

PROJECT MANUAL

ISSUED FOR CONSTRUCTION

FH100 FVSU FIELD HOUSE MODIFICATION

For
FORT VALLEY STATE UNIVERSITY

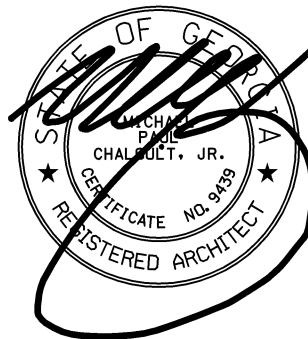
FORT VALLEY,
Georgia

SPDG PROJECT #
25039

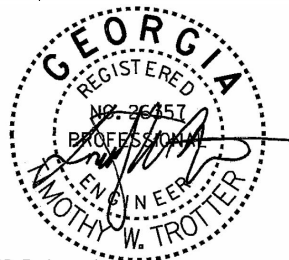
DATE:
05/18/26



NBP Engineers, Inc.
COA#PEF000774
COA Expiration: 6.30.2026



Architects and Engineers Inc.



NBP Engineers, Inc.
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FORT VALLEY STATE UNIVERSITY
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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 CONTRACTOR FIRM NAME
(CONTRACTOR)**

AND

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

For the Use and Benefit of:

Fort Valley State University

**PROJECT NO. – FH100
FVSU FIELD HOUSE MODIFICATIONS**

INCLUDES:

**Executive Summary of Contents
Form of Contract
Bid Requirements
Table of Contents
General Conditions
Forms**

Preface
Contract 1 to Contract 4
pp 1 - 13
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EXECUTIVE SUMMARY OF CONTENTS**FORM OF CONTRACT****BID REQUIREMENTS****GENERAL CONDITIONS****SECTION 1 – GENERAL**

- Part 1 - General
- Part 2 - Contractor's General Responsibilities and Duties.
- Part 3 - Owner's General Responsibilities and Rights.
- Part 4 - Protection of Persons and Property
- Part 5 - Bonds, Indemnity, and Insurance
- Part 6 - Hazardous Conditions and Materials
- Part 7 - Miscellaneous Provisions.

SECTION 2 – PRE-COMMENCEMENT PHASE

- Part 1 - Pre-commencement Phase Services
- Part 2 - Construction Documents and Site Plan

SECTION 3 – CONSTRUCTION PHASE

- Part 1 - Construction Phase Services
- Part 2 - Changes to the Work
- Part 3 - Time.
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SECTION 4 – COMPENSATION

- Part 1 - General.
- Part 2 - Payments Withheld
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SECTION 6 – PROJECT COMPLETION

- Part 1 - Material Completion
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SECTION 7 – FORMS

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

CONSTRUCTION CONTRACT
BETWEEN CONTRACTOR AND OWNER

THIS CONSTRUCTION CONTRACT (hereinafter the "Contract") made this _____ day of _____ (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 **Fort Valley State University** (hereinafter the "Using Agency" or "Institution") LEGAL Firm Name, (hereinafter the "CM/GC"), whose address is MUST be a physical address. NO P.O. Boxes.

(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: _____

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. FH100

Project Name and Description: FVSU FIELD HOUSE MODIFICATIONS (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:

INSERT CONTRACT SUM Dollars (\$ _____)

3. The Material Completion and Occupancy Date shall be achieved within ONE HUNDRED FIFTY (150) consecutive calendar days beginning the date specified in the Proceed Order.

4. The agreed daily amount for Liquidated Damages is: \$ 0 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:

Contractor Name
Physical Address, NO P.O. Boxes
City, State Zip
Attention: Contractor POC for Project
Phone Number: Contractor Phone
Facsimile Number: Contractor Fax
Email: Contractor Email address

OWNER: Board of Regents of the University System of Georgia
 270 Washington Street, SW, 6th Floor
 Atlanta, Georgia 30334
 Attention: Vice Chancellor for Facilities
 Phone Number: 404-656-2243
 Facsimile Number: 404-657-7433

OWNER'S REPRESENTATIVE: Board of Regents of the University System of Georgia
 270 Washington Street, SW, 6th Floor
 Atlanta, Georgia 30334
 Attention: Choose One
 Phone Number: BOR - PM Phone
 Facsimile Number: 404-657-1479
 Email: Choose Appropriate Email

USING AGENCY (Institution): Fort Valley State University
 1005 State University Drive
 Fort Valley, Georgia 31034314
 Attention: Dr. Paul Jones
 Phone Number:
 Facsimile Number:
 Email:

DESIGN PROFESSIONAL: SP Design Group, Architects and Engineers Inc.
 5191 Columbus Road
 Macon, Georgia 31206
 Attention: Robert A. Day
 Phone Number: 478 745 1167
 Facsimile Number:
 Email: bday@spdesigngrp.com

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 70 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. 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.

Contractor

ATTEST:

_____ (L.S.)

By: _____ (L.S.)

_____, SECRETARY

_____, PRESIDENT

(SEAL, OVER SIGNATURE)

(If not a corporation, signature must be notarized.)

APPROVED: USING AGENCY

By: _____

Dr. Paul A. Jones, PRESIDENT
FORT VALLEY STATE UNIVERSITY

WITNESS: _____

(PRINT NAME / TITLE)

Attachments:

1. General Conditions and Forms
2. Supplementary General Conditions

BID REQUIREMENTS

INVITATION TO BID

The Owner will receive sealed bids from Licensed General Contractors in the **Family Development Auditorium** of the **Family Development Building** at Fort Valley State University, Carver Drive, Fort Valley, Georgia. Bids must be physically on the table in the Bid Room by **2:00** o'clock pm., at the time legally prevailing in Fort Valley, Georgia on **June 30, 2026**, for the construction of **Project No. FH100, FVSU Field House Modifications**, located in Fort Valley, Georgia. At the time and place noted above, the bids will be publicly opened and announced.

Bidding Documents may be obtained online at the Georgia Procurement site.

Bidders are cautioned that acquisition of Bidding Documents through any unauthorized source 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.

There will be a *pre-bid* conference held on **June 9, 2026**, at **10:00** a.m. in the **Family Development Auditorium** of the **Family Development Building** on Carver Drive on the campus of Fort Valley State University. Attendance at this conference is **MANDATORY** for any Contractor intending to bid on this project. Others may attend if they so desire.

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: Ms. Becky Horton

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 added. 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.
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 13-10-90 *et seq.* Contractor shall certify that Contractor has registered at <https://www.vis-dhs.com/EmployerRegistration> to verify information of all newly hired employees in order to comply with the Immigration reform and Control Act of 1986 (IRCA), D.L. 99-603 and the Georgia Security Immigration Compliance Act. 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 Labor set forth at Rule 300-10-1-01 *et seq.* 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

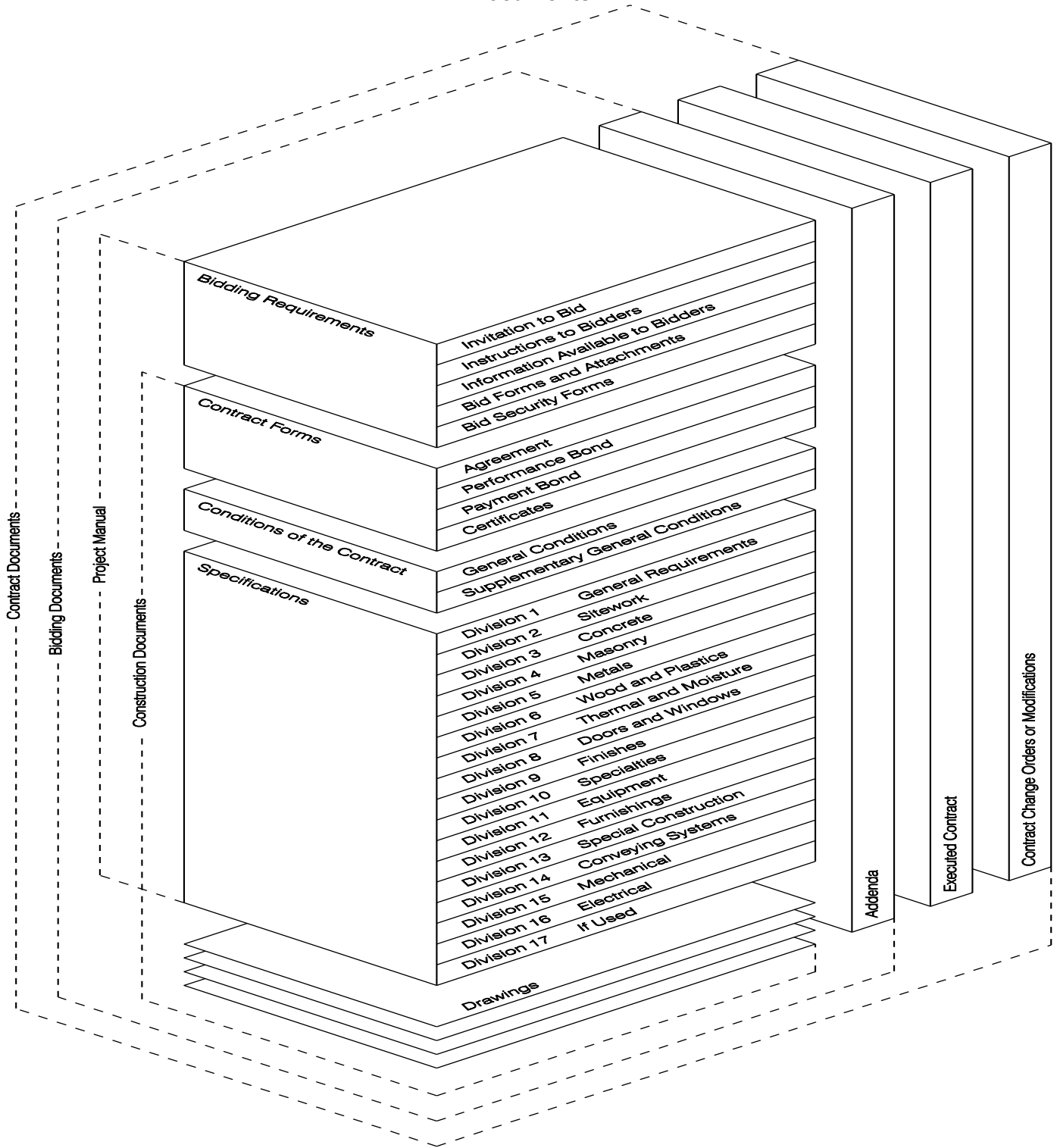
(e) Whether the bidder's past work provides evidence of an ability to successfully complete public works projects within the established time, quality, or cost, or to comply with the bidder's contract obligations.

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.

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Organization and Classification of Contract Documents



BID REQUIREMENTS

BID FORM

To: OWNER _____

Re: Project Name and No. FH100, FVSU FIELD HOUSE MODIFICATIONS

Bid Date: _____ June 30, 2026, 2:00 pm _____

THE BID:

Bid. Having carefully examined the Specifications entitled **PROJECT NO. FH100, FVSU FIELD HOUSE MODIFICATIONS**, and the Bidding Documents and Addendum (a) No.(s) A1, _____, 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 (see section 01 2300, Alternates) be accepted and be incorporated in the Contract, the Bid will be altered in each case as follows:

NONE

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 **Two Hundred Ten (150)** consecutive calendar days 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 (P.O. BOX IS INSUFFICIENT)

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:

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

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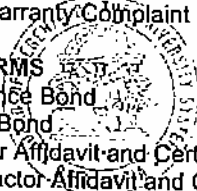
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SUPPLEMENTARY GENERAL CONDITIONS



GENERAL CONDITIONS OF THE CONSTRUCTION CONTRACT

SECTION 1 – GENERAL PART 1 – GENERAL PROVISIONS

1.1.1 General Matters.

1.1.1.1 This Contract and Affiliated Agreements – Requirement for Written Agreements. This Contract and all Affiliated Agreements, including any subsequent modifications, must be in writing, dated, and executed by the parties. Affiliated Agreements, including financial arrangements with respect to this Project, must be promptly and fully disclosed to the Owner upon their execution or modification.

1.1.1.2 Basic Statement of Owner Objectives. The Owner's basic objectives are the construction of the Project within the limits of the funds available to Owner for construction of the Project, and in accordance with the approved Construction Documents.

1.1.1.3 Project Team. To accomplish Owner's objectives, Owner intends to employ a team concept in connection with the construction of the Project. The basic roles and general responsibilities of team members are set forth in general terms below but are more fully set forth in the Design Professional Contract with respect to the Design Professional, in the Program Management Agreement with any Program Manager, and in this Contract with respect to the Contractor.

1.1.1.3.1 Relationship of Parties. The Owner and the Contractor agree to proceed with the Project on the basis of trust, good faith, and fair dealing and to cooperate fully with each other. The Owner and the Contractor shall do all things reasonably necessary to perform this Contract in an economical and timely manner, including without limitation, consideration of design modifications to enhance constructability and alternative materials or equipment, if considered necessary or convenient by the Owner. The Contractor agrees to procure or furnish, as permitted by the laws of Georgia, all Pre-Commencement phase services and construction phase services as set forth herein. The Owner shall endeavor to promote harmony and cooperation among the Owner, Program Manager, Design Professional, the Using Agency, Contractor and other persons or entities employed by the Owner for the Project.

1.1.1.3.2 Design Professional. The Design Professional is retained in accordance with the Design Professional Contract (i) for the design and preparation of Construction Documents that are necessary to implement the Program governing the construction of the Project or Components thereof, and the design and preparation of any necessary documents antecedent to preparation of such Construction Documents, or (ii) for construction contract administration of the Work under Contract Documents, or (iii) for both. The Contractor acknowledges and agrees that the Contract Documents are addressed to skilled tradesmen in the construction profession who shall be required to use their special skills and experience, through submittals and shop drawings, to translate the Design Professional's design intent as expressed in the Contract Documents into a completed structure. The Contract Documents shall specify when shop drawings or submittals require the seal of a specialty consultant.

1.1.1.3.2.1 The basis of the Owner's engagement of the Design Professional is the "Design Professional Contract." The Contractor is advised that both the Owner and the Design Professional have on file, at their respective places of business, copies of that executed agreement. The Design Professional is not the agent of the Owner, except to the extent so specified in writing, but is employed as a consultant to the Owner to assist the Owner in determining if the conditions of the contract have been met. All decisions of the Design Professional on matters of aesthetics are final, conclusive, and binding on all parties if consistent with the requirements of the Contract Documents.

1.1.1.3.2.2 The Contractor promptly shall request and review a copy of the Design Professional Contract during the Pre-commencement Phase and shall become familiar with the respective services, authorities, obligations, and responsibilities of the parties therein. Contractor agrees to develop a working relationship with the Design Professional to effectuate the purposes of the Project in accordance with the terms of this Contract and with consideration of the Design Professional's responsibilities under the Design Professional Contract.

1.1.1.3.2.3 The Contractor acknowledges that the respective contracts require the Owner and the Design Professional to proceed with the Project on the basis of trust, good faith, and fair dealing, and they will take all actions reasonably necessary to ensure the Project proceeds to completion within the Owner's time and budgeting constraints. The Contractor also acknowledges that the Design Professional is to perform all tasks and services required of it under the Design Professional Contract. The Contractor further acknowledges that, in order for the Design Professional to perform its obligations, the Design Professional requires certain materials, information, or other submissions pursuant to the Contract Documents from the Contractor. The Contractor agrees to provide the Design Professional with the submittals required by the Contract Documents. The Contractor further agrees to cooperate with the Design Professional to ensure timely completion of all obligations under this Contract to complete the entire Project.

1.1.1.3.2.4 Contractor agrees that the services provided by the Design Professional under the Design Professional Contract are intended to coordinate and complement, but not to diminish, alter or substitute for, any of the services, authority, obligations, or responsibilities of the Contractor under this Contract. Contractor further agrees that the performance of services by the Design Professional in connection with the Project shall in no way relieve Contractor from any of its services, authority, obligations, or responsibilities under this Contract, and shall not alter or diminish those services, authority, obligations, or responsibilities in any way whatsoever.

1.1.1.3.3 Program Manager. Owner may designate a Program Manager to administer the Project and this Contract. In lieu of a Program Manager, Design Professional may be designated to perform the role of Program Manager. The Program Manager may also be designated as the Owner's Representative, and if no Owner's Representative is designated, the Program Manager shall be the Owner's Representative.

1.1.1.3.4 Owner's Representative. Owner shall from time to time in writing designate one person as Owner's Representative under this Contract. Owner may designate the Program Manager, if any, as the Owner's Representative. Owner's Representative so designated in writing shall serve as Owner's Representative under this Contract unless or until Owner gives notice in writing of the appointment of his successor. Owner or Owner's Representative may designate in writing assistants to serve as Owner's Representative with respect to the Project governed by this Contract or in different phases or in specific areas of responsibility with respect to the Project. All requests for consents and approvals required of Owner in connection with the Project, whether by Program Manager, Design Professional, or Contractor, shall be submitted to Owner's Representative, or if the matter is within the written designation of authority of his assistant, to his designated assistant. Design Professional and Contractor may rely upon written consents and approvals signed by the Owner's Representative, or his designated assistant acting within the scope of his written designation, as the consent and approval of Owner.

1.1.1.3.5 Using Agency, Using Agency's Representative. The Project is intended for the benefit of the Using Agency. A copy of all matters submitted to Owner shall also be submitted to Using Agency for Using Agency's information. The Using Agency may designate one or more representatives to participate with Owner in Owner's activities under this Contract. Neither the Using Agency nor any representative of Using Agency shall have any authority to act for or in the name of the Owner. Participation in the Project by Using Agency or its representative(s) shall be solely advisory to the Owner. The Program Manager, Design Professional, Contractor, or any Separate Contractor must not act or rely solely upon any directive, interpretation, decision, act, or omission of Using Agency or the Using Agency's Representative.

1.1.1.3.6 Owner's Construction Inspector. Owner may from time to time in writing designate a person or firm as Owner's Construction Inspector under this Contract. The Owner's Construction Inspector may be hired by Owner or hired under the Program Manager's Contract or the Design Professional's Contract and shall provide inspection services of the Work on behalf of the Owner. The presence of an Owner's Construction Inspector does not relieve the Contractor of any of its responsibilities for quality control and independent testing set forth in the General Requirements. The Owner's Construction Inspector has the authority to report any deviations from the Contract Documents directly to the Contractor's superintendent at the job site for immediate action, and also to report same to the Program Manager or Design Professional, and Owner.

1.1.1.3.7 Representatives. The designated representatives of the Contractor and the Owner shall have full authority to act (other than for the receipt of notices that must be given as specified in Paragraph 1.1.5) in matters relating to this Contract until notice is given that such authority has been revoked. Contractor and the Owner may each rely upon the written certification of the other as to the appointment of a designated representative or the revocation of his authority. The Contractor shall designate, in writing, a representative authorized to act on the Contractor's behalf with respect to the Project. The Contractor's initial authorized representative shall be the Project Superintendent of the Contractor as identified by the Contractor. Contractor shall employ the Project Superintendent and necessary assistants who shall be in attendance at the Site during the progress of the Work. The Contractor's designee shall represent Contractor. All written communications given to the Contractor's designee shall be binding upon Contractor.

1.1.1.3.8 Separate Contractor. Owner may select one or more Separate Contractors to perform work with respect to the Project or Components thereof. The Contractor shall afford the Owner's Separate Contractors reasonable opportunity for introduction and storage of their materials and equipment and performance of their activities and shall coordinate the Separate Contractors' schedules with those of the Contractor. The Owner's Separate Contractors shall adhere to the Contractor's work rules, schedule, laydown areas, and safety requirements.

1.1.1.3.9 Commissioning Authority. Owner may select and employ a Commissioning Authority to perform building commissioning activities and monitor testing activities. The Commissioning Authority shall perform and coordinate and accomplish its work as set forth in Articles 1.3.4 and 2.1.9.

1.1.2 Project Team, Cooperation, Partnering.

1.1.2.1 Concept. It is the Owner's expectation that the Program Manager, Design Professional, Owner, Using Agency, Contractor, and any Separate Contractor, shall work as a Project Team to effect the commencement of and completion of construction in accordance with the Project Schedule, and to achieve Final Completion of the Project. Each team member shall communicate with all other team members to assure overall coordination, cooperation, and efficiency. Each team member shall cooperate fully with and coordinate fully with each other team member in order to achieve Project completion in an expeditious and economical manner. The Contractor shall schedule regular meetings of the key principals of the Project Team in an effort to solve problems in a partnering atmosphere to facilitate the ability of each team member to meet its business objectives, so long as its business objectives are consistent with the successful completion of the Project. It is the Owner's intent that all consensus decisions of the Project Team, where differing from the Contract Documents, be reduced to writing in an appropriate Change Order.

1.1.2.2 Conference. Promptly after the execution of this Contract, Contractor shall confer with the Program Manager, Design Professional, Owner, and Using Agency to identify personnel and relevant organizational charts of each team member, and to establish working relationships with each team member.

1.1.2.3 Authority of Contractor. Contractor is, and at all times during the term of this Contract shall be, an independent contractor in the performance of its duties and obligations under this Contract. Contractor shall have no authority to bind or otherwise obligate Owner, orally, in writing or by any acts, unless specifically authorized by Owner in writing. Nothing contained in this Contract shall constitute or be deemed or construed to create a partnership or joint venture, or any agency relationship, between Owner and Contractor.

1.1.2.4 Team Evaluation Process, Covenant not to Sue. If Team Evaluation is elected as part of this Contract, all team members agree to participate in good faith in the State of Georgia's formal Team Evaluation Process [copies of which will be made available to any bidder on request]. By executing this agreement for construction services with the Owner, the Contractor waives any and all legal rights for defamation, libel or slander and covenants not to sue the Board of Regents, the Owner, the Design Professional, the Using Agency, other team members, and their respective representatives and agents for comments, rankings, and results related to the Contractor's performance posted in good faith as a part of, and in accordance with, said Team Evaluation Process. The Design Professional and other team members, in their agreements with the Owner, have executed, or will execute, a similar agreement.

1.1.3 Constitutional Principles Applicable to State Public Works Projects.

1.1.3.1 Title to Project Site. Title to the Site is vested in the Board of Regents of the University System of Georgia as public property of the State of Georgia, and is not subject to levy or lien.

1.1.3.2 Title to Improvements and Delivered Materials. Title to all improvements constructed at the Site vests *instanter* in the Board of Regents. Title to all materials vests in the Board of Regents upon their delivery without rejection by the

Contractor at the Site, regardless of the status of payment or nonpayment of the costs thereto. Protection of laborers and Suppliers (regarding payment for services and materials) is effected through the provision of payment and performance bonds by the State.

1.1.3.3 Limited Waiver of Sovereign Immunity *Ex Contractu*. Contractor acknowledges and agrees that Owner is an agency or instrumentality of the State of Georgia, and as such is entitled to the protection of sovereign immunity. As set forth in Article I, Section II, Paragraph IX of the 1983 Georgia Constitution, sovereign immunity is waived "as to any action *ex contractu* for the breach of any written contract." Contractor specifically acknowledges the constitutional and contractual requirements that written changes, modifications, and waivers to this Contract must be specifically executed by the Owner as set forth in the Contract Documents. Accordingly, Contractor specifically acknowledges the constitutional prohibitions against claims against Owner based solely upon oral statement, course of conduct, customs of the trade, quasi-contract, *quantum meruit*, or O.C.G.A § 13-4-4 (mutual departure from contract terms).

1.1.3.4 Limitations upon Authority of Agents. Contractor further acknowledges that Owner is an agency or instrumentality of the State of Georgia, and as such acts through specific public officials. The legal concepts of agency applicable to the Owner are solely as set forth in O.C.G.A. §45-6-5 and as further specified in the Contract Documents. Contractor specifically acknowledges the statutory and contractual requirements that written changes, modifications, and waivers to this contract must be executed only by the identified representatives of Owner as set forth in the Contract Documents. Accordingly, Contractor specifically acknowledges that any claims against Owner based upon the act of any non-authorized employee or official are invalid.

1.1.3.5 U.C.C. Not Generally Applicable. Contractor further acknowledges and agrees that Owner, as set forth in subsection (3) above, has granted only a limited waiver of sovereign immunity, such that the provisions of the Uniform Commercial Code (O.C.G.A §11-1-101 through §11-2-725) governing sales of goods do not apply to this Contract. Contractor specifically acknowledges the contractual requirements that written changes, modifications, and waivers to this contract must be specifically executed by the Owner as set forth in the Contract Documents. Accordingly, Contractor specifically waives and covenants not to make against Owner any claims based upon the Uniform Commercial Code. Contractor understands, however, that Contractor's subcontracts with Suppliers and Subcontractors may in fact include sales of goods and therefore be properly governed by the Uniform Commercial Code; nonetheless Contractor covenants that any such application shall in no way be construed to have any legal effect upon this contract between Owner and Contractor.

1.1.4 Third Party Beneficiary. Contractor acknowledges, stipulates, and agrees that the Owner is a public department, agency, or commission of the executive branch of government of the State of Georgia performing an essential public and governmental function by means of the Contract. Contractor acknowledges, stipulates, and agrees that the Using Agency is an express third party beneficiary of this Contract. There are no individual or personal third party beneficiaries of this Contract.

1.1.5 Notice.

1.1.5.1 General Requirement. Any notice, election, demand, request, consent, approval, or other communication required or permitted to be given under this Contract shall be in writing signed by an officer or duly authorized representative of the party making same and shall be delivered personally or shall be sent by certified or statutory mail, postage prepaid, return receipt requested, shall be effective as of the date on which it is received or would have been received but for the refusal of the addressee to accept delivery, and shall be addressed as shown in the Contract. The persons and addresses to which notices should be given may be changed by notice given in accordance with this Article.

1.1.5.2 Copies of Notices to Owner. Wherever the Contract Documents provide that a copy of any notice, request, or demand filed with the Design Professional by the Contractor shall be furnished to the Owner, such notice, request, or demand shall not become effective until the Owner has received his copy. No notice in writing or given orally to the Design Professional or to the Contract Compliance Specialist is notice to the Owner unless copy of the aforesaid notice in writing shall have been properly served upon the Owner at the address shown in the Contract.

1.1.6 Liquidated Damages.

1.1.6.1 Time of the Essence. Time being of the essence of this Contract, and a material consideration thereof, it is mutually agreed by the parties hereto in case of the Contractor's failure to complete the construction within the time specified, the Owner will be damaged thereby. The Contractor shall commence performance of the Work on the Site under this Contract as of the Proceed Order Date. The Contractor shall complete construction, except for Minor Items and Permitted Incomplete Work (see Article 6.1.1), not later than the Material Completion and Occupancy Date, as adjusted by Change Order.

1.1.6.2 Liquidated Damages. Because it is difficult to definitely ascertain and prove the amount of said damages, inclusive of, but not limited to, expenses for inspection, superintendence, loss of use, and necessary traveling expenses, the Owner, Contractor, and Using Agency hereby agree that the amount of such damages shall be the daily

rate specified in the Contract, beginning upon the contractually required Material Completion and Occupancy Date and ending on the date that the Certificate of Material Completion is issued. The parties agree that the specified Liquidated Damages are not established as a penalty but are calculated and agreed upon in advance as a fair and equitable amount reasonably estimated in advance to cover losses to be incurred by the Owner and Using Agency for such delay or interruption in view of the uncertainty and impossibility of ascertaining actual damages that would be incurred.

1.1.6.2.1 Contractor Agrees to Pay. The Contractor agrees to pay the amount, computed by multiplying the Liquidated Damages set forth in the Contract by the number of days between the contractually required Material Completion and Occupancy Date and the date that the Certificate of Material Completion is issued.

1.1.6.2.2 Deducted as They Accrue. Liquidated Damages shall be deducted from periodic payments as they accrue and such deduction shall be in addition to the retainage provided for in the Contract. The remaining balance of any Liquidated Damages shall be deducted from the Payment for Material Completion to the Contractor or its Surety. If the unpaid balance of the Contract Sum is less than the total amount to be deducted for Liquidated Damages as herein above provided, the Contractor shall promptly pay to the Owner, upon the Owner's demand, the amount by which such sum exceeds the unpaid balance of the Contract Sum.

1.1.6.3 Limitation on Owner's Damages. Except as otherwise set forth in the Contract Documents, damages of the Owner and Using Agency for delay shall be limited to the Liquidated Damages as defined herein. Nothing in this Article 1.1.6 shall be construed to limit Owner's right to pursue damages or remedies for claims against the Contractor for reasons other than delay.

1.1.7 Documents.

1.1.7.1 Precedence of Documents and Changes. In the event of conflict, the Contract takes precedence over the Supplementary Conditions, and the Supplementary Conditions take precedence over the General Conditions. No change to the Contract Documents is effective unless notice shall have been issued by the Owner bearing the imprimatur of the Owner as follows:

"By order of the Board of Regents of the University System of Georgia, Owner."

The Design Professional has no authority to amend the Contract Documents, orally or in writing, either expressly or by implication.

1.1.7.2 Copies of Contract Documents to Contractor. Without charge to the Contractor, the Design Professional shall furnish to the Contractor up to twenty-five sets of completed Contract Documents in hardcopy, one set of reproducible and electronic background floor and reflected ceiling plan drawings and, if requested, one copy in read-only electronic format. The Contractor may obtain such additional sets of Contract Documents, as the Contractor deems necessary and shall pay the cost of reproduction of such additional sets to the Design Professional.

1.1.7.3 Marked-Up ("As-Built") Documents. Prior to Final Completion, the Contractor shall provide one complete set of Marked-Up Documents to the Design Professional. The Marked-Up Documents shall consist of the Contract Documents annotated and changed to reflect the as-built condition of the Project, including all Change Orders, field instructions, answers to RFI's, clarifications, sketches, delegated contractor design drawings and locations of utilities and other hidden elements.

1.1.7.4 Copies to the Owner. Upon Owner's request, the Contractor shall furnish the Owner with copies of Project related correspondence, letters of transmittal, etc.

1.1.8. Defined Terms. Wherever used in the Contract Documents, the terms defined in this Contract will have the meanings indicated that are applicable to both the singular and plural, and to the masculine and feminine thereof. In addition to terms specifically defined, terms with initial capital letters in the Contract Documents may include references to identified articles and paragraphs, and the titles of other documents or forms.

1.1.8.1 Meaning of Words and Phrases. Unless the context or the Contract Documents taken as a whole indicate to the contrary, words used in the Contract Documents that have usual and common meanings shall be given their usual and common meanings; words having technical or trade meanings shall be given their customary meaning in the subject business, trade, or profession. Materials or work described in words that, so applied, have a well-known technical or trade meaning shall be held to refer to such recognized meaning.

1.1.8.2 Cross-References, Headings, and Citations to the Contract. Cross-references, headings, and citations to the Contract, if any, are for the convenience of the Contractor and the Owner and are not intended to be plenary or exhaustive nor are they to be considered in interpreting the Contract Documents or any part of the Contract Documents.

1.1.8.3 Install, Deliver, Furnish, Supply, Provide and Other Such Words. Install, deliver, furnish, supply, provide, and other such words mean that the Work in question shall be put in place by the Contractor ready for use unless expressly provided to the contrary.

1.1.8.4 Articles Not Plenary. This Article and Article 1.1.9 are not entire, plenary, or exhaustive of all terms used in the Contract and General Conditions that require definition. There may be definitions of other terms under articles to which the terms are related.

1.1.9 Basic Definitions

1.1.9.1 Addenda. Written or graphic instruments issued prior to the opening of bids that clarify, correct, or change any of the component parts of the Bidding documents.

1.1.9.2 Affiliate. With respect to Contractor, any firm, partnership, corporation or other legal entity that is owned by, under common ownership or control with, or having a common principal or shareholder with, the Contractor, whether such relationship is direct or indirect. In addition, unless the consequences of such relationship for the purposes of this Contract are expressly waived in writing by the Owner after full disclosure by the Contractor, the term "Affiliate" also includes any entity currently affiliated with Contractor as a partner or joint venturer with respect to any commercial venture, whether or not such venture includes the Project. See O.C.G.A. §13-10-23.

1.1.9.3 Affiliated Agreement. Any agreement concerning the Project between the Contractor and an Affiliate, including all modifications and amendments thereto.

1.1.9.4 Application for Payment. The form acceptable to Owner that is to be used by the Contractor during the course of the Work in requesting payment from the Owner and that is to be accompanied by such supporting documentation as is required by the Contract Documents.

1.1.9.5 Asbestos. Any material that contains more than one percent asbestos and is friable or is releasing asbestos fibers into the air above current action levels established by the United States Occupational Safety and Health Administration.

1.1.9.6 Authorization for Using Agency to Enter. The Notice from Owner to the Contractor and the Using Agency, upon issuance of a Certificate of Material Completion, that the Using Agency is authorized to take possession of the Project.

1.1.9.7 Bid. The offer of a Bidder submitted on the prescribed form setting forth the Contract Sum for all activities required by the Bidding Documents.

1.1.9.8 Bid Bond. A bond, required by law, with a surety in accordance with the Instructions to Bidders, substantially in the form and substance specified in the Bidding Documents, with the Owner as obligee, and intended to secure the execution of the Contract by the Bidder.

1.1.9.9 Bidding Documents. The Construction Documents, the Invitation to Bid, the Instructions to Bidders, the Bid Form, and all Addenda, upon which the Bidder submits a Bid.

1.1.9.10 Bulletin. Written or graphic material issued after the award of the contract that clarifies, corrects, or proposes a change in any of the component parts of the Contract Documents.

1.1.9.11 Business Day. A business day is each calendar day other than Saturday, Sunday, and any holiday observed by Owner.

1.1.9.12 Change Order. A document issued on or after the Effective Date of the Contract, signed by the Contractor and the Owner and ordinarily certified by the Design Professional, which may authorize a change or changes, including but not limited to a change to the Contract Sum, the Contract Time, or the Contract Documents.

1.1.9.13 Claim. A demand or assertion by the Owner or the Contractor seeking an adjustment of the Contract Sum or Contract Time, or both, or other relief with respect to the terms of the Contract. The term "Claim" also includes other disputes and matters in question between the Owner and the Contractor arising out of or relating to the Contract. The

responsibility to substantiate a Claim shall rest with the party making the Claim. A demand for money or services by a third party, including a Trade Contractor, Supplier, or subcontractor to the Contractor, is ipso facto not a Claim against the Owner.

1.1.9.14 *Construction Documents.* The architectural and engineering documents setting forth the design for the Project prepared by the Design Professional. Construction Documents include, but are not limited to, the Specifications, the Drawings, the Supplementary Conditions, the General Conditions, and all Addenda.

1.1.9.15 *Construction Progress Schedule.* A schedule indicating proposed activity sequences and durations, milestone dates for receipt and approval of pertinent information, preparation, submittal, and processing of Shop Drawings and Samples, delivery of materials or equipment requiring long-lead time procurement, and proposed date(s) of Material Completion and Occupancy and Final Completion. The schedule will be developed to represent the sixteen or seventeen CSI Specification Divisions. It shall have a minimum number of activities as required to adequately represent to Owner the complete scope of work and define the Project's critical path and associated activities. If the Project is to be phased, then each individual Phase should be identified from start through completion of the overall Project and should be individually scheduled and described, including any Owner's occupancy requirements and showing portions of the Project having occupancy priority. The format of the schedule will have dependencies indicated on a monthly grid identifying milestone dates such as construction start, phase construction, structural top out, dry-in, rough-in completion, metal stud and drywall completion, equipment installation, systems operational, Material Completion and Occupancy Date, final inspection dates, Punchlist, and Final Completion date.

1.1.9.16 *Contract.* The written document that is the evidence of the Contract between the Owner and the Contractor.

1.1.9.17 *Contract Compliance Specialist.* A person, if so designated by the Owner, to record daily events at the Site, including deliveries of equipment and supplies, and the progress of the Work. The Contract Compliance Specialist is not an inspector, and has no authority or power to act as agent for the Owner or to approve or disapprove any action of the Contractor. The Contract Compliance Specialist has no authority to and shall not be requested to sign or initial documents such as delivery receipts, drayage or hauling receipts, or time and materials tickets, or other similar documents evidencing transactions among the Contractor and Subcontractors.

1.1.9.18 *Contract Documents.* The Contract Documents include the executed Contract, the Bid, the Bidding Documents, and all Change Orders.

1.1.9.19 *Contract Sum.* The amount of money payable by the Owner to the Contractor for completion of the Pre-Commencement Services and the Work in accordance with the Contract Documents.

1.1.9.20 *Contract Time.* The period of time established for completion of the Project by the Contract Documents. Contract Time commences upon the date specified in the Proceed Order and ends upon the Material Completion and Occupancy Date, as it may be amended.

1.1.9.21 *Contractor.* The person or entity responsible for the proper completion of the activities described in the Contract Documents and who executes the Contract.

1.1.9.22 *Cost of the Work.* The sum of all allowable costs necessarily incurred and paid by Contractor in the proper performance of the Work.

1.1.9.23 *Day.* Unless otherwise stated, reference to the terms "day," "days," "month," or "months" mean calendar day, calendar days, calendar month, and calendar months, respectively.

1.1.9.24 *Defective Work.* Work that, for any reason, is not in compliance with the Contract Documents. Defective Work is usually identified in a Notice of Non-Compliant Work.

1.1.9.25 *Design Professional Contract.* The Contract between the Owner and the Design Professional for the design of the Project.

1.1.9.26 *Design Professional.* The architect or engineer or architectural or engineering firm selected by Owner (i) for the design and preparation of Contract Documents governing the construction of a Project, or (ii) for construction contract administration under the Contract Documents, or (iii) for both, all such services and the scope thereof to be set forth in the Design Professional Contract. The Design Professional is not an employee of the Owner but is engaged or retained by it for the purpose of performing design and construction administration services for the project. The term "Design Professional" includes architects, engineers, surveyors, designers, and other consultants retained by the Design Professional.

1.1.9.27 *Drawings*. That part of the Contract Documents prepared or approved by the Design Professional that graphically show the scope, extent, and character of the Work to be performed by Contractor. Shop Drawings and other Contractor submittals are not Drawings as so defined.

1.1.9.28 *Effective Date of the Contract*. The date indicated on the Contract or as otherwise specified therein.

1.1.9.29 *Final Certificate, Design Professional's Certificate of Final Completion*. The Certificate issued by the Design Professional stating that all work has been completed in accordance with the terms of the Contract Documents. See Section 6, Project Completion.

1.1.9.30 *Final Completion*. The full and final completion of all Work in accordance with the Contract Documents.

1.1.9.31 *Final Notice of Non-Compliant Work*. The Final Notice of Non-Compliant Work issued as a result of the Inspection for Material Completion, also known as the Final Punch List. Upon the completion or correction of this Non-Compliant Work ("punch list" work) the Design Professional will issue the Final Certificate.

1.1.9.32 *Hazardous Substances*. See Section 1 Part 6.

1.1.9.33 *Material Completion and "Material Completion and Occupancy Date"*. See Section 6 Part 1.

1.1.9.34 *Milestone*. A principal event specified in the Contract Documents including the Material Completion and Occupancy Date and other events relating to an intermediate completion date or time.

1.1.9.35 *Notice*. Written notice. See Article 1.1.5.

1.1.9.36 *Notice of Apparent Successful Bid*. The written notice by the Owner to the Successful Bidder stating that upon timely compliance by the Successful Bidder with the conditions precedent listed therein, the Owner will sign and deliver the Contract. The Construction Preparation Period begins on the Effective Date of the Contract. (See Section 2, Part 1.)

1.1.9.37 *Notice of Non-Compliant Work*. A Notice of Non-Compliant Work shall be in writing, shall be dated, shall be signed by the Design Professional, and shall be addressed to the Contractor with a copy to the Owner, as set forth in Section 3, Part 4 (Correcting the Work) and Section 6, Part 6 (Correcting the Work after Final Payment).

1.1.9.38 *Owner*. The Board of Regents, by and through a State Agency, identified as such in this Contract with whom Contractor has entered into the Contract and for whom the Work is to be completed.

1.1.9.39 *Overall Project Schedule*. The Construction Progress Schedule that is approved by the Owner.

1.1.9.40 *Pre-Commencement Phase Services*. The services required to be provided by the Contractor for the Pre-Commencement Phase of the Project in accordance with the Contract Documents.

1.1.9.41 *Proceed Order*. The Proceed Order is a written notice from the Owner that includes a specified date (i.e. the *Proceed Order Date*) upon which the Contractor is authorized to commence physical work on the Site. Unless the Proceed Order states otherwise, the Proceed Order Date shall be the date upon which the Proceed Order is actually signed and dated by the Owner's authorized representative. A Proceed Order is a condition precedent to the execution of any Work on the site by the Contractor. The Proceed Order was formerly referred to as the "Notice to Proceed."

1.1.9.42 *Project*. The total and complete undertaking for the public works facility to be constructed under this Contract.

1.1.9.43 *Project Manual*. A bound manual prepared by the Design Professional. It includes the Invitation to Bid, Instructions to Bidders, the Bid Form, the Specifications, the General Conditions and Supplementary General Conditions.

1.1.9.44 *Resident Engineer Inspector*. Synonymous with Contract Compliance Specialist. See Paragraph 1.1.9.16.

1.1.9.45 *Samples*. Physical examples of materials, equipment, or workmanship that are representative of some portion of the Work and that establish the standards by which such portion of the Work will be judged. The Contractor shall furnish for approval all samples required by the Contract Documents. The Work shall be in accordance with approved samples.

1.1.9.46 *Separate Contractor.* Any person or entity other than Contractor that enters into an agreement with Owner to perform the construction of all or any portion of the construction on a Project.

1.1.9.47 *Site.* Lands or areas indicated in the Contract Documents as being furnished by the Owner upon which the Work is to be performed, including rights-of-way and easements for access thereto, and such other lands furnished by the Owner that are designated for the use of the Contractor. Also referred to as Project Site, Job Site and Premises.

1.1.9.48 *Specifications.* That part of the Contract Documents consisting of written requirements for materials, equipment, systems, standards, and workmanship as applied to the Work, and certain administrative requirements and procedural matters applicable thereto. The term "Specifications" shall also include all written matter in the Project Manual or on the drawings and any Addenda or Change Orders thereto.

1.1.9.49 *Subcontractor.* The generic term subcontractor as employed herein includes only those having a direct contract with the Contractor.

1.1.9.50 *Submittals.* Shop Drawings, schedules, data, catalogue cuts, manufacturers' published recommendations, charts, bulletins, brochures, illustrations, circulars, roughing drawings or formulae, etc., that are specifically prepared, distributed, or assembled by or for Contractor or by Subcontractors, manufacturers, or Suppliers and submitted by Contractor to illustrate some portion of the Work or for use in installing the Work. The Contract Documents shall specify when shop drawings or submittals require the seal of a specialty consultant.

1.1.9.51 *Successful Bidder.* The responsible Bidder submitting the lowest responsive Bid.

1.1.9.52 *Supplier.* A manufacturer, fabricator, distributor, supplier, or vendor of goods or equipment in connection with the Work, or any other party having a Contract or Purchase Order with the Contractor or with a Subcontractor to furnish materials or equipment to be incorporated in the Work by the Contractor or a Subcontractor.

1.1.9.53 *Trade Contractor.* A Subcontractor who furnishes and installs materials according to the plans and specifications of this Project but does not include one who merely furnishes materials. See 1.1.9.49.

1.1.9.54 *Underground Facilities.* All underground pipelines, conduits, ducts, cables, wires, manholes, vaults, tanks, tunnels, or other such facilities or attachments, and any encasements containing such facilities, including without limitation those that convey electricity, gases, steam, liquid petroleum products, telephone or other communications, cable television, water, wastewater, storm water, other liquids or chemicals, or traffic or other control systems.

1.1.9.55 *Unit Price Work.* Work to be paid for on the basis of unit prices as defined and described in the Contract Documents. A percentage markup for overhead or profit shall be included in all unit prices.

1.1.9.56 *Using Agency.* The State entity for which the Project is being constructed. The term may include an institution (e.g., University of Georgia) that is a part of the Board of Regents of the University System of Georgia.

1.1.9.57 *Using Agency's Representative.* The Using Agency may designate from time to time a Using Agency's Representative, who shall work with the Design Professional and the Owner's Representative as a liaison with the Using Agency.

1.1.9.58 *Work.* All labor, materials, and services necessary to produce the construction of the Project in accordance with the Contract Documents, including the entire construction or the various separately identifiable parts thereof. Work includes and is the result of performing or providing all labor, services, and documentation necessary to produce such construction, and furnishing, installing, and incorporating all equipment, fixtures, and supplies into such construction, all as required by the Contract Documents.

PART 2 -- CONTRACTOR'S GENERAL RESPONSIBILITIES AND DUTIES

1.2.1 Contractor's General Responsibilities.

1.2.1.1 Representations of Contractor.

1.2.1.1.1 Independent Contractor. The Contractor represents that it is an independent contractor, competent, knowledgeable, and familiar with the type of work contemplated by this Contract. The Contractor agrees and understands that neither it nor any of its agents or employees may act in the name of the Owner except and unless specifically authorized in writing by the Owner to do so. The Contractor shall furnish construction administration and management services and use the Contractor's best efforts to perform the Project in an expeditious and economical manner consistent with the interests of the Owner.

1.2.1.1.2 Familiarity with Project. Contractor represents that it has: (a) visited and examined the Site(s), (b) taken into account local conditions and observed conditions that affect the Project, the Work, or the cost thereof, (c) investigated the labor situation related to the Project, (d) examined the superintendence of the Project, the Work, the time of completion, and other relevant matters, and (e) has taken these into consideration in submitting his bid.

1.2.1.2 Responsibility to Coordinate. Contractor acknowledges its responsibility to coordinate the Work with that of Separate Contractors to be selected for the installation of other work within the Project, or in the proximity of the Project. Contractor expressly agrees to schedule and, with the assistance of Owner, coordinate the Work with such Separate Contractors and to permit each phase of the Project to be completed on schedule.

1.2.1.3 Project Delivery. Contractor shall construct the Project in accordance with the Contract Documents, and Contractor shall deliver the Project completed in accordance with the Contract Documents, substantially free from defects, and within the Contract Time.

1.2.1.4 Contractor's Warranty as to Performance. The Contractor warrants that he is familiar with the codes applicable to the Work and that he has the skill, knowledge, competence, organization, and plant to execute the Work promptly and efficiently in compliance with the requirements of the Contract Documents. The Contractor has the obligation to keep a competent superintendent on the Work during its progress, to employ only skilled workers, and to enforce strict discipline and good order among his employees. The Contractor is responsible for seeing that the Work is installed in accordance with the Contract Documents. Failure or omission on the part of the Owner, representatives of the Owner, agents of the Owner, the Contract Compliance Specialist, engineers employed by the Design Professional, representatives of the Design Professional, or the Design Professional either to discover or to bring to the attention of the Contractor any deviation from, omission from, or noncompliance with the Contract Documents shall not be used by the Contractor or its surety as a defense for failure on his part to install the Work in accordance with the Contract Documents or for any other neglect to fulfill requirements of the Contract; neither shall the presence of any one, or all, or any of the foregoing at the Site or the fact that any one, or all, or any of the foregoing may have examined the Work or any part of the Work be used as a defense by the Contractor against a claim for failure on his part to install the Work in accordance with the Contract Documents or for any neglect to fulfill requirements of the Contract. No requirement of this Contract may be altered or waived except by Change Order.

1.2.2 Contractor's General Duties.

1.2.2.1 Construction Staging and Construction Services. The Contractor shall provide and pay for all labor, materials, equipment, transportation, construction, resources, work, and services necessary or incidental to completing the Work for each phase of the Project in a proper and timely manner in accordance with the Contract Documents and applicable laws.

1.2.2.2 Supervision and Direction. Contractor shall supervise and direct the Work using diligent skill and attention. Contractor shall be responsible for and shall coordinate all construction means, methods, techniques, sequences, and procedures. (See Article 3.1.1 *et seq.*)

1.2.2.3 Enforce Discipline. Contractor shall at all times enforce strict discipline and good order among its employees, Subcontractors, and others performing the Work, and shall not employ or permit the employment of unfit persons or persons not skilled in the task assigned to them.

1.2.2.4 Security Clearances. Where work is required within a specially secured controlled access environment, work shall be performed by personnel who have passed a security screening.

1.2.2.5 Maintain Records. Contractor shall keep Owner informed of the progress of the Work. Contractor shall maintain records of the cost for the Work pursuant to and in compliance with GASB 34 accounting requirements and such other methods as Owner may require, including complete backup documentation for all pay applications.

1.2.2.6 Answer Questions. Contractor, with reasonable promptness and in accordance with time limits set by Owner, shall answer Owner's questions and provide Owner with requested Project information.

1.2.2.7 Acts and Omissions. Employees of or Subcontractors to the Contractor shall perform the Work required by this Contract. The Contractor is responsible to the Owner for acts and omissions of the Contractor's employees, Subcontractors and their agents and employees, and other persons.

1.2.2.8 Contractor. Contractor shall, in coordination with the Design Professional, accomplish the construction of the Project, including all required submittals, and such Change Orders as may be issued.

1.2.2.9 Meetings with the Owner. Contractor shall schedule and conduct meetings with the Owner, Design Professional, Separate Contractors, and appropriate Subcontractors, not less than biweekly, for the purpose of discussing the status and progress of the Work. Such meetings shall be held as often as Owner determines.

1.2.2.10 Schedule and Coordination Meetings. Contractor shall schedule and conduct meetings as necessary with Subcontractors, Suppliers, and other appropriate Project Team Members to coordinate and schedule the Work.

1.2.3 Audit. At the request of the Owner, the Contractor shall allow the Owner the opportunity to select an auditor to examine and inspect the Project and the Contractor's books, records, and any and all accounts and similar data related to the Project. The Owner shall bear the cost of such audit. The auditor may sign a confidentiality agreement before conducting any such audit. Notwithstanding such agreement, Contractor understands and agrees that all project records are subject to the Georgia Open Records Act.

1.2.4 Employment of Georgia Citizens and Use of Georgia Products and Georgia Forest Products. Given that the Work provided for in this Contract is to be performed in Georgia, it is the wish 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 nor 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. O.C.G.A. §§50-5-60 to 63 are further incorporated into the General Conditions of the Contract as expressed below:

(a) No contract for the construction of, addition to, or repair of any facility, the cost of which is borne by the State, or any department, agency, commission, authority, or political subdivision thereof shall be let, unless said contract contains a stipulation therein providing that the Contractor, Construction Manager or Subcontractor shall use exclusively Georgia forest products in construction thereof, when forest products are to be used in such construction, addition or repair, and if Georgia forest products are available.

(b) These provisions shall not apply when in conflict with Federal law, rules, and regulations concerning interstate commerce or construction.

PART 3 – OWNER'S GENERAL RESPONSIBILITIES AND RIGHTS

1.3.1 Owner's Representative.

1.3.1.1 Written Designation. The Owner shall designate, in writing, a representative authorized to act on the Owner's behalf with respect to the Project. The Owner hereby designates the party identified in the Contract as its initial authorized representative and reserves the right to designate additional or replacement representatives by written notice to the Contractor.

1.3.1.2 Accessibility. The Owner's Representative shall be readily accessible (either on site or by computer, phone, fax or otherwise), shall be well acquainted with the Project, and shall have authority promptly to render decisions and to furnish information required of, or to be provided by, the Owner hereunder.

1.3.1.3 Independent Review and Inspection. The Owner may undertake independent inspection of the installation of the Work. Such independent inspector shall operate on behalf of the Owner and shall act to protect the best interests of the Owner.

1.3.2 Design Professional.

1.3.2.1 Design Professional to Design Work. The Design Professional Contract requires the Design Professional to design and to prepare the Contract Documents, a copy of which shall be furnished to the Contractor upon request. The Design Professional Contract requires the Design Professional to designate a readily accessible representative (either on Site or by computer, phone or fax or otherwise) who shall have authority promptly to render decisions and to furnish information required of the Design Professional.

1.3.2.2 Copies of Contract Documents to Contractor. The Design Professional Contract requires that the Contractor be furnished, free of charge, up to twenty-five sets of completed Contract Documents in hard copy, one full set of reproducible drawings and electronic background floor and reflected ceiling plan drawings and, if requested, one complete copy in read-only electronic format. The Contractor may obtain such additional sets of Contract Documents as the Contractor deems necessary and shall pay the cost of reproduction of such additional sets to the Design Professional.

1.3.2.3 Contract Administration. The Design Professional shall provide periodic review of the Work to assess compliance with the Contract Documents. The Design Professional shall not review any Work in respect to safety. The Design Professional is not the agent of the Owner, but is engaged as a consultant to the Owner to assist the Owner in determining if the conditions of the contract have been met. He is the agent of the Owner only when in special instances he is authorized in writing by the Owner so to act, and in such instances he shall, upon request, show the Contractor written authority. He has authority to stop the Work whenever such stoppage may be necessary to enforce the proper execution of the Contract.

1.3.2.4 Impartial Decisions. The Design Professional is the interpreter of the conditions of the Construction Contract and the judge of its performance, in the first instance. The Design Professional shall side neither with the Owner nor with the Contractor, but shall use its powers to enforce performance by both.

1.3.2.5 Design Professional Decisions. Design Professional's decisions must be in writing and signed by the Design Professional of Record.

1.3.2.5.1 Promptness. The Design Professional shall make decisions within fourteen calendar days after proper presentation of evidence on (1) any issue, claim, or dispute of the Owner or Contractor, or (2) a demand of the Owner or Contractor for a decision on any matter relating to the execution or progress of the Work.

1.3.2.5.2 Additional Time. If because of events beyond the Design Professional's reasonable control, it is not able to meet the specified time period, then it should be entitled to ask the Owner for additional time, which request shall not be unreasonably denied.

1.3.2.5.3 Protests of Design Professional's Decisions. All decisions of the Design Professional on any claim, dispute, or demand shall be final and binding on the Contractor in the absence of written notice of protest from the Contractor received by the Owner within fourteen calendar days of the date of the decision of the Design Professional is received by the contractor. See Section 5 Part 2.

1.3.2.6 **Aesthetics.** All decisions of the Design Professional on matters of aesthetics are final, conclusive, and binding on all parties if consistent with the requirements of the Contract Documents.

1.3.2.7 **Succession.** In case of the termination of the employment of the Design Professional, the Owner shall appoint a capable and reputable Design Professional against whom the Contractor makes no reasonable objection and whose status under the Contract shall be that of the former Design Professional.

1.3.3 **Permits, Licenses, and Inspections.** The Owner shall cooperate with the Contractor in obtaining building and other permits, licenses, and inspections. See also Subparagraph 2.1.2.2.3 and Article 2.1.5.

1.3.4 **Testing.** The Owner shall provide and pay for initial and subsequent independent construction testing as required by the Contract Documents. Laboratories for testing services shall be selected by, engaged by, and responsible to the Design Professional. In the case of tests (a) prescribed in the Contract Documents or any part thereof, or (b) requested by the Design Professional, the Contractor must give notice to the selected testing agency stating the date and the hour when he will be ready for the test to be made. In the event the test fails or the Contractor is not ready for the test, the expense of the services of the testing laboratory shall be deducted from the Contract Sum, upon notice to the Contractor by the Owner accompanied by a copy of the invoice for the testing services for the test that failed or for which the Contractor was not ready. The notice and readiness provisions of this article do not apply to verification of design mix on concrete.

1.3.5 **No Partial Occupancy.** There shall be no partial occupancy by the Using Agency of the Project prior to the achievement of Material Completion. This provision may be modified in the Supplementary General Conditions only for phased construction projects with stand-alone components, or may be modified by Change Order.

1.3.6 **Disqualification of Potential "Pre-Qualified" Subcontractors.** The Owner may disqualify for just cause any pre-qualified potential subcontractors identified in the Bidding Documents. Owner shall pay any difference in the cost of the Work resulting from such disqualification.

1.3.7 **Owner's Right to Perform Work.** The Owner reserves the right to perform construction or operations related to the Project with Separate Contractors on the Site. If the Contractor claims that delay or additional cost is because of such action by the Owner, the Contractor shall assert such claims as provided in Section 5, Part 2 of the General Conditions.

PART 4 – PROTECTION OF PERSONS AND PROPERTY

1.4.1 Reasonable Precautions. The Contractor shall take reasonable precautions for the safety of, and shall provide reasonable protection to prevent damage, injury or loss to: (a) employees performing the Work and other persons, including without limitation the General Public, who may be affected thereby; (b) the Work and materials and equipment to be incorporated therein, whether in storage on or off the Site, under care, custody, or control of the Contractor or the Contractor's Subcontractors; or (c) other property at or adjacent thereto, such as trees, shrubs, lawns, walks, pavements, roadways, structures and utilities not designated for removal, relocation, replacement or other rearrangement in the course of construction.

1.4.2 Duty to Protect Property. The Contractor shall continuously maintain adequate protection of the Work from damage and shall protect all other property on the Site from damage, injury, or loss regardless of who may be the owner of said property. He shall make good any such damage, injury, or loss.

1.4.3 Safety Precautions. The Contractor shall comply with the rules and regulations of OSHA and the Department of Labor (O.C.G.A. Section 34-2-6) and, where not inconsistent with the foregoing, the "Manual of Accident Prevention in Construction" issued by the Associated General Contractors of America, Inc., for safety and prevention of accidents, and shall maintain an accurate record of all cases of death, occupational disease, and injury requiring medical attention or causing loss of time from work arising out of and in the course of employment on work under the Contract. The Contractor shall be responsible for the safety, efficiency, and adequacy of his plant, appliances, and methods, and for any damage that may result from their improper construction, maintenance, or operations. He shall erect and properly maintain at all times, as required by the conditions and progress of the Work, proper safeguards for the protection of workers and the public and shall post danger warnings against any hazards created by the construction operations. The Contractor shall designate a responsible member of his organization, normally the superintendent, whose duty shall be the prevention of accidents.

1.4.4 Emergencies. In an emergency affecting the safety of persons or property or the Work or of adjoining property, the Contractor shall take reasonable precautions to prevent imminent damage, injury, or loss.

1.4.5 Fire Protection. Contractor shall take adequate and reasonable precautions to protect the Work against damage by fire and smoke. For example, without limitation, Contractor shall do the following:

- (a) Provide fire extinguishers or fire hoses in readily accessible locations;
- (b) Periodically inspect fire extinguishers, remove discharged extinguishers immediately, and replace with new or recharged extinguishers;
- (c) Keep fire extinguishers or fire hoses within five (5) feet of any welding or open flame operations;
- (d) Remove oil-soaked and paint-soaked materials, including paper and rags, from the Site daily, and more frequently as necessary, to eliminate danger of fire.
- (e) Prohibit workers from smoking during operations involving combustible adhesives, solvents, mastics, or other fire hazard materials.

1.4.6 Remedy Damages. The Contractor shall promptly remedy damages and loss to property at the Site caused by the Contractor, by any Subcontractor, by anyone directly or indirectly employed by the Contractor or any such Subcontractor, or by anyone for whose acts the Contractor or any such Subcontractor may be liable. Should the Contractor cause damage to any Separate Contractor's work, the Contractor agrees, upon due notice, to settle with the Separate Contractor.

1.4.7 Written Programs. Contractor shall have written environmental, quality control, crisis/emergency management, health and safety programs in place with a designated (qualified) coordinator as the point of contact during the project. Such plans shall be on the Site and the superintendent and the project management team shall be familiar with and utilize such programs.

PART 5 – BONDS, INDEMNITY, AND INSURANCE

1.5.1 Bonds

1.5.1.1 Performance Bond and Payment Bond. The Contractor shall furnish both a performance bond and a payment bond in the exact form set forth in Section 7, (Forms) of these General Conditions.

1.5.1.2 Required Qualifications for Surety. 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. All bonds at the time of issuance must be issued by a company authorized by the Insurance Commissioner to transact the business of suretyship in the State of Georgia, and shall have a Best Policyholders Rating of "A-" or better and with a financial size rating of Class V or larger.

1.5.1.3 Penal Amount of Bonds, State Law. The Contractor acknowledges and agrees that, pursuant to O.C.G.A. §§13-10-2, 13-10-20, 13-10-40 and 13-10-60, the performance bond and the payment bond must be in a penal amount equal to at least 100% of the Contract Sum. Accordingly, the Contractor warrants and agrees that, for any Change Order increasing the Contract Sum by five percent or more or when the total cost of the work has increased by five percent or more, it shall obtain a written amendment to the payment bond and the performance bond increasing the penal amounts of both bonds to 100% of the Contract Sum, effective as of the date of the Change Order. The premium increase, if any, may be properly included in the cost of the Change Order. The Design Professional shall approve no payment for the work provided by the Change Order until the Contractor has provided the written amendment to the Owner.

1.5.2 Liability and Indemnification.

1.5.2.1 General Liability. The Contractor shall be responsible to the Owner from the time of the signing of the agreement or the beginning of the first work, whichever shall be earlier, for all injury or damage of any kind resulting from any negligent act or omission or breach, failure or other default regarding the Work by the Contractor, or any of its Subcontractors, its agents, employees or others working at the direction of the Contractor or on its behalf, regardless of who may be the owner of the property.

1.5.2.2 Indemnification Agreement. Contractor hereby agrees to indemnify and hold harmless the Owner, the State of Georgia and its departments, agencies and instrumentalities and all of their respective officers, members, employees and directors (hereinafter collectively referred to as the "Indemnitees") from and against any and all claims, demands, liabilities, losses, costs or expenses, including attorneys' fees, due to liability to a third party or parties, for any loss due to bodily injury (including death), personal injury, and property damage arising out of or resulting from the performance of this Contract or any act or omission on the part of the Contractor, its agents, employees or others working at the direction of Contractor or on its behalf, or due to any breach of this Contract by the Contractor, or due to the application or violation of any pertinent Federal, State or local law, rule or regulation. This indemnification extends to the successors and assigns of the Contractor. This indemnification obligation survives the termination of the Contract and the dissolution or, to the extent allowed by law, the bankruptcy of the Contractor. If and to the extent such damage or loss (including costs and expenses) as covered by this indemnification is paid by the State Tort Claims Trust Fund, the State Authority Liability Trust Fund, the State Employee Broad Form Liability Fund, the State Insurance and Hazard Reserve Fund, and other self-insured funds (all such funds hereinafter collectively referred to as the "Funds") established and maintained by the State of Georgia Department of Administrative Services Risk Management Division (hereinafter "DOAS") the Contractor agrees to reimburse the Funds for such monies paid out by the Funds.

1.5.2.2.1 This indemnification does not extend beyond the scope of this Contract and the work undertaken thereunder. Nor does this indemnification extend to claims for losses or injuries or damages incurred directly by the Indemnitees due to breach, negligence or default by the Indemnitor under the terms and conditions of this Contract.

1.5.2.2.2 This indemnification does not extend to claims for losses or injuries or damages incurred by the Indemnitees due to any negligent act, error, or omission of a design professional in the performance of professional services that fails to meet the applicable professional standard of care, skill and ability as employed by others in their profession.

1.5.2.3. DOAS. Risk Management will endeavor to notify affected insurers of claims made against the State that fall within this indemnity. In the event of litigation, the Attorney General will endeavor to keep the Contractor and its general liability insurer as named on the insurance certificate informed regarding the claims and settlement.

1.5.3 Insurance Requirements.

1.5.3.1 Insurance Certificates. The Contractor shall, in accordance with 2.1.2.2, procure the insurance coverages identified below at the Contractor's expense (e.g. within the bid price and Contract Sum) and shall furnish the Owner an insurance certificate listing the Owner as the certificate holder and as an additional insured. Evidence of insurance coverages shall be provided on the form shown in Section 7 or on a form acceptable to the Owner. The insurance certificate must provide the following:

- (a) Name and address of authorized agent
- (b) Name and address of insured
- (c) Name of insurance company(ies)
- (d) Description of policies
- (e) Policy Number(s)
- (f) Policy Period(s)
- (g) Limits of liability
- (h) Name and address of Owner as certificate holder
- (i) Project Name and Number
- (j) Signature of authorized agent
- (k) Telephone number of authorized agent
- (l) Mandatory thirty day notice of cancellation or non-renewal (except ten days for non payment).

1.5.3.2 Insurer Qualifications, Insurance Requirements. Each of the insurance coverages required below (i) shall be issued by a company licensed by the Insurance Commissioner to transact the business of insurance in the State of Georgia for the applicable line of insurance, and (ii) shall be an insurer (or, for qualified self-insureds or group self insureds, a specific excess insurer providing statutory limits) with a Best Policyholders Rating of "A-" or better and with a financial size rating of Class V or larger. Each such policy shall contain the following provisions:

1.5.3.2.1 The insurance company agrees that the policy shall not be canceled, changed, allowed to lapse or allowed to expire until thirty days after the Owner has received written notice thereof, as evidenced by return receipt of certified mail or statutory mail, or until such time as other insurance coverage providing protection equal to protection called for in this Contract shall have been received, accepted and acknowledged by the Owner. Such notice shall be valid only as to the Project as shall have been designated by Project Number and Name in said notice.

1.5.3.2.2 The policy shall not be subject to invalidation as to any insured by reason of any act or omission of another insured or any of its officers, employees, agents or other representatives ("Separation of Insureds").

1.5.3.2.3 Each Insurer is hereby notified that the statutory requirement that the Attorney General of Georgia shall represent and defend the Indemnities remains in full force and effect and is not waived by issuance of any policy of insurance. In the event of litigation, any settlement on behalf of the indemnities must be expressly approved by the Attorney General. The Contractor and its insurance carrier may retain, but are not obligated to retain, counsel to assist with the defense of the Indemnities, in which case there will be mutual cooperation between the Attorney General and such counsel. See O.C.G.A. § 45-15-12.

1.5.3.2.4 All deductibles shall be paid for by the Contractor.

1.5.3.2.5 Self-insured retention, except for qualified self-insurers or group self-insurers, in any policy shall not exceed \$100,000.00.

1.5.3.3 Required Insurance Coverages. The Contractor also agrees to purchase insurance and have the authorized agent state on the insurance certificate that the Contractor has purchased the following types of insurance coverages, consistent with the policies and requirements of O.C.G.A. §50-21-37. The minimum required coverages and liability limits are as follows:

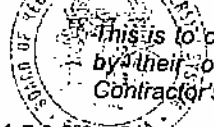
1.5.3.3.1 Workers' Compensation Insurance. The Contractor agrees to provide at a minimum Workers' Compensation coverage in accordance with the statutory limits as established by the General Assembly of the State of Georgia. A group insurer must submit a certificate of authority from the Insurance Commissioner approving the group insurance plan. A self-insurer must submit a certificate from the Georgia Board of Workers' Compensation stating the Contractor qualifies to pay its own workers' compensation claims. The Contractor shall require all Subcontractors performing work under this Contract to obtain an insurance certificate showing proof of Workers' Compensation Coverage and shall submit a certificate on the letterhead of the Contractor in the following language:

This is to certify that all subcontractors performing work on this Project are covered by their own workers' compensation insurance or are covered by the Contractor's workers' compensation insurance.

1.5.3.3.2 Employers' Liability Insurance. The Contractor shall also maintain Employer's Liability Insurance Coverage with limits of at least:

- (i) Bodily Injury by Accident \$1,000,000 each accident;
- (ii) Bodily Injury by Disease \$1,000,000 each employee; and
- (iii) Bodily Injury/Disease Aggregate \$1,000,000 each accident.

The Contractor shall require all Subcontractors performing work under this Contract to obtain an insurance certificate showing proof of Employers Liability Insurance Coverage and shall submit a certificate on the letterhead of the Contractor in the following language:



This is to certify that all subcontractors performing work on this Project are covered by their own Employers Liability Insurance Coverage or are covered by the Contractor's Employers Liability Insurance Coverage.

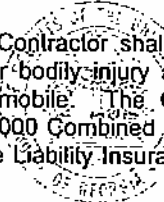
1.5.3.3.3 Commercial General Liability Insurance. The Contractor shall provide Commercial General Liability Insurance (2001 ISO Occurrence Form or equivalent) that shall include, but need not be limited to, coverage for bodily injury and property damage arising from premises and operations liability, products and completed operations liability, blasting and explosion, collapse of structures, underground damage, personal injury liability and contractual liability. The CGL policy must include separate aggregate limits per Project and shall provide at a minimum the following limits:

	Coverage	Limit
1.	Premises and Operations	\$ 1,000,000.00 per Occurrence
2.	Products and Completed Operations	\$ 1,000,000.00 per Occurrence
3.	Personal Injury	\$ 1,000,000.00 per Occurrence
4.	Contractual	\$ 1,000,000.00 per Occurrence
5.	General Aggregate	\$ 2,000,000.00 per Project



Additional Requirements for Commercial General Liability Insurance are shown below at Paragraph 1.5.3.3.6.

1.5.3.3.4 Commercial Business Automobile Liability Insurance. The Contractor shall provide Commercial Business Automobile Liability Insurance that shall include coverage for bodily injury and property damage arising from the operation of any owned, non-owned, or hired automobile. The Commercial Business Automobile Liability Insurance Policy shall provide not less than \$1,000,000 Combined Single Limits for each accident. Additional Requirements for Commercial Business Automobile Liability Insurance are shown below at Paragraph 1.5.3.3.6.



1.5.3.3.5 Commercial Umbrella Liability Insurance. The Contractor shall provide a Commercial Umbrella Liability Insurance to provide excess coverage above the Commercial General Liability, Commercial Business Automobile Liability and the Workers' Compensation and Employers' Liability to satisfy the minimum limits set forth herein. The umbrella coverage shall follow form with the Umbrella limits required as follows:

For Contract Amounts Less Than \$5,000,000.00:	For Contract Amounts Equal to or Greater than \$5,000,000:
\$ 2,000,000 per Occurrence	\$2,000,000 per Occurrence
\$ 4,000,000 Aggregate	\$10,000,000 Aggregate

Additional Requirements for Commercial Umbrella Liability Insurance are shown below at Paragraph 1.5.3.3.6.

1.5.3.3.6 Additional Requirements for Commercial Policies in Paragraphs 1.5.3.3.3 through 1.5.3.3.5

- (a) The policy shall name as additional Insureds the officers, members, and employees of the Owner and the Using Agency.
- (b) The policy must be on an "occurrence" basis.

1.5.3.3.7 Builders Risk Insurance. Contractor shall provide a Builder's Risk Policy to be made payable to the Owner and Contractor, as their interests may appear. The policy amount should be equal to 100% of the Contract Sum, written on a Builder's Risk "All Risk", or its equivalent. The policy shall be endorsed as follows:

The following may occur without diminishing, changing, altering or otherwise affecting the coverage and protection afforded the insured under this policy:

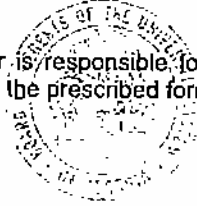
- (i) Furniture and equipment may be delivered to the insured premises and installed in place ready for use; and
- (ii) Partial or complete occupancy by Owner; and
- (iii) Performance of work in connection with construction operations insured by the Owner, by agents or lessees or other Contractors of the Owner or Using Agency

In the event that the Contract is for renovation, addition or modification of an existing structure and Builders Risk Insurance is not available, the Owner will accept an Installation Floater Insurance Policy with the above endorsements in lieu of the Builders' Risk Insurance Policy. Such floater must insure loss to materials and equipment prior to acceptance by Owner and must be on an ALL RISK BASIS with the policy written on a specific job site.

1.5.3.3.8 Disposition of Insurance Documents. One original certificate of insurance with all endorsements attached must be deposited with Owner for each insurance policy required.

1.5.3.4 Termination of Obligation to Insure. Unless otherwise expressly provided to the contrary, the obligation to insure as provided herein shall not terminate until the Design Professional shall have executed the Certificate of Material Completion.

1.5.3.5 Failure of Insurers. The Contractor is responsible for any delay resulting from the failure of his insurance carriers to furnish proof of proper coverage in the prescribed form.



PART 6 – HAZARDOUS CONDITIONS AND MATERIALS

1.6.1 Hazardous Materials.

1.6.1.1 Definition.

1.6.1.1.1 The term "Hazardous Materials shall mean any material or substance within the meaning and definition for "Hazardous Substance" and/or "Hazardous Waste" as those terms are employed and set forth in the Georgia Hazardous Site Response Act and the Comprehensive Environmental Response Compensation and Liability Act as amended, 42 USC § 6901 et seq., and regulations promulgated thereunder (collectively "CERCLA") and any corresponding state or local law or regulation, and shall also include: (a) any Pollutant or Contaminant as those terms are defined in CERCLA; (b) any Solid Waste or Hazardous Constituent as those terms are defined by, or are otherwise identified by, the Resource Conservation and Recovery Act as amended, 42 USC § 6901 et seq., and regulations promulgated thereunder (collectively "RCRA") and any corresponding state or local law or regulation; (c) crude oil, petroleum and fractions of distillates thereof and petroleum releases ; (d) any other material, substance or chemical defined, characterized or regulated as toxic or hazardous under any applicable law, regulation, ordinance, directive or ruling, including, but not limited to, Asbestos or polychlorinated biphenyl (PCB), and, (e) any infectious or medical waste or environmental contamination as defined by any applicable federal or state laws or regulations.

1.6.1.1.2 The term "Hazardous" Materials does not include those materials that are expressly and specifically required to be installed under the Contract Documents.

1.6.1.1.3 The term "Hazardous" Materials does not include products or materials that are commonly used in construction or industrial practice so long as they are used in accordance with the manufacturer's instructions or Material Safety Data Sheets issued for the product or materials. (See Article 1.6.3 below.)

1.6.1.2 Obligation to Notify Owner of Existing Hazardous Materials. The Contractor shall immediately notify the Owner and the Design Professional, both orally and in writing, of the presence and location of any physical evidence of, or information regarding the presence of Hazardous Materials at the Site of which it becomes aware. If the Contractor encounters Hazardous Materials on the Site the Contractor shall (i) immediately stop performance of Work or that portion of the Work affected by or affecting such Hazardous Materials; (ii) secure the contaminated area against intrusion; (iii) not disturb or remove the Hazardous Materials; (iv) not proceed, or allow any subcontractor or supplier to proceed, with any Work or other activities in the area affected by such Hazardous Materials until such materials have been properly remediated and until directed in writing to do so by the Owner; and, (v) take any other steps necessary to protect life and health and the surrounding environment. The Contractor shall be entitled to adjustment of the Contract Time and the Contract Sum pursuant to Section 5, Part 2 of these General Conditions in order to compensate for the impact of any required demolition, re-work, shutdown, delay, protection of work, disruption, and start-up resulting from the encountering of such Hazardous Materials on the Site for which the Contractor is not responsible.

1.6.1.3 Prohibition Against Selecting and Installing Products Containing Hazardous Materials. The Contractor shall not select, install or otherwise incorporate any products or materials containing Hazardous Materials within the boundaries of the Site. Should the Contractor or any Subcontractors have knowledge that, or believe that, an item, component, material, substance, or accessory within a product or assembly selected by the Contractor or any Subcontractor may contain Hazardous Materials it is the Contractor's responsibility to secure a written certification from the manufacturer of any suspected material which identifies the specific Hazardous Material(s) contained, together with the Material Safety Data Sheets (MSDS) for such materials which shall be submitted to the Owner and Design Professional.

1.6.1.4 Fill, Backfill and Landscaping. No soil found on Site, or transported to the Site from remote locations, which contains debris or waste or Hazardous Materials shall be used for fill, backfill or landscaping topsoil.

1.6.2 Responsibility and Warranty of Subcontractors, Trade Contractors and Suppliers. Products that are specified by reference standards or in descriptive manner without a manufacturer's name, model number or trade name, to be selected by the Contractor, shall not contain Hazardous Materials in any form, except as and to the extent permitted in 1.6.1, above, and 1.6.3, below. The Contractor shall require that each of its Subcontractors and Suppliers warrant to the Owner and Design Professional that all materials, products and assemblies, other than those which specifically and expressly required by the Contract Documents, incorporated, or submitted for incorporation into this Project, are free of Hazardous Materials. This warranty shall also include all materials, components, and accessories not specifically enumerated or detailed in the Contract Documents but which are required by performance specifications or recommended by manufacturers for complete installation of materials, products and assemblies.

1.6.3 Hazardous Materials and Substances Used On the Job Site. Products containing Hazardous Materials may be employed in the performance of work by the Contractor and its Subcontractors, as allowed by subparagraph 1.6.1.1.2 and 1.6.1.1.3 above, as a means and methods application or as part of its performance of the Work, such as chemicals used on the Site, but only provided that: (i) such products are used in accordance with the manufacturer's instructions and Material Safety Data Sheets; (ii) such products are rendered harmless upon completion of the affected Work; (iii) reasonable precautions can be and are taken to prevent foreseeable bodily injury or death to persons involved in the Work or in its proximity, including the ultimate users of the completed Work; (iv) the Contractor shall make available to the Owner and the Design Professional copies of Material Safety Data Sheets (MSDS) for any such products used on the Site, and (v), the Contractor shall immediately notify Owner, Design Professional and appropriate regulatory agencies if there is a spill or release or misuse of any such product used on the Site that exceeds State or Federal reportable limits.

1.6.4 Hazardous Conditions. The Contractor and Owner acknowledge that previously unknown hazardous conditions may be uncovered at any job site, and in particular where existing structures are being demolished and/or remodeled to accommodate new construction or to reutilize existing facilities. Should a hazardous condition not involving Hazardous Materials as set forth above be encountered on the Site, and should reasonable safety precautions be deemed by the Contractor in good faith to be inadequate to prevent foreseeable personal injury to persons encountering the hazardous condition, the Contractor shall, upon recognizing the hazardous condition, stop work in the affected area and immediately report the hazardous condition to the Design Professional and Owner in writing. The Owner shall undertake, or shall contract (by Change Order) with the Contractor or contract with a Separate Contractor, to resolve the condition. So long as the hazardous condition did not result from activities or substances brought on the Site by the Contractor, the Contractor is entitled to adjustments in the Contract Time and the Contract Sum as set forth in Paragraph 1.6.1.2 above.



PART 7 – MISCELLANEOUS PROVISIONS

1.7.1 Legal Compliance.

1.7.1.1 General. This Contract shall be governed by the law of Georgia. The Contractor shall comply with all laws, rules, regulations, ordinances, and orders of any government agency having jurisdiction in the performance of the Work and shall ensure the compliance of its Subcontractors.

1.7.1.2 Specific Laws. Without limiting the generality of the foregoing Paragraph, the following laws are specifically referenced:

- 1.7.1.2.1 The Drug-Free Workplace Act, O.C.G.A. § 50-24-1, *et seq.*
- 1.7.1.2.2 Preference for Georgia Supplies, materials, equipment, and agricultural products, O.C.G.A. §§50-5-60 through 61.
- 1.7.1.2.3 Preference for Georgia forest products, O.C.G.A. § 50-5-63.
- 1.7.1.2.4 Preference for local sellers of Georgia products, O.C.G.A. § 50-5-62.
- 1.7.1.2.5 Standards and Requirements for Construction, Alterations, etc., O.C.G.A. § 8-2-1 *et seq.*
- 1.7.1.2.6 Control of Soil Erosion and Sedimentation, O.C.G.A. § 12-7.1, *et seq.*
- 1.7.1.2.7 Regulation of Fire and other Hazards, O.C.G.A. § 25-2-1 *et seq.*
- 1.7.1.2.8 Regulation of Blasting Operations, O.C.G.A. § 25-2-1 *et seq.* and 25-9-1 *et seq.*
- 1.7.1.2.9 Providing safe workplace, O.C.G.A. §§ 34-2-10 and 34-7-20
- 1.7.1.2.10 Georgia Facility Protection Act, O.C.G.A. § 25-9-1 *et seq.* (See Article E-12(f))
- 1.7.1.2.11 High Voltage Safety Act, O.C.G.A. § 46-3-30 *et seq.*
- 1.7.1.2.12 Access and Use by Physically Handicapped Persons, O.C.G.A. § 30-3-1 *et seq.*
- 1.7.1.2.13 Small and Minority Business Enterprises, O.C.G.A. §§ 50-5-120 *et seq.* and 50-5-130 *et seq.*
- 1.7.1.2.14 Trading with the State or State Officials, O.C.G.A. §§ 45-10-20 to 45-10-71
- 1.7.1.2.15 Title VII of the Civil Rights Act, 42 U.S.C. § 2000a through 2000h-6
- 1.7.1.2.16 Age Discrimination in Employment Act, 29 U.S.C. § 621 *et seq.*; 42 U.S.C. § 6101 *et seq.*
- 1.7.1.2.17 Americans with Disabilities Act, 42 U.S.C. § 12101 *et seq.*
- 1.7.1.2.18 Federal Occupational Safety and Health Act, 29 U. S. C. § 651 *et seq.*
- 1.7.1.2.19 Federal Emergency Planning and Community Right-to-Know Act, 42 U. S. C. § 11001 *et seq.*
- 1.7.1.2.20 Georgia Open Records Act, O.C.G.A. §50-18-70 *et seq.*
- 1.7.1.2.21 Georgia Blasting Standards Act, O.C.G.A. § 25-8-1 *et seq.* and Blasting, Excavating Nearby Underground Gas Pipes and Utilities, 25-9-1 *et seq.*
- 1.7.1.2.22 Scaffolding and Staging Statute, O.C.G.A. §34-1-1 *et seq.*
- 1.7.1.2.23 Department of Labor Rules and Regulations, O.C.G.A. § 34-2-6 *et seq.*
- 1.7.1.2.24 Hazardous Chemical Protection and Right to Know Act, O.C.G.A. § 45-22-2 *et seq.*,

1.7.1.2.25 Retainage on Public Works Contracts, O.C.G.A. §13-10-80 *et seq.*

1.7.1.2.26 Compliance with “federal work authorization programs” and federal Immigration Reform and Control Act of 1986 by Georgia Public Employers, contractors and subcontractors, O.C.G.A. §13-10-90 *et seq.*

1.7.1.3 Building Codes. The following Building Codes, in the latest editions approved by the Georgia Department of Community Affairs, shall be used. (See O.C.G.A. §8-2-20.) The Design Professional will designate any additional codes or special modifications in the Supplementary General Conditions. As of the year 2000, these codes are published jointly by the Southern Building Code Congress International, the International Code Council, the Building Officials and Code Administrators, International, and the International Conference of Building Officials, and are commonly referred to as the International Building Codes.

1.7.1.3.1 Georgia State Minimum Standard Building Code (International Building Code, 2000 Edition) with Georgia Amendments.

1.7.1.3.2 Georgia State Minimum Standard Mechanical Code (International Mechanical Code, 2000 Edition), with Georgia Amendments.

1.7.1.3.3 Georgia State Minimum Standard Gas Code (International Fuel Gas Code, 2000 Edition), with Georgia Amendments.

1.7.1.3.4 Georgia State Minimum Standard Plumbing Code (International Plumbing Code, 2000 Edition), with Georgia Amendments.

1.7.1.3.5 Georgia State Minimum Standard Electric Code (National Electrical Code, 2002 Edition), with Georgia Amendments.

1.7.1.3.6 Georgia State Minimum Standard Energy Code (International Energy Conservation Code, 2000 Edition), with Georgia Amendments.

1.7.1.3.7 Georgia State Minimum Standard Fire Prevention Code (International Fire Code, 2003 Edition), with Georgia Amendments.

1.7.1.4 Fire, Life Safety, and Accessibility Codes. The following codes, in the versions approved by the Georgia State Fire Marshal/Fire Safety Commissioner and Department of Human Resources, shall be used. The Design Professional will designate any additional codes or special modifications in the Supplementary General Conditions.

1.7.1.4.1 Georgia State Life Safety Code (NFPA 101)

1.7.1.4.2 State Accessibility Codes (See O.C.G.A. §30-3-3)

1.7.1.4.3 Rules and Regulations of the Georgia Safety Fire Commissioner (See O.C.G.A. §§25-2-4, 12.)

1.7.1.4.4 Swimming Pool Permits and Regulations (See O.C.G.A. §31-45-3, Rules and Regulations Chapter 290-5-57)

1.7.1.5 Latest Edition. The latest edition approved by the implementing agency of the regulations, rules, and codes listed in Paragraphs 1.7.1.3 and 1.7.1.4 above, with all amendments as of the date of the opening of bids, shall govern the installation of all Work and is adopted and incorporated into the Contract Documents and made a part thereof by reference, Provided, however that the drawings and specifications shall be adhered to in all cases where they call for quality of materials, quality of workmanship, or quality of construction which is equal to or in excess of the quality required by the above stated codes and Provided also: That there may be no variances from the drawings and specifications except to the extent that the said variances shall be necessary in order to comply with the above stated codes. It shall be the responsibility of the Contractor to familiarize himself with the requirements of the above stated codes. If there are any express requirements in the drawings or specifications that are at variance to the above stated codes, all changes in the Work necessary to eliminate or add to the said requirements and make the Work conform to the above stated codes shall be adjusted as provided in the Contract for changes in the Work.

