

BOARD OF REGENTS OF THE UNIVERSITY SYSTEM OF GEORGIA



Project Manual

Georgia Southern University
Biological Sciences Field
House Condenser
Replacement
Project# 0260-26048

PREPARED BY

GEORGIA SOUTHERN

UNIVERSITY

A Unit of the University System of Georgia

Georgia Southern University
Biological Sciences Field House Condenser Replacement
Project No. 0260-26048

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BID REQUIREMENTS**INVITATION TO BID**

The Owner will receive sealed bids from Contractors in Room #1055, 3769 Old Register Road, Statesboro Ga. 30460. Bids must be physically on the table in the Bid Room by 2:00 P.M. o'clock, at the time legally prevailing in Statesboro, Georgia on November 6, 2026, for the construction of **0260-26048 BIOLOGICAL SCIENCES FIELD HOUSE: CONDENSER REPLACEMENTS** located on GEORGIA SOUTHERN UNIVERSITY STATESBORO CAMPUS, STATESBORO, Georgia. At the time and place noted above, the bids will be publicly opened and announced.

Bidding Documents may be viewed and ordered online by registering with Duncan Parnell via their bid room at <https://bidroom.duncan-parnell.com/>. Registration with Duncan Parnell is required to obtain the bid documents and be added to the official Plan Holder's List. Addenda notification will be sent to those buying full sets from Duncan Parnell via their bid room. The cost of bid documents and shipping is non-refundable. Neither OWNER, ARCHITECT nor ENGINEER will be responsible for copies of the bid documents obtained from sources other than from Duncan Parnell. If you need any assistance ordering or getting registered on <https://bidroom.duncan-parnell.com/> please contact our bidroom administrator at constech@duncan-parnell.com.

There will be a *pre-bid* conference held on **10/16/2026 2:00 PM**, at Georgia Southern University, Statesboro Campus at **Room #1055 and 3769 Old Register Road, Statesboro Ga. 30460**. Attendance at this conference is **MANDATORY** for any Contractor intending to bid on this project. Others may attend if they so desire.

The Following items shall be submitted with the bid package. **Failure to submit any of these items will subject the bidder to disqualification: Please submit in bid package, at the time the bid is due.**

Addendum Acknowledgement (If Any)

E-Verify
Bid Bond
Base Bid

Contract, if awarded, will be on a lump sum basis. No bid may be withdrawn for a period of thirty-five days after time has been called on the date of opening except in accordance with the provisions of Georgia law. Bids must be accompanied by a Bid Bond made payable to the Owner in an amount equal to not less than five percent of the Bid. Both a performance bond and a payment bond will be required, each in an amount equal to 100 percent of the Contract Sum prior to execution of contract.

The Owner reserves the right in its sole and complete discretion to waive technicalities and informalities. The Owner further reserves the rights in its sole and complete discretion to reject all bids and any bid that is not responsive or that is over the budget. The Owner anticipates that the contract will be awarded to the responsive and responsible bidder who provides the lowest bid within the budget. In judging whether the bidder is responsible, the Owner will consider, but is not limited to, the following:

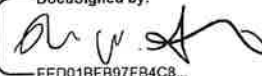
- Whether the bidder or its principals are currently ineligible, debarred, suspended, or otherwise excluded from bidding or contracting by any state or federal agency, department, or authority;
- Whether the bidder or its principals have been terminated for cause or are currently in default on a public works contract;
- Whether the bidder can demonstrate sufficient cash flow to undertake the project as evidenced by a Current Ratio of 1.0 or higher;
- Whether the bidder can demonstrate a commitment to safety with regard to Workers' Compensation by having an Experience Modification Rate (EMR) over the past three years not having exceeded an average of 1.2; and
- Whether the bidder's past work provides evidence of an ability to successfully complete public works projects within the established time, quality, or cost, or to comply with the bidder's contract obligations.

In the event all responsive and responsible bids are in excess of the budget, the Owner, in its sole and absolute discretion and in addition to rejecting all bids, reserves the right either to supplement the budget or to negotiate with the lowest responsive and responsible bidder (after all accepted deductive alternates are taken) but only for the purpose of making changes to the project that will result in a cost to the Owner that is within the budget, as it may be supplemented.

DIVISION OF FACILITIES SERVICES OF GEORGIA SOUTHERN UNIVERSITY

BY: MICHELLE STEWART, INTERIM DIRECTOR OF FPD&C

BOARD OF REGENTS OF THE UNIVERSITY
SYSTEM OF GEORGIA

DocuSigned by:

FED01BF897F84C8...

By: Ron Stalnaker,
Vice President of Business and Finance
Georgia Southern University
A Unit of the University System of Georgia
Statesboro, GA 30460-8012

BID REQUIREMENTS**INSTRUCTIONS TO BIDDERS**

1. **Basis of Contract.** Contract, if awarded, will be on a lump sum basis and will be substantially in accordance with the Contract shown on pages Contract – 1 to Contract – 4.
2. **Examination of Site.** In undertaking the work under this Contract, the Contractor acknowledges that he has visited the Project Site and has taken into consideration all observed conditions that might affect his work.
3. **Surety and Insurance Companies.** The Contract provides that the surety and insurance companies must be acceptable to the Owner. Only those sureties listed in the Department of Treasury's Listing of Approved Sureties (Department Circular 570) are acceptable to the Owner. At the time of issuance, all insurance and bonds must be issued by a company licensed by the Georgia Insurance Commissioner to transact the business of insurance in the State of Georgia for the applicable line of insurance. Such company shall be an insurer (or, for qualified self-insurers or group self-insureds, a specific excess insurer providing statutory limits) with an A.M. Best Financial Strength Rating of "A-" or better and with an A.M. Best Financial Size Category of Class V or larger.
4. **Bidding Documents.** The Bidding Documents comprise of the bid package listed above.
5. **Addenda.** All Addenda issued prior to bid date adjust, modify, or change the drawings and specifications as set forth in the Addenda. No Addenda will be issued within five days of the date set for opening bids without an extension of the bid date. All such Addenda are part of the contract.
6. **Interpretations.** No oral interpretation will be made to bidders as to the meaning of the drawings and specifications. Requests for interpretation of drawings and specifications must be made in writing to the Design Professional not later than six days prior to the date set for receipt of the bids. Failure on the part of the successful bidder to request clarification shall not relieve him as Contractor of the obligation to execute such work in accordance with a later interpretation by the Design Professional. All interpretations made to bidders will be issued in the form of Addenda to the plans and specifications and will be sent to all plan holders of record. Acknowledgement of receipt of such Addenda shall be listed in the Bid Form by the Contractor.
7. **Alternates.** Unless otherwise stipulated, all alternate bids are deductive. It is in the best interest of the public, and the intent of the Owner is, that the entire Project be constructed within the funds allocated in the Project budget. The acceptance of any deductive alternate will be utilized as a last resort to accomplish the Project without requiring a redesign and rebidding of the Project. Any alternate, or alternates, if taken, will be taken in numerical sequence to the extent necessary.
8. **Sales Tax.** Unless otherwise provided for in the Contract Documents, the Contractor shall include in his bid all sales taxes, consumer taxes, use taxes, and all other applicable taxes that are legally in effect at the time bids are received.
9. **Trade Names, Specifications.**
 - (a) *No Restriction of Competition.* When reference is made in the Contract Documents to trade names, brand names, or to the names of manufacturers, such references are made solely to indicate that products of that description may be furnished and are not intended to restrict competitive bidding. If it is desired to use products of trade or brand names or of manufacturers' names that are different from those mentioned in the Bidding Documents, application for the approval of the use of such products must reach the hands of the Design Professional at least ten days prior to the date set for the opening of bids (see 9(b) below). This provision applies only to the party making a submittal prior to bid. If approved by Design Professional, the Design Professional will issue an addendum to all bidders. This provision does not prevent the Owner from initiating the addition of trade names, brand names, or names of manufacturers by addendum prior to bid.
 - (b) *Request for Approval of Substitute Product.* All requests for approval of substitution of a product that is not listed in the Bidding Documents must be made to the Design Professional in writing. For the Design Professional to prepare an addendum properly, an application for approval of a substitute product must be accompanied by a copy of the published recommendations of the manufacturer for the installation of the product together with a complete schedule of changes in the drawings and specifications, if any, that must be made in other work in order to permit the use and installation of the proposed product in accordance with the recommendations of the manufacturer of the product. The application to the Design Professional for approval of a proposed substitute product must be accompanied by a

schedule setting forth in which respects the materials or equipment submitted for consideration differ from the materials or equipment designated in the Bidding Documents.

(c) *Burden of Proof.* The burden of proving acceptability of a proposed product rests on the party making the submission. Therefore, the application for approval must be accompanied by technical data that the party requesting approval desires to submit in support of its application. The Design Professional will consider reports from reputable independent testing laboratories, verified experience records showing the reputation of the proposed product with previous users, evidence of reputation of the manufacturer for prompt delivery, evidence of reputation of the manufacturer for efficiency in servicing its products, or any other written information that is helpful in the circumstances. The degree of proof required for approval of a proposed product as acceptable for use in place of a named product or named products is that amount of proof necessary to convince a reasonable person beyond all doubt. To be approved, a proposed product must also meet or exceed all express requirements of the Contract Documents.

(d) *Issuance of Addenda.* If the Design Professional approves the submittal, an addendum will be issued to all prospective bidders indicating the approval of the additional product(s). Issuance of an addendum is a representation to all bidders that the Design Professional in the exercise of his professional discretion established that the product submitted for approval is acceptable and meets or exceeds all express requirements. If a submittal is initially rejected by the Design Professional, but determined to be acceptable to Design Professional after a conference with the Owner, an addendum covering the said submittal will be issued prior to the opening of bids. The successful bidder may furnish no products of any trade names, brand names, or manufacturers' names except those designated in the Contract Documents unless approvals have been published by addendum in accordance with the above procedure. Oral approvals of products are not valid.

(e) *Conference with the Owner.* Any party who alleges that rejection of a submittal is the result of bias, prejudice, caprice, or error on the part of the Design Professional may request a conference with a representative of the Owner, provided: that the request for said conference, submitted in writing, shall have reached the Owner at least six days prior to the date set for the opening of bids, time being of the essence.

10. Employment of Georgia Citizens and Use of Georgia Products. The work provided for in this Contract is to be performed in Georgia. It is the desire of the Owner that materials and equipment manufactured or produced in Georgia shall be used in the work and that Georgia citizens shall be employed in the work at wages consistent with those being paid in the general area in which the work is to be performed. This desire on the part of the Owner is not intended to restrict or limit competitive bidding or to increase the cost of the work; nor shall the fulfillment of this desire be asserted by the Contractor as an excuse for any noncompliance or omission to fulfill any obligation under the contract.

11. Trading with the State Statutes, Ethics. By submitting a bid, the bidder certifies that the provisions of law contained in O.C.G.A. Sections 45-10-20 to 45-10-71, which prohibit officials and employees of the state from engaging in certain transactions with the state and state agencies, and the Governor's Executive Orders governing ethics, have not and will not be violated in any respect in regard to this contract and further certifies that registration and all disclosures required thereby have been complied with.

12. Georgia Security and Immigration Compliance Act Requirements. No bid will be considered unless the Contractor certifies its compliance with the Immigration reform and Control Act of 1986 (IRCA), D.L. 99-603 and the Georgia Security Immigration Compliance Act OCGA 13-10-91 *et seq.* The Contractor shall execute the Georgia Security and Immigration Compliance Act Affidavit, as found in Section 7 of the Construction Contract. Contractor also agrees that it will execute any affidavits required by the rules and regulations issued by the Georgia Department of Audits and Accounts. If the Contractor is the successful bidder, contractor warrants that it will include a similar provision in all written agreements with any subcontractors engaged to perform services under the Contract.

13. Owner's Policy Statement. The policy of the Owner is that minority business enterprises shall have the maximum opportunity to participate in the Owner's purchasing process. The Owner encourages all minority business enterprises to compete for, win, and receive contracts for goods, services, and construction. In addition, Georgia law provides a state income tax credit available to any business that subcontracts with a minority-owned business. [See O.C.G.A. §48-7-38 and O.C.G.A. §50-5-130. See also Executive Order of the Governor No. A-11-0002-1992.] For more information, please contact the Board of Regents' Office of Business Development by e-mail at BusinessDevelopment@usg.edu. Any questions regarding statements contained hereunder should be directed to {Name, Address, and Telephone Number of Designee, as described in the box below}.

14. Bids.

(a) *Bid Opening.* Bids will be opened and announced as stated in the Invitation to Bid.

(b) *Bid Submission.* All bids must be submitted on the Bid Form as attached hereto and must be signed, notarized, and sealed by a notary public. All blanks for information entry in bid forms submitted to Owner should be filled. Blanks left unfilled constitute irregularities in the bid and place the bidder at risk of having the bid rejected *unless* the Owner rules the irregularity to be an informality or technicality that the director can waive, as is made clear in Paragraph 16 of these "Instructions to Bidders" and on the Bid Form. Numbers shall be written in English words and in Arabic numerals. **The inclusion of any condition, alternate, qualification, limitation, or provision not called for shall render the bid nonresponsive and shall be sufficient cause for rejection of a bid.**

(c) *Bid Security.* Bids must be accompanied by a Bid Bond made payable to the Owner in an amount not less than five percent of the Bid. Bid Bonds should be furnished on forms accepted as standard by the insurance industry, but shall be substantially in accordance with the Bid Security Form attached hereto.

(d) *Delivery of Bids.* Bids are to be addressed to the Owner, at the address and room number shown in the Invitation to Bid. Bids must be enclosed in an opaque, sealed envelope; marked with the Bid Date, Bid Time, Bid Number, Name of Project; and identified with the words "Bid for Construction." Bids must be placed in the hands of the Owner at the specified location by not later than the hour and date named in the Invitation to Bid. After that time, no bids may be received. It is the sole responsibility of the bidder to ensure the delivery of the bids to the required address.

(e) *Alternates.* A bid must be submitted for all alternates. Failure to do so may render the bid nonresponsive and be sufficient cause for rejection of a bid.

(f) *Withdrawal of Bids.* Bids may be withdrawn by bidders prior to the time set for official opening. After time has been called, no bid may be withdrawn for a period of thirty-five days after the time and date of opening except as provided in O.C.G.A Section 13-10-22 (appreciable error in calculation of bid). Negligence or error on the part of any bidder in preparing his bid confers no right of withdrawal or modification of his bid after time has been called except as provided by Georgia law.

15. Contract Award. Award shall be made on a lump sum basis to the lowest responsive and responsible bidder. The lowest bid will be the bid whose price, after incorporating all accepted alternates, and evaluation of the unit pricing is the lowest responsive bid that was received from a responsible bidder. No bid may be withdrawn for a period of thirty-five days after time has been called on the date of opening except in accordance with the provisions of law.

16. Owner's Rights Concerning Award. The Owner reserves the right in its sole and complete discretion to waive technicalities and informalities. The Owner further reserves the right in its sole and complete discretion to reject all bids and any bid that is not responsive or that is over the budget, as amended. In judging whether the bidder is responsible, the Owner will consider, but is not limited to consideration of, the following:

(a) Whether the bidder or its principals are currently ineligible, debarred, suspended, or otherwise excluded from bidding or contracting by any state or federal agency, department, or authority;

(b) Whether the bidder or its principals have been terminated for cause or are currently in default on a public works contract;

(c) Whether the bidder can demonstrate sufficient cash flow to undertake the project as evidenced by a Current Ratio of 1.0 or higher;

(d) Whether the bidder can demonstrate a commitment to safety with regard to Workers' Compensation by having an Experience Modification Rate (EMR) over the past three years not having exceeded an average of 1.2; and

(e) Whether the bidder's past work provides evidence of an ability to successfully complete public works projects within the established time, quality, or cost, or to comply with the bidder's contract obligations.

17. Owner's Right to Negotiate with the Lowest Bidder. In the event *all* responsive and responsible bids are in excess of the budget, the Owner, in its sole and absolute discretion and in addition to the rights set forth above, reserves the right either to (i) supplement the budget with additional funds to permit award to the lowest responsive and responsible bid, or (ii) to negotiate with the lowest responsive and responsible bidder (after taking all deductive alternates) only for the purpose of making changes to the Project that will result in a cost to the Owner that is within the budget, as it may be amended.

18. **Contract Forms.** The contract forms, including the payment and performance bonds, shall be as set forth in the General Conditions, Section 7 – Forms.

[Remainder of Page Intentionally Left Blank]

BID REQUIREMENTS**BID FORM**

To: Owners Representative: Georgia Southern University

Re: Project Name and No. Biological Sciences Field House: Condenser Replacements #260-26048

Bid Date: 11/6/2026

THE BID:

Bid. Having carefully examined the Specifications entitled PROJECT # 0260-26048, Project Name: Biological Sciences Field House: Condenser Replacements, and the Bidding Documents and Addendum #, _____, as well as the Site and conditions affecting the Work, bidder hereby proposes to furnish all services, labor, materials, and equipment called for by them for the entire Work, in accordance with the aforesaid documents, for the sum of:

_____ Dollars (\$ _____)

which sum is hereinafter called the Bid. The Bid shall be the amount of the Contract Sum executed between the Owner and the Contractor unless Alternates are accepted.

Alternates: We further propose that, should any of the following alternates be accepted and be incorporated in the Contract, the Bid will be altered in each case as follows (Insert: NO ALTERNATES if there are no alternates):

Scope of Work:

The replacement of two Condensing Units at the Biological Sciences Field House.

Errors or Revisions. Prior to the bid opening date and hour, errors may be stricken or revisions may be made and corrections entered on this proposal form or on the bid envelope with sufficient clarity to be easily understood. All such annotations shall be binding on the bidder.

No Withdrawal. For and in consideration of the sum of \$10.00, the receipt of which is hereby acknowledged, bidder and Owner agree that this bid may not be revoked or withdrawn after the time set for the opening of bids, except as provided in Georgia law, but is an irrevocable offer that shall remain open for acceptance for a period of thirty-five days following the time set for the opening of bids.

Execution of the Contract. If bidder is notified in writing by statutory mail of the acceptance of this bid within thirty-five days after time set for the opening of bids, bidder agrees to execute within ten days the Contract for the Work for the above stated Bid, as adjusted by the accepted Alternates, and at the same time to furnish and deliver to the Owner a Performance Bond and a Payment Bond on forms shown in Section 7 of the General Conditions of the Contract, both in an amount of equal to 100 percent of the Contract Sum.

Commencement and Completion of Work. Upon the Effective Date of the Contract, bidder agrees to commence all Preconstruction Activities. Upon issuance of a Proceed Order, bidder agrees to commence physical activities on the Site with adequate forces and equipment and to complete to Material Completion all work in (120) consecutive calendar days beginning the day after the date of the Notice To Proceed Order.

Bid Bond. Enclosed herewith is a Bid Bond (NO OTHER FORM ACCEPTABLE) in the amount of _____ Dollars (\$ _____) (being not less than five percent of the Bid). Bidder agrees that the above stated amount is the proper measure of liquidated damages that the Owner will sustain by bidder's failure to execute the Contract or to furnish the Performance and Payment Bonds should bidder's bid be accepted.

Obligation of Bid Bond. If this bid is accepted within thirty-five days after the date set for the opening of bids and bidder fails to execute the Contract within ten days after Notice of Successful Bid, or if bidder fails to furnish both Performance and Payment Bonds, the obligation of the Bid Bond will remain in full force and effect and the money payable thereon shall be paid into the funds of the Owner as liquidated damages for such failure; otherwise, the obligations of the Bid Bond will be null and void.

Bidder Certification

Certification under Oath. Under oath I certify that I am a principal or other representative of the bidder, and that I am authorized by it to execute the foregoing bid on its behalf; and further, that I am a principal person of the bidder with management responsibility for the construction for the bidder, and as such I am personally knowledgeable of all its pertinent matters. I further certify that this bid is made without prior understanding, agreement, or connection with any corporation, firm, or person submitting a bid for the same services, materials, labor, supplies, or equipment and is in all respects fair and without collusion or fraud. Bidder and its principals understand that collusive bidding is a violation of state and federal law and can result in fines, prison sentences, and civil damage awards. Bidder agrees to abide by all conditions of this bid.

BY: _____
Authorized Signature (BLUE INK)

Printed Name Title

Sworn to and subscribed before me this ____ Day of _____, 20_____.

Notary Public

My commission expires: _____

(SEAL)

**NOTE: THE NOTARY SEAL MUST BE APPLIED UNDER GEORGIA LAW, WHETHER OR
NOT THE LAW OF THE STATE WHERE EXECUTED PERMITS OTHERWISE.**

**STATEMENT OF BIDDER'S QUALIFICATIONS:
(To be subscribed and sworn to before a notary public.)**

The bidder submits the following statement of bidder's qualifications for consideration by the Owner.

Bidder's Name: _____
LEGAL NAME OF BUSINESS

Bidder's Address: _____
LEGAL BUSINESS ADDRESS (NO P.O. BOX, **MUST** BE PHYSICAL ADDRESS)

CITY STATE ZIP

MAILING ADDRESS IF DIFFERENT FROM ABOVE

Telephone Number: _____
AREA CODE NUMBER

The full names of persons and firms interested in the foregoing bid as principals are as follows:

(1) _____
Circle One: President Partner Owner Other

(2) _____
Circle One: Vice President Secretary Partner Other

(3) _____
Circle One: Vice President Secretary Partner Other

Note: If incorporated: The names of both the President and Corporate Secretary must be indicated.
If a partnership, all partners must be indicated.

Social Security Number or FEIN: _____

Contractor's Georgia License Type and Number: _____

Contractor's Federal Employment Verification Certification: (Must include completed Contractor Affidavit as found in Section 7 of the Contract)

The Contractor is registered with, authorized to use, is using and will continue to use, the federal work authorization program throughout the term of the contract, and holds the following authorization:

User Identification Number: _____

Date of Authorization: _____

State Where Organized or Incorporated: _____

Plan of Organization: (Circle One) Proprietorship Corporation Partnership Joint Venture Other (Describe)

Years Engaged in Construction Contracting in Present Firm Organization: _____ years.

Bidder Hereby Certifies that bidder:

- a. Has never refused to sign a contract at the original bid on a public works contract except as allowed under Georgia law.
- b. Has never been terminated for cause on a public works contract.
- c. Has had no (criminal or felony) convictions, suspensions, or debarments of the bidder, its officers, or its principals for building code violations, bid rigging, or bribery in the last ten years.
- d. Is not and its organization or its principals are not debarred, suspended, declared ineligible, or otherwise excluded by any Federal or State department or agency from doing business with the Federal Government or a State.
- e. Has insurance required by the Contract Documents in place or has arranged to obtain it from an insurer authorized to do business in the State of Georgia.
- f. Has sufficient bonding capacity to obtain a payment and performance bond from a surety meeting the requirements of the Contract Documents and authorized to do business in the State of Georgia.
- g. Has sufficient cash flow to perform this Project.

Remarks or explanations of the above paragraphs a through g:

Bidder Certification

Certification under Oath. Under oath I certify that I am a principal or other representative of the bidder, and that I am authorized by it to execute the foregoing Statement of Bidder's Qualifications is true and correct, including any explanation above and submitted under oath.

BY: _____
Authorized Signature (BLUE INK PLEASE)

 Printed Name Title

Sworn to and subscribed before me this ____ Day of _____, 20____.

 Notary Public

My commission expires: _____

(SEAL)

NOTE: THE NOTARY SEAL MUST BE APPLIED UNDER GEORGIA LAW, WHETHER OR NOT THE LAW OF THE STATE WHERE EXECUTED PERMITS OTHERWISE.

Statistical Information. This request is made for statistical purposes only.

PLEASE INDICATE BELOW WHICH OF THE FOLLOWING DESCRIPTIONS APPLY TO YOUR COMPANY:

_____ MINORITY BUSINESS ENTERPRISE (MBE) – One of the following statements describes this business: **a)** Owned by a member of a minority race; or **b)** a partnership of which a majority of interest is owned by one or more members of a minority race; or **c)** a public corporation of which a majority of the common stock is owned by one or more members of a minority race. A member of a minority race is defined as a person who is a member of a race that comprises less than fifty percent of the total population of the State of Georgia. For recordkeeping purposes, this includes, but is not limited to, persons who are Black, Hispanic, Asian-Pacific American, Native American, or Asian-Indian American.

_____ GEORGIA MINORITY BUSINESS ENTERPRISE (GMBE) – Business meets the definition of a minority-owned business and, in addition, meets the following criteria: **a)** was organized in the State of Georgia; or **b)** reports income from the business for Georgia Income Tax purposes; or **c)** minority stockholders report earnings for Georgia Minority Business Enterprise. For more information, please contact the Board of Regents' Office of Business Development by e-mail at BusinessDevelopment@usg.edu.

_____ NEITHER DESCRIPTION APPLIES TO YOUR COMPANY.

STATEMENT OF BIDDER'S QUALIFICATIONS

**BID REQUIREMENTS
BID SECURITY FORM**

NOTE TO CONTRACTOR: Use of Surety's standard Bid Bond form is acceptable as long as it substantially complies with the following:

KNOW ALL BY THESE PRESENTS, That we, {Insert Contractor's Legal Name and Address} as Principal, hereinafter called the Principal, and {Insert Legal Name and Address of Surety}, a corporation duly organized under the laws of the State of {Insert State of Corporate Organization}, as Surety, hereinafter called the Surety, are held and firmly bound unto:

OWNER: _____

Attention: _____

Phone Number: _____

Facsimile Number: _____

as Oblige, hereinafter called the Oblige in the sum of _____ (Not less than five percent of the Bid) Dollars (\$ _____), for the payment of which sum well and truly to be made, the said Principal and the said Surety, bind ourselves, our heirs, executors, administrators, successors and assigns, jointly and severally, firmly by these presents.

WHEREAS, the Principal has submitted a Bid for _____;
{Insert Owner's Project Number and Project Description}

NOW, THEREFORE, if the Oblige shall accept the Bid of the Principal and (1) the Principal shall enter into a Contract with the Oblige in accordance with the terms of such Bid, and the Principal shall execute the Contract and give such bond or bonds as may be specified in the Bidding or Contract Documents with good and sufficient surety for the faithful performance of such Contract and for the prompt payment of labor and material furnished in the prosecution thereof; or (2) in the event of the failure of the Principal to enter such Contract and give such bond or bonds, and the Principal shall pay to the Oblige the difference not to exceed the difference hereof between the amount specified in said Bid and such larger amount for which the Oblige 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.

Signed and sealed this _____ Day of _____, 20____

Name of Contractor: _____
Principal

Witness

By: _____ (Seal)

Title

Name of Surety: _____
Surety

Witness

By: _____ (Seal) (*)

(*) Attach Power of Attorney

STATEMENT OF BIDDER'S QUALIFICATIONS

DESIGN-BID-BUILD CONSTRUCTION CONTRACT

BETWEEN CONTRACTOR AND OWNER



TO BE USED WITH
BOARD OF REGENTS OF THE UNIVERSITY SYSTEM OF GEORGIA'S
DESIGN PROFESSIONAL (ARCHITECTURAL) CONTRACT

BETWEEN

LEGAL GC FIRM NAME
(CONTRACTOR)



AND
BOARD OF REGENTS OF THE UNIVERSITY SYSTEM OF GEORGIA
(OWNER)

For the Use and Benefit of:

INSTITUTION NAME
USING AGENCY (INSTITUTION)



PROJECT NO. PROJECT NUMBER AND DESCRIPTION

INCLUDES:

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- Non-Influence Affidavit
- Statutory Affidavit
- Five Year Bond on Roofs and Walls
- Specimen Certificate of Manufacturer
- Certificate of Insurance
- Bond to Discharge Claim
- Change Order Forms
- Application for Payment Form
- Subcontractor Retainage Release Certificate
- Final Certification of Costs

SUPPLEMENTARY GENERAL CONDITIONS

CONSTRUCTION CONTRACT

BETWEEN CONTRACTOR AND OWNER

THIS CONSTRUCTION CONTRACT (hereinafter the "Contract") made this Date day of Month, Year (hereinafter the "Effective Date"), by and between the **BOARD OF REGENTS OF THE UNIVERSITY SYSTEM OF GEORGIA** (hereinafter the "Owner"), for the use and benefit of INSTITUTION NAME (hereinafter the "Using Agency" or "Institution") LEGAL GC Firm Name, (hereinafter the "General Contractor" / "Contractor"), whose address is MUST be a physical address. NO P.O. Boxes.; Phone: XXX-XXX-XXXX; Fax XXX-XXX-XXXX

(a) Contractor's FEIN or Tax Identification Number: _____

(b) Contractor's Georgia License Type and Number: _____

(c) Contractor's Federal Employment Verification Certification:

The Contractor is registered with, authorized to use, is using and will continue to use, the federal work authorization program throughout the term of the contract, and holds the following authorization:

User Identification Number: _____

Date of Authorization: Date

WITNESSETH, that the Contractor and the Owner, for the consideration set forth herein, the adequacy and sufficiency of which is hereby acknowledged by each party, agree as follows:

Project No. Project Number

Project Name and Description: PROJECT NAME AND DESCRIPTION (hereinafter the "Project.")

1. Existing Documents. The Contractor has reviewed and taken into consideration the Bidding Documents in preparing his bid.

2. The Contract Sum: The Owner shall pay the Contractor for the performance of the contract, subject to additions and deductions provided by approved change orders, in current funds, the Contract Sum as follows, base bid less Deductive Alternate 1:

_____ AND /100 DOLLARS (\$ _____)

3. The Material Completion and Occupancy Date shall be achieved within Days consecutive calendar days beginning the date specified in the Proceed Order. *(Or by a date certain – be specific as to what was represented in the Bid Documents – REMOVE THIS STATEMENT PRIOR TO FINALIZING THE CONTRACT!)*

4. The agreed daily amount for Liquidated Damages is: \$_____ per day.

5. The agreed daily amount for Time Dependent Overhead Costs is: \$_____ per day.

6. Notice. All notices in accordance with Section 1.1.5 shall be given to the following addresses:

CONTRACTOR:	LEGAL GC Firm Name Physical Address, NO P.O. Boxes City, State Zip Attention: CM-POC, Title Phone Number: CM-POC Phone Facsimile Number: CM-POC Fax Email: CM-POC Email address
OWNER:	Board of Regents of the University System of Georgia 270 Washington Street, SW, 6 th Floor Atlanta, Georgia 30334 Attention: Jim James, Vice Chancellor for Facilities Phone Number: 404-962-3155 Facsimile Number: 404-962-3188
OWNER'S REPRESENTATIVE:	Board of Regents of the University System of Georgia 270 Washington Street, SW, 6 th Floor Atlanta, Georgia 30334 Attention: Choose One Phone Number: BOR-PM Phone Facsimile Number: 404-962-3188 Email: Choose Appropriate Email
USING AGENCY (Institution):	Institution Name Physical Address, NO P.O. Boxes City, State Zip Attention: Project POC, Title Phone Number: Project POC Phone Facsimile Number: Project POC Fax Email: Project POC Email Address
DESIGN PROFESSIONAL:	LEGAL DP Firm Name Physical Address, NO P.O. Boxes City, State Zip Attention: DP-POC, Title Phone Number: DP-POC Phone Facsimile Number: DP-POC Fax Email: DP-POC Email Address

7. **Scope Of The Work:** The Contractor shall furnish all the materials, perform all of the Work, and do all things required by the Contract Documents.

8. **Schedule and Completion:** The Pre-commencement Phase Services to be performed under this Contract shall commence upon the Effective Date of the Contract and be completed within 60 days thereafter. Activities on the Site shall commence on the date specified in the Proceed Order and shall be materially complete in accordance with established Milestones, and not later than the Material Completion and Occupancy Date.

9. **Periodic Progress Payments:** The Owner shall make progress payments, less retainage, as set forth in Section 4 of the General Conditions.

10. **Payment for Material Completion:** The Contractor may request payment of the remaining contract balance, including retainage, less amounts credited the Owner or incurred as liquidated damages, and less amounts withheld for the Punchlist

by reason of Minor Items or Permitted Incomplete Work (See Paragraph 6.5.3.2). Payment for Material Completion shall be made by a check payable jointly to the Contractor and Surety and shall be mailed to the Surety.

11. Final Payment: Final Payment shall be made within ten days of receipt of the final payment application as set forth in Section 6, Part 2 of the General Conditions, provided that all other requirements of the Contract shall have been met in full.

12. The Contract Documents: This Contract, together with the Bidding Documents and the Bid, shall constitute the Contract Documents for the Project.

13. Bonds: The Contractor shall furnish both a performance bond and a payment bond and shall pay the premiums thereon as a Cost of the Work. The Performance Bond shall guarantee the full performance of the Contract.

14. Full Performance: The Owner and the Contractor hereby agree to the full performance of the Contract Documents.

15. Applicable Law: This Contract and all rights, privileges and responsibilities shall be interpreted and construed according to the laws of the State of Georgia.

16. No Conflict Of Interest: The Contractor covenants that it presently has no interest and shall not acquire any interest, direct or indirect, that would conflict in any manner or degree with the performance required under this Contract. The Contractor further covenants that, in the performance of this Contract, it shall neither contract with nor employ any person having any such interest.