1.7.1.6 Compliance with Executive Orders Concerning Ethics. The Contractor warrants that he and his firm have complied in all respects with the Governor's Executive Orders concerning ethics matters, including, but not limited to, Executive Order dated January 13, 2003 (establishing Code of Ethics for Executive Branch Officers and Employees, including provisions governing former officers and employees); Executive Order dated October 1, 2003 (governing vendors to state agencies and disclosure and registration of lobbyists); and O.C.G.A. Sections 21-5-70(5), 21-5-71 and 21-5-73, all as amended effective January 9, 2006 (requiring registration and disclosure filings by state agency vendor lobbyists). In this regard, the Contractor certifies that any lobbyist employed or retained by the Contractor or his firm has both registered and made the required disclosures required by the Executive Orders, as amended.

1.7.1.7 Compliance with Federal and State Work Authorization and Immigration Laws. The Contractor and all subcontractors, suppliers and consultants must comply with all federal and state work authorization and immigration laws, and must certify compliance using the form set forth in Section 7 ("Certificate of Compliance – Federal and State Work Authorization"). The required certificates must be filed with the Owner and copied maintained by the Contractor as of the beginning date of this contract and each subcontract, supplier contract, or consultant contract, and recertified as of July 15 of each year, and upon final payment to the subcontractor or consultant. State officials, including officials of the Georgia Department of Labor, officials of the Owner, retain the right to inspect and audit the Project Site and employment records of the Contractor, subcontractors and consultants without notice during normal working hours until Final Completion, and as otherwise specified by law and by Rules and Regulations of the Georgia Department of Labor.

1.7.2 Surveys, Permits, and Regulations. The Owner shall furnish all surveys unless otherwise specified. Permits and licenses of a temporary nature necessary for the prosecution of the Work shall be obtained and paid for by the Contractor. Permits, licenses, and easements for permanent structures or permanent changes in existing facilities shall be obtained and paid for by the Owner unless otherwise specified. The Contractor and its Subcontractors must pay any municipal or county occupational licenses, taxes, or fees, if any. The Contractor shall give all notices and comply with all laws, ordinances, rules, and regulations bearing on the conduct of the Work. If the Contractor observes that the drawings or specifications are at variance with any such laws, ordinances, rules or regulations, he shall promptly notify the Owner in writing, and any necessary changes shall be adjusted as provided in the Contract for changes in the Work. If the Contractor performs any Work knowing it to be contrary to such laws, ordinances, rules or regulations without such notice to the Owner, he shall bear all costs arising therefrom. Nothing in this paragraph shall be construed to impose design responsibility on the Contractor except as noted in the Contract Documents.

1.7.3 Open Records Act. Owner and Design Professional and Contractor acknowledge and agree that all records of the project and the Work, including records of Subcontractors, are subject to the Georgia Open Records Act, O.C.G.A. §50-18-70 et seq., with particular attention being called to O.C.G.A. §50-18-70(a) regarding the records of private persons, firms, corporations, or other private entity engaged in performance of services or functions on behalf of a state agency, public agency or public office.

1.7.4 Use of Site. The Contractor has a revocable license to come on, use, and perform Work upon the Premises, shall confine thereto his plant, his apparatus, the staging and storage of materials, the operations of his forces and the Work to limits indicated by law, ordinances, permits, or the Contract Documents, and shall not unreasonably encumber the Premises with his materials. The Contractor shall not load or permit any part of the Work to be loaded with weight that will endanger its safety. The Contractor shall enforce Contract requirements regarding signs, advertisements, fires, and smoking and shall remove from the Premises and properly dispose all trash and debris.

1.7.5 Office for Contract Compliance Specialist (CCS). The Contractor shall provide at his expense a temporary office, services, utilities, equipment, and supplies at the Site for the use of the CCS. The office shall be a minimum of 100 square feet in size; weather-tight; and shall be provided with heat, ventilation, cooling, electric lights, adequate windows, and securable access. The following services shall be provided: at least four dual-plug 110 v. electrical outlets, two private telephone connections and local telephone service. The following equipment for the CCS's exclusive use shall be provided: a desk with drawers, two chairs, a four drawer metal file cabinet, a plan table and rack, a telephone with messaging capability, and connection, cables/electrical surge protection for the electronic equipment and for the CCS's computer. The following items, which may be used in common with the Contractor's facilities, shall be provided: wet (flush) toilet, potable water and soap for hand washing, potable water suitable for drinking, access to fax machine and copier, and use of a room with table and chairs to accommodate meetings of a minimum of eight (8) people. The use of a temporary portable wet toilet with a holding tank is acceptable only when a sanitary sewer is not available on the Site. Toilet tissue and paper hand towels shall be provided at all times. At the completion of the project, all of the equipment provided will be returned to the Contractor. The Contractor is not responsible for providing the following items for the CCS: computer equipment, internet access, long distance, stationery supplies, and personal safety equipment.

1.7.6 Utilities. Pending the extension and connection of permanent water, permanent gas, permanent sewer taps, and permanent electric power, the Contractor shall obtain temporary water, temporary gas, temporary electric power, and provide

sewage disposal at his own expense. In the absence of provisions to the contrary, the Contractor shall pay for all utilities services until Material Completion has been achieved.

1.7.7 Royalties and Patents. The Contractor shall pay all royalties and license fees. He shall defend all suits or claims for infringement of any patent rights and shall save the Owner harmless from loss on account thereof. The Owner shall defend and be responsible for all such loss when a particular process or the product of a particular manufacturer or manufacturers is specified.

1.7.8 Separate Contracts. The Owner reserves the right at any time and from time to time upon notice to Contractor to perform, or cause to be performed by other Contractors, other work at the Site in connection with the development of the Project that is not contemplated hereby or that is contemplated hereby if the Contractor and the Owner shall be unable to agree upon a Change Order incorporating such work as Work of the Contractor under this Contract. In either case, the Owner shall assure that such personnel or Contractors do not cause any conflict with the Work of Contractor. Contractor shall afford the Owner and other Contractors reasonable opportunity for the introduction, protection, and storage of material and equipment at the Site and the execution of work, and shall properly connect, if required by Contract Documents, and coordinate its work with theirs. If any work by the Owner or its other Contractors increases Contractor's costs or extends the time of performance, Contractor shall be entitled upon timely claim to a Change Order for payment by Owner of any reasonable costs actually incurred by Contractor as a result thereof and to an extension of time for performance for such reasonable time as the Design Professional shall determine. Contractor has no responsibility hereunder to certify the suitability or correctness of any work performed by Owner's own personnel or other Contractors under direct contract with the Owner. This Article also applies to installation of loose equipment and fixtures by the Owner, Using Agency, or a Separate Contractor.

1.7.9 Women, and Disadvantaged Business Participation.

1.7.9.1 Good Faith Efforts. Contractor shall, to the extent consistent with quality, price, risk and other lawful and relevant considerations, use its good faith efforts to achieve participation by minority, women, and disadvantaged business enterprise participation in Work and services contracted to Contractor under this Contract.

1.7.9.2 Policy of the State of Georgia. It is the policy of the State of Georgia that minority business enterprises shall have the maximum opportunity to participate in the State purchasing process. Therefore, the State of Georgia encourages all minority business enterprises to compete for, win, and receive Contracts for goods, services, and construction. In addition, the State encourages all companies to sub-contract portions of any State Contract to minority business enterprises. It is the wish of the Owner that minority businesses be given the opportunity to propose on the various parts of the Work. This desire on the part of the Owner is not intended to restrict or limit competitive selection or to increase the cost of the Work. The Owner supports a healthy free market system that seeks to include responsible businesses and provides ample opportunity for business growth and development.

1.7.9.3 Minority Vendor Designee. The minority vendor designee of the Owner shall be specified in the Supplementary General Conditions or the Instructions to Bidders. For more information, please contact the Board of Regents' Office of Business Development by e-mail at BusinessDevelopment@usg.edu.

1.7.10 Assignment. The Contractor shall not assign the Contract or sublet it as a whole nor shall the Contractor assign any moneys due or to become due to him hereunder. Contractors may subcontract portions of the Work, normally performed by Subcontractors.

1.7.11 Interpretation of Contract Documents. The Contract Documents shall be construed neither against nor in favor of either party, but shall be construed in a neutral manner.

1.7.12 Counterparts. This Contract may be executed in multiple counterparts. All counterparts shall constitute one and the same instrument. One (1) counterpart of this Contract shall be delivered to the Owner and one (1) counterpart to the Contractor.

1.7.13 Forms and Specimens. The forms and specimens in Section 7 are incorporated by reference herein and shall be executed in substantial conformance as required or convenient in describing obligations under the Contract Documents.

1.7.14 Entire Agreement. The Contract Documents referenced herein constitute the entire Contract between the Owner and the Contractor with respect to the Project and supersedes all prior negotiations, representations, and agreements. Except as set forth herein, there are no other promises, understandings, agreements, representations or warranties, oral or written, expressed or implied between the parties. This Contract may not be changed, modified, or terminated, in whole or in part, nor any provision waived except by Change Order.

SECTION 2 – PRE-COMMENCEMENT PHASE

PART 1 – PRE-COMMENCEMENT PHASE SERVICES

2.1.1 Pre-commencement Coordination. As early as practicable and reasonably in advance of the commencement of Work on the Project, the Contractor shall schedule and conduct an initial construction coordination meeting for the purpose of determining and developing the appropriate and necessary processes and procedures for proper planning and coordination for the installation of all the Work. The meeting shall include all of the Subcontractors, Trade Contractors, and Suppliers materially involved in such installation of the Work. The Contractor shall assure that each necessary Subcontractor involved in performance of the Work shall be present and represented by a knowledgeable person with authority to reach agreement on the coordination procedures and processes involving its portion of the Work. The Owner shall be represented at this initial meeting by the Owner's Representative, and shall require that authorized and knowledgeable representatives of each of the separate disciplines in the design team, comprising the Design Professional and all Consultants contributing to the design preparation, shall also be present at the initial meeting. If necessary, additional meetings shall be scheduled by the Contractor with all of the affected parties to continue review and resolution of any real or apparent conflicts or interferences.

2.1.2 Construction Preparation Period.

2.1.2.1 Requirement for Project Planning. No physical work will begin on the construction site until the receipt of a Proceed Order issued by the Owner. The Contract assumes that a Proceed Order will be issued in not more than sixty days from the Effective Date of the Contract. Failure of the Contractor to provide the necessary documentation for the issuance of a Proceed Order shall not entitle the Contractor to any extension of time. If a Proceed Order is not issued within sixty days from the award of the Contract and non-issuance is due to nonperformance by the Contractor, the Contractor may be in default.

2.1.2.2 Timing of Submission of Documents. No Proceed Order shall be issued until the Owner has received, in good and proper order, the following documents. The documents shall be submitted in accordance with the following schedule:

2.1.2.2.1 Within ten days of the Notice of Apparent Successful Bid:

- (a) Contract executed by Contractor
- (b) Payment and Performance Bonds in accordance with Article 1.5.4

2.1.2.2.2 Within fourteen days of the Effective Date of the Contract:

- (a) Proof of Insurance as required in Paragraph 1.5.3.1
- (b) List of intended Subcontractors

2.1.2.2.3 Prior to the issuance of the Proceed Order, but in any event, within sixty days of the Effective Date of the Contract:

- (a) Submittal and Shop Drawing Schedule as required in Article 2.2.3
- (b) Construction Progress Schedule as required in Article 2.1.5
- (c) Documents Review Report as required in paragraph 2.1.2.3
- (d) Construction Management Plan as required in Article 2.1.3
- (e) Documentation necessary for receiving land disturbance permits, See Article 2.2.5
- (f) Contractor's Quality Control Program as required in Article 2.1.4
- (g) Written Safety Program as required in Article 1.4.7
- (h) Contractor's Schedule of Rental Rates and Wage Rates

2.1.2.3 Document Review and Verification. Within one business day of receipt of the Effective Date of the Contract Contractor shall commence a review of the plans and Specifications, to identify conflicts, omissions, or constructability issues in the documents. Contractor shall prepare a report containing a list of issues and suggested modifications identified. He shall provide a copy of the report to the Design Professional and the Owner prior to the end of the Construction Preparation Period. If a fire protection sprinkler system is required, the Contractor shall submit to the Design Professional the certificate of competency of the fire protection sprinkler system Trade Contractor as required by State of Georgia Fire Protection and Safety Code. The certificate of competency shall be provided to the Design Professional prior to any work being performed on the fire protection sprinkler system. Nothing in this paragraph shall be construed to impose design responsibility on the Contractor except as noted in the Contract Documents.

2.1.3 Construction Management Plan. Contractor shall prepare and furnish to the Owner a thorough and complete plan for the management of the Project from issuance of the Proceed Order through the issuance of the Design Professional's Certificate of Material Completion. Such plan shall include, without limitation, an estimate of the manpower requirements for each trade and the anticipated availability of such manpower, a schedule prepared using the critical path method that will amplify and support the schedule required in Article 2.1.5 below, and the Submittal Schedule as required in Article 2.2.3. The Contractor shall include in his plan the names and resumés of the Project Superintendent, Project Manager and the person in charge of Safety.

2.1.4 Quality Control Program.

2.1.4.1 Responsibility for Quality of Materials and Installation. Contractor acknowledges that he has full, total, and complete responsibility for providing materials, labor, and all other items necessary for providing the level of quality specified in the Contract Documents. He agrees that this responsibility is indivisible, non-delegable, non-transferable, and not diminished by any inspections provided by the Design Professional or his consulting engineers, nor by any inspections provided by the Owner. In recognition of this, Contractor will prepare for submission and review by the Design Professional, a written program describing the efforts that will be taken to insure the proper quality level is achieved. The program shall be submitted prior to the issuance of a Proceed Order.

2.1.4.2 Written Program. Contractor's written Quality Control Program shall describe in detail the steps the Contractor will take to ensure quality and will include, without limitation, those personnel, in addition to the Superintendent, who will provide review and verification of the proper installation of the Work. Each Subcontractor having responsibility for more than \$100,000 of the contract cost shall be addressed in the plan. The written program shall include affidavits from each of the involved Subcontractors acknowledging their responsibilities under the Contract in general and the Quality Control Program specifically.

2.1.5 Construction Progress Schedule; Overall Project Schedule. The Contractor shall submit for review by the Design Professional and approval by the Owner a Construction Progress Schedule based upon the Design Professional's Preliminary Design and Construction Schedule and prepared using a CPM (Critical Path Method) process within sixty days after the Effective Date of the Contract, utilizing a full-featured software package in a form satisfactory to the Design Professional and Owner, showing the dates for commencement and completion of the Work required by the Contract Documents, including coordination of mechanical, plumbing, and electrical disciplines, as well as coordination of the various subdivisions of the Work within the Contract. Milestones must be clearly indicated and sequentially organized to identify the critical path of the Project. The Construction Schedule will be developed to represent the CSI specification divisions. It shall have the minimum number of activities required to adequately represent to the Owner the complete scope of Work and define the Project's (and each Phase's if phased) critical path and associated activities. The format of the Construction Progress Schedule will have dependencies indicated on a monthly grid identifying milestone dates such as construction start, phase construction, structural top out, dry-in, rough-in completion, metal stud and drywall completion, equipment installation, systems operational, inspections for Material Completion and Occupancy Date, and Final Completion Date. The Contractor shall submit, along with the Construction Progress Schedule, the Submittal Schedule for approval by the Design Professional, correlating the associated approval dates for the documents with the Construction Progress Schedule. Upon recommendation by the Design Professional and approval by the Owner, the Construction Progress Schedule shall become the Overall Project Schedule, which shall be utilized by the Design Professional, Owner and Contractor. The Contractor must provide the Design Professional and the Owner with monthly updates of the Overall Project Schedule indicating completed activities and any changes in sequencing or activity durations, including approved change orders. See also Article 3.3.5.

2.1.6 Progress Reports and Information. When required, the Contractor shall submit to the Owner such schedule of quantities and costs, payrolls, bills, vouchers, correct copies of all subcontracts, statements, reports, correct copies of all agreements, correspondence, and written transactions with the surety on the performance bond that have any relevance to the Work, estimates, records, and other data as the Owner may request that concerns the Work performed or to be performed under this Contract. When requested by the Owner, the Contractor shall give the Owner access to its records relating to the foregoing. (See also Article 1.2.3, Audits.) The above reports shall include, but are not limited to, (a) written notice of dates by which specified Work will have been completed, (b) written notice of dates by which Non-Compliant Work will be made good, (c) written notice that Non-Compliant Work has been made good, (d) written notice as to the date or dates by which Work that has not been performed with equal steps and at the same rate required by the Overall Project Schedule shall have been brought into conformity with the Overall Project Schedule, (e) date by which any undisputed claim of a Subcontractor supplier, or laborer shall have been paid, (f) written advice regarding the nature and amount of any disputed claim of a Subcontractor, supplier, or laborer, and (g) information regarding Work performed under Change Orders.

2.1.7 Rental Rates and Wage Rates for Change Orders. As soon as is practical, but prior to the completion of the Construction Preparation Period and in any event prior to the commencement of any Work on the Site, the Contractor shall submit in accordance with the style and format of a specimen to be furnished by the Owner for consideration of the Owner the following: (1) a proposal for rental rates on heavy construction equipment that shall apply in the event Change Order Work is performed, and (2) a proposal for wage rates for the types of project labor that shall apply in the event of the execution of any Change Order Work. Under penalty of false swearing, a principal of the contracting firm shall certify that the proposal for rental rates and proposal for wage rates do not exceed current costs for like services. The Owner will in no event consider a rental rate in excess of eighty percent of the rate set forth in the latest edition of the "Compilation of Nationally Averaged Rental Rates for Construction Equipment" of the Associated Equipment Distributors unless the rates proposed in excess of eighty percent are supported by proof satisfactory to the Owner that the excess rates are reasonable. If the equipment is owned by the Contractor the costs shall be charged at a maximum of eighty percent of market monthly rental rates for the amount of time used. If applicable, transportation costs may be included. The decision of the Owner shall be final, binding, and conclusive on all parties. Rental rates shall be payable only for the actual time the equipment is required on the Site.

2.1.8 Unit Prices.

2.1.8.1 During Construction Preparation Period. Prior to the completion of the Construction Preparation Period, the Contractor shall establish with the Owner Unit Prices not already bid. Examples include additional installation of stormwater management BMPs, any other anticipated Change Order Work that can utilize Unit Prices, or for any items of Work considered necessary by the Design Professional and not established in the Contract Documents.

2.1.8.2 During Construction. Upon request of the Owner the Contractor shall submit written proposals for unit prices to be applied in the event Change Order Work is authorized by the Owner to be performed under Case (b).

2.1.8.3 Calculation of Unit Prices. Unit Prices include all sums for payment, repayment, reimbursement, remittance, remuneration, compensation, profit, cost, overhead, expense, loss, expenditure, allowance, charge, demand, hire, wages, salary, tax, cash, assessment, price, money, bill, statement, dues, recovery, restitution, benefit, recoupment, exaction, or injury. Unit prices to cover the addition or reinstallation of stormwater management BMPs shall be calculated by type and linear foot. Unit Prices shall not include any Time Dependent Overhead Costs, as such costs will be added as appropriate pursuant to Section 3, Part 3. The Contractor shall certify that the Unit Prices submitted do not exceed current costs in the industry or trade for like services or materials.

2.1.9 Building Commissioning Services. The Owner may provide as a part of its testing services the Building Commissioning services involving the project's HVAC and exhaust systems, temperature control systems, fire detection and alarm systems, emergency power and lighting system, fire suppression system, security locks and security locking control systems, food service equipment (if applicable), and laundry equipment (if applicable). In the event the Using Agency's Program specifies additional commissioning services, the Owner shall procure such services as well. The Owner, through its Executive Administrator, may engage an independent Commissioning Authority. It is the intent of this Article that the Commissioning Authority enforce the requirements mentioned herein and certify that the systems and equipment listed all function properly prior to the initiation of each final inspection.

2.1.9.1 Initial Building Commissioning Plan. The Owner may develop with its Commissioning Authority, the Contractor and the Design Professional, an initial Building Commissioning plan to consist of the following:

2.1.9.1.1 The Building Commissioning Plan shall include a summary of understanding of the design intent for each of the relevant building systems and equipment. Each design intent summary shall establish critical performance criteria that indicates whether a system is properly functioning.

2.1.9.1.2 The Building Commissioning Plan shall include a commissioning schedule listing the duration of each commissioning activity such as system and equipment manual submittal and approval, equipment start-up, and system and equipment training, and combining all such activities in a manner reflecting the inherent subsidiary relationships between activities. This schedule shall be used as a basis for accomplishing the commissioning portion of the Overall Progress Schedule.

2.1.9.2 Define Duties. The Contractor, in coordination with the Commissioning Authority and the Design Professional, shall during preparation of the Contract Documents clearly define all duties and activities required of the various Trade Contractors relating to Building Commissioning, any necessary order in which these activities and duties must take place, and define all critical performance criteria to be achieved.

2.1.9.3 Inspect, Review, and Monitor. The Commissioning Authority shall inspect, review and monitor all Building Commissioning related construction activities for timeliness, completeness and conformance with the criteria established by the contract documents, and report same to the Contractor, Owner and the Design Professional. The Contractor and Commissioning Authority shall coordinate and supervise the training activities of each system.



PART 2 – CONTRACT DOCUMENTS AND SITE PLAN

2.2.1 Contract Documents.

2.2.1.1 Familiarity with Contract Documents. Contractor represents that it has reviewed or will review and become familiar with the Contract Documents, not later than the commencement of the construction phase.

2.2.1.2 Identification of Construction Documents. The Design Professional shall identify the Construction Documents, which shall include, but are not limited to, the Specifications, the Drawings, and all Addenda. The Construction Documents are included within the Contract Documents.

2.2.1.3 Correlation and Intent. It is the intention of the Owner, Design Professional, and Contractor that the Construction Documents include all items necessary for proper execution and full and final completion of the Work. The Contract and Construction Documents (the Contract Documents) are complementary, and what is required by one is as binding as if required by all. Performance by the Contractor is required to the extent consistent with and reasonably inferable from the Contract Documents as being necessary to produce the design intent as expressed in the Contract Documents. The intention of the Owner and the Design Professional is that the Contract and Construction Documents include all labor and materials, equipment, and transportation necessary for the proper execution of the work. It is not intended, however, that materials or work not covered by or properly inferable from any heading, branch, class, or trade of the specifications shall be supplied unless noted on the drawings.

2.2.1.4 Arrangement of Specifications. The Specifications are separated into numbered and titled divisions for convenience of reference. Neither the Owner nor the Design Professional shall assume any responsibility for defining the limits of any subcontracts on account of the arrangement of the Specifications. Notwithstanding the appearance of such language in the various divisions of the Specifications as, "The Plumbing Contractor," "The Electrical Contractor," "The Roofing Contractor," etc., the Contractor is responsible to the Owner for the entire Contract and the execution of all of the Work referred to in the Contract Documents. No partial sets of Bidding Documents shall be issued by the Design Professional. Any partial documents issued by the Contractor shall be the responsibility of the Contractor.

2.2.1.5 Conflicts. The following general principles shall govern the settlement of disputes that may arise over conflicts in the Contract Documents: (a) as between figures given on drawings and the scaled measurements, the figures shall govern; (b) as between large-scale drawings and small-scale drawings, the larger scale shall govern; (c) as between the Contract and the Specifications, the requirements of the Contract, as executed, shall govern. Conflicts noted shall be reported to the Design Professional. The principles set forth herein shall not alter the provisions of Paragraph 1.1.7.1. Schedules, lists, indexes, tables, inventories, written instructions, written descriptions, summaries, statements, classifications, Specifications, written selections, or written designations, although appearing on the drawings, are deemed to be and are Specifications.

2.2.1.6 Requests for Information (RFI). In the event the Contract Documents are not complete, definite, and clear, the Contractor shall request the Design Professional in writing for additional instructions and shall furnish the Owner a copy of the RFI. With reasonable promptness but not more than five days thereafter, the Design Professional shall furnish complete, definite, and clear instructions in writing, or by means of drawings, or both. In the event such additional instructions are given orally for expediency, they shall be confirmed in writing or by drawings or both within five days following the oral instructions. Any such additional instructions shall be consistent with the Contract Documents and reasonably inferable therefrom. The Work shall be executed in conformity with the aforesaid instructions. The Design Professional shall furnish the Owner a copy of all additional instructions issued to the Contractor. If, because of events beyond its reasonable control, the Design Professional is not able to meet the specified time period, then it is entitled to ask for additional time from the Owner.

2.2.1.7 Effect of Addenda, Bulletins, and Change Orders. No special implication, interpretation, construction, connotation, denotation, import, or meaning shall be assigned to any provision of the Contract Documents because of changes created by the issuance of any (1) Addendum, (2) Bulletin, or (3) Change Order other than the precise meaning that the Contract Documents would have had if the provision thus created had read originally as it reads subsequent to the (1) Addendum, (2) Bulletin, or (3) Change Order by which it was created.

2.2.1.8 Intellectual Property Rights in Construction Documents, Drawings, and Models. The drawings, Specifications and other documents prepared by the Design Professional pursuant to this Contract (including, without limitation, the Construction Documents), are the property of the Owner, whether or not the Project for which they are made commences or completes construction. Neither the Contractor nor any Subcontractor or material or equipment supplier shall own or claim a copyright in such drawings, Specifications, and other similar or related documents; Owner shall retain all common law, statutory, and other intellectual property rights with respect thereto. The Contractor must deliver remaining copies of such documents to the Owner upon request or upon completion of the Work, except that the Contractor may keep one copy of such documents for its files. The Contractor shall only use such drawings, Specifications and other documents for this Project. Neither the Contractor nor any Subcontractor or material or equipment supplier may use such drawings, Specifications, and other documents on other projects without the specific written consent of the Owner. All models are the property of the Owner.

2.2.2 Documents at the Project Site.

2.2.2.1 Drawings and Specifications at the Project Site. The Contractor shall keep at the Site at least one copy of the Contract Documents and Change Orders, all in good order and available to the Design Professional and to his representatives.

2.2.2.2 Recording Changes. The Contractor shall record all changes and shall annotate a copy of the drawings to reflect the as-built condition as required in Paragraph 1.1.7.3 above.

2.2.3 Submittals. Submittals required by the Contract Documents shall be prepared specifically for the Work by the Contractor to illustrate some portion of the Work. Submittals are not Contract Documents.

2.2.3.1 Submittal Schedule. Within sixty days after the Effective Date of the Contract, the Contractor shall prepare and submit a Submittal Schedule for review and approval of the Design Professional. In establishing the Submittal Schedule the Contractor shall take into account large submittal documents that will require longer review times, e.g., submittals with over fifty sheets of drawings. The Design Professional's approval shall be based on conformance of the Submittal Schedule with the Overall Project Schedule, subject to change from time to time in accordance with the progress of the Work.

2.2.3.2 Submission and Approval. The Contractor's Submittals must comply with the Contract Documents. The Contractor shall review and approve all Submittals prior to submission. The Contract Documents shall specify when shop drawings or submittals require the seal of a specialty consultant. The Contractor shall submit copies of Submittals as required by the Contract Documents for the Work of the various trades. The Design Professional shall review, approve, or take other appropriate action with respect to shop drawings, samples, or other submissions of the Contractor, including, but not limited to, confirming conformance with the design concept of the Project and with the Contract Documents. The Design Professional shall respond to and return said items to the Contractor within fourteen calendar days from receipt provided that the Submittals are submitted by the Contractor in accordance with the required Submittal schedule. The Design Professional shall review and give comment or approval to Submittal schedule within fourteen calendar days from receipt. Large submittal documents may require longer review times, e.g., submittals with over fifty sheets of drawings. If, because of events beyond its reasonable control, the Design Professional is not able to meet the specified time period, then it is entitled to ask for additional time from the Owner. The Contractor shall make all corrections required by the Design Professional and furnish such corrected copies as may be needed. If the Contractor believes that any corrections required by the Design Professional constitute a change to the contract, the Contractor shall immediately notify the Design Professional and Owner and request instructions. By forwarding the approved Submittals to the Design Professional, the Contractor represents that the Contractor has determined and verified materials, field measurements, and field construction criteria related thereto, or will do so, and has checked and coordinated the information contained within such Submittals with the requirements of the Work and of the Contract Documents. The Design Professional's approval of Submittals shall not relieve the Contractor from the responsibility for errors of any sort in Submittals or schedules. The Contractor shall perform no portion of the Work for which the Contract Documents require Submittals until the Design Professional has approved the respective Submittal. The Contractor shall maintain at the Site one copy of all approved Submittals.

2.2.3.3 Cost of Additional Review. The Design Professional shall be responsible for an initial and one subsequent review of the Submittal. Where the subsequent Submittal is not accepted due to noncompliance with the Contract Documents, the Contractor shall be responsible for payment for the additional time required by the Design Professional to complete the Submittal review.

2.2.4 Manufacturer's Recommendations. All work or materials shall be installed in accordance with the manufacturer's recommendations and requirements. The Contractor shall obtain the manufacturer's recommendations and requirements, for its use at the Site in executing the Work, copies of bulletins, circulars, catalogues, or other publications bearing the manufacturer's titles, numbers, editions, dates, etc. If the manufacturer's recommendations and requirements are not available, the Contractor shall request installation instructions from the Design Professional.

2.2.5 Site Plan.

2.2.5.1 General. The Design Professional is responsible for providing the initial sealed Site Plan as a part of the Bidding Documents. During the Pre-Commencement phase, the Contractor shall review the initial Site Plan and make and submit recommendations for any changes to the initial Site Plan. The Contractor is required to obtain the land disturbance permit(s) applicable to the Owner that implement the National Pollution Discharge Elimination System (NPDES) requirements for stormwater management for construction activities from the appropriate issuing authority. Compliance requires that there be properly designed Best Management Practices (BMPs), properly installed BMPs, and inspection and maintenance of the installed BMPs.

2.2.5.2 Implementation. The Design Professional will depict upon the Site Plan its initial recommendations as to elements of the erosion, sedimentation, and pollution control plan, specifying his recommended design of BMPs for the Project, including stormwater management facilities, and other like matters. It is the Contractor's responsibility to review the design of the BMPs and submit any changes to the plan, including the Contractor's desired use of entrances to the Site, Contractor's trailer(s) location, laydown areas and other similar matters affecting the design and implementation of the BMPs. The Design Professional and Contractor shall arrive at a final sealed Site Plan for submission to the permitting officials that enables the land disturbance permitting of the Project. The Design Professional and Contractor shall resolve with the local permitting official any deficiencies by the end of the Pre-commencement period.

2.2.5.3 Installation, Inspection, and Maintenance. The Contractor is responsible for installation and maintenance of the BMPs as a part of its Bid. The Design Professional shall obtain the services of a qualified testing laboratory to inspect the BMPs in accordance with the permits, the costs of such inspections to be borne by the Owner. In the event of Abnormal Weather Conditions or *force majeure*, the Contractor shall be compensated for re-installation of BMPs at established Unit Prices.

2.2.6 Geological and Archeological Specimens. If, during the execution of the Work, the Contractor, any Subcontractor, or any servant, employee, or agent of either should uncover any valuable material or materials, such as, but not limited to, treasure trove, geological specimens, archival material, archeological specimens, or ore, the Contractor acknowledges that title to the foregoing is vested in the Owner. The Contractor shall notify the Owner upon the discovery of any of the foregoing, shall take reasonable steps to safeguard it, and seek further instruction from the Design Professional. Any additional cost incurred by the Contractor shall be addressed under the provision for changed conditions. The Contractor agrees that the Geological and Water Resources Division and the Historic Preservation Division of the Georgia Department of Natural Resources may inspect the Work at reasonable times.

SECTION 3 – CONSTRUCTION PHASE

PART 1 – CONSTRUCTION PHASE SERVICES

3.1.1 Basic Construction Services.

3.1.1.1 Requirement to Commence Work. The Contractor shall under all circumstances commence work under this Contract no later than ten days after the Proceed Order Date of the Proceed Order.

3.1.1.2 Payment for Services and Work. Unless otherwise stipulated, the Contractor shall provide and pay for all materials, supplies, labor, services, water, tools, equipment, light, power, transportation, and other utilities and facilities necessary for the proper execution and completion of the Work.

3.1.1.3 Quality of Materials and Workmanship. Unless otherwise specified, all materials shall be new, and both workmanship and materials shall be of good quality. The Contractor shall, if required, furnish satisfactory evidence as to the kind and quality of materials and work. The burden of proof is on the Contractor.

3.1.1.4 Quality and Discipline of Employees. The Contractor shall at all times enforce strict discipline and good order among his employees and shall not employ on the work any unfit person or anyone not skilled in the work assigned to him.

3.1.1.5 Failure of the Contractor to Supply Workmen. A Notice of Non-Compliant Work may be issued for failure of the Contractor to supply enough workers or enough materials or proper materials.

3.1.1.6 Superintendence and Supervision by Contractor.

3.1.1.6.1 Supervision by Contractor. The Contractor shall give efficient supervision to the work, using his best skill and attention. He shall carefully study and compare all drawings, specifications, and instructions and shall at once report to the Design Professional any error, inconsistency, or omission that he may discover, but he shall not be held responsible for their existence or discovery.

3.1.1.6.2 Superintendent of Contractor. The Contractor shall keep on this work during its progress and until the Final Certificate has been executed by the Design Professional a competent Project Superintendent and any necessary assistants, all satisfactory to the Design Professional and Owner. The Project Superintendent shall not be changed except with the consent of the Owner and the Design Professional unless the superintendent proves to be unsatisfactory to the Contractor and ceases to be in his employ. The superintendent represents the Contractor and all directions given to the superintendent shall be as binding as if given to the Contractor.

3.1.1.6.3 Replacement Project Superintendent. If the Contractor terminates the Project Superintendent or, if the Contractor, for any reason, engages a Project Superintendent different from the one originally assigned to the Project, Contractor must ensure that the replacement Project Superintendent has similar qualifications and experience as the originally identified Project Superintendent. Furthermore, the Contractor must obtain the Owner's prior written approval before engaging a permanent replacement Project Superintendent.

3.1.2 Measurements and Dimensions. Before ordering material or doing work that is dependent upon coordination with building conditions, the Contractor shall verify all dimensions, elevations, grades, and pitch by taking measurements at the building and shall be responsible for the correctness of same. Any discrepancies between the drawings and/or specifications and the existing conditions shall be referred to the Design Professional for additional instructions before any work affected thereby is begun.

3.1.3 Rain Water, Surface Water, and Back-up. The Contractor shall protect all Work, including but not limited to, excavations and trenches, from rainwater, surface water, and back up of drains and sewers. The Contractor shall furnish all labor, pumps, shoring, enclosures, and equipment necessary to protect and to keep the Work free of water.

3.1.4 Dust Control. Dust-proof enclosures or partitions for protection wherever dusty or dirty work is performed and dampening of debris to avoid dusting when removed shall be provided and included as a cost of the work.

3.1.5 Cutting, Patching, and Fitting. The Contractor shall do all cutting, patching, and fitting of the Work that may be required to make its several parts come together properly and fit.

3.1.6 Space Conditions. All pipes passing through floors, walls, and ceilings shall be installed with sufficient space between them to permit installation of pipe insulation and floor, wall, and ceiling plates without cutting of insulation or plates. Roughed-in dimensions shall be prepared by the Contractor to accomplish this requirement. The Contractor shall locate all equipment that must be serviced, operated, or maintained in fully accessible positions. This provision includes but is not limited to valves, traps, cleanouts, motors, controllers, switchgear, drain points, filter, access doors, and fire dampers. If spaces, dimensions, or other design conditions do not permit compliance with the present article, the Contractor shall file a request in writing with the Design Professional for additional instructions, furnishing a copy to the Owner.

3.1.7 Cleaning Up.

3.1.13.1 During Construction. At all times, the Contractor shall keep the premises free from accumulations of waste material or rubbish caused by his employees, Trade Contractors, or work. Periodically during the course of the Work he shall remove all his rubbish from and about the building and all his tools, scaffolding, and surplus materials and shall leave his work "broom clean" or its equivalent, unless more exactly specified. Prior to Final Completion by a Trade Contractor of any Trade Contract, Contractor shall require the Trade Contractor to remove from the Work and Site all temporary systems, tools, equipment, machinery, and surplus materials not required for the continued performance of any Work under the Trade Contract or this Contract. In case of dispute, after 48 hours written notice the Owner may remove the rubbish and charge the cost to the Contractor.

3.1.13.2 Prior to Material Completion. Prior to the inspection for Material Completion of the Project Contractor shall remove from the Site all wastes and rubbish, clean all tile and glass surfaces, replace broken glass, remove stains, paint spots, and clean and polish all plumbing fixtures and equipment, leave the Work "vacuum clean" or its substantial equivalent, all hard surface floors swept and mopped, all carpeted floors vacuumed, all surfaces other than floors dusted, blower dusted, or wiped (depending on type of surface) and surface blemishes cleaned, all glazing washed [both sides], and all electrical and mechanical equipment and fixtures cleaned, with all ductwork cleaned and filters replaced, if such are dirty, before other cleaning is started, and re-cleaned if any dust or dirt has gotten into the ductwork during the cleaning process. The Contractor shall restore existing facilities such as roads, other paved surfaces, fencing, curbing and the like at the Site to at least their preconstruction conditions, provided, however, the Contractor may, in an orderly fashion, leave such equipment and supplies at the Site as necessary to achieve Final Completion of the Project. This cleaning must be completed before the Contractor can expect the Design Professional to commence the inspection for Material Completion. To achieve Material Completion, the Contractor shall have fully cleaned the Site – all debris must have been removed from the site and all paved surfaces must have been broom swept and thoroughly hosed down.

3.1.8 Duty of Contractor to Report Defects. If any part of the Contractor's work depends for proper execution or results upon the work of any Separate Contractor to the Owner, the Contractor shall inspect and promptly report to the Design Professional any apparent defects in such work that render it unsuitable for such proper execution and results.

3.1.9 Duty of Contractor to Report Conflicts. To ensure the proper execution of his subsequent work, the Contractor shall measure work already in place and shall at once report to the Design Professional any discrepancy between the executed Work and the drawings or specifications.

PART 2 – CHANGES TO THE WORK

3.2.1 Acknowledgement of Existing Physical Conditions. In undertaking the work under this Contract, the Contractor acknowledges that he has visited the premises and has taken into consideration all open and apparent conditions that might affect his work. No claim based on lack of knowledge of existing conditions shall be allowed unless the existing physical conditions cannot be discovered by a reasonably observant person. Any claims relating to conditions that are materially different from the Contract Documents that were not open and apparent may be adjusted as provided in this Part.

3.2.2 Owner's Right to Make Changes. Without invalidating the Contract, the Owner, by Change Order and without notice to the sureties, may authorize or order extra work or changes by altering, adding to, or deducting from the Work or the Contract Time, the Contract Sum being adjusted accordingly. All Change Orders shall be performed under the conditions of the original Contract except that any claim for extension of time caused thereby shall be adjusted at the time of signing of the Change Order. (See Change Order formats in Section 7.) Prior to the issuance of the Proceed Order, the Contractor and the Owner shall advise each other in writing of their designees authorized to accept and approve changes to the Contract Sum and the limits to each designee's authority. Should any designee or limits of authority change during the time this Contract is in effect, the Contractor or Owner shall give written notice to the other as provided in Article 1.5. There is no legal limitation on the Owner's right to make changes such as may be, in the Owner's sole discretion, useful or desirable to the Project.

3.2.3 Changes Forbidden without Consent of Owner. Neither the Design Professional nor the Contractor shall make any change whatsoever in the work without an approved Change Order. In the absence of an approved Change Order, the Contractor shall have no claim for payment, repayment, reimbursement, remittance, remuneration, compensation, profit, cost, overhead, expense, loss, expenditure, allowance, charge, demand, hire, wages, salary, tax, cash, assessment, price, money, bill, statement, dues, recovery, restitution, benefit, recoupment, exaction, injury, damages, or time based upon or resulting from any change. The provisions of this Article do not apply to emergencies as described in Article 1.4.4.

3.2.4 Form and Execution of Change Orders.

3.2.4.1 The Change Order. The Change Order is the instrument by which adjustments in the Contract Sum and the Contract Time are effected. The Change Order shall be accompanied by a breakdown as set forth in Paragraph 3.2.7.4. The breakdown is for the purpose of enabling the Design Professional and the Owner to make a judgment on the dollar amount of the adjustment in the Contract Sum and is not a part of the Change Order. No condition, term, qualification, limitation, exception, exemption, modification, or proviso, except as set forth in this Part, shall appear in the breakdown. Only such conditions, terms, qualifications, limitations, exceptions, exemptions, modifications, and provisos as are permitted under this Part are valid. The Design Professional shall certify to the dollar amount and description of the adjustments permitted by the Change Order.

3.2.4.2 Execution of Change Orders. Change Orders shall be signed by the Contractor, ordinarily certified by the Design Professional, and approved by the Owner in accordance with the form of Change Order prescribed by the Owner. No request for payment by the Contractor for a Change Order shall be due, nor shall any such request appear on an Application for Payment, until the Change Order is executed by the Owner. In the event of emergency (see Article 1.4.4) or significant impact to the Overall Project Schedule, the Owner shall direct the Change Order to proceed upon a Force Account until the cost and time is resolved in the manner set forth in Paragraph 3.2.7.3 below.

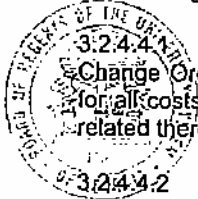
3.2.4.3 Disagreement between Design Professional and Contractor.

3.2.4.3.1 As to Contract Sum. Should the Design Professional disagree with the Contractor as to the amount of the adjustment to the Contract Sum and such disagreement is not resolved between them within seven days, the Owner, if it desires the Change Order work to proceed, may direct a Change Order for Force Account or Indeterminate Units.

3.2.4.3.2 As to Contract Time. Should the Design Professional disagree with the Contractor as to the amount of the adjustment to the Contract Time and such disagreement not be resolved between them within seven days, the decision of the Design Professional as to any adjustment in the Contract Time, including any designation by the Design Professional of such time as is eligible for Time Dependent Overhead Costs, shall be final, subject to protest to the Owner of the Design Professional's decision as set forth in Section 5 Part 2.

3.2.4.3.3 As to Other Disagreements. Should the Design Professional disagree with the Contractor as to matters other than Contract Sum or Contract Time, the dispute shall be resolved by the Owner as set forth in Section 5, Part 2.

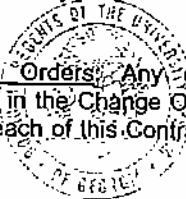
3.2.4.4 Change Order Conditions. All Change Orders are issued under the following conditions and shall contain the following language as appropriate:



3.2.4.4.1 For Lump Sum Change Order: The payment and extension of time (if any) provided by this Change Order constitutes compensation in full to the Contractor and its Subcontractors and Suppliers for all costs and markups directly and indirectly attributable to the Change Order herein, for all delays related thereto and for performance of changes within the time stated.

3.2.4.4.2 For Force Account or Indefinite Amount Change Order: The payment and extension of time (if any) provided by this Change Order constitutes interim compensation to the Contractor and its Subcontractors and Suppliers for actual costs and markups directly and indirectly attributable to the Change Order herein, for all delays related thereto and for performance of changes within the time stated.

3.2.4.4.3 For All Change Orders: Any changes or reservations by the Contractor to the representations and releases in the Change Order, or refusal of the Contractor to execute the Change Order, shall be a material breach of this Contract that may be sufficient cause to issue a declaration of default.



3.2.5 All Cost and Time Impacts to be Included. Each Change Order shall include all time and monetary impacts of the change. Failure to include a change in Contract Time or in Contract Sum in Change Orders shall be considered a zero price/zero time Change Order and shall waive any change in Contract Time and Contract Sum. Commencement of Work upon a Change Order is conclusive proof that the Contractor accepts the Change Order.

3.2.6 Changes in Contract Time. All Change Orders must state that the Contract Time and the Material Completion and Occupancy Date either are not changed or are increased or decreased by a specific number of Days. The CONTRACTOR must provide written justification for the extension to the Design Professional and to the Owner. The written justification must demonstrate an anticipated actual increase in the time required to complete the Work beyond that allowed by the Contract as adjusted by prior Change Orders to the Contract. No extension to the Contract Time shall be allowed unless the additional or changed Work increases the length of the critical path beyond the Material Completion and Occupancy Date. If approved, the increase in time required to complete the Work shall be added to the Contract Time. The Owner may decrease, by Change Order, the Contract Time when an Owner-requested deletion from the Work results in a decrease in the actual time required to complete the Work as demonstrable on the critical path of the Construction Progress Schedule. Eligibility and processing requirements for Time Dependent Overhead Costs for compensable delay is addressed in Article 3.3.8 and 3.3.10.

3.2.7 Determining the Cost to Owner for Changes. The cost to the Owner of any change shall be determined in one or more of the following ways:

3.2.7.1 Lump Sum. The Change Order cost is determined by mutual agreement as a lump sum amount changing the Contract Sum allowed for completion of the Work. The Change Order shall be substantiated by documentation itemizing the estimated quantities and costs of all labor, materials and equipment required as well as any mark-up used. The price change shall include the cost percent allowed for the Contractor's overhead and profit and, if eligible, Time Dependent Overhead Costs.

3.2.7.2 Unit Price Work. The Change Order cost is calculated by using unit prices and calculating the number of net units of Work in each part of the Work that is changed, either as the Work progresses or before Work on the change commences, and by then multiplying the calculated number of units by the applicable unit price set forth in the Contract or multiplying by a mutually agreed unit price if none was provided in the Contract. No

additional percentage markup for overhead or profit shall be added to the unit prices as this markup is included within the unit prices. Time Dependent Overhead Costs will be added if eligible.

3.2.7.3 Force Account. The Change Order cost is accomplished by Force Account in the event the Contractor and Design Professional cannot agree on the cost of the Change Order or the cost cannot be reasonably determined prior to beginning the Work.

3.2.7.3.1 A Force Account is the establishment by the Owner's Incumbrance Record of a maximum dollar amount (Stipulated Maximum Sum) beyond which no changed work may be undertaken, subject to amendment, for funding all costs of a Change Order. As the Work authorized by the Change Order progresses, the Contractor must provide an accounting of actual costs incurred in accomplishing the Work. The accounting must include an annotated copy of the Overall Project Schedule to accurately show the status of the Work at the time the Change Order utilizing a Force Account is issued, to show the start and finish of the changed Work, and to show the status of the Work when the changed Work is completed.

3.2.7.3.2 Actual costs, except as otherwise agreed to in writing by the Owner, shall not exceed those prevailing for the trades or crafts, materials, and equipment in the locality of the Project, may include only those items listed as allowable in Article 3.2.9, and shall not include any of the costs listed as not allowable in Article 3.2.10. The Owner shall be permitted, on a daily basis, to verify such records and may require such additional records as are necessary to determine the cost of the change to the Work.

3.2.7.3.3 The Owner shall prescribe the dollar limit for a Force Account in writing by authorizing a Stipulated Maximum Sum of money to be committed toward execution of the said change, and the Contractor shall have no authority to perform any change that will cost the Owner in excess of the Stipulated Maximum Sum. The Stipulated Maximum Sum shall be based on the estimated cost of the Work and the Contractor's allowance for overhead and profit as set forth in 3.2.8 below, including any time extension, Time Dependent Overhead Costs (if eligible), and a reasonable contingency. It shall be the sole responsibility of the Contractor to apply in writing to the Owner, NOT to the Design Professional, for an increase in the Stipulated Maximum Sum if the total value of the Work is approaching and might exceed the Stipulated Maximum Sum.

3.2.7.3.4 Within fourteen days of the conclusion of such Work ordered by Force Account, the Contractor and the Owner shall arrive at the total lump sum cost for the Change Order. Such lump sum cost shall be incorporated into and finalize the Change Order, and shall reference and close the Incumbrance Record establishing the Force Account.

3.2.7.4 Breakdown of Expenditures. The Contractor shall review any Owner requested or directed change and shall respond in writing within fourteen calendar days after receipt of the proposed change (or such other reasonable time as the Owner may direct), stating the effect of the proposed change upon his Work, including any increase or decrease in the Contract Time and Sum. The Contractor shall furnish to the Owner and the Design Professional an itemized breakdown of the quantities and prices and expenditures for labor and materials used in computing the proposed change in Contract Sum, in the form prescribed by the Owner, and the breakdown shall be accompanied by the following declaration:

I do solemnly swear to the best of my knowledge, information, and belief, that the costs shown hereinabove do not exceed current costs for like services or materials in the locality of the Project and, in the case of a Force Account, the costs represented do not exceed the actual costs to the Contractor; and that the quantities shown do not exceed actual requirements.

The Contractor shall obtain and furnish as back up to the Contractor's breakdown a separate breakdown for each subcontractor's charges prepared by each subcontractor on the letterhead of the subcontractor and properly signed by the subcontractor. The Owner shall review the Contractor's proposal and respond to the Contractor within fourteen days of receipt.

3.2.8 Cost Allowable for Changes to the Work, Allowances for Contractor, and Permissible Expenditures.

3.2.8.1 Overhead and Profit. The percentage for overhead and profit to be used in calculating additive changes in the Work (not including changes covered by unit prices) shall not exceed the percentages for each category listed below. Said percentages for overhead and profit shall be applied only on the net cost of the changed Work, (i.e., the difference in cost between original and revised Work).

3.2.8.1.1 Contractor. If the Contractor does all or part of the changed Work with employees that work directly for the Contractor, its markup for overhead and profit on the changed Work the Contractor performs with its employees shall be twenty-five percent of the first \$50,000 of the net Allowable Costs, and twenty percent of the remaining net Allowable Costs, if any.

3.2.8.1.2 Subcontractor. If a Subcontractor does all or part of the changed Work with employees that work directly for the Subcontractor, the Subcontractor's markup for overhead and profit on the Work the Subcontractor performs with its employees shall be twenty-five percent of the first \$50,000 of the net Allowable Costs, and twenty percent of the remaining net Allowable Costs, if any. Determination of a Subcontractor's extended overhead costs, if any, is the responsibility of the Contractor.

3.2.8.1.3 Contractor's Markup on Subcontractor's Work. The Contractor's management markup on the subcontractor's net additional allowable expenditures shall be seven and one half percent. The Contractor shall not be permitted the overhead and profit markup on Time Dependent Overhead Costs, but shall be permitted a management markup of five percent on Time Dependent Overhead Costs.

3.2.8.1.4 Second and Lower Tier Subcontractor. If a Subcontractor at any tier does all or part of the changed Work with its employees, the Subcontractor's markup on the Subcontractor's work with its employees shall be twenty-five percent of the first \$50,000 of the cost, and twenty percent of the remaining cost, if any. The management markup of a Subcontractor's work by the Contractor and all intervening tiers of Subcontractors shall not exceed seven and one half percent for the Contractor and any Subcontractor, or a total of fifteen percent for the changes to the Work.

3.2.8.2 The above percentages shall be applied to the net Allowable Costs, if any, as limited and defined in this Part. If the net difference between Allowable Costs and credits to the Owner results in a decrease in the Owner's cost, the amount of credit allowed the Owner shall be the net decrease without any allowance for profit and overhead. Other than any eligible Time Dependent Overhead Costs, all costs that are not Allowable Costs in Article 3.2.9 or are disallowed in Article 3.2.10 shall be considered as overhead and shall be exclusively compensated in the allowances provided for in paragraph 3.2.8.1 above.

3.2.9 Allowable Costs for Changes in the Work. Allowable cost for changes to the Work are limited to the following:

3.2.9.1 Labor costs for employees directly employed in the change in the Work, including salaries and wages plus the cost of payroll charges and fringe benefits and overtime premiums, if such premiums are explicitly authorized by the Owner, set at rates established in the manner set forth in Article 2.1.7.

3.2.9.2 Materials incorporated into the change to the Work, including costs of transportation, handling, fuel, and on-site storage, if applicable.

3.2.9.3 Equipment incorporated in the changed Work or equipment used directly in accomplishing the Work. If the equipment is rented expressly for accomplishing the change in the Work, that cost shall be the rental rate according to the terms of the rental agreement, which the Owner shall have the right to approve, or shall be set at rates established in the manner set forth in Article 2.1.7. The decision of the Owner shall be final, binding, and conclusive on all parties.

3.2.9.4 Costs of increases in premiums for the Contractor's Payment Bond and Performance Bond or for bond premiums for its Subcontractors, to the extent that such increased costs are a result of coverage adjustments for changes in Work approved by the Owner. Prior to requesting payment for the Change Order work, the Contractor shall provide proof of its notification to the Surety of the change in the Work and of the Surety's agreement to include such change in its coverage. The cost of the increase in premium shall be an allowable cost but shall not be marked up. In no event shall a cost in excess of two percent of the cost of the change be allowable.

3.2.9.5 Sales, consumer, use, and other applicable taxes that are legally in effect at the time the change order is approved.

3.2.9.6 Any other costs directly attributable to the change in the Work, such as professional engineering costs, except those set forth in Articles 3.2.8 and 3.2.10.

3.2.9.7 For Change Order Work directed by the Owner, where the headquarters of the Subcontractor actually performing the work is more than 100 miles from the Project Site, the Subcontractor may include in the cost of the Change Order a stipend of fifty dollars per day for each worker performing work at the Site if that worker is receiving a per diem under present company policy, not to exceed the number of workers and number of days determined by Design Professional's decision to be attributable to the new work so ordered, so long as the number of workers and number of days attributable to any deleted work is deducted there from. No allowance for overhead or profit as set forth in Article 3.2.8 may be added to the Change Order cost on account of the stipend amount, and the full amount of the stipend must be actually paid to the eligible worker or it shall be forfeited by the Contractor and Subcontractor(s).

3.2.9.8 The Owner may require any or all of the following documentation to be provided by the Contractor to support the Allowable Costs:

- (a) certified payroll records showing the name, classification, date, daily hours, total hours, rate, and extension for each laborer, foreman, supervisor or other worker;
- (b) equipment type & model, dates, daily hours, total hours, rental rate or other specified rate, and extension for each unit of equipment;
- (c) invoices for materials showing quantities, prices, and extensions;
- (d) daily records of waste materials removed from the Site and/or fill materials imported to the Site;
- (e) certified measurements of over excavations, piling installed and similar work; and/or
- (f) transportation records for materials, including prices, loads, and extensions;

3.2.10 Costs Not Allowable for Changes in the Work. Costs not allowable under any circumstances are as follows:

3.2.10.1 Costs due to the negligence of the Contractor, Subcontractors, or other persons for whom the Contractor is responsible, including but not limited to costs of delay, costs for the correction of Non-Compliant Work, costs for improper disposal of material, costs for equipment wrongly supplied, costs for the Contractor's delay in performing the Work, or costs for delay in ordering and obtaining normally available materials or equipment.

3.2.10.2 Home office expenses, including payroll costs for the Contractor's or any Subcontractors' officers, executives, administrators, accountants, counsel, engineers, timekeepers, estimators, clerks, and other similar administrative personnel employed by the Contractor, whether at the Site or in the Contractor's or a Subcontractor's principal or branch office for general administration of the Work (including those referred to as "Eichlay costs"). These costs are deemed overhead included in the percentage markups allowable in Article 3.2.8 above.

3.2.10.3 Home and branch office expenses that include, but are not limited to, expenses of Contractor's home and branch offices, Contractor's capital expenses, interest on Contractor's capital used for the Work, charges for delinquent payments, small tools, incidental costs, rent, utilities, telephone and office equipment, and other general overhead expenses of the home and branch office (including those referred to as "Eichlay costs").

3.2.10.4 Where Work is deleted from the Contract (by Bulletin, Change Order, or otherwise) prior to commencement of that Work without substitution of other similar Work, one hundred percent of the Contract Sum attributable to that Work shall be deducted from the Contract Sum. However, in the event that material submittals have been approved and orders placed for said materials, a lesser amount as justified by proper documentation shall be deducted from the Contract Sum. The credit if any to the Owner for reduced premiums

on payment bonds and performance bonds shall be in all cases one hundred percent of the credit. If the deductive Change Order affects the critical path or the schedule and it causes an overall reduction in the Contract Time, jobsite time dependent expenses shall be included in the deduction at the rate established in the Contract for Time Dependent Overhead Costs.

3.2.10.5 Wages of a foreman, if the foreman is concurrently supervising other Work at the Site.

3.2.10.6 Premiums for bonds required of Subcontractors by the Contractor.

3.2.11 Change Order Formats. Formats for Lump Sum Change Orders and for Change Orders based upon either a force account or upon unit pricing with an indeterminate number of units are in Section 7, Forms.

3.2.12 Changes due to Subsurface or Other Unforeseen Conditions.

3.2.12.1 Subsurface Conditions. Unless the Contract Documents stipulate specific quantities and units of rock or unsuitable soils, the Contractor shall assume material below the surface of the Earth to be earth and other material that can be removed by power shovel or similar equipment. Should conditions encountered below the surface of the ground be at variance to the number of unit requirements as indicated by drawings or specifications, and absent an agreed-upon unit price established prior to the bid by Addendum, or after contract execution by Change Order, the Contract Sum and/or time shall be adjusted as provided in the Contract Documents for changes in the work.

3.2.12.2 Other Unforeseen Conditions. If unknown physical conditions are encountered at the Site that differ materially from those indicated in the Contract Documents, then the Contractor shall give notice to the Design Professional promptly before conditions are further disturbed, but in no event later than two business days after the first observance of the conditions. The Design Professional shall promptly investigate such conditions and, if they differ materially and cause an increase or decrease in the Contractor's cost or time required for performance of any part of the Work, the Design Professional may recommend an adjustment by Change Order to the Contract Sum or Contract Time, or both. If the Design Professional determines that the conditions at the Site are not materially different from those indicated in the Contract Documents and that no change in the terms of the Contract is justified, the Design Professional shall so notify the Owner and the Contractor in writing, stating the reasons. Protest by either party of the Design Professional's decision shall be in accordance with Section 5, Part 2.

3.2.13 Compensable Rock. CAUTION: No rock for which extra compensation is expected to be received shall be removed except pursuant to and in conformity with a written authorization or order of the Owner. Unless otherwise provided in the Bid Documents, no removal of rock as defined herein shall be included in the Bid. Shale, rottenstone, or stratified rock that can be loosened with a pick or removed by a hydraulic excavator equivalent to a Caterpillar Model 215, a single engine pan (Caterpillar 621 or equivalent) that is pushed by a crawler tractor (Caterpillar D-8K or equivalent), or similar equipment shall not be classified as rock.

3.2.13.1 Definitions of Compensable Rock. Rock, for the purposes of pricing its removal, is defined as follows:

3.2.13.1.1 Rippable Rock. Rippable rock is defined as any material that can be ripped with a single-tooth hydraulic ripper drawn by a crawler tractor having a minimum draw bar pull rated at not less than 56,000 pounds (Caterpillar D-8K or equivalent) and occupies an original volume of at least one cubic yard.

3.2.13.1.2 Mass Rock. Mass rock is defined as any material that cannot be ripped with a single-tooth hydraulic ripper drawn by a crawler tractor having a minimum draw bar pull rated at not less than 56,000 pounds (Caterpillar D-8K or equivalent) and occupies an original volume of at least one cubic yard.

3.2.13.1.3 Trench Rock. Trench rock is defined as any material that must be removed from a trench that cannot be excavated with a hydraulic excavator having a bucket curling force rated at not less than 18,300 pounds (Caterpillar Model 215 or equivalent) and occupies an original volume of at least one-half cubic yard.

3.2.13.1.4 Caisson Rock. Caisson Rock is defined as material that must be removed from a shaft which cannot be penetrated faster than two feet per hour (fifteen minute minimum) using a rock auger with bullet-shaped hardened steel teeth (Kennametal bits or equivalent), and the drilling equipment should have the capacity to produce a continuous torque of at least 1,000,000 inch pounds and a downward

force of at least 50,000 pounds (a Hughes LLDH in good working condition) for piers up to seventy two inches in diameter. Use of equipment with greater torque or downward force modifies the definition of refusal to be the point at which the equipment cannot penetrate faster than two feet per hour (fifteen minute minimum). In rare cases, refusal may occur on a rock seam or boulder above the general massive rock surface. The compensation for Caisson Rock should include only material that cannot be penetrated by the rock auger at the specified rate.

3.2.13.2 Pricing for Compensable Rock. All compensable rock shall be priced by unit prices upon volume prior to removal and shall be calculated by survey and engineering calculations. No rock shall be priced by truckload, bucket load, or other similar pricing methods. Unit prices shall be determined prior to removal, either in the Contract Documents or by Change Order. Unit prices shall be inclusive of all profit and overhead, except for Time Dependent Overhead Costs. Unit prices shall include the following:

- (a) Excavation and removal of all rubble;
- (b) Addition and removal of overburden for blasting;
- (c) Excavation of all blast rubble;
- (d) Replacement of suitable soils in areas of overblasting or over removal; and
- (e) All costs of labor, equipment, supplies, blasting materials, safety requirements, drayage, haulage, and disposal, including offsite disposal costs.

The Contractor expressly agrees that the Contractor's sole monetary remedy for extensions of Contract Time due to removal of rock that materially affects the completion of the Work by lengthening the critical path of the Overall Project Schedule shall be the daily rate established in the Time Dependent Overhead Costs in the Contract. Extensions of Time and compensation for Time Dependent Overhead Costs for compensable rock are to be processed as a Change Order pursuant to Article 3.2.6.

3.2.14 Subcontractor Claims for Extended General Conditions Costs. The daily rate for Time Dependent Overhead Costs established in the Contract is intended to compensate the Contractor for the additional jobsite overhead costs resulting from any compensable time extension. The Contractor, in its sole discretion, shall be responsible for allocating the Time Dependent Overhead Costs among its affected subcontractors and itself. Owner's payment of the Time Dependent Overhead Costs to the Contractor, and Contractor's allocation thereof, shall constitute the only monetary compensation the Contractor and subcontractors shall be entitled to receive as reimbursement for Time Dependent Overhead Costs incurred as a result of any compensable delay to the Project.

3.2.15 Release of Claims. The execution by the Contractor of a Change Order shall be and operate as a release to the Owner of all claims by the Contractor and of all liability owing to the Contractor for all things done or furnished in connection with the Work described in the Change Order. The execution of any Change Order by the Owner shall not be an acceptance of any Work or materials not in accordance with the Contract Documents, nor shall it relieve the Contractor of responsibility for faulty materials or workmanship or operate to release the Contractor or his surety from any obligation arising under the Contract or the Performance Bond or Payment Bond.

3.2.16 Sole Source Designation for Change Order Work.

3.2.16.1 Definition of Sole Source. As used in this Article 3.2.16, "Sole Source" means a Trade Contractor or Supplier or Subcontractor specified by name in a Bulletin as the exclusive source from which conforming goods or services may be obtained. Designation of goods or services by reference to a named source accompanied by the qualification "or equal" or similar language is not a designation of a Sole Source as that term is defined herein.

3.2.16.2 Limitations. This Article 3.2.16 applies only to Bulletins referenced in a proposed Change Order that designates a Sole Source that was not designated in the Bidding Documents. Except as stated in this Article, the Contractor's inability to obtain payment and performance bonds from Sole Source Subcontractors or warranties from Subcontractors, as required under the Bidding Documents for this Contract, shall not otherwise excuse the Contractor from its bonding and warranty obligations under this Contract.

3.2.16.3 Sole Source as Grounds for Rejection of a Change Order. If a Change Order is submitted to Contractor for the purposes of adding a Bulletin to this Contract and said Bulletin designates a Sole Source from which Contractor is required to procure goods or services necessary to perform the Work, which Sole Source has not been designated previously, Contractor shall be entitled to reject the proposed Change Order if the designated Sole Source refuses to provide to Contractor the warranties, bonds, terms or schedule required under the Contract Documents, including any warranty or terms or schedule required by Bulletins referenced in the proposed Change Order. In such event, Contractor shall give written notice to the Owner rejecting the

proposed Change Order and, if possible, shall accompany said written notice with a proposal from Contractor for changes or modifications to the Bulletin so as to eliminate the Sole Source designation but to achieve goods or services equal in quality or function. The Owner may then require the Design Professional to revise the subject Bulletin so as to eliminate the designation of the Sole Source by incorporation of Contractor's proposal or otherwise. Upon revision of the Bulletin by the Design Professional and approval thereof by the Owner, the Owner shall again submit to the Contractor a proposed Change Order for the purpose of adding the revised Bulletin to this Contract. If the Owner decides to retain the Sole Source in the Change Order and Contractor cannot acquire the full contractually required warranties from the Sole Source, Contractor shall be held only to the warranty terms and schedule obtainable from the Sole Source.

3.2.16.4 No Excuse Without Notice. If Contractor accepts a proposed Change Order adding a Bulletin to this Contract that designates a Sole Source without invoking this Article and putting the Owner on notice, Contractor shall not be excused from its obligations with respect to the described Work by reason of the refusal of a designated Sole Source to provide warranties as required under this Contract.



PART 3 – TIME

3.3.1 Time is of the Essence. Time is of the essence of this Contract and all obligations hereunder.

3.3.2 Competent Management of Time. The Contractor has represented to the Owner, in order to be awarded this contract, that the Contractor is experienced in managing construction in accordance with contract requirements and in a timely manner and that the Contractor has included in his proposal sufficient sums to carefully and competently manage this project for completion within the stipulated Contract Time.

3.3.3 Contract Time.

3.3.3.1 Fair and Reasonable. The Contractor has carefully examined and analyzed the Site, the Contract Documents, and all known factors related to his ability to complete this project within the Contract Time stipulated. By submitting his bid for this project, the Contractor agrees that the stipulated Contract Time is fair and reasonable.

3.3.3.2 Delays. The parties recognize there may be delays to perform Change Order work in the event that conditions encountered at the Site are different from those indicated in the Contract Documents, or to perform Change Order work to correct errors in the plans and specifications. Execution of any change must be authorized. In such event, there shall be an adjustment in the Contract Sum as provided in the Contract Documents for changes in the Work. The parties agree that such delays are not a ground for claiming extraordinary remunerations except as set forth in this Contract in Article 3.3.8 below.

3.3.4 Commencement, Prosecution, and Completion.

3.3.4.1 Commencement, Prosecution, and Completion of Work. The Contractor will be required (a) to commence the Work under this Contract on the applicable Proceed Order Date, (b) to prosecute the Work with faithfulness and energy (c) to install the various parts of the work with equal steps shown on the Overall Project Schedule and at the same rate (or better) shown on the Overall Project Schedule and (d) to complete the Work within the Contract Time, as adjusted. Commencement of the Work shall mean actual physical work on the Site. Unless otherwise agreed, and subject to Change Orders, Material Completion of the Project must be achieved on or before the date established as the Material Completion and Occupancy Date under the Schedule.

3.3.4.2 Contractor's Acceleration for failure to meet Schedule Requirements. In the event the Contractor shall be delinquent in respect to achieving the Milestone dates established in the Overall Project Schedule, Contractor shall, within seven days after receipt of written demand of the Owner, cause its employees and Subcontractors to perform work at an accelerated pace with hours and days in addition to the normal working hours and working days, as necessary to promptly bring the Work into compliance with the Overall Project Schedule. Fulfillment of this requirement as to overtime work shall not relieve the Contractor from liability for breach of the covenant as to time. For account of recovery of lost time required of the Contractor for its breach of covenant as to time, the Contractor shall be entitled to no claim against the Owner for any payment, repayment, reimbursement, remittance, remuneration, compensation, profit, cost, overhead, expense, loss expenditure, allowance, charge, demand, hire, wages, salary, tax, cash, assessment, price, money, bill, statement, dues, recovery, restitution, benefit, recoupment, exaction, injury or damages.

3.3.5 Construction Progress Schedule (Overall Project Schedule).

3.3.5.1 Submittal, Approval, and Updates. Not later than sixty days after the Effective Date of the Contract, but prior to the Proceed Order, the Contractor must submit a Construction Progress Schedule in accordance with Section 2.1.5.

3.3.5.2 Approval of Overall Project Schedule. Upon recommendation by the Design Professional and approval by the Owner, the Construction Progress Schedule shall become the Overall Project Schedule, and becomes a part of this Contract. The Overall Project Schedule shall govern the schedule of activities of the Contractor under this Contract

3.3.5.3 Monthly Updates. The Contractor must provide the Design Professional and the Owner with monthly updates of the Overall Project Schedule indicating completed activities and any changes in sequencing or activity durations. (See also Articles 2.1.2 and 2.1.5).

3.3.6 Completion Date. The Work under this Contract shall be completed by midnight of the date required in the Contract as the Material Completion and Occupancy Date unless extended by approved requests for extension of time.

3.3.7 General Rule – No Damages for Delay, Extension of Time Sole Remedy. Contractor shall not be entitled to any damages for delay or to any other reimbursement as a Cost of the Work, or to an increase in the contract amount, or to payment, damages, monies, or compensation of any kind from Owner for direct, indirect, impact, or disruption damages (including but not limited to costs of acceleration of Work or any Phase thereof) arising because of delay or other hindrance of any kind whatsoever; except as specifically permitted by Article 3.3.8. Extension of the time is the Contractor's sole remedy for any delays not the fault of the Contractor.

3.3.8 Exception to General Rule – Compensable Delay. The extension of the Contract Time and the adjustment to the Contract Sum specifically provided for in this Article shall be Contractor's sole and exclusive remedy for delays, hindrances, interferences or resulting inefficiencies and re-sequencing.

3.3.8.1 Compensable Delay – Unavoidable Delay.

3.3.8.1.1 Delay by Owner or Design Professional. If the Contractor is delayed in the progress of the Work between the Proceed Order Date and the Material Completion and Occupancy Date, as amended, by an act or neglect of the Owner, Owner's employees, Design Professional or Separate Contractors employed by the Owner, or by other causes beyond the Contractor's control which the Design Professional determines are the fault of the Owner or the Design Professional and may justify delay, then the Contract Time will be extended by Change Order for such reasonable time as the Design Professional and the Owner may determine; provided, however, that (i) such delays extend the Overall Project Schedule's critical path; (ii) the Contractor has taken all reasonable actions to mitigate the effects of the delay on the Work; (iii) the fault or negligence of the Contractor, the Contractor's agents or employees did not materially contribute to such causes; and (iv) the Contractor shall have notified Owner of the cause or causes of such delay within fourteen days from the date on which the Contractor first becomes aware of such delay.

3.3.8.1.2 Delay in Responses to Submittals. Any claim by Contractor for a change in the Material Completion and Occupancy Date due to delay of responses to submittals may be made during the time while the failure of the Design Professional to act or perform continues, or within seven days after such failure to act or perform has been cured. If no Submittal Schedule or agreement as required in Paragraph 2.2.3.1 is agreed upon, then a claim for delay will be allowed only after the Design Professional has been allowed fourteen days to take action. Any claim for extension of time must be reasonable and take into consideration the nature of the submittal.

3.3.8.1.3 To be Processed as a Part of the Change Order Process. Extensions of Time and compensation for Time Dependent Overhead Costs for Unavoidable Delay are to be processed as a Change Order pursuant to Article 3.2.6.

3.3.8.2 Compensable Delay – Certain Change Orders.

3.3.8.2.1 Owner-Requested Changes. If the Owner requests changes in the Contract Documents that would materially affect the completion of the Work by lengthening the critical path of the Overall Project Schedule, the Design Professional shall determine the appropriate number of days and thereby extend the Material Completion and Occupancy Date. The Contractor expressly agrees that the Contractor's sole monetary remedy for such extensions of Contract Time shall be calculated at the daily rate established for Time Dependent Overhead Costs in the Contract.

3.3.8.2.2 Other Change Orders. For Change Orders involving the following situations that would materially affect the completion of the Work by lengthening the critical path of the Construction Progress Schedule, the Design Professional shall determine the appropriate number of days and thereby extend the Material Completion and Occupancy Date. The Contractor expressly agrees that the Contractor's sole monetary remedy for such extensions of Contract Time shall be calculated at the daily rate established for Time Dependent Overhead Costs in the Contract.

- (a) Changes due to Subsurface or Other Unforeseen Conditions, Article 3.2.12.
- (b) Changes for Compensable Rock, Article 3.2.13.
- (c) Changes deleting work, Paragraph 3.2.10.4

3.3.8.2.3 To be Processed as a Part of the Change Order Process. Extensions of Time and compensation for Time Dependent Overhead Costs for all Change Orders are to be processed as a part of each Change Order pursuant to Article 3.2.6.

3.3.8.3 Compensable Delay – Force Majeure. If, between the Proceed Order Date and the Material Completion and Occupancy Date, as amended, the CM/GC is unable to perform or is delayed in the performance of any of the terms and provisions of this Contract, that materially affects the completion of the Work by lengthening the critical path of the Construction Progress Schedule, as a result of (i) governmental preemption of materials in connection with a national emergency declared by the President of the United States; (ii) riot, insurrection, acts of terror or terrorism or other civil disorder affecting performance of the Work; (iii) labor strikes that could not be reasonably anticipated, or (iv) earthquakes, or unusual and extreme weather conditions constituting Acts of God, then, and in any such event, such inability or delay shall be excused, and the time for completing the affected portions of the Project (and the entire Project, if applicable) shall be extended for such reasonable period of time as the delay has affected the critical path of the performance of the Work hereunder.

3.3.8.3.1 Mitigation of Delay. Contractor shall take all reasonable actions to minimize the delay caused by any of the above factors, and shall notify Owner in writing with a copy to the Design Professional of any event allowing for excuse or delay not later than seven days after the Contractor first becomes aware of the event, or should have become aware, of the event; otherwise Contractor will be deemed to have waived the excuse or delay.

3.3.8.3.2 To be Processed as a Part of the Change Order Process. Extensions of Time and compensation for Time Dependent Overhead Costs for *Force Majeure* are to be processed as a Change Order pursuant to Article 3.2.6.

3.3.8.4 Compensable Delay – Abnormal Weather. Extensions of time will be granted for abnormal inclement weather conditions that delay the critical path of the progress of the work.

3.3.8.4.1 Abnormal weather delay is defined as days lost to weather conditions either (i) in excess of days specified in the Supplementary General Conditions, or (ii) if not defined in the Supplementary General Conditions, as days in excess of a local historic average prevailing at the Site recorded by the National Oceanic and Atmospheric Administration (NOAA) for the 120 months immediately preceding the Proceed Order Date.

3.3.8.4.2 Not later than ten days after of the first occurrence of the event giving rise to the claim or with respect to claims for extension of time as a result of abnormal weather, and not later than ten days after the end of each calendar month thereafter, the Contractor shall file a claim with the Design Professional with a copy to the Owner. By not later than fifteen days from the receipt of the claim, the Design Professional shall render a decision concerning the allowance of an extension of time and shall report his decision to both the Contractor and the Owner.

3.3.8.4.3 Extensions of Time and compensation for Time Dependent Overhead Costs for Abnormal Weather are to be processed as a Change Order pursuant to Article 3.2.6.

3.5.8.5 Protest. The Design Professional's decision as to abnormal weather delay shall be subject to protest by either the Contractor or the Owner as set forth in Section 5, Part 2.

3.3.9 Non-Compensable Delay. Contractor understands, acknowledges and agrees that delays occasioned by the events and occurrences set forth below are not compensable delays and do not constitute reason for extending the Date for Material Completion and Occupancy. It is Contractor's responsibility to make adequate provision for the following in scheduling the Work:

3.3.9.1 Normal Weather Conditions. Weather conditions other than those that substantially vary from the normal climatology conditions that prevailed at the Site for the preceding 120 months, as evidenced by data published by the National Oceanic and Atmospheric Administration.

3.3.9.2 Delay in Delivery of Materials or Equipment. Delay in delivery of materials or equipment for any cause other than those specified in Paragraph 3.3.8.3. No claim will be approved if materials or equipment are delayed due to Contractor's tardy procurement or expediting.

3.3.9.3 All Other Delay. All delay not covered in Article 3.3.8.

3.3.10 Submission of Claims for Compensable Delay and to Extend the Material Completion and Occupancy Date.

3.3.10.1 Time for Submission. Except as specified below, any claim by Contractor for a change in the Contract Time or the Material Completion and Occupancy Date shall be made within fourteen days of the day on which the Contractor becomes aware of the event on which the claim is based or, if the Contract Documents specify a shorter or longer period with respect to such event, within the period specified by the Contract Documents.

3.3.10.2 Delay Claim Must Be In Writing. Any claim to extend the Contract Time and Material Completion and Occupancy Date must be in writing, must set forth in detail the basis for the claim and the number of days of delay claimed, must be correlated with the approved Overall Project Schedule, must be executed by the Contractor and delivered to the Design Professional and the Owner, and must be reviewed and an appropriate time assessed by the Design Professional.

3.3.10.3 When Delay Claim Deemed Waived. Any claim to extend the Contract Time and Material Completion and Occupancy Date not made in writing to Owner within the above time periods shall be deemed waived and shall not thereafter be valid. In the case of a continuing delay as a result of a single event, only one claim submission is necessary.

3.3.10.4 Design Professional to Decide. The Contract Time and the Material Completion and Occupancy Date may be extended for such reasonable time as the Design Professional may decide, and the Overall Project Schedule shall then be updated.

3.3.10.5 Payment for Extensions of Contract Time. The Contractor expressly agrees that the Contractor's sole monetary remedy for Compensable Delay shall be calculated at the daily rate established for the Time Dependent Overhead Costs in the Contract.

3.3.10.6 Claims Related to Extraordinary Time Dependent Overhead Cost. In situations where Time Dependent Overhead Costs are authorized, and the cost incurred exceeds 170% of the established Time Dependent Overhead Cost daily rate, then the Contractor may submit a claim under this article for consideration of such extraordinary additional cost.

3.3.11 Recovery of Schedule Delays.

3.3.11.1 Recovery of Schedule Delays. If the Design Professional determines that the Project is one week or more behind schedule, per the approved Overall Project Schedule, the Design Professional shall so notify the Contractor in writing. Within seven days of the date of the Design Professional's notice, the Contractor shall deliver to the Design Professional and Owner a written plan explaining how the Contractor intends to bring the Project back on schedule. The Contractor's plan must provide sufficient detail to allow the Design Professional and Owner to determine the proposal's feasibility.

3.3.11.2 Recovery of Schedule Delays During Last Sixty Days of Contract Time. At any time during the last sixty days of the Contract Time that the Design Professional finds that the Contractor is behind schedule per the Contract Time, as amended, the Design Professional shall notify the Contractor in writing. Within seven days of the date of the Design Professional's notice, the Contractor shall prepare and deliver to the Design Professional and Owner a written plan explaining how the Contractor intends to bring the Project back on schedule. The Contractor's plan must provide sufficient detail to allow the Design Professional and Owner to determine the proposal's feasibility.

**PART 4 – CORRECTING THE WORK, INSPECTIONS,
COVERING AND UNCOVERING WORK**

3.4.1 Correcting the Work.

3.4.1.1 Notice of Non-Compliant Work. A Notice of Non-Compliant Work shall be in writing, shall be dated, shall be signed by the Design Professional, shall be addressed to the Contractor with a copy to the Owner, and shall contain three elements as follows:

3.4.1.1.1 Description of Work.



- (a) that has been omitted or
- (b) that is unexecuted as of the date of the Notice of Non-Compliant Work, the time for its incorporation into the work as planned in the Overall Project Schedule having expired, or
- (c) that has not been executed in accordance with the methods and materials designated in the Contract Documents.

3.4.1.1.2 Contract References: Citation of the provision or provisions of the Contract Documents which specify the Work to be executed.

3.4.1.1.3 Time for Compliance. Fixing of a reasonable space of time within which the Contractor shall have made good the deficiency (which said space of time shall not be deemed to be an extension of Contract Time) for filing the Notice of Readiness for Inspection for Material Completion pursuant to Article 6.3.2 nor shall it be deemed to be authorization for amendment to the Overall Project Schedule.

3.4.1.2 Failure to Supply Workmen or Materials or to Prosecute the Work. A Notice of Non-Compliant Work may be issued for failure of the Contractor to supply enough workers or enough materials or proper materials to prosecute the Work. A Notice of Non-Compliant Work in such event may be based on Article 3.3.2 (Competent Management of Time), and upon the definition of Work as set forth under Paragraph 1.1.9.58.

3.4.1.3 Removal and Making Good of Non-Compliant Work. The Contractor shall remove from the Site within the space of time designated in Notice of Non-Compliant Work all work determined by the Design Professional as failing to conform to the contract, whether incorporated in the work or not, and the Contractor shall promptly replace and re-execute the work in accordance with the Contract and without expense to the Owner and shall bear the expense of making good all work of other contractors destroyed by such removal or replacement. The Contractor shall supply any omitted work and perform all unexecuted work within the space of time fixed by the Design Professional in Notices of Non-Compliant Work.

3.4.1.4 Remedy of the Owner for Breach of Notice of Non-Compliant Work.

3.4.1.4.1 Failure to Make Good a Deficiency. If the Contractor does not make good a deficiency within a reasonable space of time fixed in a Notice of Non-Compliant Work, the Owner may do any of the following:

(a) Remove the Non-Compliant Work and store it at the expense of the Contractor. If the Contractor does not pay the expenses of such removal and storing within ten days after receipt of written demand of the Owner, the Owner may upon three days' notice in writing to the Contractor sell such materials at private sale or at auction and shall account for the net proceeds thereof after deducting all proper costs incurred by the Owner.

(b) Supply omitted work, perform unexecuted work, or replace and re-execute work not done in accordance with the methods and materials designated in the Contract Documents, and deduct the cost thereof from any payment then or thereafter due the Contractor. The Design Professional shall approve the amount charged to the Contractor.

3.4.1.4.2 Other Remedies. The remedies stated in this article are in addition to the remedies otherwise available to the Owner, do not exclude such other remedies, and are without prejudice to any other remedies. Time limits stated in Notices of Non-Compliant Work are of the essence of the contract. Unless otherwise agreed to by the Owner in writing, the making good of Non-Compliant work shall physically commence at the Site in not more than seven days after receipt of the Notice of Non-Compliant Work, except that in case of emergency correction shall physically commence at the Site at once, and except that the Contractor shall in any event physically commence the correction at the Site early enough to complete within the space of time allowed in the Notice of Non-Compliant Work. The Owner shall give prompt consideration to reasonable requests for delay in commencement of the making good of Notices of Non-Compliant Work. The making good of Non-Compliant work shall be completed within the space of time allowed in the Notice of Non-Compliant Work unless the Contractor shall have requested from the Design Professional an increase in the amount of time allowed and the Design Professional shall have given notice to the Contractor in writing, with copy to the Owner, stating the additional amount of time, if any, allowed.

3.4.1.5 Notice of Correction from Contractor. The Contractor shall give prompt notice in writing to the Design Professional, with copy to the Owner, upon completion of the correction of the Non-Compliant work. In the absence of such notice, it shall be and is presumed under this Contract that there has been no correction, supplying remedy, or performance of unexecuted work.

3.4.1.6 The Owner's Right to Correct Work. If the Contractor should neglect to prosecute the Work properly or fail to correct Non-Compliant Work or fail to perform any provision of this Contract, the Owner, after three days' written notice to the Contractor, may without prejudice to any other remedy he may have (including without limitation remedies against the Contractor's surety) make good the deficiencies and may deduct the cost thereof from the payment then or thereafter due the Contractor.

3.4.2 Inspections.

3.4.2.1 Access to Work. The Design Professional, the Owner, and their representatives shall have access at all times to the work wherever it is in preparation or progress, and the Contractor shall provide proper facilities for such access and for inspection.

3.4.2.2 Notice of Readiness for Inspection to Design Professional from Contractor Prior to Covering Work. If the specifications, the Design Professional's instructions (either in the specifications or issued later in writing), laws, ordinances or any public authority require any work to be specially tested or approved, the Contractor shall give the Design Professional timely notice in writing of its readiness for inspection. If the inspection is by any authority other than the Design Professional, the Contractor shall give timely notice of the date fixed for such inspection. Inspections by the Design Professional shall be made promptly and, where practicable, at the source of supply.

3.4.2.3 Fire Marshal Inspections.

3.4.2.3.1 General. The State Fire Marshal may make inspections at any time. It shall be the responsibility of the Contractor to request an inspection at eighty percent completion and at 100% completion and to give notice when all items on the 100% inspection report have been completed. Requests shall be in writing with a copy to the Owner and Design Professional.

3.4.2.3.2 Inspections Defined. The basic definitions for eighty percent and 100% inspections are as follows:

(a) Eighty Percent Inspection: The structural components are in place and open for review of the fire safety components. NOTE: Structural components include the following: fire walls, vertical shafts, stairways, smoke stops, hazardous area separation, roof and ceiling assemblies, corridor and door width, and HVAC system.

(b) 100% Inspection: The Contractor has completed all of the items on the eighty percent inspection report and has the certificate of occupancy in hand.

3.4.2.4 False Start. In the event the Contractor shall have issued notice of readiness prematurely, his action shall be deemed to be a "false start." The Contractor shall be liable for the damage resulting from the aforesaid false start, including, but not limited to, the salary, professional fees, and travel and living expenses of the person or parties inconvenienced by the aforesaid false start.

3.4.2.5 Certificate of Occupancy. The Contractor's obligation under the Contract is to install the Work in accordance with the Contract Documents, obtain the Certificate of Occupancy from the State Fire Marshal or his deputy, and forward it to the Design Professional as a part of the final close out procedures. The Design Professional's obligation is to design the Work to comply with the applicable codes and to qualify for a Certificate of Occupancy.

3.4.3 Covering and Uncovering Work.

3.4.3.1 Re-examination or Re-testing of Work Covered Pursuant to Consent of Design Professional. Re-examination or re-testing of questioned Work previously covered pursuant to consent of the Design Professional may be ordered by the Design Professional. If so ordered the Work must be uncovered by the Contractor. The Owner shall pay the cost of re-examination and replacement or of re-testing if such Work is found in accordance with the Contract Documents. The Contractor shall pay such cost if such Work is found not in accordance with the Contract Documents unless the Contractor can show that a Separate Contractor caused the defect in the Work. In that event, the Owner shall pay such cost. Re-examination or re-testing under the terms of this Paragraph applies only to Work that has been covered with consent of the Design Professional. Work covered without consent of the Design Professional must be uncovered for examination as provided below.

3.4.3.2 Re-examination or Re-testing of Work Covered Without Consent of Design Professional. If any Work should be covered without approval or consent of the Design Professional or contrary to any provision of the Contract Documents, such Work must be uncovered for examination by the Design Professional at the Contractor's expense. The Contractor shall be liable for the costs resulting from the aforesaid uncovering, including, but not limited to, the salary, professional fees, and travel and living expenses of the person or parties inconvenienced thereby.

3.4.4 Inspection Does Not Relieve Contractor. Under the Contract Documents, the Contractor acknowledges that it has the responsibility for furnishing all services, labor, supplies, and materials for the entire Work in accordance with such documents. No provisions of this article nor any inspection of the Work by the Owner, representatives of the Owner, the Using Agency, Contract Compliance Specialist, clerk-of-the-works, engineers employed by the Design Professional, representatives of the Design Professional, or the Design Professional shall in any way diminish, relieve, or alter said responsibility and undertaking of the Contractor. Neither shall the omission of any of the foregoing to discover or to bring to the attention of the Contractor the existence of any Work or materials injured or done not in accordance with said Contract Documents in any way diminish, relieve, or alter such obligation of the Contractor, nor shall the aforesaid omission diminish or alter the rights or remedies of the Owner as set forth in the Contract Documents. The Contract Compliance Specialist has no power to make decisions, to accept or reject work, or to consent to the covering of Work. The Contract Compliance Specialist owes no duty to the Contractor.

PART 5 – SUBCONTRACTORS, TRADE CONTRACTORS, AND SUPPLIERS,

3.5.1 Subcontractors, Trade Contractors, and Suppliers.

3.5.1.1 Submission of List. Within fourteen days of the Effective Date of the Contract, the Contractor shall submit in writing to the Design Professional a list of the names of Subcontractors that the Contractor intends to employ on the Work. The list of Subcontractors is not submitted for approval but is for the purpose of establishing the following:

3.5.1.1.1 What trades and portions of the work are to be performed under subcontract, and,

3.5.1.1.2 The names of the parties selected by the Contractor to perform work by subcontract, the aforesaid selection being a matter lying solely within the discretion of the Contractor.

3.5.1.1.3 The Contractor shall identify each minority owned and each female owned Trade Contractor and Subcontractor or Supplier performing work on or supplying material to the project.

3.5.1.1.4 By not later than the tenth day of the month following the end of each quarter the Contractor shall submit to the owner a list of all minority and female owned Subcontractors, Trade Contractors, or Supplier performing work on or supplying material to the Project and the amount paid to each for that quarter.

3.5.1.2 No Approval of Subcontractors, Trade Contractors, and Suppliers. Neither the Owner nor the Design Professional undertakes to pass upon or approve any Subcontractor, Trade Contractor, or supplier.

3.5.2 Representation of Contractor. The Contractor represents that the Subcontractors, Suppliers, and Trade Contractors selected by it are reputable, skilled, reliable, competent, qualified in the trade or field in which they are to perform on the Project, and thoroughly familiar with the codes and laws applicable to their work.

3.5.3 Contractor Responsible for Acts and Omissions. The Contractor agrees that he is as fully responsible for the acts and omissions of his Subcontractors, Trade Contractors, Suppliers, and employees, and further of all persons directly or indirectly employed by them, as the Contractor is for the acts and omissions of employees and persons directly employed by the Contractor. The failure of a Subcontractor, Trade Contractor, supplier, or employee to perform shall not be asserted by the Contractor as an excuse for any omission from or noncompliance with requirements of the Contract Documents; nor shall the Contractor be entitled to an extension of time solely because of failure of a Subcontractor, Trade Contractor, supplier, or employee to perform. The subcontracting of work does not relieve the Contractor of the responsibility for the execution of the work and for compliance with all requirements of the Contract Documents. The Contractor shall not assert negligence, inefficiency, insolvency, bankruptcy, or incompetence of any Subcontractor, Trade Contractor, supplier, or employee as excuse for the existence of any noncompliance with or omission to fulfill any obligation under the Contract either as to timely performance or as to compliance with methods and materials designated in the Contract Documents; nor shall the Contractor assert nonperformance of a Subcontractor, Trade Contractor, supplier, or employee as excuse for the existence of any noncompliance with or omission to fulfill any obligation under the Contract. As to Subcontractor, Trade Contractor, supplier, and employees of the Contractor, the doctrine that a principal is liable for the acts and omissions of his agent shall be binding on the Contractor in his relationship to the Owner, and the Contractor may not reverse the aforesaid doctrine by contract or legal mechanism.

3.5.4 No Contract between Owner and Any Subcontractor, Trade Contractor, Supplier, or Employee. Nothing contained in the Contract Documents shall create any contractual relation between the Owner and any Subcontractor, Trade Contractor, Supplier, or employee of the Contractor or its Subcontractors..

3.5.5 Relationship of Contractor With Subcontractors, Trade Contractors, and Suppliers.

3.5.5.1 Obligations of Each. The Contractor agrees to bind every Subcontractor, Trade Contractor, Supplier (hereinafter collectively referred to as "Subordinate Contractor") to the terms of the Contract Documents insofar as they are applicable to its work, including the following provisions of this Article:

3.5.5.1.1 The Contractor Agrees:

- (a) To be bound to the Subordinate Contractor by all the obligations that the Owner owes to the Contractor under the Contract Documents.
- (b) To pay the Subordinate Contractor upon the payment of certificates issued under the schedule of values described in the General Conditions the amount allowed to the Contractor on account of the Subordinate Contractor's work to the extent of the Subordinate Contractor's interest therein within seven days of receipt of payment from the Owner; provided, however, that retainage shall be released to the Subordinate Contractor as provided by law and in accordance with the statutory affidavit set forth in Section 7, Forms.
- (c) To pay the Subordinate Contractor upon the payment of certificates issued otherwise than the schedule of values such manner that at all times the Subordinate Contractor's total payments shall be as large in proportion to the value of the work done by the Subordinate Contractor as the total amount certified and paid to the Contractor is to the value of the work done by the Subordinate Contractor.
- (d) To pay the Subordinate Contractor a just share of any property insurance money received by the Contractor and due to Subordinate Contractor for work performed by Subordinate and paid for by insurance.
- (e) That no claim for services rendered or materials supplied or other matters by the Contractor against the Subordinate Contractor shall be valid unless written notice thereof is given by the Contractor to the Subordinate Contractor prior to or during the first ten days of the calendar month following that in which the Contractor determines that the claim is chargeable against that Subordinate Contractor.
- (f) To give the Subordinate Contractor, upon its request, an opportunity to be present with Contractor and to submit evidence in any dispute involving rights of the Subordinate Contractor.

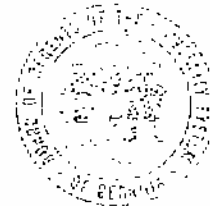
3.5.5.1.2 The Contractor Agrees to require its Subcontractors to do the following:

- (a) To be bound to the Contractor by the terms of the Contract Documents and to assume toward the Contractor all the obligations and responsibilities that the Contractor by the aforesaid documents assumes toward the Owner.
- (b) To submit to the Contractor applications for payment in such reasonable time as to enable the Contractor to apply for payment under these General Conditions.
- (c) To make all claims for extras, for extensions of time or for damages to the Contractor in the manner provided in the General Conditions for like claims by the Contractor upon the Owner, except that the time for making such claims to the Contractor is within ten days after the initial event leading to the claim.
- (d) To pay their Subordinate Contractors upon the payment of certificates issued under the schedule of values described in the General Conditions the amount allowed on account of such Subordinate Contractor's work to the extent of such Subordinate Contractor's interest therein within seven days of its receipt of payment; provided, however, that retainage shall be released as provided by law and in accordance with the statutory affidavit set forth in Section 7, Forms.
- (e) To pay their Subordinate Contractors upon Subcontractor's receipt of payment such that at all times their Subordinate Contractors' aggregate payments shall be in proportion to the Work performed by each of the Subordinate Contractors.

3.5.5.2 Owner Not Obligated to Any Subcontractor, Subordinate Contractor, Trade Contractor, or Supplier. There is no obligation on the part of the Owner to pay to or to see to the payment of any sums to any Subcontractor, Subordinate Contractor, Trade Contractor, Supplier, laborer, employee, or person supplying labor, materials, machinery or equipment to the Project.

3.5.5.3 Term "Substantial Completion" Deleted. The term "substantial completion," if found, is hereby deleted and is of no force in all Subcontracts, Trade Contracts, and in the Trade Sections of the Contract Documents. In certain contexts, the term may be superseded by the term "Material Completion" as defined in this Contract.

3.5.5.4 Failure to Incorporate Terms in Subcontracts. The Contractor agrees that failure on his part to incorporate this Article 3.5.5 in all Subcontracts, Trade Contracts, or Supplier contracts, is a material breach of an essential covenant of this Contract, and further agrees that in the event of such breach the Contractor shall, within five days after demand of the Owner, furnish proof in writing that the deficiency has been remedied to the end that (1) the Contractor may not maintain that it is beyond his competence to require performance of terms of the contract by a subcontractor and (2) no subcontractor may maintain that he has not assumed toward the Contractor all the obligations and responsibilities that the Contractor has assumed toward the Owner. Failure on the part of the Contractor to effect remedy as above within five days after receipt of written demand of the Owner shall be grounds for issuance of a declaration of default by the Owner.



SECTION 4 – COMPENSATION

PART 1 - GENERAL

4.1.1 Payments. The Owner will make progress payments to the Contractor in accordance with Section 4 of the General Conditions. Final Payment will be made in accordance with Section 6 of the General Conditions. The date and amount of payment are subject to Section 4, Part 2. Sums retained by the Owner remain the property of the Owner until such time as the Contractor shall have become entitled to receive such payment pursuant to Section 6 of the General Conditions by furnishing the remainder of the Work and services required by the Contract Documents.

4.1.2 Application for Payments.

4.1.2.1 Form of Application. The Contractor shall periodically submit to the Design Professional an Application for Payment on the form set forth in Section 7 (sometimes called a "Periodical Estimate") for each payment requested, and, if requested by the Owner or Design Professional, shall attach backup materials including, but not limited to, receipts or other vouchers showing his payments for materials and labor, including payments previously made to Subcontractors.

4.1.2.2 Initial Breakdown and Periodical Payments. Each Application for Payment shall be submitted at least ten days before each payment falls due, and the Contractor shall, before the first application, submit to the Design Professional a Schedule of Values of the various parts of the work, including quantities, aggregating the total sum of the Contract, divided in the same manner set forth in the Application for Payment Form set forth in Section 7 showing the Contractor's right to the payment claimed and so arranged and so itemized as to meet the approval of the Design Professional and, further, if requested, supported by such evidence as to its correctness as the Design Professional may direct.

4.1.2.3 Materials Stored. If the Application for Payment includes materials delivered and suitably stored at the Site but not incorporated in the work, they shall, if required by the Owner or the Design Professional, be conditional upon submission by the Contractor of bills of sale or such other procedure as will establish the Owner's title to such material or otherwise adequately protect the Owner's interest. The Contractor is responsible for the existence, protection, and, if necessary, replacement of materials until execution of the Final Certificate of the Design Professional. The Owner shall not pay for any materials stored off-site.

4.1.2.4 Retainage.

4.1.2.4.1 Withholding of Retainage; Conversion to Lump Sum. Retainage shall be withheld from each periodic payment to the Contractor in the amount of ten percent of the sum of the total amount earned for work-in-place (original Contract), total amount earned for work-in-place (Change Orders), and Value of Materials stored at the Site. After one-half of the Contract Sum, including Change Orders, becomes due and the Work meets all of the following conditions:

- (a) On or ahead of the Overall Project Schedule; and
- (b) There are no breaches of Notices of Non-Compliant Work; and
- (c) There is no delinquency in the completion of work and filing of the final breakdown and accounting pursuant to any Change Orders utilizing a Force Account;

then, if the Contractor requests and the Design Professional approves in writing, the sum being withheld as retainage will be converted to a lump sum and held by the Owner until Material Completion.

4.1.2.4.2 Reinstatement of Retainage. The Owner will withhold no further retainage from payments to the Contractor unless one or more of the following events occur:

- (a) The percentage of work complete falls behind the percentage required by the Overall Project Schedule by as much as five percent; or
- (b) The Contractor breaches a Notice of Non-Compliant Work; or
- (c) The Contractor becomes delinquent in regard to the filing of the final breakdown and accounting pursuant to any Change Orders utilizing a Force Account;

in which event or events the Owner shall reinstate the ten percent retainage on all Applications for Payment due to be paid while one or more of the events continues to exist. The Contractor will be given written notice of the reinstatement of the retainage.

4.1.2.4.3 Reconversion to Lump Sum. If the Contractor subsequently:

- (a) Recovers all lost time and puts the work back on schedule; and
- (b) Remedies all breaches of Notices of Non-Compliant Work; and
- (c) Supplies a proper breakdown and accounting pursuant to any Change Orders utilizing a Force Account;

then the sums withheld while either or all of the events existed will be again converted to a lump sum.

4.1.2.5 Subcontractor's Retainage Release. At the discretion of the Owner and request by Contractor, an amount equal to the subcontract retainage of a Subcontractor may be separately released from the retainage held by the Owner as he completes his work. An application in accordance with the Owner's specimen (See Section 7, Forms) for release of a Subcontractor's retainage shall contain a release of all claims by the Subcontractor and shall bear the original certificates of the Subcontractor, the Contractor, and the Design Professional that the Subcontractor's work has been fully performed and that the sum for which payment is requested is due by the Contractor to the Subcontractor. Checks releasing a Subcontractor's retainage shall be made payable to the Contractor, the Contractor's surety, and the Subcontractor and shall be mailed to the Contractor's surety. This article does not create any contractual relationship between the Owner and the Subcontractor or any duty of the Owner to any Subcontractor.

4.1.2.6 Accounting Format. Applications for Payment shall be broken down by CSI Category and, in certain situations, by CSI Description and capital asset category, as set forth in the form for Application for Payment. The purpose is to provide appropriate backup documents for the Contractor's Final Certification of Costs in conformance with GASB 34 accounting standards. See Section 7 – Forms, "Application for Payment" and Final Certification of Costs.

4.1.3 Processing of Application for Payment (Periodical Estimates). The Contract Compliance Specialist (CCS) will review the Application for Payment prepared and executed by the Contractor and, if he concurs, execute a certificate on the face of the Application for Payment as to its accuracy. The Design Professional shall visit the Site after the Contractor and CCS have agreed on the Application for Payment and conduct such inspections and reviews as are necessary to make a decision as to the accuracy of the Application for Payment. If the CCS and the Contractor cannot agree on the appropriateness of the Application for Payment in question, the Design Professional shall make a decision. Upon determining the appropriateness of the Application, the Design Professional shall execute the certificate on the Application for Payment and forward it to the Owner for payment. Not later than seven days after receipt of the Application for Payment, the Design Professional shall issue its certificate for such amount as it decides to be properly due or state in writing its reasons for withholding any sums in its certificate.

4.1.4 Effect of Design Professional's Certificate on an Application for Payment. No certificate issued by the Design Professional, nor payment made to the Contractor by the Owner, or partial or entire use or occupancy of the Work by the Owner shall be an acceptance of any work or materials not in accordance with the Contract Documents.

4.1.5 Payment Due. Payment of an Application for Payment shall be due ten days after receipt by the Owner of the certification of the Application for Payment by the Design Professional.

4.1.6 Payment Due Dates and Interest. Should the Owner fail to pay a proper invoice within thirty calendar days of receipt, the Contractor shall notify the Owner in writing by certified or statutory mail. If the Owner fails to pay within five business days of receipt of the notice, the Contractor shall receive, in addition the sum named in the proper invoice, interest thereon at the rate of one half percent per month on the unpaid balance as may be due.

4.1.7 Payments for Change Order Work. Payments will not be made for any changes in the Work until a Change Order has been executed.

PART 2 – PAYMENTS WITHHELD

4.2.1 Payments Withheld.

4.2.1.1 Payments Withheld or Nullified. The Design Professional or the Owner may withhold or, on account of subsequently discovered evidence, nullify the whole or a part of any certificate to such extent as may be necessary to protect the Owner from loss because of the following conditions:

- (a) Defective work not remedied.
- (b) Claims or liens filed
- (c) Failure of the Contractor to make payments properly to Subcontractor or Supplier for materials or labor.
- (d) A reasonable doubt that the Contract can be completed for the balance then unpaid.
- (e) Damage to a Separate Contractor or to the Owner or a third party.
- (f) Failure to maintain a rate of progress consistent with the Milestones.
- (g) Failure to supply enough skilled workers or proper materials.
- (h) Court ordered retention.
- (i) State Tax Forms not on file.
- (j) Breach of this Contract

4.2.1.2 Withheld Payments Restored. When the conditions above are remedied, payment shall be made for amounts withheld because of them.

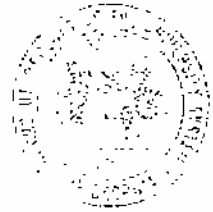
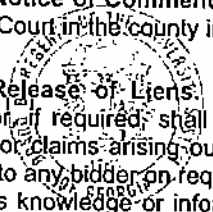


PART 3 - LIENS

4.3.1 Public Property Not Subject to Lien. The Contractor acknowledges that, pursuant to law, the Site is public property of the State of Georgia and is not subject to lien or levy. The Contractor will notify the Owner of any liens or levies against the Site of which it becomes aware. The Contractor shall cooperate with the Owner and shall use its best efforts to assist in securing the release of any liens or levies of which it becomes aware.

4.3.2 Notice of Commencement. A Notice of Commencement shall be filed by the Contractor with the Clerk of the Superior Court in the county in which the Project is located, pursuant to O.C.G.A. §13-10-62.

4.3.3 Release of Liens. Neither any part of the retainage nor the Final Payment shall become due until the Contractor, if required, shall deliver to the Owner a complete release of all liens or conditional release of lien upon payment of claims arising out of this contract in accordance with the Owner's specimen form (a copy of which will be provided to any bidder on request), or receipts in full in place thereof and, if required in either case, an affidavit that so far as he has knowledge or information the releases and receipts include all labor and materials for which a lien or claim could be filed; but the Contractor may, if any Subcontractor or claimant refuses to provide a release, furnish a bond satisfactory to the Owner to indemnify the Owner against any lien or claim. If any lien or claim remains unsatisfied after all payments are made, the Contractor shall refund to the Owner all monies that the latter may be compelled to pay in discharging such lien or claim, including all costs and reasonable attorney's fees.



SECTION 5 – CONTRACT ADJUSTMENTS, DISPUTES, AND TERMINATION

PART 1 – OWNER'S RIGHT TO SUSPEND OR STOP WORK

5.1.1 Owner's Right to Suspend Work. The Owner reserves the right, with or without the concurrence of the Design Professional, to suspend the Work at any time or from time to time at the Owner's sole discretion, upon giving Contractor five days advanced written notice thereof. If the Owner exercises this right and then resumes the Work covered hereby, Contractor shall be entitled upon timely claim to a Change Order for payment by Owner of any reasonable Actual Costs actually incurred by Contractor in connection with the suspension and resumption of the Work, as well as an extension in the time for performance of the Work to the extent Contractor is delayed by Owner's suspension, to include compensation based upon the rate for Time Dependent Overhead Costs. The Design Professional shall determine the time, which shall be binding upon both Owner and Contractor, as set forth in Section 3, Part 3.

5.1.2 Owner's Right to Stop Work. The Owner reserves the right, for itself and for any designated Construction Inspector retained by Owner, upon observation of apparent nonconforming Work, to immediately stop the affected Work. If the Work is later determined by the Design Professional to be in fact conforming Work, then Contractor shall be entitled upon timely claim to a Change Order for payment by Owner of any reasonable Actual Costs actually incurred by Contractor in connection with the stop Work order and resumption of the Work, as well as an extension in the time for performance of the Work to the extent Contractor is delayed by Owner's stop Work order. The Design Professional shall determine the time, which shall be binding upon both Owner and Contractor, as set forth in Section 3, Part 3.

5.1.3 Owner's Rights Independent from Rights and Duty of the Design Professional. The rights granted to Owner under this Article are independent of the duty and obligation of the Design Professional to stop the Work for non-compliant work or to issue Notices of Non-Compliant Work.



PART 2 – CONTRACT ADJUSTMENTS AND DISPUTES

5.2.1 General Provisions.

5.2.1.1 No Arbitration. There is no agreement to arbitrate any dispute arising under the Contract Documents. Any and all references to arbitration in any of the Contract Documents, including without limitation any exhibits, attachments or references, are hereby deleted and rendered null and void.

5.2.1.2 Continuation of the Work. Unless otherwise agreed in writing, and notwithstanding any other rights or obligations of either of the parties under any Contract Documents or Contracts, the Contractor must carry on with the performance of its contract services and the Work, including all duties and obligations hereunder, during the pendency of any Claim, dispute, and other matter in question or during any alternative dispute resolution proceeding, court proceeding, or other proceeding to resolve any Claim, dispute, and other matter in question, and the Owner will continue to make payments in accordance with the Contract Documents. The Owner, however, is under no obligation to make payments on or against such Claims, disputes, and other matters in question during the time required to resolve such Claims, disputes, and other matters in question.

5.2.2 General Claims for Contract Adjustments and Disputes.

5.2.2.1 General Claims of the Contractor. Should the Contractor suffer any injury or damage to person or property that Contractor reasonably believes a legal basis exists for liability on the part of the Owner, Program manager, or Design Professional, and that should result in an adjustment in the Cost of the Work or the Contract Time, such claim shall be made in writing in the form of a Request for Change Order to the Design Professional and copy the owner within fourteen days after such injury or damage is or has been observed. Any and all claims not made within said fourteen days are barred, waived, released, and discharged. The decision of the Design Professional is final and binding on the Contractor unless the Contractor protests the decision of the Design Professional and files a Statement of General Claim as set forth below.

5.2.2.2 Processing of General Claims. All claims must be filed and processed as a request for Change Order and subject to the processes and limitations set forth in Section 3 Part 2. If the requested Change Order is rejected, a protest may be made as set forth in Paragraph 5.2.2.3 below.

5.2.2.3 Protest; Statement of General Claim; Time of Submission. No protest of a claim decision of the Design Professional by the Contractor, whether said claim shall be accrued or prospective, shall be valid unless a "Statement of Claim" in writing and accompanied by vouchers and other supporting data shall have been filed with the Owner's Representative, or if there is no Owner's Representative, with the Owner by the Contractor not later than thirty days after the Design Professional's decision to reject the claim, time being of the essence. The "Statement of Claim" shall contain a concise and clear recital of the grounds and the legal basis upon which the claim is asserted, including a designation of the applicable provisions of the Contract Documents. The Statement of Claim shall indicate the dollar amount of the claim and the number of days of adjustment of the Contract Time. The Owner and Contractor shall endeavor to resolve the dispute in accordance with Article 5.2.3 below.

5.2.2.4 Claims by Subcontractors. No claim or protest shall be made by the Contractor solely on the ground that a Subcontractor, Supplier, or Trade Contractor has made a claim or protest against the Contractor. The Contractor must maintain its claim or protest against the Owner based upon the provisions of the Contract Documents and independent of any right the Subcontractor, Supplier, or Trade Contractor has against the Contractor. The Contractor shall defend the Owner from any claims or protests submitted by a Subcontractor, Supplier, or Trade Contractor asserted in violation of, or contrary to any provision of the Contract Documents.

5.2.3 Dispute Resolution.

5.2.3.1 Initial Dispute Resolution. If a dispute arises out of or relates to this Contract or its breach, the parties shall endeavor to settle the dispute first through direct discussions between the parties' representatives who have the authority to settle the dispute. If the parties' representatives are not able to promptly settle the dispute, they shall refer the dispute to the senior administrators of the parties who have the authority to settle the dispute, who shall meet within fourteen days thereafter. If the dispute is not settled by the senior administrators, the parties may submit the dispute to mediation in accordance with Paragraph 5.2.3.2.

5.2.3.2 Mediation. If the dispute cannot be settled pursuant to Paragraph 5.2.3.1, the parties may elect to submit the dispute to mediation. The parties agree to conclude such mediation within sixty days of electing

mediation. The parties shall select a mutually agreeable mediator and shall share the cost of the mediator equally. Either party may terminate the mediation at any time after the first session, but the decision to terminate shall be communicated directly by the party's representative to the other party's representative and the mediator.

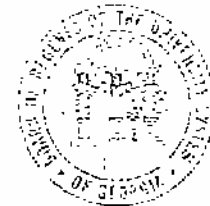
5.2.3.3 Multiparty Proceeding. All parties necessary to resolve a claim shall be parties to the same dispute resolution proceeding and shall share the costs equally. Appropriate provisions shall be included in all other contracts relating to the Work to provide for the consolidation of such dispute resolution procedures.

5.2.3.4 No Litigation. No litigation may be commenced without first following the process in this Article. Action may be filed in the Superior Court in Fulton County, Georgia, pursuant to OCGA §50-21-1, after the filing party provides thirty days written notice to the opposing party.

5.2.4 Certain Claims Excluded from General Claims.

5.2.4.1 All claims for Compensable Delay under Article 3.3.8.

5.2.4.2 All claims for changes to the Work under Article 3.2.12, Article 3.2.13, Article 3.2.14, and Article 3.2.16.



PART 3 - TERMINATION

5.3.1 Owner's Right to Terminate Contract for Convenience.

5.3.1.1 Termination for Convenience. The Owner may at any time, and for any reason or without any reason or cause, terminate this Contract by written notice to the Contractor specifying the termination date, without cause and irrespective of whether or not Contractor is in default of any of its obligations hereunder. The effective date of termination shall not be earlier than seven days from the date of confirmed receipt of the written notice.

5.3.1.1.1 The Contractor shall: (i) stop the Services or the Work (as applicable); (ii) place no further orders or Subcontracts for materials, labor, services or equipment; and (iii) terminate all material and equipment orders and Subcontracts to the extent terminable (unless otherwise directed by Owner in writing) and advise Owner of all materials, equipment and other items which cannot be canceled or which are already delivered and allow Owner to participate in the salvage or disposition thereof.

5.3.1.1.2 If Owner terminates this Contract pursuant to this Section prior to the commencement of the Construction Stage, Contractor shall, as soon as practical after receiving notice of termination under Section 5.3.1.1, submit to Owner an Application for Payment for all services performed through the date of receipt of the notice of termination, for which payment has not been previously made pursuant to the terms of this Contract.

5.3.1.1.3 If Owner terminates this Contract pursuant to this Section after commencement of the Construction Stage, Contractor shall, as soon as practical after receiving notice of termination under Section 5.3.1.1, submit to Owner an Application for Payment showing all of the costs incurred by Contractor in the performance of the Work terminated through the date of receipt of the notice of termination. The phrase "costs incurred by Contractor in the performance of the Work terminated" as used herein shall be deemed to include:

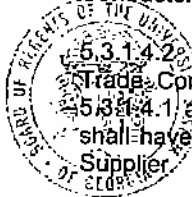
- (i) Subcontract costs of Work completed;
- (ii) Cancellation fees in regard to equipment and materials ordered;
- (iii) Cost of all materials and equipment ordered which cannot be cancelled; less actual proceeds received upon the disposition thereof;
- (iv) Field Work accomplished;
- (v) Permit, engineering, bond and inspection fees;
- (vi) All other direct costs actually incurred by Contractor that can be demonstrated by invoice, canceled check, or other appropriate documentation;
- (vii) General Conditions costs and profit incurred through the date of termination.
- (viii) Job Site and termination costs for ten business days after the date of termination to be paid at the daily rate Time Dependent Overhead Costs.

5.3.1.2, Acceptance of payment by the Contractor shall constitute a waiver of all further claims by Contractor against Owner under the Contract, and shall be Contractor's exclusive remedy for termination of the Contract. Notwithstanding anything to the contrary contained in the Contract Documents, in no event shall Contractor be entitled to any payment on account of accident or lost profits or consequential damages in connection with any termination of the Contract, or otherwise in connection with the Contract.

5.3.1.3 Condition Precedent to Payment. As a condition precedent to receiving the payment set forth in this Article 5.3.1, Contractor shall deliver to the Owner all papers, documents, assignments and agreements relating to the Project, in particular the Contract Documents (including ownership and copyright thereof) as set forth in Article 1.1.7, Paragraphs 1.1.9.17 and 2.2.1.8.

5.3.1.4 Assignment of Rights, Trade, and Subcontracts.

5.3.1.4.1 Assignment. If requested, Contractor shall assign to the Owner or to an entity of Owner's choice any or all of Contractor's contractual rights in respect thereof, so that the assignee shall be fully vested with all rights and benefits of Contractor under such papers, documents and agreements, together with releases and waivers of lien in the same manner as would be required upon Final Completion. The Owner may also request the assignment from Contractor to Owner or to the entity of Owner's choice of any or all Subcontractors and supplier agreements entered into by Contractor and in that event the assignee shall be solely obligated to the Subcontractors and Suppliers under such contracts or agreements for all sums payable thereunder and not previously paid by the Owner to Contractor.



5.3.1.4.2 Cessation of Entitlement. Upon the Contractor's assignment of agreements, contracts, Trade Contracts and/or Owner's payment of monies due Contractor as provided in Subparagraph 5.3.1.4.1 above, Contractor shall be entitled to no further compensation of any kind from Owner and shall have no further obligation with regard to the assigned agreements, contracts, Subcontractors or Supplier.

5.3.2 Owner's Right to Declare Default and/or Terminate Contract for Cause.

5.3.2.1 Termination for Cause. In the event that any provisions of this Contract are violated by the Contractor, through its own forces or by any of its subcontractors, the Owner may serve written notice upon the Contractor and the surety of the Owner's intention to declare default and terminate the Contractor. Unless within ten days after the serving of such notice upon the Contractor, such violation or delay shall cease and satisfactory arrangement of correction be made, the Contractor shall, upon the expiration of said ten days, be in default. Such notices shall outline the reasons for such intention to terminate the contract. In the event of any such default, the Owner shall immediately serve notice thereof upon the surety and the Contractor, and the Owner shall demand that the surety perform in accordance with its bond. If the surety fails to exercise its election under the bond or does not commence performance thereof within the time required by the bond, the Owner may take over the Work and prosecute the same to completion for the account of and at the expense of the Contractor. The Contractor and its surety shall be liable to the Owner for any excess cost to the Owner. The Owner may take possession of and utilize in completing the Work such materials, appliances, and plant as may be on the Site and necessary thereto.

5.3.2.2 Grounds for Issuance of Notice of Declaration of Default. It shall be a sufficient ground for the issuance of a notice of declaration of default that the Contractor has been unfaithful or delinquent in the performance of the Contract or any part of it in any respect. The Design Professional does not have authority to declare the Contractor in default.

5.3.2.2.1 Non-Compliant Work. Without limitation of the foregoing and without subtracting from any right or defense of the Owner under other provisions of the Contract Documents, the Contractor acknowledges and agrees that it is grounds for issuance of a notice of declaration of default under the performance bond if the Contractor shall have neglected or failed for any reason to remedy a breach of a Notice of Non-Compliant Work within thirty days after the Owner shall have given written notice of said breach to the Contractor.

5.3.2.2.2 Failure to Prosecute the Work. If the Contractor refuses or fails, except in cases for which extensions of time are provided, to supply enough properly skilled workmen or proper materials, or if it fails to make proper payment to Subcontractors for materials or labor, or if it fails to diligently prosecute the Work in accordance with the Contract Documents, then the Owner may, without prejudice to any right or remedy and after giving the Contractor and its Surety, after ten days' written notice of the Owner's Intent to Declare Default, during which period the Contractor fails to cure or fails to commence and thereafter diligently prosecute Work necessary to cure the violation, declare the Contractor to be in default.

5.3.2.2.3 Other Failures of the Contractor. If Contractor, without limitation, makes a general assignment for the benefit of its creditors, or if a receiver is appointed on account of its insolvency, or if it persistently disregards laws, ordinances, rules, regulations or orders of any public authority having jurisdiction over the Project, or if it otherwise is guilty of a violation of any provision of this Contract, then the Owner may, without prejudice to any right or remedy and after giving the Contractor and its Surety, if any, ten days written notice of the Owner's Intent to Declare Default, during which period the Contractor fails to cure or fails to commence and thereafter diligently prosecute Work necessary to cure the violation, declare the Contractor to be in default.

5.3.2.3 Owner's Right to Prosecute the Work. Time being of the essence, if the Contractor shall be declared in default, both the Contractor and the Surety agree that the Owner may, after giving the Contractor and Surety the required notice and time under the bond if any is required, without prejudice to any other remedy and without invalidating the performance bond, make good such deficiencies and may deduct the cost thereof from payment due the Contractor or, at the Owner's option and without prejudice to the Owner's rights against the Contractor and Surety, the Owner may terminate the Contractor and take possession of the Site and of all materials, equipment, tools and construction equipment and machinery thereon owned by the Contractor and finish the Work by whatever method the Owner shall deem expedient.

5.3.2.4 Effect of Later Determination. In the event the parties agree or a court of competent jurisdiction determines (or the parties agree to settle with a consent determination) that a default is wrongful or not the fault of the Contractor, the termination shall be considered to be a Termination for Convenience and the sole remedy available to the Contractor shall be the contractual treatment of the termination pursuant to Article 5.3.1 above and without any other damages or relief.

5.3.3 Contractor's Right to Terminate.

5.3.3.1 Contractor's Right to Stop Work. The Contractor may, upon seven days written notice to the Owner and the Design Professional, stop Work without penalty for the following reasons:

5.3.3.1.1 Order of Court or Superior Public Authority. If any court or other superior public authority issues an order that affects the Work and the order results from no act or fault of the Contractor, the Contractor may stop the affected Work. In addition, the Contractor may stop Work as a result of an act of government, such as a declaration of a national emergency, making critical materials unavailable.

5.3.3.1.2 Failure to issue Certificate of Payment. Work may be stopped if the Design Professional should fail to certify any Application for Payment within fourteen days after said certification is due from the Design Professional. This ground terminates upon any payment of the Application for Payment by the Owner.

5.3.3.2 Contractor's Right to Terminate Contract.

5.3.3.2.1 Contractor's Right to Terminate for Nonpayment. If the Owner fails to pay the Contractor when payment is due, the Contractor must give written notice of the Contractor's intention to terminate this Contract. If the Owner fails to provide the Contractor payment or written notice of a dispute as to the amount sought by the Contractor within thirty days after receipt of the Contractor's written notice, the Contractor may terminate this Contract. Upon such termination the Owner will pay the Contractor for the Work properly executed to date, and, upon timely claim therefore, for any proven loss sustained or cost incurred upon any materials, equipment, tools, construction equipment and machinery, and cancellation charges on existing obligations of the Contractor.

5.3.3.2.2 Contractor's Right to Terminate after Stopping Work. After stopping its Work in accordance with Paragraph 5.3.3.1 above, the Contractor may, upon thirty days written notice to the Owner and the Design Professional, terminate this Contract and recover from the Owner payment for all Work executed and any proven loss sustained or incurred upon any plant or any materials, equipment, tools, construction equipment and machinery, and cancellation charges on existing obligations of the Contractor, if the grounds for stopping the Work are not removed.

5.3.4 Limitation on Payments. For terminations pursuant to Article 5.3.2 and 5.3.3, the Contract Sum shall be deemed earned only to the extent of an amount that bears to the total Contract Sum the same ratio that the Work in place

at the time of termination bears to the total Work, as reasonably determined by the Design Professional, and approved by the Owner.

5.3.5 Termination by Owner for Abandonment by Contractor. Both the Contractor and the Surety agree that, after fourteen calendar days' written notice to the Contractor, the Owner may terminate the Contractor if the Contractor abandons the Project. If such termination occurs, the Owner shall credit the Contractor for Work satisfactorily completed, less any costs and liquidated damages the Owner suffers in correcting the Work, re-contracting and starting-up a replacement contractor, and completing the Project, including all warranties.

5.3.6 Notices of Termination. Notwithstanding any other provision of this Contract, no party may terminate this Contract, regardless of reason, unless the terminating party shall first issue a written Notice of Termination or of Default to the terminated or defaulted party by Statutory Mail or Certified Mail, Return Receipt Requested.



SECTION 6 - PROJECT COMPLETION

PART 1 – MATERIAL COMPLETION

6.1.1 Material Completion.

6.1.1.1 Material Completion Defined. Material Completion is when the Work or designated portion thereof is complete in accordance with the Contract Documents so that the Owner and its Using Agency can occupy and utilize the Work for its intended use. Material Completion shall include issuance of any required Health Department inspections and any necessary certificates to operate, certificate of occupancy, as well as complete operation of all applicable building systems including, but not limited to, mechanical, electrical, plumbing, fire protection, fire alarm, security, elevators, life safety, and accessibility. Material Completion occurs when the Work is complete, except for Minor Items or Permitted Incomplete Work or Warranty Complaint Items (see Article 6.6.3), and a Certificate of Material Completion is obtained.

6.1.1.1.1 Material Completion and Occupancy Date. The date designated in the Contract for Material Completion to be achieved.

6.1.1.1.2 Minor Item Defined. A Minor Item is a portion or element of the Work—

- (a) that can be totally complete within thirty days; and
- (b) that can be completed while the Using Agency occupies the Work without impeding or interfering with either the Using Agency's use and occupation of the Work or the Contractor's ability to complete the Minor Item; and
- (c) that will not interfere with the complete use and enjoyment of the project by the Using Agency.

6.1.1.1.3 Permitted Incomplete Work Defined. Permitted Incomplete Work is work that is incomplete through no fault of the Contractor, as determined by the Owner, including, but not limited to, seasonal test and balance, seasonal landscaping, scheduled elevator inspection or maintenance, incomplete work due to failure of Separate Contractors to complete work, and the like.

6.1.1.2 When Material Completion Required. Material Completion shall be achieved within the Contract Time and by the Material Completion and Occupancy Date, as amended. Failure by the Contractor to achieve Material Completion by not later than the Material Completion and Occupancy Date, as amended, shall be sufficient cause for the assessment of Liquidated Damages.

6.1.2 Effect of Achieving Material Completion. Upon the date when Material Completion is actually achieved, the following matters are conclusively determined:

6.1.2.1 Occupancy of the Work. The Using Agency may immediately occupy the Work without restriction.

6.1.2.2 Warranty Periods. All warranties begin to run from the date Material Completion is achieved.

6.1.2.3 Utilities. All utilities become the responsibility of the Using Agency.

6.1.2.4 Insurance. The Using Agency is responsible for all insurance for the Project.

6.1.2.5 Liquidated Damages. The Liquidated Damages daily rate is reduced to zero.

6.1.2.6 Payment for Material Completion. The Contractor may request payment of the remaining contract balance, including retainage, less the amounts credited the Owner or incurred as Liquidated Damages, and less the amounts withheld for the punchlist by reason of Minor Items or Permitted Incomplete Work. See Paragraph 6.5.3.2.

6.1.3 Effect of Failure to Achieve Material Completion. Should Material Completion not be achieved by the Material Completion and Occupancy Date, as amended, the following matters are conclusively determined:

6.1.3.1 Breach of Contract. As time is of the essence in the completion of the Work, the Contractor is in breach of the Contract and is subject to default.

6.1.3.2 Liquidated Damages. Liquidated Damages at the specified daily rate in the Contract begin to accrue and are payable on the day immediately following the Material Completion and Occupancy Date.

PART 2 – FINAL COMPLETION

6.2.1 Final Completion.

6.2.1.1 Final Completion Final Completion shall be evidenced by the Design Professional's Certificate of Final Completion. Final Completion should include completion of Permitted Incomplete Work, as defined in Section 6, Part 1.

6.2.1.2 When Final Completion Required. Minor Items shall be completed as expeditiously as possible, but not later than thirty days after Material Completion of the Work. Permitted Incomplete Work shall be completed as expeditiously as possible, but not later than a date established by the Design Professional. The Design Professional's Certificate of Final Completion shall not be issued until all Minor Items and Permitted Incomplete Work are completed.

6.2.1.3 Deductions for Uncorrected Work. If the Design Professional and Owner deem it inexpedient to correct work not done in accordance with Contract Documents, a deduction from the Contract Sum may be made; but there is no duty on the part of the Owner to accept any work not done in accordance with the Contract Documents.

6.2.2 Effect of Achieving Final Completion. Upon the date when Final Completion is achieved and the Design Professional's Certificate of Final Completion is issued, the following matters are conclusively determined:

6.2.2.1 Project Completion. The Project and the Work are complete.

6.2.2.2 Payment for Final Completion. All amounts withheld from Payment for Material Completion and not previously paid to the Contractor or credited to the Owner, as set forth in Section 6, Part 4, are payable upon receipt of a final pay request from the Contractor.

6.2.3 Effect of Failure to Achieve Final Completion. Should Final Completion not be achieved within the time specified, as amended, the Owner may issue to the Contractor a fourteen-day notice as a final warning to complete the Work. If Final Completion is not achieved by the end of the fourteenth day from the date of the Notice, the following matters are conclusively determined, subject to any request for extension of time as set forth in paragraph 6.2.3.3 below:

6.2.3.1 Breach of Contract. As time is of the essence in the completion of the Work, the Contractor is in breach of the Contract and is subject to default.

6.2.3.2 Ineligibility to Bid Upon State Contracts. The Contractor is ineligible to bid or propose on any contract of the Owner, the Georgia State Financing and Investment Commission, the Board of Regents of the University System of Georgia or any unit of the University System of Georgia, or the Georgia Department of Administrative Services. In the event a bid has been submitted but the bid award has not been made, the Contractor's ineligibility requires that its bid be rejected.

6.2.3.2.1 Automatic Restoration of Eligibility to Bid. The Contractor's eligibility to bid upon state contracts shall be restored automatically as of the date of achievement of Final Completion as evidenced by the Certificate of Final Completion.

6.2.3.2.2 Application to Reinstate Eligibility to Bid. If the Contractor never achieves Final Completion, the Contractor's eligibility to bid or propose on state contracts may be reinstated upon the following:

- (a) Not earlier than eighteen months after the date of failure to achieve Final Completion, a written application requesting reinstatement of eligibility to one of the following: the Director, Construction Division, GSFIC; the Vice Chancellor for Facilities, Board of Regents; or the Commissioner, Department of Administrative Services; and
- (b) The showing of good and just cause to believe that the actual achievement of Final Completion was impossible, or the showing of other good and just cause that the Contractor's eligibility should be reinstated.
- (c) The Contractor may request a personal presentation in the application.

6.2.3.3 Extension of Time for Final Completion. The Contractor may file a request for an additional extension of time in the manner prescribed in Section 3, Part 3, and the effects of Failure to Achieve Final Completion shall be suspended until the Design Professional's decision. Should the Design Professional grant the application for extension of time generally, the time for achieving Final Completion shall be adjusted accordingly. Should the

Design Professional grant the application for extension of time for a specific item of Work, that item of Work shall be deemed Permitted Incomplete Work with a specific individual final completion date.



PART 3 – INSPECTIONS FOR COMPLETION OF THE WORK

6.3.1 General Responsibility of the Contractor for Inspection. The Contractor acknowledges and agrees that it has an indivisible, non-delegable, and nontransferable contractual obligation to the Owner to make its own inspections of the Work at all stages of construction; and it shall supervise and superintend performance of the Contract in such manner as to enable it to confirm and corroborate at all times that all work has been executed strictly in accordance with the methods and materials designated in the Contract Documents. The Contractor's inspections are also for the purpose of permitting the Contractor to accurately represent that (a) its certifications on Applications for Payment are true and correct and (b) its notices of readiness for inspections are true and correct. Accordingly, the Contractor acknowledges and agrees that it may not defend or excuse any deviation from the Contract Documents on the ground (a) that another person or party failed to bring the deviation to its attention, or (b) that any Subcontractor is at fault.

6.3.2 Notice of Readiness for Inspection for Material Completion.

6.3.2.1 Preparation of Initial Punchlist. Prior to the Material Completion and Occupancy Date, as amended, the Contractor shall correct all non-compliant or incomplete work. The Contractor shall then prepare an initial punchlist itemizing to the best of the Contractor's knowledge all Minor Items and Permitted Incomplete Work (as defined in Section 6, Part 1) and provide a copy of the initial punchlist to the Design Professional and Owner. The Contractor is encouraged to consult with the Design Professional prior to finalizing the initial punchlist, in particular in arriving at consensus for Minor Items and Permitted Incomplete Work.

6.3.2.2 Contractor's Notice of Readiness for Inspection for Material Completion. After or simultaneously with the provision of the initial punchlist, the Contractor shall give the Design Professional and Owner written Notice of Readiness for Inspection for Material Completion in the following words:

The work on the Contract for the [show name of Project as it appears in the Contract] having been materially completed, I request that the Design Professional perform an inspection for Material Completion promptly in accordance with Section 6 of the General Conditions. I have attached the initial punchlist.

6.3.2.3 No Inspection without Notice. No inspection for Material Completion shall be made until such time as the Design Professional and Owner have received notice in the form indicated above. In the event the Contractor shall have issued the Contractor's Notice of Readiness for Inspection for Material Completion prematurely, the Contractor shall be liable for the damage resulting therefrom, including but not limited to the salaries, professional fees, travel expenses, and living expenses of the persons or parties inconvenienced thereby.

6.3.2.4 Additional Requirements for Inspection for Material Completion. The Contractor shall not request any inspection for Material Completion before the Contractor has provided to the Design Professional the following:

6.3.2.4.1 a copy of the initial test and balance report on the heating, ventilating, and air conditioning system;

6.3.2.4.2 a copy of the facility operation and maintenance instructions, and any other documents specified by the Design Professional in Division 1 of the Specifications; and

6.3.2.4.3 A certification from the Contractor that all building systems specified in Paragraph 6.1.1.1 above are operational. The Contractor expressly agrees that obtaining the manufacturer's warranties are solely the responsibility of the Contractor. In fulfilling this responsibility, the Contractor shall obtain the manufacturer's certificates in the format specified in Section 7 below, and shall coordinate the initial start-up and testing of building systems. In all cases where the equipment of two or more manufacturers ties in and functions together, the Contractor shall require the manufacturers' field representatives to perform simultaneously the initial start-up, the testing, and the placing of their equipment into operation. "Start-up" is defined as putting the equipment into action. "Testing" is defined as performing such testing as is stipulated in the Contract Documents to be performed. "Placing into operation" is defined as operating the equipment for a sufficient period of time to determine that it is performing properly.

6.3.3 Conducting the Inspection for Material Completion. The Design Professional shall conduct the Inspection for Material Completion within seven days of receipt of the notice specified in Paragraph 6.3.3.2. The Design Professional shall confirm the initial punchlist, shall add or delete Minor Items or Permitted Incomplete Work as appropriate, shall assign values to each item on the punchlist, and shall assign completion dates for the items of Permitted Incomplete Work. At the completion of the Inspection for Material Completion, the resulting punchlist shall be finalized by the Design Professional and provided to the Contractor within five days and shall become the final punchlist. Upon determination of conformity with the definition of Material Completion as specified in Section 6.1.1.1 above, the Design Professional shall issue a Certificate of Material Completion.

6.3.4 Notification of Using Agency of Site Visits by the Contractor or Subcontractors. Following the issuance of a Certificate of Material Completion, the Contractor or its Subcontractors shall not visit the Site without first giving notice to the Using Agency and the Owner.

6.3.5 Contractor's Notice of Readiness for Interim Inspection for Punchlist Completion. Not more than thirty days after Material Completion, and upon completion of the Final Punchlist (including all Minor Items and such Permitted Incomplete Items as are due to be completed), the Contractor shall give the Design Professional and Owner written notice requesting inspection for Final Completion in the following words:

The work on the Contract for the [show name of Project as it appears in the Contract] having been 100% completed, except for Permitted Incomplete Work not yet due to be completed, I request that the Design Professional perform an Inspection for Final Completion promptly in accordance with Section 6 of the General Conditions.

No inspection for Interim Inspection for Punchlist Completion shall be made until the Design Professional and the Owner have received notice in the form indicated above. In the event the Contractor shall have issued the Contractor's Notice of Readiness for Interim Inspection for Punchlist Completion prematurely, the Contractor shall be liable for the damages resulting therefrom, including but not limited to the salaries, professional fees, travel expenses, and living expenses of the persons or parties inconvenienced thereby.

6.3.6 Conducting the Interim Inspection for Punchlist Completion. The Design Professional will conduct the Inspection for Final Completion. The Design Professional will confirm the final punchlist has been completed including all Minor Items. Upon completion of the inspection, the Design Professional will issue a Report of Interim Inspection, noting any Permitted Incomplete Work that remains to be accomplished and the date by which it is to be completed. In the event all Permitted Incomplete Work has been completed at the time of this Interim Inspection, and the Design Professional so certifies, then this inspection shall be deemed an Inspection for Final Completion. In the event any Minor Item is determined to be incomplete, the Owner may give the fourteen-day notice of failure to complete the Work, as set forth in Article 6.2.3.

6.3.7 Conducting the Inspection for Final Completion. When all Permitted Incomplete Work has been completed or scheduled for completion, the Owner shall call for and the Design Professional shall schedule the Final Inspection with the Owner and Contractor. The Design Professional shall conduct the Inspection for Final Completion and shall confirm that all Permitted Incomplete Work has been completed. Then the Design Professional shall issue the Certificate of Final Completion and Final Payment and any remaining funds may, upon an Application for Payment, be paid to the Contractor. Any Final Documents not yet submitted must be submitted with the Application for Final Payment. In the event any item of Permitted Incomplete Work is determined to be incomplete and the date for its completion has passed, the Owner may give the fourteen-day notice of failure to complete the Work, as set forth in Article 6.2.3.

PART 4 – FINAL DOCUMENTS

6.4.1 Final Documents.

6.4.1.1 Final Documents Defined. Final Documents consist of all documents set forth in Division 1 of the specifications, as well as all warranties and guarantees required by the Contract Documents.

6.4.1.2 Minimum Specific Final Documents Required. Prior to submission of the Application for Payment for Material Completion, all Final Documents, including but not limited to the following, must be submitted to the Owner and Using Agency:

6.4.1.2.1 Affidavits.



- (a) A Non-Influence Affidavit in the exact form as shown in Section 7, Forms.
- (b) A Statutory Affidavit in the exact form as shown in Section 7, Forms. Any exceptions to the Statutory Affidavit are subject to the approval of the Owner.

6.4.1.2.2 Bonds.

- (a) A Five-Year Bond for Roofs and Walls as shown in Section 7, Forms, written by a surety authorized to do business in the State of Georgia and in the penal sum of the actual cost of the exterior walls, wall cladding, wall components, wall insulation, roof insulation, roof deck and roof but not less than the amount shown as in the approved initial breakdown for these roof systems and wall systems.
- (b) Any Bonds to Discharge Claim issued to Subcontractors and Suppliers as shown in Section 7, Forms.

6.4.1.2.3 Marked-up Construction Documents. The Contractor shall provide a complete set of Marked-up Contract Documents to the Design Professional, which set shall reflect all changes caused by RFIs, field changes, Change Orders, or observed changes by the Contractor or subcontractor(s) for the purpose of the Design Professional's issuance of Record Documents to the Owner.

6.4.1.2.4 Operation and Maintenance Data and Instructions and Training. The Contractor shall furnish proper written instructions to the Owner and Using Agency on operation and maintenance of all mechanical and electrical equipment. The Contractor shall provide training to the Using Agency in the operation and maintenance of all mechanical and electrical systems in the presence of the Design Professional and Owner and shall give notice in writing to the Design Professional, Owner and Using Agency at least fifteen days prior to the date it is proposed for the training. For all items of mechanical or electrical equipment or apparatus installed that require operation or maintenance after occupancy, the Contractor shall furnish and deliver to the Owner and Using Agency complete brochures and data as prepared and published by the manufacturers covering details of operation and maintenance.

6.4.1.2.5 Certificates of Manufacturers for Major Components. Certificates of Manufacturers shall be provided for elevators, moving walks, dumbwaiters, escalators, lifts, major components of HVAC and plumbing systems, e.g., cooling towers, compressors, condensers, absorption units, chiller units, fan coil units, air handling units, boilers, base mounted pumps, temperature controls, chemical feed systems; sewage pumps and water treatment systems, and incinerator systems; and major components of electrical systems. Start-up, testing, and placing into operation shall be performed by the field representative(s) of the manufacturer(s), and certificate(s) of the manufacturer(s) shall be filed with the Owner on the letterhead(s) of the manufacturer(s) in which the manufacturer(s) certifies or certifies that "the equipment has been installed in strict compliance with the recommendations of the manufacturer(s) and is operating properly," in the format shown in Section 7, Forms. The manufacturer shall list in the certificate the item or items furnished to the job and the date, name, or other positive means of identifying any supplementary documents containing the recommendations of the manufacturer, with a copy of each of the supplementary documents attached to the certificate.

6.4.1.2.6 Final Certification of Costs. For proper capital asset reporting of the Project, the Contractor shall submit its Final Certification of Costs in the format set forth in Section 7, Forms.

6.4.1.2.7 Keys. Unless an alternative locking or keying system is specified, a minimum of two sets of keys, with tags indicating room number or room description or door each key is intended to fit attached

to each key, shall be delivered to the Owner and Using Agency. Contractor shall prepare and furnish with the keys an itemized key schedule listing the room number or room description or door, serial number of key, and number of keys being delivered for each door or lock.

6.4.2 Presentation of Final Documents. At the time of the Inspection for Material Completion, but in any event prior to the application for Final Payment, the Contractor will provide the Owner and Using Agency with a three ring binder containing all of the Final Documents, warranties, and guarantees required by the Contract Documents. Included in the binder shall be the documents indicating the brand names actually used in the installation of the work.

6.4.3 Keys. Keys with tags indicating number and/or description of door or room each key is intended to fit attached to each key shall be delivered to the Owner and Using Agency. The Contractor shall prepare and furnish with the keys an itemized key schedule in quintuplicate listing the door or room number and/or description, serial number of key, and number of keys being delivered for each door or lock.



PART 5 – PAYMENT FOR MATERIAL COMPLETION AND FINAL PAYMENT

6.5.1 Payment for Material Completion. Payment for Material Completion shall be due 10 days after receipt by the Owner of the application for payment upon achievement and certification of Material Completion, provided that Final Documents shall have been submitted. Payment shall be made by a check payable jointly to the Contractor and surety and shall be mailed to the surety.

6.5.2 Application for Payment for Material Completion.

6.5.2.1 Certification of Contractor. The Contractor shall certify, over his own signature, that the Work provided for by the Contract Documents has been completed under the terms and conditions thereof, and that the entire balance of the contract, including retainage, is due and payable, except for those amounts determined by the Design Professional to be withheld due to credits due to the Owner and Minor Items or Permitted Incomplete Work pursuant to Article 6.6.3 below.

6.5.2.2 Supporting Documentation.

6.5.2.2.1 Financial Data. The Contractor shall submit evidence satisfactory to the Design Professional that all payrolls, material bills, and other indebtedness connected with the work have been paid.

6.5.2.2.2 Affidavits and Bonds. The Contractor shall attach copies of the affidavits and bonds set forth in subparagraphs 6.4.2.2.1 and 2 above, execute the payment certification and forward it directly to the Design Professional.

6.5.3 Release of Contractor's Retainage.

6.5.3.1 Establishment of List. At the completion of the Inspection for Material Completion, the Design Professional and Contractor, with the consent of the Owner, shall develop the Final Punchlist. The Design Professional will assign a value for each the Minor Items and Permitted Incomplete Work.

6.5.3.2 Establishment of Amount of to be Withheld for Punchlist Items. In general, the amount to be withheld from the Payment for Material Completion and to be paid upon Final Completion shall be equal to 200% of the Design Professional's value of completing the Work for each Minor Item or Permitted Incomplete Work. The following additional amounts to be withheld shall be applied where applicable.

6.5.3.2.1 Mechanical and HVAC Systems. Until such time as the Design Professional shall have certified that the heating system has been balanced under seasonable weather conditions, the amount withheld shall in no event be less than \$1,000.00.

6.5.3.2.2 Certificates. For each certificate required for major components a sum of \$500.00 shall be withheld until such certificate shall have been filed with the Owner and Institution.

6.5.4 Effect of Payment for Material Completion and Release of Claims. Owner shall process the Payment for Material Completion as expeditiously as possible in accordance with the certification of the Design Professional, but interest shall not accrue until thirty (30) days have elapsed from receipt, unless error is found in the application or supporting documents. Acceptance of Payment for Material Completion by the Contractor shall operate as settlement, waiver, release, discharge and payment in full of all claims against Owner of any nature arising out of the Project except for the work associated with the Minor Items and the Permitted Incomplete Work.

6.5.5 Final Payment. Final Payment shall be due 10 days after receipt by the Owner of the application for payment upon achievement and certification of Final Completion, provided that Final Documents shall have been submitted. Payment shall be made by a check payable jointly to the Contractor and surety and shall be mailed to the surety. Owner shall process the Final Payment expeditiously as possible in accordance with the certification of the Design Professional, but interest shall not accrue until thirty (30) days have elapsed from receipt, unless error is found in the application or supporting documents.

6.5.5.1 Certification of Contractor. The Contractor shall certify, over his own signature, that the Work provided for by the Contract Documents has been completed under the terms and conditions thereof, and that the entire balance of the contract is due and payable.

6.5.5.2 Supporting Documentation.

6.5.5.2.1 Financial Data. The Contractor shall submit evidence satisfactory to the Design Professional that all payrolls, material bills, and other indebtedness connected with the work have been paid.

6.5.5.2.2 Affidavits and Bonds. The Contractor shall attach copies of the affidavits and bonds set forth in subparagraphs 6.4.2.2.1 and 2 above, execute the payment certification, and forward it directly to the Design Professional.

6.5.6 Effect of Final Payment and Release of Claims. Acceptance of Final Payment for Material Completion by the Contractor shall operate as settlement, waiver, release, discharge and payment in full of all claims against Owner of any nature arising out of the Project.



PART 6 – CORRECTION OF WORK AFTER FINAL PAYMENT

6.6.1 Non-Compliant or Defective Work. Neither the Design Professional's Certificate of Final Completion, nor any decision of the Design Professional, nor payment, nor any provision in the Contract shall relieve the Contractor of responsibility for faulty materials, faulty workmanship, or omission of contract work, and it shall remedy any defects or supply any omissions resulting therefrom and pay for any damage to other work resulting therefrom.

6.6.1.2 Notice of Non-Compliant or Defective Work. The Owner shall give notice of observed defects or omissions with reasonable promptness. Attached to or included within the notice shall be a Notice of Non-Compliant Work.

6.6.1.3 Correction of the Work. Within the space of time designated in Notices of Non-Compliant Work and without expense to the Owner, the Contractor shall correct, remedy, replace, re-execute, supply omitted work, or remove from the premises all work designated as non-compliant by the Design Professional. The Contractor shall give prompt notice in writing to the Design Professional, with copy to the Owner, upon completion of the supplying of any omitted work or the correction of any work designated as non-compliant by the Design Professional. In the absence of said notice, it shall be and is presumed under this Contract that there has been no correction of the non-compliant work or supplying of omitted work. If the Contractor does not remove, make good the deficiency, correct, or remedy faulty work, or supply any omitted work within the space of time designated in Notices of Non-Compliant Work, then the Owner, after ten days' notice in writing to the Contractor, may remove the work, correct the work, remedy the work or supply omitted work at the expense of the Contractor. In case of emergency involving health, safety of property, or safety of life the Owner may proceed at once with correction of the Work without waiving any rights of the Owner. Correction of defective work executed under the plans and specifications or supplying of omitted work whether or not covered by warranty of a subcontractor or supplier, remains the primary, direct responsibility of the Contractor. The foregoing obligation of the Contractor shall remain in effect until the expiration of the statute of limitations covering the Work.

6.6.2 Warranty and Guaranty. The Contractor warrants and guarantees that all work executed under the Contract Documents shall be free from defects of materials or workmanship for a period of one year from the date of Material Completion. Whenever a manufacturer's warranty or the Contract Documents call for written guaranties or warranties in excess of one year, the Contractor shall furnish them in such form as to permit direct enforcement by the Owner against any Subcontractor, Supplier, or manufacturer whose guaranty or warranty is called for. The Contractor further agrees to all of the following:

6.6.2.1 Jointly and Severally Liable. The Contractor is jointly and severally liable with such Subcontractors, Trade Contractors, Suppliers, or manufacturers;

6.6.2.2 Ratification of Warranties by the Contractor. The warranties and guaranties of the Subcontractors, Trade Contractors, Suppliers, and manufacturers are provided by the Contractor for purposes of performance under this article, and the Contractor, ratifies them by its warranty and guaranty;

6.6.2.3 Service of notice. Service of notice on the Contractor that there has been breach of any warranty or guaranty will be sufficient to invoke the terms of this article;

6.6.2.4 Bind Subcontractors, etc. The Contractor shall bind its Subcontractors, Trade Contractors, Suppliers, and manufacturers to the terms of this article; and

6.6.2.5 Warranties no Limitation. The calling for or the furnishing of written warranties shall in no way limit the contractual obligation of the Contractor to correct the work as set forth in this Part. The remedies stated in this article are in addition to the remedies otherwise available to the Owner, do not exclude such other remedies, and are without prejudice to any other remedies.

6.6.3 **Warranty Complaint Item Procedure.**

6.6.3.1 Notice of Warranty/Guaranty Complaint Items. The Owner and Using Agency may provide notice of warranty work by a warranty complaint letter, sent by statutory mail or facsimile to the Contractor. The letter should outline the complaint item in non-technical language. In emergency situations, the initial notification may be oral to a person or office designated by the Contractor. The Contractor shall respond promptly to all such notices.

6.6.3.2 Duty to Correct. During the one year period of the warranty and guaranty, any defects of material or workmanship that become apparent shall be the responsibility of the Contractor until and unless the Contractor can show abuse or design defect. The Contractor shall immediately correct all defects that become known during the one year period at no cost to the Owner unless notice is given to the Design Professional, Owner and Using Agency, prior to correcting the defect that the cause of the defect is the result of abuse or design deficiency.

6.6.3.2.1 Initial Response. When the Using Agency, the Owner, or the Design Professional notifies the Contractor of a defect, the Contractor will visit the site to review the complaint within five days and shall promptly correct the Work. If the Contractor fails to respond within this time limit, the Owner may correct the defect or malfunction and charge the Contractor for the Work. The Contractor shall give notice in writing to the Owner when corrections have been completed.

6.6.3.2.2 Design Defect or User Abuse. If the Contractor believes that a design defect or user abuse has caused the malfunction or defect, he will notify the Design Professional and the Design Professional will issue a formal decision in his capacity as Design Professional and initial interpreter of the conditions of the contract. If the Contractor disagrees with the Design Professional's response, he shall protest to the Owner in accordance with Section Five Part two. If it is determined the complaint is not the responsibility of the Contractor, the Contractor shall be promptly paid for the cost of the corrective work.

6.6.3.2.3 Emergency Situations. If the condition is an emergency, this will be communicated to the Contractor with the request that corrections are to be accomplished immediately. The Contractor shall respond to the notice in emergency situations within twenty-four hours. If the Contractor fails to respond within this time limit, the Owner may correct the defect and charge the Contractor for the Work. If it is determined the complaint is not the responsibility of the Contractor, the Contractor shall be promptly paid for the cost of the corrective work. The Contractor shall give notice in writing to the Owner when corrections have been completed.

SECTION 7 – FORMS

FORMS INDEX:

Performance Bond
Payment Bond
Contractor Affidavit and Certificate of Compliance
Subcontractor Affidavit and Certificate of Compliance
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. _____

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 Obligee (hereinafter referred to as "Owner") in the amount of _____ 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 _____ for: _____

(Insert Name of Work)
in accordance with drawings and specifications prepared by: _____ which (Full Name and Title)
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. _____

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 (\$ _____)
(Insert Contract Price)

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 _____ for
(Insert Name of Work) in accordance with the drawings and

specifications prepared by: _____ which contract is incorporated herein
(Here insert Full Name and Title)

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

**CONTRACTOR AFFIDVIT AND CERTIFICATE OF COMPLIANCE
GEORGIA SECURITY AND IMMIGRATION CERTIFICATION
(FEDERAL AND STATE WORK AUTHORIZATION PROGRAMS)**

STATE OF GEORGIA;
COUNTY OF _____:

BOR PROJECT NO. _____
PROJECT NAME: _____

CONTRACTOR AFFIDAVIT, CERTIFICATE AND AGREEMENT

COMES NOW before me, the undersigned officer duly authorized to administer oaths, the undersigned contractor ("Contractor"), who, after being duly sworn, states, warrants, agrees and certifies as follows to the Board of Regents of the University System of Georgia ("Owner"), and _____ ("Using Agency"):

1.

By executing this affidavit, Contractor verifies and warrants its compliance with O.C.G.A. §13-10-90 *et seq.* and Georgia Department of Labor Rule 300-10-1-.01, and the U.S. Immigration Reform and Control Act of 1986 (IRCA), P.L. 99-603. Contractor must register and verify information of all new employees at <https://www.vis-dhs.com/EmployerRegistration> (the E Verify program) or any of the electronic verification of work authorization programs operated by the United States Department of Homeland Security or any equivalent federal work authorization program to verify information of newly hired employees, pursuant to the IRCA. Contractor affirmatively certifies that it has registered with and is participating in a federal work authorization program in accordance with the applicability provisions and deadlines established in O.C.G.A. § 13-10-91 and Georgia Department of Labor Rule 300-10-1-.02, as initialed below.

2.

Contractor verifies and warrants it utilized the following federal verification program:

_____ <https://www.vis-dhs.com/EmployerRegistration> (E Verify program)
_____ Other: _____

Verification Program User ID or Registration No. _____

3.

The Contractor further warrants and agrees that all subcontractors, suppliers and consultants contracted in connection with the provision of materials and equipment or performance of services or work for the Project described above shall be required prior to the commencement of any work on the project to supply the Subcontractor Certification verifying compliance with O.C.G.A. §13-10-90 *et seq.* and Georgia Department of Labor Rule 300-10-1-.01, and the U.S. Immigration Reform and Control Act of 1986 (IRCA), P.L. 99-603 and paragraph 5 below. Subcontractor must register and verify information of all new employees at <https://www.vis-dhs.com/EmployerRegistration> (the E Verify program) or other federal verification program. The affidavit must contain the certifications required by Georgia Department of Labor Rule 300-10-1-.08 and the requirements set forth herein. The Contractor shall maintain records of compliance and provide a copy of each such certification to the Owner and Using Agency as set forth in paragraph 5 below. Contractor warrants that Contractor has included this requirement in all written agreements with any subcontractors engaged to perform services for this Project.

4.

The Contractor further warrants and agrees to comply with the President's Executive Order 13224, which
ma
committed, or pose a risk of committing or supporting terrorist acts, and those identified on the list of Specially Designated
Nationals and Blocked Persons, generated by the Office of Foreign Assets Control ("OFAC"). The OFAC list is updated
regularly, and an up-to-date OFAC list can be obtained from the U.S. Department of the Treasury website at
<http://www.ustreas.gov/ofac>. This Executive order extends to "Affiliates," which includes any other person or entity who,
directly or indirectly, is in control of, is controlled by or is under common control with any Prohibited Person. A copy of the
Executive Order can be obtained at <http://www.ustreas.gov/offices/enforcement/ofac/sanctions/terrorism.html> and the
USA Patriot Act of 2001, restricting terrorist groups' access to financial resources in the United States can be obtained at
http://www.fincen.gov/pa_main.html

**SUBCONTRACTOR AFFIDAVIT AND CERTIFICATE OF COMPLIANCE
GEORGIA SECURITY AND IMMIGRATION CERTIFICATION
(FEDERAL AND STATE WORK AUTHORIZATION PROGRAMS)**

STATE OF GEORGIA;
COUNTY OF _____:

BOR PROJECT No. _____
PROJECT NAME: _____

SUBCONTRACTOR AFFIDAVIT, CERTIFICATE AND AGREEMENT

COMES NOW before me, the undersigned officer duly authorized to administer oaths, the undersigned subcontractor, supplier or consultant ("Subcontractor"), who, after being duly sworn, states, warrants, agrees and certifies as follows to the Board of Regents of the University System of Georgia ("Owner"), and to _____ ("Using Agency"):

1.

By executing this affidavit, Subcontractor verifies and warrants its compliance with O.C.G.A. §13-10-90 *et seq.* and Georgia Department of Labor Rule 300-10-1-.01, and the U.S. Immigration Reform and Control Act of 1986 (IRCA), P.L. 99-603. Subcontractor must register and verify information of all new employees at <https://www.vis-dhs.com/EmployerRegistration> (the E Verify program) or any of the electronic verification of work authorization programs operated by the United States Department of Homeland Security or any equivalent federal work authorization program to verify information of newly hired employees, pursuant to the IRCA. Subcontractor affirmatively certifies that it has registered [or will register] with and is [or will] participate in a federal work authorization program in accordance with the applicability provisions and deadlines established in O.C.G.A. § 13-10-91 and Georgia Department of Labor Rule 300-10-1-.02, as initialed below.

2.

Subcontractor verifies and warrants it employs the following employees as of this date and meets or shall meet the requirements set forth above by the deadline for the category initialed below:

<i>Initials</i>	<i>Number of Employees</i>	<i>Required Compliance Date</i>
_____	Over 500 employees	July 1, 2007
_____	100 to 499 employees	July 1, 2008
_____	1 to 99 employees	July 1, 2009

Subcontractor utilized the following federal verification program:

_____ <https://www.vis-dhs.com/EmployerRegistration> (E Verify program)
 _____ Other: _____

Verification Program User ID or Registration No. _____

3.

The Subcontractor further warrants and agrees that all subcontractors, suppliers and consultants contracted in connection with the provision of materials and equipment or performance of services or work for the Project described above shall be required prior to the commencement of any work on the project to supply the Subcontractor Certification verifying compliance with O.C.G.A. §13-10-90 *et seq.* and Georgia Department of Labor Rule 300-10-1-.01, and the U.S. Immigration Reform and Control Act of 1986 (IRCA), P.L. 99-603 and paragraph 5 below. Subcontractor must register and verify information of all new employees at <https://www.vis-dhs.com/EmployerRegistration> (the E Verify program) or other federal verification program. The affidavit must contain the certifications required by Georgia Department of Labor Rule 300-10-1-.08 and the requirements set forth herein. The Subcontractor shall maintain records of compliance and provide a copy of each such certification to the Owner and Using Agency as set forth in paragraph 5 below.

Subcontractor warrants that Subcontractor has included this requirement in all written agreements with any subcontractors engaged to perform services for this Project.

4.

The Subcontractor further warrants and agrees to comply with the President's Executive Order 13224, which mandates that no U.S. company shall do business with any person (Prohibited Person) who has been determined to have committed, or pose a risk of committing or supporting terrorist acts, and those identified on the list of Specially Designated Nationals and Blocked Persons, generated by the Office of Foreign Assets Control ("OFAC"). The OFAC list is updated regularly, and an up-to-date OFAC list can be obtained from the U.S. Department of the Treasury website at <http://www.ustreas.gov/ofac>. This Executive order extends to "Affiliates," which includes any other person or entity who, directly or indirectly, is in control of, is controlled by or is under common control with any Prohibited Person. A copy of the Executive Order can be obtained at <http://www.ustreas.gov/offices/enforcement/ofac/sanctions/terrorism.html> and the USA Patriot Act of 2001, restricting terrorist groups' access to financial resources in the United States can be obtained at http://www.fincen.gov/pa_main.html for review. The Subcontractor agrees to review its subcontracts and other agreements annually with the Treasury website for compliance, and maintain a record of its reviews.

5.

Subcontractor warrants and agrees that it shall submit, and shall ensure all its subcontractors and suppliers submit, the required certifications and verifications (i) at contract execution prior to commencing work or services; (ii) upon the completion or termination of the contract; and (iii) and recertified as of July 15 of each year during the term of the Project. The required certificates must be filed with the Owner and Using Agency and copies maintained by the Subcontractor in its Project files and retained for audit as specified in the Project contract. State officials, including officials of the Georgia Department of Labor, officials of the Owner, retain the right to inspect and audit the Project Site and employment records of the Subcontractor, subcontractors, suppliers and consultants without notice during normal working hours until Final Completion, and as otherwise specified by law and by Rules and Regulations of the Georgia Department of Labor.

Subcontractor Name: _____
Street/Mailing Address: _____
City, State, Zip _____
Telephone Number: _____
Facsimile Number: _____
Email Address: _____

FURTHER AFFIANT SAYETH NOT.

Subcontractor Name
By: _____
Signature of Authorized Officer or Agent

Printed Name of Authorized Officer or Agent

Title of Authorized Officer or Agent

Sworn to and subscribed before me
by the affiant named above as of this
_____ day of _____, 200__

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____.

Signature (L.S.)

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 WITNESS

By: _____
TITLE _____

Surety WITNESS

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.

INSTRUCTIONS TO PRODUCING AGENT: COMPLETE THE SHADED PORTIONS OF THIS CERTIFICATE OR SIMILAR FORM AND RETURN TO THE INSURED, WITH ADDITIONAL INSURED ENDORSEMENTS ATTACHED. NO CONDITION, TERM, QUALIFICATION, LIMITATION, EXCEPTION, EXEMPTION, MODIFICATION, OR PROVISIO SHALL APPEAR ON THE CERTIFICATE.

Certificate of Insurance

Name, Address and Telephone Number of Producing Agent	PROJECT NO.: Project Number Here
	PROJECT NAME: Project Description, Institution Here
Name and Address of Insured Contractor (Contractor)	Certificate Holder(Owner): Board of Regents of the University System of Georgia 270 Washington Street, SW, 6 th Floor Atlanta, Georgia 30334 <i>Attn: Director of Contracts & Services, Office of Facilities</i>

Type of Insurance	Policy No.	Company Affording Coverage	Policy Expiration Date	Limits
Commercial General Liability(1993 ISO Occurrence Form or its equivalent); Includes XCU Coverage				Each Person \$1,000,000.00 Each Occurrence \$1,000,000.00 Products-Co./Op Agg \$1,000,000.00 Personal & Adv injury \$1,000,000.00 Contractual \$1,000,000.00 General Aggregate \$2,000,000.00
Commercial Business Automobile Liability				Bodily Injury \$1,000,000.00 Property Damage \$1,000,000.00 Combined Single Limit \$1,000,000.00
Commercial Umbrella Liability				Each Occurrence \$2,000,000.00 Aggregate \$4,000,000.00
Workers Compensation				WC Statutory Limits
Employers' Liability				Each Accident \$1,000,000.00 Disease Each Employee \$1,000,000.00 BI - Disease-Aggregate \$1,000,000.00
Builders Risk written on 1991 Cause of Loss-Special Form or its equivalent OR Installation Floater (for other than new construction)				Cost of Project

The insured contractor has provided the contract provisions concerning insurance to the Undersigned, and the Undersigned had reviewed the insurance coverages required for the project referenced above and makes the following certifications, which shall serve to bind the various insurance carriers as follows:

1. Such insurance as is herein certified (i) are written in accordance with the company's regular policies and endorsements, subject to the company's applicable manuals or rules and rates in effect, (ii) have been issued to the insured named above, and (iii) are in force at this time.
2. With the exception of the Workers Compensation policy, the Officers, Members, Agents, & Employees of the Owner and the State of Georgia are included as additional insureds as their interests may appear and a copy of the additional insured endorsement(s) is attached hereto. The undersigned certifies that he has so notified each insurer that Georgia law requires that the Attorney General of Georgia shall represent and defend the state entities and Indemnities named herein remains in full force and effect and is not waived by issuance of any policy of insurance Disease Each Employee \$1,000,000.00
BI - Disease-Aggregate \$1,000,000.00.
3. Each policy either provides or has been endorsed to meet Georgia law that the policy shall not be canceled, changed, allowed to lapse, or allowed to expire for any reason until thirty (30) days (10 days for non-payment of premium) after the Certificate holder has received written notice thereof as evidenced by return receipt of certified or overnight letter.

Authorized Representative: _____ Date: _____
 Typed Name: _____

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 Obligee, 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 Obligee under this Bond to Discharge Claim, the penal amount of the Primary Bond is reduced *instanter* 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 ____, 200 __, 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.

RECOMMENDED FOR OWNER'S
ACCEPTANCE:

APPROVED AND AGREED BY OWNER:

(DESIGN PROFESSIONAL)

BOARD OF REGENTS OF THE UNIVERSITY
SYSTEM OF GEORGIA

By: _____

By: _____

Date approved by Design Professional: _____

Date approved by Owner: _____

APPROVED AND AGREED BY CONTRACTOR:

APPROVED AND AGREED BY USING AGENCY

By: _____

By: _____

Date approved by Contractor: _____

Date approved by Using Agency: _____

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 _____, 200____, 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.

RECOMMENDED FOR OWNER'S
ACCEPTANCE:

(DESIGN PROFESSIONAL)

By: _____

Date approved by Design Professional: _____

APPROVED AND AGREED BY CONTRACTOR:

By: _____

Date approved by Contractor: _____

APPROVED AND AGREED BY OWNER:

BOARD OF REGENTS OF THE UNIVERSITY
SYSTEM OF GEORGIA

By: _____

Date approved by Owner: _____

APPROVED AND AGREED BY USING AGENCY

By: _____

Date approved by Using Agency: _____

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.

RECOMMENDED FOR OWNER'S
ACCEPTANCE:

(DESIGN PROFESSIONAL)

By: _____

Date approved by Design Professional: _____

APPROVED AND AGREED BY CONTRACTOR:

By: _____

Date approved by Contractor: _____

APPROVED AND AGREED BY OWNER:

BOARD OF REGENTS OF THE UNIVERSITY
SYSTEM OF GEORGIA

By: _____

Date approved by Owner: _____

APPROVED AND AGREED BY USING AGENCY

By: _____

Date approved by Using Agency: _____

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 _____ (Contractor) dated _____

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:

CHANGE ORDERS		ADDITIONS			DEDUCTIONS
Number (1)	Date (2)	Authorized Amount (3)	Amount This Period (4)	Completed Previous Periods (5)	Authorized Deductions (6)

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)
<p>A. Contracting Requirements: *</p> <p>a.</p> <p>b.</p> <p>c.</p> <p>1. Division 1 – General Requirements: *</p> <p>a.</p> <p>b.</p> <p>c.</p> <p>2. Division 2 – Site Construction: **</p> <p>(i) Building</p> <p>a.</p> <p>b.</p> <p>c.</p> <p>(ii) Infrastructure</p> <p>a.</p> <p>b.</p> <p>c.</p> <p>3. Division 3 – Concrete: *</p> <p>a.</p> <p>b.</p> <p>c.</p> <p>4. Division 4 – Masonry: **</p> <p>(i) Building</p> <p>a.</p> <p>b.</p> <p>c.</p> <p>(ii) Infrastructure</p> <p>a.</p> <p>b.</p> <p>c.</p> <p>5. Division 5 – Metals: *</p> <p>a.</p> <p>b.</p>							

<p>c.</p> <p>6. Division 6 – Wood and Plastics: *</p> <p>a. b. c.</p> <p>7. Division 7 – Thermal & Moisture: ****</p> <p>a. b. c. Roof.</p> <p>8. Division 8 – Doors & Windows: *</p> <p>a. b. c.</p> <p>9. Division 9 – Finishes: *</p> <p>a. b. c.</p> <p>10. Division 10 – Specialties: *</p> <p>a. b. c.</p> <p>11. Division 11 – Equipment: ***</p> <p>(i) Fixed or Built-in:</p> <p>a. b. c.</p> <p>(ii) Moveable:</p> <p>a. b. c.</p> <p>12. Division 12 – Furnishings: ***</p> <p>(i) Fixed or Built-in:</p> <p>a. b. c.</p> <p>(ii) Moveable:</p> <p>a. b. c.</p> <p>13. Division 13 – Special Construction: *</p> <p>a. b. c.</p> <p>14. Division 14 – Conveying Systems: *</p> <p>a. b. c.</p> <p>15. Division 15 – Mechanical: ****</p> <p>(i) Building</p> <p>a. b. c.</p> <p>(ii) Infrastructure</p> <p>a. b. c.</p> <p>16. Division 16 – Electrical: **</p> <p>(i) Building</p> <p>a.</p>								
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SECTION 7 – FORMS
APPLICATION FOR PAYMENT FORM

b. c. (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. _____ during period							
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:

ITEM NO.	NAME <small>(Contractor or Subcontractor)</small>	TYPE OF MATERIAL	QUANTITY	AMOUNT <small>(Dollars)</small>
		TOTALS		

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

RE: Project Name and Number: _____;
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: _____

SECTION 01 1100

SUMMARY OF WORK

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Project description.
 - 2. Work sequence.
 - 3. Construction Manager's use of site and premises.

1.2 PROJECT DESCRIPTION

- A. The work under this contract includes the modification and renovation of the existing football field house. The square footage is 8,684. The modifications include the replacement of the mechanical systems, replacement of the plumbing fixtures, replacement of light fixtures and replacement of the toilet partitions. All walls and ceilings will be painted. The building is constructed of concrete floors, concrete masonry walls, wood trusses/rafters and a painted gypsum board ceiling.
- B. The Project will be constructed under a Stipulated Sum contract with the contractor determined to have the lowest acceptable bid.

1.3 WORK SEQUENCE

- A. Coordinate construction schedule and operations with the Owner. Note that the project will take place during/after the football season. The building will have to be operational for the games. Depending on lead times for the mechanical units, the installation of the units may come after football season.(the end of October) The contractor will have full use of the facility up until the first home game and then between the home games. The home games are as follows:
 - 1. September 19, 2026
 - 2. October 3, 2026
 - 3. October 17, 2026
 - 4. October 24, 2026
 - 5. October 29, 2026
- B. Final construction schedule shall be approved by owner.

1.4 CONTRACTOR'S USE OF SITE AND PREMISES

- A. Contractor shall have full use of the construction site in accordance with the sequence of events agreed to by the owner. Contractor shall have full use of the construction site as necessary to construct the building. As noted above, the owner will have to use the building for certain events.
- B. Contractor Assumes full responsibility for protection and safekeeping of products under this Contract stored on site.
- C. Coordinate use of site and premises with the Owner:
 - 1. Employee parking.
 - 2. Access to site and premises.
 - 3. Storage and staging areas.
 - 4. Work in or on the existing building.

- D. Confine operations to construction area unless otherwise approved by Owner.
- E. If access to adjacent occupied buildings or owner occupied areas of the building is required:
 - 1. Schedule operations with Owner in advance.
- F. Do not use or store hazardous or flammable materials on premises without Owner's approval; follow requirements of governing authorities having jurisdiction over the work.
- G. Prohibit smoking within interior spaces and on campus.

END OF SECTION

SECTION 01 2600

CONTRACT MODIFICATION PROCEDURES

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Supplemental Instructions.
 - 2. Proposal Requests.
 - 3. Contractor proposed changes.
 - 4. Construction Change Directives.
 - 5. Change Orders.
- B. Related Sections:
 - 1. Section 01 6000 - Product Requirements.