17. Transactions With State Officials, Ethics: The parties hereto certify that the provisions of law contained in the Act prohibiting full-time appointive officials and employees of the State from engaging in certain transactions affecting the State as defined in O.C.G.A. §§45-10-20–26 and the Governor's Executive Orders governing ethics, have not and will not be violated in any respect in regard to this contract and further certifies that registration and all disclosures required thereby have been complied with.

18. No Assignment: This Contract and the proceeds of this Contract may not be assigned or sublet as a whole, nor may the performance thereunder be assigned, without the prior written consent of the Owner.

19. No Waiver: The failure of the Owner at any time to require performance by the Contractor of any provision hereof, shall in no way affect the right of the Owner thereafter to enforce any provision or any part of the Contract, nor shall the failure of the Owner to enforce any breach of any provision hereof to be taken or held to be a waiver of such provision, or as a waiver, modification or rescission of the Contract itself.

20. Boycott of Israel. The Contractor certifies that it is not currently, nor will it engage in during the duration of this contract, a boycott of Israel as defined in the Official Code of Georgia (O.C.G.A. 50-5-85).

21. Full Agreement. The Contract Documents supersede all prior negotiations, discussion, statements, and agreements between Owner and Contractor and constitute the full, complete, and entire agreement between Owner and Contractor. There can be no changes to this Contract by oral means, nor by course of conduct of the parties, nor by custom of the trade. No changes to this Contract will be binding on either party hereto unless such change is properly authorized, in writing, in accordance with Section 3, Part 2 of the General Conditions.

[Remainder of Page Intentionally Left Blank]

[Signatures Begin on Next Page]

IN WITNESS WHEREOF the parties hereto have executed this Contract the day and year first written above.

LEGAL GC FIRM NAME
Contractor

ATTEST:

_____, (L.S.)
_____, SECRETARY
(SEAL, OVER SIGNATURE)
(If not a corporation, signature must be notarized.)

By: _____ (L.S.)
_____, PRESIDENT

APPROVED: USING AGENCY

By: _____
PRINT NAME AND TITLE
INSTITUTION NAME

WITNESS: _____

(PRINT NAME / TITLE)

BOARD OF REGENTS OF THE UNIVERSITY
SYSTEM OF GEORGIA, OWNER

By: _____ (L.S.)
SHARON FERGUSON POPE
ASSISTANT VICE CHANCELLOR
FOR DESIGN AND CONSTRUCTION

WITNESS: _____
TERESA CORSO
DIRECTOR OF CONTRACTS & SERVICES

Attachments:

1. General Conditions and Forms
2. Supplementary General Conditions

BID REQUIREMENTS

INVITATION TO BID

The Owner will receive sealed bids from Contractors in Room # _____, Insert PHYSICAL Address of Bid Opening (Address). Bids must be physically on the table in the Bid Room by Specific Time o'clock, at the time legally prevailing in Atlanta, Georgia on Month Day, Year, for the construction of INSERT PROJECT NUMBER AND DESCRIPTION, located in INSERT INSTITUTION NAME AND CITY, Georgia. At the time and place noted above, the bids will be publicly opened and announced.

Bidding Documents may be obtained at the office of the Design Professional, Insert DP Firm Name, Phone: Insert DP Phone. Applications for documents, together with deposit of \$ _____ per set, should be filed promptly with the Design Professional.

Bidders are cautioned that acquisition of Bidding Documents through any source other than the office of the Design Professional is not advisable. Acquisition of Bidding Documents from unauthorized sources places the bidder at risk of receiving incomplete or inaccurate information upon which to base a bid.

NOTE TO DESIGN PROFESSIONAL

{If pre-bid conference is scheduled and is mandatory, the following paragraph will be added to the Invitation to Bid.}

There will be a *pre-bid* conference held on **{date and time of pre-bid conference}**, at **{location of pre-bid conference inserted here}**. Attendance at this conference is **MANDATORY** for any Contractor intending to bid on this project. Others may attend if they so desire.

NOTE TO DESIGN PROFESSIONAL

{If the contract requires prequalification of the Contractors, the following paragraph will be added to the Invitation to Bid}

Bidders' attention is called to the Supplementary General Conditions, which establishes minimum qualifications for Contractors bidding this project. The Statement of Qualifications specified shall be submitted in writing to the Owner as required in the Supplementary General Conditions. Bids will not be accepted from Contractors failing to meet the qualifications established or from Contractors failing to submit the required documentation of qualifications. A listing of qualified bidders will be published and distributed to plan holders of record on or before **{date inserted here}**. All protests of decisions regarding qualifications must be submitted in writing to the Owner by not later than three working days thereafter.

The Design Professional will send the Bidding Documents, shipping charges collect, as soon as possible after receipt of application and deposit. The full amount of the deposit for one set of Bidding Documents will be refunded upon return of such set in good condition within thirty days after opening of bids. One-half of all other deposits for additional sets of Bidding Documents will be refunded upon return of these additional documents, complete and in good condition, within thirty days after opening of bids. "Good condition" is defined to require that documents will not have been taken apart or marked in a manner that limits their re-use for construction.

Contract, if awarded, will be on a lump sum basis. No bid may be withdrawn for a period of thirty-five days after time has been called on the date of opening except in accordance with the provisions of Georgia law. Bids must be accompanied by a Bid Bond made payable to the Owner in an amount equal to not less than five percent of the Bid. Both a performance bond and a payment bond will be required, each in an amount equal to 100 percent of the Contract Sum prior to execution of contract.

The Owner reserves the right in its sole and complete discretion to waive technicalities and informalities. The Owner further reserves the rights in its sole and complete discretion to reject all bids and any bid that is not responsive or that is over the budget. The Owner anticipates that the contract will be awarded to the responsive and responsible bidder who provides the lowest bid within the budget. In judging whether the bidder is responsible, the Owner will consider, but is not limited to, the following:

- Whether the bidder or its principals are currently ineligible, debarred, suspended, or otherwise excluded from bidding or contracting by any state or federal agency, department, or authority;
- Whether the bidder or its principals have been terminated for cause or are currently in default on a public works contract;
- Whether the bidder can demonstrate sufficient cash flow to undertake the project as evidenced by a Current Ratio of 1.0 or higher;
- Whether the bidder can demonstrate a commitment to safety with regard to Workers' Compensation by having an Experience Modification Rate (EMR) over the past three years not having exceeded an average of 1.2; and
- Whether the bidder's past work provides evidence of an ability to successfully complete public works projects within the established time, quality, or cost, or to comply with the bidder's contract obligations.

In the event all responsive and responsible bids are in excess of the budget, the Owner, in its sole and absolute discretion and in addition to rejecting all bids, reserves the right either to supplement the budget or to negotiate with the lowest responsive and responsible bidder (after all deductive alternates are taken) but only for the purpose of making changes to the project that will result in a cost to the Owner that is within the budget, as it may be supplemented.

BOARD OF REGENTS OF THE UNIVERSITY SYSTEM OF GEORGIA

BY: JIM JAMES, VICE CHANCELLOR FOR FACILITIES

NOTE – If within campus delegated authority, replace VC James' name with the campus' project procurement entity.

BID REQUIREMENTS

INSTRUCTIONS TO BIDDERS

1. **Basis of Contract.** Contract, if awarded, will be on a lump sum basis and will be substantially in accordance with the Contract shown on pages Contract – 1 to Contract – 4.
2. **Examination of Site.** In undertaking the work under this Contract, the Contractor acknowledges that he has visited the Project Site and has taken into consideration all observed conditions that might affect his work.
3. **Surety and Insurance Companies.** The Contract provides that the surety and insurance companies must be acceptable to the Owner. Only those sureties listed in the Department of Treasury's Listing of Approved Sureties (Department Circular 570) are acceptable to the Owner. At the time of issuance, all insurance and bonds must be issued by a company licensed by the Georgia Insurance Commissioner to transact the business of insurance in the State of Georgia for the applicable line of insurance. Such company shall be an insurer (or, for qualified self insurers or group self insureds, a specific excess insurer providing statutory limits) with an A.M. Best Financial Strength Rating of "A-" or better and with an A.M. Best Financial Size Category of Class V or larger.
4. **Bidding Documents.** The Bidding Documents comprise the Construction Documents, the Invitation to Bid, the Instructions to Bidders, the Bid Form, and all Addenda, upon which the bidder submits a bid.
5. **Addenda.** All Addenda issued prior to bid date adjust, modify, or change the drawings and specifications as set forth in the Addenda. No Addenda will be issued within five days of the date set for opening bids without an extension of the bid date. All such Addenda are part of the contract.
6. **Interpretations.** No oral interpretation will be made to bidders as to the meaning of the drawings and specifications. Requests for interpretation of drawings and specifications must be made in writing to the Design Professional not later than six days prior to the date set for receipt of the bids. Failure on the part of the successful bidder to request clarification shall not relieve him as Contractor of the obligation to execute such work in accordance with a later interpretation by the Design Professional. All interpretations made to bidders will be issued in the form of Addenda to the plans and specifications and will be sent to all plan holders of record. Acknowledgement of receipt of such Addenda shall be listed in the Bid Form by the Contractor.
7. **Alternates.** Unless otherwise stipulated, all alternate bids are deductive. It is in the best interest of the public, and the intent of the Owner is, that the entire Project be constructed within the funds allocated in the Project budget. The acceptance of any deductive alternate will be utilized as a last resort to accomplish the Project without requiring a redesign and rebidding of the Project. Any alternate, or alternates, if taken, will be taken in numerical sequence to the extent necessary.
8. **Sales Tax.** Unless otherwise provided for in the Contract Documents, the Contractor shall include in his bid all sales taxes, consumer taxes, use taxes, and all other applicable taxes that are legally in effect at the time bids are received.
9. **Trade Names, Specifications.**
 - (a) *No Restriction of Competition.* When reference is made in the Contract Documents to trade names, brand names, or to the names of manufacturers, such references are made solely to indicate that products of that description may be furnished and are not intended to restrict competitive bidding. If it is desired to use products of trade or brand names or of manufacturers' names that are different from those mentioned in the Bidding Documents, application for the approval of the use of such products must reach the hands of the Design Professional at least ten days prior to the date set for the opening of bids (see 9(b) below). This provision applies only to the party making a submittal prior to bid. If approved by Design Professional, the Design Professional will issue an addendum to all bidders. This provision does not prevent the Owner from initiating the addition of trade names, brand names, or names of manufacturers by addendum prior to bid.
 - (b) *Request for Approval of Substitute Product.* All requests for approval of substitution of a product that is not listed in the Bidding Documents must be made to the Design Professional in writing. For the Design Professional to prepare an addendum properly, an application for approval of a substitute product must be accompanied by a copy of the published recommendations of the manufacturer for the installation of the product together with a complete schedule of changes in the drawings and specifications, if any, that must be made in other work in order to permit the use and installation of the proposed product in accordance with the recommendations of the manufacturer of the product. The application to the Design Professional for approval of a proposed substitute product must be accompanied by a

schedule setting forth in which respects the materials or equipment submitted for consideration differ from the materials or equipment designated in the Bidding Documents.

(c) *Burden of Proof.* The burden of proving acceptability of a proposed product rests on the party making the submission. Therefore, the application for approval must be accompanied by technical data that the party requesting approval desires to submit in support of its application. The Design Professional will consider reports from reputable independent testing laboratories, verified experience records showing the reputation of the proposed product with previous users, evidence of reputation of the manufacturer for prompt delivery, evidence of reputation of the manufacturer for efficiency in servicing its products, or any other written information that is helpful in the circumstances. The degree of proof required for approval of a proposed product as acceptable for use in place of a named product or named products is that amount of proof necessary to convince a reasonable person beyond all doubt. To be approved, a proposed product must also meet or exceed all express requirements of the Contract Documents.

(d) *Issuance of Addenda.* If the Design Professional approves the submittal, an addendum will be issued to all prospective bidders indicating the approval of the additional product(s). Issuance of an addendum is a representation to all bidders that the Design Professional in the exercise of his professional discretion established that the product submitted for approval is acceptable and meets or exceeds all express requirements. If a submittal is initially rejected by the Design Professional, but determined to be acceptable to Design Professional after a conference with the Owner, an addendum covering the said submittal will be issued prior to the opening of bids. The successful bidder may furnish no products of any trade names, brand names, or manufacturers' names except those designated in the Contract Documents unless approvals have been published by addendum in accordance with the above procedure. Oral approvals of products are not valid.

(e) *Conference with the Owner.* Any party who alleges that rejection of a submittal is the result of bias, prejudice, caprice, or error on the part of the Design Professional may request a conference with a representative of the Owner, provided: that the request for said conference, submitted in writing, shall have reached the Owner at least six days prior to the date set for the opening of bids, time being of the essence.

10. Employment of Georgia Citizens and Use of Georgia Products. The work provided for in this Contract is to be performed in Georgia. It is the desire of the Owner that materials and equipment manufactured or produced in Georgia shall be used in the work and that Georgia citizens shall be employed in the work at wages consistent with those being paid in the general area in which the work is to be performed. This desire on the part of the Owner is not intended to restrict or limit competitive bidding or to increase the cost of the work; nor shall the fulfillment of this desire be asserted by the Contractor as an excuse for any noncompliance or omission to fulfill any obligation under the contract.

11. Trading with the State Statutes, Ethics. By submitting a bid, the bidder certifies that the provisions of law contained in O.C.G.A. Sections 45-10-20 to 45-10-71, which prohibit officials and employees of the state from engaging in certain transactions with the state and state agencies, and the Governor's Executive Orders governing ethics, have not and will not be violated in any respect in regard to this contract and further certifies that registration and all disclosures required thereby have been complied with.

12. Georgia Security and Immigration Compliance Act Requirements. No bid will be considered unless the Contractor certifies its compliance with the Immigration reform and Control Act of 1986 (IRCA), D.L. 99-603 and the Georgia Security Immigration Compliance Act OCGA 13-10-91 *et seq.* The Contractor shall execute the Georgia Security and Immigration Compliance Act Affidavit, as found in Section 7 of the Construction Contract. Contractor also agrees that it will execute any affidavits required by the rules and regulations issued by the Georgia Department of Audits and Accounts. If the Contractor is the successful bidder, contractor warrants that it will include a similar provision in all written agreements with any subcontractors engaged to perform services under the Contract.

13. Owner's Policy Statement. The policy of the Owner is that minority business enterprises shall have the maximum opportunity to participate in the Owner's purchasing process. The Owner encourages all minority business enterprises to compete for, win, and receive contracts for goods, services, and construction. In addition, Georgia law provides a state income tax credit available to any business that subcontracts with a minority-owned business. [See O.C.G.A. §48-7-38 and O.C.G.A. §50-5-130. See also Executive Order of the Governor No. A-11-0002-1992.] For more information, please contact the Board of Regents' Office of Business Development by e-mail at BusinessDevelopment@usg.edu. Any questions regarding statements contained hereunder should be directed to {Name, Address, and Telephone Number of Designee, as described in the box below}.

NOTE TO DESIGN PROFESSIONAL

By Executive Order of the Governor, all state agencies, authorities, commissions, and institutions shall have appointed a designee to act as a liaison between their organization and minority vendors to provide one-on-one assistance and to ensure that bid information is widely and appropriately disseminated. The name, address, and telephone number of this person is to be posted on all Bidding Documents.

The Governor's Small Business Center (<http://www2.state.ga.us/departments/doas/gsbcc/index.html>; phone 404.656.6315 or 1.800.395.0053) is charged with assisting in these matters.

14. Bids.

(a) *Bid Opening.* Bids will be opened and announced as stated in the Invitation to Bid.

(b) *Bid Submission.* All bids must be submitted on the Bid Form as attached hereto and must be signed, notarized, and sealed by a notary public. All blanks for information entry in bid forms submitted to Owner should be filled. Blanks left unfilled constitute irregularities in the bid and place the bidder at risk of having the bid rejected *unless* the Owner rules the irregularity to be an informality or technicality that the director can waive, as is made clear in Paragraph 16 of these "Instructions to Bidders" and on the Bid Form. Numbers shall be written in English words and in Arabic numerals. **The inclusion of any condition, alternate, qualification, limitation, or provision not called for shall render the bid nonresponsive and shall be sufficient cause for rejection of a bid.**

(c) *Bid Security.* Bids must be accompanied by a Bid Bond made payable to the Owner in an amount not less than five percent of the Bid. Bid Bonds should be furnished on forms accepted as standard by the insurance industry, but shall be substantially in accordance with the Bid Security Form attached hereto.

(d) *Delivery of Bids.* Bids are to be addressed to the Owner, at the address and room number shown in the Invitation to Bid. Bids must be enclosed in an opaque, sealed envelope; marked with the Bid Date, Bid Time, Bid Number, Name of Project; and identified with the words "Bid for Construction." Bids must be placed in the hands of the Owner at the specified location by not later than the hour and date named in the Invitation to Bid. After that time, no bids may be received. It is the sole responsibility of the bidder to ensure the delivery of the bids to the required address.

(e) *Alternates.* A bid must be submitted for all alternates. Failure to do so may render the bid nonresponsive and be sufficient cause for rejection of a bid.

(f) *Withdrawal of Bids.* Bids may be withdrawn by bidders prior to the time set for official opening. After time has been called, no bid may be withdrawn for a period of thirty-five days after the time and date of opening except as provided in O.C.G.A Section 13-10-22 (appreciable error in calculation of bid). Negligence or error on the part of any bidder in preparing his bid confers no right of withdrawal or modification of his bid after time has been called except as provided by Georgia law.

15. Contract Award. Award shall be made on a lump sum basis to the lowest responsive and responsible bidder. The lowest bid will be the bid whose price, after incorporating all accepted alternates, is the lowest responsive bid that was received from a responsible bidder. No bid may be withdrawn for a period of thirty-five days after time has been called on the date of opening except in accordance with the provisions of law.

16. Owner's Rights Concerning Award. The Owner reserves the right in its sole and complete discretion to waive technicalities and informalities. The Owner further reserves the right in its sole and complete discretion to reject all bids and any bid that is not responsive or that is over the budget, as amended. In judging whether the bidder is responsible, the Owner will consider, but is not limited to consideration of, the following:

(a) Whether the bidder or its principals are currently ineligible, debarred, suspended, or otherwise excluded from bidding or contracting by any state or federal agency, department, or authority;

(b) Whether the bidder or its principals have been terminated for cause or are currently in default on a public works contract;

(c) Whether the bidder can demonstrate sufficient cash flow to undertake the project as evidenced by a Current Ratio of 1.0 or higher;

(d) Whether the bidder can demonstrate a commitment to safety with regard to Workers' Compensation by having an Experience Modification Rate (EMR) over the past three years not having exceeded an average of 1.2; and

(e) Whether the bidder's past work provides evidence of an ability to successfully complete public works projects within the established time, quality, or cost, or to comply with the bidder's contract obligations.

17. Owner's Right to Negotiate with the Lowest Bidder. In the event *all* responsive and responsible bids are in excess of the budget, the Owner, in its sole and absolute discretion and in addition to the rights set forth above, reserves the right either to (i) supplement the budget with additional funds to permit award to the lowest responsive and responsible bid, or (ii) to negotiate with the lowest responsive and responsible bidder (after taking all deductive alternates) only for the purpose of making changes to the Project that will result in a cost to the Owner that is within the budget, as it may be amended.

18. Contract Forms. The contract forms, including the payment and performance bonds, shall be as set forth in the General Conditions, Section 7 – Forms.

[Remainder of Page Intentionally Left Blank]

BID REQUIREMENTS**BID FORM**

To: OWNER _____

Re: Project Name and No. _____

Bid Date: _____

THE BID:

Bid. Having carefully examined the Specifications entitled {DESIGN PROFESSIONAL insert Project name and number}, the Bidding Documents, Drawings: {DESIGN PROFESSIONAL insert sheet numbers and revision dates here. i.e.,: A1, A2, G3 dated August 1, 2016}, and Addendum No.(s): _____ as well as the Site and conditions affecting the Work, bidder hereby proposes to furnish all services, labor, materials, and equipment called for by them for the entire Work, in accordance with the aforesaid documents, for the sum of:

_____ Dollars (\$ _____)

which sum is hereinafter called the Bid. The Bid shall be the amount of the Contract Sum executed between the Owner and the Contractor unless Alternates are accepted.

Alternates. We further propose that, should any of the following alternates be accepted and be incorporated in the Contract, the Bid will be altered in each case as follows:

NOTE TO DESIGN PROFESSIONAL: Insert:
NO ALTERNATES
 (If there are no alternates)

OR (for example, if there are alternates)

Alternate No. 1 – Delete prime coat, asphalt base course, tack coat and asphalt surface courses as specified in Section 02513 – Asphaltic Concrete Paving, and all areas indicated to receive "Asphalt Paving" and "Asphalt Paving – Heavy Duty." Do not delete preparation of subgrade to receive asphaltic concrete paving.

Deduct the sum of _____ Dollars (\$ _____)

Alternate No. 2 – Delete perimeter fence lighting including light fixtures, poles, underground branch circuits and branch circuit breakers, 44 total.

Deduct the sum of _____ Dollars (\$ _____)

[Design Professional is cautioned not to set alternates that are subsets of other alternates, rendering it impossible to accept any or all alternates in numerical sequence.]

Errors or Revisions. Prior to the bid opening date and hour, errors may be stricken or revisions may be made and corrections entered on this proposal form or on the bid envelope with sufficient clarity to be easily understood. All such annotations shall be binding on the bidder.

No Withdrawal. For and in consideration of the sum of \$10.00, the receipt of which is hereby acknowledged, bidder and Owner agree that this bid may not be revoked or withdrawn after the time set for the opening of bids, except as provided in Georgia law, but is an irrevocable offer that shall remain open for acceptance for a period of thirty-five days following the time set for the opening of bids.

Execution of the Contract. If bidder is notified in writing by statutory mail of the acceptance of this bid within thirty-five days after time set for the opening of bids, bidder agrees to execute within ten days the Contract for the Work for the above stated Bid, as adjusted by the accepted Alternates, and at the same time to furnish and deliver to the Owner a Performance Bond and a Payment Bond on forms shown in Section 7 of the General Conditions of the Contract, both in an amount of equal to 100 percent of the Contract Sum.

Commencement and Completion of Work. Upon the Effective Date of the Contract, bidder agrees to commence all Preconstruction Activities. Upon issuance of a Proceed Order, bidder agrees to commence physical activities on the Site with adequate forces and equipment and to complete to Material Completion all work in **DESIGN PROFESSIONAL insert the number of days for completion of the Project** consecutive calendar days (**remove consecutive calendar days if it is a date certain**) beginning the day after the date of the Proceed Order.

Bid Bond. Enclosed herewith is a Bid Bond (*NO OTHER FORM ACCEPTABLE*) in the amount of _____ Dollars (\$ _____) (being not less than five percent of the Bid). Bidder agrees that the above stated amount is the proper measure of liquidated damages that the Owner will sustain by bidder's failure to execute the Contract or to furnish the Performance and Payment Bonds should bidder's bid be accepted.

Obligation of Bid Bond. If this bid is accepted within thirty-five days after the date set for the opening of bids and bidder fails to execute the Contract within ten days after Notice of Successful Bid, or if bidder fails to furnish both Performance and Payment Bonds, the obligation of the Bid Bond will remain in full force and effect and the money payable thereon shall be paid into the funds of the Owner as liquidated damages for such failure; otherwise, the obligations of the Bid Bond will be null and void.

Bidder Certification

Certification under Oath. Under oath I certify that I am a principal or other representative of the bidder, and that I am authorized by it to execute the foregoing bid on its behalf; and further, that I am a principal person of the bidder with management responsibility for the construction for the bidder, and as such I am personally knowledgeable of all its pertinent matters. I further certify that this bid is made without prior understanding, agreement, or connection with any corporation, firm, or person submitting a bid for the same services, materials, labor, supplies, or equipment and is in all respects fair and without collusion or fraud. Bidder and its principals understand that collusive bidding is a violation of state and federal law and can result in fines, prison sentences, and civil damage awards. Bidder agrees to abide by all conditions of this bid.

BY: _____
Authorized Signature (BLUE INK)

Printed Name Title

Sworn to and subscribed before me this ____ Day of _____, 20____.

Notary Public

My commission expires: _____

(SEAL)

NOTE: THE NOTARY SEAL MUST BE APPLIED UNDER GEORGIA LAW, WHETHER OR NOT THE LAW OF THE STATE WHERE EXECUTED PERMITS OTHERWISE.

**STATEMENT OF BIDDER'S QUALIFICATIONS:
(To be subscribed and sworn to before a notary public.)**

The bidder submits the following statement of bidder's qualifications for consideration by the Owner.

Bidder's Name: _____
LEGAL NAME OF BUSINESS

Bidder's Address: _____
LEGAL BUSINESS ADDRESS (NO P.O. BOX, MUST BE PHYSICAL ADDRESS)

CITY STATE ZIP

MAILING ADDRESS IF DIFFERENT FROM ABOVE

Telephone Number: _____
AREA CODE NUMBER

The full names of persons and firms interested in the foregoing bid as principals are as follows:

(1) _____
Circle One: President Partner Owner Other

(2) _____
Circle One: Vice President Secretary Partner Other

(3) _____
Circle One: Vice President Secretary Partner Other

Note: If incorporated: The names of both the President and Corporate Secretary must be indicated.
If a partnership, all partners must be indicated.

Social Security Number or FEIN: _____

Contractor's Georgia License Type and Number: _____

Contractor's Federal Employment Verification Certification: (Must include completed Contractor Affidavit as found in Section 7 of the Contract)

The Contractor is registered with, authorized to use, is using and will continue to use, the federal work authorization program throughout the term of the contract, and holds the following authorization:

User Identification Number: _____

Date of Authorization: _____

State Where Organized or Incorporated: _____

Plan of Organization: (Circle One) Proprietorship Corporation Partnership Joint Venture Other (Describe)

Years Engaged in Construction Contracting in Present Firm Organization: _____ years.

Bidder Hereby Certifies that bidder:

- a. Has never refused to sign a contract at the original bid on a public works contract except as allowed under Georgia law.
- b. Has never been terminated for cause on a public works contract.
- c. Has had no (criminal or felony) convictions, suspensions, or debarments of the bidder, its officers, or its principals for building code violations, bid rigging, or bribery in the last ten years.
- d. Is not and its organization or its principals are not debarred, suspended, declared ineligible, or otherwise excluded by any Federal or State department or agency from doing business with the Federal Government or a State.
- e. Has insurance required by the Contract Documents in place or has arranged to obtain it from an insurer authorized to do business in the State of Georgia.
- f. Has sufficient bonding capacity to obtain a payment and performance bond from a surety meeting the requirements of the Contract Documents and authorized to do business in the State of Georgia.
- g. Has sufficient cash flow to perform this Project.

Remarks or explanations of the above paragraphs a through g:

Bidder Certification

Certification under Oath. Under oath I certify that I am a principal or other representative of the bidder, and that I am authorized by it to execute the foregoing Statement of Bidder's Qualifications is true and correct, including any explanation above and submitted under oath.

BY: _____
 Authorized Signature (BLUE INK PLEASE)

 Printed Name Title

Sworn to and subscribed before me this ____ Day of _____, 20____.

 Notary Public

My commission expires: _____

(SEAL)

NOTE: THE NOTARY SEAL MUST BE APPLIED UNDER GEORGIA LAW, WHETHER OR NOT THE LAW OF THE STATE WHERE EXECUTED PERMITS OTHERWISE.

Statistical Information. This request is made for statistical purposes only.

PLEASE INDICATE BELOW WHICH OF THE FOLLOWING DESCRIPTIONS APPLY TO YOUR COMPANY:

_____ MINORITY BUSINESS ENTERPRISE (MBE) – One of the following statements describes this business: **a)** Owned by a member of a minority race; or **b)** a partnership of which a majority of interest is owned by one or more members of a minority race; or **c)** a public corporation of which a majority of the common stock is owned by one or more members of a minority race. A member of a minority race is defined as a person who is a member of a race that comprises less than fifty percent of the total population of the State of Georgia. For recordkeeping purposes, this includes, but is not limited to, persons who are Black, Hispanic, Asian-Pacific American, Native American, or Asian-Indian American.

_____ GEORGIA MINORITY BUSINESS ENTERPRISE (GMBE) – Business meets the definition of a minority-owned business and, in addition, meets the following criteria: **a)** was organized in the State of Georgia; or **b)** reports income from the business for Georgia Income Tax purposes; or **c)** minority stockholders report earnings for Georgia Minority Business Enterprise. For more information, please contact the Board of Regents' Office of Business Development by e-mail at BusinessDevelopment@usg.edu.

_____ NEITHER DESCRIPTION APPLIES TO YOUR COMPANY.

**BID REQUIREMENTS
BID SECURITY FORM**

NOTE TO CONTRACTOR: Use of Surety's standard Bid Bond form is acceptable as long as it substantially complies with the following:

KNOW ALL BY THESE PRESENTS, That we, {Insert Contractor's Legal Name and Address} as Principal, hereinafter called the Principal, and {Insert Legal Name and Address of Surety}, a corporation duly organized under the laws of the State of {Insert State of Corporate Organization}, as Surety, hereinafter called the Surety, are held and firmly bound unto:

OWNER: _____

Attention: _____

Phone Number: _____

Facsimile Number: _____

as Obligee, hereinafter called the Obligee in the sum of _____ (Not less than five percent of the Bid) Dollars (\$ _____), for the payment of which sum well and truly to be made, the said Principal and the said Surety, bind ourselves, our heirs, executors, administrators, successors and assigns, jointly and severally, firmly by these presents.

WHEREAS, the Principal has submitted a Bid for _____;
{Insert Owner's Project Number and Project Description}

NOW, THEREFORE, if the Obligee shall accept the Bid of the Principal and (1) the Principal shall enter into a Contract with the Obligee in accordance with the terms of such Bid, and the Principal shall execute the Contract and give such bond or bonds as may be specified in the Bidding or Contract Documents with good and sufficient surety for the faithful performance of such Contract and for the prompt payment of labor and material furnished in the prosecution thereof; or (2) in the event of the failure of the Principal to enter such Contract and give such bond or bonds, and the Principal shall pay to the Obligee the difference not to exceed the difference hereof between the amount specified in said Bid and such larger amount for which the Obligee 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.

Signed and sealed this _____ Day of _____, 20____

Name of Contractor: _____
Principal

Witness

By: _____ (Seal)

Title

Name of Surety: _____
Surety

Witness

By: _____ (Seal) (*)

(*) Attach Power of Attorney

SECTION 7 – FORMS

FORMS INDEX:

- Performance Bond
- Payment Bond
- Georgia Security and Immigration Compliance Act Affidavit(s)
- Non-Influence Affidavit
- Statutory Affidavit
- Five Year Bond on Roofs and Walls
- Specimen Certificate of Manufacturer
- Certificate of Insurance
- Bond to Discharge Claim
- Change Order Forms
- Application for Payment Form
- Subcontractor Retainage Release Certificate
- Final Certification of Costs

PERFORMANCE BOND

Bond No. _____

Project No. Project Number

KNOW ALL MEN BY THESE PRESENTS:

That _____ as principal (hereinafter referred to as "Contractor"), and _____ as surety (hereinafter referred to as "Surety"), are held and firmly bound unto the Board of Regents of the University System of Georgia as Oblige (hereinafter referred to as "Owner") in the amount of _____ and No/100 Dollars (\$) _____, to which payment Contractor and Surety bind Themselves, their heirs, executors, administrators, successors and assigns, jointly and severally, firmly by these presents.

WHEREAS, the above bounden Principal has entered into a contract with the Owner bearing date of Month, Day, Year for: Project Number and Description, Institution Name, City, State in accordance with drawings and specifications prepared by: LEGAL DP Firm Name which said contract is incorporated herein by reference and made a part hereof, and is hereinafter referred to as the Contract.

NOW THEREFORE, THE CONDITION OF THIS OBLIGATION is such that, if the Contractor shall promptly and faithfully perform and comply with the terms and conditions of said contract; and shall indemnify and save harmless the Owner against and from all cost, expenses, damages, injury or loss to which said Owner may be subjected by reason of any wrongdoing, including patent infringement, misconduct, want of care or skill, default or failure of performance on the part of said Principal, his agents, subcontractors or employees, in the execution or performance of said contract, then this obligation shall be null and void; otherwise it shall remain in full force and effect.

(1) The said Surety to this bond, for value received, hereby stipulates and agrees that no change or changes, extension of time or extensions of time, alteration or alterations or addition or additions to the terms of the contract, or to the work to be performed thereunder, or the specifications or drawings accompanying same, or the exercise of the Owner's right to do work pursuant to Articles 1.3.7, 1.7.8, or 5.3.5, or Paragraphs 3.4.1.4 or 5.3.2.3, shall in any way affect its obligation on this bond, and it does hereby waive notice of any such change or changes, extension of time or extensions of time, alteration or alterations or addition or additions to the terms of the contract or to the Work or to the specifications or drawings. In addition, the Surety to this bond, for value received, hereby agrees to the provisions of Article 1.5.1, including Paragraph 1.5.1.3 for increases in the penal amount of this bond, and waives notice from the Owner of any such changes.