1.2 CHANGE PROCEDURES

- A. Architect's Supplemental Instructions:
 - 1. Format: AIA Document G710 or similar form - Architect's Supplemental Instructions.
 - 2. Architect will advise of minor changes in Work not involving an adjustment to Contract Sum or Contract Time as authorized by the Conditions of the Contract.
- B. Proposal Requests:
 - 1. Format: AIA Document G709 or similar form - Proposal Request.
 - 2. Architect may issue a Proposal Request that includes a detailed description of a proposed change with supplemental or revised Drawings and specifications.
 - 3. Prepare and submit an estimate of any change to Contract Sum or Contract Time within 14 days after receipt. Include:
 - a. Quantities and unit costs, with total cost or credit to Owner. If requested, furnish documentation of quantities.
 - b. Taxes, delivery charges, equipment rentals, and trade discounts as applicable.
 - c. If change in Contract Time is involved, provide updated Progress Schedule.
 - 4. Do not stop work or initiate changes in response to a Proposal Request. If approved, Architect will prepare and issue a Change Order.
 - 5. Submit one copy and/or Submit electronically in Adobe PDF format.
- C. Contractor Proposed Changes:
 - 1. Format: AIA Document G709 or similar form – Proposal Request.
 - 2. Contractor may propose a change by submitting request for change to Architect.
 - 3. Describe proposed change, reason for change, its full effect on Work, and any change to Contract Sum or Contract Time. Include:
 - a. Quantities and unit costs, with total cost or credit to Owner. If requested, furnish documentation of quantities.
 - b. Taxes, delivery charges, equipment rentals, and trade discounts as applicable.
 - c. If change in Contract Time is involved, provide updated Progress Schedule.
 - 4. Document any required substitutions in accordance with Section 01 6000.
 - 5. Submit one copy and/or Submit electronically in Adobe PDF format.
- D. Construction Change Directive:
 - 1. Architect may issue a directive, instructing Contractor to proceed with a change for subsequent inclusion in a Change Order.
 - 2. Documentation will describe changes in Work and designate method of determining any change to Contract Sum or Contract Time. Promptly execute change.

- E. Change Orders:
 - 1. Format: AIA Document G701 or similar form - Change Order.
 - 2. Execution: Architect will Prepare Change Orders for signature of parties as provided in Conditions of the Contract.

PART 2 PRODUCTS

Not used

PART 3 EXECUTION

Not used

END OF SECTION

SECTION 01 2900

PAYMENT PROCEDURES

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Schedule of Values.
 - 2. Applications for Payment.
- B. Related Sections:
 - 1. Section 01 7700 - Closeout Procedures.

1.2 SCHEDULE OF VALUES

- A. General:
 - 1. Submit a Schedule of Values to Architect at least 20 days prior to submitting first Application for Payment.
 - 2. Upon request of Architect, furnish additional data to support values given that will substantiate their correctness.
 - 3. Approved Schedule of Values will be used as basis for reviewing Contractor's Applications for Payment.
- B. Form and Content:
 - 1. Format: AIA Document G703 - Continuation Sheet of Application and Certification for Payment or Contractor's standard electronic media format with similar content.
 - 2. Use Table of Contents of Project Manual as basis of format for listing costs of Work.
 - 3. List installed value of component parts of Work in sufficient detail to serve as basis for computing values for progress payments.
 - 4. Include separate line items for:
 - a. General conditions
 - b. Contractor's overhead and profit.
 - 5. For items on which payment will be requested for stored materials, break down value into:
 - a. Cost of materials, delivered and unloaded, with taxes paid.
 - 6. For each line item that has a value of more than \$20,000.00, break down costs to list major products or operations under each item.
 - 7. Total of costs listed in Schedule shall equal Contract Sum.
- C. Submit one copy and/or Submit electronically in Adobe PDF format.
- D. Review and Resubmittal:
 - 1. After initial review by Architect, revise and resubmit if required.
 - 2. Revise and resubmit along with next Application for Payment when a Change Order is issued. List each Change Order as a new line item.

1.3 APPLICATIONS FOR PAYMENT

- A. Preparation:
 - 1. Format: AIA Document G702 - Application and Certification for Payment or Contractor's standard electronic media format with similar content, supported by AIA Document G703 - Continuation Sheet.
 - 2. Prepare required information in typewritten format or on electronic media format.

3. Use data from reviewed Schedule of Values. Provide dollar value in each column for each line item representing portion of work performed.
4. List each authorized Change Order as a separate line item, listing Change Order number and dollar value. If above \$20,000 provide additional breakdown of construction cost.
5. Prepare Application for Final Payment as specified in Section 01 7700.

B. Substantiating Data:

1. When Architect requires substantiating information, submit data justifying dollar amounts in question.
2. Provide one copy of data with cover letter showing Application number and date, and line item number and description.

C. Submittal:

1. Submit electronic application in pdf format.
2. Payment period: Submit at intervals stipulated in Owner/Contractor Agreement.

PART 2 PRODUCTS

Not used

PART 3 EXECUTION

Not used

END OF SECTION

SECTION 01 3100

PROJECT MANAGEMENT AND COORDINATION

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Project coordination.
 - 2. Coordination drawings.
 - 3. Project meetings.
- B. Related Sections:
 - 1. Section 01 7700 - Contract Closeout.

1.2 PROJECT COORDINATION

- A. Coordinate scheduling, submittals, and work of various Sections of specifications to assure efficient and orderly sequence of installation of interdependent construction elements.
- B. Verify that utility requirement characteristics of operating equipment are compatible with building utilities. Coordinate work of various Sections having interdependent responsibilities for installing, connecting to, and placing in service such equipment.
- C. Coordinate space requirements and installation of electrical items that are indicated diagrammatically on Drawings.
 - 1. Follow routing shown as closely as practical; place runs parallel with building lines.
 - 2. Utilize spaces efficiently to maximize accessibility for other installations, for maintenance, and for repairs.
- D. In finished areas, conceal pipes, ducts, and wiring within construction. Coordinate locations of fixtures and outlets with finish elements.
- E. Coordinate completion and cleanup of work of separate Sections in preparation for Substantial Completion.
- F. After Owner occupancy, coordinate access to site for correction of defective Work and Work not in accordance with Contract Documents to minimize disruption of Owner's activities.

1.3 COORDINATION DRAWINGS

- A. Coordination Drawings:
 - 1. Prior to commencement of Work, If limited space is available or if coordination is required for installation of products and materials, prepare coordination drawings to define relationship of mechanical, plumbing, fire protection, and electrical components with beams, columns, ceilings and walls.
 - 2. Include plans, elevations, sections, and details required to define relationships between components.
 - 3. Prepare drawings at 1/4 inch = 1'-0" scale for general layout and 3/8 inch = 1'-0" for plans and sections in congested areas including equipment spaces.
 - 4. Submit multiple copies (4 max for Architectural work) of coordination drawings. Architect will keep one. Contractor shall retain one returned copy as a Project Record Drawing.
- B. Hold coordination meetings with trades providing mechanical, plumbing, fire protection, and electrical work.

- C. Resolve conflicts between trades, prepare composite coordination drawings and obtain signatures on original composite coordination Drawings.
- D. When conflicts cannot be resolved:
 - 1. Cease work in areas of conflict and request clarification prior to proceeding.
 - 2. Prepare drawings to define and to indicate proposed solution.
 - 3. Submit drawings for approval when actual measurements and analysis of Drawings and Project Manual indicate that various systems cannot be installed without significant deviation from intent of Contract Documents.
- E. Submit original composite coordination drawings as part of Project Record Documents specified in Section 01 7700.

1.4 PROJECT MEETINGS

- A. Schedule and administer preconstruction conference, progress meetings and pre-installation conferences.
- B. Make physical arrangements for meetings; notify involved parties at least 4 days in advance.
- C. Record significant proceedings and decisions at each meeting; reproduce and distribute copies to parties in attendance and others affected by proceedings and decisions made.

1.5 PRECONSTRUCTION CONFERENCE

- A. Schedule within 15 days after date of Notice to Proceed at a central site convenient to all parties.
- B. Attendance:
 - 1. Contractor.
 - 2. Owner.
 - 3. Architect.
 - 4. Major subcontractors and suppliers as Construction Manager deems appropriate.
- C. Review and Discuss:
 - 1. Relation and coordination of various parties, and responsible personnel for each party.
 - 2. Use of premises, including office and storage areas, temporary controls, and security procedures.
 - 3. Construction schedule and critical work sequencing.
 - 4. Processing of:
 - a. Contract modifications.
 - b. Shop Drawings, Product Data, and Samples.
 - c. Applications for Payment.
 - d. Substitutions.
 - e. Other required submittals.
 - 5. Adequacy of distribution of Contract Documents.
 - 6. Procedures for maintaining contract closeout submittals.
 - 7. Installation and removal of temporary facilities.
 - 8. Notification procedures and extent of testing and inspection services.

1.6 PROGRESS MEETINGS

- A. Schedule progress meetings biweekly during actual construction.
- B. Location: On site or other location as agreed upon.

- C. Attendance:
 - 1. Contractor.
 - 2. Owner.
 - 3. Architect and consultants as appropriate to agenda.
 - 4. Subcontractors and suppliers as appropriate to agenda.
 - 5. Others as appropriate to agenda.

- D. Review and Discuss:
 - 1. Work progress since previous meeting, including:
 - a. Field observations, deficiencies, conflicts, and problems.
 - b. Progress and completion date.
 - c. Corrective measures needed to maintain quality standards, progress, and completion date.
 - 2. Status of:
 - a. Requests for information.
 - b. Submittals.
 - c. Contract modifications.
 - 3. Coordination between various elements of Work.
 - 4. Maintenance of Project Record Documents.

1.7 PRE-INSTALLATION CONFERENCES

- A. Where required in individual specification Section, convene a pre-installation conference at project site or other designated location.
- B. Require attendance of parties directly affecting or affected by work of the specific Section.
- C. Review conditions of installation, preparation and installation procedures, and coordination with related work.

PART 2 PRODUCTS

Not used

PART 3 EXECUTION

Not used

END OF SECTION

SECTION 01 3216

CONSTRUCTION PROGRESS SCHEDULES

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Construction progress schedule.
- B. Related Sections:
 - 1. Section 01 1100 - Summary of Work
 - 2. Section 01 2900 - Payment Procedures.

1.2 FORMAT

- A. Prepare Progress Schedule as a horizontal bar chart with separate bar for each major portion of work or operation, using the critical path method.
- B. Sequence of Listings: The chronological order of the start of each item of Work.
- C. Scale and Spacing: To provide space for notations and revisions.
- D. Sheet Size: Multiples of 8-1/2 x 11 inches.

1.3 CONTENT

- A. Show complete sequence of construction by activity, with dates for beginning and completion of each element of construction.
- B. Identify each item by specification Section number.
- C. Identify work of separate types and other logically grouped activities.
- D. Provide subschedules to define critical portions of the entire Progress Schedule.
- E. Show accumulated percentage of completion of each item, and total percentage of Work completed, as of the first day of each month.
- F. Provide separate schedule of submittal dates for Shop Drawings, Product Data, and Samples, including:
 - 1. Dates reviewed submittals will be required from Architect.
 - 2. Decision dates for selection of finishes.
- G. Coordinate content with Schedule of Values specified in Section 01 2900.
- H. Revisions:
 - 1. Indicate progress of each activity to date of submittal, and projected completion date of each activity.
 - 2. Identify activities modified since previous submittal, major changes in scope, and other identifiable changes.
- I. Provide narrative report to define problem areas, anticipated delays, and impact on Progress Schedule. Report corrective action taken, or proposed, and its effect.

1.4 SUBMITTAL

- A. Submit initial Progress Schedule within 15 days after date of Notice to Proceed. After review, resubmit required revised data within 10 days.
- B. Submit revised Progress Schedule each progress meeting.
- C. Submit one copy and Submit electronically in Adobe PDF format. Updates may be submitted electronically.

1.5 DISTRIBUTION

- A. Distribute copies of approved Progress Schedule to project site file, Subcontractors, suppliers, and other concerned parties.
- B. Instruct recipients to promptly report, in writing, problems anticipated by projections indicated in Progress Schedule.

PART 2 PRODUCTS

Not used

PART 3 EXECUTION

Not used

END OF SECTION

SECTION 01 3233

PHOTOGRAPHIC DOCUMENTATION

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Construction photographs.

1.2 PHOTOGRAPHY

- A. Provide a selection of photographs taken each month just prior to date for each scheduled Application for Payment.
- B. Photograph project as necessary to document progress of construction each week and as directed by Architect.
- C. At successive periods of photography, take photographs from same overall view as previously taken.
- D. Utilize digital technology at minimum 1280 x 960 capture resolution.
- E. Provide correct exposure and focus, high resolution and sharpness, maximum depth of field, and minimum distortion.

1.3 DIGITAL FILES

- A. Index digital files in chronological sequence as follows.
 - 1. Name of Project.
 - 2. Date taken.
 - 3. Sequential photograph number.

1.4 SUBMITTAL

- A. Submit digital files as requested and in total on thumb drive or other electronic device along with Project Record Documents.

PART 2 PRODUCTS

Not used

PART 3 EXECUTION

Not used

END OF SECTION

SECTION 01 3300

SUBMITTAL PROCEDURES

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Submittal procedures.
 - 2. Proposed Products list.
 - 3. Submittal schedule.
 - 4. Shop Drawings.
 - 5. Product Data.
 - 6. Samples.
 - 7. Quality control submittals.
- B. Related Sections:
 - 1. Section 01 4000 - Quality Requirements.

1.2 SUBMITTAL PROCEDURES

- A. Number each submittal with Project Manual section number and a sequential number within each section. Number resubmittals with original number and an alphabetic suffix.
- B. Identify Project, Contractor, Subcontractor or supplier, pertinent Drawing sheet and detail numbers, and specification Section number, as appropriate.
- C. Submit all submittals listed under "Submittals for Review" simultaneously for each Product or Specification Section.
- D. Where multiple Products function as an assembly, group submittals for all related Products into single submittal.
- E. Architect will not review incomplete submittals.
- F. Apply Contractor's stamp, signed or initialed certifying that:
 - 1. Submittal was reviewed.
 - 2. Products, field dimensions, and adjacent construction have been verified.
 - 3. Information has been coordinated with requirements of Work and Contract Documents.
- G. Schedule submittals to expedite the Project, and deliver to Architect. Coordinate submittal of related items.
- H. For each submittal, allow 14 days for Architect's review, excluding delivery time to and from Contractor.
- I. Identify variations from Contract Documents and Product or system limitations that may be detrimental to successful performance of completed Work.
- J. Revise and resubmit submittals when required; identify all changes made since previous submittal.
- K. Distribute copies of reviewed submittals to concerned parties and to Project Record Documents file. Instruct parties to promptly report any inability to comply with provisions.

1.3 SUBMITTAL SCHEDULE

- A. Within 15 days after date of Notice to Proceed, submit a submittal schedule showing all submittals proposed for project, including submittals listed as:
 - 1. Submittals for Review.
 - 2. Quality Control Submittals.
 - 3. Closeout Submittals.

- B. Include for each submittal:
 - 1. Specification section number.
 - 2. Description of submittal.
 - 3. Type of submittal.
 - 4. Anticipated submittal date.
 - 5. For submittals requiring Architect's review, date reviewed submittal will be required from Architect.

- C. Submit one copy electronically in Adobe PDF format.

1.4 SHOP DRAWINGS

- A. Present information in clear and thorough manner.

- B. Identify details by reference to sheet and detail numbers or room number shown on Drawings.

- C. Reproductions of details contained in Contract Documents are not acceptable.

1.5 PRODUCT DATA

- A. Mark each copy to identify applicable products, models, options, and other data.

- B. Supplement manufacturers' standard data to provide information unique to this Project.

1.6 SAMPLES

- A. Submit samples to illustrate functional and aesthetic characteristics of Products, with integral parts and attachment devices. Coordinate sample submittals for interfacing work.

- B. Where so indicated, submit samples of finishes from the full range of manufacturers' standard colors, textures, and patterns for Architect's selection.

- C. Include identification on each sample, with full Project information.

- D. Unless otherwise specified in individual specifications, submit two of each sample.

- E. Architect will notify Contractor of approval or rejection of samples, or of selection of color, texture, or pattern if full range is submitted.

1.7 QUALITY CONTROL SUBMITTALS

- A. Quality control submittals specified in Section 01 4000 are for information and do not require Architect's responsive action except to require resubmission of incomplete or incorrect information.

PART 2 PRODUCTS

Not used

PART 3 EXECUTION

Not used

END OF SECTION

SECTION 01 4000

QUALITY REQUIREMENTS

PART 1 PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. References.
 - 2. Quality assurance and control of installation.
 - 3. Mockups.
 - 4. Manufacturer's field services and reports.
 - 5. Design data and calculations.
 - 6. Test reports and certifications.
 - 7. Manufacturer's installation instructions.

1.2 REFERENCES

- A. For products or workmanship specified by reference to association, trade, or industry standards, comply with requirements of the standard, except when more rigid requirements are specified or are required by applicable codes.
- B. Should specified reference standards conflict with Contract Documents, request clarification from Architect before proceeding.
- C. Conform to edition of reference standard in effect as of date of Project Manual.
- D. The contractual relationship of the parties to the Contract shall not be altered from the Contract Documents by mention or inference otherwise in any reference document.

1.3 QUALITY ASSURANCE AND CONTROL OF INSTALLATION

- A. Monitor quality control over suppliers, manufacturers, Products, services, site conditions, and workmanship, to produce Work of specified quality.
- B. Comply fully with manufacturers' instructions, including each step in sequence.
- C. Should manufacturers' instructions conflict with Contract Documents, request clarification from Architect before proceeding.
- D. Comply with specified standards as a minimum quality for the Work except when more stringent tolerances, codes, or specified requirements indicate higher standards or more precise workmanship.
- E. Perform work by persons qualified to produce workmanship of specified quality.
- F. Secure Products in place with positive anchorage devices designed and sized to withstand stresses, vibration, physical distortion or disfigurement.

1.4 MOCKUPS

- A. Definition:
 - 1. Mockups are field samples constructed, applied, or assembled at the project site for review by the Owner and Architect that illustrate materials, equipment, or workmanship.
 - 2. Approved mockups establish the standard of quality by which the Work will be judged.

- B. Construct, apply, or assemble specified items, with related attachment and anchorage devices, flashings, seals, and finishes.
- C. Perform work in accordance with applicable specifications sections.
- D. Erect at project site at location acceptable to Architect. Protect from damage.
- E. Removal:
 1. Mockups may remain as part of the Work only when so designated in individual specification sections.
 2. Do not remove mockups until removal is approved by Architect or upon Final Completion.
 3. Where mockup is not permitted to remain as part of the Work, clear area after removal of mockup has been approved by Architect.

1.5 MANUFACTURERS' FIELD SERVICES AND REPORTS

- A. When specified in individual specification Sections, require material or Product suppliers or manufacturers to provide qualified staff personnel to observe site conditions, conditions of surfaces and installation, quality of workmanship, or startup of equipment, as applicable, and to initiate instructions when necessary.
- B. Individuals to report observations and site decisions or instructions given to applicators or installers that are supplemental or contrary to manufacturers' written instructions.
- C. Submit report to Architect within 5 days of observation.

1.6 TEST REPORTS AND CERTIFICATIONS

- A. When specified in individual specification Sections, require material or Product suppliers or manufacturers to provide test reports and manufacturers' certifications.
- B. Indicate that material or Product conforms to or exceeds specified requirements. Submit supporting reference data, affidavits, and certifications as appropriate.
- C. Submittals may be recent or previous test results on material or Product, but must be acceptable to Architect.
- D. Submit one copy electronically in Adobe PDF format.

1.7 MANUFACTURER'S INSTALLATION INSTRUCTIONS

- A. When Contract Documents require that Products be installed in accordance with manufacturer's instructions:
 1. Provide at job site a copy of manufacturer's most recent printed instructions for delivery, storage, assembly, installation, start-up, adjusting, and finishing, as applicable.
 - a. Indicate special procedures, perimeter conditions requiring special attention, and special environmental criteria required for application or installation.
 - b. Identify conflicts between manufacturers' instructions and requirements of Contract Documents.
 2. Perform installation of Products to comply with requirements of manufacturer's instructions.
 3. If installation cannot be performed in accordance with manufacturer's instructions, notify Architect and await instructions.

PART 2 PRODUCTS
Not used

PART 3 EXECUTION
Not used

END OF SECTION

SECTION 01 4523

TESTING AND INSPECTION SERVICES

PART 1 PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Laboratory selection and payment.
 - 2. Laboratory duties.
 - 3. Contractor's responsibilities.
- B. Related Sections: Individual specifications sections contain specific tests and inspections to be performed.

1.2 REFERENCES

- A. ASTM International (ASTM):
 - 1. C1077 - Standard Practice for Laboratories Testing Concrete and Concrete Aggregates for Use in Construction and Criteria for Laboratory Evaluation.
 - 2. D3666 - Standard Specification for Minimum Requirements for Agencies Testing and Inspecting Road and Paving Materials.
 - 3. D3740 - Standard Practice for Minimum Requirements for Agencies Engaged in the Testing and/or Inspection of Soil and Rock as Used in Engineering Design and Construction.
 - 4. E329 - Standard Specification for Agencies Engaged in Construction Inspection and/or Testing.
 - 5. E543 - Standard Specification for Agencies Performing Nondestructive Testing.

1.3 QUALITY ASSURANCE

- A. Owner will employ and pay for services of an independent testing laboratory to perform specified testing and inspections.
- B. Contractor shall cooperate with the Testing Laboratory to facilitate performance of its work.
- C. Employment of Testing Laboratory shall in no way relieve Contractor of his obligations to perform work in accordance with Contract Documents.
- D. Refer to the Conditions of the Contract for provisions related to special inspections and testing.
- E. Qualifications of Laboratory:
 - 1. Meet requirements of ASTM E329
 - 2. Authorized to operate in Georgia.

1.4 LABORATORY DUTIES

- A. Cooperate with Architect and Contractor; provide qualified personnel after due notice.
- B. Perform specified inspections, sampling, and testing of materials and methods of construction:
 - 1. Comply with specified standards.

2. Ascertain compliance or noncompliance of materials with requirements of Contract Documents.
- C. Promptly notify Architect and Contractor of observed irregularities or deficiencies of Work or products.
 - D. Promptly submit written report of each test and inspection; submit electronically in Adobe PDF format to Architect, and Contractor.
 - E. Each report to include:
 1. Date issued.
 2. Project title and number.
 3. Testing Laboratory name, address, and telephone number.
 4. Name of Inspector and signature of individual in charge.
 5. Date and time of sampling or inspection.
 6. Record of temperature and weather conditions.
 7. Date of test.
 8. Identification of product and specification section.
 9. Location of sample or test in project.
 10. Type of inspection or test.
 11. Results of tests and compliance or noncompliance with Contract Documents.
 12. Interpretation of test results when requested by Architect or Contractor.
 - F. Perform additional tests when required by Architect or Owner.
 - G. Laboratory is not authorized to:
 1. Release, revoke, alter, or enlarge on requirements of Contract Documents.
 2. Approve or accept any portion of work.
 3. Perform any duties of Contractor.

1.5 CONTRACTOR'S RESPONSIBILITIES

- A. Cooperate with Laboratory personnel; provide access to Work, and to manufacturer's operations.
- B. When materials require testing prior to being incorporated into Work, secure and deliver to Laboratory adequate quantities of representative samples of materials proposed to be used.
- C. Furnish copies of product test reports as required.
- D. Furnish incidental labor and facilities:
 1. To provide access to work to be tested.
 2. To obtain and handle samples at site or at source of product to be tested.
 3. To facilitate inspections and tests.
 4. For safe storage and curing of test samples.
- E. Notify Laboratory sufficiently in advance of operations to allow for Laboratory assignment of personnel and scheduling of tests.
- F. When tests or inspections cannot be performed after such notice, reimburse Owner for Laboratory personnel and travel expenses incurred due to Contractor's negligence.
- G. Make arrangements with Laboratory and pay for additional samples and tests required for Contractor's convenience.

PART 2 PRODUCTS

Not used

PART 3 EXECUTION

Not used

END OF SECTION

SECTION 01 5000

TEMPORARY FACILITIES AND CONTROLS

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Temporary utilities.
 - 2. Field offices and sheds.
 - 3. Temporary controls.
 - 4. Protection of installed Work.
 - 5. Security.
 - 6. Progress cleaning.
 - 7. Access roads and parking areas.
 - 8. Removal.

1.2 REFERENCES

- A. Green Seal, Inc. (GS) 37 - Environmental Standard for Industrial and Institutional Cleaners.

PART 2 PRODUCTS

Not used

PART 3 EXECUTION

3.1 TEMPORARY ELECTRICITY

- A. Contractor may use the owner's electrical service. Every effort shall be made to conserve the utility.
- B. Provide power outlets for construction operations, with branch wiring and distribution boxes located as required. Provide flexible power cords as required.
- C. Maintain distribution system and provide routine repairs. Upgrade as per contract documents.

3.2 TEMPORARY LIGHTING

- A. Provide temporary lighting for construction and security purposes.
- B. Provide branch wiring from power source to distribution boxes with lighting conductors, pigtails, and lamps as required.
- C. Maintain lamps and provide routine repairs.
- D. Provide portable lights when required to provide minimum lighting levels necessary for specific work.

3.3 TEMPORARY HEAT

- A. Provide temporary heating devices required to maintain specified ambient temperatures for construction.

3.4 TEMPORARY VENTILATION

- A. Ventilate enclosed areas to facilitate curing of materials, disperse humidity, and prevent accumulations of dust, fumes, vapors, or gases.
- B. Provide temporary fan units as required to maintain clean air for construction.

3.5 TEMPORARY TELEPHONE, FACSIMILE, AND COMPUTER SERVICES

- A. Contractor shall be accessible during normal business hours via mobile telephone with voice mail or an answering service.

3.6 TEMPORARY WATER

- A. Contractor may use the owner's water service. Every effort shall be made to conserve the utility.
- B. Extend branch piping and provide temporary hoses so that water is available at locations needed for work.
- C. Protect from freezing.
- D. Maintain distribution system and provide routine repairs.

3.7 TEMPORARY SANITARY FACILITIES

- A. Provide chemical toilets for use during construction.
- B. Maintain facilities in clean and sanitary condition.

3.8 FIELD OFFICES AND SHEDS

- A. At contractor's option, he may use the building to house his office. Provide temporary storage sheds required for construction.
- B. Do not unreasonably encumber site or premises with excess materials or equipment.
- C. Temporary Structures:
 - 1. Portable or mobile buildings, structurally sound, weather tight, with floors raised above ground.
 - 2. Thermal transmission resistance: Compatible with occupancy and storage requirements.
 - 3. Provide connections for utility services when required.
 - 4. Provide steps and landings at entrances.

3.9 BARRIERS

- A. At contractor's option, he may provide barriers to prevent unauthorized entry to construction areas and to protect existing facilities from construction operations.
- B. Fencing: (At contractors option)
 - 1. Provide temporary fencing for construction operations.
 - 2. Construction: Contractor's option.
 - 3. Height: 6 feet minimum.
 - 4. Locate to protect construction operations, materials, and equipment.
 - 5. Provide vehicular and pedestrian openings.

3.10 PROTECTION OF INSTALLED WORK

- A. Protect installed work from construction operations; provide special protection when required in individual specification sections.
- B. Protect owner's equipment from damage during construction. The units may be removed if measures can be taken to protect them from the elements.

3.11 SECURITY

- A. Provide a project security program, to:
 - 1. Protect the Work, stored products, and construction equipment from theft and vandalism.
 - 2. Prevent entry by unauthorized persons.

3.12 PROGRESS CLEANING

- A. Maintain areas free from waste materials, debris, and rubbish. Maintain site in clean and orderly condition.
- B. Provide containers for collection of waste materials, debris, and rubbish; remove and dispose of off-site as required by construction activities.
- C. Clean interior areas daily to provide suitable conditions for finish work.

3.13 TEMPORARY CONTROLS

- A. Dust Control:
 - 1. Provide dust control materials and methods to minimize dust from construction operations.
 - 2. Prevent dust from dispersing into atmosphere.
- B. Mold and Mildew Control:
 - 1. Provide continuous measures to prevent formation of mold and mildew in construction.
 - 2. Do not install materials sensitive to mold and mildew growth until protection can be provided.
 - 3. Promptly remove and replace materials exhibiting mold and mildew growth.

3.14 ACCESS ROADS AND PARKING AREAS

- A. Existing roads designated by Owner may be used for construction purposes.
- B. Provide for access by emergency vehicles.
- C. Keep fire hydrants and water control valves free from obstruction and accessible for use.
- D. Owner will designate parking facilities for construction personnel.
- E. Maintain existing construction, and restore to original or specified condition at completion of Work.

3.15 REMOVAL

- A. Remove temporary utilities, equipment, facilities, and services when construction needs can be met by use of permanent construction or upon completion of Project.
- B. Clean and repair damage caused by installation or use of temporary work.

C. Restore existing facilities used during construction to original or to specified condition.

END OF SECTION

SECTION 01 6000
PRODUCT REQUIREMENTS

PART 1 PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Products.
 - 2. Transportation and handling.
 - 3. Storage and protection.
 - 4. Reuse of existing materials.
 - 5. Product options.

1.2 PRODUCTS

- A. Provide interchangeable components by the same manufacturer for identical items.
- B. Do not use products containing asbestos or other known hazardous materials.
- C. Do not reuse materials and equipment removed from other existing construction projects.

1.3 TRANSPORTATION AND HANDLING

- A. Coordinate delivery of Products to prevent conflict with Work and adverse conditions at site.
- B. Transport and handle Products in accordance with manufacturer's instructions.
- C. Promptly inspect shipments to ensure that Products comply with requirements of Contract Documents, are undamaged, and quantities are correct.
- D. Provide equipment and personnel to handle products by methods to prevent damage.

1.4 STORAGE AND PROTECTION

- A. Store and protect Products in accordance with manufacturer's instructions with manufacturer's seals and labels intact and legible.
- B. Store Products on site unless prior written approval to store off site has been obtained from Owner.
- C. Store Products subject to damage by elements in weathertight enclosures. Maintain temperature and humidity within ranges required by manufacturer's instructions.
- D. Exterior Storage:
 - 1. Store fabricated Products above ground; prevent soiling and staining.
 - 2. Cover products subject to deterioration with impervious sheet coverings; provide ventilation to prevent condensation.
 - 3. Store loose granular materials in well drained area on solid surfaces; prevent mixing with foreign matter.
- E. Arrange storage areas to permit access for inspection. Periodically inspect stored products to verify that products are undamaged and in acceptable condition.

1.5 PRODUCT OPTIONS

- A. Products specified by reference standard only:
 - 1. Select any Product meeting the specified standard.
 - 2. Submit Product Data to substantiate compliance of proposed Product with specified requirements.
- B. Products specified by naming two or more acceptable Products: Select any named Product.
- C. Products specified by stating that the Contract Documents are based on a Product by a single manufacturer followed by the statement "Equivalent products by the following manufacturers are acceptable":
 - 1. Select the specified Product or a Product by a named manufacturer having equivalent or superior characteristics to the specified Product and meeting the requirements of the Contract Documents.
 - 2. If the specified Product is not selected, submit Product Data to substantiate compliance of proposed Product with specified requirements.
 - 3. The specified Product establishes the required standard of quality.
- D. Products specified by naming one or more Products followed by "or approved substitute" or similar statement:
 - 1. Submit a substitution request for Products not listed.
 - 2. The specified Product establishes the required standard of quality.
- E. Products specified by required performance or attributes, without naming a manufacturer or Product:
 - 1. Select any Product meeting specified requirements.
 - 2. Submit Product Data to substantiate compliance of proposed Product with specified requirements.

PART 2 PRODUCTS

Not used

PART 3 EXECUTION

Not used

END OF SECTION

SECTION 01 7329

CUTTING AND PATCHING

PART 1 PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Requirements and limitations for cutting and patching of work.

1.2 SUBMITTALS

- A. Submit written request in advance of executing cutting or alteration that affects:
 - 1. Work of Owner or separate contractor or work that affects the owners operation.
 - 2. Structural integrity of project.
 - 3. Integrity or effectiveness of weather exposed or moisture resistant elements or systems.
 - 4. Efficiency, operational life, maintenance, or safety of operational elements.
 - 5. Visual qualities of sight exposed elements.
- B. Include in Request:
 - 1. Identification of project.
 - 2. Description of work affected.
 - 3. Necessity for cutting or patching.
 - 4. Effect of cutting or patching on work of Owner or separate contractor, or on structural, weatherproof, or visual integrity of project.
 - 5. Description of proposed work:
 - a. Scope of cutting and patching.
 - b. Subcontractor and trades to execute work.
 - c. Products proposed to be used.
 - d. Extent of refinishing.
 - 6. Alternate to cutting and patching.
 - 7. Cost proposal, if applicable.
 - 8. Written permission of any separate contractor whose work will be affected.
- C. If conditions of work or schedule necessitate a change of material from that originally installed, submit substitution request.

PART 2 PRODUCTS

Not used

PART 3 EXECUTION

3.1 PREPARATION

- A. Examine existing conditions of work, including elements subject to movement or damage during cutting and patching.
- B. After uncovering work, examine conditions affecting installation of new products or performance of work.
- C. Provide protection for other portions of project.
- D. Provide protection from elements.

3.2 CUTTING AND PATCHING

- A. Execute cutting to include excavating, fitting, and patching of Work required to:
 - 1. Provide routine penetrations of nonstructural surfaces for installation of piping and electrical conduit.
- B. Execute fitting and adjustment of products to provide finished installation to comply with specified tolerances, and finishes.
- C. Execute cutting and demolition by methods that will prevent damage to other work, and will provide proper surfaces to receive installation of repairs and new work.
- D. Execute excavating and backfilling by methods that will prevent damage to other Work, and will prevent settlement.
- E. When possible employ original installer or fabricator to perform cutting and patching for:
 - 1. Weather exposed or moisture resistant elements.
 - 2. Sight exposed finished surfaces.
- F. Restore work that has been cut or removed; install new products to provide completed Work in accordance with requirements of Contract Documents.

END OF SECTION

SECTION 01 7700

CLOSEOUT PROCEDURES

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Closeout procedures.
 - 2. Final cleaning.
 - 3. Adjusting.
 - 4. Project record documents.
 - 5. Operation and maintenance data.
 - 6. Warranties.
 - 7. Spare parts and maintenance materials.
 - 8. Starting of systems.
 - 9. Demonstration and instructions.

1.2 CLOSEOUT PROCEDURES

- A. Final Inspection:
 - 1. Submit written certification that Contract Documents have been reviewed, Work has been inspected, and that Work is complete in accordance with the Contract Documents and ready for Architect's inspection.
- B. Submit final Application for Payment showing original Contract Sum, adjustments, previous payments, retainage withheld from previous payments and sum remaining due.
- C. Closeout Submittals:
 - 1. Evidence of compliance with requirements of governing authorities.
 - 2. Certificate of Occupancy.
 - 3. Project Record Documents.
 - 4. Operation and Maintenance Data.
 - 5. Warranties.
 - 6. Contractor's and major sub-contractors guarantee that all workmanship and materials shall be free from defects for a period of (1) one-year.
 - 7. Keys and keying schedule.
 - 8. Spare parts and maintenance materials signed receipt.
 - 9. Evidence of payment of Subcontractors and suppliers.
 - 10. Final lien waiver.
 - 11. Certificate of insurance for products and completed operations.
 - 12. Consent of Surety to final payment.
- D. All items noted in 1.2 C above shall be submitted electronically on thumb drive in Adobe PDF format or as noted in sections below.

1.3 FINAL CLEANING

- A. Execute final cleaning prior to final inspection.
- B. Clean surfaces exposed to view:
 - 1. Remove temporary labels, stains and foreign substances.
 - 2. Damp mop hard surface flooring.

- C. Clean equipment and fixtures to a sanitary condition.
- D. Clean or replace filters of operating equipment.
- E. Clean site; sweep paved areas, rake clean landscaped surfaces.
- F. Remove waste and surplus materials, rubbish, and construction facilities from the site.

1.4 ADJUSTING

- A. Adjust operating Products and equipment to ensure smooth and unhindered operation.

1.5 PROJECT RECORD DOCUMENTS

- A. Maintain the following record documents on site; record actual revisions to the Work:
 - 1. Drawings. (original copy and electronic)
 - 2. Specifications. (original copy and electronic)
 - 3. Addenda. (original copy and electronic)
 - 4. Change Orders and other Modifications to the Contract. (note the change on the drawings, Submit the actual documentation electronically only)
 - 5. Reviewed Shop Drawings, Product Data, and Samples. (electronically only)
 - 6. Material Safety Data Sheets. (electronically only)
- B. Store Record Documents separate from documents used for construction.
- C. Record information concurrent with construction progress.
- D. Make entries neatly and accurately.
- E. Label each set or volume with title "PROJECT RECORD DOCUMENTS", project title, and description of contents.
 - 1. Organize contents according to Project Manual table of contents.
 - 2. Provide table of contents for each volume.
- F. Drawings: Mark each item to record actual construction including:
 - 1. Measured locations of internal utilities and appurtenances concealed in construction, referenced to visible and accessible features of the Work.
 - 2. Field changes of dimension and detail.
 - 3. Details not on original Drawings.
 - 4. Changes noted in addendum.
 - 5. Change orders.
- G. Specifications: Mark each Product section description of actual Products installed, including the following:
 - 1. Manufacturer's name and product model and number.
 - 2. Product substitutions or alternates utilized.
 - 3. Changes made by Addenda, change orders and Modifications.
- H. Shop Drawings: Mark each item to record actual construction including:
 - 1. Field changes of dimension and detail.
 - 2. Details not on original Shop Drawings.
- I. Submit one original copy. (As noted above) Additionally, submit electronically on thumb drive in Adobe PDF format those items noted above.

1.6 OPERATION AND MAINTENANCE DATA

- A. Identify as "OPERATION AND MAINTENANCE INSTRUCTIONS" and title of project.
- B. Contents: Verify with individual specification sections.
 - 1. Directory: List names, addresses, and telephone numbers of Architect, Contractor, Subcontractors, and major equipment suppliers.
 - 2. Operation and maintenance instructions: Arranged by system and subdivided by specification section. For each category, identify names, addresses, and telephone numbers of Subcontractors and suppliers. Identify the following:
 - a. Significant design criteria.
 - b. List of equipment.
 - c. Parts list for each component.
 - d. Operating instructions.
 - e. Maintenance instructions for equipment and systems.
 - f. Maintenance instructions for special finishes, including recommended cleaning methods and materials and special precautions identifying detrimental agents.
 - 3. Project documents and certificates including:
 - a. Shop drawings and product data.
 - b. Air and water balance reports.
 - c. Certificates.
 - d. Copies of warranties and bonds.
- C. Submittal:
 - 1. Submit one copy at least 15 days prior to final inspection.
 - 2. Architect will notify Contractor of any required revisions after final inspection.
 - 3. Revise content of documents as required prior to final submittal.
 - 4. Submit (2) two hard copies and one electronic copy on thumb drive in Adobe PDF format of revised documents within 10 days after final inspection.

1.7 WARRANTIES

- A. Execute and assemble documents from Subcontractors, suppliers, and manufacturers.
- B. Include Table of Contents.
- C. Submit (1) one copy along with final Application for Payment. Additionally, submit electronically on thumb drive in Adobe PDF format.
- D. For items of Work delayed beyond date of Substantial Completion, provide updated submittal within 10 days after acceptance, listing date of acceptance as start of warranty period.

1.8 SPARE PARTS AND MAINTENANCE MATERIALS

- A. Provide products, spare parts, maintenance and extra materials in quantities specified in individual specification Sections.
- B. Deliver to Project site in location as directed; obtain receipt signed by owner's representative prior to final payment.

1.9 STARTING OF SYSTEMS

- A. Notify Owner and Architect at least seven days prior to startup of each system or piece of equipment.
- B. Prior to beginning startup verify that:
 - 1. Lubrication has been performed.

2. Drive rotation, belt tension, control sequences, tests, meter readings, and electrical characteristics are within manufacturer's requirements.
 3. Utility connections and support components are complete and tested.
- C. Execute start-up under supervision of applicable manufacturer's representative or Contractor's personnel in accordance with manufacturers' instructions.
 - D. When specified in individual specification Sections, require manufacturer to provide authorized representative to be present at site to inspect, check, and approve equipment or system installation prior to startup, and to supervise placing equipment or system in operation.
 - E. Submit written report that equipment or system has been properly installed and is functioning correctly.

1.10 DEMONSTRATION AND INSTRUCTIONS

- A. Demonstrate operation and maintenance of Products to Owner's personnel two weeks prior to date of Substantial Completion.
- B. For equipment or systems requiring seasonal operation, perform demonstration for other season within six months.
- C. Utilize Operation and Maintenance Manuals as basis for instruction. Review contents of manual with Owners' personnel in detail to explain all aspects of operation and maintenance.
- D. Demonstrate startup, operation, control, adjustment, troubleshooting, servicing, maintenance, and shutdown of each item of equipment at agreed upon times, at equipment location.
- E. Prepare and insert additional data in Operation and Maintenance Manuals when need for additional data becomes apparent during instruction.

PART 2 PRODUCTS

Not used

PART 3 EXECUTION

Not used

END OF SECTION

SECTION 02 4120

SELECTIVE BUILDING DEMOLITION

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Removal of designated building construction, equipment, and fixtures.
 - 2. Identification of utilities.
- B. Related Sections:
 - 1. Division 01 - Administrative, procedural, and temporary work requirements.

1.2 SUBMITTALS

- A. Submittals for Review:
 - 1. Shop Drawings: Indicate areas for demolition, removal sequence and location of salvageable items, and location and construction of temporary work.

1.3 REGULATORY REQUIREMENTS

- A. Conform to applicable code for demolition work, safety of structure, and dust control.
- B. Obtain required permits from authorities.
- C. Notify affected utility companies before starting work and comply with their requirements.
- D. Conform to applicable codes when hazardous or contaminated materials are discovered.
- E. Do not close or obstruct exits.
- F. All demolition work shall comply with the requirements of NFPA 241, 2013 Edition, Standard for Safeguarding Construction, Alteration and Demolition Operation.

1.4 PROJECT CONDITIONS

- A. Minimize interference with streets, walks, public right-of-ways, and adjacent facilities.
- B. If hazardous materials are discovered, notify Architect and await instructions.
- C. If any of the following conditions are encountered, cease work immediately, notify Architect, and await instructions:
 - 1. Structure is in danger of movement or collapse.
 - 2. Materials or conditions encountered differ from those designated in the Contract Documents.

PART 2 PRODUCTS

Not used

PART 3 EXECUTION

3.1 PREPARATION

- A. Erect temporary partitions, barricades, warning devices, and controls. Temporary enclosures to be constructed using non-combustible, flame-resistant materials.
- B. Provide protective coverings, shoring, bracing, and supports for construction designated to remain.

C. Temporarily or permanently disconnect utilities as required.

3.2 DEMOLITION

- A. Remove existing construction to extent indicated on drawings and as necessary to join new work to existing. Do not remove more than is necessary to allow for new construction.
- B. Do not damage work designated to remain.
- C. Minimize noise and spread of dirt and dust.
- D. Assign work to trades skilled in procedures involved.
- E. Plug ends of disconnected utilities with threaded or welded caps.
- F. Protect and support active utilities designated to remain. Post warning signs showing location and type of utility and type of hazard.
- G. Store items designated to remain property of Owner. (Toilet Accessories)
- H. Remove and dispose of waste materials off site. Burning of construction debris or natural materials on the site is prohibited.

END OF SECTION

SECTION 03 1000
CONCRETE FORMING

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Forms for cast-in-place concrete and anchorage.
 - 2. Form accessories.
 - 3. Stripping of forms.

1.2 REFERENCES

- A. American Concrete Institute (ACI):
 - 1. 301 - Specifications for Structural Concrete for Buildings.
 - 2. 347 - Recommended Practice for Concrete Formwork.

1.3 QUALITY ASSURANCE

- A. Design formwork in accordance with ACI 301 and 347.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Acceptable Manufacturers - Architectural Form Liners:
 - 1. Dayton Superior. (www.daytonsuperior.com)
 - 2. Fitzgerald Formliners.
 - 3. Greenstreak, Inc.
- B. Acceptable Manufacturers - Form Accessories:
 - 1. Dayton Superior. (www.daytonsuperior.com)
 - 2. Greenstreak, Inc.
 - 3. Meadow Burke. (www.meadowburke.com)
 - 4. Nox-Crete Products Group.

2.2 MATERIALS

- A. Forms:
 - 1. Wood, metal, glass fiber, Earth cuts or other approved material that will not adversely affect surface of concrete and will provide or facilitate obtaining specified surface finish.
 - 2. Wood:
 - a. Concealed surfaces:
 - 1) Lumber, No. 2 Common or better, dressed to smooth contact surfaces, or:
 - b. Exposed surfaces: Non absorptive medium density overlay plywood.
 - 3. Metal: Minimum 16 gage steel, tight fitting, stiffened to support concrete.
 - 4. Earth cuts may be used as forms for footings only where sides of cut will stand without danger of caving.
- B. Tubular Forms:
 - 1. Round, spirally wound laminated fiberboard, surface treated with release agent, non-reusable.

2.3 ACCESSORIES

- A. Form Release Agent: Nonstaining, colorless mineral oil that will not absorb moisture, stain concrete, or impair adhesion of coatings to be applied to concrete.
- B. Construction Joints Forms: Formed galvanized steel, minimum 18 gage, with keyway.
- C. Anchors and Fasteners: Size as required, sufficient strength to maintain forms in place while concrete is placed.

PART 3 EXECUTION

3.1 CONSTRUCTION

- A. Construct formwork, shoring, and bracing to produce concrete of required shape, line, and dimension.
- B. Arrange and assemble formwork with minimum joints, located to allow dismantling without damage to concrete.
- C. When exposed, provide chamfer strips in corners of forms to produce beveled external corners.
- D. Adjust supports to take up settlement caused by concrete placement.
- E. Clean form surfaces prior to concrete placement.
- F. Interior Construction Joints: Interior slabs on grade shall have control joints where noted and detailed.
 - 1. Unless otherwise indicated on drawings, each unit of construction is a single unit; place concrete continuously to provide monolithic construction.
 - 2. Where joints are not located on drawings, the following criteria shall be used to locate joints.
 - a. Slab areas between joints shall not exceed 1,200 square feet.
 - b. Length of any section shall not exceed 35 feet.(12 feet if saw cut)
 - c. Ratio of length to width shall not exceed 1.5:1.
 - 3. Joints preferably shall be located at face of walls.
 - 4. Set screed edge at required elevation. Secure to prevent movement.
 - 5. Joints located under or at face of walls may be constructed of 8" metal key-way left in place.
 - 6. All joints may be saw cut as per drawings or as noted above.
 - a. Saw cut shall be minimum $\frac{1}{4}$ of slab thickness deep.
 - b. Cuts shall be straight and true.
 - c. Contractor shall saw cut no more than 6 hours after pour or as stated on structural drawings.
- G. Exterior Construction Joints: Exterior slabs on grade shall have expansion and scored joints where noted and detailed.
 - 1. Unless otherwise indicated on drawings, each unit between expansion joints is a single unit; place concrete continuously to provide monolithic construction
 - 2. Where joints are not located on drawings, the following criteria shall be used to locate joints.
 - a. Slab areas between expansion joints shall not exceed 350 square feet.
 - b. Length of any section between expansion joints shall not exceed 35 feet.
 - c. Ratio of length to width between expansion joints shall not exceed 4:1.
 - d. Ratio of length to width between scored joints shall not exceed 1.5:1.

3. Scored joints shall be 1" deep, using jointing tool and straight edge guide, round perimeter edges to approximately ¼ inch radius.
 4. Expansion joints shall be 1/4 inch PEJ and be set down from top of slab 1/4 inch. Tool each side of expansion joint for a finished look.
 5. Apply sealants as may be specified on structural or civil drawings.
- H. Form Release Agent:
1. Apply form release agent to formwork prior to placing reinforcing, anchoring devices, and embedded items; follow manufacturer's instructions.
 2. Do not allow agent to puddle in forms or to contact hardened concrete against which fresh concrete is to be placed.
- I. Inserts and Embedded Parts:
1. Before concrete is placed, install inserts, anchor slots, anchor bolts, and embedded parts required for attachment of work.
 2. Provide formed openings where required for pipes, conduits, sleeves, and other work passing through concrete members.
 3. Maintain in position during concrete placement.
- J. Form Removal:
1. Do not remove formwork until concrete has attained sufficient strength to resist dead loads plus applied live loads.
 2. Remove formwork in manner that will not damage surfaces of concrete; patch work damaged during form removal operations.
 3. Provide shoring, reshoring, and bracing as required.
- K. Installation Tolerances:
1. Construct formwork to maintain tolerances required by ACI 301.

END OF SECTION

SECTION 03 3000

CAST-IN-PLACE CONCRETE

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes:
1. Cast-in-place concrete for foundations and slabs on grade.
 2. Equipment pads.
 3. Bases for lighting fixtures.

1.2 REFERENCES

- A. American Concrete Institute (ACI)
1. 301 - Structural Concrete for Buildings.
 2. 305R - Hot Weather Concreting.
 3. 306R - Cold Weather Concreting.
 4. 308 - Standard Practice for Curing Concrete.
 5. 318 - Building Code Requirements for Structural Concrete.
 6. ACI 117 – Specification for Tolerances for Concrete Construction and Materials.
 7. ACI 302 – Guidelines for Layout of Construction, Isolation and Contraction Joints.
- B. ASTM International (ASTM)
1. C31 - Standard Test Method for Method of Making and Curing Concrete Test Specimens in the Field.
 2. C33 - Standard Specification for Concrete Aggregates.
 3. C39 - Standard Test Method for Test Method for Compressive Strength of Cylindrical Concrete Specimens.
 4. C94 - Standard Specification for Ready-Mixed Concrete.
 5. C143 - Standard Test Method for Slump of Portland Cement Concrete.
 6. C150 - Standard Specification for Portland Cement.
 7. C171 - Standard Specification for Sheet Materials for Curing Concrete.
 8. C172 - Standard Test Method for Method of Sampling Freshly Mixed Concrete.
 9. C260 - Standard Specification for Air-Entraining Admixtures for Concrete.
 10. C309 - Standard Specification for Liquid Membrane-Forming Compounds for Curing Concrete.
 11. C330 - Standard Specification for Lightweight Aggregates for Structural Concrete.
 12. C494 - Standard Specification for Chemical Admixtures for Concrete.
 13. C1116/1116M - Standard Specification for Fiber-Reinforced Concrete.

1.3 SUBMITTALS

- A. Submittals for Review:
1. Concrete and Grout Mix Designs: Include:
 - a. Proportions of cement, fine and coarse aggregates, fibrous reinforcing, and water.
 - b. Combined aggregate gradation.
 - c. Aggregate specific gravities and gradations.
 - d. Water/cement ratio, design strength, slump, and air content.
 - e. Type of cement and aggregates.
 - f. Air dry density and split cylinder ratio for lightweight concrete.
 - g. Type and proportion of admixtures.
 - h. Special requirements for pumping.
 - i. Range of ambient temperature and humidity for which design is valid.

- j. Special characteristics of mix requiring precautions in mixing, placing, or finishing techniques to achieve finished product.
2. Submit one manufacturer's labeled package of fiber reinforcing to be used in concrete mix and documentation indicating compliance with specification.
3. Jointing and Pour Sequence Plan: If Contractor proposes a different jointing layout than that shown on drawings, provide a new proposed layout of construction, control, saw-cut, and isolation joints. Clearly delineate the different joint types.
4. Shop drawing re-submittals: Contractor shall thoroughly review Shop Drawings prior to submittal to the A/E Team.

1.4 QUALITY ASSURANCE

- A. Concrete Mix Design: In accordance with ACI 301, Method 1 or 2.

1.5 DELIVERY, STORAGE AND HANDLING

- A. Mix and deliver concrete to project ready mixed in accordance with ASTM C94. Fiber reinforcing shall be placed in the concrete mix only at the batch plant.
- B. Schedule delivery so that pours will not be interrupted for over 20 minutes.
- C. Place concrete on site within 90 minutes after proportioning materials at batch plant.

1.6 PROJECT CONDITIONS

- A. Cold Weather Placement - Protect concrete work from physical damage or reduced strength that could be caused by frost, freezing actions, or low temperatures. Comply with ACI 306R and following requirements:
 1. Air temperature at or expected to fall below 40 degrees F, uniformly heat water and aggregates before mixing to obtain a concrete mixture temperature of not less than 50 degrees F and not more than 80 degrees F at point of placement.
 2. Do not use frozen materials or materials containing ice or snow. Do not place concrete on frozen subgrade or on subgrade containing frozen materials.
 3. Do not use calcium chloride, salt, and other materials containing antifreeze agents or chemical accelerators unless otherwise accepted in mix designs.
- B. Hot Weather Placement - Place concrete in accordance with ACI 305R and following requirements:
 1. Cool ingredients before mixing to maintain concrete temperature at time of placement below 90 degrees F. Use chilled mixing water or chopped ice if water equivalent of ice is calculated in total amount of mixing water.
 2. If required, cover reinforcing steel with water soaked burlap so that steel temperature will not exceed ambient air temperature.
 3. Fog spray forms, reinforcing steel, and subgrade just before concrete is placed.
 4. Do not use water-reducing retarding admixture when required by high temperatures, low humidity, or other adverse placing conditions without prior approval of architect.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Acceptable Manufacturers - Concrete Chemicals:
 1. BASF Corporation. (www.buildingsystems.basf.com)
 2. Dayton Superior. (www.daytonsuperior.com)
 3. W. R. Meadows, Inc. (www.wrmeadows.com)
 4. Meadow Burke. (www.meadowburke.com)
 5. Nox-Crete Products Group. (www.nox-crete.com)

2.2 MATERIALS

- A. Portland Cement: ASTM C150, Type I, gray color.
- B. Normal-Weight Aggregates: ASTM C 33, coarse aggregate or better, graded. Provide aggregates from a single source with documented service record data of at least 10 years' satisfactory service in similar applications and service conditions using similar aggregates and cementitious materials.
 - 1. Fine: ASTM C33, clean, hard, durable, uncoated natural sand, free from silt, loam, and clay.
 - 2. Coarse: ASTM C33, clean, hard, durable, uncoated crushed stone, maximum 1 ½" Nominal.
 - 3. Aggregate shall be provided and classified as follows:
 - a. Footings, foundations, columns and beams not exposed to weather. Interior floor slabs with floor coverings: Class 1M.
 - b. Foundation walls above grade, retaining walls, piers and beams exposed to weather: Class 3M.
 - c. Pavements, driveways, curbs, walks: Class 4M
- C. Fibrous Reinforcing: ASTM C1116/1116M, Type III, 1 to 2-1/4 inches long, fibrillated polypropylene micro-fibers engineered and designed for use in concrete. Fiber manufacturer shall document compliance with above requirements.
 - 1. Manufacturers:
 - a. Fibermesh 300 by Propex Concrete Systems
 - b. FORTA ECONO-NET by Forta Corp.
 - c. Grace Fibers by W.R. Grace Co.

2.3 ACCESSORIES

- A. Water: Clean and potable.
- B. Admixtures:
 - 1. Air entraining: ASTM C260. Provide in all concrete and Coarse Grout
 - 2. No other admixtures (ie: water reducing agents and accelerators) will be permitted without prior approval of architect.
- C. Premolded Expansion Joint Filler: ASTM D1751, non-extruding type, interior – 1/2 inch, exterior - 1/4 inch.
- D. Premolded Expansion Joint Filler: ASTM D1752, non-asphaltic type, 1/4 inch.
- E. Non-Shrink Grout: Premixed, consisting of non-metallic aggregate, cement, water reducing and plasticizing agents; minimum 7,000 psi compressive strength at 28 days.
- F. Bonding Agent: ASTM C 1059/C 1059M, Type II, non-redispersible, acrylic emulsion or styrene butadiene.
- G. Epoxy Bonding Adhesive: ASTM C 881, two-component epoxy resin, capable of humid curing and bonding to damp surfaces, of class suitable for application temperature and of grade to suit requirements, and as follows:
 - 1. Types IV and V, load bearing, for bonding hardened or freshly mixed concrete to hardened concrete.
- H. Curing Compound: ASTM C309, water based type.
- I. Curing Paper: ASTM C171, waterproof paper or polyethylene film, 6 mil.

- J. Drainage fill under slabs on grade: Clean, uncoated gravel or crushed stone (No. 57 stone), free from shale or other soft material, ranging from 3/4 inch to 1 1/2 inches in size and screened of all fines.
- K. Flex Waterstop: Non-swelling preformed joint sealant, for embedding in concrete to prevent passage of fluids through joints. It is a single component, self –sealing adhesive compound, extruded in a square cross-section.
 - 1. Profile: Square cross-section between two quick-release protective wrappers.
 - 2. Size: 1 inch x 1 inch
 - 3. Products:
 - a. Henry; SF302 Synko-Flex
 - b. Other products by Greenstreak, CETCO and JP Specialties meeting product description is acceptable.

2.4 VAPOR RETARDERS

- A. Plastic Vapor Retarder: Vapor Retarder membrane must meet or exceed all requirements of ASTM E1745 Class A.
 - 1. Water Vapor Permeance: 0.05 Perms.
 - 2. Water Vapor Transmission Rate ASTM F1249 calibrated to ASTM E96 (water method): 0.01 grains/ft²/hr.
 - 3. Resistance to Organisms and Substrates in Contact with Soil ASTM E154, Sections 13:0.1 Perms.
 - 4. Tensile Strength ASTM E154, Section 9: 45 lbs/in.
 - 5. Puncture Resistance ASTM D1709, Method B: 2200 g.
 - 6. Thickness of Retarder (plastic): Not less than 10 mils.
- B. Seam Tape: High Density Polyethylene Tape with pressure sensitive adhesive. Minimum width to be 4".
 - 1. Tensile Strength ASTM D1000: 24 lbs/in.
 - 2. Elongation ASTM D1000: 70%.
 - 3. Total thickness (not including liner): 7.5 mils.
 - 4. Adhesive Thickness: 3 mils.
- C. Pipe Boots: Construct pipe boots from vapor barrier material and pressure sensitive tape per manufacturer's instructions or use manufacturer's standard premanufactured pipe boots.
- D. All components of vapor retarder system shall be manufactured by a single source and marketed as a complete system. Acceptable manufacturers include:
 - 1. Fortafiber Building Systems Group (Moistop Ultra 15)
 - 2. Insulation Solutions, Inc. (Viper VaporCheck II)
 - 3. Reef Industries (Griffolyn)
 - 4. Stego Industries (Stego Wrap)
 - 5. W.R. Meadows (Perminator)
- E. Granular Fill: Clean mixture of crushed stone or uncrushed gravel; ASTM D448, Size 57, with 100% passing a 1½"(37.5 mm) sieve and 0 % passing a No. 8 (2.36 mm) sieve.

2.5 LIQUID FLOOR TREATMENTS

- A. Penetrating Liquid Floor Treatment: Clear, chemically reactive, waterborne solution of inorganic silicate or silicate materials and proprietary components; odorless; that penetrates, hardens, and densifies concrete surfaces.
 - 1. Products: Provide one of the following:
 - a. Dayton Superior Corporation; Day-Chem Sure Hard (J-17).
 - b. Euclid Chemical Company (The), an RPM company; Euco Diamond Hard.

- c. Meadows, W.R., Inc.; LIQUI-HARD.
- d. BASF Sonneborn Building Products; Lapidolith.
- e. Davidson Chemicals; Concrete Hardener.

2.6 REPAIR MATERIALS

- A. Repair Underlayment: Cement-based, polymer-modified, self-leveling product that can be applied in thicknesses from 1/8 inch (3.2 mm) to 1/2 inch (12.7 mm) and that can be feathered at edges to match adjacent floor elevations.
 - 1. Cement Binder: ASTM C 150, portland cement or hydraulic or blended hydraulic cement as defined in ASTM C 219.
 - 2. Primer: Product of underlayment manufacturer recommended for substrate, conditions, and application.
 - 3. Aggregate: Well-graded, washed gravel, 1/8 to 1/4 inch or coarse sand as recommended by underlayment manufacturer.
 - 4. Compressive Strength: Not less than 5000 psi at 7 days when tested according to ASTM C 109/C 109M.
- B. Repair Overlayment: Cement-based, polymer-modified, self-leveling product that can be applied in thicknesses from 1/4 inch (6.4 mm) and that can be filled in over a scarified surface to match adjacent floor elevations.
 - 1. Cement Binder: ASTM C 150, portland cement or hydraulic or blended hydraulic cement as defined in ASTM C 219.
 - 2. Primer: Product of topping manufacturer recommended for substrate, conditions, and application.
 - 3. Aggregate: Well-graded, washed gravel, 1/8 to 1/4 inch or coarse sand as recommended by topping manufacturer.
 - 4. Compressive Strength: Not less than 5000 psi at 7 days when tested according to ASTM C 109/C 109M.

2.7 CONCRETE MIXTURES, GENERAL

- A. Prepare design mixtures for each type and strength of concrete, propositioned on the basis of laboratory trial mixture or field test data, or both, according to ACI 301.
 - 1. Use a qualified independent testing agency for preparing and reporting proposed mixture designs based on laboratory trial mixtures.
- B. Admixtures: Use admixtures according to manufacturer's written instructions.

2.8 CONCRETE MIXTURES FOR BUILDING ELEMENTS

- A. Perimeter Footings, Exterior footings, and exterior Slabs: Proportion normal-weight concrete mixture as follows:
 - 1. Minimum Compressive Strength: 3000 psi at 28 days.
 - 2. Minimum Water-Cementitious Materials Ratio: 0.45.
 - 3. Slump Limit: 4 inches plus or minus 1 inch.
 - 4. Air Content: 4.5percent, plus or minus 1.5 percent at point of delivery for 1-1/2-inch nominal maximum aggregate size.
 - 5. Exposure Class: F1.
- B. Coarse Grout: Coarse grout shall be normal weight (150 psf) and shall develop a minimum of 2500 psi compressive strength at 28 days on a standard 2 inch cube.
 - 1. Proportioning shall be in accordance with "Mortar and Grout for Reinforced Masonry (ASTM C476-02)."
 - 2. Slump shall be a maximum of 8 inches when measured using a 12 inch cone in accordance with "Slump of Portland Cement Concrete (ASTM C143)."

3. Sand, if used, shall conform to "Standard Specification for Aggregate for Masonry Mortar (ASTM C144)" except that gradation may be modified as necessary to obtain workability. Maximum size of aggregate shall be limited to 3/8 inch diameter.
- C. Use accelerating admixture in cold weather only when approved by Architect. Use of admixtures will not reduce cold weather placement requirements.

2.9 FABRICATING REINFORCEMENT

- A. Fabricate steel reinforcement according to CRSI's "Manual of Standard Practice"

2.10 CONCRETE MIXING

- A. Ready-Mixed Concrete: Measure, batch, mix, and deliver concrete according to ASTM C 94/C 94M, and furnish batch ticket information.
 1. When air temperature is between 85 and 90 deg F, reduce mixing and delivery time from 1-1/2 hours to 75 minutes; when air temperature is above 90 deg F, reduce mixing and delivery time to 60 minutes.

PART 3 EXECUTION

3.1 PREPARATION

- A. Notify Architect and Testing Laboratory minimum 24 hours prior to placing concrete.
- B. Remove water and debris from forms and excavations.
- C. Close openings left in forms for cleaning and inspection.
- D. Prepare previously placed and existing concrete surfaces by cleaning with steel wire brush and when necessary, applying bonding agent in accordance with manufacturer's instructions.
- E. Drainage fill: Roll thoroughly and tamp to level of at least the thickness shown. (min. 4") Cover with polyethylene film placed in greatest practicable lengths and lapped at least 12" min. All joints and penetrations shall be securely taped.
- F. Premolded expansion joint filler: Provide at intersections of grade slabs and masonry walls, grade slabs and steel columns, exterior concrete walks and elsewhere as shown, detailed or specified. Exterior PEJ shall be located 1/4 inch below finished surface of slab.

3.2 EMBEDDED ITEMS

- A. Place and secure anchorage devices and other embedded items required for adjoining work that is attached to or supported by cast-in-place concrete. Use setting drawings, templates, diagrams, instructions, and directions furnished with items to be embedded.
 1. Install anchor rods, accurately located, to elevations required and complying with tolerances in Section 7.5 of AISC's "Code of Standard Practice for Steel Buildings and Bridges."
 2. Post installed anchors, where permitted on drawings, shall comply with and meet requirements of ICC-ES AC308.
 3. Do not cut reinforcing steel to facilitate installation of inserts or accessories.

3.3 PLACEMENT OF CONCRETE

- A. Place concrete in accordance with ACI 301 and ACI 318.

- B. Ensure reinforcement, inserts, and embedded parts are not disturbed during concrete placement.
- C. Deposit concrete as nearly as possible in its final position to minimize handling and flowing.
- D. Place concrete continuously between predetermined expansion, control, and construction joints.
- E. Do not place partially hardened, contaminated, or retempered concrete.
- F. Do not allow concrete to free fall over 5 feet; provide tremies, chutes, or other means of conveyance.
- G. Consolidate concrete with mechanical vibrating equipment. Hand compact in corners and angles of forms.
- H. Screed slabs level, to flatness tolerance of 1/4 inch in 10 feet.
- I. Concrete in footings and slabs shall not be vibrated unless slump is less than 4". Do not use vibrators to transport concrete inside forms. Insert and withdraw vibrators vertically at uniformly spaced locations.
- J. All exterior concrete walks shall have rounded edges. Edges of scored and expansion joints shall be rounded.
- K. Before placing concrete, verify that installation of formwork, reinforcement, and embedded items is complete and that required inspections have been performed.

3.4 FINISHING FLOORS AND SLABS

- A. General: Comply with ACI 302.1R recommendations for screeding, restraightening, and finishing operations for concrete surfaces. Do not wet concrete surfaces.
- B. Float Finish: Consolidate surface with power-driven floats or by hand floating if area is small or inaccessible to power driven floats. Restraighten, cut down high spots, and fill low spots. Repeat float passes and restraightening until surface is left with a uniform, smooth, granular texture.
 - 1. Apply float finish to surfaces indicated to receive trowel finish.
- C. Trowel Finish: After applying float finish, apply first troweling and consolidate concrete by hand or power-driven trowel. Continue troweling passes and restraighten until surface is free of trowel marks and uniform in texture and appearance. Grind smooth any surface defects that would telegraph through applied coatings or floor coverings.
 - 1. Apply a trowel finish to surfaces to be covered with resilient flooring, carpet, ceramic or quarry tile set over a cleavage membrane, paint, or another thin-film-finish coating system.
- D. Broom Finish: Apply a broom finish to exterior concrete walks, steps, ramps, and elsewhere as indicated.
 - 1. Immediately after float finishing, slightly roughen trafficked surface by brooming with fiber-bristle broom perpendicular to main traffic route. Coordinate required final finish with Architect before application.

3.5 JOINTS

- A. General: Construct joints true to line with faces perpendicular to surface plane of concrete.

- B. Construction Joints: Install so strength and appearance of concrete are not impaired, at locations indicated or as approved by Design Professional.
 - 1. Place joints perpendicular to main reinforcement. Continue reinforcement across construction joints unless otherwise indicated. Do not continue reinforcement through sides of strip placements of floors and slabs.
 - 2. Form keyed joints as indicated. Embed keys at least 1-1/2 inches into concrete.
 - 3. Use a bonding agent at locations where fresh concrete is placed against hardened or partially hardened concrete surfaces.

3.6 FINISHING FORMED SURFACES

- A. Smooth-Formed Finish: As-cast concrete texture imparted by form-facing material arranged in an orderly and symmetrical manner with a minimum of seams. Repair and patch tie holes and defects. Remove fins and other projections that exceed the specified limits on formed surface irregularities.
 - 1. Apply to concrete surfaces exposed to public view.
- B. Related Unformed Surfaces: At tops of walls, horizontal offsets, and similar unformed surfaces adjacent to formed surfaces, strike off smooth and finish with a texture matching adjacent formed surfaces. Continue final surface treatment of formed surfaces uniformly across adjacent unformed surfaces unless otherwise indicated.

3.7 PLACEMENT OF COARSE GROUT

- A. Remove loose and foreign matter from concrete; lightly roughen bonding surface.
- B. Just prior to grouting, thoroughly wet concrete surfaces; remove excess water.
- C. Mix grout in accordance with manufacturer's instructions. Do not retemper.
- D. Place grout continuously, by most practical means; avoid entrapped air. Do not vibrate grout.

3.8 MISCELLANEOUS CONCRETE ITEMS

- A. Filling In: Fill in holes and openings left in concrete structures after work of other trades is in place unless otherwise indicated. Mix, place, and cure concrete, as specified, to blend with in-place construction. Provide other miscellaneous concrete filling indicated or required to complete the Work.
- B. Curbs: Provide monolithic finish to interior curbs by stripping forms while concrete is still green and by steel-troweling surfaces to a hard, dense finish with corners, intersections, and terminations slightly rounded.
- C. Equipment Bases and Foundations: Provide machine and equipment bases and foundations as shown on Drawings. Set anchor bolts for machines and equipment at correct elevations, complying with diagrams or templates from manufacturer furnishing machines and equipment.

3.9 PROTECTION

- A. Immediately after placement, protect concrete from premature drying, excessively hot or cold temperatures, and mechanical injury. Comply with ACI 306.1 for cold-weather protection and ACI 301 for hot-weather protection during curing.
- B. Maintain concrete with minimal moisture loss at relatively constant temperature for period necessary for hydration of cement and hardening of concrete.

- C. Provide artificial heat to maintain temperature of concrete above minimum specified temperature for duration of curing period.
- D. Keep forms sufficiently wet to prevent cracking of concrete or loosening of form joints.
- E. Hardener: After final curing, unless otherwise noted, treat interior floors noted in finish schedule as "exposed concrete with trowel finish", with three full even applications of liquid floor hardener applied in strict accordance with the manufacturer's written instructions.
- F. Concrete slabs used as substrate for resilient tile, wood and seamless flooring shall remain exposed (without applied finish floor covering) for a minimum of 45 days after placement. Curing components or hardeners shall not be applied to these areas.

3.10 CURING

- A. Cure concrete in accordance with ACI 308:
 - 1. Horizontal surfaces:
 - a. Use of curing compounds is prohibited for initial curing.
 - b. Initial curing shall be by ponding, continuous sprinkling, sand, burlap kept moist or moisture retaining cover (poly). Initial curing procedure shall continue for at least 7 days after concrete is placed.
 - 2. Vertical surfaces: Use either wet curing or curing compound method.
- B. Curing Compound Method (Do not use unless approved by architect in advance):
 - 1. Spray compound on surfaces in two coats, applying second at right angle to first, at minimum rate recommended by manufacturer.
 - 2. Restrict traffic on surfaces during curing.
- C. Curing Paper Method:
 - 1. Spread curing paper over surfaces, lapping ends and sides minimum 4 inches; maintain in place by use of weights.
 - 2. Remove paper after curing.
- D. Wet Curing Method: Spray water over surfaces and maintain wet for 7 days.
- E. Initial Curing may be by ponding, kept moist with sand or a moisture retaining cover.
- F. Concrete slabs used as substrate for ceramic, quarry and resilient tile flooring shall be cured for a minimum of 30 days prior to installation of flooring system. Curing compounds and hardeners shall not be applied to those areas.
- G. Final curing is defined as the point at which the concrete reaches its' specified 3,000 psi compressive strength confirmed by a cylinder break at 28 days.

3.11 CLEANING

- A. Remove efflorescence, stains, oil, grease, and foreign materials from exposed surfaces.

3.12 JOINT FILLING

- A. Prepare, clean, and install joint filler according to manufacturer's written instructions.
 - 1. Defer joint filling until concrete has aged at least one month. Do not fill joints until construction traffic has permanently ceased.
- B. Remove dirt, debris, saw cuttings, curing compounds, and sealers from joints; leave contact faces of joint clean and dry.

3.13 CONCRETE SURFACE REPAIRS

- A. Defective Concrete: Repair and patch defective areas when approved by Architect. Remove and replace concrete that cannot be repaired and patched to Architect's approval.
- B. Patching Mortar: Mix dry-pack patching mortar, consisting of one part portland cement to two and one-half parts fine aggregate passing a No. 16 sieve, using only enough water for handling and placing.
- C. Repairing Unformed Surfaces: Test unformed surfaces, such as floors and slabs, for finish and verify surface tolerances specified for each surface. Correct low and high areas. Test surfaces sloped to drain for trueness of slope and smoothness; use a sloped template.
 - 1. Repair finished surfaces containing defects. Surface defects include spalls, popouts, honeycombs, rock pockets, crazing and cracks in excess of 0.01 inch wide or that penetrate to reinforcement or completely through unreinforced sections regardless of width, and other objectionable conditions.
 - 2. After concrete has cured at least 14 days, correct high areas by grinding.
 - 3. Correct other low areas scheduled to receive floor coverings with a repair underlayment. Prepare, mix, and apply repair underlayment and primer according to manufacturer's written instructions to produce a smooth, uniform, plane, and level surface. Feather edges to match adjacent floor elevations.
 - 4. Correct other low areas scheduled to remain exposed with a repair topping. Cut out low areas to ensure a minimum repair topping depth of 1/4 inch to match adjacent floor elevations. Prepare, mix, and apply repair topping and primer according to manufacturer's written instructions to produce a smooth, uniform, plane, and level surface.
 - 5. Repair defective areas, except random cracks and single holes 1 inch or less in diameter, by cutting out and replacing with fresh concrete. Remove defective areas with clean, square cuts and expose steel reinforcement with at least a 3/4-inch clearance all around. Dampen concrete surfaces in contact with patching concrete and apply bonding agent. Mix patching concrete of same materials and mixture as original concrete except without coarse aggregate. Place, compact, and finish to blend with adjacent finished concrete. Cure in same manner as adjacent concrete.
 - 6. Repair random cracks and single holes 1 inch or less in diameter with patching mortar. Groove top of cracks and cut out holes to sound concrete and clean off dust, dirt, and loose particles. Dampen cleaned concrete surfaces and apply bonding agent. Place patching mortar before bonding agent has dried. Compact patching mortar and finish to match adjacent concrete. Keep patched area continuously moist for at least 72 hours.
- D. Perform structural repairs of concrete, subject to Architect's approval, using epoxy adhesive and patching mortar.
- E. Repair materials and installation not specified above may be used, subject to Architect's approval.

3.14 FIELD QUALITY CONTROL

- A. Testing and Inspecting: Owner will engage a qualified testing and inspecting agency to perform field tests and inspections and prepare test reports.
- B. Inspections per IBC 2012, including:
 - 1. Steel reinforcement placement.
 - 2. Headed bolts and studs.
 - 3. Verification of use of required design mixture.
 - 4. Concrete placement, including conveying and depositing.
 - 5. Curing procedures and maintenance of curing temperature.

- C. Concrete Tests: Testing of composite samples of fresh concrete obtained according to ASTM C 172 shall be performed according to the following requirements:
1. Testing Frequency: Obtain one composite sample for each day's pour of each concrete mixture exceeding 5 cu. yd., but less than 25 cu. yd. , plus one set for each additional 50 cu. yd. or fraction thereof.
 2. Slump: ASTM C 143/C 143M; one test at point of placement for each composite sample, but not less than one test for each day's pour of each concrete mixture. Perform additional tests when concrete consistency appears to change.
 3. Air Content: ASTM C 231, pressure method, for normal-weight concrete; ASTM C 173/C 173M, volumetric method, for structural lightweight concrete; one test for each composite sample, but not less than one test for each day's pour of each concrete mixture.
 4. Concrete Temperature: ASTM C 1064/C 1064M; one test hourly when air temperature is 40 deg F and below and when 80 deg F and above, and one test for each composite sample.
 5. Unit Weight: ASTM C 567, fresh unit weight of structural lightweight concrete; one test for each composite sample, but not less than one test for each day's pour of each concrete mixture.
 6. Compression Test Specimens: ASTM C 31/C 31M.
 - a. Cast and laboratory cure two sets of two standard cylinder specimens for each composite sample.
 7. Compressive-Strength Tests: ASTM C 39/C 39M.
 - a. Test one laboratory-cured specimen at 7 days and one set of two specimens @ 28 days.
 - b. When two specimens are tested, the compressive strength test shall be the average compressive strength from a set of two specimens obtained from the same composite sample and tested at the age indicated.
 - c. Retain one specimen for additional testing if requested by the Design Professional.
 8. Strength of each concrete mixture will be satisfactory if concrete has achieved the specified 28-day compressive strength.
 9. Test results shall be reported in writing to Architect, concrete manufacturer, and Contractor within 48 hours of testing. Reports of compressive-strength tests shall contain Project identification name and number, date of concrete placement, name of concrete testing and inspecting agency, location of concrete batch in Work, design compressive strength at 28 days, concrete mixture proportions and materials, compressive breaking strength, and type of break for both 7- and 28-day tests.
 10. Nondestructive Testing: Impact hammer, sonoscope, or other nondestructive device may be permitted by Architect but will not be used as sole basis for approval or rejection of concrete.
 11. Additional Tests: Testing and inspecting agency shall make additional tests of concrete when test results indicate that slump, air entrainment, compressive strengths, or other requirements have not been met, as directed by Architect. Testing and inspecting agency may conduct tests to determine adequacy of concrete by cored cylinders complying with ASTM C 42/C 42M or by other methods as directed by Architect.
 12. Additional testing and inspecting, at Contractor's expense, will be performed to determine compliance of replaced or additional work with specified requirements.
 13. Correct deficiencies in the Work that test reports and inspections indicate do not comply with the Contract Documents.
- D. Measure floor and slab flatness and levelness according to ASTM E 1155 within 48 hours of finishing.

3.15 CONCRETE ADJUSTMENTS

- A. Adjustment to Concrete Mixes: Mix design adjustments may be requested by Contractor when characteristics of materials, job conditions, weather, test results, or other circumstances warrant, as accepted by Architect. Laboratory test data for revised mix design and strength results must be submitted to and accepted by Architect before using in Work.

END OF SECTION

SECTION 04 2000

UNIT MASONRY

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Concrete unit masonry.
 - 2. Anchors/ties.
 - 3. Joint reinforcing.
 - 4. Cleaning.
- B. Related Sections:
 - 1. Division 01: Administrative and procedural work requirements.
 - 2. Section 07 9200 - Joint Sealers.

1.2 REFERENCES

- A. ASTM International (ASTM):
 - 1. A153/A153M - Standard Specification for Zinc-Coating (Hot Dip) on Iron and Steel Hardware.
 - 2. A615/A615M - Standard Specification for Deformed and Plain Billet-Steel Bars for Concrete Reinforcement.
 - 3. A951 - Standard Specification for Masonry Joint Reinforcement.
 - 4. C67 - Standard Test Methods for Sampling and Testing Brick and Structural Clay Tile.
 - 5. C90 - Standard Specification for Hollow Loadbearing Concrete Masonry Units.
 - 6. C129 - Standard Specification for Hollow Nonloadbearing Concrete Masonry Units.
 - 7. C744 - Standard Specification for Prefaced Concrete and Calcium Silicate Masonry Units.
 - 8. C780 - Standard Test Method for Preconstruction and Construction Evaluation of Mortars for Plain and Reinforced Concrete.
 - 9. C1019 - Standard Test Method for Sampling and Testing Grout
 - 10. C1314 - Standard Test Method for Compressive Strength of Masonry Prisms.
- B. The Masonry Society (TMS):
 - 1. 402 - Building Code for Masonry Structures.
 - 2. 602 - Specification for Masonry Structures.

1.3 SUBMITTALS

- A. Submittals for Review:
 - 1. Product Data: Provide information on reinforcing and anchors including sizes, profiles, materials, and finishes.

1.4 QUALITY ASSURANCE

- A. Installer Qualifications: Minimum 5 years of experience in work of this Section.
- B. Perform Work in accordance with TMS 402 and 602.

1.5 DELIVERY, STORAGE AND HANDLING

- A. Deliver masonry materials to project in undamaged condition.

- B. Store and handle masonry units off ground, under cover and in a dry location to prevent their deterioration or damage due to moisture, temperature changes, contaminants, corrosion and other causes. If units become wet, do not place until units are in an air-dried condition.
- C. Protect reinforcement and anchors from corrosion.

1.6 PROJECT CONDITIONS

- A. Wall Protection:
 - 1. During erection, cover tops of partially completed walls with strong waterproof membrane at end of each day or work stoppage.
 - 2. Extend cover minimum of 24 inches down both sides; hold securely in place.
- B. Environmental Requirements:
 - 1. Hot weather requirements: If ambient temperature is over 95 degrees F or relative humidity is less than 50 percent, protect from direct sun and wind exposure for minimum 48 hours after installation.
 - 2. Cold weather requirements: Do not use frozen materials or build on frozen work.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Acceptable Manufacturers - Masonry Accessories:
 - 1. AA Wire Products Co.
 - 2. Dur-O-Wal. (www.dur-o-wal.com)
 - 3. Heckmann Building Products. (www.heckmannbuildingprods.com)
 - 4. Hohmann and Barnard, Inc. (www.h-b.com)
 - 5. Masonry Reinforcing Corp. of America.
 - 6. National Wire Products Industries.
 - 7. Southern Construction Products, Inc.

2.2 MATERIALS

- A. Concrete Masonry Units:
 - 1. ASTM C90, hollow load bearing type, light weight (105 pounds per cubic foot maximum), grade N. All units shall have an average bearing capacity on the net area of 1,900 psi, with a minimum bearing capacity of 1,700 psi on the net area for a single unit.
 - 2. Size: Nominally 8 inches high x 16 inches long x 4, 8, and 12 inches thick. Provide other thicknesses as indicated.
 - 3. Provide special shapes where indicated: Lintels, Bond beams and Solid units.
- B. Fire-Resistance Ratings: Where indicated, provide units that comply with requirements for fire-resistance ratings indicated as determined by testing according to ASTM E 119, by equivalent masonry thickness, or by other means, as acceptable to authorities having jurisdiction.

2.3 ACCESSORIES

- A. Single Wythe Joint Reinforcement:
 - 1. Truss Type; ASTM A951, Hot dip galvanized steel wire, 9 gage side rods with 9 gage cross ties.
 - 2. Width: Nominal wall thickness less 1-1/2 inches.
 - 3. Corner and tee fittings: Type to match reinforcement
 - 4. Mill finish shall be provided in interior walls only.

- B. Corrugated Ties: Corrugated formed sheet metal, 7/8" inches wide x 6 3/4 inches long or as job conditions dictate, 22 gage minimum thickness, hot dip galvanized, ASTM A153/A153M.
- C. Fasteners: Hot-dip galvanized steel screws, minimum 3/4 inch penetration into framing.
- D. Reinforcing Bars:
 1. Steel Reinforcing Bars: ASTM A615/A615M, deformed billet steel, Grade 60.
 2. Deformed Reinforcing Wire: ASTM A 496
- E. Joint Sealer: Specified in Section 07 9200.

PART 3 EXECUTION

3.1 PREPARATION

- A. Remove dirt, loose rust, and other foreign matter from reinforcement and anchors.

3.2 INSTALLATION

- A. Lay out walls in advance for accurate spacing of surface bond patterns with uniform joint widths and for accurate locating of openings, movement-type joints, returns, and offsets. Provide full CMU units at outside corners and door/window openings.
- B. Establish lines, levels and courses indicated. Protect from displacement.
- C. Maintain masonry courses to uniform dimensions. Form horizontal and vertical joints of uniform thickness.
- D. Lay concrete masonry in running bond. Course one masonry unit and one mortar joint to equal 8 inches vertically.
- E. Lay masonry plumb and level. Do not adjust masonry units after mortar has set.
- F. Lay solid masonry units in full mortar bed, with full head joints. Lay hollow masonry units with full mortar coverage on horizontal and vertical face shells.
- G. Do not butter corners or excessively furrow joints.
- H. Machine cut masonry with straight cuts and clean edges; Hand held saw not acceptable; prevent oversized or undersized joints. Discard damaged units. Do not expose cut cells.
- I. Isolate masonry from structural members with compressible filler.
- J. When joining fresh masonry to partially set masonry, remove loose masonry and mortar; clean and lightly wet exposed surface of set masonry.
- K. Stop horizontal runs by racking back normal bond unit in each course. Tothing not permitted.
- L. Horizontal Reinforcement:
 1. Place reinforcement at maximum 16 inches on center vertically starting at top of first course.
 2. Extend minimum 24 inches each side of openings.
 3. Center reinforcing in wall.
 4. Lap ends 6 inches minimum; use fabricated tee and corner fittings at corners and intersections.