(2) If pursuant to the Contract Documents the Contractor shall be declared in default by the Owner under the aforesaid Contract and the Owner has terminated the Contractor's right to complete the Contract, the Surety shall promptly perform this bond agreement in accordance with its terms and conditions. If Surety chooses to investigate, Owner shall cooperate with the Surety in its investigation and shall make all public project records available for inspection by Surety at no cost to Owner. It shall be the duty of the Surety to give an unequivocal notice in writing to the Owner, within twenty-five (25) days after receipt of such a declaration of default, of the Surety's election to either remedy the default or defaults promptly or to perform the Contract promptly, time being of the essence. In said notice of election, the Surety shall indicate the date on which the remedy or performance will commence, and it shall then be the duty of the Surety to give prompt notice in writing to the Owner immediately upon completion of (a) the remedy and/or correction of each default, (b) the remedy and/or correction or each item of condemned work, (c) the furnishing of each omitted item of work, and (d) the performance of the contract. The Surety shall not assert its Principal as justification for its failure to give notice of election or for its failure to promptly remedy the default or defaults or perform the Contract.

(3) It is expressly agreed by the Principal and the Surety that the Owner, if he desires to do so, is at liberty to make inquiries at any time of subcontractors, laborers, materialmen, or other parties concerning the status of payments for labor, materials, or services furnished in the prosecution of the work.

(4) No right of action shall accrue on this bond to or for the use of any person or corporation other than the Owner named herein or the legal successors of the Owner.

(5) For the purposes of this bond, the name and address of the **responsible official of the Surety's claims department**, to whom correspondence and telecommunications may be addressed and/or with whom business concerning this bond may be conducted will be as follows:

NAME _____

TITLE _____

ADDRESS _____

CITY _____ STATE _____ ZIP CODE _____

TELEPHONE _____

(6) Further, this bond shall be the Performance Bond furnished under O.C.G.A. §§ 13-10-2, 13-10-20 and shall be subject to increase in the penal amount of the bond pursuant to such statutes and Article 1.5.1 of the Contract.

(7) No action can be instituted on this bond after one year from the date of Final Completion as determined pursuant to Article 6.2.2.

SIGNED AND SEALED THIS _____ DAY OF _____, 20____.

ATTEST:

(NAME OF Contractor)

Secretary(*)

By _____
President

(SURETY) (*) (*)

(TITLE)

(*) Please apply seal of Corporation over Secretary's Signature.

(*)(*) Please apply seal of Surety and arrange for countersignature by a "Georgia Licensed Agent" of Surety pursuant to O.C.G.A. §33-23-5. Kindly show title of the aforesaid agent as "Georgia Licensed Agent."

(*) Attach Power of Attorney

PAYMENT BOND

Bond No. _____

Project No. Project Number

KNOW ALL MEN BY THESE PRESENTS:

That _____ as Principal (hereinafter referred to as the
(Legal Title and Address of the Contractor)

"Principal") and _____ as Surety (hereinafter referred
(Legal Name and Address of the Surety)

to as "Surety"), are held and firmly bound unto the BOARD OF REGENTS OF THE UNIVERSITY SYSTEM OF GEORGIA as Obligee (hereinafter referred to as "Owner") for the use and benefit of claimants defined, hereinafter in the amount of _____ Dollars (\$) to which payment Principal and Surety bind themselves, their heirs, executors, administrators, successors and assigns jointly and severally, firmly by these presents.

WHEREAS, the above bounden Principal has entered into a contract with Owner dated Month, Day, Year for Project Number and Description, Institution Name, City, State in accordance with the drawings and specifications prepared by: LEGAL DP Firm Name which contract is incorporated herein by reference and made a part hereof, and is hereinafter referred to as the Contract.

NOW, THEREFORE, THE CONDITION OF THIS OBLIGATION is such that if the Principal shall promptly make payment to all claimants as hereinafter defined, for all labor and materials supplied in the prosecution of the work provided for in said Contract, then this obligation shall be void, otherwise it shall remain in full force and effect subject, however, to the following conditions:

- (1) The said Surety to this bond, for value received, hereby stipulates and agrees that no change or changes, extension of time or extensions of time, alteration or alterations or addition or additions to the terms of the contract or to the work to be performed thereunder, or the specifications or drawings accompanying same, or the exercise of the Owner's right to do work pursuant to Articles 1.3.7, 1.7.8 or 5.3.5 or Paragraphs 3.4.1.4 or 5.3.2.3, shall in any way affect its obligation on this bond, and it does hereby waive notice of any such change or changes, extension of time or extensions of time, alteration or alterations or addition or additions to the terms of the contract or to the Work or to the specifications or drawings. In addition, the Surety to this bond, for value received, hereby agrees to the provisions of Article 1.5.1, including Paragraph 1.5.1.3, for increases in the penal amount of this bond and waives notice from the Owner of any such changes.
- (2) A claimant is defined as any subcontractor and any person supplying labor, materials, machinery, or equipment in the prosecution of the work provided for in said contract.
- (3) Every person entitled to the protection hereunder and who has not been paid in full for labor or materials furnished in the prosecution of the work referred to in said bond before the expiration of a period of ninety (90) days after the day on which the last of the labor was done or performed by him, or materials or equipment or machinery was furnished or supplied by him for which claim is made, shall have the right to sue on such payment bond for the amount, or the balance thereof, unpaid at the time of the commencement of such action and to prosecute such action to final execution and judgment for the sum or sums due him, provided, however, that any person having direct contractual relationship with a subcontractor, but no contractual relationship express or implied with the Contractor furnishing said payment bond shall have (a) given written notice to said Contractor within ninety (90) days from the day on which such person did or performed the last of the labor, or furnished the last of the materials or machinery or equipment for which such claim is made stating with substantial accuracy the amount claimed and the name of the party to whom the materials were furnished or supplied or for whom the labor was performed or done; and (b) if the Contractor has filed a Notice of Commencement in accordance with the requirements of O.C.G.A. §13-10-62 and Articles 4.3.2 of the contract, given to said contractor a written Notice to Contractor within 30 days from the filing of the Notice of Commencement or 30 days following the first delivery of labor, materials, machinery or equipment, whichever is later, setting forth:
 - A) The name, address, and telephone number of the person providing labor, material, machinery, or equipment;
 - B) The name and address of each person at whose instance the labor, material, machinery or equipment is being furnished;
 - C) The name and the location of the public work; and
 - D) A description of the labor, material, machinery, or equipment being provided and, if known, the contract price or anticipated value of the labor, material, machinery, or equipment to be provided or the amount claimed to be due, if any.

It is provided further that nothing contained herein shall limit the right of action to said 90-day period. Notice may be served by the depositing of a notice, certified mail, postage paid, duly addressed to the Contractor at any place he maintains an office or conducts his business, or his residence, in any post office or branch post office or any letter box under the control of the Post Office Department or notice may be served by statutory mail pursuant to O.C.G.A. §9-10-12 or in any manner in which the sheriffs of Georgia are authorized by law to serve summons or process. Every suit instituted under this section shall be brought in the name of the claimant without Owner being made a party thereof. The official who has custody of said bond is authorized and directed to furnish, to any person making application thereof who submits an affidavit that he has supplied labor or materials for such work and payment therefore has not been made, or that he is being sued on any such bond, a copy of such bond and the contract for which it was given, certified, by the official who has custody of said bond and contract shall be admitted in evidence without further proof. Applicants

shall pay for such certified statements and such fees as the official fixes to cover the cost of preparation thereof, but in no case shall the fixed fee exceed the fees that the clerks of the superior courts are permitted to charge for similar copies.

- (4) It is expressly agreed by the Principal and the Surety that the Owner, if he desires to do so, is at liberty to make inquiries at any time of subcontractors, laborers, materialmen, or other parties concerning the status of payments for labor, materials, or services furnished in the prosecution of the work.
- (5) For the purposes of this bond, the name and address of the **responsible official of the Surety's claims department**, to whom correspondence and telecommunications may be addressed and/or with whom business concerning this bond may be conducted will be as follows:

NAME _____

TITLE _____

ADDRESS _____

CITY _____ STATE _____ ZIP CODE _____

TELEPHONE _____

- (6) Further, this bond shall be the Payment Bond furnished under O.C.G.A. §§ 13-10-1, 13-10-60 *et seq.* and shall be subject to increase in the penal amount of the bond pursuant to such statutes and Article 1.5.1 of the Contract.
- (7) No action can be instituted on this bond after one year from the date of Final Completion as determined pursuant to Article 6.2.2.

SIGNED AND SEALED THIS _____ DAY OF _____, 20_____.

ATTEST:

(NAME OF Contractor)

Secretary(*)

By _____
President

(SURETY) (*) (*)

(TITLE)

- (*) Please apply seal of Corporation over Secretary's Signature.
- (*)(*) Please apply seal of Surety and arrange for countersignature by a "Georgia Licensed Agent" of Surety pursuant to O.C.G.A. §33-23-5. Kindly show title of the aforesaid agent as "Georgia Licensed Agent."

(*) Attach Power of Attorney

GEORGIA SECURITY AND IMMIGRATION COMPLIANCE ACT AFFIDAVIT(S)

"Contractor" in the following Affidavits shall mean "General Contractor"/"Contractor" for the purpose of compliance with O.C.G.A. § 13-10-91, (b).

For the purpose of completing the attached Affidavits, please insert the following:

- "Name of Public Employer" shall mean "Board of Regents of the University System of Georgia, Owner, for the use and benefit of Institution Name, Using Agency"
- "Name of Project" shall mean "Project No. Project Number and Description"

Contractor Affidavit under O.C.G.A. § 13-10-91(b)(1)

By executing this affidavit, the undersigned contractor verifies its compliance with O.C.G.A. § 13-10-91, stating affirmatively that the individual, firm or corporation which is engaged in the physical performance of services on behalf of Board of Regents of the University System of Georgia for the use and benefit of Institution Name, Using Agency (public employer) has registered with, is authorized to use and uses the federal work authorization program commonly known as E-Verify, or any subsequent replacement program, in accordance with the applicable provisions and deadlines established in O.C.G.A. § 13-10-91. Furthermore, the undersigned contractor will continue to use the federal work authorization program throughout the contract period and the undersigned contractor will contract for the physical performance of services in satisfaction of such contract only with subcontractors who present an affidavit to the contractor with the information required by O.C.G.A. § 13-10-91(b). Contractor hereby attests that its federal work authorization user identification number and date of authorization are as follows:

Federal Work Authorization User Identification Number

Date of Authorization

Name of Contractor

Project Number and Description

Name of Project

Board of Regents of the University System of Georgia

For the use and benefit of Institution Name

Name of Public Employer

I hereby declare under penalty of perjury that the foregoing is true and correct.

Executed on _____, ____, 20__ in _____(city), _____(state).

Signature of Authorized Officer or Agent

Printed Name and Title of Authorized Officer or Agent

SUBSCRIBED AND SWORN BEFORE ME
ON THIS THE _____ DAY OF _____, 20__.

NOTARY PUBLIC

My Commission Expires: _____

Subcontractor Affidavit under O.C.G.A. § 13-10-91(b)(3)

By executing this affidavit, the undersigned subcontractor verifies its compliance with O.C.G.A. § 13-10-91, stating affirmatively that the individual, firm or corporation which is engaged in the physical performance of services under a contract with _____ (name of contractor) on behalf of Board of Regents of the University System of Georgia for the use and benefit of Institution Name, Using Agency (public employer) has registered with, is authorized to use and uses the federal work authorization program commonly known as E-Verify, or any subsequent replacement program, in accordance with the applicable provisions and deadlines established in O.C.G.A. § 13-10-91. Furthermore, the undersigned subcontractor will continue to use the federal work authorization program throughout the contract period and the undersigned subcontractor will contract for the physical performance of services in satisfaction of such contract only with sub-subcontractors who present an affidavit to the subcontractor with the information required by O.C.G.A. § 13-10-91(b). Additionally, the undersigned subcontractor will forward notice of the receipt of an affidavit from a sub-subcontractor to the contractor within five business days of receipt. If the undersigned subcontractor receives notice that a sub-subcontractor has received an affidavit from any other contracted sub-subcontractor, the undersigned subcontractor must forward, within five business days of receipt, a copy of the notice to the contractor. Subcontractor hereby attests that its federal work authorization user identification number and date of authorization are as follows:

Federal Work Authorization User Identification Number

Date of Authorization

Name of Subcontractor

Project Number and Description

Name of Project

Board of Regents of the University System of Georgia
For the use and benefit of Institution Name

Name of Public Employer

I hereby declare under penalty of perjury that the foregoing is true and correct.

Executed on _____, ____, 20__ in _____(city), _____(state).

Signature of Authorized Officer or Agent

Printed Name and Title of Authorized Officer or Agent

SUBSCRIBED AND SWORN BEFORE ME
ON THIS THE _____ DAY OF _____, 20__.

NOTARY PUBLIC

My Commission Expires:

Sub-subcontractor Affidavit under O.C.G.A. § 13-10-91(b)(4)

By executing this affidavit, the undersigned sub-subcontractor verifies its compliance with O.C.G.A. § 13-10-91, stating affirmatively that the individual, firm or corporation which is engaged in the physical performance of services under a contract for _____ (name of subcontractor or sub-subcontractor with whom such sub-subcontractor has privity of contract) and _____ (name of contractor) on behalf of Board of Regents of the University System of Georgia for the use and benefit of Institution Name, Using Agency (public employer) has registered with, is authorized to use and uses the federal work authorization program commonly known as E-Verify, or any subsequent replacement program, in accordance with the applicable provisions and deadlines established in O.C.G.A. § 13-10-91. Furthermore, the undersigned sub-subcontractor will continue to use the federal work authorization program throughout the contract period and the undersigned sub-subcontractor will contract for the physical performance of services in satisfaction of such contract only with sub-subcontractors who present an affidavit to the sub-subcontractor with the information required by O.C.G.A. § 13-10-91(b). The undersigned sub-subcontractor shall submit, at the time of such contract, this affidavit to _____ (name of subcontractor or sub-subcontractor with whom such sub-subcontractor has privity of contract). Additionally, the undersigned sub-subcontractor will forward notice of the receipt of any affidavit from a sub-subcontractor to _____ (name of subcontractor or sub-subcontractor with whom such sub-subcontractor has privity of contract). Sub-subcontractor hereby attests that its federal work authorization user identification number and date of authorization are as follows:

Federal Work Authorization User Identification Number

Date of Authorization

Name of Sub-subcontractor

Project Number and Description

Name of Project

Board of Regents of the University System of Georgia

For the use and benefit of Institution Name

Name of Public Employer

I hereby declare under penalty of perjury that the foregoing is true and correct.

Executed on _____, ___, 20__ in _____(city), _____(state).

Signature of Authorized Officer or Agent

Printed Name and Title of Authorized Officer or Agent

SUBSCRIBED AND SWORN BEFORE ME
ON THIS THE _____ DAY OF _____, 20__.

NOTARY PUBLIC
My Commission Expires: _____

NON-INFLUENCE AFFIDAVIT

COUNTY OF _____

STATE OF _____

I do solemnly swear on my oath that as to the Contract dated _____, 20____,
between _____
(NAME OF CONTRACTOR)

and the Owner, I have no knowledge of the exertion of any influence or the attempted exertion of any influence on the firm on behalf of which this affidavit is made in any way, manner, or form in the purchase of materials, equipment, or other items involved in construction, manufacture, or employment of labor under the aforesaid Contract by any employee, officer, or agent of the Owner, or any person connected with the State Government of Georgia in any way whatsoever.

This _____ day of _____, 20____.

(L.S.)
Signature

Title

Firm

COUNTY OF _____

STATE OF _____

Personally before me, the undersigned authority, appeared _____
(NAME OF PERSON SIGNING THE AFFIDAVIT)

who is known to me to be an official of the firm of _____,
(NAME OF CONTRACTOR)

and who, after being duly sworn, stated on his oath that he had read the above statement and that the same is true and correct.

Notary Public

My Commission expires _____

This _____ day of _____, 20____.

STATUTORY AFFIDAVIT

COUNTY OF _____

STATE OF _____

FROM: _____

Contractor

TO: _____

Owner

Re: Contract entered into the ____ day of _____, 20____, between the above-mentioned parties for the construction

of Project No. _____ located at _____

KNOW ALL MEN BY THESE PRESENTS:

1. The undersigned hereby certifies that all work required under the above Contract has been performed in accordance with the terms thereof, that all Subcontractors, Suppliers, Trade Contractors, mechanics, and laborers have been paid and satisfied in full, or will be paid and satisfied in full out of the proceeds of this payment as set forth in O.C.G.A. §13-10-80, and that there are no outstanding claims of any character [including disputed claims or any claims to which the Contractor has or will assert any defense] arising out of the performance of the Contract which have not been paid and satisfied in full except as listed herein below:.....

Instructions to Contractor- ENTER THE WORD "NONE" OR LIST THE NAMES OF CLAIMANTS

2. The undersigned further certifies that to the best of his knowledge and belief there are no unsatisfied claims for damages resulting from injury or death to any employees, Subcontractors, or the public at large arising out of the performance of the contract, or any suits or claims for any other damage of any kind, nature, or description which might constitute a lien upon the property of the Owner.

3. The undersigned makes this affidavit for the purpose of receiving final payment in full settlement of all claims against the Owner arising under or by virtue of the contract, and acceptance of such payment is acknowledged as a release of the Owner from any and all claims arising under or by virtue of the contract.

This ____ day of _____, 20____.

_____(L.S.)

Signature

Title

Firm

COUNTY OF _____

STATE OF _____

Personally before me, the undersigned authority, appeared _____
(NAME OF PERSON SIGNING THE AFFIDAVIT)

who is known to me to be an official of the firm of _____,
(NAME OF CONTRACTOR)

and who, after being duly sworn, stated on his oath that he had read the above statement and that the same is true and correct.

Notary Public

My Commission expires _____

This ____ day of _____, 20____.

FIVE YEAR BOND ON ROOFS AND WALLS

STATE OF GEORGIA

COUNTY OF _____

Firmly Bound. Know all men by these presents, that we, _____ (“Contractor”) as Principal, and (Name of Surety), as Surety, are held and firmly bound unto

_____ (Insert Name of Owner)

Owner, in the sum of _____ Dollars (\$ _____) for the payment of which well and truly to be made and done, we bind ourselves, our executors and administrators, our successors and assigns, jointly and severally, by these presents.

Condition of Obligation. The condition of the above obligation is such that WHEREAS Contractor has entered into a Contract with Owner dated _____ (enter date of contract), for construction of Project No. _____.

Warranty. WHEREAS, the said Contractor warrants with respect to the said work that for a period of five years from the date of the execution of the final certificate of the Design Professional, the roofs of the building (or buildings) and roofs of passages, including but not limited to the roof envelope, including but not limited to the roof decking; deck sheathing; material used as a roof base or insulation over which roof is applied; roofing materials; promenade decks or any other work on the surface of the roof; flashing; base flashing; counter flashing; metal work, gravel stops; or roof expansion joints shall be absolutely watertight and free from all leaks. At no expense to the Owner, the Contractor will make repairs to any defects that may develop in the work including but not limited to: blisters, exposed felts, ridges, wrinkles, splits, warped insulation, and loose flashing, in a manner compatible to the system and acceptable under industry standards and in accordance with the construction specifications. The Contractor also warrants that for the same five-year period the walls of the building (or buildings) and building envelope, including but not limited to: vertical and/or horizontal expansion joints, below and/or above grade waterproofing, below and/or above grade damp-proofing, thru-wall flashing, damp course flashing and waterproofing of joints at openings in walls including but not limited to door perimeters, window perimeters, vents and pipe openings shall be absolutely watertight and free from all leaks, seepage or dampness, and that he shall, at no expense to the Owner, make repairs to any defects that may develop in the work in a manner compatible to the system and acceptable under industry standards and in accordance with the construction specifications, Provided, however: That the following are excluded from the warranty:

- (a) Defects or failures resulting from abuse by the Owner, upon presentation of competent evidence of same by the Contractor.
- (b) Defects in design that the said Contractor shall produce competent evidence of having had provided clear written notice in writing to the Owner prior to commencing installation of the Work, except, however, that the Contractor shall not be responsible, insofar as liability under this bond is concerned, for bringing to the attention of the Owner defects in design involving failure of only the following three structural elements:
 - (1) Structural Frame
 - (2) Load bearing walls
 - (3) Foundations

nor shall the Contractor be responsible for correction of leaks resulting from said failure.

- (c) Damage caused by fire, tornado, hail, hurricane, acts of God, wars, riots, or civil commotion upon presentation of competent evidence of same by the Contractor.
- (d) The Contractor is not an insurer nor is he a guarantor of the design. Any other provisions of this bond to the contrary notwithstanding, the Contractor shall not be required to remedy any errors or omissions of design.

Leaks or Defects. WHEREAS the said Contractor agrees that should any leaks or defects occur in the roof envelope or wall envelope of the said (Name and Number of Project) the said Contractor will promptly remedy the said leaks or defects and pay for any damage to other work of said Project resulting therefrom, except, however, that when this instrument is executed by a Trade Contractor this Contract, shall, insofar as the Trade Contractor is concerned, extend only to the work executed by said Trade Contractor.

Notice to Surety. If the Contractor shall have been given notice to remedy leaks or defects pursuant to the Contract Documents and has been declared in default by the Owner and the Owner has terminated the Contractor's right to complete the remedy, the Surety shall be notified in writing and shall promptly perform this bond agreement in accordance with its terms and conditions. If Surety chooses to investigate, Owner shall cooperate with the Surety in its investigation and shall make all public project records available for inspection by Surety at no cost to Owner. It shall be the duty of the Surety to give an unequivocal notice in writing to the Owner, within twenty-five

(25) days after receipt of such notice, of the Surety's election to either remedy the leaks and defects promptly, time being of the essence. In said notice of election, the Surety shall indicate the date on which the remedy or performance will commence, and it shall then be the duty of the Surety to give prompt notice in writing to the Owner immediately upon completion of the remedy and/or correction of the leaks or defects. The Surety shall not assert its Principal as justification for its failure to give notice of election or for its failure to promptly remedy the leaks or defects.

Full Force and Effect. NOW, THEREFORE, the condition of this obligation is such that if the Contractor_ shall in all things promptly and faithfully perform and comply with the terms and conditions hereinbefore set forth, then this obligation shall be null and void; otherwise, it shall remain in full force and effect.

IN WITNESS WHEREOF, the parties hereto have caused this instrument to be duly executed this _____ day of _____, 20____.

Principal

By: _____

TITLE _____

Surety

By: _____

TITLE _____

(*) Attach Power of Attorney

Instructions for execution by Contractor

- (a) If the firm is a partnership, all members of the partnership must execute.
- (b) If the firm is a corporation, the president must sign, the secretary must attest, and the Seal of Corporation must be affixed.
- (c) If the firm operates as a sole proprietorship, the proprietor must execute.

SPECIMEN CERTIFICATE OF MANUFACTURER

INSTRUCTIONS FOR PREPARATION OF CERTIFICATE: To be acceptable, the certificate must be prepared in the form indicated by this specimen on the official letterhead of the manufacturer. No portions of the certificate may be omitted. Attached is a copy of the Contract provision under which the certificate is required. The Authority needs only one copy of the certificate. If equipment of a manufacturer is not installed in strict compliance with the recommendations of the manufacturer or if in the design of the work the equipment is not applied in strict compliance with the recommendations of the manufacturer, a letter from the manufacturer should be forwarded to the Contractor [with copies to the Design Professional and the Owner] setting forth a list of the deviations from the recommendations of the manufacturer and stating what remains to be done in order to bring the work into strict compliance with the recommendations of the manufacturer. Prior to calling upon the representative of the manufacturer for performance of the services necessary to enable him to execute a certificate in accordance with this specimen, it is the obligation of the Contractor to have installed the work in strict compliance with the recommendations of the manufacturer [See Article 2.2.4 of the Contract], and it is likewise the obligation of the Contractor to have put the equipment in good operating condition in absolute and final readiness for the "start-up," "testing," and "placing into operation" as defined herein below by the representative of the manufacturer.

Date: _____

Insert name and address of Owner

Re: Certificate of [JOHN DOE CORPORATION] that equipment or components furnished by it has [or have, as the case may be] been installed in strict compliance with its recommendations and is [or are, as the case may be] operating properly at PROJECT NO. _____

Gentlemen:

1. We certify through our duly authorized and acting agent that the following item [or items, as the case may be] furnished by us to the Project named in the caption was [or were, as the case may be] started up, tested, and placed in operation by our authorized field representative on [enter the date on which the field representative performed the start-up, test, and placing into operation] and is [or are, as the case may be] operating properly:

[List the item or items furnished to the job. Show catalogue number or numbers.]

2. We certify further that the aforesaid equipment was installed in strict compliance with our recommendations as published by us in the following document [or documents, as the case may be]:

[Insert the date, name, or other positive means of identifying the exact document or documents in which the recommendations for installation and use of the item or items are published.] (*)

3. A copy of the aforesaid document(s) is (are) attached hereto.

This _____ day of _____, 20____

JOHN DOE CORPORATION

By: _____
Authorized Representative

(*) The date must be shown

[See Article 6.4.1.2.5

DEFINITIONS:

1. "Start-up" is defined as putting the equipment into action.
2. "Testing" is defined as performing such testing as is stipulated in the Contract Documents to be performed.
3. "Placing into operation" is defined as operating the equipment for a sufficient period of time for the determination to be made that it is performing properly.



CERTIFICATE OF LIABILITY INSURANCE

DATE (MM/DD/YYYY)

THIS CERTIFICATE IS ISSUED AS A MATTER OF INFORMATION ONLY AND CONFERS NO RIGHTS UPON THE CERTIFICATE HOLDER. THIS CERTIFICATE DOES NOT AFFIRMATIVELY OR NEGATIVELY AMEND, EXTEND OR ALTER THE COVERAGE AFFORDED BY THE POLICIES BELOW. THIS CERTIFICATE OF INSURANCE DOES NOT CONSTITUTE A CONTRACT BETWEEN THE ISSUING INSURER(S), AUTHORIZED REPRESENTATIVE OR PRODUCER, AND THE CERTIFICATE HOLDER.

IMPORTANT: If the certificate holder is an ADDITIONAL INSURED, the policy(ies) must be endorsed. If SUBROGATION IS WAIVED, subject to the terms and conditions of the policy, certain policies may require an endorsement. A statement on this certificate does not confer rights to the certificate holder in lieu of such endorsement(s).

PRODUCER	CONTACT NAME:	
	PHONE (A/C, No, Ext):	FAX (A/C, No):
	E-MAIL ADDRESS:	
	INSURER(S) AFFORDING COVERAGE	
	INSURER A:	
INSURED	INSURER B:	
	INSURER C:	
	INSURER D:	
	INSURER E:	
	INSURER F:	

COVERAGES

CERTIFICATE NUMBER:

REVISION NUMBER:

THIS IS TO CERTIFY THAT THE POLICIES OF INSURANCE LISTED BELOW HAVE BEEN ISSUED TO THE INSURED NAMED ABOVE FOR THE POLICY PERIOD INDICATED. NOTWITHSTANDING ANY REQUIREMENT, TERM OR CONDITION OF ANY CONTRACT OR OTHER DOCUMENT WITH RESPECT TO WHICH THIS CERTIFICATE MAY BE ISSUED OR MAY PERTAIN, THE INSURANCE AFFORDED BY THE POLICIES DESCRIBED HEREIN IS SUBJECT TO ALL THE TERMS, EXCLUSIONS AND CONDITIONS OF SUCH POLICIES. LIMITS SHOWN MAY HAVE BEEN REDUCED BY PAID CLAIMS.

INSR LTR	TYPE OF INSURANCE	ACORD NO	BUSN WYD	POLICY NUMBER	POLICY EFF (MM/DD/YYYY)	POLICY EXP (MM/DD/YYYY)	LIMITS
	COMMERCIAL GENERAL LIABILITY ☐ CLAIMS-MADE ☐ OCCUR ☒ Includes XCU Coverage GEN'L AGGREGATE LIMIT APPLIES PER: ☐ POLICY ☐ PROJECT ☐ LOC ☐ OTHER						EACH OCCURRENCE \$ 1,000,000 DAMAGE TO RENTED PREMISES (Ea occurrence) \$ MED EXP (Any one person) \$ 1,000,000 PERSONAL & ADV INJURY \$ 1,000,000 GENERAL AGGREGATE \$ 2,000,000 PRODUCTS - COMP/OP AGG \$ 1,000,000 \$
	AUTOMOBILE LIABILITY ☐ ANY AUTO ☒ ALL OWNED AUTOS ☒ HIRED AUTOS ☐ SCHEDULED AUTOS ☒ NON-OWNED AUTOS						COMBINED SINGLE LIMIT (Ea accident) \$ 1,000,000 BODILY INJURY (Per person) \$ 1,000,000 BODILY INJURY (Per accident) \$ 1,000,000 PROPERTY DAMAGE (Per accident) \$ 1,000,000 \$
	☒ UMBRELLA LIAB ☐ EXCESS LIAB ☐ DED ☐ RETENTION \$						EACH OCCURRENCE \$ 2,000,000 AGGREGATE \$ \$ Umbrella Aggregate: Contract value <\$5M: \$4,000,000 Contract value \$5M+: \$10,000,000
	WORKERS COMPENSATION AND EMPLOYERS' LIABILITY ANY PROPRIETOR/PARTNER/EXECUTIVE OFFICER/MEMBER EXCLUDED? (Mandatory in NH) If yes, describe under DESCRIPTION OF OPERATIONS below	Y/N	N/A				☒ PER STATUTE ☐ OTHER E.L. EACH ACCIDENT \$ E.L. DISEASE - EA EMPLOYEE \$ E.L. DISEASE - POLICY LIMIT \$
	Builders' Risk						Cost of Project

DESCRIPTION OF OPERATIONS / LOCATIONS / VEHICLES (ACORD 001, Additional Remarks Schedule, may be attached if more space is required)

Insert Project No. and Project Name -OR- "All Jobs"

CERTIFICATE HOLDER

CANCELLATION

Send via email to: BOR_Facilities-Contracts@usg.edu

Board of Regents of the University System of Georgia
 Attn: Director of Contracts & Services, Office of Facilities
 270 Washington Street SW, 6th Floor
 Atlanta, Georgia 30334

SHOULD ANY OF THE ABOVE DESCRIBED POLICIES BE CANCELLED BEFORE THE EXPIRATION DATE THEREOF, NOTICE WILL BE DELIVERED IN ACCORDANCE WITH THE POLICY PROVISIONS.

AUTHORIZED REPRESENTATIVE

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ACORD 25 (2014/01)

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THIS FORM IS FOR OPTIONAL USE TO RELEASE TO THE CONTRACTOR FUNDS WITHHELD FROM A PAY APPLICATION IN THE EVENT A SUBCONTRACTOR FILES A CLAIM AGAINST THE CONTRACT BALANCE HELD BY THE OWNER THAT REMAINS UNRESOLVED. THIS IS A SUBORDINATE DOCUMENT TO THE PAYMENT BOND FOR THE PROJECT, AND IS CALCULATED AGAINST THE PENAL AMOUNT OF THAT PAYMENT BOND. THERE ARE OTHER METHODS THAT MAY BE USED TO REMEDY SUCH SITUATIONS, HOWEVER, THIS FORM IS EFFECTIVE WHEN NONE OF THE PARTIES ARE ABLE TO REACH AGREEMENT UPON THE CLAIM.

BOND TO DISCHARGE CLAIM

WHEREAS, _____ (hereinafter referred to as "Claimant" has filed a claim against _____ (the "Contractor", hereinafter referred to as "Principal") on the following contract:

WHEREAS, the undersigned Principal and Surety have issued Payment Bond No. _____ (the "Primary Bond") to the Owner, as Obligor, on the Contract dated _____ for Project _____ ;

WHEREAS, the undersigned Principal and Surety dispute the Claimant's entitlement to all or part of the claim and expressly reserve all rights and defenses available at law in connection therewith;

WHEREAS, _____ as Principal and _____ as Surety, desire to continue to receiving payments from the Owner for work done on the above referenced project,

NOW THEREFORE, in consideration of these premises, the undersigned Principal and Surety do hold themselves firmly bond unto _____ as Claimant, in the total amount of _____ dollars (\$ _____), representing double the amount of the claim.

The condition of this Bond to Discharge Claim is such that should the undersigned Principal or Surety pay to the Claimant the sum that may be found to be due to the Claimant upon the trial of any action that may be filed by said Claimant, or if Principal or Surety pay to the Claimant a sum agreeable to Claimant and Claimant accepts such payment, then this Bond shall be void; otherwise to remain in full force and effect.

The penal amount of the Primary Bond is conditionally reduced by the amount of this Bond to Discharge Claim, and upon payment of any sums to the Obligor under this Bond to Discharge Claim, the penal amount of the Primary Bond is reduced *instantly* by the amount of such payment.

No action can be instituted on this bond after one year from the date of Final Completion as determined pursuant to Article 6.2.2 of the Contract.

IN WITNESS WHEREOF, the said Principal and Surety have set their hands and seals this _____ day of _____, 20____.