- M. Finishing Mortar Joints:
1. Interior CMU –Match existing.
 2. Concealed locations: Cut joints flush. All openings in mortar joints, interior and exterior shall be filled.
- N. Installation Tolerances; Maximum variation from:
1. Alignment face to face of adjacent units: Plus or minus 1/16 inch.
 2. Vertical alignment of head joints: Plus or minus 1/4 inch in 10 feet.
 3. True plane of wall: Plus or minus 1/4 inch in 10 feet and 1/2 inch in 20 feet or more.
 4. Plumb: Plus or minus 1/4 inch in 10 feet noncumulative; 1/2 inch in 20 feet or more.
 5. Level coursing: Plus or minus 1/8 inch in 3 feet; 1/4 inch in 10 feet; 1/2 inch in 30 feet.
 6. Joint thickness: Plus or minus 1/8 inch.
 7. Cross sectional thickness of walls: Plus or minus 1/4 inch.

3.3 FIELD QUALITY CONTROL

- A. Testing and Inspection Services:
1. Masonry Units: Inspect masonry units prior to and during installation for compliance with specified requirements.
 2. Mortar: Mold and test one set of compressive strength cubes in accordance with ASTM C780 for each 1,000 square feet of wall area.
 3. Grout: Mold and test one set of compressive strength cubes in accordance with ASTM C1019 for each 500 square feet of wall area.

3.4 REPAIRING, POINTING AND CLEANING

- A. Remove and replace masonry units that are loose, chipped, broken, stained, or otherwise damaged or if units do not match adjoining units. Install new units to match adjoining units and in fresh mortar or grout, pointed to eliminate evidence of replacement. Remove large mortar particles by hand with wooden paddles and nonmetallic scrape hoes or chisels.
- B. Pointing: During the tooling of joints, enlarge any voids or holes, and completely fill with mortar. Point-up all joints including corners, openings and adjacent construction to provide a neat, uniform appearance, prepared for application of sealants.
- C. CAUTION MORTAR SMEARS AND SPLATTER: Exercise care to prevent smearing mortar into exposed surface of block and brick. Mortar smears and splatter on exposed face of block and brick shall be removed before mortar hardens. If necessary, use stiff brush with block.
- D. Final Cleaning: After repairs are made and walls have been pointed-up, clean exposed masonry as follows:
1. Protect adjacent and underlying surfaces.
 2. Apply masonry cleaner in accordance with manufacturer's instructions.
 3. Test clean the sample wall
 4. Wet wall surfaces prior to application of cleaner and thoroughly rinse surfaces with clean water after completion of cleaning. Remove all traces of cleaning solution.
- E. Protection: Provide final protection and maintain conditions to ensure unit masonry will be without damage and deterioration at time of substantial completion.

END OF SECTION

SECTION 05 5000

METAL FABRICATIONS

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Shop fabricated metal components.
 - 2. Steel lintels
 - 3. Miscellaneous support angles and columns.
 - 4. Other items shown on drawings.
- B. Related Sections:
 - 1. Division 01: Administrative and procedural work requirements.

1.2 REFERENCES

- A. American Architectural Manufacturers Association (AAMA):
 - 1. 611 - Voluntary Specification for Anodized Architectural Aluminum.
- B. American Welding Society (AWS):
 - 1. D1.1 - Structural Welding Code - Steel.
 - 2. D1.2 - Structural Welding Code - Aluminum.
 - 3. D1.6 - Structural Welding Code - Stainless Steel.
- C. ASTM International (ASTM):
 - 1. A36/A36M - Standard Specification for Carbon Structural Steel.
 - 2. A47/A47M - Standard Specification for Ferritic Malleable Iron Castings.
 - 3. A48/A48M - Standard Specification for Gray Iron Castings.
 - 4. A108 - Standard Specification for Steel Bars, Carbon, Cold-Finished, Standard Quality.
 - 5. A123/A123M - Standard Specification for Zinc (Hot-Galvanized) Coatings on Iron and Steel Products.
 - 6. A283 - Standard Specification for Low and Intermediate Tensile Strength Carbon Steel Plates, Shapes and Bars.
 - 7. A307 - Standard Specification for Carbon Steel Externally Threaded Standard Fasteners.
 - 8. A354 - Standard Specification for Quenched and Tempered Alloy Steel Bolts, Studs, and Other Externally Threaded Fasteners.
 - 9. A500 - Standard Specification for Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes.
 - 10. A501 - Standard Specification for Hot-Formed Welded and Seamless Carbon Steel Structural Tubing.
 - 11. A510 - Standard Specification for General Requirements for Wire Rods and Coarse Round Wire, Galvanized Steel.
 - 12. A666 - Standard Specification for Annealed or Cold-Worked Austenitic Stainless Steel Sheet, Strip, Plate, and Flat Bar.
 - 13. A780 - Standard Practice for Repair of Damaged and Uncoated Areas of Hot-Dip Galvanized Coatings.
 - 14. A1008/A1008M - Standard Specification for Steel, Sheet, Cold-Rolled, Carbon, Structural, High-Strength Low-Alloy and High-Strength Low-Alloy with Improved Formability.
 - 15. A1011/A1011M - Standard Specification for Steel, Sheet and Strip, Hot-Rolled, Carbon, Structural, High-Strength, Low-Alloy and High-Strength Low-Alloy with Improved Formability.
 - 16. B209 - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate.

17. E985 - Standard Specification for Permanent Metal Railing Systems and Rails for Buildings.

D. Society for Protective Coatings (SSPC - Painting Manual).

1.3 SUBMITTALS

A. Submittals for Review:

1. Shop Drawings: Show plans, elevations sections, details, dimensions, metal thicknesses, finishes, joints, attachments, and relationship of work to adjacent construction for each fabrication indicated. Show anchorage details as necessary.

1.4 QUALITY ASSURANCE

A. Fabricator Qualifications: Minimum 5 years of experience in work of this Section with a record of successful performance and with sufficient production capacity.

B. Welding Standards: Comply with applicable provisions of AWS D1.1 "Structural Welding Code-Steel", AWS D1.2 "Structural Welding Code-Aluminum", and AWS D1.3 "Structural Welding Code-Sheet Steel".

1.5 PROJECT CONDITIONS

A. Field Measurements: Fabricator is responsible for accurately field measuring locations of walls and other construction to which metal fabrications must fit. Provide field verified dimensions on shop drawings.

PART 2 PRODUCTS

2.1 MATERIALS - STEEL

- A. Shapes: ASTM A36/A36M.
- B. Plate: ASTM A283.
- C. Sheet: ASTM A1008/A1008M.
- D. Pipe: ASTM A501.
- E. Bars: ASTM A108.

2.2 ACCESSORIES

- A. Exposed Screws: Same material as metal being fastened; Phillips flat head, countersunk, unless noted otherwise.
- B. Bolts: ASTM A307, hexagonal head type.
- C. Primer Paint: Rust inhibitive primer, SSPC Paint 15, Type 1, red oxide.
- D. Anchoring Cement: Two component epoxy type.
- E. Hardware Wire Cloth: Plain weave square mesh cloth of relatively light wire galvanized after weaving.
 1. Sizes: 1/4 inch x 1/4 inch, No. 18 gauge or 1 inch x 1 inch, No. 14 gauge

- F. Unistrut Channels:
 - 1. Material – Cold formed to size from low-carbon strip steel, galvanized per ASTM A123, half slotted, 1 5/8 inches x 1 5/8 inches x 16 gauge minimum.
 - 2. Fittings: 1/4 inch minimum thickness, galvanized fittings with angle to suit the situation.

2.3 FABRICATION

- A. Fit and shop assemble items in largest practical sections, for delivery to site.
- B. Fabricate items with joints tightly fitted and secured.
- C. Grind exposed joints flush and smooth with adjacent finish surface. Make exposed joints butt tight, flush, and hairline. Ease exposed edges to small uniform radius.
- D. Exposed Mechanical Fastenings: Flush countersunk screws or bolts, unobtrusively located, consistent with design of component except where specifically noted otherwise.
- E. Supply components required for anchorage of fabrications. Fabricate anchors and related components of same material and finish as fabrication, except where specifically noted otherwise.
- F. Conceal fastenings where possible.
- G. Welding to conform to AWS D1.1 or D1.2 as is applicable.
 - 1. Use welds for permanent connections where possible. Grind exposed welds smooth.
 - 2. Tack welds prohibited on exposed surfaces.

2.4 FINISHES

- A. Ferrous Metal:
 - 1. Shop painted with rust inhibitive primer except steel to be encased in concrete and surfaces to be welded.
 - 2. Surface preparation: SSPC SP2 - Hand Tool Cleaning or SP3 - Power Tool Cleaning.
 - 3. Application: One coat; follow coating manufacturer's instructions.
 - 4. Minimum dry film thickness: 2.0 mils.

PART 3 EXECUTION

3.1 INSTALLATION

- A. Fastening to In Place Construction: Provide anchorage devices and fasteners where necessary for securing miscellaneous metal fabrications to in-place construction.
- B. Install items in accordance with approved Shop Drawings.
- C. Install components plumb, level, and rigid.
- D. Welding: AWS. Grind and fill exposed welds; finish smooth and flush.
- E. Install sleeved components with anchoring cement.
- F. Provide unistrut channels as necessary to create framework as detailed on drawings.
- G. Install hardware wire cloth in locations shown on plans. Wire cloth shall be installed tight, without buckles. Where wire cloth is not covered it shall be painted black.

3.2 ADJUSTING

- A. Clean and touch up damaged primer paint with same product as applied in shop.

3.3 SCHEDULE

- A. This Schedule includes principal items only; refer to Drawings for additional items not listed.
 - 1. Lintel Angles.
 - 2. Miscellaneous shapes.

END OF SECTION

SECTION 06 1000

ROUGH CARPENTRY

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Wood blocking.
 - 2. Telephone and electrical panel backboards.
- B. Related Sections:
 - 1. Division 01: Administrative and procedural work requirements.

1.2 REFERENCES

- A. American Wood Protection Association (AWPA) U1 - Use Category System - User Specification for Treated Wood.
- B. ASTM International (ASTM):
 - 1. A153/A153M - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware.
 - 2. E84 - Standard Test Method for Surface Burning Characteristics of Building Materials.
 - 3. F593 - Standard Specification for Stainless Steel Bolts, Hex Cap Screws and Studs.
- C. National Institute of Standards and Technology (NIST) - Product Standard PS 20 - American Softwood Lumber Standard.
- D. Southern Pine Inspection Bureau (SPIB) - Standard Grading Rules for Southern Pine Lumber.
- E. Engineered Wood Association (APA) PRP-108 - Performance Standards and Qualification Policy for Structural-Use Panels.

1.3 QUALITY ASSURANCE

- A. Lumber Grading Agency: Certified to NIST PS 20.
- B. Identify lumber and sheet products by official grade mark.
- C. Fire Retardant Treated Products: Bear label of recognized independent testing laboratory indicating flame spread rating of 25 or less, tested to ASTM E84.

1.4 DELIVERY, STORAGE AND HANDLING

- A. Store materials minimum 6 inches above ground on framework or blocking and cover with protective waterproof covering providing for adequate air circulation.
- B. Do not store seasoned or treated materials in damp location.
- C. Protect edges and corners of sheet materials from damage.

PART 2 PRODUCTS

2.1 MATERIALS

- A. Lumber: Grading rules: SPIB.
 - 1. Species: Southern Yellow Pine.
 - 2. Grade: marked No. 2 or better.
 - 3. Surfacing: Surfaced four sides (S4S) unless otherwise indicated.
 - 4. Maximum moisture content: 19 percent.

- B. Interior Wood Trim:
 - 1. Ponderosa pine, moisture content - 19%, C and better grade (to be painted)

2.2 ACCESSORIES

- A. Fasteners:
 - 1. Type and size: As required by conditions of use.
 - 2. Exterior locations and treated products: Hot-dip galvanized steel, ASTM A153/A153M, G90 coating class.
 - 3. Other interior locations: Plain steel.

2.3 FABRICATION

- A. Preservative Treatment:
 - 1. Treat lumber and sheet products in accordance with AWPA U1:
 - a. Interior locations protected from moisture sources: Category UC1 - Interior/Dry.
 - b. Interior locations subject to sources of moisture: Category UC2 - Interior/Damp.
 - c. Exterior locations above ground: Category UC3B - Above Ground/Exposed.
 - d. Exterior locations in contact with ground: Category UC4A - Ground Contact/General
 - 2. Treatment process: Type CCA - Chromated Copper Arsenate or Type ACQ - Ammoniacal Copper Quaternary (ACQ); free from arsenic, chromium, and other EPA classified hazardous preservatives.

- B. Fire Retardant Treatment; treat lumber and sheet products in accordance with AWPA U1:
 - 1. Interior locations: Category UCFA - Fire Retardant/Interior.
 - 2. Exterior locations: Category UCFB - Fire Retardant/Exterior.

PART 3 EXECUTION

3.1 INSTALLATION

- A. Provide blocking, nailers and other similar items as detailed.

- B. Set members level, plumb, and rigid.

- C. All wood in contact with CMU, concrete or steel and as shown on drawings shall be pretreated.(PT)

- D. Provide blocking in metal stud walls to support all toilet accessories and other wall mounted items. Locate flush with back of gypsum board.

END OF SECTION

SECTION 06 4110

PLASTIC LAMINATE CABINETWORK

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Fabricated plastic laminate cabinet units.
 - 2. Plastic laminate countertops.
 - 3. Cabinet hardware.
- B. Related Sections:
 - 1. Division 01: Administrative and procedural work requirements.

1.2 REFERENCES

- A. Architectural Woodwork Institute/Architectural Woodwork Manufacturers of Canada/Woodwork Institute (AWI/AWMAC/WI) - Architectural Woodwork Standards.
- B. Association of Electrical and Medical Imaging Equipment Manufacturers (NEMA) LD-3 - High Pressure Decorative Laminates.

1.3 SUBMITTALS

- A. Submittals for Review:
 - 1. Shop Drawings:
 - a. Include dimensioned plan, sections, elevations, and details, including interface with adjacent work.
 - 2. Samples:
 - a. 3 x 3 inch plastic laminate samples showing available colors and finishes

1.4 QUALITY ASSURANCE

- A. Fabricator Qualifications:
 - 1. Minimum 5 years of experience in work of this Section.

1.5 DELIVERY, STORAGE AND HANDLING

- A. Do not deliver materials until proper protection can be provided, and until needed for installation.

1.6 PROJECT CONDITIONS

- A. Environmental Requirements: Maintain following conditions in building for minimum 7 days prior to, during, and after installation of casework:
 - 1. Temperature: 60 to 80 degrees F.
 - 2. Humidity: 25 to 55 percent.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Acceptable Manufacturers - Plastic Laminate:
 - 1. Formica Corp. (www.formica.com)

2. Nevamar Co. (www.nevamar.com)
3. Wilsonart International, Inc. (www.wilsonart.com)

2.2 MATERIALS

- A. Plastic laminate cabinetwork:
 1. Base and wall units, including shelves in units, (except sink units) shall be constructed of 3/4 inch thick, 45 lb/cu. ft. density particleboard.
 2. Sink Units shall be constructed of 3/4 inch plywood with wood veneer core.
 3. Countertops:
 - a. Roll form type – 3/4 inch thick particleboard, 45 lbs/cu. Ft. density.
 - b. Other tops – 3/4 inch thick plywood.
 - c. Set on backsplashes – 3/4 inch thick plywood or solid stock lumber.
- B. Plastic Laminate Covering on Units: (see details) (color to be selected)
 1. Base and wall units (except sink units):
 - a. Exterior surfaces – All exterior exposed surfaces, including underside of wall cabinets, leading edges of unit box and edges of doors and drawers – General purpose plastic laminate, .050 inches thickness.
 - b. Interior surfaces, including shelves – All interior surfaces shall be Melamine, Almond color.
 2. Sink Units: All exterior and interior exposed surfaces – General purpose, .050 inch thickness.
 3. Countertops:
 - a. Roll form type - .042 thickness
 - b. Other top – general purpose .050 inch thickness
 4. Base and Wall Cabinet backs shall be 1/4 inch thick vinyl coated Luan plywood, almond color.
- C. Cabinet Hardware:
 1. Door and drawer pulls: Stanley 4484, brushed aluminum finish with 4487 base.
 2. Door hinges: 115 -130 degree, concealed type by Mepla or Blum.
 3. Drawer slides: Epoxy coated 50 lb. capacity
 4. Adjustable shelves: Metal shelf clips.

2.3 ACCESSORIES

- A. Fasteners: Type and size as required by conditions of use.

2.4 FABRICATION

- A. Cabinetwork shall be constructed to conform to shapes and sizes shown.
- B. Cabinetwork shall be erected level, plumb and without movement.
- C. Unit bases shall be solid stock lumber, plywood not acceptable.
- D. Joints at side and front panels shall be screwed and glued or doweled and glued.
- E. Stapled joints are not allowed except for attachment of backs. In addition to staples, backs shall be glued. Staples shall not be visible on any exposed surfaces, including interior of units.
- F. Number of splices in plastic laminate on countertops. Backsplashes and edges shall be minimized. Splices shall be closely fitted. Splices in countertops 12 feet or less in length is prohibited.

- G. Spaces between edge of doors, edge of drawer fronts and between top edge of doors and bottom edge of drawer fronts shall be consistent and not more than 1/4 inch.
- H. Shop assemble for delivery to project site in units easily handled.
- I. Prior to fabrication, field verify dimensions to ensure correct fit.
- J. Apply plastic laminate in full uninterrupted sheets; fit corners and joints to hairline. Slightly bevel arises.
- K. Where field fitting is required, provide ample allowance for cutting. Provide trim for scribing and site conditions. Where base and wall cabinets abut a wall, provide minimum 1-1/2 inch wide filler strips covered same as cabinets.
- L. Provide cutouts and reinforcement for plumbing, electrical, appliances, and accessories. At cutouts for sinks, seal exposed edges of sink hole with Thompsons Water Seal.

PART 3 EXECUTION

3.1 PREPARATION

- A. Prior to installation, condition cabinets to average humidity that will prevail after installation.

3.2 INSTALLATION

- A. Install in accordance with AWI/AWMAC/WI Architectural Woodwork Standards.
- B. Set plumb, rigid and level.
- C. Adhere countertops, splashes, and skirts with beads of adhesive.
- D. Sinks furnished under plumbing shall be fitted into tops at locations noted. Set in continuous bed of clear silicone caulk.
- E. Caulk top edge of base cabinet backsplashes to wall with clear silicone caulk.
- F. Exposed surfaces shall be free from damage and abrasions.

END OF SECTION

SECTION 07 8400

FIRESTOPPING

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Firestopping perimeter of and penetrations through fire and smoke rated assemblies.
- B. Related Sections:
 - 1. Division 01: Administrative and procedural work requirements.

1.2 REFERENCES

- A. ASTM International (ASTM):
 - 1. E814 - Standard Test Method for Fire Tests of Through-Penetration Firestops.
 - 2. E1966 - Standard Test Method for Fire-Resistive Joint Systems.
 - 3. E2307 - Standard Test Method for Determining Fire Resistance of Perimeter Fire Barrier Systems Using Intermediate-Scale, Multi-Story Test Apparatus.
- B. Underwriters Laboratories, Inc. (UL):
 - 1. 1479 - Fire Tests of Through-Penetration Firestops.
 - 2. 2079 - Fire Resistance of Building Joint Systems.

1.3 SYSTEM DESCRIPTION

- A. Provide continuous protection against passage of heat, fire, smoke, and gases at perimeter of and penetrations through rated assemblies.

1.4 SUBMITTALS

- A. Submittals for Review:
 - 1. Product Data:
 - a. Firestopping schedule; prepare in tabular format and identify:
 - 1) Type of assembly receiving firestop and required fire rating.
 - 2) Type of penetrating item.
 - 3) Proposed firestop system.
 - b. Include UL or equivalent details for each firestop system.
 - 2. Test Reports: Indicate conformance with ASTM E814, ASTM E1966, ASTM E2307, UL 1479, or UL 2079.
- B. Quality Control Submittals:
 - 1. Certificates of Compliance: Indicate conformance of installed systems with specified requirements.

1.5 QUALITY ASSURANCE

- A. Firestopping: Fire resistance rating of one hour; tested to ASTM E814, ASTM E1966, ASTM E2307, UL 1479, or UL 2079
- B. Mockups:
 - 1. Provide mockup of each firestopping system.
 - 2. Locate at a penetration.
 - 3. Approved mockups may remain as part of the Work.

1.6 PROJECT CONDITIONS

- A. Do not apply sealants, mortars, or putties when temperature of substrate material and surrounding air is below 40 degrees F or is anticipated to drop below that temperature within 24 hours after installation.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Acceptable Manufacturers:
 1. Hilti, Inc. (www.us.hilti.com)
 2. 3M Fire Protective Products. (www.3m.com)
 3. Nelson Firestop Products. (www.nelsonfirestop.com)
 4. Rectorseal. (www.rectorseal.com)
 5. Specified Technologies, Inc. (www.stifirestop.com)
 6. Tremco, Inc. (www.tremcosealants.com)

2.2 MATERIALS

- A. Firestopping: One or more of the following:
 1. Silicone elastomer compound: Single or multiple component, low modulus, moisture curing silicone sealant.
 2. Ceramic sealant: Single component, moisture curing ceramic sealant.
 3. Intumescent sealant: Single component, water based intumescent sealant.
 4. Acrylic sealant: Single component acrylic sealant, suitable for painting.
 5. Pillows or blocks: Formed intumescent or mineral fiber pillows or blocks.
 6. Mechanical devices: Incombustible fillers or silicone elastomer covered with sheet stainless steel jacket, joined with collars, penetration sealed with flanged stops.

2.3 ACCESSORIES

- A. Forming and Damming Materials: As recommended by firestopping manufacturer for intended use.
 1. Permanent: Mineral fiber board, mineral fiber matting, or mineral fiber putty.
 2. Temporary: Plywood, particle board, or other.

PART 3 EXECUTION

3.1 PREPARATION

- A. Prepare openings to receive firestopping as directed by manufacturer:
 1. Remove incidental and loose materials from penetration opening.
 2. Remove free liquids and oil from involved surfaces and penetration components.
 3. Install damming materials to accommodate and ensure proper thickness and fire rating requirements and provide containment during installation.
 4. Remove combustible materials and materials not intended for final penetration seal system.

3.2 INSTALLATION

- A. Install firestopping at perimeter of and penetrations through fire and smoke rated assemblies.
- B. Apply materials in accordance with manufacturer's instructions.

- C. Apply firestopping material in sufficient thickness to achieve required 1 or 2 hour ratings.
- D. Compress fibered material to achieve a density of 40 percent of its uncompressed density.
- E. Place foamed material in layers to ensure homogenous density, filling cavities and spaces. Place sealant to completely seal junctions with adjacent dissimilar materials.
- F. Place intumescent coating in sufficient coats to achieve rating required.
- G. Finish exposed surfaces to smooth, flush appearance.

END OF SECTION

SECTION 07 9200

JOINT SEALERS

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Joint backup materials.
 - 2. Joint sealers.
- B. Related Sections:
 - 1. Division 01: Administrative and procedural work requirements.

1.2 REFERENCES

- A. ASTM International (ASTM):
 - 1. C510 - Standard Test Method for Staining and Color Change of Single- or Multicomponent Joint Sealants.
 - 2. C719 - Standard Test Method for Adhesion and Cohesion of Elastomeric Joint Sealants under Cyclic Movement (Hockman Cycle).
 - 3. C794 - Standard Test Method for Adhesion-In-Peel of Elastomeric Joint Sealants.
 - 4. C834 - Standard Specification for Latex Sealing Compounds.
 - 5. C920 - Standard Specification for Elastomeric Joint Sealants.
 - 6. C1193 - Standard Guide for Use of Joint Sealants.
 - 7. C1248 - Standard Test Method for Staining of Porous Substrate by Joint Sealants.
 - 8. C1330 - Standard Specification for Cylindrical Sealant Backing for Use with Cold Liquid Applied Sealants.
 - 9. D2203 - Standard Test Method for Staining from Sealants.

1.3 SUBMITTALS

- A. Submittals for Review:
 - 1. Product Data: Indicate sealers, primers, backup materials, bond breakers, and accessories proposed for use.
 - 2. Samples:
 - a. 1/2 x 1/2 x 3 inch long joint sealer samples showing available colors.
 - b. 6 inch long joint backup material samples.
 - 3. Warranty: Sample warranty form.

1.4 QUALITY ASSURANCE

- A. Applicator Qualifications: Minimum 5 years of experience in work of this Section.
- B. Field Pre-Construction Testing: Test each joint sealer and joint substrate before beginning work of this Section:
 - 1. Install sealers in mockups using joint preparation methods and materials recommended by sealer manufacturer.
 - 2. Install field-test joints in inconspicuous location.
 - 3. Test sealers using manufacturer's standard field adhesion test; verify joint preparation and primer required to obtain optimum adhesion of sealants to joint substrate.
 - 4. When test indicates sealant adhesion failure, modify joint preparation, primer, or both and retest until joint passes sealant adhesion test.

1.5 PROJECT CONDITIONS

- A. Do not apply sealers at temperatures below 40 degrees F unless approved by sealer manufacturer.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Acceptable Manufacturers: Joint Sealer Type 1,
 - 1. Dymonic by Tremco, Inc. (www.tremcosealants.com)
 - 2. Sonolastic NP-1 by Sonneborne.
 - 3. Vulkem 921 by Mameco International.
- B. Acceptable Manufacturers: Joint Sealer Type 2
 - 1. AC-20 by Pecora Corp. (www.pecora.com)
 - 2. Latex by Tremco, Inc. (www.tremcosealants.com)
 - 3. Latex by Dick-Armstrong Pontius
 - 4. BASF Building Systems. (www.buildingsystems.basf.com)
 - 5. Dow Corning Corp. (www.dowcorning.com)

2.2 MATERIALS

- A. Joint Sealer Type 1: Exterior / Interior Sealant
 - 1. ASTM C920, Grade NS, single component polyurethane type, non-sag.
 - 2. Movement capability: Plus or minus 50 percent.
 - 3. Color to be selected from manufacturer's full color range.
- B. Joint Sealer Type 2: Interior Sealant
 - 1. ASTM C834, single component acrylic latex, non-sag.
 - 2. Movement capability: Plus or minus 7-1/2 percent.
 - 3. Color: White.

2.3 ACCESSORIES

- A. Primers, Bondbreakers, and Solvents: As recommended by sealer manufacturer.
- B. Joint Backing:
 - 1. ASTM C1330, closed cell polyethylene foam, preformed round joint filler, non-absorbing, non-staining, resilient, compatible with sealer and primer, recommended by sealer manufacturer for each sealer type.
 - 2. Size: Minimum 1.25 times joint width.

PART 3 EXECUTION

3.1 PREPARATION

- A. Remove loose and foreign matter that could impair adhesion. If surface has been subject to chemical contamination, contact sealer manufacturer for recommendation.
- B. Clean and prime joints in accordance with manufacturer's instructions.
- C. Protect adjacent surfaces with masking tape or protective coverings.
- D. Sealer Dimensions:

1. Minimum joint size: 1/4 x 1/4 inch.
2. Joints 1/4 to 1/2 inch wide: Depth equal to width.
3. Joints over 1/2 inch wide: 1/2 inch Depth.

3.2 APPLICATION

- A. Apply products in accordance with manufacturer's instructions.
- B. Install sealers and accessories in accordance with ASTM C1193.
- C. Install joint backing to maintain required sealer dimensions. Compress backing approximately 25 percent without puncturing skin. Do not twist or stretch.
- D. Fill joints full without air pockets, embedded materials, ridges, and sags.
- E. Tool sealer to smooth profile.
- F. Apply sealer within manufacturer's recommended temperature range.

3.3 CLEANING

- A. Remove masking tape and protective coverings after sealer has cured.
- B. Clean adjacent surfaces.

3.4 SCHEDULE

JOINT LOCATION OR TYPE	SEALER TYPE
Exterior: All Applications	1

JOINT LOCATION OR TYPE	SEALER TYPE
Interior:	
Seal water closet to floor	1
Other joints	2

END OF SECTION

SECTION 08 1113

HOLLOW METAL DOORS AND FRAMES

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Hollow steel doors and frames.
- B. Related Sections:
 - 1. Division 01: Administrative and procedural work requirements.
 - 2. Section 08 7100 - Door Hardware.
 - 3. Section 08 8000 - Glazing.

1.2 REFERENCES

- A. American National Standards Institute (ANSI)/Steel Door Institute (SDI):
 - 1. A250.3 - Test Procedure and Acceptance Criteria for Factory Applied Finished Painted Steel for Steel Doors and Frames.
 - 2. A250.4 - Test Procedure and Acceptance Criteria for Physical Endurance for Steel Doors, Frames, Frame Anchors and Hardware Reinforcings.
 - 3. A250.8 - Recommended Specifications for Standard Steel Doors and Frames.
 - 4. A250.10 - Test Procedure and Acceptance Criteria for Prime Painted Steel Surfaces for Steel Doors and Frames.
 - 5. A250.11 - Recommended Erection Instructions for Steel Frames.
- B. ASTM International (ASTM):
 - 1. A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy Coated (Galvannealed) by the Hot-Dip Process.
 - 2. A924 - Standard Specification for General Requirements for Steel Sheet, Metallic-Coated by the Hot-Dip Process.
 - 3. A1008/A1008M - Standard Specification for Steel, Sheet, Cold-Rolled, Carbon, Structural, High-Strength Low-Alloy and High-Strength Low-Alloy with Improved Formability.
 - 4. C518 - Standard Test Method for Steady State Thermal Transmission Properties by Means of the Heat Flow Meter Apparatus.
 - 5. E413 - Classification for Rating Sound Insulation.
- C. National Fire Protection Association (NFPA) 80 - Standard for Fire Doors and Fire Windows.
- D. Steel Door Institute (SDI) 117 - Manufacturing Tolerances for Standard Steel Doors and Frames.
- E. Underwriters Laboratories (UL):
 - 1. 10B - Standard for Fire Tests of Door Assemblies.
 - 2. 10C - Standard for Positive Pressure Fire Tests of Door Assemblies.

1.3 SUBMITTALS

- A. Submittals for Review:
 - 1. Shop Drawings: Show locations, elevations, dimensions, model designations, fire ratings, glazing requirements, preparation for hardware, and anchoring details.
 - 2. Product Data: Show elevations, dimensions, gages of metal, glazing requirements, hardware reinforcing gages and locations, and anchor types.

- B. Quality Control Submittals:
 - 1. Certificates of Compliance: Certification that products furnished comply with ANSI/SDI A250.3, ANSI/SDI 250.4, and ANSI/SDI A250.10.

1.4 QUALITY ASSURANCE

- A. Doors: ANSI/SDI A250.8.
 - 1. Grade: III - Extra Heavy Duty.
 - 2. Model: 2 - Seamless.
 - 3. Exterior doors: Maximum thermal transmittance (U-value) of 0.41 or better, tested to ASTM C518.
- B. Fire Door Construction: Conform to UL 10C.
- C. Installed Fire Rated Door Assemblies: Conform to NFPA 80.

1.5 DELIVERY, STORAGE AND HANDLING

- A. Store doors upright in protected, dry area, off ground or floor, with at least 1/4 inch space between individual units.
- B. Do not cover with non-vented coverings that create excessive humidity.
- C. Remove wet coverings immediately.

PART 2 PRODUCTS

2.1 MANUFACTURERS: Doors and frames shall be supplied by same manufacturer.

- A. Acceptable Manufacturers: Doors
 - 1. Ceco Door: Regent Series (www.cecodoor.com)
 - 2. Curries: Series 707 (www.curries.com)
 - 3. Steelcraft: Series LW (www.steelcraft.com)
 - 4. Republic: Series DE (www.republicdoor.com)

2.2 MATERIALS

- A. Steel Sheet, interior:
 - 1. ASTM A1008/1008M, cold rolled, 16 gage.
- B. Galvanized Steel Sheet:
 - 1. ASTM A653/A653M, hot dipped, Structural Quality, Class G60 galvanized.
- C. Galvannealed Steel Sheet:
 - 1. ASTM A924, hot dipped, zinc-coated carbon steel, Class A60 galvannealed.
- D. Door Core:
 - 1. Exterior doors: Rigid polystyrene insulation.
- E. Supports and Anchors: Fabricate of not less than 16-gage sheet steel: galvanized where used with galvanized frames.

2.3 ACCESSORIES

- A. Glass, Glazing Sealers, and Accessories: Specified in Section 08 8000.

- B. Primer: Zinc rich type.

2.4 FABRICATION

- A. Fabricate doors in accordance with ANSI/SDI A250.8.
- B. Fabricate exterior doors from galvanized or galvanized steel sheet.
- C. Doors:
 - 1. Fabricate from minimum 16 gage sheets.
 - 2. Provide type and size shown on drawings, 1 3/4" inch thick, 6 panel, fully welded seamless construction with no visible seams or joints on face sheets. "Bond-O" not allowed. Welded vertical edge seam is acceptable.
 - 3. Close top and bottom edges of doors with steel channel, minimum 16 gage, extending full width of door, and spot welded to both faces, with top and bottom channel flush. Inverted channels not acceptable.
 - 4. polystyrene core shall be bonded to both face sheets.
 - 5. Vertical lock and hinge edges shall be beveled 1/8 inch in 2 inches.
- D. Accurately form to required sizes and profiles.
- E. Provide labeled doors at door locations indicated. Doors shall be class indicated and carry a U.L. or factory mutual label.
- F. Doors shall be visually marked for each opening.
- G. Grind and dress exposed welds to form smooth, flush surfaces.
- H. Do not use metallic filler to conceal manufacturing defects.
- I. Fabricate with internal reinforcement for hardware specified in Section 08 7100; weld in place.
 - 1. Doors:
 - a. Closer - 14 gage x 20 inches, welded into door.
 - b. Lock strike – minimum 14 gage
 - c. Flush bolts and surface mounted hardware, minimum 16 gage.
 - d. Mortise lock box – 16 gage minimum.
 - e. Push and pull – 16 gage.
- J. Glazing Stops:
 - 1. Manufacturer's standard, screw on type with mitered corners.
 - 2. Form stops from minimum 20 gage steel; prefit for field glazing.
 - 3. Locate screws within 1 inch of ends of stops and maximum 8 inches on center.
 - 4. Install glazing stops on secure side of frames.
- K. Vision Lite frames in doors shall be steel, bevel profile and have mitered corners and be non-removable from the exterior.
- L. Design Clearances:
 - 1. Between door and frame: Maximum 1/8 inch.
 - 2. Between meeting edges of pairs of doors:
 - a. Non-fire rated doors: 3/16 inch plus or minus 1/16 inch.
 - b. Fire-rated doors: 1/8 inch plus or minus 1/16 inch.
 - 3. Undercut:
 - a. Non-fire rated doors: Maximum 3/4 inch.
 - b. At thresholds: Maximum 1/4" inch.
 - c. Fire-rated doors: Comply with NFPA 80.

4. Between face of door and stop: 1/16 to 3/32 inch.

M. Manufacturing Tolerances: In accordance with SDI-117.

2.5 FINISHES

A. Dress tool marks and surface imperfections to smooth surfaces.

B. Clean and chemically treat steel surfaces.

C. Touch up damaged metallic coatings.

D. Apply manufacturer's standard rust inhibiting primer paint, air-dried or baked on, meeting requirements of ANSI/SDI A25010.

PART 3 EXECUTION

3.1 INSTALLATION

A. Install doors in accordance with ANSI/SDI A250.11.

B. Set plumb, level and rigid.

C. Secure to adjacent construction using fastener type best suited to application.

D. Doors with holes in exposed surfaces resulting from misplaced hardware shall be replaced.

E. Install hardware in accordance with Section 08 7100.

3.2 ADJUSTING

A. Touch up minor scratches and abrasions in primer paint to match factory finish.

END OF SECTION

SECTION 08 7100

DOOR HARDWARE

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Hardware for steel doors.
 - 2. Weatherstripping and thresholds.
 - 3. Hardware for other sections referencing this section.
- B. Related Sections:
 - 1. Division 01: Administrative and procedural work requirements.

1.2 REFERENCES

- A. American National Standards Institute/Builders Hardware Manufacturers Association (ANSI/BHMA):
 - 1. A156.1 - Butts and Hinges.
 - 2. A156.2 - Bored and Preassembled Locks and Latches.
 - 3. A156.3 - Exit Devices.
 - 4. A156.4 - Door Controls - Closers.
 - 5. A156.5 - Auxiliary Locks and Associated Products.
 - 6. A156.13 - Mortise Locks and Latches.
 - 7. A156.18 - Materials and Finishes.
 - 8. A156.26 - Continuous Hinges.
 - 9. A156.31 - Electric Strikes.
- B. National Fire Protection Association (NFPA):
 - 1. 80 - Standard for Fire Doors and Windows.
 - 2. 105 - Installation of Smoke Control Door Assemblies.
- C. 2010 ADA Standards for Accessible Design:

1.3 SUBMITTALS

- A. Submittals for Review:
 - 1. Shop Drawings: Schedule hardware by door type and location; show door size, hand, thickness, edge bevel, hardware components and quantities, keying, and finishes.
 - 2. Product Data: Manufacturer's descriptive data and cutsheets for each component.
 - 3. Warranty: Sample warranty form.
- B. Closeout Submittals:
 - 1. Copy of approved hardware schedule.
 - 2. Keying list.
 - 3. Keys; tag with mark corresponding to keying schedule.

1.4 QUALITY ASSURANCE

- A. Supplier Qualifications: A recognized architectural door hardware supplier, with warehousing facilities in the project's vicinity, that has a record of successful in-service performance for supplying door hardware similar in quantity, type and quality to that indicated for this project and that employs an experienced architectural hardware consultant (AHC) who is available to

Owner, Architect, and Contractor, at reasonable times during the course of the work, for consultation.

- B. Single Source Responsibility: Obtain each type of hardware (latch and locksets, hinges, closers, etc.) from a single manufacturer.
- C. Provide hardware labeled by recognized independent testing laboratory and meeting requirements of NFPA 80 for fire rated doors. Provide proper latching hardware, door closers, approved-bearing hinges and seals whether listed in the Hardware Schedule or not.
- D. Provide smoke gasketing at fire rated doors in accordance with NFPA 105.
- E. Conform to 2010 ADA Standards for Accessible Design for locating hardware and for door opening force requirements.
- F. The Supplier shall include all necessary hardware for complete operation of all doors shown on the drawings, including metal thresholds shown on drawings but not listed in the hardware sets. The omission of any door from the following schedule but shown on drawings, does not relieve the Supplier of his obligation to supply proper hardware for same. For any door not mentioned, furnish hardware for same type as a similar opening, subject to the Architect's approval. Supplier shall provide drop plates and shoe supports for closers to fit frame condition detailed. See floor plans for metal thresholds not listed in the hardware sets.
- G. Coordination Meetings: Supplier shall set up and attend the following:
 - 1. Require supplier to meet with Owner to finalize keying requirements and to obtain final instructions in writing.
 - 2. Require supplier to meet with installer, Contractor, electrical and security contractors prior to beginning of installation of door hardware to coordinate all necessary aspects of the hardware installation.
- H. After complete installation of all hardware, the following inspections shall be completed:
 - 1. The hardware supplier shall inspect all items of hardware for proper installation, adjustment, handing and placement. A written report shall be submitted to the architect. Notify the architect 48 hours prior to the inspection.
 - 2. The lockset manufacturer shall have their technical field inspector verify proper operation and installation of the hardware on the doors. A written report shall be submitted to the Architect.

1.5 DELIVERY, STORAGE AND HANDLING

- A. Pack hardware items separately, with fasteners, installation instructions, and templates.
- B. Mark containers with item number corresponding to hardware schedule.
- C. Protect hardware from moisture, paint, chemicals, dust and excessive heat and cold.

1.6 WARRANTIES

- A. Furnish manufacturer's warranties as follows: (provide written documentation)
 - 1. Locksets – Three (3) years
 - 2. Exit devices – Three (3) years
 - 3. Closers – Ten (10) years (mechanical)
 - 4. Hinges – Life of building
 - 5. Other hardware – Two (2) years

1.7 MAINTENANCE

- A. Maintenance Tools and Instructions: Furnish a complete set of specialized tools and maintenance instructions as needed for Owner's continued adjustment, maintenance and removal and replacement of door hardware.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Acceptable Manufacturers - Butt Hinges:
 - 1. Hager Companies. (www.hagerco.com)
 - 2. Stanley Hardware. (www.stanleyworks.com)
 - 3. Ives.
 - 4. McKinney
- B. Acceptable Manufacturers - Continuous Hinges:
 - 1. Stanley Hardware. (www.stanleyhardware.com)
 - 2. Markar.
 - 3. Select Products.
 - 4. Ives.
- C. Acceptable Manufacturers - Locksets, Latchsets, Deadbolts, and Cylinders:
 - 1. Best Access Systems. (www.bestaccess.com)
 - 2. Schlage Lock Co. (www.schlage.com)
 - 3. Sargent Mfg. (www.sargentlock.com)
 - 4. Yale Security, Inc. (www.yalelocks.com)
 - 5. Hager Companies (www.hagerco.com)
- D. Acceptable Manufacturers - Closers:
 - 1. LCN Closers. (www.lcnclosers.com)
 - 2. Sargent 281. (www.sargentlock.com)
 - 3. Dormakaba
- E. Acceptable Manufacturers - Exit Devices:
 - 1. Von Duprin. (www.vonduprin.com)
 - 2. Precision.
 - 3. Sargent . (www.sargentlock.com)
- F. Acceptable Manufacturers - Door Seals and Thresholds:
 - 1. National Guard Products, Inc. (www.ngpinc.com)
 - 2. Reese Enterprises, Inc. (www.reeseusa.com)
 - 3. Zero Weatherstripping Co., Inc.
 - 4. Hager Companies. (www.hagerco.com)
 - 5. Pemko
- G. Acceptable Manufacturers – Overhead Door Holders:
 - 1. Glynn Johnson.
 - 2. Rixson Firemark.
- H. Acceptable Manufacturers – Floor Stops, Wall Bumpers, Door Bolts, Push Plates, Door Pulls, Pull Plates and Protective Plates:
 - 1. Trimco.
 - 2. Ives.
 - 3. Rockwood Manufacturing.

- I. Acceptable Manufacturers – Silencers:
 1. Hager.
 2. Ives.
 3. Rockwood Manufacturing.

2.2 MANUFACTURED UNITS

- A. Butt Hinges:
 1. Description: ANSI/BHMA A156.1, full mortise type, five knuckle, non-rising pin, hole in bottom tip for pin removal.
 2. Exterior outswinging doors: Non-removable pins.
 3. Provide rust resistant zinc base under finish coat at outswinging exterior doors.
 4. Weight: Standard weight.
 5. Bearing type: Plain bearing for doors without closer, Ball bearing for doors with closer.
 6. Size: 3-1/2 X 3-1/2 for 1-3/8" thick doors, 4-1/2 x 4-1/2 for 1 3/4" thick doors 3'-0" wide and under, 5 x 4-1/2 for 1 3/4" thick doors over 3'-0".
- B. Locksets, Latchsets, Deadbolts, and Cylinders:
 1. Locksets and latchsets:
 - a. Type: ANSI/BHMA A156.13, Grade 1, mortise, lever handles.
 - b. Latchbolts: 3/4-inch throw stainless steel anti-friction type.
 - c. Lever Trim: through-bolted, accessible design, cast or solid rod lever as scheduled. Provide tactile contact surfaces on doors into hazardous areas.
 - d. Thumbturns: accessible design not requiring pinching or twisting motions to operate.
 - e. Deadbolts: stainless steel 1-inch throw.
 - f. Strikes: 16 gage curved stainless steel, bronze or brass with 1" deep box construction, lips of sufficient length to clear trim and protect clothing.
 - g. Scheduled Lock Series and Design: Sargent 8200 series, match existing lever design.
 2. Cylinders:
 - a. Provide Key system per Owner's requirements. Keys to be of nickel silver only.
 - b. Signature for exterior and standard for interior. All locksets master keyed in one set.
 - c. All keys to be marked with the key set symbol according to the approved keying schedule in coordination with the approved Finish Hardware schedule.
 - d. Provide 3 change keys per cylinder except at keyed alike situations. DO NOT furnish more than three (3) keys total per cylinder. Provide 3 each of all new master keys. Operate cylinders with construction master key system until time of substantial completion. Provide construction master keying for this project. Provide ten (10) each construction master keys.
 - e. All keys for the entire project, shall be tagged and mounted in the key cabinet and presented to the Owner at time of acceptance unless otherwise directed by the Owner. These keys may include but are not limited to, toilet accessory keys, fire alarm and electrical panel keys, etc. The Owner will not accept these keys presented in bulk, untagged, unmarked and unrecognized.
 - f. The Contractor is responsible for delivering these keys to the Finish Hardware supplier for inclusion in this key control system.
 - g. Provide 1 copy of each of the following: "As Built" Finish Hardware Schedule, "As Built" Keying Schedule, "As Built" bitting list.
 3. Key Control: Contractor shall turn over all keys when the Owner takes possession of the building. Permanent keys are to be delivered to the Owner and signed for by the Owner at time of occupancy. Permanent keys are to be properly tagged and indexed.

Construction master keys and construction keys are to be voided when Owner occupies this facility

- C. Closers:
1. Description: ANSI/BHMA A156.4, overhead exposed, metal cover.
 2. Door closers shall have fully hydraulic, full rack and pinion action with a high strength cast iron cylinder.
 3. All closers shall utilize a stable fluid withstanding temperature range of 120 deg. F. to -30 deg. F. without seasonal adjustment of closer speed to properly close the door. Closers for fire-rated doors shall be provided with temperature stabilizing fluid that complies with standards UBC 7-2 (1997) and UL 10C.
 4. Spring power shall be continuously adjustable over the full range of closer sizes, and allow for reduced opening force for the physically handicapped. Spring power adjustment (LCN Fast tm Power Adjust) allows for quick and accurate power adjustment and visually shows closer power size settings by way of dial adjustment gauge located on closer spring tube. Hydraulic regulation shall be by tamper-proof, non-critical valves. Closers shall have separate adjustment for latch speed, general speed and back check.
 5. All closers shall have solid forged steel main arms (and forearms for parallel arm closers) and where specified shall have a cast-in solid stop on the closer shoe ("CNS"). Where door travel on out-swing doors must be limited, use "CNS" or "S-CNS" type closers. Auxiliary stops are not required when cush type closers are used.
 6. All surface closers shall be certified to exceed ten million (10,000,000) full load cycles by a recognized independent testing laboratory. All closers (overhead, surface and concealed) shall be of one manufacturer and carry manufacturer's ten year warranty (electric closers to have two year warranty).
 7. Access-Free Manual Closers: Where manual closers are indicated for doors required to be accessible to the physically handicapped, provide adjustable units complying with ADA and ANSI A-117.1 provisions for door opening force.
 8. Closers to be installed to allow door swing as shown on plans. Doors swinging into exit corridors shall provide for corridor clear width as required by code. Where possible, mount closers inside rooms.
 9. Powder coating finish to be certified to exceed 100 hours salt spray testing by ETL, an independent testing laboratory used by BHMA for ANSI certification.
- D. Exit Devices:
1. Exit devices shall be "UL" listed for life safety. All exit devices for fire rated openings shall have "UL" labels for "Fire Exit Hardware".
 2. All exit devices mounted on labeled wood doors shall be mounted on the door per the door manufacturer's requirements.
 3. All trim shall be thru-bolted to the lock stile case. Lever design to match locksets.
 4. All exit devices shall be made of aluminum material, clear anodized.
 5. Provide glass bead conversion kits to shim exit devices on doors with raised glass heads.
 6. All exit devices shall be one manufacturer. No deviation will be considered.
 7. All series exit devices shall incorporate a fluid damper, which decelerates the touchpad on its return stroke and eliminates noise associated with exit device operation. All exit devices shall be non-handed. Touchpad shall extend a minimum of 1/2 of the door width and shall extend to the height of the cross rail housing for a "no pinch" operation. Plastic touchpads are not acceptable. All latchbolts to be the deadlocking type. Latchbolts shall have a self-lubricating coating to reduce wear. Plated or plastic coated latchbolts are not acceptable. Plastic linkage and "dogging" components are not acceptable.
 8. Lever trim shall be solid case material.

9. Exit devices to include impact resistant, flush mounted end cap design to avoid damage due to carts and other heavy objects passing through an opening. End cap shall be of heavy-duty metal alloy construction and provide horizontal adjustment to provide alignment with device cover plate. When exit device end cap is installed, no raised edges will protrude.
- E. Door Stops: Wall or Floor mounted, aluminum housing with resilient bumper. Refer to Hardware Schedule.
 - F. Overhead Holders:
 1. Provide heavy duty door holders of stainless steel.
 2. Surface holders to be installed with the jamb bracket mounted on the stop.
 - G. Protective Plates:
 1. Provide manufacturers standard exposed fasteners for door trim units consisting of either machine screws or self-tapping screws.
 2. Materials: Metal plates shall be stainless steel, .050 inch (U.S. 18 gage)
 3. Fabricate protection plates not more than 2 inches less than door width on hinge side and not more than 1 inch less than door width on pull side.
 4. Heights:
 - a. Kick plates to be 10 inches in height.
 - b. Mop plates to be 4 inches in height
 - c. Armor plates to be 30 inches in height. Armor plates on fire doors to comply with NFPA 80.
 - H. Overhead Holders:
 1. Provide heavy duty door holders of stainless steel.
 2. Surface holders to be installed with the jamb bracket mounted on the stop.
 - I. Weatherstripping: Indicated in Hardware Headings.
 - J. Threshold: Indicated in Hardware Headings and door details.
 - K. Rain Drip: Indicated in Hardware Headings.

2.3 FINISHES

- A. Finishes: To ANSI/BHMA A156.18.
- B. Match items to the manufacturer's standard color and texture finish for the latch and lock sets (or push-pull units if no latch or lock sets).
- C. Provide quality of finish, including thickness of plating or coating (if any), composition, hardness, and other qualities complying with manufacturer's standards, but in no case less than specified by referenced standards for the applicable units of hardware.
- D. Provide protective lacquer coating on all exposed hardware finishes of brass, bronze, and aluminum, except as otherwise indicated. The suffix "-NL" is used with standard finish designations to indicate "no lacquer".
- E. The designations used to indicate hardware finishes are those listed in ANSI/BHMA A156.18, "Materials and Finishes", including coordination with the traditional U.S. finishes shown by certain manufacturers for their products. (See hardware schedule for finishes.)
 1. Hinges (Exterior): 630 (US32D) Satin Stainless Steel
 2. Hinges (Interior): 652 (UD26D) Satin Chrome Plated Steel

3. Continuous Hinges: 628 (US28) Satin Aluminum
4. Flush Bolts: 626 (US26D) Satin Chrome Plated Brass/Bronze
5. Locks: 626 (US26D) Satin Chrome Plated
6. Exit Devices: 628 (US28) chassis, and 630 (US32D) touchpads
7. Door Closers: 689 Powder Coat Aluminum
8. Push Plates: 630 (US32D) Satin Stainless Steel
9. Pull Plates: 630 (US32D) Satin Stainless Steel
10. Protective Plates: 630 (US32D) Satin Stainless Steel
11. Door Stops: 626 (US26D) Satin Chrome Plated Brass/Bronze
12. Overhead Holders: 630 Satin Stainless Steel
13. Thresholds/Weatherstripping: 627/628 (US27/US28) Aluminum

PART 3 EXECUTION

3.1 INSTALLATION

- A. Install hardware in accordance with approved hardware schedule and manufacturer's instructions.
- B. Install items flush with adjacent surfaces.
- C. Install locksets, closers, and trim after finish painting.
- D. Set thresholds in full bed of sealant and secure.
- E. Mount closers so that closers and closer arms are not visible on corridor or public side of doors or on exterior of building.
- F. Mounting Heights: Mount units at heights indicated in following applicable publications, except as specifically indicated or required to comply with governing regulations and except as otherwise directed by Architect.
 1. "Recommended Locations for Builders Hardware for Standard Steel Doors and Frames" by the Door and Hardware Institute.
 2. "Recommended Locations for Builders Hardware for Custom Steel Doors and Frames" by the Door and Hardware Institute.
 3. NWWDA Industry Standard I.S.1.7, "Hardware Locations for Wood Flush Doors"

3.2 PROTECTION

- A. Remove or protect hardware until painting is completed. Clean as necessary.

3.3 ADJUSTING

- A. Test and adjust hardware for quiet, smooth operation, free from binding and rattling.
- B. Provide inspections as defined above.
- C. Adjust doors to operate with maximum opening forces as follows:
 1. Interior non-fire rated doors: 5.0 pounds.
 2. Interior fire-rated doors: As per NFPA 80.
 3. Exterior doors: 8.5 pounds.

3.4 KEYING

- A. Provide interchangeable cores keyed to the existing Best Access Key system by the Best Access Factory for all doors. Provide temporary keyed construction cores in each lock. Contact Roger Daniel (verify contact with owner), 770.491.3101, to provide the required permanent key and core system. The system will be an extension approved by the Director of Plan Operations
- B. All Exterior Doors shall be keyed alike.
- C. Key Cylinders: Furnish 6-pin solid brass construction.
- D. Bitting List: Use secured shipment direct from point of origination to Owner at completion.
- E. Provide keying schedule.
- F. Provide 3 master keys and 3 keys per lock for interior locks.

3.5 SCHEDULE-See drawings.

END OF SECTION

SECTION 09 2900

GYPSUM BOARD

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Gypsum board.
 - 2. Taping and bedding of gypsum board.
- B. Related Sections:
 - 1. Division 01: Administrative and procedural work requirements.
 - 2. Section 07 9200 - Joint Sealers.

1.2 REFERENCES

- A. American National Standards Institute (ANSI):
 - 1. A108.11 - Interior Installation of Cementitious Backer Units.
 - 2. A118.9 - Test Methods and Specifications for Cementitious Backer Units.
- B. ASTM International (ASTM):
 - 1. C475 - Standard Specification for Joint Compound and Joint Tape for Finishing Gypsum Board.
 - 2. C514 - Standard Specification for Nails for the Application of Gypsum Wallboard.
 - 3. C665 - Standard Specification for Mineral Fiber Blanket Thermal Insulation for Wood Frame and Light Construction Buildings.
 - 4. C1002 - Standard Specification for Steel Drill Screws for the Application of Gypsum Board.
 - 5. C1047 - Standard Specifications for Accessories for Gypsum Wallboard and Gypsum Veneer Base.
 - 6. C1178 - Standard Specification for Glass Mat Water-Resistant Gypsum Backing Panel.
 - 7. C1396 - Standard Specification for Gypsum Board.
 - 8. C1629 - Standard Classification for Abuse-Resistant Nondecorated Interior Gypsum Panel Products and Fiber-Reinforced Cement Panels.
 - 9. D3273 - Standard Test Method for Resistance to Growth of Mold on the Surface of Interior Coatings in an Environmental Chamber.
- C. Gypsum Association (GA):
 - 1. GA-214 - Levels of Gypsum Board Finish.
 - 2. GA-216 - Recommended Specifications for the Application and Finishing of Gypsum Board.
 - 3. GA-600 - Fire Resistance Design Manual.
- D. Underwriters Laboratories, Inc. (UL) - Fire Resistance Directory.

1.3 SUBMITTALS

- A. Submittals for Review:
 - 1. Product Data: Illustrate panel product types, thicknesses, and locations; and accessories.

1.4 PROJECT CONDITIONS

- A. Do not install gypsum board until building is substantially weathertight.
- B. Maintain temperature in spaces in which work is being performed above 50 degrees F during and after installation.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Acceptable Manufacturers - Gypsum Panels:
 - 1. CertainTeed Gypsum, Inc. (www.certainteed.com)
 - 2. GP Gypsum Corporation. (www.gp.com)
 - 3. National Gypsum Co. (www.nationalgypsum.com)
 - 4. Temple-Inland. (www.templeinland.com)
 - 5. USG Corporation. (www.usg.com)

2.2 MATERIALS - GYPSUM PANELS

- A. Regular Gypsum Board: ASTM C1396; 48 inches wide x 1/2 inch or 5/8 inch thick, maximum practical length, tapered edge.
- B. Fire Resistant Gypsum Board: ASTM C1396, Type X, 48 inches wide x 5/8 inch thick, maximum practical length, tapered edge; apply to fire rated assemblies.

2.3 STUD COMPONENTS

- A. Provide components in accordance with ASTM C645.
- B. Studs: Non-load bearing rolled steel, channel shaped, punched for utility access.
 - 1. Interior wall, screw studs 1-5/8 inch, 2 1/2 inch and 3-5/8 inch, 25 gauge, design steel thickness .0188 inch. See drawings for location.
 - 2. Interior wall, screw studs 6 inch, 20 gauge, design steel thickness .0346. See drawings for location.
- C. Top and Bottom Runners: Channel shaped.
 - 1. Interior wall, 1-5/8 inch, 2 1/2 inch, 3 5/8 inch and 6 inch 20 gauge, design steel thickness .0346 inch. See drawings for location.

2.4 ACCESSORIES

- A. Fasteners: ASTM C1002, Type S screws, minimum 5/8 inch penetration into framing.
- B. Adhesive:
 - 1. Type recommended by gypsum panel manufacturer.
- C. Trim Accessories: ASTM C1047.
 - 1. Material: Formed steel, minimum 26 gage core steel, hot dip galvanized finish, expanded flanges or Extruded PVC, perforated flanges.
 - 2. Corner reinforcement: GA-216, Type CB-100 x 100.
 - 3. Casing: GA-216, Type LC.
 - 4. Control joint.

- D. Joint Treatment Materials:
 - 1. Reinforcing tape and joint compound; ASTM C475.
- E. Power Actuated Fasteners: Level 3 (green load)

PART 3 EXECUTION

3.1 INSTALLATION OF GYPSUM PANELS

- A. Install panels and accessories in accordance with ASTM C754, GA-216, and manufacturer's instructions. Install exposed gypsum board with face side out. Butt boards together for a light contact at edges and ends with not more than 1/16-inch open space between boards. Do not force into place.
- B. Accurately cut panels to fit around openings and projections. Do not tear face paper or break gypsum core. Do not install imperfect, damaged or damp boards.
- C. Apply panels in most economical manner, with ends and edges occurring over supports. Position boards so that like edges abut, tapered edges against tapered edges and fill-cut or field-cut ends against mill-cut or field-cut ends. Do not place tapered edges against cut edges or ends.
- D. Do not locate joints to align with edges of openings unless a control joint is installed.
- E. Mechanically fasten panels to framing at 8 inches on center at joints and 12 inches on center in the field. Place fasteners minimum 3/8 inch from edges of panels; drive heads slightly below surface. Stagger fasteners at abutting edges.
- F. Install gypsum wall board on ceilings prior to wall application to greatest extent possible.
- G. Install ceiling boards in the direction and manner which will minimize the number of end butt joints. Stagger end joints at least one foot.
- H. Gypsum board shall be taped, sanded and ready to receive specified finish.

3.2 INSTALLATION OF ACCESSORIES

- A. Install in accordance with manufacturer's instructions.
- B. Install corner reinforcement at outside corners. Use single lengths where length of corner does not exceed standard length.
- C. Install casings where indicated and where gypsum board abuts dissimilar materials or stops with edge exposed.
- D. Install control joints, (back to back casing beads), at walls and partitions where shown on drawings and as follows:
 - 1. At changes in backup material.
 - 2. At maximum 30 feet on center.
 - 3. Architect to approve location of all control joints in the field.

3.3 JOINT TREATMENT

- A. Treat joints and fasteners in gypsum board in accordance with GA-214.

- B. Levels of Finish:
 - 1. Surfaces in plenums and other unoccupied areas: Level 1 finish.
 - 2. Surfaces to receive tile or stone: Level 2 finish.
 - 3. Surfaces to receive paint, other than gloss, and wall coverings: Level 4 finish.
 - 4. Surfaces to receive gloss paints: Level 5 finish.

3.4 CLEAN UP

- A. Remove scrap wallboard and metal components from spaces as it accumulates.
- B. Clean exposed wallboard surfaces and leave free from soil and stains that will affect application of final finish.
- C. Damaged and defective wallboard shall be removed and replaced.

END OF SECTION

SECTION 09 6513

RESILIENT BASE

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Resilient wall base.
- B. Related Sections:
 - 1. Division 01: Administrative and procedural work requirements.

1.2 REFERENCES

- A. ASTM International (ASTM) F1861 - Standard Specification for Resilient Wall Base.
- B. Resilient Floor Covering Institute (RFCI) - FloorScore Certification Program.

1.3 SUBMITTALS

- A. Submittals for Review:
 - 1. Samples: 4 inch long samples showing available colors.

1.4 MAINTENANCE

- A. Extra Materials: One unopened carton of each profile and color.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Acceptable Manufacturers - Base:
 - 1. Allstate Rubber Corp. (www.allstaterubber.com)
 - 2. Armstrong World Industries. (www.armstrong.com)
 - 3. Johnsonite, Inc. (www.johnsonite.com)
 - 4. Roppe Corp. (www.roppe.com)
 - 5. Flexco
- B. Acceptable Manufacturers – Installation Materials:
 - 1. BASF Corporation. (www.buildingsystems.basf.com)

2.2 MATERIALS

- A. Resilient Base:
 - 1. Type: ASTM F1861, thermoset vulcanized rubber.
 - 2. Thickness: 0.125 inch. (1/8 inch)
 - 3. Profile: Coved.
 - 4. Height: 4 inches.
 - 5. Length: Continuous rolls.
 - 6. Color: To be selected from manufacturer's full color range.
 - 7. Outside corners: Preformed; profile, size, and color to match base.

2.3 ACCESSORIES

- A. Adhesive:
 - 1. Water based, waterproof, recommended by base manufacturer.

PART 3 EXECUTION

3.1 PREPARATION

- A. Prepare surfaces to receive base:
 - 1. Remove materials that could interfere with adhesion.
 - 2. Fill low spots with patching compound; finish flush with adjacent surface.
 - 3. Remove high spots, ridges and nibs.

3.2 INSTALLATION BASE

- A. Apply adhesive continuously to back of base.
- B. Maintain top edge true to line and bottom edge in continuous contact with floor. Butt joints tight; butt base tight to adjacent construction.
- C. Base will not be required behind non-removable base cabinets, storage cabinets and shelving units
- D. Base materials shall be in continuous rolls. Cut joints shall be located only at inside corners and where base abuts door frames, cabinet bases and outside corner units. Base shall be cut tightly to abutting material. Minimize joint opening.
- E. Miter and butt inside corners.
- F. At outside corners where a change of direction is more than 12" from the corner, base material may be used in maximum lengths possible. At outside corner, base material shall be scored on back, heated and then chilled to provide a permanent sharp corner. Unit shall be firmly secured to wall surface with adhesive. Rounded corners with voids not acceptable
- G. Scribe to door frames and other interruptions. Base shall be cut tightly to abutting material. Minimize joint opening.

END OF SECTION

SECTION 09 9100

PAINTING

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Surface preparation and field application of paints.
- B. Related Sections:
 - 1. Division 01: Administrative and procedural work requirements.

1.2 REFERENCES

- A. ASTM International (ASTM):
 - 1. D4442 - Standard Test Method for Direct Moisture Content Measurement of Wood and Wood-Base Materials.
 - 2. D6886 - Standard Test Method for Speciation of the Volatile Organic Compounds (VOCs) in Low VOC Content Waterborne Air-Dry Coatings by Gas Chromatography.
- B. Green Seal, Inc. (GS): 11 - Standard for Paints and Coatings.
- C. Master Painters Institute (MPI) - Architectural Painting Specification Manual.
- D. Society for Protective Coatings (SSPC) - Painting Manual.
- E. South Coast Air Quality Management District (SCAQMD) Rule 1113 - Architectural Coatings.

1.3 SUBMITTALS

- A. Submittals for Review:
 - 1. Product Data: Manufacturer's data on materials proposed for use including:
 - a. Product designation and grade.
 - b. Product analysis and performance characteristics.
 - c. Standards compliance.
 - d. Material content.
 - e. Mixing and application procedures.
 - 2. Samples:
 - a. Provide one Fan Deck(s) that represents all available color selections.
 - 3. Paint Schedule: Indicate types and locations of each surface, paint materials, and number of coats to be applied.

1.4 QUALITY ASSURANCE

- A. Applicator Qualifications: Minimum 5 years documented experience in work of this Section.
- B. Materials, Preparation, and Workmanship: Conform to MPI Painting Manual.
- C. Mockup:
 - 1. Construct mockup panels for each interior wall type 10 feet wide x 8 feet high.
 - 2. Construct mockup panels for each interior ceiling/furring type 5 feet x 4 feet high.
 - 3. Show: Each color and texture.
 - 4. Locate where directed.
 - 5. Approved mockup may remain as part of the Work.

6. Verify compatibility of primer/paint with existing surface. Do not continue until mockup has been determined to be acceptable.

1.5 DELIVERY, STORAGE AND HANDLING

- A. Container Labels: Include manufacturer's name, type of paint, brand name, lot number, brand code, coverage rates, surface preparation, drying time, cleanup requirements, color designation, and instructions for mixing and reducing. Deliver to sight in sealed containers.
- B. Paint Materials: Store at ambient temperature from 45 to 90 degrees F in ventilated area, or as required by manufacturer's instructions.

1.6 PROJECT CONDITIONS

- A. Do not apply materials when surface and ambient temperatures or relative humidity are outside ranges required by paint manufacturer.
- B. Maintain ambient and substrate temperatures above manufacturer's minimum requirements for 24 hours before, during and after paint application.
- C. Do not apply materials when relative humidity is above 85 percent or when dew point is less than 5 degrees F different than ambient or surface temperature.
- D. Provide lighting level of 80 foot-candles at substrate surface.

1.7 MAINTENANCE

- A. Extra Materials: Provide 1 gallon of each color and sheen. Label each container with color, sheen, room location and manufacturer's label.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Acceptable Manufacturers:
 1. Sherwin Williams. (SW) (www.sherwin-williams.com)
 2. Glidden Professional. (G) (www.gliddenprofessional.com)
 3. PPG Architectural Finishes, Inc. (PP) (www.pittsburghpaints.com)
- B. All paint for entire project will be produced by one manufacturer. No mixing of manufacturers is allowed. No deviations within the selected group are allowed unless a product has been discontinued; if this is the case the owner will select an equivalent substitution.

2.2 MATERIALS

- A. Paint:
 1. As scheduled below.
 2. Free from all forms of lead and mercury.

2.3 EXTERIOR PAINTS

- A. Ferrous metals
 1. Primer - One coat:
 - a. (SW) Pro Industrial Pro-Cryl Primer, B66-310 Series (2 - 4 mils. Dry)
 - b. (PPG) 90-712 Pitt Tech DTM Acrylic Primer Finish (2-3 mils DFT)
 - c. (BM) SuperSpec Acrylic Metal Primer P04 (1.7-2.3 mils DFT)

2. Finish – Two Coats:
 - a. (SW) Pro Industrial Zero VOC Gloss Acrylic B66W611 Series (2.5 - 4 mils. Dry per coat)
 - b. (PPG) 90-374 Pitt Tech Int./Ext. High Gloss DTM Industrial Enamel (2-3 mils DFT)
 - c. (BM) SuperSpec HP Acrylic DTM Gloss Enamel P28 (1.7-2.3 mils DFT)
- B. Galvanized Metals:
1. Primer - One coat:
 - a. (SW) Pro Industrial Pro-Cryl Primer, B66-310 Series (2 - 4 mils. Dry)
 - b. (PPG) 90-712 Pitt Tech DTM Acrylic Primer Finish (2-3 mils DFT)
 - c. (BM) SuperSpec Acrylic Metal Primer P04 (1.7-2.3 mils DFT)
 2. Finish – Two Coats:
 - a. (SW) Pro Industrial Zero VOC Gloss Acrylic B66W611 Series (2.5 - 4 mils. Dry per coat)
 - b. (PPG) 90-374 Pitt Tech Int./Ext. High Gloss DTM Industrial Enamel (2-3 mils DFT)
 - c. (BM) SuperSpec HP Acrylic DTM Gloss Enamel P28 (1.7-2.3 mils DFT)

2.4 INTERIOR PAINTS

- A. Ferrous Metals
1. Primer - One Coat:
 - a. (SW) Pro Industrial Pro-Cryl Primer, B66-310 Series (2 - 4 mils. Dry)
 - b. (PPG) 90-712 Pitt Tech DTM Acrylic Primer Finish (2-3 mils DFT)
 - c. (BM) SuperSpec Acrylic Metal Primer P04 (1.7-2.3 mils DFT)
 2. Finish – Two Coats:
 - a. (SW) Pro Industrial Zero VOC Semi-Gloss Acrylic B66W651 (2.5 - 4 mils. Dry per coat)
 - b. (PPG) 90-1210 Pitt Tech Plus Int./Ext. WB Acrylic Semi-Gloss (2-4 mils DFT)
 - c. (BM) Super Spec HP DTM Acrylic Semi-Gloss P29 (1.7-2.3 mils DFT)
- B. Galvanized Metals:
1. Primer - One Coat:
 - a. (SW) Pro Industrial Pro-Cryl Primer, B66-310 Series (2 - 4 mils. Dry)
 - b. (PPG) 90-712 Pitt Tech DTM Acrylic Primer Finish (2-3 mils DFT)
 - c. (BM) SuperSpec Acrylic Metal Primer P04 (1.7-2.3 mils DFT)
 2. Finish – Two Coats:
 - a. (SW) Pro Industrial Zero VOC Semi-Gloss Acrylic B66W651 (2.5 - 4 mils. Dry per coat)
 - b. (PPG) 90-1210 Pitt Tech Plus Int./Ext. WB Acrylic Semi-Gloss (2-4 mils DFT)
 - c. (BM) Super Spec HP DTM Acrylic Semi-Gloss P29 (1.7-2.3 mils DFT)
- C. Concrete Masonry – Waterborne Polyamide Epoxy: (shower spaces)
1. Acrylic Block Filler (BARE BLOCK) - One Coat:
 - a. (SW) Heavy Duty Block Filler, B42W46 (18.0 mils Wet, 10 mils. dry)
 - b. (PPG) 4-100XI Perma Crete Concrete Block Surfacer Filler (15.0-20.0 mils DFT)
 - c. (BM) Super Spec® HP Latex Block Filler 160 (8.0-13.0 mils DFT)
 2. Primer (1.6 mils DFT) Bonding Primer – One Coat: (Previously Painted CMU Surfaces)
 - a. (SW) DTM Bonding Primer, B66A50 (2.0 mils DFT)
 - b. Products meeting above standards by PPG and BM are acceptable.

3. Finish – Waterborne Polyamide Epoxy - Two Coats:
 - a. (SW) Waterbased Tile-Clad Epoxy Finish, B73-100 Series (2-4 mils DFT)
 - b. (PPG) 98-1 Aquapon WB Waterborne Semi-Gloss Epoxy (2-3 mils DFT)
 - c. (BM) Polyamide Epoxy Semi-Gloss Coating M36/M38 (2-3 mils DFT)
- D. Concrete Masonry - All other spaces not noted under epoxy
1. Block Filler - One coat: (New CMU Surfaces)
 - a. (SW) Heavy Duty Block Filler, B42W46 (18 mils. Wet, 10 mils. dry)
 - b. (PPG) 4-100XI Perma Crete Concrete Block Surfacer Filler (15.0-20.0 mils DFT)
 - c. (BM) Super Spec® HP Latex Block Filler 160 (8.0-13.0 mils DFT)
 2. Primer (1.6 mils DFT) Bonding Primer – One Coat: (Previously Painted CMU Surfaces)
 - a. (SW) DTM Bonding Primer, B66A50 (2.0 mils DFT)
 - b. Products meeting above standards by PPG and BM are acceptable.
 3. Finish – Two Coats:
 - a. (SW) Pro Industrial Acrylic Semi-Gloss, B66W651 Series (2.5 – 4.0 mils. dry per coat)
 - b. Products meeting above standards by PPG and BM are acceptable.
- E. Gypsum ceilings (in spaces other than showers-showers are to be Epoxy Semi-Gloss):
1. Primer - One Coat:
 - a. (SW) ProMar 200 Zero VOC Latex Primer, B28W2600 (4 mils. Wet, 1.2 mils. dry)
 - b. (PPG) 6-4900XI Speedhide Zero Interior Zero-VOC Latex Sealer (1.2 mils DFT)
 - c. (BM) Ultra Spec 500 Interior Latex Primer N534 (1.8 mils DFT)
 2. Finish – Two Coats:
 - a. (SW) ProMar 200 Latex Flat, B30-8200 Series (4 mils. Wet, 1.4 mils. Dry per coat)
 - b. (PPG) 6-4110XI Speedhide Zero Interior Zero-VOC Latex Flat (1.3 mils DFT)
 - c. (BM) Ultra Spec 500 Interior Latex Flat Finish N536 (1.8 mils DFT)
- F. Gypsum Board Walls:
1. Primer - One coat:
 - a. (SW) ProMar 200 Zero VOC Latex Primer, B28W2600 (4 mils. wet, 1.2 mils. dry)
 - b. (PPG) 6-4900XI Speedhide Zero Interior Zero-VOC Latex Sealer (1.2 mils DFT)
 - c. (BM) Ultra Spec 500 Interior Latex Primer N534 (1.8 mils DFT)
 2. Finish – Two Coats:
 - a. (SW) ProMar 200 Zero VOC Latex Eggshell, B20-2600 Series (4 mils. wet, 1.6 mils. Dry per coat)
 - b. (PPG) 6-4310XI Speedhide Zero Interior Zero-VOC Latex Eggshell(1.4 mils DFT)
 - c. (BM) Ultra Spec 500 Interior Latex eggshell Finish N537 (1.8 mils DFT)

2.5 ACCESSORIES

- A. Accessory Materials: Paint thinners and other materials required to achieve specified finishes; commercial quality.
- B. Patching Materials: Latex filler.
- C. Fastener Head Cover Materials: Latex filler.

2.6 MIXES

- A. Deliver paints pre-mixed and pre-tinted.
- B. Uniformly mix to thoroughly disperse pigments.

- C. Re-mix paint during application; ensure complete dispersion of settled pigment and uniformity of color and gloss.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Test shop applied primer for compatibility with subsequent coatings.
- B. Test primer for compatibility with existing painted surfaces.
- C. Verify that surfaces are ready to receive Work as instructed by the product manufacturer.
- D. Measure moisture content of surfaces using electronic moisture meter. Do not apply coatings unless moisture content of surfaces are below following maximums:
 - 1. Gypsum board and plaster: 12 percent.
 - 2. Masonry and concrete: 12 percent.
 - 3. Interior Wood: 15 percent, measured to ASTM D4442.

3.2 PREPARATION

- A. General:
 - 1. Protect adjacent and underlying surfaces.
 - 2. Remove electrical plates, hardware, light fixture trim, escutcheons, and fittings prior to preparing surfaces or finishing. Mask when device can't be removed.
 - 3. Correct defects and clean surfaces capable of affecting work of this section.
 - 4. Seal marks that may bleed through surface finishes with shellac.
- B. Impervious Surfaces: Remove mildew by scrubbing with solution of tri-sodium phosphate and bleach. Rinse with clean water and allow to dry.
- C. Gypsum Board:
 - 1. Fill minor defects with filler compound. Spot prime defects after repair.
- D. Concrete and Masonry:
 - 1. Remove dirt, loose mortar, scale, salt and alkali powder, and other foreign matter.
 - 2. Remove oil and grease with solution of tri-sodium phosphate; rinse and allow to dry.
 - 3. Remove stains caused by weathering of corroding metals with solution of sodium metasilicate after thoroughly wetting with water. Allow to dry.
 - 4. Concrete block surfaces shall be pointed-up and free from loose joints, mortar smears and splatter.
- E. Galvanized Steel: SSPC Method SP1 – Solvent Cleaning.
- F. Aluminum: SSPC Method SP1 - Solvent Cleaning.
- G. Uncoated Ferrous Metals: SSPC Method SP2 - Hand Tool Cleaning or Method SP3 - Power Tool Cleaning.
- H. Shop Primed Ferrous Metals:
 - 1. SSPC Method SP2 - Hand Tool Cleaning or Method SP3 - Power Tool Cleaning.
 - 2. Feather edges to make patches inconspicuous.
 - 3. Prime bare steel surfaces.
 - 4. Rust, mill scales and defective primer paints shall be removed to bare metal. Restore surface with specified primer.

- I. Metal Doors Scheduled for Painting: Prime metal door top and bottom edge surfaces.
- J. Existing Surfaces:
 1. Remove loose, flaking, powdery, and peeling paints.
 2. Lightly sand glossy painted surfaces.
 3. Fill holes, cracks, depressions and other imperfections with patching compound; sand flush with surface.
 4. Remove oil, grease, and wax by scraping; solvent wash and thoroughly rinse.
 5. Remove rust by wire brushing to expose base metal.
 6. Complete mockup as per section 1.4 C.

3.3 APPLICATION

- A. Apply paints in accordance with MPI Painting Manual, Premium Grade finish requirements.
- B. Spraying will not be permitted on hollow metal doors, frames and cabinetwork. Concrete block and gypsum board may be spray and rolled.
- C. Apply primer or first coat closely following surface preparation to prevent recontamination.
- D. Do not apply finishes to surfaces that are not dry.
- E. Apply coatings to minimum dry film thickness recommended by manufacturer.
- F. Apply coatings to uniform appearance without laps, sags, curtains, holidays, and brush marks.
- G. Allow applied coats to dry before next coat is applied.
- H. When required on deep and bright colors apply an additional finish coat to ensure color consistency.
- I. Continue paint finishes behind wall-mounted accessories.
- J. Match final coat to approved color samples.
- K. Tops, bottoms and sides of metal doors shall be finished same as the faces.
- L. Mechanical and Electrical Components:
 1. Paint factory primed equipment that is exposed to view, not in mechanical spaces.
 2. Remove unfinished and primed louvers, grilles, covers, and access panels; paint separately.
 3. Paint exposed and insulated pipes, conduit, boxes, ducts, hangers, brackets, collars, and supports unless factory finished. (not in mechanical spaces)
 4. Do not paint name tags or identifying markings.
 5. Paint exposed conduit and electrical equipment in finished areas.
 6. Paint duct work behind louvers, grills, and diffusers flat black to minimum of 18 inches or beyond sight line.
 7. Color code equipment, piping, conduit in accordance with requirements indicated. Color band and identify.
 8. Refer to Mechanical Section and Electrical Sections for schedule of color coding and identification banding of equipment, ductwork, piping and conduit.
- M. Do not Paint:
 1. Surfaces indicated on Drawings or specified to be unpainted or unfinished.
 2. Surfaces with factory applied finish coat or integral finish.

3. Architectural metals, including aluminum, brass, bronze, stainless steel, and chrome plating.

3.4 ADJUSTING

- A. Touch up or refinish disfigured surfaces.

3.5 CLEANING

- A. Remove paint from adjacent surfaces.

3.6 PAINT REQUIREMENTS

- A. Types of paint listed in Section 2, above, are set forth as standard of quality and type of coating required for each type of surface.
 1. Paint exposed surfaces of types listed in Section 2.
 2. Paint other exposed surfaces not specifically listed with not less than two coats of appropriate type of coating.
- B. Prime coat includes touch up on shop primed coatings.

3.7 SCHEDULE OF GENERAL ITEMS TO BE FINISHED

- A. Exterior (Painted):
 1. Surfaces noted on door schedule.
- B. Interior (Painted):
 1. Surfaces noted on finish schedule.
 2. Surfaces noted on door schedule.
 3. Exposed steel lintel plates, and miscellaneous plates and angles.
 4. Existing Door Frames in spaces to be repainted.
 5. Exposed plywood, gypsum board and concrete block in spaces to be painted.

END OF SECTION

SECTION 10 2116

PLASTIC TOILET COMPARTMENTS

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Solid plastic toilet partitions.
 - 2. Solid plastic urinal screens.
- B. Related Sections:
 - 1. Division 01: Administrative, procedural, and temporary work requirements.

1.2 REFERENCES

- A. ASTM International (ASTM) E84 - Standard Test Method for Surface Burning Characteristics of Building Materials.
- B. National Fire Protection Association (NFPA) 286 - Standard Methods of Fire Tests for Evaluating Contribution of Wall and Ceiling Interior Finish to Room Fire Growth.

1.3 SUBMITTALS

- A. Submittals for Review:
 - 1. Shop Drawings: Include layout, dimensions, materials, panel construction, finishes, hardware, and accessories.
 - 2. Samples: 3 x 3 inch panel samples showing available colors.

1.4 QUALITY ASSURANCE

- A. Installer Qualifications: Minimum 5 years experience in work of this Section.
- B. Fire Hazard Classification: Class A rated, tested to ASTM E84.
- C. Conform to applicable accessibility code for hardware types and locations.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Acceptable Manufacturers - Solid Polymer Partitions:
 - 1. AJW Architectural Products. (www.ajw.com)
 - 2. ASI Accurate Partitions Corp. (www.accuratepartitions.com)
 - 3. Global Partitions. (www.globalpartitions.com)
- B. Substitutions: Under provisions of Division 01.

2.2 MATERIALS

- A. Solid Polymer Sheet:
 - 1. High density polyethylene (HDPE), integrally colored, fabricated from extruded polymer resin forming single sheet.
 - 2. Waterproof, non-absorbent, with self-lubricating surface resistant to marks from pens, markers, and paints.

- B. Head Rail:
 1. Hollow, extruded aluminum, with anti-grip surface and cast wall sockets.
- C. Hardware: Manufacturer's standard design, heavy-duty operating hardware and accessories.
 1. Material: Stainless steel
 2. Hinges: Gravity rising. Adjustable to hold door of unoccupied compartment in ajar position.
 3. Latches: Heavy duty Sliding type requiring maximum 5 pound force to operate, with emergency release operation.
 4. Coat hook and door stop: Combination type with rubber tip.
 5. Heavy duty door strike and keeper with rubber bumper.
 6. Door Pull: Manufacturer's standard at out-swinging doors.

2.3 ACCESSORIES

- A. Fasteners: Stainless steel, theft resistant where exposed.
- B. Wall Brackets:
 1. Material: Stainless steel
 2. Shall be double ear type, continuous for full height of partitions and urinal screens.

2.4 FABRICATION

- A. Configurations:
 1. Toilet partitions: Floor mounted, Over-head braced.
 2. Urinal screens: Wall hung with continuous stainless steel brackets.
- B. Construction: Solid polymer sheet with eased edges, minimum 1 inch thick.
- C. Provide cutouts for toilet room accessories. Mark locations for partition mounted accessories.
- D. Pilaster Shoes: Formed stainless steel.

2.5 FINISHES

- A. Panels, Doors, and Pilasters: color to be selected from manufacturer's full color range.
- B. Hardware and Accessories:
 1. Stainless steel: No. 4 satin.
 2. Aluminum: Manufacturer's standard finish.

PART 3 EXECUTION

3.1 INSTALLATION

- A. Install in accordance with manufacturer's instructions and approved Shop Drawings.
- B. Set partitions straight, plumb, level, and aligned. Anchor to concrete floors with two 3/8 inch bolts in lead expansion shields
- C. Provide 3/8 to 1/2 inch vertical clearances between walls and panels and between walls and end pilasters.
- D. Attach panels and head rail brackets to walls using appropriate anchor devices. Secure head rail to pilaster with screws on inside of stall.
- E. Adjust for floor variations with screw jack integral in pilasters. Conceal floor fastenings with pilaster shoes. Secure shoe to pilaster with minimum one screw on inside of stall.

- F. Equip doors with two hinges, door latch, pull, door strike and keeper, and coat hook/door stop. Provide one additional bumper/hook and pull on out swinging doors adjacent to walls. Locate bumper on out swinging doors at top of door where it will not be a hazard. At accessible stalls locate the bumper as close to the hinge as possible at 48 inches to centerline. At accessible stalls, provide a pull on both sides of the door.
- G. Provide additional over-head rails across stalls where necessary to stabilize partitions.
- H. Holes in partitions, pilasters and doors resulting from misplaced hardware will not be acceptable. Defective units shall be replaced.

3.2 ADJUSTING

- A. Adjust hardware for proper operation.
- B. Adjust door hinges to hold door open 10 degrees when not latched.

END OF SECTION

SECTION 10 2813

TOILET ACCESSORIES

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Toilet accessories.
 - 2. Mirrors.
- B. Related Sections:
 - 1. Division 01: Administrative and procedural work requirements.

1.2 REFERENCES

- A. ASTM International (ASTM):
 - 1. A123/A123M - Standard Specification for Zinc (Hot-Galvanized) Coatings on Iron and Steel Products.
 - 2. A269 - Standard Specification for Seamless and Welded Austenitic Stainless Steel Tubing for General Service.
 - 3. A666 - Standard Specification for Annealed or Cold-Worked Austenitic Stainless Steel Sheet, Strip, Plate, and Flat Bar.
 - 4. A1008/A1008M - Standard Specification for Steel, Sheet, Cold-Rolled, Carbon, Structural, High-Strength Low-Alloy and High-Strength Low-Alloy with Improved Formability.
 - 5. B456 - Standard Specification for Electrodeposited Coatings of Copper Plus Nickel Plus Chromium and Nickel Plus Chromium.
 - 6. C1036 - Standard Specification for Flat Glass.

1.3 SUBMITTALS

- A. Submittals for Review:
 - 1. Product Data:
 - a. Schedule accessories by room; Identify room name and number, type and quantity of accessories, and mounting heights.
 - b. Include manufacturer's brochures showing sizes, details of function, finishes, and attachment methods.
 - 2. Warranty: Sample warranty form.

1.4 QUALITY ASSURANCE

- A. Conform to applicable accessibility code for locating accessories.

1.5 WARRANTIES

- A. Furnish manufacturer's 15 year warranty providing coverage against mirror silver spoilage.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Acceptable Manufacturers:
 - 1. American Specialties, Inc. (www.americanspecialties.com)
 - 2. Bobrick Washroom Equipment, Inc. (www.bobrick.com)

3. Bradley Corp. (www.bradleycorp.com)

2.2 MATERIALS

- A. Stainless Steel:
 1. Sheet: ASTM A666, Type 304, with polished No. 4 finish, 0.034 inch (22 gage) minimum thickness.
 2. Tubing: ASTM A269.
- B. Galvanized Steel:
 1. ASTM A1008/A1008M.
- C. Mirror Glass: ASTM C1036, Type I, Class 1, Quality q2, 3/16 inch thick.

2.3 TOILET TISSUE DISPENSERS

1. The owner will provide the units for the contractor to install.

2.4 GRAB BARS

- A. Stainless Steel Type: Provide grab bars with wall thickness not less than 0.05 inch (18 gage) and as follows:
 1. Mounting: Concealed, manufacturer's standard flanges and anchorages.
 2. Clearance: 1-1/2 inch clearance between wall surface and inside face of bar.
 3. Gripping Surfaces: Manufacturer's standard nonslip texture.
 4. Heavy-Duty Size: Outside diameter of 1-1/2 inches
 5. Provide at each accessible water closet.
 - a. No. B-6806.99-42 and B-6806.99-36 by Bobrick
 - b. No. 8122-00142 and 8122-00136 by Bradley
 - c. No. 3801 P x 42 and 3801 P x 36 by ASI

2.5 SURFACE MOUNTED TOILET SEAT COVER DISPENSER

1. The owner will provide the units for the contractor to install.

2.6 MIRROR UNITS

- A. Standard Stainless Steel Framed Mirror Units with Mirror Glass: Fabricate frame with channel shapes not less than 0.04 inch (20 gage), with square corners carefully mitered to hairline joints and mechanically interlocked. Provide in Type 430 bright polished finish on frame. Provide mirror glass inset. Provide one per lavatory/sink in all restrooms.
 1. No. B-2908-18 x 48 by Bobrick
 2. No. 780-18 x 48 by Bradley
 3. No. 0600-18 x 48 by ASI

2.7 UNDER LAVATORY GUARD

- A. Provide ADA compliant wheelchair accessible lavatory guard equal to Truebro Inc. pipe Guard, color shall be white.

2.8 HAND DRYER

- A. Motor: Universal, 1/7 hp, 8000 rpm, on resilient mounting. Sealed ball bearing at drive-shaft end and self lubricating sleeve bearing at non-drive end. Automatic thermal-overload switch
- B. Power Consumption: 15 amps 1725W at 115 Vac Nominal.

- C. Fan Rotor: Two balanced, double-inlet centrifugal fans. 71 CFM (cubic feet per minute)
- D. Heating Element: Two coiled nickel-chrome heating elements mounted in mica frame, thermal shut-off switch. Protected from outside contact.
- E. Warranty: 5 yr. limited manufacturer's warranty (motor brushes, 3 yrs.).
- F. Cover: 304 Stainless steel with #4 satin-finish.
- G. Circuitry: All new solid state circuitry has completely eliminated all mechanical parts. Unit is activated by infra-red sensor when hands are placed in drying chamber. Dryer operates only when in use.
 - 1. B-7128 by Bobrick.
 - 2. Equivalent products by Xlerator and Dyson

2.9 SOAP DISPENSER

- 1. The owner will provide the units for the contractor to install.

2.10 ACCESSORIES

- A. Fasteners: Stainless steel where exposed, hot dip galvanized where concealed; type best suited to substrate conditions.

2.11 FABRICATION

- A. Use stainless steel for exposed surfaces; galvanized steel may be used in concealed locations.
- B. Form exposed surfaces from single sheet of stock, free from joints, and flat, without distortion.
- C. Weld joints of fabricated components and grind smooth.
- D. Fabricate grab bars of tubing, free of visible joints, return to wall with end attachment flanges. Peen grip surfaces.
- E. Provide hangers, adapters, anchor plates, and accessories required for installation.
- F. Shop assemble units and package complete with anchors and fittings.

2.12 FINISHES

- A. Stainless Steel: No. 4 satin.
- B. Galvanizing: ASTM A123/A123M to 1.25 ounces per square foot.
- C. Chrome Plating: ASTM B456, Type SC 2, polished

PART3 EXECUTION

3.1 INSTALLATION

- A. Install in accordance with manufacturer's instructions.
- B. Set plumb, level, square, and rigid.

- C. Secure mirrors to walls in concealed, tamperproof manner with special hangers, toggle bolts or screws.
- D. Install grab bars to withstand a downward load of at least 250 lbs, complying with ASTM F 446.
- E. Clean and polish all accessories after removing labels and protective coatings.

END OF SECTION

SECTION 10 4413

FIRE EXTINGUISHERS AND CABINETS

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Portable fire extinguishers.
- B. Related Sections:
 - 1. Division 01: Administrative and procedural work requirements.

1.2 REFERENCES

- A. ASTM International (ASTM) E814 - Standard Test Method for Fire Tests of Through-Penetration Firestops.
- B. National Fire Protection Association (NFPA)10 - Portable Fire Extinguishers.
- C. Underwriters Laboratories (UL):
 - 1. 154 - Carbon Dioxide Fire Extinguishers.
 - 2. 299 - Dry Chemical Fire Extinguishers.
 - 3. 626 - 2-1/2 Gallon Stored Pressure, Water Type Fire Extinguishers.
 - 4. 711 - Rating and Fire Testing of Fire Extinguishers.
 - 5. 2129 - Halocarbon Clean Agent Fire Extinguishers.

1.3 SUBMITTALS

- A. Submittals for Review:
 - 1. Product Data: Include data on extinguishers and cabinets, brackets, operational features, materials, finishes, and anchorage.
- B. Closeout Submittals:
 - 1. Maintenance Data: Include test, refill, or recharge schedules and re-certification requirements.

1.4 QUALITY ASSURANCE

- A. Provide fire extinguishers complying with UL 711 and applicable code. NFPA 10.
- B. Cabinets in Fire Rated Partitions: Tested in accordance with ASTM E814 with fire resistance rating equivalent to adjacent construction.
- C. Conform to applicable accessibility code for locating extinguishers.

1.5 PROJECT CONDITIONS

- A. Do not install extinguishers when ambient temperature may cause freezing of extinguisher ingredients.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Acceptable Manufacturers:
 - 1. Ansul Incorporated. (www.ansul.com)
 - 2. JL Industries. (www.jlindustries.com)
 - 3. Larsen's Mfg. Co. (www.larsensmfg.com)
 - 4. Potter Roemer. (www.potterroemer.com)

- B. Class 4A:60B:C Fire Extinguishers:
 - 1. No. Cosmic 10E by J. L. Industries
 - 2. No. MP-10 by Larsen
 - 3. No. 3010 by Potter-Roemer

2.2 COMPONENTS

- A. Extinguishers:
 - 1. Multi-purpose dry chemical type, UL 299, cast steel tank, Class 4A: 60B: C, 10 pound nominal capacity with indicating gauge, upright squeeze grip operation, replaceable molded valve stem seal, metal hanging bracket and heavy metal valve and siphon tube.

2.3 ACCESSORIES

- A. Mounting Hardware: Type best suited to application.

2.4 FINISHES

- A. Extinguishers: Baked enamel, red color.

PART 3 EXECUTION

3.1 INSTALLATION

- A. Install brackets in accordance with manufacturer's instructions.
- B. Set plumb, level, and rigid. Top of extinguisher at 48" AFF.
- C. Place an extinguisher in each bracket.

END OF SECTION

**SECTION 22 0510
GENERAL PLUMBING REQUIREMENTS**

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Definitions
- B. Assurance Requirements and Installer Qualifications.
- C. Submittal Procedures Supplementing Section 01 3000.
- D. Operating and Maintenance Manuals
- E. Execution Requirements common to Division 22 systems
- F. Piping Pressure Tests.
- G. Cleaning Requirements.
- H. Finishing Requirements

1.2 RELATED SECTIONS

- A. Section 01 2300 - Alternates.
- B. Section 01 3000 - Administrative Requirements, for submittal procedures.
- C. Section 01 7700 - Closeout Procedures, for additional submittal and warranty requirements.
- D. Section 07 8400 - Firestopping.
- E. Section 07 9200 - Joint Sealants
- F. Section 09 9100 - Painting.

1.3 ALTERNATIVES

- A. Refer to Section 01 2300 - Alternates, for product alternatives affecting this Division.

1.4 DEFINITIONS

- A. Manufacturer's Representatives: Wherever MANUFACTURER'S REPRESENTATIVE is referred to in this division, said representative shall be regularly employed by the manufacturer to perform similar activities to those called for herein, which indicates his competence in that field of work.
- B. Concealed: Where the word concealed is used in this Division, it shall mean items above ceilings, in attics, in crawl spaces, in chases, in tunnels, in cabinet work, and under counters or equipment so as to be not visible from an elevation of 5 feet at a horizontal distance of 10 feet.

- C. Finished Spaces or Areas: Where finished spaces or areas are referred to in this Division, it shall mean all spaces except concealed spaces, mechanical rooms, or boiler rooms unless otherwise noted.
- D. Provide: Furnish and install.
- E. Control and Interlock Wiring: All wiring, both line voltage and low voltage, other than power wiring from an electrical distribution panel, through the primary control device, to the item of equipment.
- F. Primary Control Device: That ONE device for any item of equipment which interrupts power flow during normal operation. Where magnetic starters are provided, they are the primary control. For items not switches by starters, the primary control device will be that ONE thermostat, time clock, manual switch, aquastat, or relay performing the primary switching.
- G. Diagrammatic: A drawing that shows arrangement and relations (as of parts).i.e.: A diagrammatic drawing uses symbols rather than pictorial representation of pipes and other items shown and is not necessarily to scale. Arrangement, location, and sizes shown are firm.
- H. Readily Accessible: Equipment, valves and other items requiring service shall be installed to be readily accessible. These items shall be available for maintenance or use in a space, through an access door from floor elevation, or above a lay-in ceiling by maintenance staff standing on a ladder no taller than the ceiling.
- I. Noted, Indicated or Shown: Where the terms "Noted", "Indicated" or "Shown" are used in these specifications, the words "in the specifications or on the plans" shall be inferred.
- J. Detail: Where reference is made to a Detail, the Detail shall be on the plans unless otherwise noted.
- K. Specifications: Where reference is made to these specifications, it shall be inferred in this Division of specifications.
- L. Notification by the Contractor, and Instructions to the Contractor: Where reference is made in these specifications to notification by or instructions given to the Contractor, it shall be inferred that the Design Professional shall be the instructor or shall be notified, as the case exists.
- M. Division or Section Reference: Where reference is made to another Division or Section within this Division, refer to specifications table of contents for Division, Section, or Page Number.
- N. Flow Diagram: A single-line, two-dimension, non-scaled drawing depicting arrangement and sequence of equipment, valves, controls, thermometers, gauges, and other specialty devices in a pipe system.

1.5 REGULATORY REQUIREMENTS

- A. Where requirements of these specifications exceed specified codes and ordinances, conform to these specifications.
- B. Materials and equipment included in Underwriters Label Service shall bear that label. Electrical equipment shall be U.L. approved as installed.

- C. Jurisdiction: Where codes or guides refer jurisdiction to local governing code officials, such official in this procedure shall be the State Fire Marshal.
- D. Permits: Obtain all permits, paying all fees in connection therewith. At completion, have work inspected by proper authorities and furnish the Design Professional for the Owner an inspection certificate showing approval of installation.
- E. Plumbing: Conform to the Georgia State Minimum Standard Plumbing Code (International Plumbing Code), 2024 Edition, with all Georgia State Amendments(2026).
- F. Fire Prevention Precautions in Cutting and Welding Areas: Conform to Article 2605 Fire Prevention Precautions, Georgia State Minimum Standard Fire Prevention Code (International Fire Code), 2024 Edition, with 2026 Georgia State Amendments, for all work involving cutting and welding.
- G. Energy: Conform to the Georgia State Energy Code for Buildings (International Energy Conservation Code), 2015 Edition, with all Georgia State Amendments(2020), (2022), & (2023).
- H. All Work: Conform to State of Georgia Chapter 120-3-3 "Rules of Safety Fire Commissioner, Rules and Regulations".
- I. All Work: Conform to State of Georgia Chapter 120-3-20 "Access To and Use of Public Facilities by Handicapped Persons" and 2010 ADA Standards for Accessible Design.
- J. Electrical: Refer to Division 26. Conform to the National Electrical Code 2023 Edition with 2026 Georgia Amendments, NFPA 70.
- K. Building Code: Conform to the Georgia State Minimum Standard Building Code (International Building Code), 2024 Edition with all Georgia State Amendments(2026).

1.6 PERFORMANCE REQUIREMENTS

- A. Requirements specified herein are minimum. All equipment, when installed, shall perform equal to or exceed specified requirements.

1.7 SUBMITTALS

- A. Refer to Section 01 3000 - Administrative Requirements, for submittal procedures.
- B. Supplementing Division 1 requirements; the Contractor shall:
 - 1. Review the submittal data and check to ensure compliance with specifications prior to submitting.
 - a. The Contractor agrees that submittals of equipment and material and shop drawings of equipment and material layouts required under provisions of these specifications and processed by the Design Professional are not Change Orders. The purpose of submittals is to demonstrate that the Contractor understands the design concept of the project by indicating the equipment and materials he intends to furnish and install, and by detailing the installation he intends to achieve.

- b. The Contractor shall conform to the requirements of the Contract Documents unless a change order is issued. The Contractor shall identify on each submittal and letter form to the Design Professional any and all deviations from the Contract Documents.
 - c. Any submittal or shop drawing not conforming to the Contract Documents without this identification and notification shall be assumed to be marked "Revise and Resubmit" (acknowledges this by the submission), and the Contractor shall promptly resubmit said submittal so as to be in full compliance with the Contract Documents.
 - d. Failure of the Contractor to provide this information during the shop drawing phase shall make the Contractor responsible for all changes to achieve compliance with the Contract Documents without additional compensation.
2. Assemble the submittal data in complete sets in hard back three-ring binders, separate binders, and bound with numbered index sheets and tabs. All submittal data shall be submitted at one time unless unavailable data would delay project progress. Data shall include capacities, complete installation instructions, dimensional data and electrical data, BHP, motor HP, operating weights and load distribution at mounting points. Any submittals sent in pieces or not secured in a three ring binder will be marked not reviewed and will be returned to the contractor.
3. Identify all submittals by a cover sheet showing project name, specification sections, drawing or detail number, room number, date, revision date, contractor and subcontractor's organization and project manager with phone number, the model, style and size of item being submitted with manufacturers' representative, salesman (or a preparer who can answer questions), and Preparer's phone number.
4. Manufacturers' standard drawings shall be modified by deletions or additions to show only items applicable to this project.
5. Prepare a master list of submittal proposed to be submitted on the project. This list shall be updated for each submission and shall be the first sheet(s) of the submission in the quantity that is submitted for review. The information and general format shall contain an Tab number, Item Description, Item Status and any comment.
6. Provide a Letter stating that all submittals have been checked for compliance with specifications.
7. Deliver submittals to the Design Professional at the business address.
8. Electronic Delivery of Submittals:
 - a. Submittal data may be posted to the NBP Engineers FTP site when agreed upon by the Design Professional and the Owner during the preconstruction phase. The Construction Manager will be provided with a project folder and password.
 - b. Prepare the submittals as described above in Sections 1.7.A.1-7. Provide one pdf file for each specification section including all submittal data for that specification section. Provide labels identifying each piece of equipment, piping, or accessory to match the listed item in the specification. Take steps to reduce submittal file size.

- c. Do not scan in color or high resolution unless needed for clarity.
- d. Ensure any reproductions are legible.
- e. Send an email to submittal@nbpengineers.com with a copy to the Plumbing Design Professional and the Architectural Design Professional (if applicable) identified during the preconstruction phase.
- f. Provide a submittal index and identify the submittal in the email subject line using the official project title, specification section and submitted item. I.E. Project No. G-xxx. Addition to Administrative Building - Section 22 0519 - Meters and Gages for Plumbing Piping.
- g. Each pdf should include bookmarks to each product, and specification section to easily navigate the pdf file.
- h. Ensure the submittal posted to the FTP site has the same identification.
- i. NBP Design Professionals will not process or react to submittals which are not properly transmitted, indexed, and identified.

C. Product Data:

- 1. Provide data specific to the Product proposed indicating capacity data, all standard and optional features to be supplied and all accessories and options available for that product.
- 2. Manufacturer's standard drawings shall be modified by deletions or additions to show only items applicable to this project.

1.8 OPERATING AND MAINTENANCE MANUALS

- A. Operating and Maintenance Manuals shall be prepared by the Contractor for all equipment and be submitted for review a minimum of two months prior to the request for Material Completion.
- B. Digital delivery of Operating and Maintenance Manuals:
 - 1. Operating and Maintenance Manuals may be delivered digitally and posted to the NBP Engineers FTP site when agreed upon by the Design Professional and the Owner during the preconstruction phase. The Contractor will be provided with a project folder and password.
 - 2. Prepare the Operating and Maintenance Manuals as described above. Take steps to reduce submittal file size.
 - 3. Do not scan in color or high resolution unless required for clarity.
 - 4. Ensure any reproductions are legible.
 - 5. Send an email to submittal@nbpengineers.com with a copy to the Plumbing Design Professional and the Architectural Design Professional (if applicable) identified during the preconstruction phase.

6. Identify the manuals in the email subject line using the official project title, specification section and submitted item. I.E. Project No. G-xxx, Addition to Administrative Building.
 7. Table of Contents(Index) sheets shall be included in the order listed with identifications typed in capital letters.
 8. Ensure the manuals posted to the FTP site has the same identification.
 9. The O&M Pdf should contain bookmarks to each section of the manual, and bookmarks to each product.
 10. NBP Design Professionals will not process or react to manuals which are not properly transmitted, indexed, and identified.
- C. Each Manual shall contain the following information, data and drawings:
1. Copies of submittals (with Design Professional's review comments and stamp), equipment and materials.
 2. Manufacturer's installation, operating and maintenance instructions for each item of equipment with moving parts including recommended frequency of inspections and maintenance for one year of facility operation.
 3. Manufacturer's list of renewal parts for each item of equipment with recommended stock items and quantities indicated.
 4. Copies of as-built shop drawings showing layouts and construction details.

1.9 QUALITY ASSURANCE

- A. Plumbing Installer Qualifications:
1. Wherever the word "company" or "firm" is used in these subparagraphs, it shall mean the contractor/subcontractor of record for the installations used for proficiency qualification.
 2. Refer to the individual sections within this division for additional installer qualification requirements.
 3. The Contractor expressly warrants that the company performing the installation of the plumbing systems has demonstrated proficiency in the installation and adjustment of such systems by the successful performance of work of the nature specified herein on at least three commercial or institutional buildings, each containing water heating systems, pumping systems(i.e. hot water recirculation, sump pumps, or pressure booster pumps), and a minimum of 10 plumbing fixtures.
 4. The Contractor also warrants that the aforesaid installer, if any, has been in business performing services of the nature specified herein for at least three(3) years.

1.10 PRODUCT DELIVERY, STORAGE, AND PROTECTION

- A. Accept all products on site in factory-fabricated protective containers. Inspect for damage.

- B. Store products in a clean dry place and protect from weather and construction traffic.
- C. Handle products carefully to avoid damage to components, enclosures, and finish.
- D. After placement, protect products from damage during construction, by all trade contractors.
- E. Protect equipment nameplates and labels from damage, being painted, scaring, etc.

1.11 WARRANTY

- A. Refer to Section 01 7700 - Closeout Procedure, for additional warranty requirements.
- B. Where extended warranties beyond the Contractor's one (1) year warranty are specified, the additional warranty time shall start at the end of the Contractor's warranty.
- C. Correct defective Work within a one year period after Date of the Material Completion.

PART 2 PRODUCTS-NOT USED

PART 3 EXECUTION

3.1 EXAMINATION

- A. Refer to the specifications and Architectural and Structural drawings for additional requirements pertaining to work under this discipline. Notify the Design Professional for clarification in the event of conflict.
- B. All materials of systems installation exposed in hollow spaces that are used as ducts or plenums shall have a flame spread rating of 25 or less and a smoke development rating of 50 or less.

3.2 PREPARATION

- A. Drawings are diagrammatic and show the general proximity of the equipment and pipes. They are not to be scaled, and do not include all required changes in direction or offsets necessary in coordinating the installation of various materials either between trades or within the same trade. All dimensions shall be verified at the building site. Prefabrication and/or installation of work from drawings shall be at the Contractor's risk. Refer to Architectural plans for exact building dimensions and details.
- B. Space Conditions:
 - 1. All apparatus 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. Equipment larger than access to equipment spaces shall be disassembled into sub-assemblies for installation.
 - 2. Where deviations from the plans are required in order to conform to the space limitations, such changes shall be made at no additional cost to the Owner and shall be subject to approval.
 - 3. All equipment requiring service shall be made accessible. Coordinate piping installation to avoid conflict with other trades.

- C. Where new work is specified tying into old work and materials are different from existing, the contractor shall request a clarification from the Design Professional prior to performing the work.
- D. Where sanitary drainage systems or storm drainage systems are to be reused in existing buildings. The contractor shall camera all existing piping below slab that is to be reused to verify the piping is the correct size, the piping is sloped in the correct direction, the pipe is not broken or damaged, and the piping is free of obstructions. The contractor shall notify the design professional of any deficiencies prior to performing any work.

3.3 DEMOLITION

- A. Drawings showing existing building conditions and utilities are based on casual field observation and existing record documents only.
 - 1. Verify that construction and utility arrangements are as shown.
 - 2. Report discrepancies to the Architect before disturbing existing installation.
 - 3. Beginning of alterations work constitutes acceptance of existing conditions.
- B. The demolition plans have been prepared to assist the contractor in determining the scope of demolition work and should not be construed to be all of the demolition required. The contractor shall visit job site (after carefully reviewing the contract documents) and determine exact areas and quantities of existing materials to be removed to accomplish new construction.
- C. All existing equipment and material removed from the facility shall be the property of the Contractor, unless otherwise noted, and shall be removed from the facility as required by the Contract provisions concerning trash removal.
- D. Where the Documents indicate an equipment item to be removed. Remove all associated material including hangers, supports, etc. Do not leave abandoned items.
- E. Remove exposed and accessible piping, and other materials rendered useless due to changes or modifications. Cap outlets in piping. Repair piping insulation damaged during construction.
- F. Remove concealed piping which is exposed by the removal of walls, partitions, etc., and reconnect and re-route as required to maintain system continuity.
- G. Sleeves left open by removal of piping shall be cut flush with the finished slab or wall, filled with non-shrinking cement grout and/or fire rated foam flush with both sides of slab or wall to maintain slab or wall fire rating.
- H. Material and equipment which has been removed shall not be used in the new work, except as noted.
- I. Where existing piping and/or equipment is shown on the Drawings, its size and location shall be verified prior to performing any work relating to demolition. Notify Architect of any discrepancies.
- J. Dispose of any material to be discarded in accordance with all laws and regulations.

- K. Comply with all other applicable requirements of this Section and related Sections of the project manual.

3.4 INSTALLATION

- A. All equipment shall be installed in accordance with manufacturers' published installation instructions shipped with the equipment. In the event there is a discrepancy between these specifications or Drawings and the manufacturers' instructions, no work shall be performed until additional instructions are received.
- B. Install and connect all appliances, equipment, and appurtenances as specified, indicated or required in accordance with the manufacturer's instructions and recommendations. Furnish and install complete auxiliary piping, water seals, valves, electric connections, and similar items, recommended by the manufacturer or as required for proper operation.
- C. Seal sleeves and openings in mechanical room walls, fire rated partitions, and floors above grade vaportight, watertight, or for smoke/fire protection as applicable. Refer to Section 07 2700- Firestopping.
- D. Seal sleeves and openings in exterior walls vaportight or watertight as applicable. Refer to Section 07 9200 - Joint Sealants.
- E. Equipment and pipe support upper attachments shall be 3" x 3" x 1/4" galvanized steel angles, minimum, spanning structural members unless noted otherwise. Provide inserts and bolts for supporting pipes and equipment from structural members.
- F. Saw cut or core drill openings in existing work for the installation of the plumbing system. Patching shall be performed by the trade whose work is cut. Contractor shall lay out and install his work ahead of the work of other trades wherever possible.

3.5 PIPING PRESSURE TESTS

- A. General:
 - 1. Provide 48 hours notification to the Design Professional in advance of any test.
 - 2. Complete tests prior to insulating.
 - 3. Leaks shall be repaired, defective materials replaced, and system shall be retested.
 - 4. Strike all joints in copper and steel piping under a pressure test.
 - 5. Conduct tests prior to connecting to equipment or isolate equipment from system.
 - 6. No water pressure test shall be conducted in freezing weather where subject to freezing.
 - 7. Test shall be maintained at conditions specified until approved but, in no event, for less than eight (8) hours minimum duration, unless otherwise noted.
 - 8. Hydrostatic pressure tests shall maintain pressure without change, except that due to temperature change.

- B. Domestic Water System: Hydrostatic test; 150 PSIG.
- C. Soil, Waste and Vent System: Static test; 10 feet minimum head. Test system in its entirety or in sections. Plug all openings except highest opening above the roof. Water shall be kept in the system, or in the portion under test, for a minimum of one (1) hour. Inspect the system, or the portion under test, after one (1) hour, the system shall be tight at all points.

3.6 CLEANING AND PROTECTION

- A. All materials, equipment and mechanical rooms shall be cleaned prior to Material Completion.
- B. Paint equipment where finish has been damaged requiring retouching of finish to match factory finish.
- C. Chipped or scraped paint shall be retouched to match original finish.
- D. Clean and polish all equipment nameplates. All nameplate information shall be legible.
- E. All insulation, equipment, pipe, pipe fittings and appurtenances shall be free of dust, rust and stains prior to Material Completion.

3.7 FINISHING PLUMBING EQUIPMENT AND MATERIAL

- A. Use paint systems specified in Division 9 for the substrates to be finished.
- B. Reinstall electrical cover plates, hardware, light fixture trim, escutcheons, and fittings removed prior to finishing.
- C. Paint all exposed pipes , unless otherwise indicated.
- D. All ferrous fasteners and hanger supports not having a corrosion resistant plated finish shall be painted to prevent rust.
- E. Paint all exposed un-insulated ferrous metals.

END OF SECTION

SECTION 22 0553
IDENTIFICATION FOR PLUMBING PIPING AND EQUIPMENT

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Nameplates
- B. Pipe Markers

1.2 REFERENCE STANDARDS

- A. ASME A13.1 - Scheme for the Identification of Piping System; The American Society of Mechanical Engineers; 2007.
- B. ASTM D709 - Standard Specification for Laminated Thermosetting Materials; 2013.
- C. Refer to Section 220510- General Plumbing Requirements, for submittal procedures.
- D. List: Submit list of wording, symbols, letter size, and color coding for plumbing identification.
- E. Product Data: Provide manufacturers catalog literature for each product required.

PART 2 PRODUCTS

2.1 NAMEPLATES

- A. Description: Laminated three-layer plastic with engraved black letters on light contrasting background color.
- B. Size: 1/2 inch high letters unless otherwise noted.

2.2 PIPE MARKERS

- A. Manufacturers: Brimar, Seton Name Plate Co Setmark, Kolbi Industries Style A thru E(5 inch and smaller) else Style F thru H, Marking Services.
- B. Pipe Markers for Indoor Use: Media indicator with direction-of-flow arrows on calendered vinyl sheet; snap-around type for pipe sizes to 5-7/8 inches diameter, strap around type with nylon ties for pipe sizes 6 inches diameter and larger.
- C. Flexible Marker: Factory fabricated, semi-rigid, preformed to fit around pipe or pipe covering; minimum information indicating flow direction arrow and identification of fluid conveyed.

PART 3 EXECUTION

3.1 PREPARATION

- A. Degrease and clean surfaces to receive identification products.

3.2 INSTALLATION

- A. Install tags in clear view and align with axis of piping
- B. Install plastic tape pipe marker around pipe in accordance with manufacturer's instructions.
- C. Identify equipment such as pumps, water heaters, tanks, compressors and enclosed motor controllers with plastic nameplates.
- D. Identify control panels and major control components outside panels with plastic nameplates.
- E. Install Pipe Markers on all piping systems at the following Locations:
 - 1. Mechanical Equipment Rooms:
 - a. Within 18 inches of each valve.
 - b. Within 36 inches of each 90° elbow, tee, connection to equipment or vessel and point where pipe exits room.
 - c. At not over 20 feet intervals along all exposed piping.
 - 2. Above Suspended Ceilings:
 - a. Within 18 inches of each valve or valve assembly.
 - b. At tees, identify both main and branch within 36 inches of tee.
 - c. Within 36 inches of each 90° elbow.
 - d. At not over 15 feet intervals along all concealed piping.
 - 3. Piping Exposed in Rooms Other Than Mechanical Equipment Areas:
 - a. Omit identification on piping, 1 inch exterior diameter or smaller (insulated or uninsulated) or exposed at connections to equipment or plumbing fixtures.
 - b. With the above exception, identify at not less than one point each piping run visible in each room, with identification on not over 20 feet intervals.

END OF SECTION

**SECTION 22 1005
PLUMBING PIPING**

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Pipe, pipe fittings, specialties, and connections for piping systems.
 - 1. Sanitary sewer
 - 2. Domestic water
 - 3. Pipe flanges, unions, and couplings.
 - 4. Pipe hangers and supports.

1.2 RELATED REQUIREMENTS

- A. Section 07 8400 - Firestopping.
- B. Section 22 0510 - General Plumbing Requirements.
- C. Section 22 4010- Plumbing Fixtures

1.3 REFERENCE STANDARDS

- A. NSF/ANSI 372 - American National Standard for procedures in evaluating product compliance with the 0.25% maximum weighted average lead content requirement.
- B. ASME B16.18 - Cast Copper Alloy Solder Joint Pressure Fittings; 2012.
- C. ASME B16.22 - Wrought Copper and Copper Alloy Solder-Joint Pressure Fittings; 2013.
- D. ASTM B32 - Standard Specification for Solder Metal; 2008 (Reapproved 2014).
- E. ASTM B42 - Standard Specification for Seamless Copper Pipe, Standard Sizes; 2015a.
- F. ASTM B88 - Standard Specification for Seamless Copper Water Tube; 2014.
- G. ASTM B88M - Standard Specification for Seamless Copper Water Tube (Metric); 2013.
- H. ASTM B306 - Standard Specification for Copper Drainage Tube (DWV); 2013.
- I. ASTM D2564 - Standard Specification for Solvent Cements for Poly(Vinyl Chloride) (PVC) Plastic Piping Systems; 2012.
- J. ASTM D2665 - Standard Specification for Poly(Vinyl Chloride) (PVC) Plastic Drain, Waste, and Vent Pipe and Fittings; 2014.
- K. ASTM D2855 - Standard Practice for Making Solvent-Cemented Joints with Poly(Vinyl Chloride) (PVC) Pipe and Fittings; 1996 (Reapproved 2010).

- L. ASTM F437 - Standard Specification for Threaded Chlorinated Poly(Vinyl Chloride) (CPVC) Plastic Pipe Fittings, Schedule 80; 2015.
- M. ASTM F441/F441M - Standard Specification for Chlorinated Poly(Vinyl Chloride) (CPVC) Plastic Pipe, Schedules 40 and 80; 2013.
- N. AWWA C651 - Disinfecting Water Mains; 2005.
- O. MSS SP-69 - Pipe Hangers and Supports - Selection and Application; Manufacturers Standardization Society of the Valve and Fittings Industry, Inc.; 2003.
- P. MSS SP-89 - Pipe Hangers and Supports - Fabrication and Installation Practices; Manufacturers Standardization Society of the Valve and Fittings Industry, Inc.; 2003.
- Q. MSS SP-110 - Ball Valves Threaded, Socket-Welding, Solder Joint, Grooved and Flared Ends; 2010.
- R. NSF 61 - Drinking Water System Components - Health Effects; 2014 (Errata 2015).
- S. NSF 372 - Drinking Water System Components - Lead Content; 2011.

1.4 SUBMITTALS

- A. Refer to Section 22 0510 - General Plumbing Requirements, for submittal procedures.
- B. Product Data: Provide data on pipe materials, pipe fittings, valves, and accessories. Provide manufacturers catalog information. Indicate valve data and ratings.
- C. Project Record Documents: Record actual locations of valves.

1.5 QUALITY ASSURANCE

- A. Products specified this section to be installed in a potable water system anticipated for human consumption shall be in compliance with the amended Safe Drinking Water Act S.3874, to reduce lead in drinking water. "Reduction of Lead in Drinking Water Act". 0.25% allowable lead content.
- B. Refer to Section 22 0510 - General Plumbing Requirements for installer requirements.
- C. All buried thermoplastic pipe and fittings shall be installed in accordance with ASTM D 2321.
- D. Perform Work in accordance with State of Georgia, standards.
- E. Identify pipe with marking including size, ASTM material classification, ASTM specification, potable water certification, water pressure rating.
- F. Perform Work in accordance with State of Georgia plumbing code.
- G. Conform to applicable code for installation of backflow prevention devices.
- H. Disinfection shall be in accordance with Environmental Protection Division, Georgia Department of Natural Resources "Rules for Safe Drinking Water".

- I. Domestic water piping system shall be sterilized, complying with Federal Specifications BB-C-120. Work shall be performed by licensed operator.
- J. Water Sample Certification: Water samples from the sterilized domestic water piping system shall be tested and approved by the local Health Department.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Accept valves on site in shipping containers with labeling in place. Inspect for damage.
- B. Provide temporary end caps and closures on piping and fittings. Maintain in place until installation.
- C. Protect piping systems from entry of foreign materials by temporary covers, completing sections of the work, and isolating parts of completed system.

PART 2 PRODUCTS

2.1 GENERAL REQUIREMENTS

- A. Potable Water Supply Systems: Provide piping, pipe fittings, and solder and flux (if used), that comply with NSF 61 and NSF 372 for maximum lead content; label pipe and fittings.

2.2 SANITARY SEWER PIPING, BURIED AND WITHIN 5 FEET OF BUILDING

- A. PVC Pipe: ASTM D2665, Solid Wall, Schedule 40.
 - 1. Fittings: PVC.
 - 2. Joints: Solvent welded, with ASTM D2564 solvent cement.

2.3 WATER PIPING, ABOVE SLAB ON GRADE:

- A. Copper Tube: ASTM B 88 (ASTM B 88M), Type L (B), Drawn (H).
 - 1. Fittings: ASME B16.18, ASME B16.22, wrought copper and bronze.
 - 2. Joints: ASTM B 32, alloy Sn95 solder.
 - 3. Mechanical Press Sealed Fittings: Double pressed type, NSF 61 and NSF 372 approved or certified, utilizing EPDM, nontoxic synthetic rubber sealing elements.
 - a. Manufacturers:
 - 1) Grinnell Products, a Tyco Business: www.grinnell.com.
 - 2) Viega LLC: www.viega.com.

2.4 UNIONS, FLANGES AND COUPLINGS

- A. Unions for Pipe Sizes 3 inch and Under:

1. Copper Tube and Pipe: Class 150 bronze unions with soldered joints.
- B. Flanges for Pipe Sizes Over 1 inch:
 1. Copper Tube and Pipe: Class 150 slip-on bronze flanges; preformed neoprene gaskets.
- C. Dielectric Connections: Union with galvanized or plated steel threaded end, copper solder end, water impervious isolation barrier. Provide where connecting ferrous and non-ferrous piping.

2.5 PIPE HANGERS AND SUPPORTS

- A. Manufacturers: Anvil, B-Line, Grinnell, Globe or Michigan. Figure numbers are for Michigan.
- B. Plumbing Piping - Drain, Waste, and Vent:
 1. Hangers for Pipe Sizes 2 Inches and Over: Carbon steel, adjustable, clevis. Figure 400.
 2. Multiple or Trapeze Hangers: Steel channels with welded spacers and hanger rods.
 3. Wall Support for Pipe Sizes to 3 inch: Cast iron hook.
 4. Wall Support for Pipe Sizes 4 inch and Over: Welded steel bracket and wrought steel clamp.
 5. Floor Support: Cast iron adjustable pipe saddle, lock nut, nipple, floor flange, and concrete pier or steel support.
 6. Copper Pipe Support: Carbon steel ring, adjustable, copper plated.
- C. Plumbing Piping - Water:
 1. Hangers for Pipe Sizes 1/2 Inch to 1-1/2 Inches: Carbon steel, adjustable swivel, loop. Figure 100.
 2. Hangers for Cold Pipe Sizes 2 Inches and Over: Copper electroplated carbon steel , adjustable, clevis. Figure 402.
 3. Multiple or Trapeze Hangers(Up to 2 inch: Green epoxy coated, cold formed, lipped steel channels, sized for pipe load and span, 1-5/8" x 1-5/8" x 12 gauge minimum, with pipe/tubing clamps, elastomer cushion, spring held, hardened steel nuts and hanger rods.
 4. Copper Pipe Support: Carbon steel ring, adjustable, copper plated.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify that excavations are to required grade, dry, and not over-excavated.

3.2 PREPARATION

- A. Ream pipe and tube ends. Remove burrs. Bevel plain end ferrous pipe.

- B. Remove scale and dirt, on inside and outside, before assembly.
- C. Prepare piping connections to equipment with flanges or unions.
- D. PVC piping shall be stored off the ground, and to prevent ultraviolet damage the piping shall be covered at all times.

3.3 INSTALLATION

- A. Install in accordance with manufacturer's instructions.
- B. Equipment and pipe support upper attachments shall be 3" x 3" x 1/4" steel angles, minimum, spanning structural members unless noted otherwise. Provide inserts and bolts for supporting pipes and equipment from structural members. Attachments shall be to top cord of bar joists. Attach to beams with beam clamps. DO NOT support from roof deck.
- C. Provide non-conducting dielectric connections wherever jointing dissimilar metals.
- D. Flush all debris and pipe compound from domestic water system.
- E. Excavate in accordance with International Plumbing Code, Section 306.2.
- F. Backfill in accordance with International Plumbing Code, Section 306.3.
- G. Install water piping to ASME B31.9.
- H. PVC Pipe: Make solvent-welded joints in accordance with ASTM D2855.
- I. Sleeve pipes passing through partitions, walls and floors. Where pipes pass thru exterior walls, seal opening between sleeve and pipe.
- J. Pipe Hangers and Supports:
 - 1. Install in accordance with ASME B31.9.
 - 2. Install hangers to provide minimum 1/2 inch space between finished covering and adjacent work.
 - 3. Use hangers with 1-1/2 inch minimum vertical adjustment. Design hangers for pipe movement without disengagement of supported pipe.
 - 4. Provide copper plated hangers and supports for copper piping where hanger is in contact with tubing.
 - 5. Prime coat concealed steel hangers and supports not provided with a corrosion resistant finish. Refer to Section 09 9000.
 - 6. Support drainage piping within 12 inches of every joint.

3.4 DISINFECTION OF DOMESTIC WATER PIPING SYSTEM

- A. Prior to starting work, verify system is complete, flushed, and clean.

- B. Ensure acidity (pH) of water to be treated is between 7.4 and 7.6 by adding alkali (caustic soda or soda ash) or acid (hydrochloric).
- C. Inject disinfectant, free chlorine in liquid, powder, tablet, or gas form throughout system to obtain 50 to 80 mg/L residual.
- D. Bleed water from outlets to ensure distribution and test for disinfectant residual at minimum 15 percent of outlets.
- E. Maintain disinfectant in system for 24 hours.
- F. If final disinfectant residual tests less than 25 mg/L, repeat treatment.
- G. Flush disinfectant from system until residual equal to that of incoming water or 1.0 mg/L.
- H. Take samples no sooner than 24 hours after flushing, from 10 percent of outlets and from water entry, and analyze in accordance with AWWA C651.

3.5 SCHEDULES

- A. Hanger spacing indicated as maximum span based on pipe material and size. Conform to structural spacing and load capacity of structural support points and provide closer spacing as required.
- B. Pipe Hanger Spacing:
 - 1. Metal Piping:
 - a. Copper Pipe size: 1/2 inches to 1-1/4 inches:
 - 1) Maximum hanger spacing: 5 ft.
 - 2) Hanger rod diameter: 3/8 inches.
 - 2. Plastic Piping:
 - a. All Sizes:
 - 1) Maximum hanger spacing: 5 ft.
 - 2) Hanger Rod Diameter: 3/8 inch.

END OF SECTION

**SECTION 22 4010
PLUMBING FIXTURES**

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Water closets (WC)
- B. Urinals (UR)
- C. Wall Hung Lavatories (LV)
- D. Counter Mounted Lavatories (LV)
- E. Electric Water Coolers (EWC)
- F. Plumbing Fixtures' Fittings, Accessories, and Supplies

1.2 RELATED SECTIONS

- A. Section 07 9200 - Joint Sealants: Seal fixtures to walls and floors.
- B. Section 22 0510 - General Plumbing Requirements
- C. Section 22 1005 - Plumbing Piping.

1.3 REFERENCES

- A. NSF/ANSI 372 - American National Standard for procedures in evaluating product compliance with the 0.25% maximum weighted average lead content requirement.
- B. ARI 1010 - Self-Contained, Mechanically-Refrigerated Drinking-Water Coolers; Air-Conditioning and Refrigeration Institute; 1994.
- C. ASME A112.6.1M - Supports for Off-the-Floor Plumbing Fixtures for Public Use; The American Society of Mechanical Engineers; 1997.
- D. ASME A112.18.1 - Plumbing Fixture Fittings; The American Society of Mechanical Engineers; 2000.
- E. ASME A112.19.2M - Vitreous China Plumbing Fixtures; The American Society of Mechanical Engineers; 1998.
- F. ASME A112.19.5 - Trim for Water-Closet Bowls, Tanks and Urinals; The American Society of Mechanical Engineers; 1999.

1.4 SUBMITTALS

- A. Refer to Section 22 0510 - General Plumbing Requirements for submittal procedures.
- B. Product Data: Provide catalog illustrations of fixtures, sizes, rough-in dimensions, utility sizes, trim, and finishes.

- C. Manufacturer's Instructions: Indicate installation methods and procedures.
- D. Maintenance Data: Include fixture trim exploded view and replacement parts lists.
- E. Warranty: Submit manufacturer warranty and ensure forms have been completed in the Owner's name and registered with manufacturer.

1.5 QUALITY ASSURANCE

- A. Products specified this section to be installed in a potable water system anticipated for human consumption shall be in compliance with the amended Safe Drinking Water Act S.3874, to reduce lead in drinking water. "Reduction of Lead in Drinking Water Act". 0.25% allowable lead content.
- B. Manufacturer Qualifications: Company specializing in manufacturing the type of products specified in this section, with minimum three years of documented experience.

1.6 REGULATORY REQUIREMENTS

- A. Products Requiring Electrical Connection: Listed and classified by Underwriters Laboratories Inc., as suitable for the purpose specified and indicated.

1.7 DELIVERY, STORAGE, AND PROTECTION

- A. Accept fixtures on site in factory packaging. Inspect for damage.
- B. Protect installed fixtures from damage by securing areas and by leaving factory packaging in place to protect fixtures and prevent use.

1.8 WARRANTY

- A. See Section 01 7700 - Closeout Procedures for additional submittal and warranty
- B. Provide five year manufacturer warranty for electric water cooler from Final Observation.

PART 2 PRODUCTS

2.1 FLUSH VALVE WATER CLOSETS

- A. FIXTURE 'WC1'; WATER CLOSET (FM, FV (1.28 gpf), STD)
 - 1. Bowl:
 - a. Manufacturers:
 - 1) American Standard Inc: Model 2234.001
 - 2) Kohler Company: Model K-96053
 - 3) Toto: Model CT705UN
 - 4) Sloan: Model ST-2009

- 5) Zurn: Model Z5655-BWL1
 - b. ASME A112.19.2M; 1.28 gpf, floor mounted vitreous china closet bowl with elongated rim, 1-1/2 inch top spud, china bolt caps; standard accessible.
2. Fixture Accessories:
- a. Seat: Type 1St; See SEATS.
 - b. Flush Valve (1.28gpf): Type 9FV; See FLUSH VALVES.
- B. FIXTURE 'WC2'; WATER CLOSET (FM, FV(1.28 gpf), ADA)
1. Bowl:
- a. Manufacturers:
 - 1) American Standard Inc: Model 3043.001
 - 2) Kohler Company: Model K-96057
 - 3) Toto: Model CT705ULN
 - 4) Sloan: Model ST-2029
 - 5) Zurn: Model Z5665-BWL1
 - b. ASME A112.19.2M; 1.28 gpf, floor mounted vitreous china closet bowl with elongated rim, 1-1/2 inch top spud, china bolt caps; disabled accessible.
2. Fixture Accessories:
- a. Seat: Type 1St; See SEATS.
 - b. Flush Valve (1.28gpf): Type 9FV; See FLUSH VALVES.

2.2 TANK TYPE WATER CLOSETS

- A. FIXTURE 'WC3'; WATER CLOSET (FM, TT (1.28 gpf), ADA)
1. Bowl and Tank Assembly:
- a. Manufacturers:
 - 1) American Standard Inc; Model 215.AA.104
 - 2) Kohler Company; Model K-25077
 - 3) Toto; Model CST744EL
 - 4) Zurn; Model Z5555-K

- b. ASME A112.19.2M; 1.28 gpf, floor mounted vitreous china, siphon jet, close coupled closet combination with elongated rim bowl, tank with fittings & trip lever (position towards wide side of stall),bolt caps; disabled accessible.
2. Fixture Accessories:
- a. Supply: See SUPPLY STOPS.
 - b. Seat: Type 1St; See SEATS.

2.3 URINALS

A. FIXTURE 'UR1'; URINAL (WH,FV (0.125 gpf), STD)

- 1. Urinal:
 - a. Manufacturers:
 - 1) American Standard Inc; Model 6590.001
 - 2) Sloan; Model SU-1009
 - 3) Zurn; Model Z5755
 - 4) Toto; Model UT445U
 - 5) Kohler Company; Model K-4904-ET
 - b. ASME A112.19.2M; 0.125 gpf, vitreous china, wall hung wash-out urinal fixture with integral trap, 3/4" top spud, standard accessible.
- 2. Flush Valve (0.125gpf): Type 4FV
- 3. Urinal Carriers: See CARRIERS.

B. FIXTURE 'UR2'; URINAL (WH,FV (0.125 gpf), ADA)

- 1. Urinal:
 - a. Manufacturers:
 - 1) American Standard Inc; Model 6590.001
 - 2) Sloan; Model SU-1009
 - 3) Zurn; Model Z5755
 - 4) Toto; Model UT445U
 - 5) Kohler Company; Model K-4904-ET
 - b. ASME A112.19.2M; 0.125 gpf, vitreous china, wall hung wash-out urinal fixture with integral trap, 3/4" top spud, Disabled accessible.

2. Flush Valve (0.125gpf): Type 13FV.
3. Urinal Carriers: See CARRIERS.

2.4 WALL HUNG LAVATORIES

A. FIXTURE 'LV2'; LAVATORY (WH, VC, ADA)

1. Lavatory Basin:
 - a. Manufacturers:
 - 1) American Standard; Model 0356.421
 - 2) Kohler; Model K-2007
 - 3) Sloan; Model SS-3103
 - 4) Toto; Model LT307
 - 5) Zurn; Model Z5341
 - b. ASME A112.19.2M; vitreous china, wall hung, 21" x 18" fixture with single hole drilling, front overflow, soap depression, drilled for concealed arm carrier, disabled accessible.
2. Accessories:
 - a. Faucet: Type 5F; See FAUCETS.
 - b. Drain: Type 2D; See DRAINS.
 - c. Supplies: See SUPPLY STOPS.
 - d. Trap: Type 1T; See TRAPS.
 - e. Carrier: See CARRIERS; Concealed Arm Type.
 - f. Insulation: See FIXTURE INSULATION.

2.5 COUNTER MOUNTED LAVATORIES

A. FIXTURE 'LV1'; LAVATORY (CT, VC, ADA)

1. Lavatory Basin:
 - a. Manufacturers:
 - 1) American Standard; Model 0475.047
 - 2) Kohler; Model K-2196-1
 - 3) Sloan; Model SS-3102

- 4) Toto; Model LT501
 - 5) Zurn; Model Z5111
 - b. ASME A112.19.2M; counter mounted, vitreous china, 20" x 17" oval with single hole drilling, front overflow, soap depression; disabled accessible.
2. Accessories:
- a. Faucet: Type 5F; See FAUCETS.
 - b. Drain: Type 2D; See DRAINS.
 - c. Supplies: See SUPPLY STOPS.
 - d. Trap: Type 1T; See TRAPS.
 - e. Insulation: See FIXTURE INSULATION.

2.6 SHOWER AND TUB ASSEMBLIES

A. FIXTURE 'SH1'; SHOWER ASSEMBLY (WH, STD)

- 1. Shower Valve Assembly:
 - a. Manufacturers:
 - 1) American Standard; Model R110SS w/ T371.240.002 and 888.046.002
 - 2) Leonard Valve; Model 4501
 - 3) Speakman; Model SM-3010-IS-2
 - 4) Symmons; Model 9601-PLR-1.5-CHKS-231
 - 5) Zurn; Model Z-7301-DV-HW-LH-SS-VB
 - b. ASME A112.18.1M chrome plated brass with brass body, pressure balanced valve with built-in check stops, adjustable stop screw, chrome plated bent shower arm and escutcheon, adjustable shower head; 1.5gpm.

B. FIXTURE 'SH2'; SHOWER ASSEMBLY (WH, ADA)

- 1. Shower Valve Assembly:
 - a. Manufacturers:
 - 1) American Standard; Model 1662.601.002 w/ 1660.440.002 and 8888.046.002
 - 2) Leonard Valve; Model 4505
 - 3) Powers; Model P413-E-K-2-6-Y-W

- 4) Speakman; Model SM-3060-IS-2
 - 5) Symmons; Model 9605-PLR-CHKS-231-1.5
 - 6) Zurn; Model Z-7301-DV-HW-LH-SS-VB
- b. ASME A112.18.1M chrome plated brass with brass body, pressure balanced valve with built-in check stops, adjustable stop screw, chrome plated bent shower arm and escutcheon, adjustable shower head, lever type diverter valve, in-line vacuum breaker, chrome plated ell w/escutcheon, 59-inch flexible chrome hose w/hand held shower, with non-positive shut off, and 24-inch slide bar with bracket. 1.5gpm both shower heads.

2.7 ELECTRIC WATER COOLERS

A. FIXTURE 'EWC1'; ELECTRIC WATER COOLER/ FILLING STATION

- 1. Water Cooler
 - a. Manufacturers:
 - 1) Elkay; Model LZS8WSLP
 - 2) Halsey-Taylor
 - 3) Oasis
 - b. ARI-1010; ADA electric water cooler on the right, electric bottle filler assembly with stainless steel water surfaces, heavy duty galvanized steel wall mounting frame, elevated anti-squirt bubblers with stream guard, automatic stream regulators; front push button actuator; high efficiency cooling tank and air cooled coil delivering 8.0 gph 50-degree water at 90-degree ambient air temperature; with ADA compliant bottle filling station. Bottle filling station to have no touch sensor activation with 30 second max. shut-off timer, filter, and 1.1 gpm flow rate.
- 2. Accessories:
 - a. Supply: See SUPPLY STOPS
 - b. Trap: Type 1T; See TRAPS
 - c. Carriers: See CARRIERS

2.8 FIXTURE ACCESSORIES

A. FLUSH VALVES

- 1. Type 9FV (ADA Water Closet Valve Diaphragm Type)
 - a. Manufacturers:
 - 1) Sloan; Model 111-1.28-YBYC-1YK-XL

- 2) Zurn 'Aqua Vantage'; Model Z6000AV-HET-YK
 - b. ASME A112.18.1; Exposed chrome plated diaphragm type with side oscillating handle, non-hold open, heavy duty escutcheon with set screw, integral screwdriver stop, vacuum breaker; 1 1/2 inch top spud, 11 1/2-inches high; 1 solid-ring support; 1.28gpf maximum flush. Position valve with handle toward wide side of stall.
2. Type 13FV (Standard & ADA Urinal Valve- Diaphragm Type)
 - a. Manufacturers:
 - 1) Sloan; Regal Optima 186-0.125-YK
 - 2) Zurn 'Aqua Vantage' Z6003AV-ULF-YK
 - 3) American Standard; Model 6145.013.002
 - b. ASME A112.18.1; Exposed chrome plated diaphragm type with side oscillating handle, non-hold open, heavy duty escutcheon with set screw, integral screwdriver stop, vacuum breaker; 3/4 inch top spud, 11 1/2-inches high; 1 solid-ring support; 0.125gpf maximum flush.

B. SEATS

1. Type 1St.; Seat (Elongated, open front, less lid, white)
 - a. Manufacturers:
 - 1) Bemis; Model 1655SSC
 - 2) Plumbtech; Model 431SSC
 - 3) Kohler; Model K-4666-S-C
 - 4) Church; Model 9500SSC
 - 5) Centoco; Model 1500 series
 - 6) Zurn; Model Z-5955-SS-EL
 - b. Extra heavy weight, injection molded solid plastic, open-front, less lid, molded bumpers, external check hinges and stainless steel posts.

C. FAUCETS

1. Type 5F (Metering - Lavatories)
 - a. Manufacturers:
 - 1) American Standard; Model 1340.119
 - 2) Speakman; Model S-5122

- 3) Delta; Model 87T105
- 4) Chicago; Model 333-E2805-336CAB
- b. ASME A112.18.1M; Chrome plated brass, vandal resistant, supply fitting, easy-push metering handle, 10 second run time, aerator, 0.5 gpm; less grid drain. ASSE 1070 Thermostatic mixing valve to be installed at each faucet.

D. DRAINS

1. Type 2D (Flat grid off-set drain - Lavatories)
 - a. Manufacturers:
 - 1) Dearborn; Model 760W
 - 2) EBC; Model SG7WC
 - 3) Kohler; Model K-13885
 - 4) McGuire; Model 155-WC
 - 5) Sanitary-Dash; Model R7308
 - 6) Zurn; Model Z-8746
 - b. ASME A112.18.1M; 1 1/4" inch diameter chrome plated brass flat grid type drain with offset 17-gauge tailpiece.

E. SUPPLY STOPS

1. Type SS3 (1/2"-inch, 1/4 turn metal-to-metal; Loose Key; Water Closets)
 - a. Manufacturers:
 - 1) Chicago; Model 1006-MMABCP
 - b. ASME A112.18.1M; Chrome plated brass angle heavy duty stop with metal-to-metal seat and removable actuator key; supply tubing and escutcheon plate.
2. Type SS1 (3/8"-inch, 1/4 turn; Loose Key; Lavatories/Sinks/Electric Water Coolers)
 - a. Manufacturers:
 - 1) Brasscraft; Model KTSR17XC
 - 2) Chicago; Model 1006-MMABCP
 - 3) McGuire; Model LFHST02LK
 - 4) Zurn; Model ZH8822-XL-LR-LK-PC

- b. ASME A112.18.1M; Chrome plated brass angle heavy duty stop or ball stop, removable actuator key; supply tubing and escutcheon plate.

F. TRAPS

- 1. Type 1T (1 1/4"-inch Adj. 'P')
 - a. Manufacturers:
 - 1) EBC; Model TA-125-CF
 - 2) Dearborn; Model 707 DFBN
 - 3) Kohler; Model K-9000
 - 4) McGuire; Model 8872
 - 5) Zurn; Model Z-8700
 - b. ASME A112.18.1M; Chrome plated cast brass, 17-gauge P-trap assembly with cast brass nuts, cleanout plug and heavy duty escutcheon.

G. FIXTURE INSULATION

- 1. Manufacturers:
 - a. EBC; Model IK Series
 - b. McGuire; Model 'Pro-Wrap' Series
 - c. Plumberex; Model Pro Extreme Series
 - d. Proflo; Model PF200 Series
 - e. True-Bro; Model 'Lav Guard' Series
 - f. Zurn; Model 'Trap Wrap' Series
- 2. Insulation assembly shall be for supply stops & tubing; drains (including off-sets) and P-traps under all ADA lavatories and counter sinks.
- 3. ANSI A117.1, ADA4.19.4; Fully molded, anti-bacterial flexible vinyl insulation assembly, minimum 1/8"-inch wall thickness, white in color, self-extinguishing meeting ASTM D635, and have a K-value of 1.17.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify that walls and floor finishes are prepared and ready for installation of fixtures.
- B. Verify that electric power is available and of the correct characteristics.

- C. Confirm that millwork is constructed with adequate provision for the installation of counter top lavatories and sinks.

3.2 PREPARATION

- A. Rough-in fixture piping connections in accordance with minimum sizes indicated in fixture rough-in schedule for particular fixtures.

3.3 INSTALLATION

- A. Install each fixture with trap, easily removable for servicing and cleaning.
- B. Provide chrome plated rigid or flexible supplies to fixtures with loose key stops, reducers, and escutcheons, as specified in Fixture Accessories.
- C. Install components level and plumb.
- D. Install and secure fixtures in place with wall supports and bolts.
- E. Seal wall and floor mounted fixtures to wall and floor surfaces with silicon latex tile grout. Joints shall be finished smooth and flush, not depressed. Color to match fixture.
- F. Solidly attach water closets to closet flange with solid brass bolts, washers and nuts. Provide wax ring sealant on closet flange. Lead flashing shall not be used.
- G. Pipe runout from urinal to waste stack shall be Brass or Schedule 40 PVC piping. Copper piping shall not be used.

3.4 INTERFACE WITH WORK OF OTHER SECTIONS

- A. Review millwork shop drawings. Confirm location and size of fixtures and openings before rough-in and installation.

3.5 ADJUSTING

- A. Adjust stops or valves for intended water flow rate to fixtures without splashing, noise, or overflow.

3.6 CLEANING AND PROTECTION

- A. Clean plumbing fixtures and equipment.
- B. Do not permit use of fixtures.

3.7 SCHEDULES

- A. Refer to Fixture Schedule on plans for mounting heights and piping connections.

END OF SECTION

**SECTION 23 0510
GENERAL MECHANICAL REQUIREMENTS**

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Definitions.
- B. Quality Assurance Requirements and Installer Qualifications.
- C. General Product Delivery and Storage.
- D. Installer Warranty.
- E. Submittal Procedures Supplementing Section 01 3000.
- F. Operating and Maintenance Manuals.
- G. Execution Requirements common to Division 23 systems.
- H. Pipe Sleeves in footings and foundations.
- I. Space Conditioning during Construction.
- J. Equipment Bases and Housekeeping Pads.
- K. Equipment backboards.
- L. Starting equipment and Systems-General Requirements.
- M. Training Requirements.
- N. Cleaning Requirements.
- O. Finishing Requirements.

1.2 RELATED SECTIONS

- A. Section 01 3300 - Submittal Procedures, for submittal procedures.
- B. Section 01 7000 - Execution Requirements, for additional submittal and warranty requirements.
- C. Section 03 3000 - Cast-in-Place Concrete.
- D. Section 07 8413 - Penetration Firestopping.
- E. Section 9200 - Joint Sealants.
- F. Section 09900 - Painting and Coatings.

1.3 DEFINITIONS

- A. Manufacturer's Representatives: Wherever MANUFACTURER'S REPRESENTATIVE is referred to in this division, said representative shall be regularly employed by the manufacturer to perform similar activities to those called for herein, which indicates his competence in that field of work.
- B. Concealed: Where the word concealed is used in this Division, it shall mean items above ceilings, in attics, in crawl spaces, in chases, in tunnels, in cabinet work, and under counters or equipment so as to be not visible from an elevation of 5 feet at a horizontal distance of 10 feet.
- C. Finished Spaces or Areas: Where finished spaces or areas are referred to in this Division, it shall mean all spaces except concealed spaces, mechanical rooms, or boiler rooms unless otherwise noted.
- D. Provide: Furnish and install.
- E. Control and Interlock Wiring: All wiring, both line voltage and low voltage, other than power wiring from an electrical distribution panel, through the primary control device, to the item of equipment.
- F. Primary Control Device: That ONE device for any item of equipment which interrupts power flow during normal operation. Where magnetic starters are provided, they are the primary control. For items not switches by starters, the primary control device will be that ONE thermostat, time clock, manual switch, aquastat, P.E. switch, or relay performing the primary switching.
- G. Diagrammatic: A drawing that shows arrangement and relations (as of parts).i.e.: A diagrammatic drawing uses symbols rather than pictorial representation of pipes, ducts, conduit and other items shown and is not necessarily to scale. Arrangement, location, and sizes shown are firm.
- H. Readily Accessible: Items requiring maintenance shall be available for close approach for maintenance or use in a space, through an access door from floor elevation, or above a lay-in ceiling through an access point by maintenance staff safely standing on a ladder no taller than the ceiling.
- I. Noted, Indicated or Shown: Where the terms "Noted", "Indicated" or "Shown" are used in these specifications, the words "in the specifications or on the plans" shall be inferred.
- J. Detail: Where reference is made to a Detail, the Detail shall be on the plans unless otherwise noted.
- K. Specifications: Where reference is made to these specifications, it shall be inferred in this Division of specifications.
- L. Notification by the Contractor, and Instructions to the Contractor: Where reference is made in these specifications to notification by or instructions given to the Contractor, it shall be inferred that the Design Professional shall be the instructor or shall be notified, as the case exists.

- M. Division or Section Reference: Where reference is made to another Division or Section within this Division, refer to specifications table of contents for Division, Section, or Page Number.
- N. Flow Diagram: A single-line, two-dimension, non-scaled drawing depicting arrangement and sequence of equipment, valves, controls, thermometers, gauges, and other specialty devices in a pipe or duct system.

1.4 REGULATORY REQUIREMENTS

- A. Where requirements of these specifications exceed specified codes and ordinances, conform to these specifications.
- B. Materials and equipment included in Underwriters Label Service shall bear that label. Electrical equipment shall be U.L. approved as installed.
- C. Permits and Codes: Refer to the General Conditions.
- D. Fire Prevention Precautions in Cutting and Welding Areas: Conform to Article 2605 Fire Prevention Precautions, Georgia State Minimum Standard Fire Prevention Code (International Fire Code), 2024 Edition, with 2026 Georgia State Amendments, for all work involving cutting and welding.
- E. HVAC: Conform to the Georgia State Minimum Standard Mechanical Code, International Mechanical Code, 2024 Edition with 2026 Georgia State Amendments.
- F. Energy: Conform to the Georgia State Energy Code for Buildings, International Energy Conservation Code, 2015 Edition with 2020, 2022, and 2023 Georgia State Amendments.
- G. All Work: Conform to State of Georgia Chapter 120-3-3 "Rules of Safety Fire Commissioner, Rules and Regulations, January 1, 2015", and ADA.
- H. Electrical: Refer to Division 26. Conform to the National Electrical Code, NFPA 70, 2023 Edition with 2026 Georgia Amendments.
- I. Building Code: Conform to the Georgia State Minimum Standard Building Code, International Building Code, 2024 Edition with 2026 Georgia State Amendments.

1.5 SUBMITTALS

- A. Supplementing Division 1 Administrative Requirements; the Contractor shall:
 - 1. Identify all submittals by a cover sheet showing project name, specification section, drawing or detail number, room number, date, revision date, contractor and subcontractor's organization and project manager with phone number, the model, style and size of item being submitted with manufacturers' representative, salesman (or a preparer who can answer questions), and Preparer's phone number.
 - 2. Prepare a master list of submittal proposed to be submitted on the project. This list shall be updated for each submission and shall be the first sheet(s) of the submission in the quantity that is submitted for review. The information and general format of the master list

shall contain a Specification Section, Section Title, Item Description, Item Status and any comment.

3. Review the submittal data and check to ensure compliance with specifications prior to submitting.
 - a. The Contractor agrees that submittals of equipment and material and shop drawings of equipment and material layouts required under provisions of these specifications and processed by the Design Professional are not Change Orders. The purpose of submittals is to demonstrate that the Contractor understands the design concept of the project by indicating the equipment and materials he intends to furnish and install, and by detailing the installation he intends to achieve.
 - b. The Contractor shall conform to the requirements of the Contract Documents unless a change order is issued. The Contractor shall identify on each submittal that the submittal contains no deviations or the Contractor shall identify any proposed deviations.
 - c. Any submittal or shop drawing not conforming to the Contract Documents without this identification and notification shall be assumed to be marked "Revise and Resubmit" (the contractor acknowledges this by the submission), and the Contractor shall promptly resubmit said submittal so as to be in full compliance with the Contract Documents.
 - d. Failure of the Contractor to provide this information during the shop drawing phase shall make the Contractor responsible for all changes to achieve compliance with the Contract Documents without additional compensation.
 4. Provide a Letter from the HVAC Contractor stating that they have checked all submittals for compliance with specifications.
 5. Product Data:
 - a. Provide data specific to the product proposed indicating capacity data, all standard and optional features to be supplied and all accessories and options available for that product.
 - b. Manufacturers' standard drawings shall be modified by deletions or additions to show only items applicable to this project.
- B. Deliver submittals to the Design Professional at the business address.
- C. Digital Delivery of Submittals:
1. Submittal data may be posted to the NBP Engineers FTP site when agreed upon by the Design Professional and the Owner during the preconstruction phase. The Contractor will be provided with a project folder and a password.
 2. Prepare the submittals as described above. Take steps to reduce submittal file size.

3. Do not scan in color or high resolution unless required for clarity.
 4. Optimize any scans to help control file size.
 5. Ensure any reproductions are legible.
 6. Organize Submittal files individually by specification section with file name format as Follows; "*CS/Section# - Section Title - any further identifier required such as control drawings*"
 7. Send an email to submittal@nbpengineers.com with a copy to the HVAC Design Professional and any Architectural Design Professional (if applicable) identified during the preconstruction phase.
 8. Identify the submittal using the official project title, specification section and submitted item. i.e. Project No. G-xxx, Addition to Administrative Building-Section 230548-Vibration and Seismic Controls. Include drawing or detail number, room number, date, revision date(s), contractor and subcontractor's organization as applicable
 9. Include the project manager's and manufacturers' representatives, salesman's (or a preparer who can answer questions) contact information, email and phone number.
 10. Identify the submittal in the email subject line using the same information listed above.
 11. Provide a submittal index.
 12. Ensure any submittal posted to NBP's or other FTP site has the same identification.
 13. NBP Design Professionals will not process or react to submittals which are not properly transmitted, indexed, and identified.
- D. Tabulation of Power Wiring Requirements: Within 60 Days of the Notice to Proceed, provide a Tabulation of Power Wiring Requirements of all proposed equipment, including H.P., amps, voltage, phase and KW, tabulated on a separate sheet. A copy of the tabulation shall be transmitted independently to the Contractor, the Design Professional and to all affected trades. (Refer to Electrical Drawings for electrical provisions for equipment.)
- E. Warranty: Submit the HVAC installer's warranty letter addressed to the Owner stating the correct project name and number, if applicable, the warranty period and ensure that form has the correct date of the Material Completion.

1.6 OPERATING AND MAINTENANCE MANUALS

- A. Operating and Maintenance Manuals shall be prepared by the Contractor for all equipment and be submitted for review a minimum of prior to the request for Material Completion.
- B. Digital delivery of Operating and Maintenance Manuals:
 1. Operating and Maintenance Manuals may be delivered digitally and posted to the NBP Engineers FTP site when agreed upon by the Design Professional and the Owner during

the preconstruction phase. The Contractor will be provided with a project folder and password.

2. Prepare the Operating and Maintenance Manuals as described above. Take steps to reduce submittal file size.
 3. Do not scan in color or high resolution unless required for clarity.
 4. Ensure any reproductions are legible.
 5. Send an email to submittal@nbpengineers.com with a copy to the HVAC Design Professional and the Architectural Design Professional (if applicable) identified during the preconstruction phase.
 6. Identify the manuals in the email subject line using the official project title, specification section and submitted item. I.E. Project No. G-xxx, Addition to Administrative Building.
 7. Table of Contents(Index) sheets shall be included in the order listed with identifications typed in capital letters.
 8. Ensure the manuals posted to the FTP site has the same identification.
 9. NBP Design Professionals will not process or react to manuals which are not properly transmitted, indexed, and identified.
- C. Each Manual shall contain the following information, data and drawings:
1. Copies of submittals (with Design Professional's review comments and stamp), equipment and materials.
 2. Manufacturer's installation, operating and maintenance instructions for each item of equipment with moving parts including recommended frequency of inspections and maintenance for one year of facility operation.
 3. Manufacturer's list of renewal parts for each item of equipment with recommended stock items and quantities indicated.
 4. Control diagrams, electrical interlock diagrams, and control valve lists.
 5. Copies of as-built shop drawings showing layouts and construction details.
 6. Copies of Test and Balance Reports including list of instruments and description of methods employed.

1.7 QUALITY ASSURANCE

A. HVAC Installer Qualifications:

1. Wherever the word "company" or "firm" is used in these subparagraphs, it shall mean the contractor/subcontractor of record for the installations used for proficiency qualification.

2. Refer to the individual sections within this division for additional installer qualification requirements.
 3. The Contractor expressly warrants that the company performing the installation of the air conditioning systems has demonstrated proficiency in the installation, start-up and adjustment of such systems by the successful performance of work of the nature specified herein on at least three commercial or institutional buildings, each containing minimum of 100 tons capacity or greater with ducted air distribution and chilled water, PTAC or wall hung units excluded.
 4. The Contractor further warrants that the aforesaid subcontractor, if any, has trained personnel, instruments, tools, and equipment to perform the installation, start-up, instruction and maintenance service specified.
 5. The Contractor also warrants that the aforesaid installer, if any, has been in business performing services of the nature specified herein for at least five years.
- B. Testing and Balancing Qualifications: Refer to Section 23 0593.

1.8 WARRANTY

- A. Refer to Section 01 7000 - Contract Closeout, for additional warranty requirements.
- B. Submit manufacturers' warranties prior to final inspection. Refer to the General Conditions.
- C. Correct any defective Work within a one year period after Date of Material Completion. Provide HVAC Installer's warranty letter dated the date of the Material Completion
- D. Where warranties beyond the Contractor's one (1) year warranty are specified, the additional warranty time shall start on the same date as the Contractor's warranty.

PART 2 PRODUCTS-NOT USED

2.1 MANUFACTURED CURBS, EQUIPMENT RAILS AND OTHER ROOF ASSEMBLIES

- A. Manufactured Curbs:
 1. AES Manufacturing Inc.: www.aescurb.com.
 2. Creative Metals .
 3. Curbs Plus Inc. CPPC-*: www.curbs-plus.com.
 4. Louvers and Dampers.: www.aescurb.com.
 5. The Pate CompanyPC-*: www.patecurbs.com.
 6. RPS AccessoriesRC-*: www.rpscurbs.com.
 7. Shipman..
 8. ThyCurb TC-*: www.thybar.com.

B. Manufactured Equipment Rails:

1. AES Manufacturing Inc.: www.aescurb.com.
2. Creative Metals .
3. Curbs Plus Inc. : www.curbs-plus.com.
4. Louvers and Dampers.SES-O-RC.
5. The Pate CompanyES-*: www.patecurbs.com.
6. RPS AccessoriesER-*: www.rpscurbs.com.
7. Shipman.REB.
8. ThyCurb TEMS-*: www.thybar.com.

C. Manufactured Curbs, Equipment Rails, and Other Roof Mounting Assemblies: Factory-assembled hollow sheet metal construction with fully mitered and welded corners, integral counterflashing, internal reinforcing, and top side and edges formed to shed water.

1. Sheet Metal: Hot-dip zinc coated steel sheet complying with ASTM A 653/A 653M, SS Grade 33 ; G60 coating designation; 18 gage, 0.048 inch thick.
2. Roofing Cants: Provide integral sheet metal roofing cants dimensioned to begin slope at top of roofing insulation; 1:1 slope; minimum cant height 3 inches.
3. Manufacture curb bottom and mounting flanges for installation directly on roof deck, not on insulation; match slope and configuration of roof deck.
4. Provide the layouts and configurations shown on the drawings.

D. Curbs Adjacent to Roof Openings: Provide curb on all sides of opening, with top of curb horizontal for equipment mounting.

1. Provide preservative treated wood nailers along top of curb.
2. Insulate inside curbs with 1-1/2 inch thick fiberglass insulation.
3. Height Above Finished Roof Surface: 8 inches, minimum.
4. Height Above Roof Deck: 14 inches, minimum.

E. Equipment Rails: Two-sided curbs in straight lengths, with top of rail horizontal for equipment mounting.

1. Provide preservative treated wood nailers along top of rails.
2. Height Above Finished Roof Surface: 8 inches, minimum.
3. Height Above Roof Deck: 14 inches, minimum.

PART 3 EXECUTION

3.1 EXAMINATION

A. Hazardous Materials:

1. Design Professional's Responsibility: Plans and specifications have been prepared by the A/E for the Owner without the Design Professional having conducted investigation as to the presence of asbestos or hazardous waste on the project. Not being a part of this contract, the Design Professional has not charged any fees and has not and will not advise the Owner with regard to the detection and/or removal of asbestos or hazardous waste. the Owner is aware that asbestos or hazardous waste could be present and will make all decisions with regard to its removal. The removal of all hazardous materials and encapsulation of remaining surfaces is the sole responsibility of the Owner.
2. If the Contractor observes the existence of a friable material which must be disturbed during the course of his work, the Contractor shall promptly notify the Owner and the Design Professional. the Owner shall make all arrangements regarding testing and removal or encapsulation of asbestos material if present. the Contractor shall not perform any work pertinent to the friable material prior to receipt of special instructions from the Owner through the Design Professional.
3. "Friable Material" is any material which can be crumbled, pulverized or reduced to a powder by hand pressure when dry.

B. Refer to the specifications and Architectural and Structural drawings for additional requirements pertaining to work under this discipline. Notify the Design Professional for clarification in the event of conflict.

C. All materials of systems installation exposed in hollow spaces that are used as ducts or plenums shall have a flame spread rating of 25 or less and a smoke development rating of 50 or less.

3.2 PREPARATION

A. Drawings are diagrammatic and show the general proximity of the equipment, ducts, and pipes, etc., are not to be scaled, and do not include all required changes in direction or offsets necessary in coordinating the installation of various materials either between trades or within the same trade. All dimensions shall be verified at the building site. Prefabrication and/or installation of work from drawings shall be at the Contractor's risk. Refer to Architectural plans for exact building dimensions and details.

B. Space Conditions:

1. All apparatus 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. Equipment larger than access to equipment spaces shall be disassembled into sub-assemblies for installation.

2. Where deviations from the plans are required in order to conform to the space limitations, such changes shall be made at no additional cost to the Owner and shall be subject to approval.
3. All equipment requiring service shall be made accessible. Coordinate piping and ductwork installation to avoid conflict with other trades.

3.3 HVAC DEMOLITION

- A. The HVAC demolition plans have been prepared to assist the Contractor in determining the scope of demolition work and should not be construed to be all of the demolition required. The Contractor shall visit job site (after carefully reviewing the contract documents) and determine exact areas and quantities of existing materials to be removed to accomplish new construction.
- B. All existing material removed from the facility shall be the property of the Contractor, unless otherwise noted, and shall be removed from the facility as required by the Contract provisions concerning trash removal.
- C. All existing equipment removed from the facility shall be the property of the Contractor, unless otherwise noted, and shall be removed from the facility as required by the Contract provisions concerning trash removal.
- D. Material and equipment which has been removed shall not be used in the new work, except as noted.
- E. Where the Documents indicate an equipment item to be removed. Remove all associated material including hangers, supports, wiring, controls conduit, etc. Do not leave abandoned items.
- F. Dispose of any material to be discarded in accordance with all laws and regulations.

3.4 EXISTING HVAC SYSTEMS

- A. The existing mechanical equipment and systems shall remain "as-is" except as otherwise indicated or specified. Perform all work necessary to properly tie in new work with existing conditions and to adapt existing conditions to conform to the changes in the building and systems.
- B. Remove exposed and accessible piping, ductwork, and other materials rendered useless due to changes or modifications. Cap outlets in piping. Blank-off or patch openings in ductwork and duct insulation. Repair insulation damaged during construction.
- C. Remove concealed piping which is exposed by the removal of walls, partitions, etc., and reconnect and re-route as required to maintain system continuity.
- D. Sleeves left open by removal of piping shall be cut flush with the finished slab or wall, filled with non-shrinking cement grout and/or fire rated foam flush with both sides of slab or wall to maintain slab or wall fire rating and finished to match the space finishes.
- E. Openings left by removal of ductwork shall be patched matching existing construction.

- F. Where existing piping, duct and/or equipment is shown on the Drawings to be reused, its identity, size, flow direction and location shall be verified prior to performing any work. Notify the Design Professional of any discrepancies.

3.5 INSTALLATION

- A. Clearance above and in front of electrical switchgear, electrical power panels or control panels shall be maintained by mechanical systems so that no mechanical ducts, pipes, vents or equipment is routed above or across the space directly above this equipment in conformance with the National Electrical Code.
- B. All equipment shall be installed in accordance with manufacturers' published installation instructions shipped with the equipment. In the event there is a discrepancy between these specifications or Drawings and the manufacturers' instructions, no work shall be performed until additional instructions are received.
- C. Install and connect all appliances, equipment, and appurtenances as specified, indicated or required in accordance with the manufacturer's instructions and recommendations. Furnish and install complete auxiliary piping, water seals, valves, electric connections, and similar items, recommended by the manufacturer or as required for proper operation.
- D. Equipment, valves and other items installed under this division requiring service shall be installed to be readily accessible. Refer to definitions in this section.
- E. Coordinate with the Contractor and monitor the progress of the work so that other trades do not obstruct items requiring access for service.
- F. After final balancing, equipment with belt drives shall have their belts operating in the mid-80% position of the adjustable sheave.
- G. Provide equipment belt and coupling guards shielding the perimeter and face of all new belt drives, shafts and couplings. Provide openings opposite drive and driven shafts to permit use of revolution counter. Guards for fans shall be supported from the fan and mounting base, independent of the floor or housekeeping pad.
- H. Route piping and ductwork to avoid skylights, translucent, and transparent ceilings.
- I. Pipe sleeves in footings and foundation walls:
 - 1. Schedule 40 black steel pipe.
 - 2. Chilled water, heating water, condenser water, refrigerant, or process piping passing under a footing or through a foundation wall shall be installed in a pipe sleeve, two pipe sizes larger than the pipe passing through.
 - 3. Sleeves in walls to spaces below grade shall be provided with 10 gauge leak plates.
- J. Seal sleeves and openings in mechanical room walls, fire rated partitions, and floors above grade vaportight, watertight, or for smoke/fire protection as applicable. Refer to Section 07 8400

- K. Seal sleeves and openings in exterior walls vaportight or watertight as applicable.
- L. Equipment and pipe support upper attachments shall be 3" x 3" x 1/4" steel angles, minimum, spanning structural members unless noted otherwise. Provide inserts and bolts for supporting pipes and equipment from structural members.
- M. Saw cut or core drill openings in existing work for the installation of the mechanical system. Patching shall be performed by the trade whose work is cut. Contractor shall lay out and install his work ahead of the work of other trades wherever possible.

3.6 SPACE CONDITIONING DURING CONSTRUCTION

- A. Coordinate with the Contractor regarding the limits of space conditions specified or requested by other trade sections.
- B. Assist the Contractor in the preparation of the construction schedule and determine to what extent the project's HVAC system can be operated within the restrictions listed below to help maintain those conditions.
- C. Ducted air handling systems shall not be placed into operation for testing or for temporary space conditioning until all walls in areas served by the system have been prepared for painting and the building is broom clean.
- D. The building's HVAC system shall be kept clean during the entire construction process. Protect equipment, motor, ducts, pipes from dirt and debris.
- E. Filters during construction:
 - 1. Provide and maintain filters on all air handling equipment and terminal units used for space conditioning during construction.
 - 2. Provide and maintain filters on all return air grilles once ceilings are installed when air handling equipment or terminal units are used for space conditioning during construction.
 - 3. Provide filters with a minimum MERV rating of 8.
- F. Heating Terminal units such as unit heaters, cabinet heaters and finned radiation may be used for temporary heat during construction. Clean to new condition.

3.7 EQUIPMENT BASES AND HOUSEKEEPING PADS

- A. Provide housekeeping and equipment bases as shown or listed below. Rough up slab under bases before pouring concrete.
- B. Materials: Refer to Section 03 3000 - Cast-in-Place Concrete. Omit test cylinders for concrete poured under this section.
- C. Bases/Pads shall be rectangular with vertical sides 4-inches from centerline of anchor bolts or 2 inches from edges of equipment supports, whichever provides the larger dimension, side of equipment or base edge, unless otherwise noted.

- D. Height:
 - 1. Housekeeping Pads for Other Equipment: 4-inches or as shown on plans.
 - 2. Condensing Unit (7 Tons and Smaller): Concrete pad, refer to detail.
- E. Chamfer: 3/4-inch on edges and corners.
- F. Reinforcing: 6"x 6" 10/10 WWF at mid-depth of slab. (4 inch thick pads.)

3.8 EQUIPMENT BACKBOARDS

- A. General: Provide wood backboards for installation of surface mounted control panels, enclosed motor controllers, variable frequency controllers, and where shown.
- B. Type: 3/4-inch thick grade 1 fire retardant treated plywood supported by 3/4" x 3/4" x 1/8" aluminum angle frame attached to wall with 1/4-inch toggle bolts for hollow masonry, expansion shields for solid masonry.
- C. Finish: Frame and board with two coats light gray enamel paint.

3.9 STARTING EQUIPMENT AND SYSTEMS

- A. Adjust equipment for proper operation within manufacturers' published tolerances.
- B. Demonstrate proper operation of systems and equipment to the Owner 's designated representative.

3.10 DEMONSTRATION, TRAINING AND INSTRUCTIONS

- A. A manufacturer's service representative shall provide the instructions for each piece of equipment on system when specified in other Sections of this Division. A manufacturer's sales representative is not acceptable. (The instructor shall not be a sales person, but shall have service experience on a continuing basis and be knowledgeable about the subject equipment.)

3.11 CLEANING AND PROTECTION

- A. All materials, equipment and mechanical rooms shall be cleaned prior to Material Completion.
- B. Wash down and scrub clean all mechanical room floors, walls, equipment bases and equipment.
- C. Paint equipment where finish has been damaged requiring retouching of finish to match factory finish.
- D. All air handling equipment shall be cleaned internally prior to Material Completion. Clean unit casing externally and internally. Seal/replace all damaged duct liner.
- E. Chipped or scraped paint shall be retouched to match original finish.
- F. Clean and polish all equipment nameplates. All nameplate information shall be legible.

- G. All dents and sags in ductwork and equipment casings shall be straightened.
- H. All ductwork, insulation, equipment, pipe, pipe fittings and appurtenances shall be free of dust, rust and stains prior to Material Completion.

3.12 FINISHING EQUIPMENT AND MATERIAL

- A. Use paint systems specified in Division 9 for the substrates to be finished.
- B. Paint shop-primed equipment.
- C. Remove unfinished louvers, grilles, covers, and access panels on mechanical and electrical components and paint separately.
- D. Reinstall electrical cover plates, hardware, light fixture trim, escutcheons, and fittings removed prior to finishing.
- E. All ferrous fasteners and hanger supports not having a corrosion resistant plated finish shall be painted to prevent rust.
- F. Paint all exposed un-insulated ferrous metals, flat black.
- G. Paint interior surfaces of air ducts that are visible through grilles and louvers with one coat of flat black paint to visible surfaces.

END OF SECTION

**SECTION 23 0513
MOTORS FOR HVAC EQUIPMENT**

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Single phase electric motors.
- B. Three phase electric motors.

1.2 RELATED REQUIREMENTS

- A. Section 23 0514 - Variable Frequency Controllers.
- B. Section 26 0583 - Wiring Connections: Electrical characteristics and wiring connections.