Principal

by: _____

Surety

by: _____

Attorney-in-Fact

Type Name Above

**CHANGE ORDER FORMAT
(Lump Sum)**

NOTE TO DESIGN PROFESSIONAL:

Please prepare each Change Order in the form and wording given below, deleting inapplicable wording and adding such explanations as may be necessary. The wording in Paragraph 11 may not be changed or altered in any way by either the Design Professional or the Contractor. Send four copies, signed by you and the Contractor, to the Owner. *Do not forward a Change Order unless it is accompanied by a breakdown which has been certified by the Contract Compliance Specialist and Program Manager (if applicable).*

CHANGE ORDER No. _____

Note to Design Professional:
Please leave the Change Order number blank. The Owner will assign a number.

Project Name: _____
Project Number: _____

Owner

Note to Design Professional: *No Change Order should be forwarded unless you have been furnished with a letter from the Owner authorizing same.*

1. Submission of this Change Order for consideration was authorized by letter from the Owner, dated _____, 20____, Incumbrance Record No. _____.
2. The changes hereinafter described are applicable to the Contract for the construction of the above-referenced Project and amend the Contract Documents.
3. Description of Change:

Note to Design Professional: *Be sure to give a complete statement describing the changes in the work, including the specifications. If drawings are necessary, refer to them by date, etc., and state they are made a part of the Change Order. Copy of drawings should be attached to the Change Order.*

4. This Change Order is deemed necessary and originated with the (Design Professional) (Owner) (Contractor) (Using Agency). *(Indicate applicable entity.)*
5. This Change Order is necessary to:

Note to Design Professional: *Give a complete description of conditions which necessitate the change.*

6. The amount of the Change Order was determined by:

Choose one:
a. Estimate and acceptance in lump sum.
b. Unit prices stated in contract or subsequently agreed upon.
c. Cost and percentage as described in general conditions.

7. A memorandum is attached showing cost breakdown of labor and materials by unit and quantities as prepared by the Contractor and checked by the Contract Compliance Specialist and Program Manager (if any).

8. We have verified the quantity and quality of all materials shown on the memorandum. We have verified that all prices are reasonable and do not exceed current costs for like services or materials, and we have verified that the quality of the materials meets the requirements of the Contract Documents.

Note to Design Professional: Please observe that verification of quantities and prices means the Design Professional who signs the Change Order has personal knowledge that the quantities shown in the memorandum referred to under paragraph 7 above are correct, that he has personally satisfied himself that full credit has been extended for any work or materials deleted or omitted, and that he has conclusively established by such checking or inquire as may be necessary that the prices and allowances shown in the memorandum comparable with current costs for like services and materials.

9. The contractor shall be allowed _____ additional calendar days for completion. The Material Completion and Occupancy Date is: _____.

Note to Design Professional: Please insert the number of additional Days allowed and the new Material Completion and Occupancy Date, or, if no additional time is allowed, insert "0" for the Days and "No Change" for the date.

10. The Contract Sum shall be (increased) (decreased) by \$ _____ on account of this change.

Note to Design Professional: Please delete inapplicable language in parentheses and enter the dollar amount for this change. Insure that cost of the Work, percentage markup for profit, and the daily rate of general conditions costs is accurate and included in the amount of an additive change. If a deductive change, the amount is generally cost of the work only; however, consult with the owner in significant deductive Change Orders to determine if time or profit should be included in the deducted amount.

11. The payment and extension of time, if any, provided by this Change Order constitutes compensation in full to the Contractor and its Subcontractors, Suppliers, and Trade Contractors for all costs and markups, directly and indirectly attributable to the changes ordered herein, and for all delays or time related costs thereto and for any acceleration costs for performance of changes within the time stated and to be completed by the Material Completion and Occupancy Date and for any claims related thereto against the Owner and the Design Professional, and design consultants.

APPROVED AND AGREED BY CONTRACTOR:
LEGAL GC Firm Name

RECOMMENDED FOR OWNER'S ACCEPTANCE
DESIGN PROFESSIONAL: LEGAL DP Firm Name

By: _____

By: _____

(Print Name/Title)

(Print Name/Title)

Date approved by Contractor: _____

Date approved by Design Professional: _____

APPROVED AND AGREED BY USING AGENCY:
INSTITUTION NAME

APPROVED AND AGREED BY OWNER:
BOARD OF REGENTS OF THE UNIVERSITY

By: _____

By: _____

(Print Name/Title)

(Print Name/Title)

Date approved by Using Agency: _____

Date approved by Owner: _____

CHANGE ORDER FORMAT
(Force Account or Indeterminate Units)

NOTE TO DESIGN PROFESSIONAL:

Please prepare each Change Order in the form and wording given below, deleting inapplicable wording and adding such explanations as may be necessary. The wording in Paragraph 8 may not be changed or altered in any way by either the Design Professional or the Contractor. The wording in Paragraph 5 of the Final Cost Amendment may not be changed or altered in any way by either the Design Professional or the Contractor. Send four copies, signed by you and the Contractor, to the Owner. *Do not forward a Change Order unless it is accompanied by a breakdown which has been checked by the Contract Compliance Specialist and Program Manager (if applicable).*

CHANGE ORDER No. _____

Note to Design Professional:
Please leave the Change Order number blank. The Owner will assign a number.

Project Name: _____
Project Number: _____

Owner

Note to Design Professional: *No Change Order should be forwarded unless you have been furnished with a letter from the Owner authorizing same.*

1. Submission of this Change Order for consideration was authorized by letter from the Owner, dated _____, 20____, Incumbrance Record No. _____.
2. The changes hereinafter described are applicable to the Contract for the construction of the above-referenced Project and amend the Contract Documents..
3. Description of Change:

Note to Design Professional: *Be sure to give a complete statement describing the changes in the work, including the specifications. If drawings are necessary, refer to them by date, etc., and state they are made a part of the Change Order. Copy of drawings should be attached to the Change Order.*

4. This Change Order is deemed necessary and originated with the (Design Professional) (Owner) (Contractor) (Using Agency). *(Indicate applicable entity.)*

5. This Change Order is necessary to: Note to Design Professional: *Give a complete description of conditions which necessitate the change.*

6. The Maximum Allowable Cost of the Change Order was estimated by:

Choose one:

- a. Estimate in lump sum.
- b. Unit prices stated in contract or subsequently agreed upon, and an estimated number of units.
- c. Cost and percentage as described in general conditions.

7. A memorandum is attached showing the estimated cost breakdown of labor and materials by unit and quantities as prepared by the Contractor and checked by the Contract Compliance Specialist and Program Manager (if any).

8. The Maximum Allowed Cost for this Change Order is \$ _____, and is established as Incumbrance Record No. _____. This Maximum Allowed Cost may be amended by the Owner in the event the actual costs are expected to exceed the Maximum Allowed Cost, provided that Contractor shall give written notice of such fact prior to incurring actual costs in excess of ninety percent of the Maximum Allowable Cost. In no event shall actual costs be incurred in excess of the Maximum Allowed Cost, as it may be amended.

APPROVED AND AGREED BY CONTRACTOR:
LEGAL GC Firm Name

By: _____

(Print Name/Title)

Date approved by Contractor: _____

RECOMMENDED FOR OWNER'S ACCEPTANCE
DESIGN PROFESSIONAL: LEGAL DP Firm Name

By: _____

(Print Name/Title)

Date approved by Design Professional: _____

APPROVED AND AGREED BY USING AGENCY:
INSTITUTION NAME

By: _____

(Print Name/Title)

Date approved by Using Agency: _____

APPROVED AND AGREED BY OWNER:
BOARD OF REGENTS OF THE UNIVERSITY

By: _____

(Print Name/Title)

Date approved by Owner: _____

**FINAL COST AMENDMENT
TO
CHANGE ORDER NO. _____**

1. A memorandum is attached showing cost breakdown of labor and materials by unit and quantities as prepared by the Contractor and checked by the Contract Compliance Specialist and Program Manager (if any).

2. We have verified the quantity and quality of all materials shown on the memorandum. We have verified that all prices are reasonable and do not exceed current costs for like services or materials, and we have verified that the quality of the materials meets the requirements of the Contract Documents.

Note to Design Professional: Please observe the fact that verification of quantities and prices means the Design Professional who signs the Change Order has personal knowledge that the quantities shown in the memorandum referred to under paragraph 7 above are correct, that he has personally satisfied himself that full credit has been extended for any work or materials deleted or omitted, and that he has conclusively established by such checking or inquire as may be necessary that the prices and allowances shown in the memorandum comparable with current costs for like services and materials.

3. The contractor shall be allowed _____ additional calendar days for completion. The Material Completion and Occupancy date is: _____.

Note to Design Professional: Please insert the number of additional Days allowed and the new Material Completion and Occupancy Date, or, if no additional time is allowed, insert "0" for Days and "No Change" for the date.

4. The Contract Sum shall be (increased) (decreased) by \$ _____ on account of this change.

Note to Design Professional: Please delete inapplicable language in parentheses and enter the dollar amount for this change. Insure that cost of the Work, percentage markup for profit, and the daily rate of general conditions costs is accurate and included in the amount of an additive change. If a deductive change, the amount is generally cost of the work only; however, consult with the owner in significant deductive Change Orders to determine if time or profit should be included in the deducted amount.

5. The payment and extension of time, if any, provided by this Change Order constitutes compensation in full to the Contractor and its Subcontractors, Suppliers, and Trade Contractors for all costs and markups, directly and indirectly attributable to the changes ordered herein, and for all delays or time related costs thereto and for any acceleration costs for performance of changes within the time stated and to be completed by the Material Completion and Occupancy Date and for any Claims related thereto against the Owner and the Design Professional, and design consultants.

APPROVED AND AGREED BY CONTRACTOR:
LEGAL GC Firm Name

By: _____

(Print Name/Title)

Date approved by Contractor: _____

RECOMMENDED FOR OWNER'S ACCEPTANCE
DESIGN PROFESSIONAL: LEGAL DP Firm Name

By: _____

(Print Name/Title)

Date approved by Design Professional: _____

APPROVED AND AGREED BY USING AGENCY:
INSTITUTION NAME

By: _____

(Print Name/Title)

Date approved by Using Agency: _____

APPROVED AND AGREED BY OWNER:
BOARD OF REGENTS OF THE UNIVERSITY

By: _____

(Print Name/Title)

Date approved by Owner: _____

APPLICATION FOR PAYMENT

APPLICATION FOR PAYMENT NO. _____ PROJECT NO. _____

CERTIFICATE OF THE CONTRACTOR OR HIS DULY AUTHORIZED REPRESENTATIVE

To the best of my knowledge and belief, I certify that all items, units, quantities, and prices of work and material shown on this Application for Payment No. _____ are correct; that all work has been performed and materials supplied in full accordance with the terms and conditions of the Contract Documents between _____

(Owner)

and _____ dated _____
(Contractor)

and all authorized changes thereto; and that the following is a true and correct statement of the contract account up to and including the last day of the period covered by this Application and that no part of the "amount due this Application" has been received.

(a)	Total amount earned for work in place (original contract)	\$
(b)	Total amount earned for work in place (Change Orders)	\$
(c)	Value of materials stored at site	\$
(d)	Total amount earned ((a) plus (b) plus (c))	\$
(e)	Amount retained (10%)	\$
(f)	Total earned less retained percentage ((d) minus (e))	\$
(g)	Total previously approved	\$
(h)	Amount due THIS ESTIMATE ((f) minus (g))	\$
(i)	Retainage payment to Subcontractors per Paragraph 4.1.2.5 of the General Conditions.	\$
(j)	AMOUNT DUE Contractor ((h) minus (i))	\$

I further certify that all claims outstanding against the undersigned Contractor for labor, materials, and expendable equipment employed in the performance of said contract have been paid in full in accordance with the requirements of said contract, except such outstanding claims as are listed below or on the attached sheet, which statement contains all claims against the Contractor which are not yet paid, including all disputed claims and any claims to which the Contractor has or will assert any defense.

I further certify that all of the materials indicated on this Application for Payment as being stored on the Site, but not yet incorporated into the building, have been purchased, delivered, and are now stored on the Site for future incorporation into the building and until so incorporated the title to same is, upon payment of this statement, vested in the Owner. Furthermore, the undersigned Contractor assumes full responsibility for the existence, protection, and, if necessary, replacement of the above-mentioned materials until the completion of this contract.

Contractor _____

By

Date _____

Title

STATEMENT OF THE CONTRACT COMPLIANCE SPECIALIST

I have checked this Application for Payment and, to the best of my knowledge and belief, the statement of work performed and statement of materials stored on site by the Contractor are supported by my observations

Name _____ Contract Compliance Specialist. Date: _____

CERTIFICATE OF THE DESIGN PROFESSIONAL

I certify that I have verified this Application for Payment and, to the best of my knowledge and belief, it is a true and correct statement of work performed and statement of materials stored on site by the Contractor and that the Contractor's certified statement of his account and the amount due him is correct and just. I further certify that all work has been performed and materials have been supplied in full accordance with the terms and conditions of the Contract Documents and authorized changes thereto.

Name _____ Design Professional.

Date: _____

SCHEDULE OF CHANGE ORDERS

In support of Application for Payment No.

Project No. _____ Period Ending: _____

Contractor:

[illegible]

WORK PERFORMED TO DATE

In support of Application for Payment No.

For the period from _____, through _____ inclusive.

Project No.

Name and location of Project

Contractor's Name and Address

WORK INCLUDED IN ORIGINAL CONTRACT

DETAILED ESTIMATE				WORK PERFORMED TO DATE			
CSI Category and Description Item No. and Designation (1)	Number & Kind of Units (2)	Unit Price (3)	Estimated Cost (4)	No. of Units (5)	Amount Earned to Date (6)	Value of Incomplete Work (7)	Percent Complete (8)
A. Contracting Requirements: * a. b. c. 1. Division 1 – General Requirements: * a. b. c. 2. Division 2 – Site Construction: ** (i) Building a. b. c. (ii) Infrastructure a. b. c. 3. Division 3 – Concrete: * a. b. c. 4. Division 4 – Masonry: ** (i) Building a. b. c. (ii) Infrastructure a. b. c. 5. Division 5 – Metals: * a. b. c.							

6. Division 6 – Wood and Plastics: * a. b. c. 7. Division 7 – Thermal & Moisture: ***** a. b. c. Roof: 8. Division 8 – Doors & Windows: * a. b. c. 9. Division 9 – Finishes: * a. b. c. 10. Division 10 – Specialties: * a. b. c. 11. Division 11 – Equipment: *** (i) Fixed or Built-in: a. b. c. (ii) Moveable: a. b. c. 12. Division 12 – Furnishings: *** (i) Fixed or Built-in: a. b. c. (ii) Moveable: a. b. c. 13. Division 13 – Special Construction: * a. b. c. 14. Division 14 – Conveying Systems: * a. b. c. 15. Division 15 – Mechanical: ***** (i) Building a. b. c. (ii) Infrastructure a. b. c. 16. Division 16 – Electrical: ** (i) Building a. b. c.							
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(ii) Infrastructure a. b. c. 17. Division 17 – Special Inspections: ** (i) Building a. b. c. (ii) Infrastructure a. b. c. (iii) Documents											
A. Total Amount of original contract						B. Plus or minus total previously approved C. O.'s incl.	Nos.-----				
C. Plus or minus C. O.'s Nos.-----incl. approved covered by this est.-----						D. Total Net Adjusted Amt.					

NOTES: The following breakdowns must be accomplished in order to comply with Government Accounting requirements. Upon completion of the Project, the final Application for Payment must show all divisions and sections, and a Final Certification of Costs for Capital Asset Accounting completed and submitted with the Application for Final Payment.

- * Report Items in each division, by CSI division and such other breakdown as is useful to the Contractor or Contract Compliance Specialist.
- ** These items must be broken down into 2 categories, (i) Building and (ii) Infrastructure, reported by specification section. Infrastructure for these purposes is defined as everything outside a line five feet from the building footprint.
- *** These items must be broken down into 2 categories; (i) fixed equipment & furnishings and (ii) Moveable equipment & furnishings and reported by specification section.
- **** Division 15 – Mechanical. This item must be broken down into 2 categories, (i) Building and (ii) Infrastructure, reported by specification section. Chillers and HVAC units that serve the facility are to be included as a part of the Building, even if they are outside the 5-foot limit. Chillers and HVAC units that are outside the 5 foot limit and serve more than one facility, such as equipment used in a central plant, are to be included in Infrastructure.
- ***** Division 7 – Thermal & Moisture Components of the Roof system should be reported as a separate line item. Generally, this includes components of Sections 7500 and 7600.

SUMMARY OF MATERIALS STORED

In support Application for Payment No.

Project No. _____ Period Ending: _____

Contractor:

[illegible]

Prepared by _____ for _____ (Contractor)

Date _____, and certified by him to be a true and accurate statement.

Checked:

By: Contract Compliance Specialist

Date:

SUBCONTRACTOR RETAINAGE RELEASE CERTIFICATE

(To be Originated by Subcontractor)

TO: Board of Regents of the University System of Georgia, Owner
Institution Name, Using Agency

RE: Project Name and Number: Project Number and Description, Institution Name, City, State:
Certificate Regarding Subcontractor's Completed Work and Retainage Release

1. This is to certify that our work is one hundred percent complete for our subcontract number _____.
Our retainage is due in accordance with the contract documents. Our scope of work included the
_____. The total amount of retainage now due is \$_____.

2. The Subcontractor hereby certifies that all work required under the above contract has been performed in accordance with the terms thereof, that all materialmen, subcontractors, mechanics, and laborers have been paid and satisfied in full, and that there are no outstanding claims of any character (including disputed claims or any claims to which the subcontractor has or will assert any defense) arising out of the performance of the contract which have not been paid and satisfied in full except as listed hereinbelow, which exceptions apply only to the release in Paragraph 5, below:

[Enter: "None" or List or Make Reference & Attach Exhibit A.]

3. The Subcontractor further certifies that to the best of his knowledge and belief there are no unsatisfied claims for damages resulting from injury or death to any employees, subcontractors, or the public at large arising out of the performance of the contract, or any suits or claims for any other damage of any kind, nature, or description which might constitute a claim or lien upon the property of the Owner.

4. The Subcontractor has received final payment in full settlement of all claims against the Owner arising under or by virtue the contract, and acceptance of such payment is acknowledged as a release of the Owner from any and all claims arising under or by virtue of the contract. This release includes any claims set forth or excepted in Paragraph 2 above.

5. *[Strike out if not applicable]* The Subcontractor has received final payment in full settlement of all claims against the Contractor arising under or by virtue the contract, and acceptance of such payment is acknowledged as a release of the Contractor from any and all claims arising under or by virtue of the contract except as set forth in Paragraph 2 above.

6. Payments pursuant to this certificate shall in no way diminish, change, alter or affect the rights of the Owner under the contract documents.

SUBCONTRACTOR:

By: _____ Date: _____

CONTRACTOR:

By: _____ Date: _____

DESIGN PROFESSIONAL:

By: _____ Date: _____

NOTICE: OWNER MUST RECEIVE A COPY WITH ALL ORIGINAL SIGNATURES.

FINAL CERTIFICATION OF COSTS FOR CAPITAL ASSET ACCOUNTING

Date: _____

To: _____ (Owner)

The following accounting of costs for Project No. _____, Project Name: _____

_____ at _____

is submitted as follows, with the breakdown of costs as specified in the Final Pay Request attached hereto and incorporated herein, for the purposes of capital asset accounting pursuant to GASB 34 Accounting Statements:

1.	BUILDING AND BUILDING IMPROVEMENTS: *	\$ _____
2.	INFRASTRUCTURE: **	\$ _____
3.	FURNISHINGS AND EQUIPMENT: ***	\$ _____
		=====
	TOTAL:	\$ _____

Notes: (Contractor must insure costs from all Change Orders are apportioned and included in each line item above)
 * **Building:** Include totals from Items A, 1, 3, 5, 6, 7, 8, 9, 10, 13, 14, 15 and "Building" portions of Items 2, 4, and 16.
 ** **Infrastructure:** Include totals from the "Infrastructure" portions of Items 2, 4 and 16.
 *** **Furnishing and Equipment:** Include totals from only the "moveable" portions of Items 11 and 12.

I certify to the best of my knowledge and belief that all of the amounts set forth on this Certificate are true and correct and are supported by the financial records for this project on file with the Contractor.

Contractor _____ By: _____

Date _____ Title: _____

CERTIFICATE OF THE DESIGN PROFESSIONAL

I certify to the best of my knowledge, information and belief that the amounts certified by the Contractor are consistent with the estimates provided in my final Statement of Probable Cost for the Project; that the Building Improvement contains a footprint based upon a line 5 feet outside the building structure) of _____ square feet, a total of _____ gross square feet, and contains _____ floors (including basements). The building fire protection system is _____ (include type of system). The Certificate of Occupancy was issued on _____. I further certify that the design intent for this project is that the Building and Building Improvements are of Building Construction Class _____ and ISO Occupancy Type(s) _____ and have an expected useful life of _____ years from the date of this Certificate, and that my observations of the construction confirm these expectations. (See Exhibit J of Design Professional Contract.)

Name _____ Design Professional. Date: _____

CERTIFICATE OF THE USING AGENCY OR OWNER

I certify that to the best of my knowledge, information, and belief that the cost of the real property covered by this project, to the boundaries on the final Site Plan, was \$ _____ and the cost of additional government-supplied furnishings and equipment acquired for this Project was \$ _____

Name _____ Title: _____ Date: _____

SUPPLEMENTARY GENERAL CONDITIONS

1. Minority Vendor Designee. The minority vendor designee of the Board of Regents of the University System of Georgia to act as liaison with minority vendors is Ms. Christina Hobbs. For more information, please contact the Board of Regents' Office of Business Development by e-mail at BusinessDevelopment@usg.edu.
2. The use of all forms of tobacco products on property owned, leased, rented, in the possession of, or in any way used by the USG or its affiliates is expressly prohibited. "Tobacco Products" is defined as cigarettes, cigars, pipes, all forms of smokeless tobacco, clove cigarettes and any other smoking devices that use tobacco such as hookahs or simulate the use of tobacco such as electronic cigarettes. (Board of Regents Policy Manual, 9.1.7 Tobacco and Smoke-Free Campus Policy. http://www.usg.edu/policymanual/section9/policy/C503/#p9.1.7_tobacco_and_smoke_free_campus_policy)
3. Design Builder may be required to use e-Builder, the BOR's Capital Program Management Software.

Division	Section Title	Pages
DIVISION 23 - HEATING, VENTILATING, AND AIR CONDITIONING (HVAC)		
230513	COMMON REQUIREMENTS FOR HVAC EQUIPMENT	10
230514	CLOSEOUT DOCUMENT REQUIREMENTS FOR HVAC	6
230529	HANGERS AND SUPPORTS FOR HVAC PIPING AND EQUIPMENT	8
230553	IDENTIFICATION FOR HVAC PIPING AND EQUIPMENT	4
230593	TESTING, ADJUSTING, AND BALANCING FOR HVAC	8
230716	HVAC EQUIPMENT INSULATION	4
230900	INSTRUMENTATION AND CONTROL FOR HVAC	6
232113	HYDRONIC PIPING	4
232300	REFRIGERANT PIPING	6
235413	DX COOLING COILS	2
236200	PACKAGED COMPRESSOR AND CONDENSER UNITS	8
DIVISION 26 - ELECTRICAL		
260500	COMMON WORK RESULTS FOR ELECTRICAL	8
260519	LOW-VOLTAGE ELECTRICAL POWER CONDUCTORS AND CABLES	4
260526	GROUNDING AND BONDING FOR ELECTRICAL SYSTEMS	2
260529	HANGERS AND SUPPORTS FOR ELECTRICAL SYSTEMS	4
260533	RACEWAY AND BOXES FOR ELECTRICAL SYSTEMS	8
260553	IDENTIFICATION FOR ELECTRICAL SYSTEMS	4

END OF TABLE OF CONTENTS

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SECTION 230513 - COMMON REQUIREMENTS FOR HVAC EQUIPMENT

PART 1 - GENERAL

1.01 RELATED WORK

- A. All Division 23 sections.

1.02 WORK SEQUENCE

- A. Install mechanical piping, duct, controls, equipment and accessories as construction progresses so cutting and patching of new construction will not be required. See also paragraph "Sequencing and Scheduling" herein.
- B. The existing building will be occupied during construction. The Contractor shall schedule work so as to minimize disruption to the normal operation of the facility in accordance with instructions and schedules provided by the Engineer and/or Owner.

1.03 SUBMITTALS

- A. Provide submittals in accordance with Section 013300 - Submittal Procedures.
- B. Submittal data containing manufacturer's data shall be sent to the Architect, Engineer and Owner for review.
- C. Electronic submittal data shall be assembled in Adobe Acrobat's Portable Data Format (PDF) for review.
- D. Electronic submittal data shall be assembled in one (1) complete PDF file and shall include an index sheet (TOC) listing each submittal item by specification number and its content. Each file shall also be organized with "Bookmarks" of each section. Submittals that do not have each submittal item referenced by "Bookmarks" shall be rejected.
- E. All electronic submittal data for a trade shall be submitted at one time except as noted herein.
- F. Data not submitted shall have a statement explaining why the data was not submitted.
- G. Submittals not conforming to any of the above requirements shall be rejected.
- H. The contractor shall go to each specification section to determine all technical information/data required and organize information/data using tabs for major headings as follows as appropriate per school.
 - 1. Section 230529 - Hangers and Supports for HVAC Piping and Equipment
 - a. Upper attachments
 - b. Pipe attachment (hangers and clamps)
 - c. Lower pipe supports.

- d. Metal framing channel
- e. Vibration isolators
- f. Non-penetrating type equipment supports.
 - 1) Condensate and refrigerant pipe supports.
 - 2) Equipment supports.
- 2. Section 230553 - Identification for HVAC Piping and Equipment
 - a. Equipment and pipe markers.
- 3. Section 230593 - Testing, Adjusting, and Balancing for HVAC
 - a. TAB Agent NEBB or AABC Certificate (Do not submit samples of TAB forms)
- 4. Section 230716 - HVAC Equipment Insulation
 - a. Insulation Product Information
 - b. Jackets and Accessories Product Information
 - c. Proof of Insulation Contractor's Three Years Experience
 - d. System sheet for each system identifying material, thickness and finish for each system.
- 5. Section 230900 - Instrumentation and Controls for HVAC
 - a. Control Product Data
 - b. Sequence of Control
- 6. Section 232113 - Hydronic Piping
 - a. Single sheet indicating piping system and application and the pipe material intended to be used. Do not submit data sheets on piping.
- 7. Section 232300 - Refrigerant Piping
 - a. Single sheet indicating piping system and application and the pipe material intended to be used. Submit data sheets on piping.
- 8. Section 235413 – DX Cooling Coils
 - a. Cooling Coils
- 9. Section 236200 - Packaged Compressors and Condenser Units
 - a. Condensing Units
- 10. Letter from Contractor stating submittals have been checked and comply with the Contract Documents

11. Certification that all items are furnished under this contract are free of hazardous materials (e.g., asbestos, PCBs)
- I. Manufacturer's data sheets shall be marked to clearly indicate the manufacturer, model number, size, color, accessories, required clearances, field connection details, weight loading, electrical characteristics, capacities, etc. being submitted. Submittals shall only include the products relevant to this specific project. Submittals shall not include other products produced by the manufacturer which are not specified on this project. Submittals containing several products on the same sheet shall have an arrow or other marker to identify the specific product submitted. Also, submittals for a single product that have options shall have an arrow or other marker to identify that the specified options are being provided. Submittals that include products not specified for this project, or that include several products on one sheet without being marked, or that do not show options selected shall be rejected. Variations from specifications shall be explained. Submittal preparer's name and telephone number shall be listed on the index sheet.
- J. Piping Submittals: Submittal data required for piping systems shall consist of a single sheet of paper with the type of piping systems on this project, and the corresponding piping the contractor intends to provide.
- K. Review, Corrections, or Comments made on the Submittals do not relieve the Contractor from compliance with the requirements of the Drawings, Specifications and Addendums (Contract Documents). By entering into this Contract, the Contractor agrees that the purpose of submittals is to demonstrate to the Engineer that the Contractor understands the design concept and that he demonstrates his understanding by indicating which equipment and material he intends to furnish and install and use. Review of shop drawing will be general only for basic conformance with the design concept. The review of such drawings, schedules or cuts shall not relieve the Contractor from the responsibility for correcting all errors of any sort contained in the submittals. The Contractor is responsible for confirming and correlating all quantities and dimensions; selecting proper fabrication processes, construction methods and installation techniques; coordinating this work with that of all other trades; and performing all work in a safe, workmanlike and satisfactory manner.
- L. Below are the submittal item codes that will be used when reviewing the submittal data. These codes show up on the "Submittal Review" sheet. Only one copy of the submittal review sheet is returned upon completion of the review for each trade.
 1. RNE - Reviewed, No Exceptions Noted
 - a. Indicates the information provided has been reviewed and no exceptions are taken. Contractor must still comply with the contract documents.
 - b. No corrective action required at this time.
 2. FNC - Furnish with Noted Corrections
 - a. Indicates the contractor shall ensure that all necessary or noted corrections are incorporated into equipment furnished to the project.
 - b. Contractor shall incorporate items requested in review comments, but re-submittal not required.

3. RES - Revise and Resubmit
 - a. Indicates item is not presently acceptable as submitted but may be accepted provided additional information and/or changes are made.
 - b. Contractor shall revise and resubmit item to Engineer with additional information indicating compliance with Contract Documents prior to proceeding with work.
 4. PSD - Provide Submittal Data
 - a. Indicates submittal data was not provided for this item or section.
 - b. Contractor shall provide submittal data meeting the explicit requirements of the plans, specifications, and all addenda.
- M. Shop drawings and data submittals for materials requiring extra long delivery time shall be submitted for approval as soon as possible after execution of contract. All items shall be submitted for approval in a timely manner (prior to other submittals if necessary) so they may be properly incorporated in the building's structure. Allow a minimum of three weeks for review. No substitutions of materials or extensions of contract time will be allowed for Contractor's failure to submit or order such materials sufficiently in advance of the work.

1.04 REGULATORY REQUIREMENTS

- A. All work installed under Division 23 shall conform to the current adopted Edition of Building/Mechanical Codes and their appropriate amendments:
 1. Life Safety Code, NFPA 101
 2. International Building Code with Georgia Amendments
 3. International Mechanical Code with Georgia Amendments
 4. Standard for the Installation of Air Conditioning and Ventilating Systems, NFPA 90A
 5. City of Statesboro and Bulloch County Codes and applicable local city codes.
 6. Requirements of the State of Georgia Fire Marshall's Office.
 7. ASHRAE 62.1 - 2004, Ventilation for Acceptable Indoor Air Quality.
 8. GA State Minimum Standard Energy Code.
 9. ASHRAE 15, Safety Code for Mechanical Ventilation.
- B. Obtain and pay for all permits, and request inspections from all authorities having jurisdiction, in a timely manner.
- C. Materials and Equipment included in Underwriter's Label Service shall bear that label. Electrical equipment shall be UL approved as installed, and bear the UL label, unless noted otherwise herein. All fans shall be AMCA certified and bear that label for performance and sound. All air conditioning equipment shall be AHRI certified and bear that label.
- D. Where requirements of these specifications differ from specified codes and ordinances, conform to the more stringent requirements.

1.05 PROJECT/SITE CONDITIONS

- A. Install Work in locations shown on Drawings, unless prevented by Project conditions. Shift or relocate equipment or systems to avoid conflicts with other trades. Modifications to the work required to accommodate project conditions encountered in the field shall be made at no additional cost to the contract.
- B. Prepare drawings showing proposed rearrangement of Work to meet Project conditions, including changes to Work specified in other Sections. Obtain permission of Engineer before proceeding.
- C. Install items so that there are no obstructions (e.g., pipes, conduits, etc.) blocking service panels of the equipment, or preventing the removal of the equipment.

1.06 SEQUENCING AND SCHEDULING

- A. Contractor shall coordinate work so as to avoid conflicts with other work in progress.
- B. Work shall progress in a manner that will not interfere with other trades. The Division 23 Contractor shall have coordination meetings with all other Contractors to ensure that all systems installed in "share areas" (e.g., ceiling plenums, mechanical rooms, etc.) are coordinated and installed to insure proper fit and access. All costs required for the coordination of the work between trades shall be borne solely by the Contractor.
- C. Install one condensing unit/cooling coil complete for review by the Engineer and Owner prior to the installation of remaining units.
- D. Contractor shall provide confirmation letters from the factory (not from the contractor) to the Owner that long lead items have been ordered. Long lead items are defined as items having longer than six-week fabrication schedules. See Division 1 - Summary for additional requirements.
- E. Phasing: Contractor shall conform to phasing plans.

1.07 ACCEPTABLE PRODUCTS

- A. Basis of Design: Model numbers indicated herein or shown on the drawings are the Basis of Design and are based on the most recent literature provided to the Engineer from the Manufacturer's Representative. The Contractor may substitute equal and approved equipment from the basis of design manufacturer or manufacturers listed in this specification (or set forth in an addendum) provided said equipment has all features which are inherent with the "Basis of Design" equipment, meets all requirements of the plans and specifications, has like electrical characteristics (e.g., same voltage, phase, ampacity/fusing/circuit breaker requirements, single or multiple points of connection as indicated on the electrical drawings), and will properly fit in the available spaces in the building. If the Contractor chooses to provide equipment which meets all of the aforementioned requirements, but has different characteristics, from that shown on the Contract Electrical Drawings, he shall bear all costs associated with that substitution.

Electrical costs include, but are not limited to materials (breakers, fuses, disconnects, wiring, conduits, panels, starters, contactors, and the like) installation costs and re-engineering. All electrical connections shall be coordinated with the Engineer and with the electrical subcontractor. Other costs may include, but are not limited to, additional structural support for heavier equipment than basis of design.

- B. Prior Approval: Substitutions of specified items and prior approvals of other manufacturers will not be considered.
- C. Acceptable Products: Where a manufacturer has been listed as being acceptable in the various specification sections (or addendums) hereinafter for a certain product, it shall be understood that the manufacturer has been approved as being capable of producing this product. This does not necessarily constitute approval of their standard product. The manufacturer's product shall still comply with all of the requirements and standards of this specification and not necessarily their standard specification, to the extent that it might require special custom manufacture to meet the requirements and standards of this specification, the requirements of the drawings and the inherent features of the "Basis of Design". Submitted products, not complying with the explicit requirement of these specifications and drawings and with the features of the "Basis of Design" will be rejected even if their manufacturer is listed in the specifications.

1.08 DRAWINGS

- A. General: Both the drawings and specifications shall be considered supplemental to one another so that materials and labor required by one but not the other shall be supplied and installed as though specifically called for by both. Where drawings and specification conflict, Contractor shall conform to the more stringent or costly of the two requirements.
- B. Scaling: The drawings are diagrammatic only and show generally the location of the equipment, ducts and pipes but are not to be scaled. All dimensions shall be verified at the building site. Prefabrication of work from the drawings shall be at the Contractor's risk.

1.09 SPACE CONDITIONS AND SERVICE CLEARANCE

- A. All equipment and materials shall fit into the available spaces in the building and must be introduced into the building so as not to cause damage to the structure. All equipment normally requiring service shall be made readily accessible by not locating it above (behind, etc.) piping, ductwork, conduit or other systems. Contractor shall also provide access by means of access panels, doors, etc. to be provided under this section of specifications where required or specified. Provide sufficient space to allow service (e.g., filter removal) of all new equipment. Coordinate with all trades to ensure accessibility and service of all equipment. Equipment located above lift out ceilings shall be considered to be accessible. Equipment located above hard (unremovable) ceilings shall be considered to be inaccessible and access panels shall be provided as specified herein.

- B. The contractor shall be responsible for verifying that the particular manufacturer's equipment that he chooses will fit in the available space and shall verify (prior to submitting equipment) that the service clearances that the manufacturer requires are available and shall not submit equipment that will not allow the manufacturer's service clearances. During construction, the contractor shall install the equipment such that the manufacturer's service clearances are provided by reading the installation instructions. The contractors shall bear all costs associated with providing equipment that requires service clearances different from the basis of design equipment. If the manufacturer's service clearances are not provided, the contractor shall remove the equipment and provide equipment with service clearances equal to the basis of design equipment. The contractor shall submit a detailed sketch and description of any modifications to install the particular manufacturer's equipment that he chooses, to demonstrate that the equipment will fit and have the manufacturer's service clearances. The sketch is not submitted for review or approval or for confirmation that it is correct, only to certify that the contractor has completely considered the installation of substitute equipment.

1.10 MOISTURE INTEGRITY

- A. Wall: All wall penetrations shall be sealed and caulked watertight.

1.11 NOISE AND VIBRATION

- A. When in operation, all systems included in this section of specifications shall be free from objectionable or abnormal noise and vibration. See Division 23 - Hangers and Supports for HVAC Piping and Equipment of the specifications for specific vibration isolation requirements.

1.12 PROTECTION OF MATERIALS AND EQUIPMENT

- A. Delivery, Storage and Handling: Deliver products to site in factory-fabricated protective containers, with (where appropriate) factory-installed shipping skids and lifting lugs. Store in clean, dry place and protect from weather and construction traffic. Handle carefully to avoid damage to components, enclosures, and finish.
- B. During Construction: Pipe openings shall be closed with caps or plugs. All open duct shall be sealed tight with polyethylene. All equipment and material shall be stored in accordance with manufacturer's recommendations. No equipment, ductwork, piping, or materials shall be stored inside or outside the building unless it is properly protected from the weather. The Engineer reserves the right to reject any items furnished under Division 23 which have been damaged or are not in "like-new" condition. Existing facilities shall be protected. Any existing items damaged during construction shall be replaced or restored to their original condition by the Contractor, at no cost to the contract.
- C. Non-Suspended Ductwork, Equipment and Piping: Contractor is required to wrap mechanical equipment, ductwork and piping that is not suspended with two layers of 4 mil polyethylene.

- D. Prior to Final Construction Review: All materials and equipment shall be cleaned. Chipped or scraped paint shall be retouched to match. All dents and sags in ductwork and equipment casings shall be straightened or replaced.
- E. Equipment Painting: Equipment which has been damaged beyond the point of retouching or has been retouched not to match the original finish shall be repainted.

1.13 ELECTRICAL

- A. General: Motors, controls, relays and switches required for proper operation of equipment covered under this section shall be furnished and installed under this division of the specifications.
- B. Wiring: All control and interlock wiring shall be furnished and installed under Divisions 23 - Mechanical. Power wiring through the disconnect and starter and to the motor shall be furnished and installed under Electrical Section. All control wiring and conduit shall conform to the material and installation requirements of Division 26.
- C. Electrical Connections: Voltage, phase, ampacity and connection arrangement (e.g. single or multiple point) of each item of electrically driven equipment provided under this section of specifications shall conform to that shown on the Electrical drawings.
- D. Electrical Characteristics: The horsepower, voltages and phases shown on the drawings and specified herein, are the estimated power requirements of all equipment furnished herein and is the basis of the design shown on the electrical drawings. If the Contractor provides equipment from the "Basis of Design" manufacturer or from other approved manufacturers with larger horsepower, different voltages, different phases or ampacity, he shall coordinate with other trades to provide any additional wiring, circuitry, starters, breakers, transformers, etc., as required at no additional cost to the Contract.

1.14 PAINTING

- A. All bare steel piping, pipe fittings, pipe hangers, supports and miscellaneous metal exposed to view provided under this section of specifications, shall be cleaned and painted. Supports, hangers and accessories exposed to view shall not be electroplated, in order to allow them to be painted. All bare steel piping, pipe hangers, supports and miscellaneous metal in the mechanical rooms shall be cleaned and painted.

1.15 CLEANING

- A. The Contractor shall keep the site reasonably clean and free of excessive debris and leftover materials at all times. All trash and debris shall be hauled from the job site on a daily basis for disposal. Prior to testing and adjusting, equipment shall be clean and free of any construction debris and litter.
- B. Contractor shall meet all contractual requirements related to site cleanliness including dust control.

1.16 HAZARDOUS MATERIAL ALERT FOR NEW MATERIALS

- A. Contract Materials which are scheduled to be incorporated into the work under this Contract shall first either be certified by the Manufacturer to be free of hazardous materials or be inspected and tested by accredited laboratories and certified to be free of hazardous material content (e.g., Asbestos, PCBs, lead, etc.) in accordance with OSHA, EPA and AHERA Rules (and 1982 School Rules).

1.17 STRUCTURAL COORDINATION

- A. The party responsible for the installation of the system furnished under Division 23 shall provide the Contractor with the weight of all mechanical equipment and ductwork and piping and the exact location. Contractor shall then ensure all structural members are properly sized and all mechanical penetrations are properly framed to support the full perimeter of the equipment. See also paragraph "Acceptable Products".

END OF SECTION

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SECTION 230514 - CLOSEOUT DOCUMENT REQUIREMENTS FOR HVAC

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Mechanical Closeout Document Requirements which are specifically applicable to all Division 23 Sections, in addition to the requirements of Division 1 - General Requirements.
- B. HVAC Closeout document requirements.
- C. Record Document Submittals "As-Built".
- D. Contractor Guarantee.
- E. Manufacturer Warranties.
- F. Operating Instructions and Training.
- G. Operation and Maintenance (O&M) Manuals.
- H. O&M Instruction Form.
- I. Manufacturer's Field Services and Start-up by Manufacturer's Authorized Personnel

1.2 RELATED WORK

- A. All Division 23 sections.

1.3 RECORD DOCUMENT SUBMITTALS "AS-BUILTS"

- A. The contractor shall be required to maintain a clean, undamaged set of blue or black line white prints of contract drawings and shop drawings.
- B. The HVAC contractor shall mark the set to show the actual installation where the installation varies substantially from the work as originally shown. Mark whichever drawing is most capable of showing conditions fully and accurately; where Shop Drawings are used, record a cross-reference at the corresponding location on the Contract Drawings. Give particular attention to concealed elements that would be difficult to measure and record at a later date.
 - 1. Mark record sets with red erasable pencil; use other colors to distinguish between variations in separate categories of the work.
 - 2. Mark new information that is important but was not shown on Contract Drawings or Shop Drawings.
 - 3. Note related Change Order numbers where applicable.
 - 4. Organize record drawing sheets into manageable sets, bind with durable paper cover sheets, and print suitable titles, dates and other identification on the cover of each set.

5. "As-builts" shall be submitted to the architect/engineer for review of the mechanical as installed upon completion of the work. Changes on "as-builts" are to be shown using standard engineering drafting practices. Freehand drawn changes will not be accepted.

1.4 CONTRACTOR GUARANTEE

- A. All equipment and materials furnished (and/or installed under this section) and all work performed under this section of specifications, shall be guaranteed to be free of defective materials and workmanship for a period of one year (unless a longer period is specified elsewhere) after date of substantial completion. Upon notice of failure of any part of the guaranteed equipment during the guarantee period, the affected part or parts shall be promptly replaced with new parts by the Contractor at no additional cost to the Owner. All labor required to perform guarantee shall be included as part of the complete guarantee warranty.

1.5 MANUFACTURER'S WARRANTIES

- A. Provide as a minimum a one (1) year manufacturer's equipment warranty against defective components for each piece of equipment and its components installed under their respective specification section prior to final inspection in accordance with each of the trades listed below. Equipment warranties shall commence on the date of Substantial Completion as established in the Certificate of Substantial Completion issued by the Engineer. Contractor shall note that there may be more than one certificate of Substantial Completion and date of Substantial Completion for this contract. Any parts which fail during the first year shall be replaced by the Contractor at no additional cost to the Owner.
- B. Each piece of equipment and its components furnished shall carry a minimum one (1) year warranty for replacement of parts and the labor required to complete such warranty work. Equipment and parts requiring warranties longer than one (1) year will be listed below.
 1. All HVAC equipment (i.e., condensing units, etc.) containing compressors shall carry a minimum five (5) year manufacturer's parts and labor warranty on the compressor.

1.6 OPERATING INSTRUCTIONS AND TRAINING

- A. Instructions: Instruct operating personnel as required (but a minimum of four (4) hours) in operation and maintenance of systems as noted in the "O & M Instruction Form" paragraph. In addition, there shall be the quantity of dedicated instruction for certain specific pieces of equipment as specified in the individual specification sections herein. Provide signed O & M Instruction Verification Form as specified in later paragraph certifying instructions have been received.
- B. Training: See each specification section for specific training requirements.

1.7 OPERATING AND MAINTENANCE (O&M) MANUALS

- A. Operating and maintenance manuals shall comply with Division 1 - Operation and Maintenance Data.
- B. One bound and indexed Operating and Maintenance Manual and two electronic (PDF format on thumb drive) copies shall be prepared by the Contractor and be submitted for approval prior to delivery to operating personnel. Binder shall be 3-ring commercial grade, complete with inside storage pockets, sheet protectors, spine and front cover labels.
- C. Each Manual shall contain the following information, data and drawings. The exact format and order of the following information shall comply with Division 1 requirements. If no Division 1 requirement exists, format and order shall be as listed below.
 - 1. List of Contents. Insert under clear front cover of binder.
 - 2. Contractors one (1) year guarantee.
 - 3. Manufacturer's equipment warranties (provide a warranty for each piece of equipment).
 - 4. Copy of O & M Instruction Form showing Contractor has instructed designated personnel in the proper operation of all Division 23 systems.
 - 5. Installation, operating and maintenance instructions for each item of equipment. Provide trouble shooting checklist guide.
 - 6. Manufacturer's list of renewal parts for each item of equipment with recommended stock items and quantities indicated.

1.8 MANUFACTURER'S FIELD SERVICES AND START-UP BY FACTORY AUTHORIZED PERSONNEL/MANUFACTURER

- A. Refer to each specification section for additional requirements the manufacturer shall provide under the provisions of this specification.
- B. Upon completion of the equipment installation the Contractor shall obtain the services of the factory authorized and trained representative or manufacturer at no additional cost to the owner to perform a start-up of the piece of installed equipment. The factory authorized and trained representative shall submit a certificate or letter stating the equipment has been successfully started, adjusted and tested in accordance with the manufacturer's recommendations. Contractor shall refer to each specification section to determine which equipment/systems require start-up by factory authorized personnel or manufacturer. Some representative equipment/systems which require start-up are listed below.
 - 1. Condensing Unit/DX Coil: Manufacturer startup. Authorized service agent startup is not acceptable.
 - 2. DDC Controls: Manufacturer startup. Authorized service agent startup is not acceptable.

1.9 MECHANICAL CONTRACTOR'S START-UP CARDS AND CHECK LISTS

A. Condensing Unit/DX Coil Check List:

1. Provide a check list to verify that the refrigerant pipe supports for the condensing units have been secured, double nuts or lock nuts are installed on the drop rods and all filters and access panels are removable for service. The purpose of this checklist is to ensure that no piping will vibrate loose from their supports and fall causing injury and to ensure accessibility of all filters/access panels.
2. The checklist shall include the
 - a. Project Name.
 - b. Company Name.
 - c. Contractor's Name and Title
 - d. Contractor's Telephone Number
 - e. Date check list was performed.
 - f. Signature of personnel performing check list.
3. The checklist shall also include the following for each system.
 - a. Condensing Unit Tag
 - b. Verify unit access panels are accessible.
 - c. Verify supports have been secured.

1.10 O & M INSTRUCTION FORM

- A. Contractor shall provide instruction to operating personnel for the minimum hours specified in each specification section.

- B. Contractor shall coordinate a schedule of startup/operation and maintenance instruction meetings between the Owner's representatives, various subcontractors and manufacturer's representatives. Submit the following completed form. Some representative systems and equipment are included in the form below, but contractor shall customize the form based on the specific systems and equipment on this project.

OPERATIONAL INSTRUCTION VERIFICATION FORM

Operation and maintenance procedures for major systems and equipment were thoroughly explained to the Representatives as follows:

Equipment Item	Date Instruction Received	Owner's Representative Name (printed)	Owner Representative Initial or Signature
Controls (DDC/BMS)			
Condensing Units (4 Hours)			
DX Coils			
"I certify that the operation and maintenance procedures of all the major mechanical systems have been thoroughly explained to the Owner's Representative."			
Company:			
Name:			
Title:			
Signature:			
Date:			

END OF SECTION

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SECTION 230529 - HANGERS AND SUPPORTS FOR HVAC PIPING AND EQUIPMENT

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section includes the following hangers, supports and accessories for mechanical system piping and equipment:
 - 1. Coatings
 - 2. Upper attachments
 - 3. Pipe attachment (hangers and clamps)
 - 4. Lower pipe supports.
 - 5. Metal Framing Channel
 - 6. Hanger Rods
 - 7. Insulation Shields
 - 8. Concrete Equipment Bases
 - 9. Sleeves
 - 10. Vibration Isolators

1.2 PERFORMANCE REQUIREMENTS

- A. All supports utilized under Division 23 shall meet the sizing criteria specified herein. No support shall be loaded to more than 20% of its yield strength (thereby providing a safety factor of 5). All support sizes specified herein (for hanger rods, trapeze hangers, pipe attachments, etc.) are minimum sizes required. Contractor shall utilize larger size supports where actual loads dictate a larger support.

1.3 SUBMITTALS

- A. Submit product data under provisions of Division 23 - Common Requirements for HVAC Equipment.
- B. Submit product data on supports, non-penetrating supports, upper attachments, pipe attachments, lower pipe supports, and vibration isolators.

1.4 WELDING REQUIREMENTS

- A. Welding Requirements: All welding performed to support Mechanical piping and equipment shall comply with AWS D1.1, "Structural Welding Code - Steel". Welders shall be qualified per AWS and welding certificates shall be posted at the jobsite.

1.5 COATINGS

- A. All supports for piping and equipment, hangers and accessories, including but not limited to bolts, nuts, washers, rods, beam clamps, etc. shall be galvanized, except as indicated in the following paragraphs.

- B. Hangers and supports in direct contact with copper piping shall be copper plated.

PART 2 - PRODUCTS

2.1 UPPER ATTACHMENT

- A. Poured in Place Concrete: Contractor may install concrete inserts or drill concrete anchors. Inserts shall be:

1. B-Line: B 2500
2. C&P: 75
3. Anvil: 281
4. Erico/Michigan: 355
5. PHD: 950, 951

- B. Concrete Anchors: Anchors shall be expansion "drop-in" type with an actual load less than 1/3 the manufacturers listed allowable working load for tension in 2,000 psi concrete. Anchors shall be installed in drilled holes per manufacturer's recommendations. Approved manufacturers:

1. Hilti: 5490000
2. Red Head: RM-Multi-Set II
3. Rawl: 6300 Drop-In

- C. Steel Beams:

1. Piping 2" and smaller: Malleable Iron C-Clamp with Lock Nut.
 - a. B-Line: B 3033 or B3034
 - b. C&P: 192
 - c. Anvil: 92
 - d. Erico/Michigan: 280
 - e. PHD: 350 or 360
 - f. FNW: 7203 or 7204
2. Piping 2-1/2" and larger: Malleable Iron Beam Clamp.
 - a. B-Line: B 3054
 - b. C&P: 82
 - c. Anvil: 218
 - d. Erico/Michigan: 360
 - e. PHD: 630 w/25
 - f. FNW

- D. Steel Bar Joist: Malleable Iron C-Clamp with Lock Nut.

1. B-Line: B 3033 or B3034
2. C&P: 192
3. Anvil: 92

4. Erico/Michigan: 280
5. PHD: 350 or 360
6. FNW: 7203 or 7204

2.2 PIPE ATTACHMENT

- A. Copper tubing hangers: Size pipe hangers for refrigerant and condensate piping to fit outside insulation, with insulation shield installed between the hanger and the pipe insulation.
1. B-Line: B3170CT
 2. C&P: 800CT
 3. Anvil: CT-69
 4. Erico/Michigan: 101
 5. PHD: 152
 6. FNW: 7015EC
- B. Copper Refrigerant Tubing Hangers for Condensing Unit/DX System: Provide Polypropylene Copolymer U.V. resistant pipe saddles designed for tool-free installation to clip directly on standard 1 5/8" x 1 5/8" metal framing channel/strut. Hangers shall be designed for horizontal installation and no insulation compression with operating temperature of -40°F to 178°F. Hangers shall be paintable with non-adhesive surface to allow for linear expansion of thermal insulation. Hangers shall be black, and UL classified for US (UL-723 / ASTM E84) and ULC listed for Canada (ULC-S102.2). Hangers shall be Insuguard model as manufactured by Armacell, or prior approved equal.

2.3 LOWER PIPE SUPPORTS

- A. Floor or Mezzanine Mounted Pipe Supports (For Piping 1-1/2" and Smaller Only):
1. Floor mounted pipe supports shall be malleable iron extension split pipe clamp, with integral 3/8" threaded rod tapping. Split pipe clamp shall be B-Line Model 3198R or approved equal by C & P, Anvil, PHD or Erico/Michigan.
 2. Lower pipe support base supporting the split pipe clamp shall be malleable iron ceiling flange with pre-drilled holes for anchoring to floor, and integral 3/8" threaded rod tapping. Malleable iron ceiling flange shall be B-Line Model B-3199 or approved equal by C & P, Anvil, PHD, FNW or Erico/Michigan.

2.4 METAL FRAMING CHANNEL

- A. Where possible and practical, piping may be supported with trapeze hangers consisting of a metal framing system of channel, fittings, and hardware as defined in the Metal Framing Manufacturer's Association Standard Publication MFMA-1. Length of trapeze supports shall not exceed 4 feet unless contractor performs and submits calculations which indicate the channel is within the manufacturer's recommendations with a safety factor of 30% added to the load.

- B. Vertical Pipe Supports: Where shown on the drawings, vertical routed piping shall be supported and/or stabilized by steel channel meeting the requirements for channel as specified herein.
- C. Channel shall be constructed of 12-gauge steel. Nominal width shall be 1-5/8" x 1-5/8" with a 9/16" wide and 7/8" long slot face opening, with slots on 2" centers. Channel shall be pre-galvanized in accordance with ASTM A 653 G90, or have a factory applied electro-deposited epoxy finish.
- D. Pipe clamps shall be sized as follows:
 - 1. Insulated Piping: Sized to fit outside of insulation.
 - 2. Copper Piping: Sized to fit outside of piping plus elastomeric isolation material.
 - 3. Insulated Copper Tubing Supported by Unistrut/Metal Framing Channel: Provide pipe supports at each pipe clamp. Pipe supports shall either be factory pre-insulated type or factory uninsulated type. For insulated type, pipe supports outer diameter shall match the outer diameter of the Armaflex insulation, and inside diameter of pipe support shall match copper pipe outer diameter. Pipe clamp shall not connect directly to copper pipe. Pipe clamp shall be sized for outer diameter of insulated pipe support/insulation. Insulated pipe supports shall be constructed with hinged, 360-degree position-free, rigid polyurethane core with high compressive load joined by two NBR/PVC-based elastomeric insulation collars. Outer PVC jacket with overlapping tab system shall serve as a vapor barrier. For uninsulated type support, supports shall be hinged with high strength thermoplastic olefin (TPO) sized for outer diameter of tubing, with pipe insulation inserted into coupling to provide vapor barrier. Supports shall be black, suitable for service temperatures from -40°F to 220°F, designed to ensure proper insulation thickness at load bearing points. Insulated pipe supports shall be K-Flex 360 model number, or equal by B-Line, Erico and ZSI-Foster. Uninsulated type shall be Hydro-Zorb Klo-Shure 7 series model.
- E. Approved Manufacturers: B-Line Model B22SH, Elcen, Unistrut, and Superstrut by Midland-Ross.

2.5 HANGER RODS

- A. Steel Hanger Rods: Continuous threaded rod. Size as indicated in individual piping specification sections.
- B. Rods supporting trapeze hangers shall be 1/2" unless actual loads dictate a larger rod. Rods supporting mechanical equipment shall be sized in accordance with the manufacturer's installation instructions. If no size is given, rod size shall be minimum 3/8", unless actual load dictates a larger rod. No support shall be loaded to more than 20% of its yield strength (thereby providing a safety factor of 5).
- C. Rod couplings shall be:
 - 1. B-Line: B3220
 - 2. C&P: 167

3. Anvil: 136, 136R
4. Erico/Michigan: 26
5. PHD: 100, 105

2.6 INSULATION SHIELD

- A. Provide insulation shields at all pipe hangers installed on the exterior of the insulation and at all pipe clamps and trapeze supports. Shields shall be fabricated from minimum 18-gauge galvanized steel. Shields at pipe hangers shall be 12" long with a 180-degree arc. Shields at pipe clamps shall cover entire pipe. Contractor may utilize the following shields:
 1. B-Line: B3151
 2. C&P: 265P
 3. Anvil: 167
 4. Erico/Michigan: 121
 5. PHD: 170
 6. FNW: 7750

2.7 EQUIPMENT BASES

- A. Bases shall be 3,000 psi concrete and provided in accordance with Division 3, Cast-In-Place Concrete.
- B. For equipment that is shown atop existing concrete pads, contractor shall pour additional concrete pad extensions as required to that edge of pad is 4-inches from edge of equipment.
 1. Condensing Units - 6 inches above grade (coordinate size and location). Use existing pads and extend as required.

2.8 SLEEVES

- A. Pipe Sleeves: Pipe sleeves for refrigerant piping thru interior/exterior walls shall be fabricated of 20-gauge galvanized sheet metal, size approximately 3-1/2" x 3-1/2" (or wider if necessary). Sleeve shall be flush with both sides of walls.

2.9 VIBRATION ISOLATORS

- A. General: Furnish and install vibration isolators for equipment as listed below. All isolation devices shall be selected for uniform static deflections according to distribution of weight and for the lowest disturbing frequency of the unit.
- B. Isolator Types:
 1. Type 5 Isolators: Oil resistant neoprene with upper and lower surfaces corrugated and running 90° to each other, minimum 3/8" thick, designed to support loads up to 50 psi for normal (non-impact) applications. Provide steel load transfer plates to distribute the supported load over the entire face area of the pad. When used on the corners of equipment, pads shall be minimum of 3" x 3".

C. Equipment Isolation:

1. The following equipment shall be isolated as indicated:

a. Condensing Units: Type 5 (factory provided_

D. Manufacturers: The vibration isolators shall be manufactured by Peabody Noise Control, Mason, Vibration Isolation Co. Inc., Vibro Acoustics, Vibration Eliminator Company or Kinetics. Isolators meeting the specification requirements which are engineered and approved by the equipment manufacturer may also be furnished by the equipment manufacturer.

PART 3 - EXECUTION

3.1 HANGER AND SUPPORT APPLICATIONS

- A. Specific hanger and support spacing requirements are specified in Sections specifying piping systems and equipment.
- B. Use galvanized hangers and supports for piping and equipment that will not have field-applied finish.
- C. Use nonmetallic coatings on attachments for electrolytic protection where attachments are in direct contact with copper tubing.

3.2 HANGER AND SUPPORT INSTALLATION

- A. Pipe Hanger Installation: Comply with MSS SP-69 and MSS SP-89. Install hangers, supports, clamps, and attachments as required to properly support piping from building structure.
- B. Trapeze Pipe Hanger Installation: Comply with MSS SP-69 and MSS SP-89. Arrange for grouping of parallel runs of horizontal piping and support together on field-fabricated trapeze pipe hangers.
 - 1. Pipes of Various Sizes: Support together and space trapezes for smallest pipe size or install intermediate supports for smaller diameter pipes as specified above for individual pipe hangers.
 - 2. Field fabricate from ASTM A 36/A 36M, steel shapes selected for loads being supported. Weld steel according to AWS D1.1.
- C. Hanger Shield Installation: Install shield in pipe hanger or shield for insulated piping.
- D. Install hangers and supports complete with necessary inserts, bolts, rods, nuts, washers, and other accessories.
- E. Install hangers and supports to allow controlled thermal and seismic movement of piping systems, to permit freedom of movement between pipe anchors, and to facilitate action of expansion joints, expansion loops, expansion bends, and similar units.

- F. Install lateral bracing with pipe hangers and supports to prevent swaying.
- G. Load Distribution: Install hangers and supports so piping live and dead loads and stresses from movement will not be transmitted to connected equipment.
- H. Pipe Slopes: Install hangers and supports to provide indicated pipe slopes and so maximum pipe deflections allowed by ASME B31.1 (for power piping) and ASME B31.9 (for building services piping) are not exceeded.

3.3 PIPE HANGER ADJUSTING

- A. Hanger Adjustments: Adjust hangers to distribute loads equally on attachments and to achieve indicated slope of pipe. Trim excess length of continuous-thread hanger and support rods to 1-1/2 inches.

3.4 PAINTING

- A. Touch Up: Cleaning and touchup painting of field welds, bolted connections, and abraded areas of shop paint on miscellaneous metal are specified in Division 9 Painting Section.
- B. Galvanized Surfaces: Clean welds, bolted connections, and abraded areas and apply galvanizing-repair paint to comply with ASTM A 780.
- C. In areas that are to be painted and also are exposed to view in public areas, supports for piping and equipment, hangers and accessories including but not limited to bolts, nuts, washers, rod, angle iron, beam clamps, etc. shall be plain steel with a coat of rust inhibiting primer. Primer shall be applied prior to installation of supports. Supports, hangers and accessories exposed to view shall not be galvanized or electroplated, in order to allow them to be painted. Areas that are to be painted but that are not exposed to view to the public, such as mechanical rooms, shall be galvanized as required above.

3.5 SLEEVES AND PENETRATIONS

- A. Provide pipe sleeves for all piping and conduit penetrations through floors and walls.
- B. Piping and Conduit Penetrations through Rated Walls or Floors: Firestopping methods and materials shall be in accordance with "Through-Penetration Firestop System" specification section. Assembly shall meet the wall or floor rating as specified.
- C. Piping and Conduit Penetrations through Non-rated Walls or Floors: Pack space between pipe or conduit and sleeve with fiberglass batts and with a minimum of 1-inch thick, non-sagging caulking material on one side. Caulk material is not required to be fire rated but shall comply with caulking specification section.
- D. Install chrome plated steel escutcheons at finished surfaces for piping.

3.6 SUSPENDED EQUIPMENT, DUCTWORK AND PIPING SUPPORTS

- A. Provide steel drop rod supports or angle iron supports, secured (spot welded or clamped in bar joist areas) to building main structural components for all suspended mechanical equipment, ductwork and piping. Supplemental angle iron framing shall be provided where required between bar joists and shall be minimum 3 x 3 x 1/4 for equipment and large piping (4" and larger), and minimum 2 x 2 x 1/4 for large ductwork, small equipment and small piping, and 2 x 2 x 1/8 for small ductwork and refrigerant and condensate drain piping. 1-5/8 x 1-5/8 x 12-gauge channel may be used to span bar joist in lieu of 2 x 2 x 1/4 angle provided that previous paragraph "Performance Requirements" are met. Contractor shall note that supplemental angle sizes are minimum. Contractor shall provide larger size supplemental angle iron framing as appropriate to safely and appropriately support equipment. Provide vibration isolation where specified. Coordinate all mechanical equipment, duct and pipe supports with steel fabricator/erector and do not overload any building structural members or supplemental framing members. Provide securely tightened lock nuts on all drop rod supports and connections.

END OF SECTION

SECTION 230553 - IDENTIFICATION FOR HVAC PIPING AND EQUIPMENT

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section includes the following mechanical identification materials and their installation:
 - 1. Equipment nameplates.
 - 2. Equipment markers.
 - 3. Pipe markers

1.2 SUBMITTALS

- A. Product data for each type of product included herein shall be submitted under provisions of Division 23 - Common Requirements for HVAC Equipment.

1.3 COORDINATION

- A. Coordinate installation of identifying devices with completion of covering and painting of surfaces where devices are to be applied.
- B. Coordinate installation of identifying devices with location of access panels and doors.
- C. Install identifying devices before installing acoustical ceilings and similar concealment.

PART 2 - PRODUCTS

2.1 NAMEPLATES

- A. General: Provide nameplates for all equipment and panel mounted controls. Location shall be accessible and visible.
- B. Equipment Nameplates: Metal with data engraved or stamped, permanently attached to equipment. As a minimum, nameplate shall include manufacturer, model number, serial number and electrical data.

2.2 EQUIPMENT MARKERS

- A. Markers shall be Contractor fabricated to have equipment "tag" or number (e.g., CU-V1, , etc.) on marker.

B. Designation:

1. Equipment tag shall be etched in 1/4" maximum, 1/8" minimum height letters and mounted on or adjacent to device cover or attached to the item of equipment. For items above ceiling, marker shall be attached to ceiling on t-bar grid in location approved by Owner.
2. Type: White core black bakelike secured with epoxy glue or screws, unless otherwise noted.
3. Some specific pieces of equipment or controls are identified as having equipment markers with customized messages. These include the following, and the customized messages:
 - a. Actual System Charge – Type 454B___ pounds (Contractor fill in pounds). (Include on condensing units).

2.3 IDENTIFICATION OF PIPING

- A. Piping shall be labeled with pre-tension pre-coiled semi-rigid plastic snap-on pipe markers equal to Seaton "Setmark" pipe markers or by Brimer or Brady, or self-adhesive plastic pipe markers with pressure sensitive, permanent type self-adhesive back, or field stenciled if pre-made marker is not manufactured. Provide arrow identifying direction and system description as listed below. Background and letter colors shall be in conformance with latest version of ANSI/ASME A13.1. The following piping systems shall be provided with pipe markers.
1. Refrigeration (suction and hot gas)
 2. Refrigeration (liquid)
 3. Condensate
- B. Height of letters shall be as follows:
1. Outside Diameter (Outside insulation on insulated piping)
 - a. 1/2" - 1-1/4": Letter height shall be 1/2"
 - b. 1-1/2" to 2": Letter height shall be 3/4"

PART 3 - EXECUTION

3.1 EQUIPMENT IDENTIFICATION

- A. Install and permanently fasten equipment nameplates on each major item of mechanical equipment that does not have nameplate or has nameplate that is damaged or located where not easily visible. Locate nameplates where accessible and visible.
- B. Install equipment markers with permanent adhesive on or near each major item of mechanical equipment.