1.3 REFERENCE STANDARDS

- A. ABMA STD 9 - Load Ratings and Fatigue Life for Ball Bearings; 2015.
- B. IEEE 112 - IEEE Standard Test Procedure for Polyphase Induction Motors and Generators; 2004.
- C. NEMA MG 00001 - Motors and Generators; 2024.
- D. NFPA 70 - National Electrical Code, 2023 Edition with 2026 Georgia Amendments; National Fire Protection Association.

1.4 SUBMITTALS

- A. See Section 01 3000 - Administrative Requirements for submittal procedures.
- B. See Section 23 0510 - General Mechanical Requirements, for submittal procedures.
- C. Product Data:
 - 1. Provide wiring diagrams with electrical characteristics and connection requirements.
 - 2. Provide product data including motor horsepower, voltage, phase, cycles, RPM, full load amps, locked rotor amps, frame size, manufacturer's name and model number, motor type, enclosure type, insulation class, NEMA design designation, service factor, power factor at full load, nominal efficiency at full load and weight.
- D. Manufacturer's Installation Instructions: Indicate setting, mechanical connections, lubrication, and wiring instructions.
- E. Maintenance Data: Include assembly drawings, bearing data including replacement sizes, and lubrication instructions.

1.5 QUALITY ASSURANCE

- A. Conform to NFPA 70.
- B. Products Requiring Electrical Connection: Listed and classified by Underwriters Laboratories Inc. as suitable for the purpose specified and indicated.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Protect motors stored on site from weather and moisture by maintaining factory covers and suitable weather-proof covering. For extended outdoor storage, remove motors from equipment and store separately.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Baldor, Century, Lincoln, Marathon, Magnetec, Toshiba

2.2 GENERAL CONSTRUCTION AND REQUIREMENTS

- A. Electrical Service:
 - 1. Motors 1/2 HP and Smaller: 115 volts, single phase, 60 Hz.
 - 2. Motors 1/2 HP and larger: three phase 60 Hz.
 - a. 200 volt motors on 208 volt systems.
 - 3. Refer to Electrical drawings for voltage and phase required.
- B. Overload Protection: Single phase motors shall be furnished with built-in automatic reset overload protection.
- C. Efficiency: Motors 1 HP and larger shall be premium efficiency motors and have minimum full load efficiencies not less than listed in the Energy Code.
- D. Brake Horsepower: All motors shall have rated horsepower at least 10 percent above the indicated brake horsepower of equipment including belt losses and inlet vane losses.
- E. Construction:
 - 1. Open drip-proof type except where specifically noted otherwise.
 - 2. Design for continuous operation in 40 degrees C environment.
 - 3. Design for temperature rise in accordance with NEMA MG 1 limits for insulation class, service factor, and motor enclosure type.
 - 4. All copper windings and leads.

5. Motors for belt driven equipment and base mounted pumps shall have cast iron yoke and bearing housings.
- F. Visible Nameplate: Indicating motor horsepower, voltage, phase, cycles, RPM, full load amps, locked rotor amps, frame size, manufacturer's name and model number, service factor, power factor, efficiency.
- G. Motors serviced by Variable Frequency Controllers:
 1. Motors shall be Definite Purpose Inverter-Fed Motors complying with NEMA MG1-Part 31. Stator laminations shall be vacuum-pressure impregnated with varnish for reduction of audible motor noise.
 2. Motors shall be equipped with factory installed grounding rings to electrically ground the motor shaft to prevent eddy current damage to bearings, AEGIS-SCR.
 3. Provide terminal lugs to match branch circuit conductor quantities, sizes, and materials indicated. Enclose terminal lugs in terminal box sized to NFPA 70, threaded for conduit.
 4. For fractional horsepower motors where connection is made directly, provide threaded conduit connection in end frame.

2.3 APPLICATIONS

- A. Exception: Motors less than 250 watts, for intermittent service may be the equipment manufacturer's standard and need not conform to these specifications.
- B. Single phase motors for shaft mounted fans or blowers: Permanent split capacitor type.
- C. Single phase motors for fans: Capacitor start, capacitor run type.
- D. Motors located in outdoors: Totally enclosed weatherproof epoxy-treated type.

2.4 SINGLE PHASE POWER - PERMANENT-SPLIT CAPACITOR MOTORS

- A. Starting Torque: Exceeding one fourth of full load torque.
- B. Starting Current: Up to six times full load current.
- C. Multiple Speed: Through tapped windings.
- D. Open Drip-proof or Enclosed Air Over Enclosure: Class A (50 degrees C temperature rise) insulation, minimum 1.0 Service Factor, prelubricated sleeve or ball bearings, automatic reset overload protector.

2.5 SINGLE PHASE POWER - CAPACITOR START MOTORS

- A. Starting Torque: Three times full load torque.
- B. Starting Current: Less than five times full load current.
- C. Pull-up Torque: Up to 350 percent of full load torque.

- D. Breakdown Torque: Approximately 250 percent of full load torque.
- E. Motors: Capacitor in series with starting winding; provide capacitor-start/capacitor-run motors with two capacitors in parallel with run capacitor remaining in circuit at operating speeds.
- F. Drip-proof Enclosure: Class A (50 degrees C temperature rise) insulation, NEMA Service Factor, prelubricated sleeve bearings.
- G. Enclosed Motors: Class A (50 degrees C temperature rise) insulation, 1.0 Service Factor, prelubricated ball bearings.

2.6 THREE PHASE POWER - SQUIRREL CAGE MOTORS

- A. Starting Torque: Between 1 and 1-1/2 times full load torque.
- B. Starting Current: Six times full load current.
- C. Power Output, Locked Rotor Torque, Breakdown or Pull Out Torque: NEMA Design B characteristics.
- D. Design, Construction, Testing, and Performance: Conform to NEMA MG 1 for Design B motors.
- E. Insulation System: NEMA Class B or better.
- F. Testing Procedure: In accordance with IEEE 112. Load test motors to determine free from electrical or mechanical defects in compliance with performance data.
- G. Motor Frames: NEMA Standard T-Frames of steel, aluminum, or cast iron with end brackets of cast iron or aluminum with steel inserts.
- H. Bearings: Grease lubricated anti-friction ball bearings with housings equipped with plugged provision for relubrication, rated for minimum ABMA STD 9, L-10 life of 20,000 hours. Calculate bearing load with NEMA minimum V-belt pulley with belt center line at end of NEMA standard shaft extension. Stamp bearing sizes on nameplate.
- I. Sound Power Levels: To NEMA MG 00001.
- J. Nominal Efficiency: As scheduled at full load and rated voltage when tested in accordance with IEEE 112.

PART 3 EXECUTION

3.1 INSTALLATION

- A. Install in accordance with manufacturer's instructions.
- B. Install securely on firm foundation. Mount ball bearing motors with shaft in any position.
- C. Check line voltage and phase and ensure agreement with nameplate.

END OF SECTION

SECTION 23 0514
VARIABLE FREQUENCY CONTROLLERS

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Variable frequency controllers

1.2 RELATED SECTIONS

- A. Section 23 0513 - Motors for HVAC Equipment.
- B. Section 23 0553 - Identification HVAC Piping and Equipment.
- C. Section 23 0994 - HVAC Sequence of Operation.
- D. Section 26 2717 - Equipment Wiring: Electrical characteristics and wiring connections.

1.3 REFERENCES

- A. NEMA ICS 7.1 - Safety Standards for Construction and Guide for Selection, Installation and Operation of Adjustable-Speed Drive Systems; 2006.
- B. NEMA ICS 7 - Industrial Control and Systems: Adjustable Speed Drives; National Electrical Manufacturers Association, 2006.
- C. NEMA 250 - Enclosures for Electrical Equipment (1000 Volts Maximum), National Electrical Manufacturers Association, 2008.
- D. IEEE 519 - IEEE Recommended Practices and Requirements for Harmonic Control in Electric Power Systems; Institute of Electrical and Electronic Engineers; 1992 (R2004).
- E. NFPA 70 - National Electrical Code 2023 Edition with 2026 Georgia Amendments.

1.4 SUBMITTALS

- A. Refer to Section 23 0510 - General Mechanical Requirements, for submittal procedures.
- B. Product Data: Provide catalog sheets showing voltage, controller size, ratings and size of switching and overcurrent protective devices, short circuit ratings, dimensions, and enclosure details.
- C. Provide programming manual for drive. Manual shall be tabbed for items indicated in item H above.
- D. Shop Drawings: Indicate front and side views of enclosures with overall dimensions and weights shown; conduit entrance locations and requirements; and nameplate legends.
- E. Rating: Submittal shall specifically indicate that drive size submitted is rated for horsepower being served with drive at 40 degrees C (104 degrees F) and minimum of 4,000 hz switching frequency. Drives rated at lower frequencies are not acceptable.

- F. Test Reports: Indicate field test and inspection procedures and test results.
- G. Manufacturer's Instructions: Indicate application conditions and limitations of use stipulated by testing agency. Include instructions for storage, handling, protection, examination, preparation, and installation of product.
- H. Manufacturer's Field Reports: Indicate start-up inspection findings.
- I. Operation Data: NEMA ICS 7.1. Include instructions for starting and operating controllers, and describe operating limits that may result in hazardous or unsafe conditions.
- J. Maintenance Data: NEMA ICS 7.1. Include routine preventive maintenance schedule.
- K. Warranty: Submit manufacturer's warranty and ensure forms have been filled out in the Owner's name and registered with manufacturer.
- L. Certificate: Provide Manufacturer's Certificate complying with the requirements of the General Conditions.

1.5 QUALITY ASSURANCE

- A. Conform to requirements of NFPA 70.
- B. Products: Listed and classified by Underwriters Laboratories, Inc. as suitable for the purpose specified and indicated.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Store in a clean, dry space. Maintain factory wrapping or provide an additional heavy canvas or heavy plastic cover to protect units from dirt, water, construction debris, and traffic.
- B. Handle in accordance with manufacturer's written instructions. Lift only with lugs provided for the purpose. Handle carefully to avoid damage to components, enclosure, and finish.

1.7 WARRANTY

- A. Provide a three year warranty to include materials only.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. ABB ACH580, AC Technology QC3000, Allen Bradley Powerflex, Danfoss VLT HVAC, Eaton DH-1 HVAC, Emerson EVC, Hitachi SJ700D, Yaskawa Z1000, Omron VT5 Series, Schneider Electric Altivar ATV, Toshiba E3 Series, Johnson Controls, Inc. Series II.

2.2 DESCRIPTION

- A. Variable Frequency Controllers: Enclosed controllers suitable for operating the indicated loads, in conformance with requirements of NEMA ICS 7. Select unspecified features and options in accordance with NEMA ICS 3.1.

1. Employ microprocessor-based inverter logic isolated from power circuits.
 2. Employ pulse-width-modulated inverter system providing a carrier frequency adjustable from 4,000Hz to 8,000Hz.
 3. Design for ability to operate controller with motor disconnected from output.
 4. Design to attempt five automatic restarts following fault condition before locking out and requiring manual restart.
- B. Enclosures: NEMA 250, Type 1, suitable for equipment application in places restricted to persons employed on the premises.
- C. Finish: Manufacturer's standard enamel.

2.3 OPERATING REQUIREMENTS

- A. Rated Input Voltage: 480 volts, three phase, 60 Hertz.
- B. Motor Nameplate Voltage: 460 volts, three phase, 60 Hertz.
- C. Displacement Power Factor: Between 1.0 and 0.95, lagging, over entire range of operating speed and load.
- D. Operating Ambient: 0 degrees C to 40 degrees C.
- E. Minimum Efficiency at Full Load: 95 percent.
- F. Volts Per Hertz Adjustment: Plus or minus 10 percent.
- G. Current Limit Adjustment: 60 to 110 percent of rated.
- H. Acceleration Rate Adjustment: .5 to 360 seconds.
- I. Deceleration Rate Adjustment: 1 to 360 seconds.
- J. Input Signal: 4 to 20 mA DC.

2.4 COMPONENTS

- A. Display: Provide integral digital display to indicate output voltage, output frequency, and output current.
- B. Status Indicators: Separate indicators for overcurrent, overvoltage, ground fault, overtemperature, and input power ON.
- C. Furnish HAND-OFF-AUTOMATIC selector switch and manual speed control. Omit on fans with automatic isolation dampers.
- D. Include undervoltage release.
- E. Control Power Source: Integral control transformer.

- F. Door Interlocks: Furnish mechanical means to prevent opening of equipment with power connected, or to disconnect power if door is opened; include means for defeating interlock by qualified persons.
- G. Safety Interlocks: Furnish terminals for remote contact to inhibit starting under both manual and automatic mode.
- H. Control Interlocks:
 - 1. Furnish terminals for remote contact to allow starting in automatic mode.
 - 2. Provide auxiliary outputs to comply with the sequence of operation specified in Section 23 0994. Furnish programmable analog outputs(two minimum) and programmable digital outputs(three minimum).
- I. Emergency Stop: Use dynamic brakes for emergency stop function.
- J. Jogging: On drives serving motors of supply, return, or exhaust fans ducted into one single header duct, provide capability to bring motor up to preset, adjustable, low speed, prior to fan isolation damper opening, signal fan isolation damper to open, then continue to ramp motor up to controlled speed.
- K. Disconnecting Means: Include integral circuit breaker on the line side of each controller.
- L. Wiring Terminations: Match conductor materials and sizes indicated.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify that surface is suitable for controller installation.
- B. Do not install controller until building environment can be maintained within the service conditions required by the manufacturer.

3.2 INSTALLATION

- A. Install in accordance with NEMA ICS 7.1 and manufacturer's instructions.
- B. Tighten accessible connections and mechanical fasteners after placing controller.
- C. Select and install overload heater elements in motor controllers to match installed motor characteristics.
- D. Provide engraved plastic nameplates; refer to Section 23 0553 - Mechanical Identification, for product requirements and location.
- E. Neatly type label inside each motor controller door identifying motor served, nameplate horsepower, full load amperes, code letter, service factor, and voltage/phase rating. Place in clear plastic holder.

3.3 MANUFACTURER'S FIELD SERVICES

- A. Provide services of factory trained representative for minimum of one day(s) to prepare and start the controllers, calibrate the controls and inspect the installation.
- B. Provide services of factory trained representative for minimum of one day(s) to instruct the Owner on operation and maintenance.
- C. Provide start-up certificate in the format prescribed by the General Conditions.

3.4 ADJUSTING

- A. Make final adjustments to installed controller to assure proper operation of load system. Obtain performance requirements from installer of driven loads.

3.5 DEMONSTRATION

- A. Demonstrate operation of controllers in automatic and manual modes.

END OF SECTION

SECTION 23 0548
VIBRATION AND SEISMIC CONTROLS FOR HVAC PIPING AND EQUIPMENT

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Vibration isolators.

1.2 REFERENCE STANDARDS

- A. ASHRAE (HVACA) - ASHRAE Handbook - HVAC Applications; 2015.

1.3 SUBMITTALS

- A. Refer to Section 23 0510 - General HVAC Requirements, for submittal procedures.
- B. Product Data:
 - 1. Provide manufacturer's product literature documenting compliance with PART 2 PRODUCTS.
- C. Shop Drawings:
 - 1. Provide schedule of vibration isolator type with location and load on each.
- D. Manufacturer's Instructions: Indicate installation instructions with special procedures and setting dimensions.

1.4 QUALITY ASSURANCE

- A. Perform design and installation in accordance with applicable codes.
- B. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section, with not less than three years of documented experience.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Amber Booth: www.amberbooth.com.
- B. Kinetics Noise Control, Inc: www.kineticsnoise.com.
- C. Korfund Dynamics: www.thevmcgroup.com.
- D. Mason Industries: www.mason-ind.com.
- E. Vibration Eliminator Company, Inc; _____: www.veco-nyc.com
- F. Vibration Mounting and Control: www.vmc-kdc.com.
- G. Vibro-Acoustics: <http://www.vibro-acoustics.com>.

2.2 PERFORMANCE REQUIREMENTS

A. General:

1. All vibration isolators, base frames and inertia bases to conform to all uniform deflection and stability requirements under all operating loads.
2. Steel springs to function without undue stress or overloading.
3. All equipment mounted on vibration isolated bases to have minimum operating clearance of 2 inches between the base and floor or support beneath unless noted otherwise.

2.3 VIBRATION ISOLATORS

A. Non-Seismic Type:

1. Neoprene Rubber Mount or Hanger: Molded rubber designed for 0.4 inch deflection with threaded insert.
2. Neoprene Pad Isolators:
 - a. Rubber or neoprene waffle pads.
 - 1) Hardness: 30 durometer.
 - 2) Thickness: Minimum 1/2 inch.
 - 3) Maximum Loading: 50 psi.
 - 4) Rib Height: Maximum 0.7 times width.
 - b. Configuration: Single layer.
 - c. Configuration: 1/2 inch thick waffle pads bonded each side of 1/4 inch thick steel plate.

PART 3 EXECUTION

3.1 INSTALLATION - GENERAL

- A. Install in accordance with manufacturer's instructions.
- B. Vibration isolation hangers shall be positioned as close as possible to the structure without coming in contact with any object (including the structure).
 1. Hanger rods shall not contact any object which would short circuit the isolator.

3.2 SCHEDULE

- A. Equipment Isolation Schedule.
 1. Suspended fans:

- a. Isolator Type: Rubber Mount or Hanger.
 - b. Isolator Deflection: 0.75 inches.
2. Air Cooled Condensing Units, 7-1/2 tons capacity and less. Refer to Detail on Drawings.
- a. Isolator Type: Neoprene Pad.
 - b. Isolator Deflection: 0.25 inches.

END OF SECTION

**SECTION 23 0553
IDENTIFICATION FOR HVAC PIPING AND EQUIPMENT**

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Nameplates.

1.2 REFERENCE STANDARDS

- A. ASME A13.1 - Scheme for the Identification of Piping Systems; 2007.

1.3 SUBMITTALS

- A. Refer to Section 23 0510- General HVAC Requirements, for submittal procedures.
- B. Chart and Schedule: Submit valve chart and schedule, including valve tag number, location, function, and valve manufacturer's name and model number.
- C. Product Data: Provide manufacturers catalog literature for each product required.
- D. Submit an equipment list for all equipment specified here-in, including all equipment, such as air handling equipment, pumps, heat transfer equipment, tanks, enclosed motor controllers, variable speed drives, control panels, major control components, air vents, and water treatment devices, to Emory University's Preventive Maintenance Group. Emory will determine the labeling scheme for the building and install the labeling for the building. Coordinate installation of the nameplates with the project schedule.

PART 2 PRODUCTS

2.1 NAMEPLATES

- A. Description: Laminated three-layer plastic with engraved black letters on light contrasting background color.
- B. Size: 1/2 inch high letters unless otherwise noted.
- C. Size when located on ceiling grid: 3/8 inch high letters unless otherwise noted.

PART 3 EXECUTION

3.1 PREPARATION

- A. Degrease and clean surfaces to receive adhesive for identification materials.

3.2 INSTALLATION

- A. Install nameplates with corrosive-resistant mechanical fasteners, or adhesive. Apply with sufficient adhesive to ensure permanent adhesion and seal with clear lacquer.
- B. Identify split system heat pumps, fan coil units and power ventilators with plastic nameplates.

C. Identify thermostats relating to fan coils with nameplates.

END OF SECTION

**SECTION 23 0593
TESTING, ADJUSTING AND BALANCING FOR HVAC**

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Initial testing, adjustment, and balancing of air systems.
- B. Winter and Summer Seasonal testing, adjustment, and balancing of air systems.
- C. Measurement of final operating condition of HVAC systems.
- D. Testing of control sensors, controllers and safeties.

1.2 REFERENCE STANDARDS

- A. AABC (NSTSB) - AABC National Standards for Total System Balance, 7th Edition; 2016.
- B. AABC MN-1 - National Standard for Testing and Balancing Heating, Ventilating, and Air Conditioning Systems; Associated Air Balance Council; 2002.
- C. NEBB (TAB) - Procedural Standards for Testing Adjusting Balancing of Environmental Systems; 2005, Seventh Edition.

1.3 SUBMITTALS

- A. Refer to Section 23 0510 - General HVAC Requirements for submittal procedures.
- B. Submit name and experience affidavit of the adjusting and balancing agency for approval within 30 days after Notice to Proceed.
- C. TAB Plan: Submit a written plan indicating the testing, adjusting, and balancing standard to be followed and the specific approach for each system and component.
 - 1. Include at least the following in the plan:
 - a. List of all air flow, water flow, sound level, system capacity and efficiency measurements to be performed and a description of specific test procedures, parameters, formulas to be used.
 - b. Copy of field checkout sheets and logs to be used, listing each piece of equipment to be tested, adjusted and balanced with the data cells to be gathered for each.
 - c. Discussion of what notations and markings will be made on the duct and piping drawings during the process.
 - d. Final test report forms to be used.
 - e. Procedures for formal deficiency reports, including scope, frequency and distribution.

- D. Initial Review: Submit results of testing and balancing agency's examination of documents and systems within 30 days after Notice to Proceed.
- E. Initial Report: Indicate deficiencies in systems that would prevent proper testing, adjusting, and balancing of systems and equipment to achieve specified performance.
 - 1. Submit under provisions of Section 01 4000.
 - 2. Submit prior to the Contractor's Request for Material Completion.
 - 3. Submit copies of report for review prior to final acceptance of Project. Provide final copies for the Design Professional and for inclusion in operating and maintenance manuals.
 - 4. Include actual instrument list, with manufacturer name, serial number, and date of calibration.
 - 5. Form of Test Reports: Where the TAB standard being followed recommends a report format use that; otherwise, follow ASHRAE Std 111.
 - 6. Units of Measure: Report data in both I-P (inch-pound) and SI (metric) units.
 - 7. Test Reports: Indicate data on AABC MN-1 forms, forms prepared following ASHRAE Std 111, or NEBB forms.
 - 8. Include the following on the title page of each report:
 - a. Name of Testing, Adjusting, and Balancing Agency.
 - b. Address of Testing, Adjusting, and Balancing Agency.
 - c. Telephone number of Testing, Adjusting, and Balancing Agency.
 - d. Project name.
 - e. Project location.
 - f. Project the Design Professional.
 - g. Project Engineer.
 - h. Project the Contractor.
 - i. Report date.
- F. Seasonal Reports: In addition to the initial Test and Balance report, provide two seasonal Test and Balance reports after the material completion date. Seasonal adjustments shall be performed on or about the peak cooling season and on or about the peak heating season. Submit seasonal report within 14 days of completion of seasonal adjustments. Include test reports for any equipment that could not be tested at the initial report due to season, temperature or other conditions.
 - 1. List of deficiencies noted, adjustments made and corrective action taken.

2. Temperature of each conditioned space and dry bulb setting of controlling thermostat.
3. Temperature at all sensors in equipment, space duct or pipe and settings of controllers.
4. Date and outdoor DB and WB range during the time of the seasonal test.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION

3.1 GENERAL REQUIREMENTS

- A. Perform total system balance in accordance with one of the following:
 1. AABC (NSTSB), AABC National Standards for Total System Balance.
 2. NEBB Procedural Standards for Testing Adjusting Balancing of Environmental Systems.
- B. Begin work after completion of systems to be tested, adjusted, or balanced and complete work and submit Report prior to the Final Observation of the project.
- C. Begin work after completion of systems to be tested, adjusted, or balanced and complete work prior to Substantial Completion of the project.
- D. TAB Agency Qualifications:
 1. Company specializing in the testing, adjusting, and balancing of systems specified in this section.
 2. Certified by one of the following:
 - a. AABC, Associated Air Balance Council: www.aabc.com/#sle; upon completion submit AABC National Performance Guaranty.
 - b. NEBB, National Environmental Balancing Bureau: www.nebb.org/#sle.
 3. Company shall an independent firm with no relationship with any Contractor on this Project.
- E. TAB Supervisor and Technician Qualifications: Certified by same organization as TAB agency.
- F. Acceptable TAB Agencies: Testing and Balancing shall be performed by one of the following firms:
 1. AireBal.
 2. Air Data - Macon, Inc.
 3. Commissioning Services, LLC.
 4. Environmental Testing Service of Columbus.

5. Georgia Balance.
6. HVAC Testing Services, Inc.
7. MDG Balancing - Dothan, AL
8. Research Air Flo Inc.

3.2 EXAMINATION

- A. Review the contract documents and existing conditions for appurtenances and arrangement for balancing prior to the installation of any equipment or material. the Contractor shall notify the Design Professional of any omissions noted within 30 days of the Contractor's notice to proceed.
- B. Verify that systems are complete and operable before commencing work. Ensure the following conditions:
 1. Systems are started and operating in a safe and normal condition.
 2. Temperature control systems are installed complete and operable.
 3. Proper thermal overload protection is in place for electrical equipment.
 4. All filters are clean and in place. If required, install temporary media in addition to filters.
 5. Duct systems are clean of debris.
 6. Fans are rotating correctly.
 7. Fire and volume dampers are in place, accessible, operable and open. Report observation on test report.
 8. All dampers and operators function smoothly from shut-off to full open.
 9. Air coil fins are cleaned and combed.
 10. Access doors are installed at specified components are accessible, are closed and duct end caps are in place.
 11. Air outlets are installed and connected.
 12. Duct system leakage is minimized.
- C. Submit field reports. Report defects and deficiencies that will or could prevent proper system balance.

3.3 PREPARATION

- A. Provide instruments required for testing, adjusting, and balancing operations. Make instruments available to the Design Professional to facilitate spot checks during testing.

- B. Testing of equipment shall be simultaneous where components of a systems are connected; e.g. DX coil and condensing unit.

3.4 ADJUSTMENT TOLERANCES

- A. Air Handling Systems: Adjust to within plus or minus 5 percent of design for supply systems and plus or minus 10 percent of design for return and exhaust systems.
- B. Air Outlets and Inlets: Adjust total to within plus 5 percent and minus 5 percent of design to space. Adjust outlets and inlets in space to within plus or minus 10 percent of design.
- C. Building Pressure: Ensure that installation tolerances result in each floor of the building being positively pressurized with respect to outside ambient pressure.

3.5 RECORDING AND ADJUSTING

- A. Ensure recorded data represents actual measured or observed conditions.
- B. Permanently mark settings of valves, dampers, and other adjustment devices allowing settings to be restored. Set and lock memory stops.
- C. After adjustment, take measurements to verify balance has not been disrupted or that such disruption has been rectified.
- D. Leave systems in proper working order, replacing belt guards, closing access doors, closing doors to electrical switch boxes, and restoring thermostats to specified settings.

3.6 AIR SYSTEM PROCEDURE

- A. Adjust air handling and distribution systems to provide required or design supply, return, and exhaust air quantities at site altitude.
- B. Make air quantity measurements in ducts by Pitot tube traverse of entire cross sectional area of duct. Close openings after measurement with permanent manufactured plugs.
- C. Measure air quantities at air inlets and outlets.
- D. Adjust distribution system to obtain uniform space temperatures free from objectionable drafts and noise.
- E. Use volume control devices to regulate air quantities only to the extent that adjustments do not create objectionable air motion or sound levels. Effect volume control by duct internal devices such as dampers and splitters.
- F. Vary total system air quantities by adjustment of fan speeds by drive sheave adjustment. Provide drive changes required to place belt in mid-position at final RPM. Vary branch air quantities by damper regulation.
- G. Provide system schematic with required and actual air quantities recorded at each outlet or inlet.

- H. Measure static air pressure conditions on air supply units, including pressure drops at all components including filters and fans, and total pressure across the fan. Make allowances for 50 percent loading of filters.
- I. Adjust outside air automatic dampers, outside air, return air, and exhaust dampers for design conditions. Adjust operators on outside air dampers to ensure tight seal when shut.
- J. Measure temperature conditions across outside air, return air, and exhaust dampers to check leakage.
- K. The differential at the time of balance between the outside and return air streams shall be 15 degrees F, minimum, when the outside air quantities are established by temperature differential.
- L. Where modulating dampers are provided, take measurements and balance at extreme conditions. Balance variable volume systems at maximum air flow rate, full cooling, and at minimum air flow rate, full heating.
- M. Measure building static pressure and adjust supply, return, and exhaust air systems to provide required relationship between each to maintain positive building pressure near the building entries under all operational sequences.

3.7 CONTROL SYSTEM PROCEDURE

- A. Low Limit Thermostats, Fire Thermostats, Smoke Detectors and other Safety devices: Test and verify operation. Record setpoint.
- B. Sequence of Operation: Operate systems thru specified Sequence and confirm system function.
- C. Thermostats, Input/Output sensors and Controls: Measure temperature or flow at device and record measurement and setting of controller.
- D. Humidistats, Humidity Input/Output sensors and Controls: Measure temperature and relative humidity at device and record measurement and setting of controller.

3.8 BALANCE UNDER SEASONAL OPERATING CONDITIONS

- A. After the initial balance has been completed, reviewed and accepted; the contractor shall balance and adjust the system under seasonal operating conditions by performing operational tests over a minimum period of eight hours under both cooling and heating conditions.
- B. These tests shall be performed only after each piece of equipment has been individually tested, and is verified to be in correct operating condition, and shall be made at times when outdoor dry bulb temperatures are above 85 F for cooling, or below 50 F for heating.
- C. When test is run during the cooling cycle the building must be occupied, and all lights shall be turned on for a minimum of six (6) hours. Doors to all spaces shall be closed and all space thermostats set at its normal setpoint.

- D. Purpose: Prove correctness of installation; prove functioning of capacity and safety controls; prove calibration of operating controls; and prove stability of operation under actual loading conditions.

3.9 SCOPE

- A. Test, adjust, and balance the following:
 - 1. Packaged Dedicated OA Systems.
 - 2. Split System Heat Pump Systems.
 - 3. Fans, Powered Ventilators and Exhausters
 - 4. Air Inlets and Outlets.

3.10 MINIMUM DATA TO BE REPORTED

- A. Electric Motors:
 - 1. Manufacturer.
 - 2. Model/Frame.
 - 3. HP/BHP.
 - 4. Phase, voltage, amperage; nameplate, actual, no load.
 - 5. RPM.
 - 6. Service factor.
 - 7. Starter size, rating, heater elements.
 - 8. Sheave Make/Size/Bore.
- B. V-Belt Drives:
 - 1. Identification/location.
 - 2. Required driven RPM.
 - 3. Driven sheave, diameter and RPM.
 - 4. Belt, size and quantity.
 - 5. Motor sheave diameter and RPM.
 - 6. Center to center distance, maximum, minimum, and actual.
- C. Air Cooled Condensers/Condensing Units:
 - 1. Identification/number.

2. Location.
3. Manufacturer.
4. Model number.
5. Serial number.
6. Entering DB air temperature, design and actual.
7. Leaving DB air temperature, design and actual.
8. Number of compressors.

D. Cooling Coils:

1. Identification/number.
2. Location.
3. Service.
4. Manufacturer.
5. Air flow, design and actual.
6. Entering air DB temperature, design and actual.
7. Entering air WB temperature, design and actual.
8. Leaving air DB temperature, design and actual.
9. Leaving air WB temperature, design and actual.
10. Saturated suction temperature, design and actual.
11. Air pressure drop, design and actual.

E. Electric Heaters:

1. Manufacturer.
2. Identification/number.
3. Location.
4. Model number.
5. Design kW.
6. Number of stages.
7. Phase, voltage, amperage.

8. Test voltage (each phase).
9. Test amperage (each phase).
10. Air flow, specified and actual.
11. Temperature rise, specified and actual.

F. Air Moving Equipment:

1. Location.
2. Manufacturer.
3. Model number.
4. Serial number.
5. Arrangement/Class/Discharge.
6. Air flow, specified and actual.
7. Return air flow, specified and actual.
8. Outside air flow, specified and actual.
9. Total static pressure (total external), specified and actual.
10. Inlet pressure.
11. Discharge pressure.
12. Sheave Make/Size/Bore.
13. Number of Belts/Make/Size.
14. Fan RPM.
15. Describe filter condition.
16. Plot actual fan operating point on fan curve chart.

G. Return Air/Outside Air:

1. Identification/location.
2. Design air flow.
3. Actual air flow.
4. Design return air flow.
5. Actual return air flow.

6. Design outside air flow.
7. Actual outside air flow.
8. Return air temperature.
9. Outside air temperature.
10. Required mixed air temperature.
11. Actual mixed air temperature.
12. Design outside/return air ratio.
13. Actual outside/return air ratio.

H. Exhaust Fans:

1. Location.
2. Manufacturer.
3. Model number.
4. Serial number.
5. Air flow, specified and actual.
6. Total static pressure (total external), specified and actual.
7. Inlet pressure.
8. Discharge pressure.
9. Sheave Make/Size/Bore.
10. Number of Belts/Make/Size.
11. Fan RPM.
12. Plot actual operating point on pump curve chart.

I. Duct Traverses:

1. System zone/branch.
2. Duct size.
3. Area.
4. Design velocity.
5. Design air flow.

6. Test velocity.
 7. Test air flow.
 8. Duct static pressure.
 9. Air temperature.
 10. Air correction factor.
- J. Air Distribution Tests:
1. Air terminal number.
 2. Room number/location.
 3. Terminal type.
 4. Terminal size.
 5. Area factor.
 6. Design velocity.
 7. Design air flow.
 8. Test (final) velocity.
 9. Test (final) air flow.
 10. Percent of design air flow.
 11. Relative position of balancing damper
- K. Space Temperature and Humidity:
1. Temperature and humidity (whether controlled or not) of each conditioned space
 2. Setpoint of each controlling thermostat or humidity sensing device.

END OF SECTION

**SECTION 23 0713
DUCT INSULATION**

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Duct insulation
- B. Duct Liner
- C. Insulation jackets

1.2 REFERENCE STANDARDS

- A. ASTM C518 - Standard Test Method for Steady-State Thermal Transmission Properties by Means of the Heat Flow Meter Apparatus; 2010.
- B. ASTM C553 - Standard Specification for Mineral Fiber Blanket Thermal Insulation for Commercial and Industrial Applications; 2013.
- C. ASTM C612 - Standard Specification for Mineral Fiber Block and Board Thermal Insulation; 2014.
- D. ASTM C916 - Standard Specification for Adhesives for Duct Thermal Insulation; 2014.
- E. ASTM C1071 - Standard Specification for Fibrous Glass Duct Lining Insulation (Thermal and Sound Absorbing Material); 2012.
- F. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2015a.
- G. SMACNA (DCS) - HVAC Duct Construction Standards Metal and Flexible; 2005.

1.3 SUBMITTALS

- A. Refer to Section 23 0510 - General HVAC Requirements, for submittal procedures.
- B. Product Data: Provide product description, thermal characteristics, list of materials and thickness for each service, and locations.

1.4 QUALITY ASSURANCE

- A. Applicator Qualifications: Company specializing in performing the type of work specified in this section, with minimum three years of experience .

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Accept materials on site in original factory packaging, labeled with manufacturer's identification, including product density and thickness.

- B. Protect insulation from weather and construction traffic, dirt, water, chemical, and mechanical damage, by storing in original wrapping.

1.6 FIELD CONDITIONS

- A. Maintain ambient temperatures and conditions required by manufacturers of adhesives, mastics, and insulation cements.
- B. Maintain temperature during and after installation for minimum period of 24 hours.

PART 2 PRODUCTS

2.1 GLASS FIBER, FLEXIBLE

- A. Manufacturer:
 - 1. Johns Manville: www.jm.com.
 - 2. Owens Corning Corporation; SOFTR: www.ocbuildingspec.com.
 - 3. CertainTeed Corporation: www.certainteed.com.
- B. Insulation: ASTM C 553; flexible, noncombustible blanket.
 - 1. 'K' value: 0.27 at 75 degrees F, when tested in accordance with ASTM C 518.
 - 2. Maximum Service Temperature: 250 degrees F.
 - 3. Maximum Water Vapor Sorption: 5.0 percent by weight.
 - 4. Density: 1.0 lb./cu ft.
- C. Vapor Barrier Jacket:
 - 1. Kraft paper with glass fiber yarn and bonded to aluminized film.
 - 2. Moisture Vapor Permeability: 0.029 ng/Pa s m (0.02 perm inch), when tested in accordance with ASTM E96/E96M.
 - 3. Secure with pressure sensitive tape.
- D. Vapor Barrier Tape:
 - 1. Kraft paper reinforced with glass fiber yarn and bonded to aluminized film, with pressure sensitive rubber based adhesive.
- E. Tie Wire: Annealed stainless steel, 16 gage.

2.2 GLASS FIBER, RIGID

- A. Manufacturer:
 - 1. Johns Manville: www.jm.com.

2. Owens Corning Corporation; 700 Series FIBERGLAS Insulation: www.ocbuildingspec.com/#sle.
 3. CertainTeed Corporation: www.certainteed.com.
- B. Insulation: ASTM C 612; rigid, noncombustible board.
1. 'K' Value: 0.24 at 75 degrees F, when tested in accordance with ASTM C518.
 2. Maximum Service Temperature: 450 degrees F.
 3. Maximum Water Vapor Absorption: 5.0 percent.
 4. Density: 6 lb./cu ft.
- C. Vapor Barrier Jacket:
1. Kraft paper with glass fiber yarn and bonded to aluminized film.
 2. Moisture Vapor Permeability: 0.029 ng/Pa s m (0.02 perm inch), when tested in accordance with ASTM E96/E96M.
 3. Secure with pressure sensitive tape.
- D. Vapor Barrier Tape:
1. Kraft paper reinforced with glass fiber yarn and bonded to aluminized film, with pressure sensitive rubber based adhesive.

2.3 JACKETS

- A. Interior Glass Fabric Vapor Barrier Finish:
1. Cloth: Untreated 9 oz./sq. yd. weight plain mesh glass cloth.
 2. Blanket: 1.0 lb./cu ft density.
 3. Weave: 5x5.
 4. Lagging Adhesive: Fire resistant compatible with insulation.
 5. Finish: Vinyl emulsion type acrylic, compatible with insulation, white color.
- B. Adhesive Foil/Film Jacket:
1. Manufacturer:
 - a. Foster Vapor-Fas 62-05.
 - b. Polyguard Alumagard Lite Silver.
 - c. Venture Tape, Inc, Model 1577 Venture Clad.

2. A multi-ply laminate for interior and exterior use, UV resistant
3. Thickness: Five ply, 5 mil, minimum, total thickness.
4. Acrylic adhesive with a temperature range of -40 Degree F to 425 Degree F.
5. Adhesive peel strength: 55oz/inch.
6. Puncture resistance: 35 lbs.
7. Seaming: Seal using 3-inch laps, minimum.
8. Finish: White or White stucco embossed.

2.4 DUCT LINER - GLASS FIBER

- A. Manufacturers: Certainteed Toughguard2, Owens-Corning QuietR Textile Duct Liner, JohnsManville Permacote Linacoustic HP.
- B. Insulation: Incombustible glass fiber complying with ASTM C 1071; flexible blanket; impregnated surface and edges coated with acrylic polymer shown to be fungus and bacteria resistant by testing to ASTM G 21.
 1. Apparent Thermal Conductivity: Maximum of 0.31 at 75 degrees F.
 2. Service Temperature: Up to 250 degrees F.
 3. Rated Velocity on Coated Air Side for Air Erosion: 5,000 fpm, minimum.
 4. Density: 1.5 pcf.
 5. Minimum Noise Reduction Coefficients:
 - a. 1 inch Thickness: 0.45.
 - b. 2 inch Thickness: 0.70.
- C. Adhesive: Waterproof, fire-retardant type, ASTM C916.
- D. Liner Fasteners: Galvanized steel, welded with press-on head.

2.5 ADHESIVES, COATINGS, SEALING COMPOUNDS AND PROTECTIVE FINISHES

- A. Lagging Adhesive and Coating for Glass Cloth Jackets and Other Facings - MIL-A-3316 B, Class 1.
- B. Lap Adhesive for Vapor Barrier Jacket - MIL-A-3316 B, Class 2.
- C. Bonding Adhesives - for securing insulation to metal surfaces - MIL-A-3316 B, Class 2 for temperature up to 200 degree F.

- D. Contact Type Adhesive - For installing flexible unicellular insulation - MIL-A-24179, Type II, Class 1.
- E. Bedding Compound and Joint Sealers - MIL-B-19564A.
- F. Coating Compound - Vapor Barrier Treatment - MIL-C-19565B, Type 1 or II.
- G. Protective Finish Outside of Buildings - Coating Compound MIL-C-19565 B, Type I.
- H. Manufacturers: Childers, Foster, Armstrong, Mon-Eco.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify that ducts have been tested before applying insulation materials.
- B. Verify that surfaces are clean, foreign material removed, and dry.

3.2 INSTALLATION

- A. Install in accordance with manufacturer's instructions.
- B. Install in accordance with NAIMA National Insulation Standards.
- C. Provide insulation with vapor barrier jackets.
- D. Seal all joints, mechanical fastener penetrations, and vapor barrier penetrations with Vapor Barrier Tape
- E. Continue insulation through walls, sleeves, hangers, and other duct penetrations.
- F. Insulate entire system including fittings, joints, flanges, fire dampers, flexible connections, duct lined with duct liner, heating coil return bends at terminal units, and expansion joints.
- G. Fiber Glass, Flexible:
 1. Do not pull insulation tight around ducts.
 2. Lap transverse joints 2 inch, minimum and secure with staples 18 inches on center.
 3. Wrap insulation with Tie Wire 18 inches on center, maximum.
 4. Install mechanical fasteners not more than 18 inches on center on ducts over 24 inches wide.
 5. Provide 24 inch length, minimum, of rigid glass fiber insulation on bottom of ducts supported from trapeze hangers.
- H. Glass Fiber, Rigid:
 1. Cut to fit between standing seams and stiffeners to provide 1/2 inch, minimum cover.

2. Secure insulation to ducts with duct insulation adhesive applied to duct to provide 100% coverage and with mechanical fasteners 12 inch on centers, maximum.
 3. Butt transverse joints.
 4. Secure metal corner beads to all exterior edges.
 5. Tape all joints and fastener penetrations with 4 inch wide, minimum, foil scrim kraft tape after pointing clip penetrations with insulating cement.
- I. Weld mechanical fasteners to duct. No glue or stick on allowed.
- J. Rigid duct insulation exposed in the mechanical equipment rooms or Finished Spaces : Finish with glass cloth adhered with fire resistant adhesive and finished with a white coating.
- K. Exterior Applications:
1. Under no circumstances shall insulation applied to exterior ductwork be allowed to get wet prior to final material covering.
- L. Adhesive Foil/Film Jacket Installation:
1. Install jacket over rigid insulation in accordance with manufacturer's instructions.
 2. Install jacket on **Sealed Ducts** with a **SMACNA class A seal** only. Ensure seal complies with the manufacturer's recommendations.
 3. Verify that board insulation has been properly applied and mechanically fastened to the sealed duct.
 4. Apply jacket with laminate roller for wrinkle-free, film adhesion.
 5. Install insulation and jacket to create a "Water-Shed" following the manufacturer's instructions, maintaining recommended overlaps. Provide crowned or pitched top on wide (over 32 inches) rectangular ducts.
- M. Duct Accessories, Duct Mounted Meters and Gages Instruments and Duct Mounted Instrumentation and Other Control Devices:
1. In conditioned spaces devices shall be left exposed and/or accessible above the insulation vapor barrier jacket for access. Seal to vapor barrier jacket.
 2. In non-conditioned spaces devices shall be insulated within the insulation vapor barrier jacket with the insulation and jacket arranged to provide access.
 3. Accessible devices to include:
 - a. Duct mounted Instrumentation,
 - b. Airflow Measuring Station pressure ports,
 - c. Input/Output Sensors,

- d. Duct access door handles,
 - e. Volume Control damper handles(MVD),
4. Damper operators shall be left exposed and/or accessible above the insulation vapor barrier jacket for access. Seal to vapor barrier jacket.
- N. Duct Liner Locations:
- 1. Line supply, return, and mixed air ducts where noted on drawings with 1 inch liner.
 - 2. Provide 2 inch liner at field fabricated mixing plenums.
 - 3. Do not install liner in duct within six feet downstream of a cooling coil or outside air intake.
- O. Duct and Plenum Liner Application: (Glass Fiber Liner)
- 1. Install liner in accordance with manufacturer's Published Installation Instructions and SMACNA Installation Standards including Figure No. 7-11 and 7-12.
 - 2. Adhere insulation with adhesive for 90 percent coverage.
 - 3. Secure insulation with mechanical liner fasteners, type 3 or 4 located in accordance with SMACNA Figure 7-11. Refer to SMACNA (DCS) Standards for spacing.
 - 4. Install with longitudinal and transverse joints under compression.
 - 5. Seal and smooth all longitudinal and transverse joints, field cuts exposed edges and any minor surface damage with edge coat.
 - 6. Seal liner surface penetrations with edge coat.
 - 7. Provide 26 gauge metal nosing on leading edge at fan discharges and at any interval of lined duct proceeded by unlined duct.
 - 8. Terminate liner at duct mounted accessories such as turning vanes and dampers. Provide sheet metal "hat" section build out in accordance with SMACNA Figure 7-13.
 - 9. Duct dimensions indicated are net metal inside dimensions required for air flow. Do not increase duct size to allow for insulation thickness.
 - 10. Provide protection for surfaces that may be subject to damage by tradesmen installing electrical, controls or other work.

3.3 CLEANING

- A. Clean adjacent surfaces, valves, valve handles, etc. of jacketing materials.

3.4 SCHEDULES

- A. Exhaust Ducts Within 10 ft of Exterior Openings/Termination:

1. Glass Fiber, Flexible;2 inch thick.

B. Plenums:

1. Concealed: Glass Fiber, Flexible; 2 inch thick.
2. Exposed: Glass Fiber, Rigid; 2 inch thick (R-8, installed) with glass fabric vapor barrier jacket.

C. Supply Ducts:

1. Exposed Supply Ducts in Mechanical Rooms and Non-Conditioned Interior Spaces: Glass Fiber, Rigid; 2 inch thick with glass fabric jacket.
2. Concealed and exposed in Vented Attics, Crawl Spaces or other Spaces at exterior temperature and humidity conditions: Glass Fiber, Flexible; two layers of 2 inch thick.
3. Exposed Supply Ducts in Conditioned Spaces: Do Not Insulate.
4. Tops of Ceiling diffusers: Glass Fiber, Flexible; 2 inch thick.
5. Exterior Supply Ducts: Two layers of rigid fiberglass insulation; 4 inch thick total thickness protected with Adhesive Foil/Film jacket. Apply layers of insulation with staggered laps and seams.

D. Return Ducts:

1. Concealed Return ducts in Non-Conditioned Space: Glass Fiber, Flexible; 2 inch thick.
2. Exposed Return Ducts in Non-Conditioned Space: Glass fiber, Rigid;2 inch thick with glass fabric vapor barrier jacket.
3. Return Ducts in Conditioned Space or Return Air Plenum: Do Not Insulate.
4. Exterior Return Ducts: Two layers of rigid fiberglass insulation; [4] inch thick total thickness protected with Adhesive Foil/Film jacket. Apply layers of insulation with staggered laps and seams.

END OF SECTION

**SECTION 23 0719
HVAC PIPING INSULATION**

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Piping insulation.

1.2 REFERENCE STANDARDS

- A. ASTM C534/C534M - Standard Specification for Preformed Flexible Elastomeric Cellular Thermal Insulation in Sheet and Tubular Form; 2014.
- B. ASTM C553 - Standard Specification for Mineral Fiber Blanket Thermal Insulation for Commercial and Industrial Applications; 2013.
- C. ASTM C 1126 - Standard Specification for Faced or Unfaced Rigid Cellular Phenolic Thermal Insulation; 2009.

1.3 SUBMITTALS

- A. See Section 23 0510 - General HVAC Requirements for submittal procedures.
- B. Product Data: Provide product description, thermal characteristics, list of materials and thickness for each service, and locations.
- C. Manufacturer's Instructions: Indicate installation procedures that ensure acceptable workmanship and installation standards will be achieved.

1.4 QUALITY ASSURANCE

- A. All insulation, mastics, coatings, sealants, and adhesives shall be certified by the manufacturer to be Asbestos-free.
- B. Applicator Qualifications: Company specializing in performing the type of work specified in this section with minimum Three years of experience.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Accept materials on site, labeled with manufacturer's identification, product density, and thickness.

PART 2 PRODUCTS

2.1 FLEXIBLE ELASTOMERIC CELLULAR INSULATION

- A. Manufacturer:
 - 1. Aeroflex USA, Inc; Aerocel: www.aeroflexusa.com/#sle.
 - 2. Armacell LLC: www.armacell.us/#sle.

3. K-Flex USA LLC; Insul-Tube: www.kflexusa.com/#sle.
- B. Insulation: Preformed flexible closed-cell elastomeric rubber insulation complying with ASTM C 534 Grade 1; use molded tubular material. Split tube installation is prohibited.
1. 'K' ('Ksi') value: 0.25 at 75 degrees F (0.04 at 24 degrees C).
 2. Maximum Moisture Absorption: < 1.0 percent (pipe) by volume, when tested in accordance with ASTM C 209.
 3. Water Vapor Permeability: 0.05 perm-inches, when tested in accordance with ASTM E 96.
 4. Minimum Service Temperature: Minus 40 degrees F.
 5. Maximum Service Temperature: 220 degrees F.
 6. Connection: Waterproof vapor barrier adhesive.
- C. Elastomeric Foam Adhesive: Air dried, contact adhesive, compatible with insulation.

2.2 STAPLES, BANDS, AND WIRES

- A. Staples shall be outward clinching type of type 304 or 316 stainless steel, or monel.
- B. Bands shall be galvanized steel, aluminum, brass, or nickel copper alloy, of 3/4 inch nominal width. The band thickness exclusive of coating shall be not less than 30 gauge for steel and nickel copper alloy.
- C. Wire shall be 18-gauge stainless steel.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify that piping has been tested before applying insulation materials.
- B. Verify that surfaces are clean and dry, with foreign material removed.

3.2 INSTALLATION

- A. Install in accordance with manufacturer's instructions.
- B. Install in accordance with NAIMA National Insulation Standards.
- C. Exposed Piping: Locate insulation and cover seams in least visible locations. Exterior of insulation shall be uniform in appearance.
- D. Insulation jacket shall fit snug to insulation.
- E. Valves and fittings:

1. Insulate pipe and all valves and fittings including valve bonnets on A.C. condensate drain and refrigerant suction piping. Leave only valve stems, open ends of wells and gauge cocks exposed.
- F. Insulation at Hangers: Hangers for horizontal, A.C. condensate drain, refrigerant suction, and trapeze supports shall be outside of insulation with saddles as specified herein.
- G. Saddles:
1. Provide galvanized steel saddles at each point where pipe insulation passes through a hanger or rests on a support.
 2. Saddles shall be 180 arc for horizontal piping, 360 arch for vertical piping.
 3. Center saddle on pipe hanger.
 4. Length and gauge of saddle shall be as follows:
 - a. 2 inch pipe size and smaller: 18 Gauge saddle, 8 inch long, minimum.
 - b. 2-1/2 & 3 inch pipe size: 18 Gauge saddle, 12 inch long, minimum.
 - c. 4 inch pipe size: 16 Gauge saddle, 16 inch long, minimum.
 - d. 6 inch pipe size and larger: 16 Gauge saddle, 24 inch long, minimum.
- H. Flexible elastomeric cellular rubber insulation: Install without splitting and under compression during pipe fabrication. Seal Joints with adhesive. Paint exposed insulation with two coats of vinyl insulation paint after adhesive has dried for twelve hours, minimum. Allow two hours, minimum, between coats.
- I. Continue insulation through walls, sleeves, pipe hangers, and other pipe penetrations. Finish at supports, protrusions, and interruptions. At fire separations, refer to Section 15010.

3.3 CLEANING

- A. Clean adjacent surfaces, valves, valve handles, etc. of jacketing materials.

3.4 SCHEDULES

- A. DX Cooling Systems:
1. Refrigerant Suction: 3/4 inch thick preformed flexible elastomeric cellular rubber insulation.
- B. Condensate Drains from Cooling Coils: 3/4 inch thick preformed flexible elastomeric cellular rubber insulation.

END OF SECTION

**SECTION 23 0913
INSTRUMENTATION AND CONTROL DEVICES FOR HVAC**

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Thermostats.
- B. Miscellaneous accessories.

1.2 REFERENCE STANDARDS

- A. NFPA 90A - Standard for the Installation of Air-Conditioning and Ventilating Systems; 2015.

1.3 SUBMITTALS

- A. Refer to Section 23 0510- General HVAC Requirements for submittal procedures.
- B. Product Data: Provide description and engineering data for each control system component. Include sizing as requested. Provide data for each system component and software module.
- C. Shop Drawings: Indicate complete operating data, system drawings, wiring diagrams, and written detailed operational description of sequences. Submit schedule of valves indicating size, flow, and pressure drop for each valve. For automatic dampers indicate arrangement, velocities, and static pressure drops for each system.
- D. Operation and Maintenance Data: Include inspection period, cleaning methods, recommended cleaning materials, and calibration tolerances.

1.4 QUALITY ASSURANCE

- A. Installer Qualifications: Company specializing in performing the work of this section with minimum 5 years' experience employed directly by the digital equipment manufacturer.
- B. Products Requiring Electrical Connection: Listed and classified by Underwriters Laboratories Inc., as suitable for the purpose specified and indicated.

PART 2 PRODUCTS

2.1 EQUIPMENT - GENERAL

- A. Products Requiring Electrical Connection: Listed and classified by Underwriters Laboratories Inc., as suitable for the purpose specified and indicated.

2.2 SWITCHING DEVICES

- A. Electric Relays:
 - 1. Heavy duty, isolated, cabinet mounted, blade plug-in type with base.
 - 2. Rating: 10 amps, minimum at 125 VAC:

2.3 THERMOSTATS

A. Electric Room Thermostats:

1. Manufacturers: Honeywell VisionPro 8000
2. Room thermostat shall incorporate:
 - a. Automatic switching from heating to cooling.
 - b. Set-up for four separate temperatures per day.
 - c. Instant override of set point for continuous or timed period from one hour to 31 days.
 - d. Short cycle protection.
 - e. Programming based on weekdays, Saturday and Sunday.
 - f. Switch selection features including imperial or metric display, 12hour clock, keyboard disable, fan on-auto.
 - g. Dry Contact for interlocking fan(s).
 - h. WiFi capability for remote access.
3. Room thermostat display shall include:
 - a. Time of day.
 - b. Actual room temperature.
 - c. Programmed temperature.
 - d. Programmed time.
 - e. Day of week.
 - f. System mode indication: heating, cooling, auto, off, fan auto, fan on.
 - g. Stage (heating or cooling) operation.

B. Room Thermostat Accessories:

1. Thermostat Guards: Locking transparent plastic mounted on separate base.

C. Fire Thermostats(Firestats):

1. UL labeled, factory set in accordance with NFPA 90A.
2. Normally closed contacts, adjustable setpoint, manual reset, dust cover and adjustable duct mounting flange with extension for mounting on insulated duct.
3. Set point range: 100-250 Degree F.

4. Initial Setpoint: 195 Degree F

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify existing conditions before starting work.
- B. Verify that systems are ready to receive work.
- C. Beginning of installation means installer accepts existing conditions.
- D. Sequence work to ensure installation of components is complementary to installation of similar components in other systems.
- E. Coordinate installation of system components with installation of mechanical systems equipment such as air handling units and air terminal units.
- F. Ensure installation of components is complementary to installation of similar components.

3.2 INSTALLATION

- A. Install in accordance with manufacturer's instructions.
- B. Locate all control devices except for sensors and devices integral to equipment within control panels, unless otherwise noted.
- C. Install control devices in a readily accessible location. Refer to definitions in Section 23 0510.
- D. Coordinate with the Contractor and monitor the work so that other trades do not obstruct control devices or other items requiring access for service.
- E. Device mounting:
 1. All devices shall be permanently mounted and secured in place.
 2. Gypsum Board and Plaster walls: Moly-bolt type anchor. No adhesive or plastic insert anchors.
 3. Concrete Walls: Non-ferrous screws and expansion shields.
 4. Concrete masonry units: Mount to recessed box or secure with moly-bolt type anchor.
 5. Provide accessory wall adapter plates where required to cover block or wall opening edges.
- F. Identification:
 1. Nameplates: Identify all sensors mounted in mechanical rooms using device ID and number from control drawings with permanent label mounted adjacent to device. Nameplates shall be engraved plastic laminate with uppercase black letters on a white field, 1/4 inch minimum height.

- a. Include sensor type, normal setpoints information on nameplate.
 - b. Mounting: Attach nameplates with epoxy cement or non-ferrous screws after final painting.
2. Color code conductors with both ends identified with manufactured alpha-numeric self-adhesive vinyl tags, 3 mils thick, minimum, keyed to termination points.
- G. Electrical wiring:
1. All control and interlock wiring shall be provided under this section.
 2. No splices between field devices and control panels are permitted.
 3. All Wiring materials and methods shall comply with Division 26 except:
 - a. Minimum wire size shall be 14 AWG(copper) for line voltages.
 - b. Minimum wire size shall be 18 AWG(copper) for signal.
 4. Fire Alarm System Interface: Signal for fan shutdown shall be obtained from fire alarm output relay located in mechanical room adjacent to the starter/motor control center, unless otherwise noted.
- H. Check and verify location of thermostats and exposed control sensors with plans and room details before construction of wall assemblies. Locate between 42 to 48 inches above finished floor. Mount at common elevation within same space. Align with lighting switches . Refer to Section 26 0537.
- I. Mount in center of 8x8 inch block face with recessed mounting box and accessory wall adapter plate covering block opening where mounted in concrete masonry units.

END OF SECTION

**SECTION 23 0923
DIRECT-DIGITAL CONTROL SYSTEM FOR HVAC**

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. System description.
- B. Controllers.
- C. Power supplies and line filtering.
- D. Controller software.
- E. Software set-up and application programming.
- F. Owner demonstration and training.

1.2 RELATED REQUIREMENTS

- A. Section 23 0510 -General HVAC Requirements-Demonstration, Training and Instructions.
- B. Section 23 0913 - INSTRUMENTATION AND CONTROL DEVICES FOR HVAC.
- C. Section 23 0994 - HVAC Sequence of Operation.
- D. Section 26 2717 - Equipment Wiring: Electrical characteristics and wiring connections.

1.3 REFERENCE STANDARDS

- A. MIL-STD-810 - Environmental Engineering Considerations and Laboratory Tests; Revision G, 2014.
- B. NFPA 70 - National Electrical Code; 2023 Edition with 2026 Georgia Amendments.

1.4 SUMMARY

- A. The campus building automation system (BAS) is a Tridium Niagara 4 supervisor with JACE 8000 panels as the Building Point of Connection (BPOC). New programmable controllers shall be individually licensed controllers (ILC). Communication from the JACE panel to the new controllers shall be BACnet MSTP.

1.5 SYSTEM DESCRIPTION

- A. Automatic temperature control field monitoring and control system using field programmable micro-processor based units.
- B. Base system on distributed system of fully intelligent, stand-alone controllers, operating in a multi-tasking, multi-user environment on token passing network, with central and remote hardware, software, and interconnecting wire and conduit. Provide Building Controllers (BC),

Advanced Application Controllers (AAC), and Application Specific Controllers (ASC) as required to achieve specified sequences and performance.

- C. Include computer software and hardware, operator input/output devices, control units, local area networks (LAN), sensors, control devices, actuators.
- D. Provide control systems consisting of thermostats, control valves, dampers and operators, indicating devices, interface equipment and other apparatus and accessories required to operate mechanical systems, and to perform functions specified.
- E. The Contractor shall be responsible for all equipment, cables, installation, and programming to implement the required interface with the campus network.
- F. Include installation and calibration, supervision, adjustments, and fine tuning necessary for complete and fully operational system.

1.6 SUBMITTALS

- A. Refer to Section 23 0510 - General HVAC Requirements for submittal procedures.
- B. Product Data: Provide data for each system component and software module.
- C. Shop Drawings:
 - 1. Table of Contents listing sheet titles and sheet numbers.
 - 2. Each sheet shall have a title indicating the type of information included and the HVAC system controlled.
 - 3. Provide drawing legend and list of abbreviations.
 - 4. System architecture: Provide a drawing of the proposed system architecture showing configuration and locations of DDC controllers (existing and new), fan coil unit controllers, and hardware and wiring for connections to networks external to the building.
 - 5. Provide floor plans in electronic and hard copy format locating all controls units (existing and new), existing workstations, existing servers, LAN interface devices, existing gateways, etc. Include all WAN and LAN communication wiring routing, power wiring, power originating sources, and low voltage power wiring. Indicate network number, and controller type for each control unit. Indicate media, protocol, baud rate, and type of each LAN. All optical isolators, repeaters, end-of-line resistors, junctions, ground locations, etc. shall be located on the floor plans. Wiring routing as-built conditions shall be maintained accurately throughout the construction period and the drawing shall be updated to accurately reflect accurate, actual installed conditions coordinated with the work of other trades.
 - 6. DDC system data: Proposed system manufacturer's data sheets on DDC controllers, sensors, meters, relays, actuators, motors, fan coil unit controllers, protection devices, and other devices specified herein. Include data on system software packages to be installed and illustrations of proposed graphics displays.

7. Diagrams: Separate field wiring diagrams for each system, motor starting and interlock wiring, ladder diagrams, control wiring, interior electrical circuits of control instruments with terminal and control device designations, actuators and motors, color of wires, locations of instruments and remote elements, interfaces with communications equipment provided with equipment specified in other Sections, and normal positions of relays. Each diagram shall have terminals labeled as they will be marked on the installed equipment. Electrical wiring diagrams shall include diagrams with all wire numbers and terminal block numbers identified. Provide panel termination drawings on separate drawings. Ladder diagrams shall appear on system schematic. Clearly differentiate between portions of wiring, which is existing, factory-installed and portions to be field-installed.
 8. The control submittal is to include schematic control drawings showing the configuration of the equipment, the location of all sensors, monitoring inputs, and controlled devices and any equipment that the control system monitors, enables or controls, even if the equipment is primarily controlled by packaged or integral controls.
- D. With each schematic, provide a point summary table listing building number and abbreviation, system type, equipment type, full point name, point description, Ethernet backbone network number, network number, device ID, object ID (object type, instance number). Provide a full points list with the following included for each point:
1. Controlled system
 2. Point abbreviation/acronym
 3. Point description
 4. Engineering unit to be displayed with the point
 5. Control point or set-point (Yes / No)
 6. Monitoring point (Yes / No)
 7. Intermediate point (Yes / No)
 8. Calculated point (Yes / No)
- E. Proposed Graphics: Submittal shall include all proposed displays and proposed revisions to existing displays as required by the project documents and specifications.
- F. Sequences of operation: Complete detailed sequences of operation, including a narrative of the system operation and interactions and interlocks with other systems written by the control vendor; notations indicating whether interlock or interaction is accomplished through software or hard-wired connections; detailed delineation of control between packaged controls and the DDC system; and sequences of operation for packaged controlled equipment that interfaces with the DDC system describing what points the DDC system monitors only and what points are control points and are adjustable. Sequence shall include:
1. Equipment start-up sequences.

2. Warm-up mode sequences.
3. Normal operating mode sequences.
4. Detailed sequences for all control strategies, e.g., economizer control, optimum start/stop, capacity control, staging, optimization, etc.
5. Temperature and pressure control: setbacks, setups, resets, etc.
6. Shutdown sequences.
7. Unoccupied mode sequences.
8. Sequences for all alarms and emergency shut downs.
9. Effects of power or equipment failure with all standby component functions.
10. Seasonal operational differences and recommendations.
11. Initial and recommended values for all adjustable settings, set-points and parameters that are typically set or adjusted by operating staff; and any other control settings or fixed values, delays, etc. that will be useful during testing and operating the equipment.
12. Schedules, if known.
13. All sequences shall be written in small statements, each with a number for reference. For a given system, numbers will not repeat for different sequence sections, unless the sections are numbered

G. BACnet Systems:

1. BACnet object description, object ID, and device ID, for each I/O point.
2. Documentation for any non-standard BACnet objects, properties, or enumerations used detailing their structure, data types, and any associated lists of enumerated values.
3. Submit PICS indicating the BACnet functionality and configuration of each controller.

H. Electronic Submittals: While all requirements for hard copy submittal apply, control submittals and O&M information shall also be provided in electronic format as follows:

1. Drawings and Diagrams: Schematic flow diagrams and system architecture diagrams shall be provided on electronic media as AutoCAD 2005 or later version drawing files. Other drawings and diagrams may be provided as either AutoCAD files or PDF files, as most appropriate.
2. Other submittals: All other submittals shall be provided in Adobe Portable Document Format.

I. Manufacturers' Instructions: Indicate manufacturer's installation instructions for all manufactured components.

- J. Project Record Documents: Record actual locations of control components, including control units, thermostats, and sensors.
- K. Operation and Maintenance Data:
1. Include interconnection wiring diagrams complete field installed systems with identified and numbered, system components and devices.
 2. Include keyboard illustrations and step-by-step procedures indexed for each operator function.
 3. Include inspection period, cleaning methods, cleaning materials recommended, and calibration tolerances.
 4. Provide maintenance instructions and spare parts lists for each type of control device, control unit, and accessory.
 5. Provide BAS User's Guides (Operating Manuals) for each controller type and for all workstation hardware and software and workstation peripherals.
 6. Provide BAS advanced Programming Manuals for each controller type and for all workstation software.
 7. Include all submittals (product data, shop drawings, control logic documentation, hardware manuals, software manuals, installation guides or manuals, maintenance instructions and spare parts lists) in maintenance manual; in accordance with the requirements of Divisions 1 and 23.
 8. Provide as-built network architecture drawings showing all BACnet nodes including a description field with specific controller identification, description and location information.
 9. Record copies shall include individual floor plans with controller locations (existing and new) with all interconnecting wiring routing including space sensors, LAN wiring, power wiring, low voltage power wiring. Indicate device instance, MAC address and drawing reference number.
 10. Provide record system architecture riser diagram showing the location of all controllers (existing and new).
 11. Complete original issue diskettes for all software provided, including operating systems, programming language, back up copy of programming code for the controllers in the project, operator workstation software and graphics software.
 12. Licenses, guarantees, and warranty documents for all equipment and systems.
 13. Maintain project record documents throughout the construction period and submit final documents at Material Completion.

- L. Observation by the Design Professional: Provide an affidavit to the Design Professional stating the Controls Systems are performing in accordance with the contract documents prior to Request for Material Completion.
- M. Warranty: Submit manufacturer's warranty and ensure forms have been filled out in the Owner's name and registered with manufacturer.
- N. Certificate: Provide Manufacturer's Certificate complying with the requirements of the General Conditions.

1.7 QUALITY ASSURANCE

- A. Perform work in accordance with NFPA 70.
- B. Personnel: Mechanics and electricians performing this work shall be regularly engaged in the installation of automatic temperature controls and be in the direct employ of the installing company and shall have a copy of the approved submittal data in immediate possession when performing work.
- C. Products Requiring Electrical Connection: Listed and classified by Underwriters Laboratories Inc., as suitable for the purpose specified and indicated.

1.8 WARRANTY

- A. See Section 01 7800 - Closeout Submittals for additional warranty requirements.
- B. All components, system software, and parts furnished and installed by the BAS contractor shall be guaranteed against defects in materials and workmanship for one year from date of Material Completion. Project-specific software, database software, and firmware updates which resolve known software deficiencies as identified by the BAS Contractor shall be provided to the Owner at no charge during the warranty period. All corrective software modifications made during warranty period shall be updated on all user documentation and on user and manufacturer archived software disks.
- C. At Material Completion, the BAS contractor shall upgrade all control software and firmware packages to the latest release available from the vendor.
- D. Provide five year manufacturer's warranty for field programmable micro-processor based units.

1.9 PROTECTION OF SOFTWARE RIGHTS

- A. The owner shall sign a copy of the manufacturer's standard software and firmware licensing agreement as a condition of this contract. Such license shall grant use of all programs and application software to owner as defined by the manufacturer's license agreement, but shall protect manufacturer's rights to disclosure of trade secrets contained within such software. All project developed software and documentation shall become the property of the owner. These include, but are not limited to:
 - 1. Project graphic images

2. Record drawings
 3. Project network database
 4. Project-specific application programming code
 5. All documentation
- B. The Contractor shall provide additional software licensing as follows:
1. Provide or upgrade all licensing for all software packages at all required workstations. Building automation system licensing shall allow unlimited simultaneous users for access to all aspects of the system including system access, workstations, points, programming, database management, graphics etc. No restriction shall be placed on the licensing. All operator interfaces, programming environment, networking, database management and any other user software used by the Contractor to install the system or needed to operate the system to its full capabilities shall be licensed and provided to the Owner.
 2. All software should be available on all Operator Workstations or servers provided, and on all Portable Operator Terminals. Hardware and software keys to provide all rights shall be installed on all workstations. At least 2 sets of CDs shall be provided with backup software for all software provided, so that the Owner may reinstall any software as necessary. Include all licensing for workstation operating systems, and all required third-party software licenses.
 3. Provide licensing and original software copies for each Operator Workstation or server.

PART 2 PRODUCTS

2.1 MANUFACTURERS

A.

2.2 BACNET COMMUNICATION

- A. Control products, communication media, connectors, repeaters, hubs, and routers shall comprise a BACnet internetwork. Controller and operator interface communication shall conform to the latest edition of ANSI/ASHRAE Standard 135, BACnet.
- B. Each controller shall have a communication port for temporary connection to a laptop computer or other operator interface. Connection shall support memory downloads and other commissioning and troubleshooting operations.
- C. Controllers with real-time clocks shall use the BACnet Time Synchronization service. The system shall automatically synchronize system clocks daily from an operator-designated controller via the internetwork. If applicable, system shall automatically adjust for daylight saving and standard time.
- D. Web server or workstation and controllers shall communicate using BACnet protocol. Web server or workstation and control network backbone shall communicate using ISO 8802-3

(Ethernet) Data Link/Physical layer protocol and BACnet/IP addressing as specified in ANSI/ASHRAE 135 BACnet Annex J.

- E. The system shall use BACnet as the native communication protocol between distributed controllers communicating on the controller network (i.e., Field Bus) and must, as a minimum, support the following Objects and Application Services (Conformance Class 3):
 - 1. Objects > Binary Input Services > Readproperty
 - 2. Binary Output Writeproperty
 - 3. Binary Value
 - 4. Analog Input
 - 5. Analog Output ReadMultipleProperty
 - 6. Analog Value WriteMultipleProperty
 - 7. Calendar
 - 8. Schedules

2.3 CONTROLLERS

- A. Arrange Controllers and Unit I/O so that control unit functions continue if communications over network are lost.

2.4 BUILDING CONTROLLERS

- A. Type: JACE 8000
- B. General:
 - 1. Manage global strategies by one or more, independent, standalone, microprocessor based controllers.
 - 2. Provide sufficient memory to support controller's operating system, database, and programming requirements.
 - 3. Share data between networked controllers.
 - 4. Controller operating system manages input and output communication signals allowing distributed controllers to share real and virtual object information and allowing for central monitoring and alarms.
 - 5. Utilize real-time clock for scheduling.
 - 6. Continuously check processor status and memory circuits for abnormal operation.
 - 7. Controller to assume predetermined failure mode and generate alarm notification upon detection of abnormal operation.

8. Communication with other network devices to be based on assigned protocol.
- C. Communication:
1. Controller to reside on a BACnet network using ISO 8802-3 (ETHERNET) Data Link/Physical layer protocol.
 2. Perform routing when connected to a network of custom application and application specific controllers.
 3. Provide service communication port for connection to a portable operator's terminal or hand held device with compatible protocol.
- D. Anticipated Environmental Ambient Conditions:
1. Outdoors and/or in Wet Ambient Conditions:
 - a. Mount within waterproof enclosures.
 - b. Rated for operation at 40 to 150 degrees F.
 - c. Conditioned Space:
 - 1) Mount within dustproof enclosures.
 - 2) Rated for operation at 32 to 120 degrees F.
- E. Provisions for Serviceability:
1. Diagnostic LEDs for power, communication, and processor.
 2. Make all wiring connections to field removable, modular terminal strips, or to a termination card connected by a ribbon cable.
- F. Memory: In the event of a power loss, maintain all BIOS and programming information for a minimum of 72 hours.
- G. Power and Noise Immunity:
1. Maintain operation at 90 to 110 percent of nominal voltage rating.
 2. Perform orderly shutdown below 80 percent of nominal voltage.
 3. Operation protected against electrical noise of 5 to 120 Hz and from keyed radios up to 5 W. at 3 feet.

2.5 APPLICATION SPECIFIC CONTROLLERS

- A. General:
1. Not fully user programmable, microprocessor based controllers dedicated to control specific equipment.

2. Customized for operation within the confines of equipment served.
 3. Communication with other network devices to be based on assigned protocol.
- B. Communication:
1. Controller to reside on a BACnet network using MS/TP Data Link/Physical layer protocol.
 2. Provide service communication port for connection to a portable operator's terminal or hand held device with compatible protocol.
- C. Anticipated Environmental Ambient Conditions:
1. Outdoors and/or in Wet Ambient Conditions:
 - a. Mount within waterproof enclosures.
 - b. Rated for operation at 40 to 150 degrees F.
 - c. Conditioned Space:
 - 1) Mount within dustproof enclosures.
 - 2) Rated for operation at 32 to 120 degrees F.
- D. Provisions for Serviceability:
1. Diagnostic LEDs for power, communication, and processor.
 2. Make all wiring connections to field removable, modular terminal strips, or to a termination card connected by a ribbon cable.
- E. Memory: In the event of a power loss, maintain all BIOS and programming information for a minimum of 72 hours.
- F. Power and Noise Immunity:
1. Maintain operation at 90 to 110 percent of nominal voltage rating.
 2. Perform orderly shutdown below 80 percent of nominal voltage.
 3. Operation protected against electrical noise of 5 to 120 Hz and from keyed radios up to 5 W at 3 feet.

2.6 INPUT/OUTPUT INTERFACE

- A. Hardwired inputs and outputs tie into the DDC system through building, custom application, or application specific controllers.
- B. All Input/Output Points:

1. Protect controller from damage resulting from any point short-circuiting or grounding and from voltage up to 24 volts of any duration.
 2. Provide universal type for building and custom application controllers where input or output is software designated as either binary or analog type with appropriate properties.
- C. Binary Inputs:
1. Allow monitoring of On/Off signals from remote devices.
 2. Provide wetting current of 12 mA minimum, compatible with commonly available control devices and protected against the effects of contact bounce and noise.
 3. Sense dry contact closure with power provided only by the controller.
- D. Pulse Accumulation Input Objects: Conform to all requirements of binary input objects and accept up to 10 pulses per second.
- E. Analog Inputs:
1. Allow for monitoring of low voltage 0 to 10 VDC, 4 to 20 mA current, or resistance signals (thermistor, RTD).
 2. Compatible with and field configurable to commonly available sensing devices.
- F. Binary Outputs:
1. Used for On/Off operation or a pulsed low-voltage signal for pulse width modulation control.
 2. Outputs provided with three position (On/Off/Auto) override switches.
 3. Status lights for building and custom application controllers to be selectable for normally open or normally closed operation.
- G. Analog Outputs:
1. Monitoring signal provides a 0 to 10 VDC or a 4 to 20 mA output signal for end device control.
 2. Provide status lights and two position (AUTO/MANUAL) switch for building and custom application controllers with manually adjustable potentiometer for manual override on building and custom application controllers.
 3. Drift to not exceed 0.4 percent of range per year.
- H. Tri State Outputs:
1. Coordinate two binary outputs to control three point, floating type, electronic actuators without feedback.

2. Limit the use of three point, floating devices to the following zone and terminal unit control applications:
 - a. VAV terminal units.
 - b. Duct mounted heating coils.
 3. Control algorithms run the zone actuator to one end of its stroke once every 24 hours for verification of operator tracking.
- I. System Object Capacity:
1. System size to be expandable to twice the number of input output objects required by providing additional controllers, including associated devices and wiring.
 2. Hardware additions or software revisions for the installed operator interfaces are not to be required for future, system expansions.

2.7 POWER SUPPLIES AND LINE FILTERING

A. Power Supplies:

1. Provide UL listed control transformers with Class 2 current limiting type or over-current protection in both primary and secondary circuits for Class 2 service as required by the NEC.
2. Limit connected loads to 80 percent of rated capacity.
3. Match DC power supply to current output and voltage requirements.
4. Unit to be full wave rectifier type with output ripple of 5.0 mV maximum peak to peak.
5. Regulation to be 1 percent combined line and load with 100 microsecond response time for 50 percent load changes.
6. Provide over-voltage and over-current protection to withstand a 150 percent current overload for 3 seconds minimum without trip-out or failure.
7. Operational Ambient Conditions: 32 to 120 degrees F.
8. EM/RF meets FCC Class B and VDE 0871 for Class B and MIL-STD 810 for shock and vibration.
9. Line voltage units UL recognized and CSA approved.

B. Power Line Filtering:

1. Provide external or internal transient voltage and surge suppression component for all workstations and controllers.
2. Minimum surge protection attributes:

- a. Dielectric strength of 1000 volts minimum.
- b. Response time of 10 nanoseconds or less.
- c. Transverse mode noise attenuation of 65 dB or greater.
- d. Common mode noise attenuation of 150 dB or greater at 40 to 100 Hz.

2.8 LOCAL AREA NETWORK (LAN)

- A. Provide communication between control units and operator station(s) over local area network (LAN).
- B. LAN Capacity: Not less than 60 stations or nodes.
- C. Break in Communication Path: Alarm and automatically initiate LAN reconfiguration.
- D. LAN Data Speed: Minimum 2500 Kb.
- E. Communication Techniques: Allow interface into network by multiple operation stations and by auto-answer/auto-dial modems. Support communication over telephone lines utilizing modems.
- F. Transmission Median: Fiber optic or single pair of solid 24 gauge twisted, shielded copper cable.
- G. Network Support: Time for global point to be received by any station, shall be less than 3 seconds. Provide automatic reconfiguration if any station is added or lost. If transmission cable is cut, reconfigure two sections with no disruption to system's operation, without operator intervention.

2.9 CONTROLLER SOFTWARE

- A. Supervisory Software Manufacturer: Tridium Niagara 4
- B. All applications reside and operate in the system controllers and editing of all applications occurs at the operator workstation.
- C. System Security:
 - 1. User access secured via user passwords and user names.
 - 2. Passwords restrict user to the objects, applications, and system functions as assigned by the system manager.
 - 3. User Log On/Log Off attempts are recorded.
 - 4. Automatic Log Off occurs following the last keystroke after a user defined delay time.
- D. Object or Object Group Scheduling:
 - 1. Weekly Schedules Based on Separate, Daily Schedules:

- a. Include start, stop, optimal stop, and night economizer.
 - b. 10 events maximum per schedule.
 - c. Start/stop times adjustable for each group object.
- E. Provide standard application for equipment coordination and grouping based on function and location to be used for scheduling and other applications.
- F. Alarms:
- 1. Binary object is set to alarm based on the operator specified state.
 - 2. Analog object to have high/low alarm limits.
 - 3. All alarming is capable of being automatically and manually disabled.
 - 4. Alarm Reporting:
 - a. Operator determines action to be taken for alarm event.
 - b. Alarms to be routed to appropriate workstation.
 - c. Reporting Options:
- G. Maintenance Management: System monitors equipment status and generates maintenance messages based upon user-designated run-time limits.
- H. Sequencing: Application software based upon specified sequences of operation in Section 23 0993.
- I. PID Control Characteristics:
- 1. Direct or reverse action.
 - 2. Anti-windup.
 - 3. Calculated, time-varying, analog value, positions an output or stages a series of outputs.
 - 4. User selectable controlled variable, set-point, and PED gains.
- J. Staggered Start Application:
- 1. Prevents all controlled equipment from simultaneously restarting after power outage.
 - 2. Order of equipment startup is user selectable.
- K. Energy Calculations:
- 1. Accumulated instantaneous power or flow rates are converted to energy use data.
 - 2. Algorithm calculates a rolling average and allows window of time to be user specified in minute intervals.

3. Algorithm calculates a fixed window average with a digital input signal from a utility meter defining the start of the window period that in turn synchronizes the fixed-window average with that used by the power company.

L. Anti-Short Cycling:

1. All binary output objects protected from short-cycling.
2. Allows minimum on-time and off-time to be selected.

M. On-Off Control with Differential:

1. Algorithm allows binary output to be cycled based on a controlled variable and set-point.
2. Algorithm to be direct-acting or reverse-acting incorporating an adjustable differential.

N. Run-Time Totalization:

1. Totalize run-times for all binary input objects.
2. Provides operator with capability to assign high run-time alarm.

2.10 HVAC CONTROL PROGRAMS

A. General:

1. Support Inch-pounds and SI (metric) units of measurement.
2. Identify each HVAC Control system.

B. Optimal Run Time:

1. Control start-up and shutdown times of HVAC equipment for both heating and cooling.
2. Base on occupancy schedules, outside air temperature, seasonal requirements, and interior room mass temperature.
3. Start-up systems by using outside air temperature, room mass temperatures, and adaptive model prediction for how long building takes to warm up or cool down under different conditions.
4. Use outside air temperature to determine early shut down with ventilation override.

2.11 PROGRAMMING APPLICATION FEATURES

A. Trend Point:

1. Sample up to 6 points, real or computed, with each point capable of collecting samples at intervals specified in minutes, hours, days, or month.
2. Output trend logs as line graphs or bar graphs. Output graphic on terminal, with each point for line and bar graphs designated with a unique pattern, vertical scale either actual

values or percent of range, and horizontal scale time base. Print trend logs up to 12 columns of one point/column.

B. Alarm Messages:

1. Allow definition of minimum of 50 messages, each having minimum length of 180 characters for each individual message.
2. Assign alarm messages to system messages including point's alarm condition, point's off-normal condition, totalized point's warning limit, hardware elements advisories.
3. Output assigned alarm with "message requiring acknowledgments".
4. Operator commands include define, modify, or delete; output summary listing current alarms and assignments; output summary defining assigned points.

C. Weekly Scheduling:

1. Automatically initiate equipment or system commands, based on preselected time schedule for points specified.
2. Provide program times for each day of week, per point, with one minute resolution.
3. Automatically generate alarm output for points not responding to command.
4. Provide for holidays, minimum of 100 consecutive holidays.
5. Output summary: Listing of programmed function points, associated program times, and respective day of week programmed points by software groups or time of day.

D. Interlocking:

1. Permit events to occur, based on changing condition of one or more associated master points.
2. Binary contact, high/low limit of analog point or computed point shall be capable of being utilized as master. Same master may monitor or command multiple slaves.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify existing conditions before starting work.
- B. Verify that conditioned power supply is available to the control units and to the operator work station.
- C. Verify that field end devices, wiring, and pneumatic tubing is installed prior to installation proceeding.

3.2 PROGRAMING

- A. Include operating system programming of software capability specified to provide:
 - 1. Set-up of system I/O capability, operator access as defined by the User, database creation and support.
 - 2. Graphic Display-Systems:
 - a. Update existing color graphics providing menu-generated flow charting of each building process using background graphics, standard and user defined symbols and dynamic variables.
 - b. Provide flow charting for each system indicating all available points.
 - c. Indicate setpoint condition status by changing color, flashing. Provide flow charting for each system indicating all available points.
 - 3. Graphic Displays- Floor Plans:
 - a. Provide building floor plan graphics with thermographics or temperature readouts and a change in color during alarms.
 - b. Show actual locations of equipment, and thermostats on the graphics.
 - 4. Equipment Runtime monitoring.
- B. Include Load Control and HVAC programming of software to provide:
 - 1. System and equipment operating to specified Sequence of Operation:
 - 2. Start-stop Optimization.
 - 3. Night set-up/set-back of temperature set-points as directed by User.
- C. Include Application system programming of software capability specified to provide:
 - 1. Trend logging:
 - 2. Logging, reporting and graphing of user defined system trends on disk file and printer as directed by user.
 - 3. Organize data in each trend logs to facilitate documenting system operation in compliance with Sequence of Operation.
 - 4. Alarms: Logging, reporting and printing of user defined system alarms on disk file and printer as directed by user.
 - 5. Scheduling:
 - a. Program user defined system scheduling of occupied times as directed by user.

- b. Implement optimized starting and stopping for building warm-up/cool-down before occupancy.
- c. Program user defined system scheduling as directed by user.