3.2 PIPING IDENTIFICATION

- A. Install manufactured pipe markers indicating service on each piping system. Install with flow indication arrows showing direction of flow.
 - 1. Pipes with OD, Including Insulation, Less Than 6 Inches: Pre-tensioned pipe markers. Use size to ensure a tight fit.
 - 2. Pipes with OD, Including Insulation, Less Than 6 Inches: Self-adhesive pipe markers. Use color-coded, self-adhesive plastic tape, at least 3/4 inch wide, lapped at least 1-1/2 inches at both ends of pipe marker, and covering full circumference of pipe.
- B. Locate pipe markers and color bands as follows:
 - 1. Near major equipment items and other points of origination and termination.
 - 2. At 25 feet intervals on all straight runs of pipe.
 - 3. On both sides of walls or floors where pipe passes through walls or floors.

3.3 ADJUSTING

- A. Relocate mechanical identification materials and devices that have become visually blocked by other work.

3.4 CLEANING

- A. Clean faces of mechanical identification devices to an "as new" condition immediately prior to Final Certification.

END OF SECTION

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PROJECT NO. 0260-26048A

BIOLOGICAL SCIENCES FIELD HOUSE CONDENSER REPLACEMENT DESIGN
GEORGIA SOUTHERN UNIVERSITY

STATESBORO, BULLOCH COUNTY, GEORGIA

AH&P - 2025182

IDENTIFICATION FOR HVAC
PIPING AND EQUIPMENT

230553 - 4

SECTION 230593 - TESTING, ADJUSTING, AND BALANCING FOR HVAC

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section includes TAB to produce design objectives for the following:
 - 1. Air Systems.
 - 2. Verifying that automatic control devices are functioning properly.
 - 3. Reporting results of activities and procedures specified in this Section.

1.2 SUBCONTRACTOR COORDINATION

- A. Testing, Adjusting and Balancing (TAB) work shall be performed by NEBB/AABC agent as described in this section of the specifications; however, all devices that the TAB agent will be required to perform work on described in this section, shall be provided by the Contractors' Division 23 mechanical sub-contractor(s). These devices include, but are not limited to: balancing dampers, "Petes" plugs, re-insulation of ductwork after duct test holes are drilled by TAB agent, adjustable sheaves, pulleys, belts, balance valves, etc. and the labor to install these devices. Sub-contractor(s) providing the Division 23 HVAC systems must provide labor to support the TAB Agent. The mechanical systems shall be fully operational and ready for TAB work to begin a minimum of four weeks prior to the Contractual date of "Substantial Completion". Additionally, the Division 23 Contractor(s) shall furnish a qualified technician(s)/mechanic(s) to assist the TAB agent in the performance of his duties until all work specified herein is accomplished. The Division 23 sub-contractor(s) shall correct all deficiencies found by the TAB agent.

1.3 DEFINITIONS

- A. Adjusting: The varying of system flows by partially closing balancing devices, such as dampers and valves, and varying fan speeds to achieve optimum system operating conditions within design and installation limits.
- B. Balancing: The methodical proportioning of air flows through the system main branches, and terminal devices using acceptable procedures to achieve the specified airflow within installation, testing and design limitations.
- C. TAB: Testing, adjusting, and balancing. A systematic process or service applied to HVAC systems and other environmental systems, to achieve and document air.
- D. Test: A procedure to determine quantitative performance of systems or equipment.
- E. Testing, Adjusting, and Balancing (TAB) Firm: The entity responsible for performing and reporting TAB procedures.

1.4 SUBMITTALS

- A. Qualification Data: Within 45 days from Contractor's Notice to Proceed, submit 4 copies of evidence that TAB firm and this Project's TAB team members meet the qualifications specified in "Quality Assurance" Article.
- B. Sample Report Forms: Submit one set of sample TAB report forms. Forms are to be project specific for the systems to be tested, adjusted and balanced.
- C. Contract Documents Examination Report: Within 45 days from Contractor's Notice to Proceed, submit 4 copies of the Contract Documents review report as specified in Part 3.
- D. Certified Final TAB Reports: Submit four copies of reports prepared on approved forms certified by TAB firm.

1.5 QUALITY ASSURANCE

- A. TAB Firm Qualifications: Engage a TAB firm certified by either AABC or NEBB. Test and balancing by non-AABC or non-NEBB firms is not allowed.
- B. TAB Report Forms: Use standard forms from AABC's "National Standards for Total System Balance" or NEBB's most recent "Procedural Standard for Testing, Adjusting, and Balancing of Environmental Systems."
- C. Instrumentation Type, Quantity, and Accuracy: As described in AABC's "National Standards for Total System Balance" or NEBB's most recent copy of "Procedural Standard for Testing, Adjusting, and Balancing of Environmental Systems," Section 4, "Standards for Instruments and Calibration."
- D. Instrumentation Calibration: Calibrate instruments at least every twelve months or more frequently if required by instrument manufacturer.
 - 1. Keep an updated record of instrument calibration that indicates date of calibration and the name of party performing instrument calibration.

1.6 COORDINATION

- A. Notice: Provide seven days' advance notice for each test. Include scheduled test dates and times. Test and Balance Agent shall contact Engineer and Owner 48 hours prior to test and balance work to allow (but not require) Engineer and owner to be present during TAB work.

1.7 WARRANTY

A. Performance Guarantee:

1. Provide one of the following:

- a. For AABC Certified Firms: Provide a guarantee stating that AABC will assist in completing requirements of the Contract Documents if TAB firm fails to comply with the Contract Documents.
- b. For NEBB Certified Firms: Provide a guarantee stating that NEBB will assist in completing requirements of the Contract Documents if TAB firm fails to comply with the Contract Documents. Guarantee for either AABC or NEBB shall include the following provisions:
 - 1) The certified TAB firm has tested and balanced systems according to the Contract Documents.
 - 2) Systems are balanced to optimum performance capabilities within design and installation limits.

- B. TAB work shall be guaranteed by AABC or NEBB. Submit copy of AABC or NEBB National Performance Guaranty when final balance report is submitted. If for any reason, the TAB agency fails to comply with the specifications, with the exception of termination of business by the TAB agency, equipment malfunction or inadequacy, which prevents proper balancing of the systems, the Associated Air Balance Council or NEBB shall provide supervisory personnel to assist the TAB agency to perform work in accordance with AABC or NEBB standards. As part of this Performance Guaranty, the engineer or building owner may call upon AABC or NEBB to assist him with any technical and/or field problems pertaining to the final balanced condition of the systems. These services will be made available at no additional charge by the TAB agency or by AABC or NEBB.

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. Provide Contract Documents Examination Report to report on acceptability and/or deficiencies in Contract Documents.
1. Contract Documents are defined in the General and Supplementary Conditions of Contract.
 2. Verify that balancing devices, such as test ports, flow-control devices, balancing valves and fittings, and manual volume dampers, are required by the Contract Documents. Verify that quantities and locations of these balancing devices are accessible and appropriate for effective balancing and for efficient system and equipment operation.

- B. Examine approved submittal data of HVAC systems and equipment.
- C. Examine system and equipment installations to verify that they are complete and that testing, cleaning, adjusting, and commissioning specified in individual Sections have been performed.
- D. Examine HVAC system and equipment installations to verify that indicated balancing devices, such as test ports, flow-control devices, balancing valves and fittings, and manual volume dampers, are properly installed, and that their locations are accessible and appropriate for effective balancing and for efficient system and equipment operation.
- E. Report deficiencies discovered before and during performance of TAB procedures.

3.2 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" or NEBB's most recent "Procedural Standards for Testing, Adjusting, and Balancing of Environmental Systems" and this Section.
- B. Cut insulation, ducts, pipes, and equipment cabinets for installation of test probes to the minimum extent necessary to allow adequate performance of procedures. After testing and balancing, close probe holes and patch insulation with new materials identical to those removed. Restore vapor barrier and finish according to insulation Specifications for this Project.
- C. Mark equipment and balancing device settings with paint or other suitable, permanent identification material, including damper-control positions, valve position indicators, fan-speed-control levers, and similar controls and devices, to show final settings.
- D. Take and report testing and balancing measurements in inch-pound (IP) units.

3.3 SAFETY CONTROLS DATA

- A. Provide unit designation or location with description of device and setpoint. Activate and verify operation of all safety devices. Smoke detectors shall be activated with smoke. Test button activations is not acceptable.

3.4 GENERAL PROCEDURES FOR TESTING ADJUSTING AND BALANCING

- A. Air systems including, but not limited to all split systems, etc., shall be Tested and Balanced using the procedures outlined in NEBB's most recent copy of "Procedural Standard for Testing Adjusting and Balancing of Environmental Systems", or AABC's "National Standards for Total System Balance".

3.5 TOLERANCES

- A. Set HVAC system airflow within the following tolerances:
 - 1. Supply, Return, and Exhaust Fans and Equipment with Fans: Plus 10 percent to minus 10 percent.
 - 2. Air Outlets and Inlets: Plus 10 percent to minus 10 percent.

3.6 CERTIFIED FINAL TAB REPORT

- A. General: Computer printout in letter-quality font, on standard bond paper, in three-ring binder, tabulated and divided into sections by tested and balanced systems.
- B. The content for the Certified TAB Report shall include all content and data required by the firm's certifying agency (AABC or NEBB) for each system or component included in the scope of work. In addition to this data and content, the Final TAB Report shall contain all content and data listed in this section.
- C. Functional Performance Testing
 - 1. Provide written verification of complete sequence of control system operation.
- D. A2L Detectors
 - 1. Installed Unit Data:
 - a. Unit designation or installed location.
 - b. Manufacturer
 - c. Model Number
 - 2. Testing and Data:
 - a. Activate with A2L refrigerant and verify proper operation. Provide installed unit data and confirm operation. (Test button activation is not acceptable).
 - b. Verify all AHU mitigation strategy when emergency HVAC shutdown is activated.
 - c. Verify all specified equipment shuts down when emergency HVAC shutdown is activated.

3.7 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.
 - 2. Randomly check the following for each system:
 - a. Measure airflow of at least 10 percent of air outlets.

- b. Measure room temperature at each thermostat/temperature sensor. Compare the reading to the set point.
- c. Verify that balancing devices are marked with final balance position.
- d. Note deviations to the Contract Documents in the Final Report.

B. Final Inspection:

- 1. After initial inspection is complete and evidence 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 Owner and Engineer.
- 2. TAB firm test and balance engineer shall conduct the inspection in the presence of Owner and Engineer.
- 3. Owner and Engineer shall randomly select measurements documented in the final report to be rechecked. The 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 the rechecks yield measurements that differ from the measurements documented in the final report by more than $\pm 10\%$, 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.
- 6. TAB firm shall recheck all measurements and make adjustments. Revise the final report and balancing device settings to include all changes and resubmit the final report.
- 7. Request a second final inspection. If the second final inspection also fails, Owner shall contract the services of another TAB firm to complete the testing and balancing in accordance with the Contract Documents and deduct the cost of the services from the final payment.

3.8 REPORT

- A. Provide four copies of the Test and Balance report to the Architect/Engineer by the earlier of the following two dates:
 - 1. A minimum of 48 hours prior to the semi-final on-site project construction site review by the Architect/Engineer.
 - 2. Two weeks prior to the date the facility is scheduled to be turned over to the Owner.

- B. TAB work shall be guaranteed by AABC or NEBB. Submit copy of AABC or NEBB National Performance Guaranty when final balance report is submitted. If for any reason, the TAB agency fails to comply with the specifications, with the exception of termination of business by the TAB agency, equipment malfunction or inadequacy, which prevents proper balancing of the systems, the Associated Air Balance Council or NEBB shall provide supervisory personnel to assist the TAB agency to perform work in accordance with AABC or NEBB standards. As part of this Performance Guaranty, the engineer or building owner may call upon AABC or NEBB to assist him with any technical and/or field problems pertaining to the final balanced condition of the systems. These services will be made available at no additional charge by the TAB agency or by AABC or NEBB National Headquarters.

END OF SECTION

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SECTION 230716 - HVAC EQUIPMENT INSULATION

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section includes mechanical insulation for duct, equipment, and pipe, including the following:
 - 1. Insulation materials
 - 2. Fitting materials.
 - 3. Insulation finish materials
 - 4. Accessories

1.2 SUBMITTALS

- A. Product data shall be submitted under provisions of Division 23 - Common Requirements for HVAC Equipment for each type of product indicated; identify thermal conductivity, thickness, and jackets (both factory and field applied, if any). Provide a sheet that identifies each system (e.g., refrigerant piping, supply duct, etc.), and the submitted material, thickness, and finish for each system.
- B. Submit proof of three years minimum experience in insulation installation.

1.3 QUALITY ASSURANCE

- A. Insulation and related materials shall meet the requirements of NFPA-90A.
- B. Fire-Test-Response Characteristics: Insulation and related materials shall have fire-test-response characteristics indicated, as determined by testing products per ASTM E 84. Factory label insulation and jacket materials and adhesive, mastic, and cement material containers, with appropriate markings of applicable testing and inspecting agency.
 - 1. Insulation Installed Indoors: Flame-spread index of 25 or less, and smoke-developed index of 50 or less.
 - 2. Insulation Installed Outdoors: Flame-spread index of 75 or less, and smoke-developed index of 150 or less.
- C. Applicator: Company specializing in insulation application with three years minimum experience.

1.4 GENERAL INSULATION NOTES

- A. Any HVAC equipment which is factory insulated, and which has sweating/condensation forming on the equipment while operating under design conditions, shall be replaced or field insulated by the contractor until the condensation is eliminated.
- B. Piping and ductwork is considered concealed for purposes of this Specification Section when located above ceilings or in chases.

PART 2 - PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS

- A. Certain Teed, Owens-Corning, Johns Manville, Armacell, IMCOA, Nomaco, Knauf, Pittsburg Corning, The Dow Chemical Company, Dyplast, Foster, Childers and Hi-Therm.
- B. Substitutions: Under provisions of Division 23 - Common Requirements for HVAC Equipment.

2.2 INSULATION MATERIALS

- A. I2: Preformed flexible elastomeric expanded closed-cell pipe insulation having a flame spread rating of 25 or less and a smoke density of 50 or less when tested by ASTM E-84 method. Temperature range -40°F to 220°F. Insulation shall be CFC and HCFC free and formaldehyde free. Thermal conductivity of 0.27 btu-in/hr sq. ft °F at 75°F mean temperature. All seams and butt joints shall be sealed with factory applied adhesive. Provide insulation shield on exterior of insulation at all hangers.
- B. I4: Flexible elastomeric expanded closed-cell similar to that specified as the preformed "I2" insulation specified herein.
- C. I6: Rigid Glass Fiber: Minimum 6 lb. /ft³ density board. ANSI/ASTM C612m Class 1; "K" value of 0.24 at 75°F. Jacket shall be factory applied foil-skim-kraft (FSK) unless noted otherwise. Secure insulation to duct with welded or adhered clips and washers on 12" centers. If insulation thickness will not allow standing seams to be covered with 1" insulation, install expanded rib metal lath over seams for insulation support. Depress washers so pins can be cut flush with surface. Point up washer indentations with insulation cement. Seal washers and pins with gray type F3 finish. All joints and breaks in the vapor barrier shall be sealed with FSK tape and F3.

2.3 INSULATION FINISH MATERIALS

- A. F1: Two coats of Armacell Armaflex finish or equal
- B. F3: Fungus Resistant, white or gray vapor barrier mastic with 10 x 10 glass cloth or polyester reinforcing membrane to develop 37 mil dry film thickness. Foster Vapor Safe 30-80 AF conforming to ASTM D 5590 with 0 rating and Chil Glas #10 reinforcing mesh or prior approved equals.
- C. F6: 0.010" Aluminum jacketing with joints sealed watertight with sealant.

2.4 ACCESSORIES

- A. Metal Jacket Bands: 1/2-inch wide; 0.015-inch thick aluminum.
- B. Adhesives: Compatible with insulation materials, jackets and substrates and for bonding insulation to itself and to surfaces to be insulated, unless otherwise indicated.

- C. Insulation Shields: Provided in accordance with Division 23 - Hangers and Supports for HVAC Piping and Equipment.
- D. Mastics: Materials shall be compatible with insulation materials, jackets, and substrates.
- E. Tapes: FSK foil face, vapor retardant type tape matching factory applied jacket with acrylic adhesive; complying with ASTM C1136 and UL listed. Width shall be three inches; thickness shall be 6.5 mils.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Surface Preparation: Clean and dry surfaces to receive insulation. Remove materials that will adversely affect insulation application.

3.2 COORDINATION

- A. Coordinate with trade installing piping to verify all piping has been pressure tested prior to application of insulation.

3.3 COMMON INSTALLATION REQUIREMENTS

- A. Install insulation, fitting materials, finish materials and accessories in accordance with manufacturer's installation requirements and recommendations.
- B. Install insulation materials, accessories, and finishes with smooth, straight, and even surfaces; free of voids throughout the length of equipment, ducts and fittings, and piping including fittings, valves, and specialties.
- C. Install insulation with longitudinal seams at top and bottom of horizontal runs. Install multiple layers of insulation with longitudinal and end seams staggered. Install insulation with tight longitudinal seams and end joints. Bond seams and joints with adhesive recommended by insulation material manufacturer.
- D. Keep insulation materials dry during application and finishing.
- E. Install insulation with least number of joints practical.
- F. Where vapor barrier is indicated, seal joints, seams, and penetrations in insulation at hangers, supports, anchors, and other projections with vapor-barrier mastic (Type F3).
- G. Cut insulation in a manner to avoid compressing insulation more than 75 percent of its nominal thickness.
- H. Continue insulation with vapor barrier through penetrations.

3.4 INSULATION SCHEDULE

Service/Location	INSULATION			FINISH	
	Pipe/Duct	Fitting	Thickness	Pipe/Duct	Fitting
PIPING:					
Refrigerant Suction and Hot Gas Piping Serving Condensing Unit, Exposed Outdoors	I2	I2	1"	F1 & F6	F1 & F6
Refrigerant Liquid Piping Serving Condensing Unit, Exposed Outdoors, or as required by manufacturer	--	--	--	--	--
Split System Suction and Hot Gas Piping, Exposed inside Mechanical Room	I2	I2	1"	--	--
Split System Liquid Piping, Exposed inside Mechanical Room	--	--	--	--	--
Condensate Piping:					
Condensate Piping, Copper Exposed Inside Mechanical Room	I2	I2	1"	--	--
DUCT:					
General Exhaust Duct	--	--	--	--	--
Outdoor Air, Supply and Return Ducts Serving AHU In Mechanical Room	I6	I6	2"	F3	F3

EQUIPMENT:

Mechanical Equipment

Shall have factory installed insulation to prevent condensation or excessive heat loss/gain

END OF SECTION

SECTION 230900 - INSTRUMENTATION AND CONTROL FOR HVAC

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section includes control equipment for HVAC systems and components, including control components for equipment not supplied with factory-wired controls.

1.2 WORK INCLUDED

- A. Complete control system for all heating, ventilating and air conditioning (HVAC) systems and exhaust systems including all integral and field mounted devices and control wiring. All control components shall be provided under this section of the specifications unless specifically provided elsewhere. A complete and fully operational control system shall be provided for all mechanical systems furnished under Division 23 to achieve the sequence of control specified: (1) herein (2) in other specification section or (3) as required to achieve proper operation of the equipment.
- B. This system shall include all devices specified herein and shall include, but is not limited to; software, graphics package, sensors, relays, switches, contactors, transformers, etc.
- C. Existing Control System Operation: New equipment included in this project shall be connected to Owner's existing Johnson control system.

1.3 SUBMITTALS

- A. Submit shop drawings and product data under provisions of Section 230513 to the Owner and Engineer.
- B. Each submittal shall contain the following information, as appropriate based on this particular project.
 - 1. Single line schematics and flow diagrams showing the location of all control devices.
 - 2. Vender's own written description for each sequence of operation.
 - 3. Catalog cut sheets for all equipment used, including but not limited to sensors, thermostats, actuators, etc.
 - 4. Submittal drawing index sheet with control system legend.
- C. Controls contractor shall not order material or begin field installation until receiving approved submittals.
- D. Submit electrical requirements for power supply wiring including wiring diagrams for interlock and terminal to terminal control wiring, clearly indicating factory-installed and field-installed wiring associated with all equipment. Wiring diagrams shall show all point-to-point wiring connections between all components of the control system. **No devices, conduit or wiring shall be installed until Contractor has received approved shop drawings from the Architect/Engineer.**

- E. Field quality-control test reports.
- F. Operation and Maintenance Data: For HVAC instrumentation and control system, submit under the provisions of Section 230514.

1.4 QUALITY ASSURANCE

- A. Installer Qualifications: Automatic control system manufacturer's authorized representative who is trained and approved for installation of system components required for this Project.
- 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. Comply with ASHRAE 135 for DDC system components.
- D. Complete control system and submittal data for this system shall be prepared and provided by a factory authorized representative of the Control System Manufacturer with a minimum of five (5) years experience in control systems of similar size and complexity. The control system manufacturer must be able to demonstrate 5 similar projects with control systems operating successfully in the field for a minimum of five years.
- E. The control contractor shall be a factory authorized branch office that is regularly engaged in the engineering, programming, installation and service of the control systems of similar size and complexity. The controls contractor shall have a local branch office with a 100 mile radius of the job site. Emergency service shall be available on a 24 hour, seven day a week basis.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Factory-Mounted Components: Where control devices specified in this Section are indicated to be factory mounted on equipment, arrange for shipping of control devices to equipment manufacturer.
- B. System Software: Update to latest version of software at Project completion.

1.6 COORDINATION

- A. Coordinate location of sensors, and other exposed control sensors with plans and room details before installation.

1.7 WARRANTY

- A. See Section 230514 for warranty information.
- B. Emergency Service: The controls contractor shall restore the control system to proper operating condition within three calendar days after receiving a request for service.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Provide a system of controls as manufactured and installed by Johnson Controls.

2.2 WIRING

- A. All control wiring (including but not limited to control, interlock, sensor, thermostat, etc.) shall be provided under this section of these specifications. If 120 volt AC power for control devices is required and if Division 26 electrical drawings do not indicate 120 volt AC is provided to control devices, the control contractor is responsible for providing 120 volt AC as specified herein.

2.3 CONTROL COMPONENTS AND THEIR FUNCTION

- A. Cabinets: Provide and install control cabinets constructed of heavy gauge steel or aluminum and consisting of a one piece rectangular or square ring, a sub-panel and a door with continuous hinge, and quick turn latch with keyed lock. Unless otherwise specified, all controllers, and other equipment furnished as part of the control system which are not required to be mounted on mechanical equipment shall be cabinet mounted. All wiring connections shall be made inside the cabinet. All electrical devices shall be wired to a numbered terminal strip. No field wiring shall be required within the cabinet except to the terminal strip.
- B. Conduit and Raceway: Provide and install under this section.
 - 1. Refer to Division 26 - Electrical for material requirements for conduit and flexible conduit. Conduit sleeves with bushing shall be provided at all control wiring penetrations through walls.
 - 2. Outlet Boxes: Refer to Division 26. Provide and install under this section.
- C. Conductors:
 - 1. 50 to 600 volts: Refer to Section Division 26 for requirements.
 - 2. Below 50 volts: Minimum size for individual conductors is AWG No. 18. Minimum conductor sizes for multiconductor cables is AWG No. 22. Provide shielded cable as required to avoid EMI where conduits natural shielding effect is insufficient. Conductors shall be sized within acceptable voltage drop parameters.
 - 3. Plenum Rated Cable: Plenum rated cable with flame spread of 25 or less and smoke development of 50 or less as tested by ASTM-E84.
 - 4. Conductor Insulation: "TFFN", unless noted otherwise.
 - 5. Taps and Joints: Mechanically and electrically sound.
 - 6. Tape: Per Division 26. Provide and install under this section.
 - 7. Lacing: Per Division 26. Provide and install under this section.
 - 8. Lubricants: Per Division 26. Provide and install under this section.
 - 9. Color Code: All low voltage control conductors shall be color coded by factory or provided with numbered ends.

D. Contactors and Disconnects:

1. All contactors for equipment specified in Division 23 shall be provided under this section of the specifications unless explicitly shown furnished by Electrical on the Electrical Drawings. Provide herein all relays and contactors necessary for the proper operation of all Division 23 equipment.
2. All electrical disconnects for equipment specified in Division 23 shall be provided under this section of the specifications unless explicitly shown furnished by Electrical on the Electrical Drawings.
3. Control Relays and Contactors: Relays for control purposes shall be the plug-in type with plastic enclosure surrounding the relay with contacts rated for a minimum of 110VAC and 24VDC. Relay shall operate properly over -25°C to 55°C ambient. Relay shall be UL recognized. Pick up voltage shall be a maximum of 80% of nominal and drop off voltage shall be a maximum of 30% of nominal. Contact rating, in-rush current, number of poles, coil voltage, etc. shall be appropriate for the application. Provide neon or LED "ON" indicator lamp.

E. Control Transformer: Provide transformers at all equipment as necessary to power control system. Provide at each piece of equipment with a field mounted DDC controller a field mounted 24V control transformer adequately sized for the DDC controller and other controls required for proper unit operation. Transformers shall be protected with in-line fuses on both the primary and secondary sides in accordance with Table 450.3(B) of the National Electric Code, unless the following primary current conditions apply. Transformers with a primary current less than 2 amperes shall be permitted to be fused on the primary side only provided the fuses do not exceed 300% of the transformer's rated primary current. Transformers with a primary current less than 9 amperes shall be permitted to be fuse protected on the primary side only provided the fuses do not exceed 167% of the transformer's rated primary current. If control contractor intends to utilize any on board transformer provided by the HVAC equipment manufacturer, he shall provide signed statement from the equipment manufacturer indicating the allowable additional "VA" load that is available for additional devices.

F. A2L Sensor(s): Provide A2L sensor(s) 454B refrigerant leak detection. Sensor shall be 24 VAC/DC, operating range -40°F to 221°F (5% to 95% RH), IP 54 enclosure, etc. Provide sensor(s) and control module as required for BMS. Provide Johnson Model GM200 or equals.

2.4 DIRECT DIGITAL CONTROL (DDC) SYSTEM GENERAL PRODUCT DESCRIPTION

- A. General: Control contractor shall provide upgrades necessary to connect to existing DDC control system for control and monitoring of the new condensers/A2L sensors, etc. The DDC system shall perform the sequence of operation specified on drawings. The DDC architecture shall consist of all DDC components necessary for the sequence of control and as required by Owner.
- B. Off-Site Interface: Control Contractor shall reprogram/modify/upgrade the Owner's existing off-site remote control center and software to allow full control and monitoring of this building off-site.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verify that power supply is available to control devices.
- B. Verify that duct-, pipe-, and equipment-mounted devices are installed before proceeding with installation.

3.2 INSTALLATION

- A. Install software in control units and operator workstation(s). Implement all features of programs to specified requirements and as appropriate to sequence of operation.
- B. Connect and configure equipment and software to achieve sequence of operation specified.

3.3 ELECTRICAL WIRING AND CONNECTION INSTALLATION

- A. Install all systems in accordance with manufacturer's installation instructions, NFPA-70 and NFPA-90A.
- B. Installation of Conduit and Wiring:
 - 1. All wiring and conduit installed under this section of the specifications shall be installed by a state-licensed contractor(s) and all work shall be done by state-certified technicians. All wiring systems shall be color coded and conductors shall be tagged at all junctions and terminals. Label cables identification numbers as directed by Owner. The Engineer and Owner reserves the right to move any device fifteen (15) feet without additional costs before the device is installed. All wiring and conduit shall be installed in accordance with Division 26 - Electrical.
 - 2. All wiring shall be installed in conduit, except for plenum rated cable as specified below.
 - 3. All conduit shall be concealed, except in mechanical/ electrical rooms.
 - 4. On existing construction areas, surface metal raceway will be allowed.
 - 5. Contractor shall provide a conduit location plan and submit to the Owner for review prior to installing conduit and control devices. Conform to requirements of Owner concerning patching of existing walls.

3.4 FIELD QUALITY CONTROL

- A. Manufacturer's Field Service: Engage a factory-authorized service representative to inspect, test, and adjust field-assembled components and equipment installation, including connections, and to assist in field testing. Report results in writing.

3.5 DEMONSTRATION

- A. Engage a factory-authorized service representative to train Owner's maintenance personnel to adjust, operate, and maintain HVAC instrumentation and controls.

3.6 TRAINING

- A. Provide training of Owner's personnel in accordance with provisions of Section 230514.
- B. Training Course Content: For guidance in planning the required instruction, the contractor shall assume that attendees will have a high school education or equivalent, and are familiar with HVAC systems. The training course shall cover all of the material contained in the Operating and Maintenance Instructions, the layout and location of each HVAC control panel, the layout of one of each type of unitary equipment and the locations of each, the location of each control device external to the panels, preventive maintenance, troubleshooting, diagnostics, calibration, adjustment, commissioning, tuning and repair procedures. Typical systems and similar systems may be treated as a group, with instruction on the physical layout of one such system. The results of the performance verification test and the calibration, adjustment and commissioning report shall be presented as benchmarks of HVAC control system performance by which to measure operation and maintenance effectiveness.

3.7 ALARMS

- A. All alarms specified herein shall send a signal to the host and offsite interface to notify the Owner of an alarm condition.

3.8 SEQUENCE OF OPERATION

- A. See Sheet M401 for sequence of operation.

END OF SECTION

SECTION 232113 - HYDRONIC PIPING

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section includes pipe and fitting materials, joining methods and piping specialties as described below:

1. Air conditioning condensate-drain piping.

1.2 SUBMITTALS

- A. Product data for each of the following shall be submitted under provisions of Division 23 - Common Requirements for HVAC Equipment.
1. Hydronic piping material.
 2. Hydronic specialties.
- B. Operation and Maintenance Data for Air Control Devices and Hydronic Specialties: Submit operation and maintenance data under provisions of Division 23 - Closeout Document Requirements for HVAC.

1.3 QUALITY ASSURANCE

- A. Steel Support Welding: Qualify processes and operators according to AWS D1.1/D1.1M, "Structural Welding Code - Steel."
- B. Welding: Qualify processes and operators according to ASME Boiler and Pressure Vessel Code: Section IX.
1. Comply with provisions in ASME B31 Series, "Code for Pressure Piping."
 2. Contractor shall certify that each welder has passed AWS qualification tests for welding processes involved and that certification is current.
 3. Conform to applicable state labor regulations.
- C. ASME Compliance: Comply with ASME B31.9, "Building Services Piping," for materials, products, and installation. Safety valves and pressure vessels shall bear the appropriate ASME label.

1.4 DELIVERY, STORAGE AND HANDLING

- A. Deliver products to site under provisions of Division 23 - Common Requirements for HVAC Equipment.
- B. Store and protect products under provisions of Division 23 - Common Requirements for HVAC Equipment.

PART 2 - PRODUCTS

2.1 SOLDER

- A. Solder shall be lead free having composition of minimum 94% tin, 4% to 5% copper and 0.4% to 0.2% silver or selenium. Solder shall have a minimum tensile strength of 6,900 psi at 70°F, melting temperature of between 410°F and 440°F maximum to protect valve seat material. Solder shall conform to ASTM B-32 and shall be applied in conformance with ASTM B-828. Flux shall conform to ASTM B-813. Solder shall be manufactured for the HVAC industry not circuit board industry. Solder shall be Taramet Sterling Lead Free as manufactured by Taracorp, Dutch Boy Silver as manufactured by Taracorp or Lenox Sterling Lead Free.

2.2 AIR CONDITIONING CONDENSATE DRAIN PIPING

- A. Copper Tubing: ASTM B88 type "L" hard drawn copper tubing. Fittings: Sweat type, wrought copper. Joints: Lead free solder as specified herein.

PART 3 - EXECUTION

3.1 PIPING INSTALLATIONS

- A. Drawings show the general arrangement, layout and location, of piping, appurtenances, etc., but do not show all required fittings and offsets that may be necessary to connect piping to equipment, etc., offset around obstructions, and to coordinate with other trades. Fabricate and install piping, appurtenances, etc., based on field measurements. Provide all necessary fittings and offsets at no additional cost to the Owner. Coordinate with other trades, etc., for space available and relative location of piping, appurtenances, etc. Pipe, appurtenances, etc., locations shown on drawings shall be altered by Contractor where required to avoid interference and clearance difficulties.
- B. Install piping in concealed locations, unless otherwise indicated and except in equipment rooms and service areas.
- C. 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. Route piping in an orderly manner.
- D. Install piping above accessible ceilings to allow sufficient space for ceiling panel and lay in light fixture removal. Install piping to conserve space and not interfere with use of space.
- E. Install piping to permit valve servicing.
- F. Install piping at indicated slopes.
- G. Install piping free of sags and bends.
- H. Install fittings for changes in direction and branch connections.
- I. Install piping to allow application of insulation.

- J. Select system components with pressure rating equal to or greater than system operating pressure.
- K. Install piping to allow for expansion and contraction without stressing pipe, joints, or connected equipment.

3.2 HANGERS AND SUPPORTS

- A. Hanger, support, and anchor devices are specified in Division 23 - Hangers and Supports for HVAC Piping and Equipment. Comply with the following requirements for maximum spacing of supports.
- B. Install hangers for drawn-temper copper piping with the following maximum spacing and minimum rod sizes:
 - 1. NPS 3/4: Maximum span, 5 feet; minimum rod size, 3/8 inch.
 - 2. NPS 1: Maximum span, 6 feet; minimum rod size, 3/8 inch.
 - 3. NPS 1-1/4: Maximum span, 6 feet; minimum rod size, 3/8 inch.
 - 4. NPS 1-1/2: Maximum span, 8 feet; minimum rod size, 3/8 inch.
 - 5. NPS 2: Maximum span, 8 feet; minimum rod size, 3/8 inch.
- C. Support vertical runs at each floor, and at 10-foot intervals between floors.
- D. Install a hanger within 12-inches of each horizontal elbow.

3.3 PIPE JOINT CONSTRUCTION

- A. Join pipe and fittings according to the following requirements and Division 23 Sections specifying piping systems. Joints shall be determined by the equipment connections or by the valve or fitting specified herein.
- B. Ream ends of pipes and tubes and remove burrs. Bevel plain ends of steel pipe.
- C. Remove scale, slag, dirt, and debris from inside and outside of pipe and fittings before assembly.
- D. Soldered Joints: Apply ASTM B 813, water-flushable flux, unless otherwise indicated, to tube end. Construct joints according to ASTM B 828 or CDA's "Copper Tube Handbook," using lead-free solder alloy complying with ASTM B 32.
- E. Threaded Joints: Thread pipe with tapered pipe threads according to ASME B1.20.1. Cut threads full and clean using sharp dies. Ream threaded pipe ends to remove burrs and restore full ID. Join pipe fittings and valves as follows:
 - 1. Apply appropriate tape or thread compound to external pipe threads unless dry seal threading is specified.
 - 2. Damaged Threads: Do not use pipe or pipe fittings with threads that are corroded or damaged. Do not use pipe sections that have cracked or open welds.
 - 3. Use threaded pipe only in accessible locations.

3.4 INSTALLATION OF CONDENSATE DRAIN PIPING

- A. Slope piping a minimum of 1/4" per one foot of run. Provide full size drain piping with minimum 6" deep (water seal) open (cleanable) trap at each cooling coil. Interior equipment's condensate shall discharge at nearest drain or plumbing system connection provided. Do not install the condensate drain pipe in a manner which interferes with equipment access panels. Install the condensate drain piping in a manner which will minimize the possibility of pipe being a tripping hazard or walking obstruction.

END OF SECTION

SECTION 232300 - REFRIGERANT PIPING

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section includes refrigerant piping used for air-conditioning applications and associated refrigerant piping specialties, brazing alloy and refrigerants.

1.2 PERFORMANCE REQUIREMENTS

- A. Line Test Pressure for Refrigerant R-454B:
 - 1. Suction Lines for Air-Conditioning Applications: 300 psig.
 - 2. Suction Lines for Condensing Unit Applications: 535 psig.
 - 3. Hot-Gas and Liquid Lines: 535 psig.

1.3 SUBMITTALS

- A. Product Data: Submit under provisions of Division 23 Section "Common Requirements for HVAC Equipment."

1.4 QUALITY ASSURANCE

- A. Brazing: Qualify procedures and personnel according to ASME Boiler and Pressure Vessel Code: Section IX, "Welding and Brazing Qualifications."

1.5 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 are clean when installed.

PART 2 - PRODUCTS

2.1 COPPER TUBE AND FITTINGS

- A. Copper Tube: ASTM B 280, Type ACR, hard temper drawn seamless hard straight lengths. Tube shall be cleaned and dehydrated and positively pressurized with nitrogen and ends capped.
- B. Wrought-Copper Fittings: ASME B16.22.

2.2 BRAZING ALLOY

- A. Brazing alloy shall be copper and phosphorous with minimum 15% silver, minimum melting temperature of 1190°F. Brazing alloy shall meet AWS BcUP-5 classification.

2.3 VALVES AND SPECIALTIES (AS REQUIRED BY MANUFACTURER)

- A. Manufacturers: Alco, Henry or Sporlan
- B. Provide all solenoid valves, thermostatic expansion valves, moisture/liquid indicators as required by manufacturer. Items shall be approved by HVAC equipment manufacturer.
- C. 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. Working Pressure Rating: 500 psig.
 - 7. Maximum Operating Temperature: 240°F.

2.4 REFRIGERANTS

- A. R-454B.

PART 3 - EXECUTION

3.1 PIPING INSTALLATION

- A. Provide and install all refrigeration piping and specialties in accordance with manufacturer's recommendations and instructions. Refrigeration piping shall be brazed and shall be installed in accordance with ASME Standard B31.5, "Refrigeration Piping."
- B. Refrigerant piping indicated on Drawings is schematic only. Contractor shall size piping and design actual piping layout, including oil traps, double risers, slopes of horizontal runs, specialties, and pipe and tube sizes to accommodate, as a minimum, equipment provided, elevation difference between compressor and evaporator, and length of piping to ensure proper operation and compliance with warranties of connected equipment.
- C. Drawing plans, schematics, and diagrams indicate general location and arrangement of piping systems. Install piping as indicated unless deviations to layout are approved on Shop Drawings.
- D. Install refrigerant piping according to ASHRAE 15.
- E. Install piping in concealed locations unless otherwise indicated and except in equipment rooms and service areas.
- F. 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.
- G. Install piping to conserve building space and not to interfere with use of space. Install piping above accessible ceilings to allow sufficient space for ceiling panel removal.

- H. Install piping adjacent to machines to allow service and maintenance.
- I. Install piping free of sags and bends.
- J. Install fittings for changes in direction and branch connections.
- K. Select system components with pressure rating equal to or greater than system operating pressure.
- L. Insulate piping in accordance with Division 23 Section "HVAC Equipment Insulation."
- M. Install piping as short and direct as possible, with a minimum number of joints, elbows, and fittings.
- N. Arrange piping to allow inspection and service of refrigeration equipment. Install valves and specialties in accessible locations to allow for service and inspection.
- O. Slope refrigerant piping as required by manufacturer.
- P. When brazing, do not apply heat near components prohibited by manufacturer.
- Q. Install pipe sleeves at penetrations in exterior and interior walls and floor assemblies.
- R. Seal penetrations through fire and smoke barriers according to Division 7 Section "Through-Penetration Firestop Systems."
- S. Install piping with adequate clearance between pipe and adjacent walls and hangers or between pipes for insulation installation.
- T. Install sleeves through floors, walls, or ceilings, sized to permit installation of full-thickness insulation.
- U. Seal pipe penetrations through exterior walls.

3.2 VALVE AND SPECIALTY APPLICATIONS

- A. Install valves and refrigerant specialties as required in manufacturer's installation manual and recommendations.
- B. Install filter dryers in liquid line between compressor and thermostatic expansion valve, unless prohibited by equipment manufacturer.

3.3 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. Fill pipe and fittings with an inert gas (nitrogen), during brazing or welding, to prevent scale formation.
- 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.

3.4 HANGERS AND SUPPORTS

- A. Hanger, support, and anchor products are specified in Division 23 Section "Hangers and Supports for HVAC Piping and Equipment."
- B. Install the following pipe attachments:
 - 1. Adjustable steel clevis hangers for individual horizontal runs less than 20 feet long.
 - 2. Copper-clad hangers and supports for hangers and supports in direct contact with copper pipe.
- C. Install hangers for copper tubing with the following maximum spacing and minimum rod sizes:
 - 1. NPS 1/2: Maximum span, 5 feet; minimum rod size, 3/8inch.
 - 2. NPS 5/8: Maximum span, 5 feet; minimum rod size, 3/8inch.
 - 3. NPS 1: Maximum span, 6 feet; minimum rod size, 3/8inch.
 - 4. NPS 1-1/4: Maximum span, 6 feet; minimum rod size, 3/8 inch.
 - 5. NPS 1-1/2: Maximum span, 8 feet; minimum rod size, 3/8 inch.

3.5 PRESSURE TESTS

- A. Piping systems shall be subjected to constant inspection and final approval of the Owner, Engineer and Code Authorities having jurisdiction. Contact Engineer and all code authorities 48 hours before making any pressure tests. Tests, in addition to those included in this section required to show compliance, shall be performed as directed at no additional cost.
- 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 on drawings or in manufacturer's instructions.
 - 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.

3.6 SYSTEM CHARGING

- A. Condensing Unit Refrigerant Charging: See Sheet M402 for condensing unit charging/pressure/vacuum test requirements.

END OF SECTION

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SECTION 235413 - DX COOLING COILS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. This section includes the following:
 - 1. DX Cooling Coils.

1.3 QUALITY ASSURANCE

- A. Air Coils: Certify capacities, pressure drops, and selection procedures in accordance with ARI 410 and bear the ARI seal.
- B. Products of manufacturer regularly engaged in production of components who issues complete catalog data on total product. Cooling Coil must be manufactured by same manufacturer as condensing unit.

1.4 SUBMITTALS

- A. Submit shop drawings and product data under provisions of Division 23 - Common Requirements for HVAC Equipment Provide fan curves with specified operating point clearly plotted.
- B. Submit manufacturer's installation instructions under provisions of Division 23 - Closeout Document Requirements for HVAC. Submit operation and maintenance data under provisions of Division 23 - Closeout Document Requirements for HVAC.

1.5 ENVIRONMENTAL REQUIREMENTS

- A. Do not operate units for any purpose, temporary or permanent, until ductwork is clean, filters are in place, and fan has been test run under observation.

1.6 WARRANTY

- A. See Division 23 - Closeout Document Requirements for HVAC for warranty information.

PART 2 - PRODUCTS

2.1 DIRECT EXPANSION EVAPORATOR COOLING COILS

- A. Coils shall meet or exceed performance scheduled on drawings.

- B. Coils shall be provided with performance certified in accordance with AHRI Standard 410 for coil capacity and pressure drop, wherever applicable. Coils circuits shall be designed such that the fluid velocity is within the range of certified rating conditions at design flow.
- C. Cooling coils shall be provided with a maximum face velocity as scheduled. Face velocity calculations shall be based on the finned area of the coil.
- D. Coil segment casing shall accommodate full-face coils as scheduled.
- E. Coils shall be built in their own full perimeter frame. Tube sheets on each end shall have fully drawn collars to support and protect tubes. Horizontal coil casing and support members shall allow moisture to drain. Casing and support members shall not block finned area.
- F. Individual coils shall be removable from the side of the AHU.
- G. Gap between coil stub out connection and AHU casing, shall be insulated with a spool-shaped sleeve grommet. Adhesive rings applied to the casing walls shall not be acceptable.
- H. DX coils shall be provided with a tube OD of 5/8". Mechanically expand tubes shall form fin bond and provide burnished, work-hardened interior surface.
- I. Continuous aluminum or copper fins shall be provided for coils with die-formed fins. Fins shall have fully drawn collars to accurately space fins and protect tubes. Fins shall be 0.01" thick.
- J. Manufacturer: The direct expansion evaporator coils shall be of the same manufacturer as the condensing units and rated with its respective condensing unit.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install in accordance with manufacturer's instructions and in conformance with ARI 435. System shall not be operated without filters in place.
- B. Provide insulated, open, trapped, condensate piping to drain and refrigerant piping to associated condensing unit.

END OF SECTION

SECTION 236200 - PACKAGED COMPRESSOR AND CONDENSER UNITS

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section includes air-cooled condensing units.

1.2 SUBMITTALS

- A. Product Data: For each condensing unit, include rated capacities, operating characteristics, furnished specialties, and accessories. Include equipment dimensions, weights and structural loads, required clearances, method of field assembly, components, and location and size of each field connection.
- B. Field quality-control test reports.
- C. Submit operation and maintenance data under provisions of Division 23 - Closeout Document Requirements for HVAC.
- D. Warranty: See Division 23 - Closeout Document Requirements for HVAC for warranty information.

1.3 QUALITY ASSURANCE

- A. Product Options: Drawings indicate size, profiles, and dimensional requirements of condensing units and are based on the specific system indicated. Refer to Division 1 - 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. Condensing unit and cooling coil shall be by the same manufacturer.
- D. Verification of Performance: Rate condensing units according to ARI 210/240.
 - 1. Coefficient of Performance: Equal to or greater than prescribed by ASHRAE/IESNA 90.1, "Energy Efficient Design of New Buildings except Low-Rise Residential Buildings."
 - 2. Energy-Efficiency Ratio: Equal to or greater than prescribed by ASHRAE/IESNA 90.1, "Energy Efficient Design of New Buildings except Low-Rise Residential Buildings."
- E. Sound Testing Requirements: Factory test sound-power-level ratings according to ARI 270.

1.4 COORDINATION

- A. Coordinate size and location of concrete bases. Cast anchor-bolt inserts into bases. Concrete, reinforcement, and formwork requirements are specified in Division 23 - Hangers and Supports for HVAC Piping and Equipment.
- B. Coordinate location of piping and electrical rough-ins.

PART 2 - PRODUCTS

2.1 CONDENSING UNITS

- A. General: Install and commission, as shown on the schedules and plans, factory assembled, charged, and tested air cooled scroll compressor condensing unit as specified herein. Condensing Unit shall include, but is not limited to not less than two refrigerant circuits, scroll compressors, air-cooled condenser, refrigerant, lubrication system, interconnecting wiring, safety and operating controls including capacity controller, control center, motor starting components, and special features as specified herein or required for safe, automatic operation.
- B. Cabinet: External structural members shall be constructed of heavy gauge, galvanized steel coated with baked on powder paint which, when subject to ASTM B117, 1000 hour, 5% salt spray test, yields minimum ASTM 1654 rating of 6.
- C. Compressors: Compressors are hermetic, scroll-type, including
 - 1. Compliant design for axial and radial sealing.
 - 2. Refrigerant flow through the compressor with 100% suction cooled motor.
 - 3. Large suction side free volume and oil sump to provide liquid handling capability.
 - 4. Compressor crankcase heaters to provide extra liquid migration protection.
 - 5. Annular discharge check valve and reverse vent assembly to provide low pressure drop, silent shutdown and reverse rotation protection.
 - 6. Initial oil charge.
 - 7. Oil level sight glass.
 - 8. Vibration isolator mounts for compressors.
 - 9. Brazed-type connections for fully hermetic refrigerant circuits.
- D. Refrigerant Circuit: Two independent refrigerant circuits are present on each unit. All unit piping will be copper, with brazed joints. The liquid line will include a field connection shutoff valve with charging port located on each condenser circuit. Suction line connections are provided on each refrigeration circuit. All expansion valves, liquid line solenoid valves, filter driers, sight glasses, refrigerant, and refrigerant piping are supplied and installed by others. Provide full charge of 454B refrigerant.
- E. Heat Exchangers Air Cooled Condenser:
 - 1. Coils: Internally enhanced, seamless copper tubes, mechanically expanded into aluminum alloy fins with full height collars. Subcooling coil is an integral part of condenser. Design working pressure shall be 650 psig (45 barg).

2. Fans: Shall be dynamically and statically balanced, direct drive, corrosion resistant glass fiber reinforced composite blades molded into low noise, full airfoil cross section, providing vertical air discharge from extended orifices for efficiency and low sound. Each fan in its own compartment to prevent cross flow during fan cycling. Guards of heavy gauge PVC (polyvinyl chloride) coated steel.
3. Fan motors: High efficiency, direct drive, 6 pole, 3 phase, insulation class F, current-protected, Totally Enclosed Air-Over (TEAO), rigid mounted, with double sealed, permanently lubricated, ball bearings.

F. Controls:

1. General: Automatic start, stop, operating, and protection sequences across the range of scheduled conditions and transients.
2. Microprocessor enclosure: Rain and dust tight NEMA 3R/12 (IP55) powder painted steel cabinet with a latched and gasket sealed door.
3. Microprocessor control center:
 - a. Condensing unit control is set for Discharge Air Temperature Control.
 - b. Automatic control of compressor start/stop, anti-coincidence and anti-recycle timers, automatic pump-down shut-down, condenser fans, unit alarm contacts, and condensing unit operation from 0°F to 125°F (-18°C to 52°C) ambient. Automatic reset to normal chiller operation after a power failure.
 - c. Software stored in non-volatile memory, with programmed set-points retained in lithium battery-backed real time clock (RTC) memory for minimum 5 years.
 - d. Forty character liquid crystal display, descriptions in English, Spanish, French, Italian, or German, numeric data in English or Metric units. Sealed keypad with sections for Setpoints, Display/Print, Entry, Unit Options and clock, and On/Off Switch.
 - e. Programmable Setpoints (within Manufacturer limits): display language, suction pressure setting and control range, remote reset temperature range, set daily schedule/holiday for start/stop, manual override for servicing, low and high ambient cutouts, number of compressors, low suction pressure cutout, high discharge pressure cutout, anti-recycle timer (compressor start cycle time), and anti-coincident timer (delay compressor starts).
 - f. Display data: Suction temperatures, low ambient temperature cutout setting, outdoor air temperature, English or metric data, suction pressure cutout setting, each system suction pressure, discharge pressure, discharge air reset via Building Automation System (by others) through a 4 mA to 20 mA or 0 VDC to 10 VDC input with BAS interface, anti-recycle timer status for each system, anti-coincident system start timer condition, compressor run status, no cooling load condition, day, date and time, daily start/stop times, holiday status, automatic or manual system lead/lag control (when controlling based on Discharge Air Temperature only), automatic lead/lag of compressors within a system, compressor starts/ operating hours (each), status of hot gas valves and fan operation, run permissive status, number of compressors running, liquid solenoid valve status, and load and unload timer status.

- g. System safeties: Shall cause individual compressor systems to perform auto shut down; manual reset required after the third trip in 90 minutes. Includes: high discharge pressure, low suction pressure, high pressure switch, and motor protector. Compressor motor protector shall protect against damage due to high input current or thermal overload of windings.
 - h. Unit safeties: Unit safeties are automatic reset and cause compressors to shut down if low ambient, or under voltage.
 - i. Alarm contacts: Low ambient, low voltage, low battery, and (for each compressor circuit): high discharge pressure, and low suction pressure.
 - j. High ambient control: Permits unit operation above 115°F (46°C) ambient.
4. Manufacturer shall provide any controls not listed above, necessary for automatic condensing unit operation. Mechanical contractor shall provide field control wiring necessary to interface sensors to the condensing unit control system.

G. Power Connection And Distribution

1. Power Panels:
- a. NEMA 3R/12 (IP55) rain/dust tight, powder painted steel cabinets with latched and gasket sealed outer doors. Provide main power connections, control power connections, compressor and fan motor start contactors, current overloads, and factory wiring.
 - b. Power supply shall enter unit at a single location, be 3-phase of scheduled voltage, and connect to individual terminal blocks for each compressor. Separate disconnecting means and external branch circuit protection (by contractor) required for each applicable local or national codes.
2. Exposed compressor, control, and fan motor power wiring shall be routed through liquid tight conduit.

H. Accessories and Options

- 1. Microprocessor controlled, Factory installed Across-the-Line type compressor motor starters as standard.
- 2. Outdoor Ambient Temperature Control Low Ambient Control: Permits unit operation to 0°F (-18°C) ambient. Standard unit controls to 32°F (0°C) ambient.
- 3. Power Supply Connections:
 - a. Single Point: Single point Non-Fused Disconnect(s) and lockable external handle (in compliance with Article 440-14 of N.E.C.) can be supplied to isolate the unit power voltage for servicing. Separate external fusing must be supplied, by others, in the incoming power wiring, which must comply with the National Electric Code and local codes.
- 4. Pressure & Temperature Transducers and Sensors
 - a. Discharge Pressure Transducers: Permits unit to sense and display discharge pressure.
 - b. Suction Pressure Transducers: Permits unit to sense and display suction pressure.

- c. Suction Temperature Sensors: Permits units to sense and display suction temperature.
- 5. Control Power Transformer: Converts unit power voltage to 120-1-60 (500 VA capacity). Factory mounting includes primary- and secondary-wiring between the transformer and the control panel.
- 6. Power Factor Correction Capacitors: Provided to correct unit compressor factors to a 0.90-0.95.
- 7. Protective Condensing Unit Panels (Factory or Field Mounted):
 - a. Wire Panels (full unit): Heavy gauge, welded wire-mesh, coated to resist corrosion, to protect condenser coils from incidental damage and restrict unauthorized access to internal components.
- 8. Service Isolation valves: Service suction and discharge (ball type) isolation valves are added to unit per system. This option also includes a system high pressure relief valve in compliance with ASHRAE15. (Factory-mounted.)
- 9. Hot Gas By-Pass: Permits continuous, stable operation at capacities below the minimum step of unloading to as low as 5% capacity (depending on both the unit & operating conditions) by introducing an artificial load. Hot gas bypass is installed on only refrigerant system 1 on two circuited units.
- 10. Building Automation System (EMS) Reset Interface: Condensing Unit to accept 4 mA to 20 mA, 0 VDC to 10 VDC, input to reset the discharge air temperature.
- 11. Vibration Isolation (Field Mounted): Neoprene Pad Isolators.
- I. Manufacturers: The condensing units shall be manufactured by York/Johnson or prior approved equal.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of condensing units.
- B. Examine roughing-in for refrigerant piping systems to verify actual locations of piping connections before equipment installation.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

- A. Install units level and plumb, firmly anchored in locations indicated.
- B. Install grade mounted condensing units on concrete base. Concrete base is specified in Division 23 - Hangers and Supports for HVAC Piping and Equipment.
- C. Install in accordance with manufacturer's instructions.

- D. Maintain manufacturers' recommended clearances for service and maintenance and airflow, as listed in manufacturer's installation instructions.
- E. Loose Components: Install electrical components, devices, and accessories that are not factory mounted.
- F. Install in full accordance with the manufacturer's requirements, project drawings, and contract documents.
- G. Locate condensing unit as indicated on drawings, including cleaning and service maintenance clearance per manufacturer instructions. Adjust and level condensing unit on support structure.
- H. Components: Provides and installs all auxiliary devices and accessories for fully operational condensing unit.
- I. Coordinate electrical requirements and connections for all power feeds with the electrical contractor (Division 26).
- J. Coordinate all control requirements and connections with the controls contractor.
- K. Paint damaged and abraded factory finish with touch-up paint matching factory finish.

3.3 CONNECTIONS

- A. Piping installation requirements are specified in other Division 23 Sections. Drawings indicate general arrangement of piping, fittings, and specialties.
- B. Install piping adjacent to machine to allow service and maintenance.
- C. Connect refrigerant piping to air-cooled condensing units; maintain required access to unit. Install furnished field-mounted accessories. Refrigerant piping and specialties are specified in Division 23 - Refrigerant Piping.

3.4 FIELD QUALITY CONTROL

- A. Perform the following field tests and inspections and prepare test reports:
 - 1. Perform electrical test and visual and mechanical inspection.
 - 2. Leak Test: After installation, charge systems with refrigerant and oil and test for leaks. Repair leaks, replace lost refrigerant and oil, and retest until no leaks exist.
 - 3. Operational Test: After electrical circuitry has been energized, start units to confirm proper operation, product capability, and compliance with requirements.
 - 4. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.
 - 5. Verify proper airflow over coils.
- B. Remove and replace malfunctioning condensing units and retest as specified above.

3.5 STARTUP SERVICE

- A. Complete installation and startup checks according to manufacturer's written instructions and perform the following:
 - 1. Inspect for physical damage to unit casing.
 - 2. Verify that access doors move freely and are weathertight.
 - 3. Clean units and inspect for construction debris.
 - 4. Verify that all bolts and screws are tight.
 - 5. Verify that controls are connected and operational.
- B. Verify that fan wheel is rotating in the correct direction and is not vibrating or binding.

3.6 MANUFACTURER'S AND CONTRACTOR'S FIELD SERVICES

- A. Supply initial charge of R-454B refrigerant and oil for each refrigerant circuit. Installing Contractor shall replace any refrigerant and oil lost during the first year of system operation.
- B. The installing contractor shall have been certified by the unit manufacturer to install systems, having attended and successfully completed a Service & Installation course at an approved training facility. A copy of this certificate shall be presented to the Engineer prior to the commencement of installation activity.
- C. Unit manufacturer shall provide two (2) onsite visits during the course of the project's completion.

3.7 REFRIGERANT PRE START-UP REQUIREMENTS (MINIMUM REQUIREMENTS OR AS REQUIRED BY THE MANUFACTURER)

- A. The installing contractor shall have prepared the refrigeration piping systems per equipment installation and service manuals. All refrigerant piping systems, upon completion of assembly, shall have been pressurized to a minimum 600 PSI, using dry nitrogen, and held for an uninterrupted 24HR period, with acceptable change due to atmospheric conditions. Also, see Sheet M402.
 - 1. A record of the pressure check process shall be recorded and tagged at the outdoor unit. The tag shall contain the following information: date & time of pressure check start, fill pressure, outdoor temperature at start & stop, date & time of pressure check completion, and the person's full name & company information completing the pressure check.
 - 2. The installing contractor shall engage the Owner/Engineer as a witness of the pressure check process, confirming that all steps and procedures related to the pressure check were properly followed and that the system held the holding pressure of 600PSI for a period of 24hr hours, with acceptable change due to atmospheric conditions. Witness information, including full name, company name, title, phone number and signature shall be recorded on same pressure tag used by installing contractor.

- B. Upon completion of the 600 PSI pressure check, the system shall be evacuated to a level of 500 microns, where it will be held for a period of 1HR with no deflection. The installing contractor shall utilize the triple evacuation method per the equipment install and service manuals.
1. Evacuation start & stop dates, times, and persons involved shall be recorded and tagged at the outdoor equipment.
 2. Installing contractor shall digitally capture a photo of the micron gauge reading, at the conclusion of the 1hr holding period, for each system and provide a copy to the Owner/Engineer/Manufacturer. Each photo shall contain a tag providing the outdoor units Serial number.
- C. Upon the completion of the 500-micron hold, the calculated additional refrigerant charge can be added. The calculated refrigerant charge shall have been calculated using the manufacturer's design software/guidelines.
- D. Total refrigerant charge of each system shall be recorded and displayed at the outdoor unit by permanent means.

END OF SECTION

SECTION 260500 - COMMON WORK RESULTS FOR ELECTRICAL

GENERAL

1.1 SUMMARY

- A. Basic electrical requirements, which are specifically applicable to all Division 26 Sections.

1.2 SUBMITTALS

- A. Submittal data containing manufacturer's data shall be sent to the Architect, Engineer and Owner for review.
- B. Electronic submittal data shall be assembled in Adobe Acrobat's Portable Data Format (PDF) for review.
- C. Electronic submittal data shall be assembled in one (1) complete PDF file and shall include an index sheet (TOC) listing each submittal item by specification number and its content. Each file shall also be organized with "Bookmarks" of each section. Submittals that do not have each submittal item referenced by "Bookmarks" shall be rejected.
- D. All electronic submittal data for a trade shall be submitted at one time except as noted herein.
- E. Data not submitted shall have a statement explaining why the data was not submitted.
- F. Submittals not conforming to any of the above requirements shall be rejected.
- G. The contractor shall go to each specification section to determine all technical information/data required and organize information/data using tabs for major headings as follows:
 - 1. Section 260519 - Low-Voltage Electrical Power Conductors And Cables
 - a. Building wire and cable (600 volts and less)
 - b. Connectors, splices and terminations (600 volts and less)
 - 2. Section 260529 - Hangers and Supports for Electrical Systems
 - a. Steel slotted support systems
 - b. Fastening hardware
 - c. Plywood backboards
 - 3. Section 260533 - Raceways and Boxes for Electrical Systems
 - a. Rigid steel conduit
 - b. IMC
 - c. EMT
 - d. Flexible metal conduit

- e. Liquidtight flexible metal conduit
 - f. Conduit fittings and bodies
 - g. Junction boxes
4. Section 260553– Identification for Electrical Systems
- a. Product Data
 - b. Identification Schedule
 - c. Samples
- H. Manufacturer's data sheets shall be marked to clearly indicate the manufacturer, model number, size, color, accessories, required clearances, field connection details, weight loading, electrical characteristics, capacities, etc. being submitted. Variations from specifications shall be explained. Submittal preparer's name and telephone number shall be listed on the index sheet.
- I. Only manufacturers listed in specifications or addendums will be considered.
- J. Review, corrections, or comments made on the submittals do not relieve the Contractor from compliance with the requirements of the Drawings, Specifications and Addendums (Contract Documents). By entering into this Contract, the Contractor agrees that the purpose of submittals is to demonstrate to the Engineer that the Contractor understands the design concept and that he demonstrates his understanding by indicating which equipment and material he intends to furnish and install and use. Review of shop drawing will be general only for basic conformance with the design concept. The review of such drawings, schedules or cuts shall not relieve the Contractor from the responsibility for correcting all errors of any sort contained in the submittals. The Contractor is responsible for confirming and correlating all quantities and dimensions; selecting proper fabrication processes, construction methods and installation techniques; coordinating this work with that of all other trades; and performing all work in a safe, workmanlike and satisfactory manner.
- K. Below are the submittal item codes that will be used when reviewing the submittal data. These codes show up on the "Submittal Review" sheet. Only one copy of the submittal review sheet is returned upon completion of the submittal review.
- 1. RNE - Reviewed, No Exceptions Noted
 - a. Indicates the information provided has been reviewed and no exceptions are taken. Contractor must still comply with the contract documents.
 - b. No corrective action required at this time.
 - 2. FNC - Furnish with Noted Corrections
 - a. Indicates the contractor shall insure that all necessary or noted corrections are incorporated into equipment furnished to the project.
 - b. Contractor shall incorporate items requested in review comments, but re-submittal not required.

3. RES - Revise and Resubmit
 - a. Indicates item is not presently acceptable as submitted, but may be accepted provided additional information and/or changes are made.
 - b. Contractor shall revise and resubmit item to Engineer with additional information indicating compliance with Contract Documents prior to proceeding with work.
 4. PSD - Provide Submittal Data
 - a. Indicates submittal data was not provided for this item or section.
 - b. Contractor shall provide submittal data meeting the explicit requirements of the plans, specifications, and all addenda.
- L. Shop drawings and data submittals for materials requiring extra long delivery time shall be submitted for approval as soon as possible after execution of contract. All sleeves must be precast in concrete or concrete block and accordingly provided to the mason in a timely manner. Accordingly, all items such as these shall be submitted for approval in a timely manner (prior to other submittals if necessary) so they may be properly incorporated in the building's structure. Allow a minimum of three weeks for review. No substitutions of materials or extensions of contract time will be allowed for Contractor's failure to submit or order such materials sufficiently in advance of the work. See Architectural specification section for additional requirements for submittals.
- 1.3 REGULATORY REQUIREMENTS
- A. All work installed under Division 26 shall conform to the current adopted Edition of Building/Electrical Codes and their appropriate amendments:
 1. NFPA 70 2020 National Electrical Code
 2. Life Safety Code, NFPA 101
 3. Requirements of the State of Georgia Fire Marshall's Office.
 4. GA State Energy Code.
 5. Standard Building Code
 6. Standard Mechanical Code (Georgia Edition)
 7. City of Statesboro and Bulloch County Codes
 - B. Obtain and pay for all permits, and request inspections from all authorities having jurisdiction, in a timely manner.
 - C. Materials and Equipment included in Underwriter's Label Service shall bear that label. Electrical equipment shall be UL approved as installed, and bear the UL label, unless noted otherwise herein.
 - D. Where requirements of these specifications differ from specified codes and ordinances, conform to the more stringent requirements.

1.4 CONTRACTOR GUARANTEE

- A. All equipment and materials furnished and all work performed under these specifications, shall be guaranteed to be free of defective materials and workmanship for a period of one year (unless a longer period is specified elsewhere) after Architect's Final Certificate. Upon notice of failure of any part of the guaranteed equipment during the guarantee period, the affected part or parts shall be promptly replaced with new parts by the Contractor at no additional cost to the Owner. All labor required to perform guarantee shall be included as part of the complete guarantee warranty.

1.5 OPERATING AND MAINTENANCE (O&M) MANUALS

- A. Three bound and indexed Operating and Maintenance Manuals shall be prepared by the Contractor and be submitted for approval prior to delivery to operating personnel. Binders shall be 3-ring commercial grade, complete with inside storage pockets, sheet protectors, spine and front cover labels.

1.6 PROJECT/SITE CONDITIONS

- A. Install work in locations shown on Drawings, unless prevented by project conditions. Shift or relocate equipment or systems to avoid conflicts with other trades. Modifications to the work required to accommodate project conditions encountered in the field shall be made at no additional cost to the contract.
- B. Prepare drawings showing proposed rearrangement of Work to meet Project conditions, including changes to Work specified in other Sections. Obtain permission of Architect/Engineer before proceeding.
- C. Install items so that there are no obstructions (e.g., pipes, conduits, etc.) blocking service panels of the equipment, or preventing the removal of the equipment.
- D. Electrical items are shown on drawings in approximate locations unless dimensioned. Install at location required to serve intended purpose. Include installation within ten (10) feet of location shown.

1.7 SEQUENCING AND SCHEDULING

- A. Contractor shall coordinate work so as to avoid conflicts with other work in progress.
- B. Work shall progress in a manner that will not interfere with other trades. The Division 26 Contractor shall have coordination meetings with all other Contractors to ensure that all systems installed in "share areas" (e.g. ceiling plenums, mechanical rooms, etc.) are coordinated and installed to ensure proper fit and access. All costs required for the coordination of the work between trades shall be borne solely by the Contractor.

- C. Contractor shall provide confirmation letters from the factory (not from the contractor) to the Owner that long lead items have been ordered. Long lead items are defined as items having longer than six week fabrication schedules. See Section 01100 - Summary for additional requirements.

1.8 ACCEPTABLE PRODUCTS

- A. Where a manufacturer has been listed as being acceptable in the various specification sections hereinafter for a certain product, it shall be understood that the manufacturer has been approved as being capable of producing this product. This does not necessarily constitute approval of his standard product. His product shall still comply with all of the requirements and standards of this specification and not necessarily his standard specification, to the extent that it might require special manufacture to meet the requirement and standards of this specification.
- B. Prior Approval: Substitutions of specified items and prior approvals of other manufacturers will not be considered.
- C. Addenda: If the substitution is allowed, such approval will be set forth in an Addendum.
- D. Costs: All costs incurred by the acceptance of substitutions shall be borne by the contractor.

1.9 DRAWINGS

- A. General: Both the drawings and specifications shall be considered supplemental to one another so that materials and labor required by one but not the other shall be supplied and installed as though specifically called for by both. Where drawings and specification conflict, Contractor shall conform to the more stringent or costly of the two requirements.
- B. Scaling: The drawings are diagrammatic only and show generally the location of the equipment, ducts and pipes but are not to be scaled. All dimensions shall be verified at the building site. Prefabrication of work from the drawings shall be at the Contractor's risk.
- C. Existing Conditions: It shall be the Contractor's responsibility to visit the site prior to bidding the project and prior to beginning work to make himself familiar with existing conditions.

1.10 PROTECTION OF MATERIALS AND EQUIPMENT

- A. Delivery, Storage and Handling: Deliver products to site in factory-fabricated protective containers, with (where appropriate) factory-installed shipping skids and lifting lugs. Store in clean, dry place and protect from weather and construction traffic. Handle carefully to avoid damage to components, enclosures, and finish.
- B. Prior to Final Construction Review: All materials and equipment shall be cleaned. Chipped or scraped paint shall be retouched to match.

- C. Equipment Painting: Equipment which has been damaged beyond the point of retouching or has been retouched not to match the original finish shall be repainted in accordance with the Architectural painting section.

1.11 CLEANING

- A. The Contractor shall keep the site reasonably clean and free of excessive debris and leftover materials at all times. All trash and debris shall be hauled from the job site on a daily basis for disposal. Prior to testing and adjusting, equipment shall be clean and free of any construction debris and litter.
- B. Contractor shall meet all contractual requirements related to site cleanliness including dust control.

1.12 ROOM NUMBERS

- A. The room numbers indicated on the Contract Documents were provided by the Architect to assist in identifying spaces during construction. These room numbers may not necessarily be the Owner's final choice of room numbers. The contractor shall obtain from the Owner the final choice of room numbers, and shall use these numbers wherever required. (For example, room numbers are used in programming of fire alarm systems and intercom system, and shall match the Owner's final choice.)

1.13 CONTRACTOR REQUESTS FOR ELECTRONIC COPIES OF CAD DRAWINGS

- A. If the Contractor requests to obtain electronic copies (emailed files or disc files) of CAD drawings from Andrews, Hammock & Powell, Inc., (AH&P) this paragraph shall describe the conditions for this action to take place.
 - 1. The Contractor must obtain written permission from the Architectural client, that the Architect does not object to providing electronic copies when AH&P is hired by an Architect to perform Engineering services.
 - 2. If AH&P is prime party (i.e. not hired by an Architect, but hired by the client directly), Contractor must obtain permission of AH&P to obtain electronic copies.
 - 3. If approval by Architect or Engineer (as noted above) is obtained, Contractor may obtain electronic copies based on the following rates: \$25 per sheet, with minimum \$200 per project.
 - 4. Contractor shall mail a copy of the check to AH&P, payable to AH&P and shall sign the enclosed indemnification letter, and send this letter to AH&P, along with requested sheets. If time is of essence, a copy of the check and indemnification may be faxed as evidence of the Contractor's intent to mail said documents.
 - 5. Upon receiving the check or faxed copy, and signed indemnification letter, electronic copies of requested sheets shall be provided. AH&P reserves the right to alter the electronic copies by removing Professional Engineering Stamp, title block information, company logo, and similar information that is not relevant to the Contractor's needs. Contractor shall indicate the desired format for CAD drawings (DWG or DGN).

END OF SECTION

Andrews, Hammock and Powell, Inc.
250 Charter Lane
Macon, GA 31210

Re: Letter of Indemnification

(Project Name)

Gentlemen:

By hereby executing this Letter of Indemnification on behalf of itself and its subcontractors and suppliers, _____ (company name) agrees to hold harmless and indemnify Andrews, Hammock and Powell, Inc. and the project architect and the consultants from and against all claims, liabilities, losses, damages and costs including but not limited to attorney's fees, arising out of or in any way connected with the use of, modification of, misinterpretation of, misuse of, or reuse by others of computer aided design (CAD) information and data provided on the above referenced project. The foregoing information applies, without limitation, to any use of the project information on this project, other projects, for additions to this project, or for any changes to this project by others.

_____ (company name) also acknowledges that the drawings prepared by Andrews, Hammock and Powell, Inc. is schematic in nature and is not intended as a shop drawing, dimensional drawing or fabrication drawing. Any dimensional information extracted from the CAD data by

_____ (company name) is done purely at their own risk.

_____ (company name) agrees to insure that any use of the above referenced CAD information without the expressed written authorization for any other projects other than referenced project is hereby prohibited.

Signing on behalf of _____ (company name),

Signature

Print Name

Date

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SECTION 260519 - LOW-VOLTAGE ELECTRICAL POWER CONDUCTORS AND CABLES

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section includes the following:
 - 1. Building wires and cables rated 600 V and less.
 - 2. Connectors, splices, and terminations rated 600 V and less.

1.2 SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Qualification Data: For testing agency.
- C. Field quality-control test reports.

1.3 QUALITY ASSURANCE

- A. Comply with NFPA 70.

1.4 COORDINATION

- A. Determine required separation between this and other work.
- B. Determine routing to avoid interference with other work.

PART 2 - PRODUCTS

2.1 CONDUCTORS AND CABLES

- A. Available Manufacturers: Only products of domestic manufacturer will be accepted.
- B. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1. American Insulated Wire Corp.; a Leviton Company.
 - 2. General Cable Corporation.
 - 3. Senator Wire & Cable Company.
 - 4. Southwire Company.
 - 5. Allied
 - 6. Carol.
 - 7. Pirelli.
 - 8. Rome.
 - 9. Triangle.

- C. Copper Conductors: Comply with NEMA WC 70.
- D. Conductor Insulation: Comply with NEMA WC 70 for Types THHN-THWN and XHHW.

2.2 CONNECTORS AND SPLICES

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1. 3M; Electrical Products Division.
 - 2. Burndy Hydent.
 - 3. IlSCO.
 - 4. Thomas and Betts.
 - 5. Ideal.
- B. Description: Factory-fabricated connectors and splices of size, ampacity rating, material, type, and class for application and service indicated.
 - 1. Solderless Pressure Connectors: 3M Skotch-loks, T & B Freespring, or Ideal Wing Nut for 10 AWG and smaller.
 - 2. Compression Connectors: Burndy Hydent, IlSCO or Thomas and Betts, Color-Keyed for 8 AWG and larger.
 - 3. Terminal Lugs: Thomas and Betts STA-KON for 10 AWG and smaller; Thomas and Betts Color-Keyed for 8 AWG and larger. Equal product as manufactured by Burndy or IlSCO are acceptable.

PART 3 - EXECUTION

3.1 CONDUCTOR MATERIAL APPLICATIONS

- A. Feeders: Copper. Stranded for all sizes.
- B. Branch Circuits: Copper. Stranded for all sizes

3.2 CONDUCTOR INSULATION APPLICATIONS AND WIRING METHODS

- A. Exposed Circuits: Single conductors in raceway,
- B. Circuits Concealed in Ceilings, Walls, Partitions, and Crawlspace: Single conductors in raceway.
- C. Class 1 Control Circuits: Type THHN-THWN, in raceway.
- D. Class 2 Control Circuits: Type THHN-THWN, in raceway.
- E. Insulation: ANSI/NFPA 70; Type XHHW insulation for transformer primary and all circuits 6AWG and larger; Type THHN/THWN insulation for circuits 8 AWG and smaller.

3.3 INSTALLATION OF CONDUCTORS AND CABLES

- A. Conceal cables in finished walls, ceilings, and floors, unless otherwise indicated.
- B. Use manufacturer-approved pulling compound or lubricant where necessary; compound used must not deteriorate conductor or insulation. Do not exceed manufacturer's recommended maximum pulling tensions and sidewall pressure values.
- C. Use pulling means, including fish tape, cable, rope, and basket-weave wire/cable grips, that will not damage cables or raceway.
- D. Identify and color-code conductors and cables according to Division 26 Section "Electrical Identification."
- E. Install products in accordance with manufacturers' instructions.
- F. Use conductor not smaller than 12 AWG for power and lighting circuits.
- G. Pull all conductors into raceway at same time.
- H. Use suitable wire pulling lubricant for building wire 4 AWG and larger.
- I. Neatly train and lace wiring inside boxes, equipment, and panelboards using nylon cable ties by Thomas and Betts, Panduit or Ideal.

3.4 CONNECTIONS

- A. Tighten electrical connectors and terminals according to manufacturer's published torque-tightening values. If manufacturer's torque values are not indicated, use those specified in UL 486A and UL 486B.
- B. Make splices and taps that are compatible with conductor material and that possess equivalent or better mechanical strength and insulation ratings than unspliced conductors.
- C. Clean conductor surfaces before installing lugs and connectors.
- D. Make splices, taps, and terminations to carry full ampacity of conductors with no perceptible temperature rise.
- E. Where compression connectors are used for conductor splices and taps; tape uninsulated conductors and connector with electrical tape to 150 percent of insulation rating of conductor.
- F. Use terminal lugs for connecting all stranded conductors and for all multiple connections to terminals.

3.5 FIRESTOPPING

- A. Apply firestopping to electrical penetrations of fire-rated floor and wall assemblies to restore original fire-resistance rating of assembly.

3.6 FIELD QUALITY CONTROL

- A. Tests and Inspections:
 - 1. After installing conductors and cables and before electrical circuitry has been energized, test for compliance with requirements.
 - a. Verify continuity of each branch circuit.
 - 2. Perform each visual and mechanical inspection and electrical test stated in NETA Acceptance Testing Specification. Certify compliance with test parameters.
- B. Remove and replace malfunctioning units and retest as specified above.

END OF SECTION

SECTION 260526 - GROUNDING AND BONDING FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL

1.1 SUMMARY

- A. Electrical equipment and raceway grounding and bonding.

1.2 QUALITY ASSURANCE

- A. 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.
- B. Comply with UL 467 for grounding and bonding materials and equipment.

PART 2 - PRODUCTS

2.1 CONDUCTORS

- A. Insulated Conductors: Copper wire or cable insulated for 600 V unless otherwise required by applicable Code or authorities having jurisdiction.

2.2 CONNECTORS

- A. Listed and labeled by a nationally recognized testing laboratory acceptable to authorities having jurisdiction for applications in which used, and for specific types, sizes, and combinations of conductors and other items connected.

PART 3 - EXECUTION

3.1 APPLICATIONS

- A. Bond together system neutrals, service equipment enclosures, exposed non-current carrying metal parts of electrical equipment, metal raceway systems, grounding conductor in raceways and cables, and receptacle ground connections.
- B. Provide a separate grounding conductor in all conduits, no exceptions. Connect outlet boxes to grounding conductors with screw fastened bonding jumper.
- C. Conductors:
 - 1. Grounding Electrode Conductors (NEC Table 250.66): Install solid conductor for No. 6 AWG, and stranded conductors for No. 4 AWG and larger.
 - 2. Equipment Grounding Conductors: Install stranded conductor per NEC Table 250.122.

3.2 FIELD QUALITY CONTROL

- A. Inspect grounding and bonding system conductors and connections for tightness and proper installation.

END OF SECTION

SECTION 260529 - HANGERS AND SUPPORTS FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL

1.1 SUMMARY

- A. Conduit and equipment supports.
- B. Fastening hardware.

1.2 DEFINITIONS

- A. EMT: Electrical metallic tubing.
- B. IMC: Intermediate metal conduit.
- C. RMC: Rigid metal conduit.

1.3 PERFORMANCE REQUIREMENTS

- A. Design supports for multiple raceways capable of supporting combined weight of supported systems and its contents.
- B. Design equipment supports capable of supporting combined operating weight of supported equipment and connected systems and components.

1.4 SUBMITTALS

- A. Product Data: For the following:
 - 1. Steel slotted metallic support systems.
 - 2. Fastening hardware.
- B. Indicate hanger and support framing and attachment methods.

1.5 QUALITY ASSURANCE

- A. Comply with NFPA 70.
- B. Support systems shall be adequate for weight of equipment and conduit, including wiring, which they carry.

1.6 COORDINATION

- A. Coordinate with Division 23 contractor to route conduit concealed within curb of rooftop mounted HVAC equipment.

PART 2 - PRODUCTS

2.1 SUPPORT, ANCHORAGE, AND ATTACHMENT COMPONENTS

- A. Steel Slotted Support Systems: Comply with MFMA-4, factory-fabricated components for field assembly.
 - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Cooper B-Line, Inc.; a division of Cooper Industries.
 - b. ERICO International Corporation.
 - c. GS Metals Corp.
 - d. Thomas & Betts Corporation.
 - e. Unistrut; Tyco International, Ltd.
 - 2. Channel Dimensions: Selected for applicable load criteria.
- B. Raceway and Cable Supports: As described in NECA 1 and NECA 101.
- C. Conduit and Cable Support Devices: Steel hangers, clamps, and associated fittings, designed for types and sizes of raceway or cable to be supported.
- D. Structural Steel for Fabricated Supports and Restraints: ASTM A 36/A 36M, steel plates, shapes, and bars; black and galvanized.
- E. Mounting, Anchoring, and Attachment Components: Items for fastening electrical items or their supports to building surfaces include the following:
 - 1. Mechanical-Expansion Anchors: Insert-wedge-type, zinc-coated steel, for use in hardened Portland cement concrete with tension, shear, and pullout capacities appropriate for supported loads and building materials in which used.
 - a. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1) Cooper B-Line, Inc.; a division of Cooper Industries.
 - 2) Empire Tool and Manufacturing Co., Inc.
 - 3) Hilti Inc.
 - 4) ITW Ramset/Red Head; a division of Illinois Tool Works, Inc.
 - 5) MKT Fastening, LLC.
 - 2. Clamps for Attachment to Steel Structural Elements: MSS SP-58, type suitable for attached structural element.
 - 3. Through Bolts: Structural type, hex head, and high strength. Comply with ASTM A 325.
 - 4. Toggle Bolts: All-steel springhead type.
 - 5. Hanger Rods: Threaded steel.

- F. Do not use powder-actuated anchors.

PART 3 - EXECUTION

3.1 APPLICATION

- A. Comply with NECA 1 and NECA 101 for application of hangers and supports for electrical equipment and systems except if requirements in this Section are stricter.
- B. Maximum Support Spacing and Minimum Hanger Rod Size for Raceway: Space supports for EMT, IMC, and RMC as required by NFPA 70. Minimum rod size shall be 3/8inch in diameter.
- C. Multiple Raceways: Install trapeze-type supports fabricated with steel slotted support system, sized so capacity can be increased by at least 25 percent in future without exceeding specified design load limits.
- D. Secure raceways and cables to these supports with two-bolt conduit clamps.

3.2 SUPPORT INSTALLATION

- A. Comply with NECA 1 and NECA 101 for installation requirements except as specified in this Article.
- B. Raceway Support Methods: In addition to methods described in NECA 1, EMT, IMC, and RMC may be supported by openings through structure members, as permitted in NFPA 70.
- C. Strength of Support Assemblies: Where not indicated, select sizes of components so strength will be adequate to carry present and future static loads within specified loading limits. Minimum static design load used for strength determination shall be weight of supported components plus 200 lb.
- D. Mounting and Anchorage of Surface-Mounted Equipment and Components: Anchor and fasten electrical items and their supports to building structural elements by the following methods unless otherwise indicated by code:
 - 1. To Wood: Fasten with lag screws or through bolts.
 - 2. To New Concrete: Bolt to concrete inserts.
 - 3. To Masonry: Approved toggle-type bolts on hollow masonry units and expansion anchor fasteners on solid masonry units.
 - 4. To Light Steel: Sheet metal screws.
 - 5. Items Mounted on Hollow Walls and Nonstructural Building Surfaces: Mount cabinets, panelboards, disconnect switches, control enclosures, pull and junction boxes, transformers, and other devices on slotted-channel racks attached to substrate.
- E. Do not fasten supports to piping, ductwork, mechanical equipment, or conduit.

3.3 INSTALLATION OF FABRICATED METAL SUPPORTS

- A. Cut, fit, and place miscellaneous metal supports accurately in location, alignment, and elevation to support and anchor electrical materials and equipment.
- B. Fabricate supports from structural steel or steel channel, rigidly bolted to present a neat appearance. Use hexagon head bolts with spring lock washers under all nuts or double nuts jammed tight.

3.4 PAINTING

- A. Touchup: Clean abraded areas of shop paint. Paint exposed areas immediately after erecting hangers and supports. Use same materials as used for shop painting. Comply with SSPC-PA 1 requirements for touching up field-painted surfaces.
 - 1. Apply paint by brush or spray to provide minimum dry film thickness of 2.0 mils.
- B. Galvanized Surfaces: Clean bolted connections, and abraded areas and apply galvanizing-repair paint to comply with ASTM A 780.

END OF SECTION

SECTION 260533 - RACEWAY AND BOXES FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section includes raceways, fittings and boxes for electrical wiring.
- B. Related Sections include the following:
 - 1. Section 260526 – Grounding and Bonding
 - 2. Section 260529 – Hangers and Supports

1.2 DEFINITIONS

- A. EMT: Electrical metallic tubing.
- B. FMC: Flexible metal conduit.
- C. IMC: Intermediate metal conduit.
- D. LFMC: Liquidtight flexible metal conduit.

1.3 QUALITY ASSURANCE

- A. 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.
- B. Comply with NFPA 70.

PART 2 - PRODUCTS

2.1 METAL CONDUIT AND TUBING

- 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 following:
 - 1. Alflec Inc.
 - 2. Allied Tube & Conduit; a Tyco International Ltd. Co.
 - 3. Anamet Electrical, Inc.; Anaconda Metal Hose.
 - 4. Electri-Flex Co.
 - 5. Manhattan/CDT/Cole-Flex.
 - 6. Maverick Tube Corporation.
 - 7. O-Z Gedney; a unit of General Signal.

8. Wheatland Tube Company.
 9. Anaconda
 10. Triangle
 11. LTV
- C. Rigid Steel Conduit: ANSI C80.1.
- D. IMC: ANSI C80.6.
- E. EMT: ANSI C80.3.
- F. LFMC: Flexible steel conduit with PVC jacket.
- G. Fittings for Conduit (Including all Types and Flexible and Liquidtight) and EMT: NEMA FB 1; listed for type and size raceway with which used, and for application and environment in which installed.

2.2 BOXES

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
1. Cooper Crouse-Hinds; Div. of Cooper Industries, Inc.
 2. EGS/Appleton Electric.
 3. O-Z/Gedney; a unit of General Signal.
 4. RACO; a Hubbell Company.
 5. Scott Fetzer Co.; Adalet Division.
 6. Spring City Electrical Manufacturing Company.
 7. Thomas & Betts Corporation.
 8. Steel City
- B. Sheet Metal Outlet and Device Boxes: NEMA OS 1.
- C. Cast-Metal Outlet and Device Boxes: NEMA FB 1, ferrous alloy, Type FD, with gasketed cover. Provided threaded hubs.
- D. Small Sheet Metal Pull and Junction Boxes: NEMA OS 1, galvanized steel.
- E. Cast-Metal Access, Pull, and Junction Boxes: NEMA FB 1, cast aluminum with gasketed cover.

PART 3 - EXECUTION

3.1 RACEWAY APPLICATION

- A. Outdoors: Apply raceway products as specified below, unless otherwise indicated:
1. Exposed Conduit: Rigid steel conduit.
 2. Concealed Conduit, Aboveground: Rigid steel conduit.

3. Connection to Vibrating Equipment (Including Electric Solenoid or Motor-Driven Equipment): LFMC.
 4. Boxes and Enclosures, Aboveground: NEMA 250, Type 3R.
 5. Use cast outlet box in exterior locations exposed to the weather and wet locations.
- B. Comply with the following indoor applications, unless otherwise indicated:
1. Exposed, less than or equal to 1 1/4": EMT.
 2. Exposed, greater than 1 1/4": IMC.
 3. Exposed and Subject to Severe Physical Damage: Rigid steel conduit. Includes raceways in the following locations:
 - a. Loading dock.
 - b. Corridors used for traffic of mechanized carts, forklifts, and pallet-handling units.
 - c. Mechanical rooms.
 4. Concealed in Ceilings and Interior Walls and Partitions: EMT.
 5. Connection to Vibrating Equipment (Including Electric Solenoid or Motor-Driven Equipment): FMC, except use LFMC in damp or wet locations.
 6. Damp or Wet Locations: Rigid steel conduit.
 7. Boxes: NEMA 250, Type 1, except use NEMA 250, Type 4, in damp or wet locations.
- C. Minimum Raceway Size: 1/2-inch trade size.
- D. Raceway Fittings: Compatible with raceways and suitable for use and location.
1. Rigid and Intermediate Steel Conduit: Use threaded rigid steel conduit fittings, unless otherwise indicated.
 2. Electrical metal Tubing:
 - a. Description: ANSI C80.3; galvanized tubing.
 - b. Fittings and Conduit Bodies: ANSI/NEMA FB 1; insulated throat steel compression type. Set screw or indenter type are unacceptable.

3.2 CONDUIT INSTALLATION

- A. Comply with NECA 1 for installation requirements applicable to products specified in Part 2 except where requirements on Drawings or in this Article are stricter.
- B. Threaded Conduit Joints, Exposed to Wet, Damp, Corrosive, or Outdoor Conditions: Apply listed compound to threads of raceway and fittings before making up joints. Follow compound manufacturer's written instructions.

- C. Install raceway sealing fittings at suitable, approved, and accessible locations and fill them with listed sealing compound. For concealed raceways, install each fitting in a flush steel box with a blank cover plate having a finish similar to that of adjacent plates or surfaces. Install raceway sealing fittings at the following points:
 - 1. Where conduits pass from warm to cold locations, such as boundaries of refrigerated spaces.
 - 2. Where otherwise required by NFPA 70.
- D. Do not pull wiring into conduit until conduit systems are complete.
- E. All conduit shall be routed concealed where possible.
- F. Arrange supports to prevent misalignment during wiring installation.
- G. Support conduit using coated steel or malleable iron straps, lay-in adjustable hangers, clevis hangers, and split hangers.
- H. Group related conduits; support using conduit rack. Construct rack using steel channel; provide space on each for 25 percent additional conduits.
- I. Fasten conduit supports to building structure and surfaces under provisions of Section 260529.
- J. Do not support conduit with wire or perforated pipe straps. Remove wire used for temporary supports
- K. Do not attach conduit to ceiling support wires.
- L. Arrange conduit to maintain headroom and present neat appearance.
- M. Route exposed conduit parallel and perpendicular to walls.
- N. Route conduit installed above accessible ceilings parallel and perpendicular to walls.
- O. Maintain adequate clearance between conduit and piping.
- P. Maintain 12 inch clearance between conduit and surfaces with temperatures exceeding 104 degrees F.
- Q. Cut conduit square using saw or pipecutter; de-burr cut ends.
- R. Bring conduit to shoulder of fittings; fasten securely.
- S. Use conduit hubs to fasten conduit to sheet metal boxes in damp and wet locations and to cast boxes.

- T. Install no more than equivalent of four 90-degree bends between boxes. Use hydraulic one-shot bender to fabricate or factory elbows for bends in metal conduit larger than 2 inch size.
- U. Provide sealing fittings on all conduit runs which penetrate exterior walls and refrigerated spaces to prevent circulation of air and/or condensation.
- V. Avoid moisture traps; provide junction box with drain fitting at low points in conduit system.
- W. Provide insulating bushings on all RGS and IMC conduits entering wireways, pullboxes, cabinets, panelboards, etc.
- X. Provide suitable fittings to accommodate expansion and deflection where conduit crosses seismic, control and expansion joints.
- Y. Provide Thomas Jet-Line Polyolefin pull cord, minimum 500 lbs., in each empty conduit except sleeves and nipples.
- Z. Use "Push-Pennies" to protect installed conduit against entrance of dirt and moisture.
- AA. Ground and bond conduit under provisions of Section 260533.
- BB. Where connections to free-standing equipment in excess of 18" from structure are required, a vertical, minimum size 3/4", rigid conduit secured to ceiling and floor shall be utilized with wiring into this conduit by means of a rigid connection to a conduit body and wiring from this conduit by means of a conduit body with a flexible conduit connection to equipment.
- CC. Flexible conduit shall not exceed 2'-0" in length unless specified otherwise.

3.3 INSTALLATION OF BOXES

- A. Install electrical boxes as shown on Drawings, and as required for splices, taps, wire pulling, equipment connections and compliance with regulatory requirements.
- B. Mounting heights as specified in other sections shall be to the bottom of the outlet.
- C. Install electrical boxes to maintain headroom and to present neat mechanical appearance.
- D. Install pull boxes and junction boxes above accessible ceilings and in unfinished areas only.
- E. Install boxes to preserve fire resistance rating of partitions and other elements.
- F. Align adjacent wall-mounted outlet boxes for switches, thermostats, and similar devices with each other.
- G. Use flush mounting outlet boxes in finished areas.

- H. Secure flush mounting box to interior wall. Accurately position to allow for surface finish thickness.
- I. Install flush mounting box without damaging wall insulation or reducing its effectiveness.
- J. Use adjustable steel channel fasteners for hung ceiling outlet box.
- K. Do not fasten boxes to ceiling support wires.
- L. Support boxes independently of conduit, except cast box that is connected to two rigid metal conduits both supported within 12 inches of box.
- M. Use gang box where more than one line voltage device is mounted together. Do not use sectional box.
- N. Use separate boxes for low voltage systems. Do not install line voltage and low voltage devices within same outlet.
- O. Use 4 inch square box with plaster ring for single device outlets.
- P. Use cast outlet box in exterior locations exposed to the weather and wet locations.
- Q. Locate flush mounting box in masonry wall to require cutting of masonry unit corner only. Coordinate masonry cutting to achieve neat opening.
- R. Adjust flush-mounting outlets to make front flush with finished wall material.
- S. Install knockout closure in unused box opening.

3.4 FIRESTOPPING

- A. Apply firestopping to electrical penetrations of fire-rated floor and wall assemblies to restore original fire-resistance rating of assembly.
- B. Install conduit to preserve fire resistance rating of partitions and other elements in accordance with Section 07841. Seal penetrations with Flame-Safe FS900 series firestop compounds as manufactured by International Protective Coatings Corporation (800-334-8796) or equal by 3M or Hilti. Verification of these requirements shall be the responsibility of this Contractor.

3.5 PROTECTION

- A. Provide final protection and maintain conditions that ensure coatings and finishes are without damage or deterioration at time of Substantial Completion.
 - 1. Repair damage to galvanized finishes with zinc-rich paint recommended by manufacturer.

2. Repair damage paint finishes with matching touchup coating recommended by manufacturer.

END OF SECTION

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SECTION 260553 - IDENTIFICATION FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes the following:

1. Identification for conductors and communication and control cable.
2. Equipment identification labels.
3. Miscellaneous identification products.
4. Panelboard directories.
- 5.

1.2 SUBMITTALS

- A. Product Data: For each electrical identification product indicated.
- B. Identification Schedule: An index of nomenclature of electrical equipment and system components used in identification signs and labels.

1.3 QUALITY ASSURANCE

- A. Comply with ANSI A13.1 and ANSI C2.
- B. Comply with NFPA 70.
- C. Comply with 29 CFR 1910.145.

1.4 COORDINATION

- A. Coordinate identification names, abbreviations, colors, and other features with requirements in the Contract Documents, Shop Drawings, manufacturer's wiring diagrams, and the Operation and Maintenance Manual, and with those required by codes, standards, and 29 CFR 1910.145. Use consistent designations throughout Project.
- B. Coordinate installation of identifying devices with completion of covering and painting of surfaces where devices are to be applied.
- C. Coordinate installation of identifying devices with location of access panels and doors.
- D. Install identifying devices before installing acoustical ceilings and similar concealment.
- E. The room numbers indicated on the Contract Documents were provided by the Architect to assist in identifying spaces during construction. These room numbers may not necessarily be the Owner's final choice of room numbers. The contractor shall obtain from the Owner the final choice of room numbers, and shall use these numbers wherever required. (For example, room numbers are used in programming of fire alarm systems and intercom system, and shall match the Owner's final choice.)

PART 2 - PRODUCTS

2.1 CONDUCTOR AND CONTROL-CABLE IDENTIFICATION MATERIALS

- A. Color-Coding Conductor Tape: Colored, self-adhesive vinyl tape not less than 3 mils (0.08 mm) thick by 1 to 2 inches (25 to 50 mm) wide.
- B. For building wire and cables in sizes 8 AWG and smaller provide with factory insulation to correspond to color code; in sizes 6 AWG and larger provide 3/4" colored tape bands in lieu of colored insulation.

2.2 EQUIPMENT IDENTIFICATION LABELS

- A. Engraved, Laminated Two Layer Acrylic: Mechanically (screw) fastened with black letters on white background

2.3 MISCELLANEOUS IDENTIFICATION PRODUCTS

- A. Cable Ties: Fungus-inert, self-extinguishing, 1-piece, self-locking, Type 6/6 nylon cable ties.
 - 1. Minimum Width: (3/16 inch).
 - 2. Tensile Strength: (50 lb), minimum.
 - 3. Temperature Range: (Minus 40 to plus 185 deg F).
 - 4. Color: Black, except where used for color-coding.
- B. Fasteners for Labels: Self-tapping, stainless-steel screws or stainless-steel machine screws with nuts and flat and lock washers.

PART 3 - EXECUTION

3.1 APPLICATION

- A. Branch-Circuit Conductor Identification: Where there are conductors for more than three branch circuits in same junction or pull box, use color-coding conductor tape. Identify each ungrounded conductor according to source and circuit number.
- B. Conductors to Be Extended in the Future: Attach to conductors and list source and circuit number.
- C. Auxiliary Electrical Systems Conductor Identification: Identify field-installed alarm, control, signal, sound, intercommunications, voice, and data connections.
- D. Identify conductors, cables, and terminals in enclosures and at junctions, terminals, and pull points. Identify by system and circuit designation.

- E. Equipment Identification Labels: On each unit of equipment, install unique designation label that is consistent with wiring diagrams, schedules, and Operation and Maintenance Manual. Apply labels to disconnect switches and protection equipment, central or master units, control panels, control stations, terminal cabinets, and racks of each system. Systems include power, lighting, control, communication, signal, monitoring, and alarm systems unless equipment is provided with its own identification.

1. Labeling Instructions:

- a. Indoor Equipment: Engraved, laminated acrylic or melamine label. Unless otherwise indicated, provide a single line of text with (1/2-inch-) high letters on (1-1/2-inch-) high label; where 2 lines of text are required, use labels (2 inches) high.
- b. Outdoor Equipment: Engraved, laminated acrylic or melamine label.
- c. Elevated Components: Increase the sizes of labels and letters to those appropriate for viewing from the floor.

2. Equipment to Be Labeled:

- a. Access doors and panels for concealed electrical items.
- b. Disconnect switches.
- c. Motor starters.
- d. Contactors.

3.2 INSTALLATION

- A. Verify identity of each item before installing identification products.
- B. Location: Install identification materials and devices at locations for most convenient viewing without interference with operation and maintenance of equipment.
- C. Apply identification devices to surfaces that require finish after completing finish work.
- D. Attach mechanically fastened signs and plastic labels with screws and hardware appropriate to the location and substrate.
- E. For building wire and cables in sizes 8 AWG and smaller provide with factory insulation to correspond to color code; in sizes 6 AWG and larger provide 3/4" colored tape bands in lieu of colored insulation.

1. Colors for 208/120-V Circuits:

- a. Phase A: Black.
- b. Phase B: Red.
- c. Phase C: Blue.

2. Colors for 480/277-V Circuits:

- a. Phase A: Brown.

- b. Phase B: Orange.
 - c. Phase C: Yellow.
3. Field-Applied, Color-Coding Conductor Tape: Apply in half-lapped turns for a minimum distance of (6 inches) from terminal points and in boxes where splices or taps are made. Apply last two turns of tape with no tension to prevent possible unwinding. Locate bands to avoid obscuring factory cable markings.
- F. Painted Identification: Prepare surface and apply paint as required.
- G. For all panelboards, provide neatly typewritten directory of each device usage including building room numbers (e.g. Convenience Outlets Room A101).
- H. Locate directory inside panelboard door. Protect directory with clear plastic.

END OF SECTION