3.3 INSTALLATION

- A. Install control units and other hardware in position on permanent walls where accessible for inspection, maintenance and repair and not subject to excessive vibration.
- B. Identification:
 - 1. Nameplates: Identify all sensors mounted in mechanical rooms using device ID and number from control drawings with permanent label mounted adjacent to device. Nameplates shall be engraved plastic laminate with uppercase black letters on a white field, 1/4 inch minimum height.
 - 2. Mounting: Attach nameplates with epoxy cement or non-ferrous screws after final painting.
 - 3. Conduit/Cable Markers:
 - 4. Color coded, sunlight resistant cable ties.
 - 5. Location: Install on all conduit and raceways exposed or above ceilings in a visible location at:
 - a. Connections to junction, pull boxes, or manholes. Label box cover with nominal system voltage, circuit number and panel identification legibly written with permanent marker.
 - b. Connections to equipment.
 - c. Each side of a wall, roof or floor penetration.
 - d. Along straight runs at 50 feet intervals.
 - e. At changes of direction.
 - f. Parallel Conduits: Group markers on each conduit in-line with the adjacent marker.
 - 6. Color: Baby Blue.
 - 7. Color code cable with both ends identified with manufactured alpha-numeric self-adhesive vinyl tags, 3 mils thick, minimum, keyed to termination points.
- C. Electrical wiring:
 - 1. No splices between control panels are permitted.
 - 2. All terminations of field wiring shall be to terminal strips.

3. Power wiring to control units shown on drawings is provided under Division 26. Provide conduit and conductors and power supplies and transformers to extend power to all supplemental control units.
 4. Analog input and output cable shall be shielded with panel connection grounded to comply with Part 15, Sub-part J of FCC Rules and Regulations.
 5. All Wiring materials and methods shall comply with Division 26 except:
 - a. Minimum wire size shall be 18 AWG(copper).
 - b. Conduit for concealed low voltage wiring above accessible ceilings may be omitted and plenum rated cable substituted.
- D. Provide conduit and electrical wiring in accordance with Section 26 2717. Electrical material and installation shall be in accordance with appropriate requirements of Division 26.

3.4 COMMISSIONING SUPPORT REQUIREMENTS:

- A. The contractor is to include and specifically itemize the cost of commissioning in the contract price.
- B. The Contractor shall attend a preliminary commissioning scoping meeting and other commissioning coordination meetings during the construction process as necessary to facilitate the commissioning process. Contractor is to keep the Commissioning Authority and mechanical Commissioning Supervisor informed of progress with the Project and of changes to the proposed installation, programming and test plan.
- C. The Contractor shall provide assistance to the Commissioning Authority (CxA) for scheduling and witnessing of testing. Review the Prefunctional and Functional test procedures to ensure feasibility, safety, and equipment protection.
- D. Preparation of a written start-up and initial checkout plan indicating in a step-by-step manner the procedures that will be followed to test, check-out, and adjust the control system prior to beginning functional testing. Submit the proposed plan to the Commissioning Authority and mechanical Commissioning Supervisor for review and approval prior to startup. At minimum, the plan shall include for each type of equipment controlled by the automatic controls:
 1. Step-by-step procedures for testing each type controller after installation, including:
 - a. Process of verifying proper hardware and wiring installation.
 - b. Process of downloading programs to load controllers and verifying that they are addressed correctly.
 - c. Process of verifying proper hardware and wiring installation.
 - d. Process of performing operational checks of each controlled component.
 - e. Plan and process for calibrating valve and damper actuators and sensors.

- f. A description of the expected field adjustments for transmitters, controllers and control actuators should control responses fall outside of expected values.
 - g. A copy of the log and field check-out sheets that will document the process. This log shall include a place for initial and final values read during calibration of each point and clearly indicate when a sensor or controller has passed and is operating within the contract parameters. Notification of any equipment failures shall be documented.
 - h. A description of the expected field adjustments for transmitters, controllers and control actuators should control responses fall outside of expected values.
 - i. A description of the instrumentation required for testing, including a certification of calibration for each test instrument.
 - j. Identify which tests and systems should be completed prior to using the control system for test, adjustment, and balance work.
 - k. The Commissioning Agent may request further documentation necessary for the commissioning process.
2. Provide the Commissioning Authority and mechanical Commissioning Supervisor complete system logic diagrams, describing the proposed system programming, with programmed attributes shown. These diagrams shall be updated with field modifications from the start-up, check-out, and pre-functional testing prior to the beginning of the functional testing of the DDC system. Provide a copy of each proposed graphical interface screen with interface points shown for the entire system. Provide assistance to the Commissioning Authority in preparing the specific functional performance test procedures required, to include normal cut sheets and shop drawing submittals of commissioned equipment and any additional requested documentation, prior to normal O&M manual submittals. Review test procedures to ensure feasibility, safety and equipment protection and provide necessary written alarm limits to be used during the tests.
 3. Pre-functional tests: Provide skilled technicians to execute startup of equipment and to execute the pre-initial checkout as described by the approved plan. Ensure that they are available and present during the agreed upon schedules and for sufficient duration to complete the necessary tests, adjustments and problem solving. Verify and document the proper installation, addressing, calibration, programming, operation, and failure mode of DDC control points, sequences, and equipment and provide a copy to the commissioning authority. Provide a signed and dated certification to the Commissioning Authority and Commissioning Supervisor upon completion of the check-out of each controlled device, equipment, and system that installation, set-up, adjustment, calibration, and system programming is complete and as indicated on the Drawings, except functional testing. Completed pre-functional documentation of the system verification shall be submitted to the Commissioning Authority and Commissioning Supervisor for review and approval prior to the functional testing of the DDC control system or its being used in the testing of other equipment or systems, or other purposes. Copies of final field check-out sheets and trend logs shall be provided to the Commissioning Authority and Commissioning Supervisor for inclusion in the Commissioning Report.

4. Meet with the testing, adjusting, and balancing contractor prior to beginning the test, adjustment, and balance process and review the test, adjusting, and balancing plan to determine the capabilities and requirements of the control system in completing the testing, adjusting, and balancing process. For a given area, have all required pre-functional checklists, calibrations, startup and selected functional tests of the system completed and approved by the Commissioning Authority prior to beginning the testing, adjusting, and balancing effort. Provide the testing, adjusting, and balancing contractor with the appropriate software and any needed unique instruments for setting terminal units and instruct the testing, adjusting, and balancing contractor personnel in their use. Assist and cooperate with the testing, adjusting, and balancing contractor by providing a qualified technician to operate the controls as required to assist the testing, adjusting, and balancing contractor in performing his work, or alternatively, provide sufficient training for the testing, adjusting, and balancing contractor to operate the system without assistance. Verify the proper operation of affected controls at the completion of the test, adjustment, and balance procedure.
5. Address current A/E punch list items before functional testing. Air and water TAB shall be completed with discrepancies and problems remedied before functional testing of the control systems for the respective air- or water-related systems.
6. Functional tests: Conduct and document a functional test under the direction of the Commissioning Authority of the complete installed DDC control system. Functional testing is intended to begin upon completion of a system but may be conducted in phases or sections, as defined by the requirements of the Functional Test, or as approved by the Commissioning Authority. The DDC system, or applicable portions of the system, shall have completed pre-functional testing and be approved by the Commissioning Authority and Commissioning Supervisor before being used for other purposes, such as test and balance measurements, or in support of the functional testing of other systems.
 - a. Provide technicians and or knowledgeable programming personnel as required to conduct the required functional testing. Assist the Commissioning Authority in resolving issues found during the functional testing process.
 - b. Assist in the functional testing of equipment and systems by implementing trend logs and equipment monitoring as specified in the contract documents. The monitoring and data logging capabilities of the DDC system shall be available for use in the commissioning process. Assist the Commissioning Authority in the testing and documentation process by using the data logging and trending capability of the DDC system in monitoring the testing effort and recording the performance of systems and interpreting the monitoring data, as necessary.
 - c. The controls contractor shall coordinate with the University Facilities personnel and provide and set up a temporary testing operator station to allow full operator station interface with the system during the entire functional testing process. This temporary operator station shall provide all functions required of the system at the operator station, including real time graphic displays and report generation.

7. Correct deficiencies (differences between specified and observed performance) as interpreted by the Commissioning Authority and Design Professional and retest the equipment.

E. Seasonal Adjustment:

1. Assist the Commissioning Authority and Commissioning Supervisor with the seasonal adjustment process. During this effort the Commissioning Authority and Commissioning Supervisor will:
 - a. Check and verify the calibration of temperature control devices and thermostats.
 - b. Test and verify control sequences for proper operation for the season.
 - c. Where deficient operation or defective equipment is discovered, provide corrective measures as required by the warranty provisions specified herein.

3.5 MANUFACTURER'S FIELD SERVICES

- A. Start and commission systems. Allow sufficient time for start-up and commissioning prior to placing control systems in permanent operation.
- B. Provide start-up certificate in the format prescribed by the General Conditions.

3.6 DEMONSTRATION, TRAINING AND INSTRUCTIONS

- A. Refer to Section 23 051023 0510- Demonstration, Training and Instructions for additional requirements.
- B. Demonstrate a complete and operating system to the Owner.

END OF SECTION

**SECTION 23 0994
HVAC SEQUENCE OF OPERATION**

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Listing of required monitor points.
- B. Sequence of operation for:
 - 1. Packaged AC Units.
 - 2. Dedicated OA Units.
 - 3. Fan Interlocks.

1.2 RELATED SECTIONS

- A. Section 23 0923 - Digital Control Equipment.

1.3 SYSTEM DESCRIPTION

- A. This Section defines the manner and method by which controls function. Requirements for each type of control system operation are specified. Equipment, devices, and system components required for control systems are specified in other Sections.

1.4 SUBMITTALS

- A. Refer to Section 23 0510 - General HVAC Requirements for submittal procedures.
- B. Shop Drawings: Indicate mechanical system controlled and control system components.
 - 1. Label with settings, adjustable range of control and limits.
 - 2. Include written description of control sequence.
 - 3. Include flow diagrams for each control system, graphically depicting control logic.
- C. Project Record Documents: Record actual locations of components and setpoints of controls, including changes to sequences made after submission of shop drawings.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION

3.1 GENERAL

- A. All operators shall be in NORMAL position when each system is OFF.
- B. Provide smoke detector in supply air stream on all air systems over 2000 CFM. Refer to NFPA 90A , 2002 .

C. All temperatures are Fahrenheit.

3.2 MONITOR POINTS

- A. Arrangement: Locate all control points for a system within one DDC panel within the mechanical equipment room containing the majority of the equipment for that system.
- B. Monitoring: In addition to the temperature, pressure, digital or flow sensor points required to implement the sequence of operation, the points provided shall include as a minimum:
 - C. Temperatures:
 - 1. Outside air.
 - 2. Return air.
 - 3. Mixed air.
 - 4. Cooling coil discharge.
 - 5. Supply air. (Each RTU)
 - D. Humidity:
 - 1. Return Air Relative. (Each RTU)
- E. Variable Frequency Drive(s); Monitor Drive Status and other state points as listed by ASHRAE standards though BACNET interface card.

3.3 PACKAGED SAV ROOF TOP AIR CONDITIONERS

- A. Supply Fan Start-Stop:
 - 1. A normally open digital output relay on time of day programming commands the variable frequency speed controller.
 - 2. Vary the unit start and stop times so that space temperatures are within setpoint for varying outdoor conditions using start/stop optimization software. Refer to 23 0923 .2.5.C
 - 3. The minimum OA damper is opened at the occupied time.
 - 4. The digital output relay stops the fan.
 - 5. Digital thermostat un-occupied high and low limits shall start unit fan when any space temperature exceeds 85 degrees or is 60 degrees or lower during un-occupied times.
- B. Safety Controls to Stop Supply Fan:
 - 1. Firestat in R.A. duct.
 - 2. Normally closed fire alarm output relay (hardwire).

C. Supply Fan Capacity Control:

1. Fan speed shall be modulated through variable speed drive in sequence with staged compression. Fan speeds shall be preset from factory to match corresponding stage of compression.

D. Minimum OA/RA Dampers (N.C./N.O.):

1. The normally closed minimum OA damper shall open when air unit SA fan is on and the time of day indicates the building is occupied. The OA and RA dampers shall open to preset fixed positions during first stage of cooling and shall modulate in sequence to secondary fixed position to maintain 2,500 cfm of OA. Air quality sensor in RA duct resets positions of OA and RA dampers to maintain scheduled OA as space occupancy rises. Secondary and maximum positions of dampers to be set by test and balance

E. Economizer: Factory provide controller shall open OA dampers to provide 100% outside air when ODT temperature is 55 degrees and there is call for cooling.

F. Space Temperature Control:

1. Wall mounted digital thermostat provides control thru factory provided unit controller to stage supply air fan, cycle compressors, modulate hot gas reheat, economizer dampers, and electric heating coil to maintain space temperature control. Provide for occupied and unoccupied cooling and heating setpoints.

3.4 DEDICATED OUTSIDE AIR UNIT

A. Supply Fan Start-Stop:

1. The DDC time of day programming shall provide a signal to start-stop the unit in accordance with the building occupied/unoccupied programmed schedules.
2. The OA damper shall open when the unit is operating.
3. The digital output relay stops the fan.

B. Safety Controls to Stop Supply Fan:

1. Smoke detector in supply air duct.
2. Normally closed fire alarm output relay.

C. Temperature Control: Unit operates on built-in controls to cycle compressors, modulate hot-gas reheat coil and stage electric heating coil to dehumidify the outside air and maintain space temperature at 75 deg F. OA dampers shall be interlocked with the field house lights to open when lights re ON. RA dampers shall open when lights are OFF.

3.5 MISCELLANEOUS FAN SEQUENCES

- A. General: Where exhaust fans are indicated to be interlocked with air handling equipment, fans shall be interlocked with minimum outside air dampers for indicated equipment, unless otherwise noted.
- B. Exhaust Fans EF-5: Interlock with DOAS-1.
- C. Exhaust Fans EF-2 and EF-3: Interlock with DOAS-2.
- D. Exhaust Fan EF-4: Interlock with toilet room lights.

3.6 DUCTLESS SPLIT SYSTEM AIR CONDITIONING UNITS

- A. Temperature Controls: Provided with unit. Refer to Section 23 8130.

END OF SECTION

**SECTION 23 2300
REFRIGERANT PIPING**

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Piping.

1.2 RELATED REQUIREMENTS

- A. Section 07 8413 - Penetration Firestopping.
- B. Section 23 0719 - HVAC Piping Insulation.

1.3 REFERENCE STANDARDS

- A. AHRI 710 - Performance Rating of Liquid-Line Driers; 2009.
- B. ASME BPVC-IX - Boiler and Pressure Vessel Code, Section IX - Welding, Brazing, and Fusing Qualifications; 2015.
- C. ASME B16.22 - Wrought Copper and Copper Alloy Solder-Joint Pressure Fittings; 2013.
- D. ASME B31.5 - Refrigeration Piping and Heat Transfer Components; 2013.
- E. ASME B31.9 - Building Services Piping; 2014.
- F. ASTM A234/A234M - Standard Specification for Piping Fittings of Wrought Carbon Steel and Alloy Steel for Moderate and High Temperature Service; 2015.
- G. ASTM B280 - Standard Specification for Seamless Copper Tube for Air Conditioning and Refrigeration Field Service; 2013.
- H. MSS SP-58 - Pipe Hangers and Supports - Materials, Design, Manufacture, Selection, Application, and Installation; 2009.

1.4 SYSTEM DESCRIPTION

- A. Where more than one piping system material is specified ensure system components are compatible and joined to ensure the integrity of the system is not jeopardized. Provide necessary joining fittings.
- B. Provide pipe hangers and supports in accordance with ASME B31.5 unless indicated otherwise.

1.5 SUBMITTALS

- A. Refer to Section 23 0510 - General Mechanical Requirements for submittal procedures.
- B. Product Data: Provide general assembly of specialties, including manufacturers catalogue information. Provide manufacturers catalog data including load capacity.

- C. Shop Drawings: Indicate schematic layout of piping system, including equipment, critical dimensions, slopes, piping components and pipe sizes.
- D. Design Data: Submit design data indicating pipe sizing. Indicate load carrying capacity of trapeze, multiple pipe, and riser support hangers.
- E. Manufacturer's Installation Instructions: Indicate support, connection requirements, and isolation for servicing.
- F. Maintenance Data: Include instructions for changing cartridges, assembly views, spare parts lists.

1.6 QUALITY ASSURANCE

- A. Installer Qualifications: Company specializing in performing the type of work specified in this section, with minimum 5 years of documented experience.

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Deliver and store piping and specialties in shipping containers with labeling in place.
- B. Protect piping and specialties from entry of contaminating material by leaving end caps and plugs in place until installation.
- C. Dehydrate and charge components such as piping and receivers with dry nitrogen, seal prior to shipment, until connected into system.

PART 2 PRODUCTS

2.1 PIPING

- A. Copper Tube: ASTM B 280, H58 hard drawn
 - 1. Fittings: ASME B16.22 wrought copper.
 - 2. Joints:
 - a. Coil connections, and within equipment cabinets: Soldered ASTM B32 lead and antimony free solder, 96 Sn/4 Ag (tin-silver) alloy with zinc fluoride flux. Typical product is Harris Product Group 'Stay -Brite' with 'Staya-Clean' flux.
 - b. Couplings, Tees and elbows in piping mains and branches:
 - 1) Brazed. AWS A5.8/A5.8M BuCP copper/silver/phosphorous alloy, minimum 1485 degree F liquidus.
 - 2) Solder shall be rated for recommended joint clearance of 0.002" to 0.006".
 - 3) Silver content shall be 5-15%, except 6% silver alloys are not acceptable.
 - 4) Typical products are Harris Product Group 'Stay-Silv 15', 'Stay Silv 5' and 'Dynaflow'.

B. Pipe Supports and Anchors:

1. Conform to ASME B31.5.
2. Upper attachments shall not be attached to roof or floor decks. Upper attachments shall be attached to structural members
3. Attachments to joists shall be from top chord only.
4. Hangers for Pipe Sizes 1/2 to 1-1/2 Inch: Malleable iron adjustable swivel, split ring.
5. Hangers for Pipe Sizes 2 Inches and Over: Carbon steel, adjustable, clevis.
6. Multiple or Trapeze Hangers: Steel channels with welded spacers and hanger rods.
7. Wall Support for Pipe Sizes to 3 Inches: Cast iron hook.
8. Vertical Support: Steel riser clamp.
9. Copper Pipe Support: Carbon steel ring, adjustable, copper plated.
10. Hanger Rods: Mild steel threaded both ends, threaded one end, or continuous threaded.
11. Design Working Pressure: 650 psi, minimum
12. UL Listed.

PART 3 EXECUTION

3.1 PREPARATION

- A. Ream pipe and tube ends. Remove burrs.
- B. Remove scale and dirt on inside and outside before assembly.
- C. Prepare piping connections to equipment with flanges or unions.

3.2 INSTALLATION

- A. Install refrigeration specialties in accordance with manufacturer's instructions.
- B. Route piping in orderly manner, with plumbing parallel to building structure, and maintain gradient.
- C. Install piping to conserve building space and avoid interference with use of space.
- D. Group piping whenever practical at common elevations and locations. Slope piping one percent in direction of oil return.
- E. Install piping to allow for expansion and contraction without stressing pipe, joints, or connected equipment.
- F. Pipe Hangers and Supports:

1. Install in accordance with ASME B31.5.
 2. Support horizontal piping as scheduled.
 3. Install hangers to provide minimum 1/2 inch space between finished covering and adjacent work.
 4. Place hangers within 12 inches of each horizontal elbow.
 5. Support vertical piping at every other floor. Support riser piping independently of connected horizontal piping.
 6. Where several pipes can be installed in parallel and at same elevation, provide multiple or trapeze hangers.
 7. Provide copper plated hangers and supports for copper piping.
 8. Upper attachments:
 - a. Provide attachment to upper cord of bar joist or to flanges of steel beams. Attach with beam clamps or other listed devices for this purpose.
 - b. Do not support from roof deck.
 - c. Weights of 15 Lbs. or less may be supported from floor decks.
 - d. Unless otherwise noted, connect pipe supports to structural members only. Where structural members do not occur above piping, provide supports spanning between members. Supports shall be sized for weight to be supported.
- G. Arrange piping to return oil to compressor. Provide traps and loops in piping as recommended by manufacturer or as detailed. Slope horizontal piping 0.40 percent in direction of flow.
- H. Provide clearance for installation of insulation and access to valves and fittings.
- I. Flood piping system with nitrogen when brazing.
- J. Where pipe support members are welded to structural building frame, brush clean, and apply one coat of zinc rich primer to welding.
- K. Insulate piping; refer to Section 23 0719.
- L. Follow ASHRAE Std 15 procedures for charging and purging of systems and for disposal of refrigerant.
- M. Fully charge completed system with refrigerant after testing.

3.3 FIELD QUALITY CONTROL

- A. Test refrigeration system in accordance with ASME B31.5.

- B. Pressure test system with dry nitrogen to 200 psi. Perform final tests at 27 inches vacuum and 200 psi using electronic leak detector. Test to no leakage.
- C. Pressure test for 6 hours minimum duration.
- D. Vacuum test; 500 microns; 15 minutes minimum duration.
- E. Break vacuum with dry nitrogen and re-evacuate to 500 microns a second time.
- F. Break vacuum with dry nitrogen and re-evacuate to 500 microns a third time.
- G. Break vacuum with refrigerant charge.

3.4 SCHEDULES

- A. Hanger Spacing for Copper Tubing.
 - 1. 1/2 inch, 5/8 inch, and 7/8 inch OD: Maximum span, 5 feet; minimum rod size, 1/4 inch.
 - 2. 1-1/8 inch OD: Maximum span, 6 feet; minimum rod size, 1/4 inch.
 - 3. 1-3/8 inch OD: Maximum span, 7 feet; minimum rod size, 3/8 inch.
 - 4. 1-5/8 inch OD: Maximum span, 8 feet; minimum rod size, 3/8 inch.
 - 5. 2-1/8 inch OD: Maximum span, 8 feet; minimum rod size, 3/8 inch.

END OF SECTION

**SECTION 23 3100
HVAC DUCTS AND CASINGS**

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Metal ductwork.
- B. Flexible Ducts.
- C. Ductwork Fabrication.

1.2 RELATED REQUIREMENTS

- A. Section 07 8400 - Firestopping.
- B. Section 09 9123 - Interior Painting: Weld priming, paint or coating.
- C. Section 23 0510 - Mechanical General - Ductwork Shop Drawings.
- D. Section 23 0593 - Testing, Adjusting and Balancing for HVAC.
- E. Section 23 0713 - Duct Insulation: External insulation and duct liner.
- F. Section 23 3300 - Air Duct Accessories.
- G. Section 23 3700 - Air Outlets and Inlets.

1.3 REFERENCE STANDARDS

- A. ASTM A36/A36M - Standard Specification for Carbon Structural Steel; 2014.
- B. ASTM A240/A240M - Standard Specification for Chromium and Chromium-Nickel Stainless Steel Plate, Sheet, and Strip for Pressure Vessels and for General Applications; 2015b.
- C. ASTM A480/A480M - Standard Specification for General Requirements for Flat-Rolled Stainless and Heat-Resisting Steel Plate, Sheet, and Strip; 2015.
- D. ASTM A1008/A1008M - Standard Specification for Steel, Sheet, Cold-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, Solution Hardened, and Bake Hardenable; 2015.
- E. ASTM B209M - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate [Metric]; 2014.
- F. ASTM C443M - Standard Specification for Joints for Concrete Pipe and Manholes, Using Rubber Gaskets (Metric); 2011.
- G. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2015a.

- H. SMACNA (LEAK) - HVAC Air Duct Leakage Test Manual; Sheet Metal and Air Conditioning Contractors' National Association; 1985, First Edition.
- I. SMACNA (DCS) - HVAC Duct Construction Standards Metal and Flexible; 2005.
- J. SMACNA Round Industrial Duct Construction Standards; 1999, 2nd Edition.
- K. SMACNA - Duct Cleanliness for New Construction Guidelines., 2000.
- L. UL 181 - Standard for Factory-Made Air Ducts and Air Connectors; current edition, including all revisions.

1.4 DEFINITIONS

- A. Low Pressure Duct: Duct having Pressure Class of 2-inches or less.

1.5 SUBMITTALS

- A. Refer to Section 23 0510 - General HVAC Requirements for submittal procedures.
- B. Product Data: Provide data for :
 - 1. Duct take-off fittings.
 - 2. Manufactured metal ductwork and fittings.
 - 3. Flexible ducts.
 - 4. Transverse Duct Connection System.
- C. Test Reports: Indicate pressure tests performed. Include date, section tested, test pressure, and leakage rate, following SMACNA (LEAK).
- D. Manufacturer's Installation Instructions: Indicate special procedures for glass fiber ducts.
- E. Project Record Documents: Record actual locations of ducts and duct fittings. Record changes in fitting location and type. Show additional fittings used.

1.6 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing the type of products specified in this section, with minimum three years of documented experience, and approved by manufacturer.
- B. Installer Qualifications: Company specializing in performing the type of work specified in this section, with minimum five years of documented experience.

1.7 FIELD CONDITIONS

- A. Do not install duct sealants when temperatures are less than those recommended by sealant manufacturers.

- B. Maintain temperatures within acceptable range during and after installation of duct sealants.

1.8 DELIVERY, STORAGE, AND PROTECTION(REFER TO DUCT CLEANLINESS LEVEL SPECIFIED IN INSTALLATION)

- A. Store in clean dry place and protect from weather and construction traffic.
- B. Exercise care during construction to prevent the accumulation of dust, dirt, and refuse in the supply and return ductwork.
- C. All openings shall be tightly closed with 8-mil polyethylene when work creating dust and debris is in progress.

PART 2 PRODUCTS

2.1 MATERIALS

- A. Galvanized Steel for Ducts: Hot-dipped galvanized steel sheet, ASTM A653/A653M FS Type B, with G90/Z275 coating.
- B. Provide Paint-Grip finish on exposed galvanized ducts for field painting.
- C. Joint Sealers and Sealants: Non-hardening, water resistant, mildew and mold resistant.
 - 1. Type: Heavy mastic or liquid used alone or with tape, suitable for joint configuration and compatible with substrates, and recommended by manufacturer for pressure class of ducts.
 - 2. VOC Content: Not more than 250 g/L, excluding water.
 - 3. Surface Burning Characteristics: Flame spread index of zero and smoke developed index of zero, when tested in accordance with ASTM E84.
 - 4. Manufacturers:
 - a. Manufacturers (water based): Ductmate Proseal, Hardcast IronGrip 601, Marathon 460, Foster 32-19; Childers CP-146, DuroDyne SAS.
- D. Hanger Rod: ASTM A36/A36M; steel, galvanized; threaded both ends, threaded one end, or continuously threaded.

2.2 DUCTWORK FABRICATION

- A. General:
 - 1. Fabricate and support in accordance with SMACNA HVAC Duct Construction Standards - Metal and Flexible, and as indicated. Provide duct material, gages, reinforcing, and sealing for operating pressures indicated.
- B. Provide duct material, gages, reinforcing, and sealing for operating pressures indicated.

- C. Construct T's, bends, and elbows with radius of not less than 1-1/2 times width of duct on centerline. Where not possible and where rectangular elbows must be used, provide air foil turning vanes of perforated metal with glass fiber insulation.
- D. Provide turning vanes of perforated metal with glass fiber insulation when acoustical lining is indicated.
- E. All dimensions are net inside metal measurements in inches unless otherwise shown.
- F. Duct sizes shown include allowance for liner thickness unless otherwise noted, except sizes shown for lined round spiral and flat oval duct are sizes of perforated inner liner
- G. Transverse Duct Connection System: SMACNA "E" rated rigidly class connection, interlocking angle and duct edge connection system with sealant, gasket, cleats, and corner clips.
- H. Low Pressure Duct- Supply, Return, and Exhaust (2" Class or less):
 - 1. Longitudinal Seams:
 - a. Corner Seams: Fig. 2-2, Type L1 (Pittsburgh Lock).
 - 1) Corner seams for ducts less than 18 inch, L-2 (Button Punch Snap Lock) is acceptable.
 - b. Fig. 2-2, Type L-3 for seams other than corner.
 - 2. Transitions:
 - a. Changes in duct sizes shall be made by transitions.
 - b. Refer to Fig. 4-7, CONCENTRIC TRANSITION, unless otherwise noted.
 - c. Increase duct sizes gradually, not exceeding 15 degrees divergence wherever possible; maximum 30 degrees divergence upstream of equipment and 45 degrees convergence downstream.
 - d. Transitions shall be provided between equipment and duct where sizes are not the same.
 - 3. Rectangular Duct:
 - a. Elbows:
 - 1) Mitered with turning vanes. Type RE 2, Figure 4-2, unless otherwise noted.
 - b. Turning Vanes:
 - 1) Turning vanes shall be in accordance with Figs 4-3 and 4-4, unless otherwise noted.
 - 2) Provide single wall vanes for ducts 18" width or less.

- 3) Provide double wall vanes for ducts over 18" width.
- c. Splits and Tees:
 - 1) Fig. 4-5, Type 1, Type 2 (with stationary splitter), 4A, or 4B only.
 - 2) Use of Square Throat Elbow with Turning Vanes is acceptable, unless otherwise noted.
 - (a) Provide volume control damper in each branch.
 - 3) Omit volume control damper in Return and Exhaust duct unless otherwise noted.
- d. Where acoustical lining is indicated, provide acoustical turning vanes of perforated metal with glass fiber insulation.
4. Round Duct - Manufactured Spiral Duct:
 - a. Elbows: Radius elbow with radius not less than 1-1/2 times width of duct on centerline.
5. Branch and Runout Connections:
 - a. Entry fittings for Return and Exhaust: Construct for a 45 degree entry angle to ease the turbulence created by converging airstreams. Increase the minimum length shown in Fig. 4-6, 45 DEGREE ENTRY, from 4 inch to 6 inch.
 - b. Rectangular Branch or Runout from Rectangular Duct:
 - 1) Fig. 4-6, 45 DEGREE ENTRY, with flange and gasket for connection to trunk with a minimum of six screws.
 - c. Round Branch or Runout from Rectangular Duct:
 - 1) Fig. 4-6, 45 DEGREE LEAD IN, with flange and gasket for connection to trunk with a minimum of six screws.
 - 2) Provide volume control damper with locking quadrant at branch or runout connection.
 - d. Round Branch or Runout from Round Duct:
 - 1) Fig. 3-5, 90 DEGREE tee fitting with 45 DEGREE oval to round tap, unless otherwise noted.
 - 2) Fig. 3-6, CONICAL TEE fitting.
 - e. Rectangular Runout to Sidewall Grille/Register:
 - 1) Fig. 4-6, 45 DEGREE ENTRY, with flange and gasket for connection to trunk with a minimum of six screws.

6. Offsets: Fig. 4-7, Type 1 and Type 3 only, unless otherwise indicated.
7. Dampers: Fig. 7-4, SINGLE BLADE TYPE, or 7-5, MULTIBLADE TYPE.
8. Reinforcement:
 - a. Fabricate ducts in clearance critical areas such as chases and above ceilings to unreinforced standards, Fig. 2-8.
 - 1) Tie Rod Reinforcement is acceptable in Supply, Return, and Exhaust duct only.
 - 2) No screw or rivets are allowed to penetrate ducts.
- I. Field Fabricated Mixing Plenums:
 1. Outer wall to provide pressure class rating scheduled.
 2. Provide 2 inch acoustical lining.
 3. Inner wall to be 20 gauge perforated sheet metal.
 4. For air handling unit mixed air plenums, provide LOCK Type 2, Fig. 7-2M.
- J. Ducts Connecting to Wall Louvers:
 1. Provide sheet metal plenum sealing louver area and connecting duct.
 2. Fabricate in accordance with Fig. 6-1.
 3. Fabricate plenum using same material and pressure class as connecting duct.
 4. Paint exterior side of plenum flat black.

2.3 MANUFACTURED DUCTWORK AND FITTINGS

- A. Manufacture in accordance with SMACNA HVAC Duct Construction Standards - Metal and Flexible, and as indicated. Provide duct material, gages, reinforcing, and sealing for operating pressures indicated.
- B. Round Ducts: Machine made from round spiral lockseam duct.
 1. Manufacture in accordance with SMACNA (DCS).
 2. Machine made from round spiral lockseam duct with light reinforcing corrugations; fittings manufactured of at least two gages heavier metal than duct.
 3. Fittings: Seams shall be fully welded. Tack welding and sealing is not acceptable.
 4. Take-offs: Take-offs to terminal units, etc. shall be tee fittings, except;
 - a. where saddletaps are indicated on Drawings or,

- b. duct manufactured by McKenney's, Inc. may be saddle-tap connections, installed by cutting hole and field welded tap to straight section of duct and sealed.
 - 5. Transformations: Transformations shall comply with lengths indicated in United Metal (McGill Airflow catalogs (maximum of 24" long)
 - 6. Provide relief type access panels (RAP) downstream of all fire dampers and where indicated on drawings
 - 7. Fittings: Manufacture at least two gages heavier metal than duct.
 - 8. Provide duct material, gages, reinforcing, and sealing for operating pressures indicated.
 - 9. Manufacturer-Layout Basis: United McGill Corporation.
 - a. Other Acceptable manufacturers:
 - 1) BH&W Sheetmetal (Atlanta)
 - 2) Dixie Sheet Metal Products.
 - 3) Don Park, Inc.
 - 4) Eastern Sheet Metal.
 - 5) Hamlin Sheet Metal Company.
 - 6) Lindab, Inc.
 - 7) McKenney's, Inc. (Atlanta)
 - 8) Monroe Metals.
 - 9) Semco.
 - 10) South Spiral Pipe, Inc.
- C. Flexible Ducts: UL 181, Class 1, aluminum laminate and polyester film with latex adhesive supported by helically wound spring steel wire.
- 1. Insulation: Fiberglass insulation with polyethylene vapor barrier film.
 - 2. Insulation thickness shall be 1 inch thick, minimum; 3/4 lbs./cu ft, minimum.
 - 3. Pressure Rating: 10 inches WG positive and 1.0 inches WG negative.
 - 4. Maximum Velocity: 4000 fpm.
 - 5. Temperature Range: Minus 20 degrees F to 210 degrees F.
 - 6. Manufacturers:
 - a. Atco Rubber Products, Inc; Model UPC-037: www.atcoflex.com.

- b. Flexible Technologies Group-Thermafex, Inc; Model M-KE: www.thermafex.net
 - c. Flexmaster USA; Model Type 3M: www.flexmasterusa.com.
 - d. Wiremold, Inc; Model WK: www.wiremold.com.
- D. Transverse Duct Connection System: SMACNA "E" rated rigidly class connection, interlocking angle and duct edge connection system with sealant, gasket, cleats, and corner clips in accordance with SMACNA (DCS).
- E. Exposed Spiral Duct:
- 1. Exposed round duct shall be Machine made from round spiral lockseam duct with light reinforcing corrugations with fittings manufactured of at least two gages heavier metal than duct.
 - 2. Size duct lengths to minimize joint connections. All seams shall be fully welded.
 - 3. Spiral seams shall be aligned at duct connections. Provide ribbed fitting elbows to match the appearance of the ribbed spiral duct.
 - 4. Provide factory welded conical manifold taps in lieu of tee fittings. All taps on a single duct section shall be aligned unless otherwise noted.
 - 5. Provide Keating coupling or Spiralmate round duct connector for duct sizes up to 48-inch diameter.
 - 6. Duct sizes larger than 48-inch diameter shall be connected with angle rings with bolts.
 - 7. Duct finish shall be mill phosphatized for field painting. Welds shall be ground smooth.
 - 8. Protect duct from physical damage during shipping and storage. Provide protective covering of corrugated or bubble pack wrapping material.

PART 3 EXECUTION

3.1 INSTALLATION

- A. Install, support, and seal ducts in accordance with SMACNA (DCS).
- B. Install in accordance with manufacturer's instructions.
- C. During construction provide temporary closures of metal or taped polyethylene on open ductwork to prevent construction dust from entering ductwork system.
- D. Duct sizes for lined duct are net metal and include allowance for liner. For unlined duct, sizes are inside clear dimensions.
- E. Duct sizes for runouts to grilles, registers and diffusers shall match the size of the device unless otherwise noted.

- F. Duct Cleanliness level: Advanced Level in accordance with SMACNA Duct Cleanliness for New Construction Guidelines.
- G. Provide openings in ductwork where required to accommodate thermometers and controllers. Provide pilot tube openings where required for testing of systems, complete with metal can with spring device or screw to ensure against air leakage. Where openings are provided in insulated ductwork, install insulation material inside a metal ring.
- H. Locate ducts with sufficient space around equipment to allow normal operating and maintenance activities.
- I. Use double nuts and lock washers on threaded rod supports.
- J. Seal all transverse and longitudinal joints in all metal supply, exhaust and return ducts.
 - 1. Class B seal for pressure class less than 4 in. wg.
- K. Exposed Round & flat oval duct in finished spaces: Size duct lengths to minimize joints. Align spiral seams at joints. Install longitudinal and transverse joints in least visible locations. Apply sealer to female fitting and assemble where sealer is not visible.
- L. Connect diffusers to concealed low pressure ducts with 5 feet maximum length of flexible duct held in place with metal strap or clamp.
- M. Secure flexible ducts to metal ducts with draw bands and metal strap or clamp.

3.2 SCHEDULES

- A. Ductwork Material:
 - 1. Low Pressure Supply: Galvanized Steel.
 - 2. Return and Relief: Galvanized Steel.
 - 3. General Exhaust: Galvanized Steel.
 - 4. Outside Air Intake: Galvanized Steel.
 - 5. Louver Plenums: Galvanized Steel.
- B. Ductwork Pressure Class:
 - 1. Supply System: 2 inch.
 - 2. Return and Relief: 2 inch.
 - 3. General Exhaust: 2 inch negative.
 - 4. Outside Air Intake: 2 inch negative.

END OF SECTION

**SECTION 23 3300
AIR DUCT ACCESSORIES**

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Duct access doors.
- B. Flexible duct connections.
- C. Volume control dampers.

1.2 RELATED REQUIREMENTS

- A. Section 23 0548 - Vibration and Seismic Controls for HVAC Piping and Equipment.
- B. Section 23 3100 - HVAC Ducts and Casings.

1.3 REFERENCE STANDARDS

- A. SMACNA (DCS) - HVAC Duct Construction Standards Metal and Flexible; 2005.

1.4 SUBMITTALS

- A. Refer to Section 23 0510 - General HVAC Requirements for submittal procedures.
- B. Product Data: Provide for shop fabricated assemblies including volume control dampers. Include electrical characteristics and connection requirements.

1.5 QUALITY ASSURANCE

- A. Products Requiring Electrical Connection: Listed and classified by Underwriters Laboratories Inc. as suitable for the purpose specified and indicated.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Protect dampers from damage to operating linkages and blades.

PART 2 PRODUCTS

2.1 DUCT ACCESS DOORS(AP)

- A. Manufacturer: Cesco Model *AD.
- B. Other acceptable manufacturers offering equivalent products: Airstream, Flexmaster Inspector Series, Nailor Industries Model 0800, National Controlled Air ADR, Prefco, Ruskin, Ventlok, Pottorff.
- C. Fabrication:
 - 1. Factory fabricated in accordance with SMACNA (DCS) - HVAC Duct Construction Standards - Metal and Flexible, Figures 7-2, 7-3 and as indicated.

2. Rigid and close-fitting of galvanized steel with sealing gaskets and quick fastening locking devices.
 3. Install minimum 1 inch thick insulation with sheet metal cover for insulated ducts.
 4. Access doors up to 2 inch pressure class:
 - a. Less Than 12 inches Square: Secure with sash locks.
 - b. Up to 18 inches Square: Provide two hinges and two sash locks.
 - c. Up to 24 x 48 inches: Three hinges and two compression latches with outside and inside handles.
 - d. Larger Sizes: Provide an additional hinge.
 5. Fabricate access doors over 2 inch pressure class in accordance with Figure 7-2.
- D. Access doors with sheet metal screw fasteners are not acceptable.

2.2 FLEXIBLE DUCT CONNECTIONS

- A. Fabricate in accordance with SMACNA (DCS) - HVAC Duct Construction Standards - Metal and Flexible, Figures 7-8 and 7-9, and as indicated.
- B. Fabric: UL listed fire-retardant neoprene coated woven glass fiber fabric to NFPA 90A, minimum density 30 oz per sq yd.
 1. Net Fabric Width: Approximately 2 inches wide.
 2. Metal: 3 inches wide, 24 gage, 0.0239 inch thick galvanized steel.

2.3 VOLUME CONTROL DAMPERS (MVD).

- A. Manufacturer: Ruskin MD35.
- B. Other acceptable manufacturers offering equivalent products: Airstream, Arrow, Greenheck, Nailor Industries, National Controlled Air, Prefco, Pottorff.
- C. Single Blade Dampers: Figure 7-4. Fabricate for duct sizes up to 6 x 30 inch.
- D. Multi-Blade Damper: Figure 7-5. Fabricate of opposed blade pattern with maximum blade sizes 8 x 48 inch long. Assemble center and edge crimped blades in galvanized channel frame with suitable hardware; 16 gauge, minimum, steel channel frame with blade stops top and bottom; 16 gauge steel blades with formed edge groove to have 3/8 inch interlock between adjacent blades, with 1/2 inch diameter cadmium plated shaft extended 6 inches beyond frame and blade linkage.
- E. End Bearings: Except in round ducts 12 inches and smaller, provide end bearings. On multiple blade dampers, provide oil-impregnated nylon or sintered bronze bearings.
- F. Quadrants:

1. Provide locking, indicating quadrant regulators on single and multi-blade dampers.
2. On insulated ducts mount quadrant regulators on stand-off mounting brackets, bases, or adapters.
3. Where rod lengths exceed 30 inches provide regulator at both ends.

PART 3 EXECUTION

3.1 INSTALLATION

- A. Install accessories in accordance with manufacturer's instructions, NFPA 90A, and follow SMACNA (DCS). Refer to Section 23 3100 for duct construction and pressure class.
- B. Duct Access Doors:
 1. Provide duct access doors for inspection and cleaning before automatic dampers and controls devices and elsewhere as indicated for service access or cleaning access.
 2. Provide minimum 8 x 8 inch size for hand access, 18 x 18 inch size for shoulder access, and as indicated. Provide 4 x 4 inch for balancing dampers only. Review locations prior to fabrication.
- C. Label access doors as required by IMC.
- D. Provide flexible connections immediately adjacent to equipment in ducts associated with fans and motorized equipment, and supported by vibration isolators. Refer to Section 23 0548.
 1. Do not install on air handling units with factory flexible connections on fan.
 2. Do not install on curb mounted fans or curb mounted range fans.
- E. Provide balancing dampers at points on supply, return, and exhaust systems where branches are taken from larger ducts as required for air balancing. Install minimum 2 duct widths from duct take-off.
- F. Volume Control Dampers:
 1. Install where shown on drawings or required by details.
 2. Lock all volume control dampers in the full open position for adjustment by the TAB agency.

END OF SECTION

**SECTION 23 3423
HVAC POWER VENTILATORS**

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Roof exhausters.
- B. Ceiling exhaust fans.

1.2 RELATED REQUIREMENTS

- A. Section 23 0513 - Motors for HVAC Equipment.
- B. Section 26 0583 - Wiring Connections: Electrical characteristics and wiring connections.

1.3 REFERENCE STANDARDS

- A. AMCA 261 - Directory of Products Licensed to Use the AMCA Certified Ratings Seal; Air Movement and Control Association International, Inc.;
<http://www.amca.org/licenses/search.aspx>.
- B. NEMA MG 00001 - Motors and Generators; 2024.
- C. UL 705 - Power Ventilators; Current Edition, Including All Revisions.

1.4 SUBMITTALS

- A. Refer to Section 23 0510 - General HVAC Requirements for submittal procedures.
- B. Product Data: Provide data on fans and accessories including fan curves with specified operating point clearly plotted, power, RPM, sound power levels at rated capacity, and electrical characteristics and connection requirements.
- C. Manufacturer's Instructions: Indicate installation instructions.
- D. Maintenance Data: Include instructions for lubrication, motor and drive replacement, spare parts list, and wiring diagrams.

1.5 QUALITY ASSURANCE

- A. Products Requiring Electrical Connection: Listed and classified by Underwriters Laboratories Inc. as suitable for the purpose specified and indicated.

1.6 DELIVERY, STORAGE, AND PROTECTION

- A. Refer to Section 23 0510 - General HVAC Requirements for delivery, storage and protection requirements.
- B. Do not operate units until ductwork is clean, filters are in place, bearings lubricated, and fan has been test run under observation.

1.7 FIELD CONDITIONS

- A. Permanent ventilators may be used for ventilation during construction only after ductwork is clean, filters are in place, bearings have been lubricated, and fan has been test run under observation.

PART 2 PRODUCTS

2.1 POWER VENTILATORS - GENERAL

- A. Static and Dynamically Balanced: AMCA 204 - Balance Quality and Vibration Levels for Fans.
- B. Performance Ratings: Determined in accordance with AMCA 210 and bearing the AMCA Certified Rating Seal.
- C. Sound Ratings: AMCA 301, tested to AMCA 300 and bearing AMCA Certified Sound Rating Seal.
- D. Fabrication: Conform to AMCA 99.
- E. UL Compliance: UL listed and labeled, designed, manufactured, and tested in accordance with UL 705.
- F. Electrical Components: Listed and classified by Underwriters Laboratories Inc. as suitable for the purpose specified and indicated.

2.2 ROOF EXHAUSTERS (RF)

- A. Manufacturers: Acme PL, Breidert S, Cook HLC, Greenheck LB, PennBarry LC.
- B. Fan Unit: V-belt or Direct driven as indicated, with low silhouette spun aluminum housing hinged for servicing with stainless steel restraining cables; resilient mounted motor; 1/2 inch mesh, 0.62 inch thick aluminum wire birdscreen; square base to suit roof curb with continuous curb gaskets.
- C. Roof Curb: Curb height shall provide 8 inch clear above roofing, of galvanized steel with continuously welded seams, built-in cant strips, insulation and curb bottom, and factory installed nailer strip.
- D. Disconnect Switch: Factory wired, non-fusible, in housing for thermal overload protected motor . Provide NEMA 1 housing for interior locations and NEMA 3R for exterior locations.
- E. Backdraft Damper: Gravity actuated, aluminum multiple blade construction, felt edged with offset hinge pin, nylon bearings, blades linked.
- F. Direct Drive Units: Provide solid state speed controller on direct driven fans.
- G. Drive and Sheaves: Drives rated at 1.5 time motor HP, minimum. Cast iron or steel sheaves, dynamically balanced, bored to fit shafts and keyed; variable and adjustable pitch motor sheave selected so required rpm is obtained with sheaves set at mid-position; fan shaft with self-aligning pre-lubricated ball bearings.

2.3 CABINET(CAB) AND CEILING(CLG) EXHAUST FANS

- A. Manufacturers: Acme V, Carnes VCDB, Cook Gemini, Greenheck SP, Jenn J, PennBarry Z, Powerline CF, Rupp CF, Twin City TCTB.
- B. Motor: Refer to Section 23 0513.
- C. Centrifugal Fan Unit: Direct driven unless noted otherwise with galvanized steel housing lined with acoustic insulation, resilient mounted motor, gravity backdraft damper in discharge.
- D. Disconnect Switch: Cord and plug in housing for thermal overload protected motor and wall mounted switch.
- E. Capacity Control: Solid State speed controller mounted on/in fan housing.
- F. Grille for ceiling mounted fan(s): Molded white plastic.
- G. Service Access: Removable grille for ceiling mounted fan(s) or access panel for inline cabinet fan(s).
- H. Sheaves: Cast iron or steel, dynamically balanced, bored to fit shafts and keyed; variable and adjustable pitch motor sheaves selected so required rpm is obtained with sheaves set at mid-position; fan shaft with self-aligning pre-lubricated ball bearings.

PART 3 EXECUTION

3.1 PREPARATION

- A. Seal all duct roof penetrations at roof structure air-tight.
- B. Ensure exhaust duct is clean and free of debris.

3.2 INSTALLATION

- A. Install in accordance with manufacturer's instructions.
- B. Secure roof exhausters with stainless steel lag screws to roof curb.
- C. Extend ducts to roof exhausters into roof curb. Counterflash duct to roof opening.
- D. Suspended Fans:
 - 1. Install fans with resilient mountings and flexible electrical leads. Refer to Section 23 0548.
 - 2. Install flexible connections specified in Section 23 3300 between fan and ductwork. Ensure metal bands of connectors are parallel with minimum one inch flex between ductwork and fan while running.
- E. Provide a second adjustable sheave to place belt at mid-position of sheave at RPM required for final air balance.
- F. Install backdraft dampers on inlet to roof and wall exhausters.

G. Provide backdraft dampers on outlet from cabinet and ceiling exhauster fans and as indicated.

3.3 STARTING EQUIPMENT

A. Adjust for proper operation within manufacturer's published tolerances.

B. Demonstrate proper operation of equipment to the Owner 's designated representative.

3.4 SCHEDULES

A. Refer to Schedule on Drawings.

END OF SECTION

**SECTION 23 3700
AIR OUTLETS AND INLETS**

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Diffusers
- B. Registers/grilles

1.2 SUBMITTALS

- A. Refer to Section 23 0510 - General HVAC Requirements for submittal procedures.
- B. Product Data: Provide data for equipment required for this project. Review outlets and inlets as to size, finish, and type of mounting prior to submission. Submit schedule of outlets and inlets showing type, size, location, application, and noise level.

PART 2 PRODUCTS

2.1 RECTANGULAR LOUVERED FACE (RLF1) CEILING DIFFUSERS

- A. Manufacturer: Titus Model TMS.
- B. Other acceptable manufacturers offering equivalent products:
 - 1. Nailor Model RNS.
 - 2. Carnes Model SJTA.
 - 3. Price Model RCDA.
 - 4. Krueger Model SH-FR23.
 - 5. Metalaire Model 5700.
 - 6. Tuttle & Bailey Model 'S1200'
- C. Type: Square and rectangular, adjustable pattern, multi-louvered diffuser with round neck duct connection and rod mounted air pattern deflectors as required by pattern indicated on floor plans.
- D. Frame: Surface Mount, Snap-In, Inverted T-Bar(Lay-in), or Spline type to match ceiling. Refer to schedule on Drawings. A rapid mount plaster sub-frame may be substituted to convert a Lay-in frame for use in a sheetrock or plaster ceiling provided that the diffuser & frame match the face size specified.
- E. Fabrication: Diffusers shall be constructed of 24 gauge steel or 0.04 aluminum and shall have a finish as scheduled.
- F. Dimensions:

1. The diffuser neck shall have a minimum 1 1/8-inch depth for duct connection.

G. Accessories:

1. Radial opposed blade damper adjustable from diffuser face as scheduled on drawings.

2.2 CEILING GRID CORE EXHAUST AND RETURN REGISTERS/GRILLES (CGC)

A. Manufacturer: Titus Model 50F

B. Other acceptable manufacturers offering equivalent products:

1. Anemostat GC5
2. Carnes RAPAF
3. Price 80
4. Krueger RA
5. Nailor 51EC.
6. MetalAire CC5
7. Tuttle & Bailey CRE500

C. Type: Fixed grilles of 1/2 x 1/2 x 1/2 inch eggcrate grid core.

D. Fabrication: Aluminum with factory off-white enamel finish.

E. Frame: 1-1/4 inch margin with countersunk screw mounting.

F. Damper: Integral, gang-operated, opposed blade type with removable key operator, operable from face.

PART 3 EXECUTION

3.1 INSTALLATION

A. Install in accordance with manufacturer's instructions.

B. Check location of outlets and inlets and make necessary adjustments in position to conform with architectural features, symmetry, and lighting arrangement.

C. Install diffusers to ductwork with air tight connection.

3.2 AIR OUTLET AND INLET SCHEDULE

A. Refer to Schedule on Drawings.

END OF SECTION

**SECTION 23 4000
HVAC AIR CLEANING DEVICES**

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Disposable, extended area panel filters.
- B. Disposable panel filters.

1.2 RELATED SECTIONS

- A. Section 23 0510 - General HVAC Requirements - Space Conditioning during construction and building flushout.

1.3 REFERENCE STANDARDS

- A. ASHRAE Std 52.2 - Method of Testing General Ventilation Air-Cleaning Devices for Removal Efficiency by Particle Size; 2012, with 2015 amendments.
- B. UL 900 - Standard for Air Filter Units; Current Edition, Including All Revisions.

1.4 SUBMITTALS

- A. Refer to Section 23 0510 - General Mechanical Requirements for submittal procedures.
- B. Product Data: Provide data on filter media, filter performance data, filter assembly and filter frames, dimensions, motor locations and electrical characteristics and connection requirements.
- C. Shop Drawings: Indicate filter assembly and filter frames, dimensions, motor locations, and electrical characteristics and connection requirements.
- D. Manufacturer's Installation Instructions: Indicate assembly and change-out procedures.
- E. Operation and Maintenance Data: Include instructions for operation, changing, and periodic cleaning.
- F. Maintenance Materials: Furnish the following for the Owner's use in maintenance of project.
 - 1. See Section 01 6000 - Product Requirements, for additional provisions.
 - 2. Provide filters whenever any system is operated during construction. Refer to Section 23 0510.
 - 3. For every system requiring filters;
 - a. Provide and install one set of new disposable panel filters at Material Completion.
 - b. Provide one set of spare disposable panel filters at Material Completion.

1.5 QUALITY ASSURANCE

- A. Products Requiring Electrical Connection: Listed and classified by Underwriters Laboratories Inc. as suitable for the purpose specified and indicated.

PART 2 PRODUCTS

2.1 DISPOSABLE, EXTENDED AREA PANEL FILTERS (EAPF)

- A. Manufacturers: American Air Filter Prepleat HC, Air Guard, CamFil-Farr 30/30, Purolator.
- B. Media: UL 900 Class 2, pleated, lofted, non-woven, reinforced synthetic media; supported and bonded to welded wire grid .
 - 1. Frame: Cardboard.
 - 2. Nominal size: 24 x 24 inches.
 - 3. Nominal thickness: 2 inches.
- C. Minimum Efficiency Reporting Value (MERV): 8, when tested in accordance with ASHRAE Std 52.2.
- D. Initial resistance at 500 fpm face velocity: 0.20 in-wc.
- E. Recommended final resistance: 0.9 inch WG.

2.2 DISPOSABLE PANEL FILTERS

- A. Media: UL 900 Class 2, fiber blanket, factory sprayed with flameproof, non-drip, non-volatile adhesive.
 - 1. Thickness: 1 inch.
- B. Performance Rating:
 - 1. Face Velocity: 500 FPM.
 - 2. Initial Resistance: 0.15 inch WG.
 - 3. Recommended Final Resistance: 0.50 inches WG.
- C. Minimum Efficiency Reporting Value (MERV): 8, when tested in accordance with ASHRAE Std 52.2.
- D. Casing: Cardboard frame.

PART 3 EXECUTION

3.1 INSTALLATION

- A. Install air cleaning devices in accordance with manufacturer's instructions.

- B. Prevent passage of unfiltered air around filters with felt, rubber, or neoprene gaskets.
- C. Do not operate fan system until filters (temporary or permanent) are in place. Replace temporary filters used during construction and testing, with clean set.

3.2 SCHEDULES

- A. Provide filter media for Units specified in sections 23 7423, and 23 7425.

END OF SECTION

**SECTION 23 7423
PACKAGED AIR CONDITIONING UNITS**

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Packaged Air Conditioning Units
- B. Unit Controls

1.2 RELATED SECTIONS

- A. Section 22 0513 - Motors for Mechanical Equipment
- B. Section 23 0913 - Instrumentation and Control Devices for HVAC
- C. Section 23 0994 - HVAC Sequence of Operation
- D. Section 23 3100 - HVAC Ducts and Casings
- E. Section 26 2717 - Equipment Wiring: Electrical characteristics and wiring connections

1.3 REFERENCES

- A. ARI 210/240 - Unitary Air-Conditioning and Air-Source Heat Pump Equipment; Air-Conditioning and Refrigeration Institute; 2005.
- B. ASHRAE Std 90.1 - Energy Efficient Design of New Buildings Except Low-Rise Residential Buildings; American Society of Heating, Refrigerating and Air-Conditioning Engineers, Inc.; 2007.
- C. ARI 270 - Sound Rating of Outdoor Unitary Equipment; Air-Conditioning and Refrigeration Institute; 1995.
- D. NFPA 90A - Standard for the Installation of Air Conditioning and Ventilation Systems; National Fire Protection Association; 2002.

1.4 SUBMITTALS

- A. Refer to Section 23 0510 - General Mechanical Requirements for submittal procedures.
- B. Product Data: Provide capacity and dimensions of manufactured products and assemblies required for this project. Indicate electrical service with electrical characteristics and connection requirements, and duct connections.
- C. Shop Drawings: Indicate capacity and dimensions of manufacturer products and assemblies required for this project.
 - 1. Indicate electrical characteristics and connection requirements and duct connections.

2. Provide shop drawings showing rooftop equipment curb and duct arrangement proposed by the contractor when the rooftop unit arrangement is different from the layout basis.
 3. If the contractor's proposed equipment results in an arrangement different than that shown, the contractor shall coordinate structural support members beneath unit(s) with the Design Professional.
- D. Manufacturer's Instructions: Indicate assembly, support details, connection requirements and include start-up instructions.
- E. Operation and Maintenance Data: Include manufacturers descriptive literature, operating instructions, installation instructions, maintenance and repair data and parts listing.
- F. Warranty: Submit manufacturer's warranty and ensure that all forms have been filled out in the Owner's name and registered with the manufacturer.
- G. Certificate: Provide Manufacturer's Certificate in accordance with the requirements of the General Conditions.

1.5 QUALITY ASSURANCE

- A. Products Requiring Electrical Connection: Listed and classified by UL as suitable for the purpose specified and indicated.

1.6 DELIVERY, STORAGE, AND PROTECTION

- A. Protect units from physical damage by storing off-site until roof mounting curbs are in place and ready for immediate installation.

1.7 WARRANTY

- A. See Section 01 7800 - Closeout Submittals, for additional warranty requirements.
- B. Provide five-year manufacturer warranty to include coverage for refrigeration compressors.

1.8 EXTRA MATERIALS

- A. See Section 01 6000 - Product Requirements, for additional provisions.
- B. Provide one set of disposable panel filters at Material Completion.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Acceptable Manufacturers:
1. Carrier
 2. Daikin
 3. Trane

4. JCI

2.2 AIR CONDITIONING UNITS

- A. Packaged single zone Air Conditioning unit designed for grade mounting with horizontal discharge and return air openings, assembled in a housing with the following:
 1. Centrifugal blower fan section.
 2. DX cooling section.
 3. Filter section.
 4. Outside Air Intake/Mixed Air section.
 5. Relief Air section.
 6. Compressor section.
 7. Condenser section.
 8. Hot Gas Reheat Coil section
 9. Electric Heat section
 10. Dampers and actuators.
 11. Refrigeration and temperature controls.
 12. Discharge Curb.
- B. Units shall have Energy Efficiency Rating (EER)/Coefficient of Performance (COP) not less than prescribed by ASHRAE Std 90.1.

2.3 FABRICATION

- A. Cabinet: Steel with baked enamel finish, including access doors with piano hinges and locking handle. Structural members shall be minimum 18 gage, with access doors or panels of minimum 20 gage.
- B. Insulation: 1-inch thick insulated bottom of cabinet, and 1-inch thick fiberglass insulated sides and top of cabinet. Insulation shall be neoprene coated glass fiber with edges protected from erosion.
- C. Heat Exchangers: Stainless steel, of welded construction.
- D. Supply Fan: Variable speed, forward curved centrifugal type, resiliently mounted with direct drive or V-belt drive, adjustable variable pitch motor pulley, and rubber isolated hinge mounted high efficiency motor. If belt drive, belts shall be cogged, molded-notch construction.
- E. Variable Frequency Drive: Refer to Section 23 0514.

- F. Air Filters (EAPF): 2-inch deep disposable, extended area panel filters. Refer to Section 23 4000.
- G. Drain Pan: Condensate drain pans shall be water tight welded stainless steel pitched for flow to drain connection. Pan shall be insulated with 1/2-inch thick minimum closed cell rigid foamed insulation secured with waterproof adhesive, or foamed in place.
- H. Casing or protective guard shall protect condenser coil return bends and fins from damage.

2.4 EVAPORATOR COIL

- A. Multiple-circuited DX evaporator coils of aluminum finned copper tubes, connected to a condensing unit section containing vibration isolated hermetic motor compressor(s), crankcase heater, discharge temperature limiter, current and temperature sensing motor overloads, condenser fans and coil.
- B. Coils shall be sized for maximum of 500 FPM face velocity.

2.5 HOT GAS REHEAT COIL

- A. Provide copper tube aluminum fin coil assembly with connection where scheduled.

2.6 COMPRESSOR

- A. Provide two-stage hermetic scroll compressors, 3600 rpm maximum, resiliently mounted with positive lubrication, crankcase heater, high and low pressure safety controls, motor overload protection, suction and discharge service valves and gage ports.
- B. Five minute stop to restart circuit to delay compressor start.

2.7 CONDENSER COIL

- A. Provide copper tube aluminum fin coil assembly with subcooling rows and coil guard.
- B. Provide direct drive propeller fans, resiliently mounted with fan guard, motor overload protection, wired to operate with compressor. Provide high efficiency fan motors.

2.8 REFRIGERANT CIRCUIT

- A. Provide each multiple compressor unit with two independent refrigerant circuits, factory supplied and piped. Refrigerant charge shall be R-410a.
- B. For each refrigerant circuit, provide:
 - 1. Filter dryer .
 - 2. Liquid line sight glass and moisture indicator.
 - 3. Thermal expansion valve for maximum operating pressure.
 - 4. Insulated suction line.

5. Hot gas reheat valve and controls where scheduled.
6. Charging valve.

2.9 ELECTRIC HEATING COIL

- A. Helical nickel-chrome resistance wire coil heating elements with refractory ceramic support bushings easily accessible with automatic reset thermal cut-out, built-in magnetic contactors and terminal block mounted in a heater control box with integral fusing, control circuit transformer and fuse, airflow proving device, and toggle switch (pilot duty),

2.10 MIXED AIR SECTION

- A. Dampers: Provide outside and return air dampers with damper operator and control package to automatically vary outside air quantity for economizer operation. Outside air damper to fail to closed position.
- B. Dampers (Return Air/Outside Air/Relief Air Section): Provide adjustable barometric relief damper and control dampers required for 100 % outside air economizer operation with relief air through unit. Dampers shall be low leak type with maximum leakage of 10 cfm/sq. ft. at 1-inch pressure difference.

2.11 SAFETY CONTROLS

- A. Provide safety controls arranged so any one will shut down unit and require manual reset:
 1. High discharge pressure switch for each compressor.
 2. Low suction pressure switch for each compressor.
 3. Oil pressure switch.
 4. Firestat in R.A. duct.
 5. Smoke detector in supply air duct.

2.12 OPERATING CONTROLS

- A. General: Unit control system shall be a factory-supplied, direct digital electronic integrated system with equipment manufacturer solely responsible.
- B. Locate controls in a NEMA ICS 6 weatherproof steel control cabinet separated from power wiring and other components. Provide an LED display indicating the status of all serial communication, error messages, power status, and all digital output and analog input points.
- C. RTU Start-Stop: The BAS system shall provide a signal to start-stop the RTU.
- D. Supply fan modulation: Provide a variable frequency controller meeting the requirements of Section 15068. BAS vendor shall provide a signal for fan modulation and monitor VFD status.

- E. Minimum outside air: The BAS system shall provide a signal indicating the building is occupied. The RTU controls shall open the normally closed outdoor air damper and modulate the damper under control of an air quality sensor to modulate the outside air up to the maximum specified to maintain indoor air quality.
- F. Space Temperature Control: Room temperature sensor stages compressors, reheat coil, and electric heater in sequence to maintain room temperature setpoint.
- G. Provide low ambient control kit to allow cooling operation down to 0 degrees F ODT.
- H. Furnish BACnet communication protocol for interface with the BAS.

2.13 POWER WIRING

- A. Locate power wiring in a NEMA ICS 6 weatherproof steel cabinet separated from controls and other components.
- B. Provide factory wired units with a single point of electrical connection.
- C. Provide across-the-line starter, non-recycling compressor overload, starter relay for each compressor. Provide manual reset current overload protection.
- D. Provide starter relay for each condenser fan and motor with built-in overload protection.
- E. Provide a surge capacitor and lightning arrestor in starter cabinet for protection from power surges due to lightning and switching transients.
- F. Ground shall be #6 A.W.G. Provide separate driven ground for ground units.
- G. Provide motor protector.
- H. Control Power Transformers: 120 volt secondary. 45 VA minimum. Provide fused primary, secondary, and bond unfused leg of secondary to enclosure.
- I. Disconnect Switch: Factory mount disconnect switch on power cabinet. Switch shall be accessible without the use of tools.
- J. Receptacle: Provide prewired GFI protected 120 volt service power receptacle.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify that area on site is ready for installation of unit for mounting on a concrete pad.
- B. Verify that proper power supply is available.

3.2 INSTALLATION

- A. Install in accordance with manufacturer's instructions.
- B. Install in accordance with NFPA 90A.

- C. Route copper evaporator condensate piping, full size, thru trap as detailed on Drawings to drywell.

3.3 STARTING EQUIPMENT

- A. Provide manufacturer's field representative to prepare and start equipment.
- B. Adjust for proper operation within manufacturer's published tolerances.
- C. Provide start-up certificate in accordance with the General Conditions.

3.4 CLOSEOUT ACTIVITIES

- A. Demonstrate proper operation and maintenance of equipment to the Owner's designated representatives.
- B. Provide the services of the manufacturer's field representative to conduct training.

3.5 SCHEDULES

- A. Capacities shall not be less than scheduled at 95 F ODT.
- B. Total GTH and Sensible capacities shown are the minimum.
- C. Refer to the Schedule on Project Drawings.

END OF SECTION

**SECTION 23 7425
PACKAGED DEDICATED OUTSIDE AIR UNITS**

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Packaged Dedicated Outside Air System
- B. Unit Controls.

1.2 RELATED REQUIREMENTS

- A. Section 23 0513 - Common Motor Requirements for HVAC Equipment.
- B. Section 23 0514 - Variable Frequency Controllers.
- C. Section 23 0913 - Instrumentation and Control Devices for HVAC
- D. Section 23 0994 - HVAC Sequence of Operation
- E. Section 23 3100 - HVAC Ducts and Casings
- F. Section 23 4000 - HVAC Air Cleaning Devices: Filters.
- G. Section 26 2717 - Equipment Wiring: Electrical characteristics and wiring connections.

1.3 REFERENCE STANDARDS

- A. AHRI 210/240 - Standard for Performance Rating of Unitary Air Conditioning and Air-Source Heat Pump Equipment; Air-Conditioning, Heating, and Refrigeration Institute; 2008.
- B. AHRI 270 - Sound Rating of Outdoor Unitary Equipment; Air-Conditioning, Heating, and Refrigeration Institute; 2008.
- C. AHRI 520 - Performance Rating of Positive Displacement Condensing Units; Air-Conditioning, Heating, and Refrigeration Institute; 2004.
- D. ASHRAE Std 23 - Methods of Testing for Rating Positive Displacement Refrigerant Compressors and Condensing Units; American Society of Heating, Refrigerating and Air-Conditioning Engineers, Inc.; 2005.
- E. ASHRAE Std 90.1 - Energy Standard for Buildings Except Low-Rise Residential Buildings; American Society of Heating, Refrigerating and Air-Conditioning Engineers, Inc.; 2007. (ANSI/ASHRAE/IESNA Std 90.1).
- F. NEMA MG 1 - Motors and Generators; National Electrical Manufacturers Association; 2009, Revision 1 - 2010.
- G. NFPA 70 - National Electrical Code; National Fire Protection Association ; 2023 Edition with 2026 Georgia Amendments.

1.4 SUBMITTALS

- A. Refer to Section 23 0510 - General Mechanical Requirements for submittal procedures.
- B. Product Data: Provide capacity and dimensions of manufactured products and assemblies required for this project. Indicate electrical service with electrical characteristics and connection requirements, gas piping service and connection requirements, and duct connections.
- C. Controls Data:
 - 1. The control submittal is to include schematic control drawings showing the configuration of new units, the location of all sensors, monitoring inputs, and controlled devices and any equipment that the control system monitors, enables or controls, even if the equipment is primarily controlled by packaged or integral controls.
 - 2. Sequences of Operation: Include a narrative of the system operation, and the sequences of operation for packaged controlled equipment, and what points are control points and are adjustable.
- D. Manufacturer's Instructions: Indicate assembly, support details, connection requirements and include start-up instructions.
- E. Operation and Maintenance Data: Include manufacturers descriptive literature, operating instructions, installation instructions, maintenance and repair data and parts listing.
- F. Warranty: Submit manufacturers warranty and ensure that all forms have been filled out in the Owner's name and registered with the manufacturer.
- G. Certificate: Provide Manufacturer's Certificate in accordance with the requirements of the General Conditions.

1.5 REGULATORY REQUIREMENTS

- A. Conform to NFPA 70.
- B. Products Requiring Electrical Connection: Listed and classified by Underwriters Laboratories Inc., as suitable for the purpose specified and indicated.

1.6 DELIVERY, STORAGE, AND PROTECTION

- A. Protect units from physical damage by storing until concrete support pad is in place and ready for immediate installation.
- B. Store unit under cover and elevated above grade.

1.7 WARRANTY

- A. See Section 01 7800 - Closeout Submittals, for additional warranty requirements.
- B. Provide five-year manufacturer warranty to include coverage for refrigeration compressors.

1.8 EXTRA MATERIALS

- A. Provide one set of disposable panel filters at Material Completion.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Layout Basis: Greenheck.
- B. Other Acceptable Manufacturers:
 - 1. Aaon, Inc.
 - 2. Venmar.
 - 3. CaptiveAire
 - 4. Trane

2.2 DESCRIPTION

- A. Packaged, single zone outside air unit, assembled in a housing and suspended with horizontal discharge duct arrangement with the following:
 - 1. Centrifugal blower fan section.
 - 2. DX cooling/dehumidification coil.
 - 3. Hot gas reheat coil.
 - 4. Electric heat coil.
 - 5. Filter section.
 - 6. Air intake section.
 - 7. Mixed Air section.
 - 8. Compressor section.
 - 9. Condenser section and fans.
 - 10. Dampers and actuators.
 - 11. Refrigeration and temperature controls.
- B. Units shall have Energy Efficiency Rating (EER)/Coefficient of Performance (COP) not less than prescribed by ASHRAE Std 90.1.

2.3 FABRICATION

- A. Unit shall be completely factory assembled, piped and wired and shipped in one section.

- B. Unit shall be specifically designed for outdoor application with a fully weatherproof cabinet and pitched roof assembly.
- C. Cabinets shall be double wall construction of G90 galvanized steel with the exterior constructed of min. 22 gauge, interior panels of minimum 22 gauge.
- D. Cabinet shall be entirely double-wall construction with foam injected or fiberglass insulation, minimum 2-in. thick panels. There shall be no exposed insulation in the airstream.
- E. Unit specific color coded wiring diagrams shall match the unit color coded wiring and will be provided in both point-to-point and ladder form.
- F. Diagrams shall also be laminated in plastic and permanently affixed inside the control compartment.
- G. Access to filters, fans, coils, heating section, and other items needing periodic checking or maintenance shall be through access panels.
- H. All access doors shall be double wall insulated similar to cabinet wall construction.
- I. Unit shall have decals and tags to indicate unit lifting and rigging, service areas and caution areas. Installation and maintenance manuals shall be supplied with each unit.
- J. Plenum Curb:
 - 1. If required, provide a supply plenum mounted under the air unit to allow side supply air delivery.
 - 2. Plenum shall be 24-in. high insulated galvanized steel double-wall construction, minimum 2-inch thickness. Exterior seams shall be fully welded.

2.4 SUPPLY FANS:

- A. Type: V-Belt driven with permanently lubricated bearings, double width, double inlet, forward curved centrifugal fan.
- B. Performance Ratings: Conform to AMCA 210 and label with AMCA Certified Rating Seal.
- C. Sound Ratings: AMCA 301; tested to AMCA 300 and label with AMCA Certified Sound Rating Seal.
- D. Mounting: Locate fan and motor internally on welded steel base coated with corrosion resistant paint. Provide access to fan sections through access panels
- E. Blowers, drives and motors shall be dynamically balanced.
- F. Provide a factory installed variable frequency drive (VFD).
- G. Motors shall be thermally protected and premium efficiency.

2.5 OUTSIDE AIR SECTION:

- A. The outside air damper assemblies shall be constructed of extruded aluminum, hollow core, air foil blades with rubber edge seals and aluminum end seals. Damper blades shall be gear driven and designed to have no more than 25 CFM of leakage per sq. ft. of damper area when subjected to 2 in. w.g. air pressure differential across the damper.
- B. Damper motors shall be spring return to ensure closing of outdoor air damper during periods of unit shut down or power failure.

2.6 FILTERS:

- A. Supply Air: EAPF - 2" thick fiberglass pleated, MERV-8.

2.7 EVAPORATOR COIL AND HOT GAS REHEAT COIL:

- A. Coils shall be copper tube with aluminum fins mechanically bonded to the tubes.
- B. Coils shall have galvanized end casings.
- C. Coils shall have equalizing type vertical tube headers.
- D. Coils shall be furnished with a thermostatic expansion valve.
- E. Coils shall be furnished with a double sloped stainless steel drain pan for the positive drainage of condensate.
- F. Provide minimum of 6-in. separation between the evaporator coil and HGR coil.
- G. Electro-Coil Coating: Evaporator finned tubed coil shall be protected with a flexible cationic epoxy electrocoat uniformly applied to all coil surface areas without material bridging between fins.

2.8 REFRIGERATION SYSTEM:

- A. Compressors shall be hermetic digital scroll type with internal thermal overload protection and mounted on the compressor manufacturer's recommended rubber vibration isolators. Each compressor shall have independent refrigerant circuits.
- B. System shall be equipped with thermostatic expansion valve type refrigerant flow control, located at air handling unit.
- C. System shall be equipped with head pressure control, and automatic reset low pressure and manual reset high-pressure refrigerant controls.
- D. Unit shall be equipped with Schrader type service fittings on both the high side and low-pressure sides of the system.
- E. Unit shall be equipped with refrigerant liquid line driers.
- F. Unit shall have holding charge of refrigerant, R-410A.

- G. The following features shall be provided:
1. Each compressor shall be individually staged for capacity control.
 2. All circuits shall be equipped with liquid line sight glasses.
 3. Unit shall be provided with a hot gas reheat coil with modulating hot gas reheat control valve.
 4. Unit shall be equipped with a 5 minute anti-short cycle delay timer for each stage.
 5. Each compressor shall be equipped with suction and discharge service valves.

2.9 ELECTRIC HEAT SECTION:

- A. Unit shall include an electric heating section complete with fuses, and a resettable high temperature limit switch with capacity as scheduled.
- B. Helical nickel-chrome resistance wire coil heating elements with refractory ceramic support bushings easily accessible with automatic reset thermal cut-out, built-in terminal block mounted in a heater control box with integral fusing, control circuit transformer and fuse, airflow proving device, and toggle switch (pilot duty). Provide SCR heater controller.

2.10 AIR COOLED CONDENSER SECTION

- A. The condenser coil shall be configured for draw-thru airflow for uniform air distribution across the coil face. Coil shall be made with continuous plate type aluminum fin with copper tubes. All coils shall be factory leak checked under pressure.
- B. Corrosion protection: Provide electro-coil coating on condenser coil.
- C. Condenser fans shall be incorporate fully drawn fan venturi with vertical air discharge.
- D. Fan motor shall be totally enclosed (TEFC) type.

2.11 OPERATING CONTROLS

- A. General: Unit control system shall be a factory-supplied, direct digital electronic integrated system with equipment manufacturer solely responsible.
- B. Automatic control and monitoring and system using factory installed programmable micro-processor based units installed in the air unit.
- C. Provide BACnet interface for connection to BAS.
- D. Locate controls in a NEMA ICS 6 weatherproof steel control cabinet separated from power wiring and other components. Provide an LED or LCD display indicating the status of all serial communication, error messages, power status, and all digital output and analog input points.

- E. Provide control systems consisting of sensors, indicating devices, interface equipment and other apparatus and accessories required to operate mechanical systems and to perform functions specified.
- F. Include installation and calibration, supervision, adjustments, and fine tuning necessary for complete and fully operational system.
- G. Supply fan modulation: Provide a variable frequency controller meeting the requirements of Section 23 0514
- H. Unit Start-Stop: The BAS system shall provide a signal to start-stop teh DOAS.
- I. Supply Air Dehumidification/Temperature Control: : Unit operates on built-in controls to cycle compressors, modulate hot gas reheat coil and stage electric heater to dehumidify the outside air and maintain supply air temperature setpoint at 56°F dewpoint (or less), and DB temperature at 65°F - 68°F (adj.). At no time shall supply dewpoint rise above 56°F.
- J. Built-In Controls: Additional built-in controls shall include power phase/voltage protection, smoke detector, surge capacitor, safety controls, control transformer, and contact for fire alarm relay shutdown.

2.12 POWER WIRING

- A. Provide electrical access for both main power and control power connections.
- B. Provide factory wired units with a single point of electrical connection.
- C. Provide across-the-line starter, non-recycling compressor overload, starter relay for each compressor. Provide manual reset current overload protection.
- D. Provide starter relay for each condenser fan and motor with built-in overload protection
- E. Provide a surge capacitor in starter cabinet for protection from power surges due to lightning and switching transients.
- F. Ground shall be #6 A.W.G. Provide separate driven ground for grade mounted units.
- G. Provide motor protector.
- H. Control Power Transformers: 120 volt secondary. 45 VA minimum. Provide fused primary, secondary, and bond unfused leg of secondary to enclosure.
- I. Disconnect Switch: Factory mount disconnect switch on power cabinet. Switch shall be accessible without the use of tools.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify that area on site is ready for installation of unit for mounting on a concrete pad.

- B. Verify that proper power supply is available.

3.2 INSTALLATION

- A. Install in accordance with manufacturer's instructions.
- B. Install in accordance with NFPA 90A.
- C. Route copper evaporator condensate piping, full size, thru trap as detailed on Drawings to drywell. Refer to mechanical floorplan drawings.
- D. Install flexible connections specified in Section 23 3300 between fan inlet and discharge ductwork. Ensure metal bands of connectors are parallel with minimum one inch flex between ductwork and unit while running.
- E. Check and verify location of thermostats with plans and room details before construction of wall assemblies. Locate between 42 to 48 inches above finished floor. Mount at common elevation within same space. Align with lighting switches [$\langle \rangle$].
- F. Provide level concrete mounting pad, minimum 8 in. height.

3.3 STARTING EQUIPMENT

- A. Provide manufacturer's field representative to prepare and start equipment.
- B. Adjust for proper operation within manufacturer's published tolerances.
- C. Provide start-up certificate in accordance with the General Conditions.

3.4 CLOSEOUT ACTIVITIES

- A. Refer to Section 23 0510 - Demonstration, Training and Instructions for additional requirements.
- B. Demonstrate proper operation and maintenance of equipment to the Owner's designated representatives.
- C. Provide the services of the manufacturer's field representative to conduct training.

3.5 SCHEDULES

- A. Capacities shall not be less than scheduled at 95 F ODT.
- B. Total cooling and heating capacities shown are the minimum.
- C. Refer to the Schedule on Project Drawings.

END OF SECTION

SECTION 23 8130
DUCTLESS SPLIT SYSTEM AIR CONDITIONERS (DAC-* & DCU-*)

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Interior Unit.
- B. Exterior Unit.
- C. Controls.

1.2 RELATED SECTIONS

- A. Section 23 0510 - General HVAC Requirements - Warranty.
- B. Section 23 0513 - Motors for HVAC Equipment: Evaporator and condenser fan motors.
- C. Section 23 2300 - Refrigerant Piping and Specialties.

1.3 SUBMITTALS

- A. Refer to Section 23 0510 - General HVAC Requirements for submittal procedures.
- B. Product Data: Provide data for manufactured products and assemblies. Indicate water, drain, thermostatic valves, and electrical rough-in connections with electrical characteristics and connection requirements.
- C. Refrigerant Piping: Obtain manufacturer's recommendations for piping and piping appurtenances for the equipment supplied and incorporated into the refrigerant piping specified in Section 23 2300.
- D. Manufacturer's Instructions: Indicate assembly, support details, connection requirements, and include start-up instructions.
- E. Warranty: Submit manufacturer's warranty and ensure forms have been filled out in the Owner's name and registered with manufacturer.

1.4 WARRANTY

- A. See Section 01 7800 - Closeout Submittals, for additional warranty requirements.
- B. See Section 23 0510 - General HVAC Requirements, for additional Warranty requirements.
- C. Provide a five year warranty to include coverage for compressor including materials only.

1.5 EXTRA MATERIALS

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Vertiv Leibert SRC.
- B. Carrier.
- C. Daikin.
- D. Hitachi.
- E. Johnson Controls.
- F. Mitsubishi .

2.2 AIR CONDITIONING UNITS

- A. Description: Packaged, ductless split air conditioning system consisting of interior evaporator with a variable speed inverter driven compressor located in a remote condensing unit. The system shall consist of a single phase outdoor condensing unit, a matched capacity indoor evaporator unit, and a wired wall-mounted controller.

2.3 INTERIOR UNIT

- A. Cabinet
 - 1. Cabinet shall be manufactured of high strength molded thermoplastic polymer and high impact polystyrene with smooth finish with access to filter through front panel.
- B. Evaporator fan
 - 1. Fan: Direct drive fan assembly with multi-speed motor.
 - 2. Motor: high efficiency, with permanently lubricated bearings.
- C. Evaporator coil
 - 1. Direct expansion coiling coil of seamless copper tubes expanded into aluminum fins.
 - 2. Provide factory mounted water sensing device to shut down unit if water is sensed in the evaporator drain pan.
- D. Air filters
 - 1. Half-inch thick, aluminum, washable filter with service access from the front of the evaporator cabinet.

2.4 EXTERIOR UNIT

- A. Casing

1. House components in galvanized steel panels with weather resistant, baked enamel finish.
 2. Mount contactors and controls in weatherproof panel provided with full opening access doors.
 3. Provide removable access doors or panels with quick fasteners .
 4. Wind Baffle: 20 gauge painted sheet metal.
- B. Compressor
1. Compressor: twin-rotor rotary compressor with variable speed inverter.
- C. Condenser coils
1. Coils: Aluminum fins mechanically bonded to seamless copper tubing or all aluminum fins and tube. Air test under water to 600 psig, and vacuum dehydrate. Seal with holding charge of refrigerant.
 2. Coil Guard: Louvered or PVC coat steel wire .
- D. Fans and motors
1. Direct driven propeller type condenser fans with fan guard on discharge.
 2. Weatherproof motors suitable for outdoor use, single phase permanent split capacitor with permanent lubricated ball bearings and built in thermal overload protection.
- E. Refrigerant: Charge with R-410A.
- F. Refrigerant circuit
1. For each refrigerant circuit, provide:
 - a. Suction accumulator.
 - b. Suction and liquid line service valves and gage ports.
 - c. Charging valve.
 - d. Condenser pressure relief mechanism.
 - e. Electronic thermal expansion valve.
- G. Controls
1. Factory wired with single point power connection.
 2. Factory wired controls shall include contactor, high and low pressure cutouts, internal winding thermostat for compressor, control circuit transformer, non-cycling reset relay.

3. Provide a surge capacitor and lightning arrestor in unit cabinet for protection from power surges due to lightning and switching transients.
4. Provide controls to permit operation down to 0 degrees F ambient temperature to include:
 - a. Head pressure switch to cycle fan motors in response to refrigerant condensing pressure.
 - b. Solid state control to vary speed of one condenser fan motor in response to refrigerant condensing pressure.

2.5 CONDENSATE PUMP

- A. Manufacturer: Little Giant EC-400
- B. Field installed, fully automatic, two-piece condensate pump with self-priming pump and separate reservoir.
- C. Pump:
 1. Self-priming
 2. Automatic start/stop and overflow detection.
 3. Thermally protected motor.
- D. Reservoir:
 1. Float-sensor

2.6 CONTROLS

- A. Factory wired, microprocessor-based control system.
- B. Wall mounted remote controller:
 1. LCD display with built-in weekly schedule with multiple event settings per day.
 2. Incorporate the following:
 - a. Setpoint/program control
 - b. Temperature setpoint adjustment
 - c. Fan speed selection
 - d. Unit operation mode.
 - e. Temperature display shall be in Fahrenheit or Celsius.
- C. Unit Controls:
 1. Short cycle protection.

2. System auto restart: system shall provide automatic restart with programmable time delay up start up after power failure.
3. Alarms: Control system shall monitor unit operation and activate a visual alarm in the event of any factory preset alarm conditions.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify that substrates are ready for installation of units and openings are as indicated on shop drawings.
- B. Verify that proper power supply is available and in correct location.

3.2 INSTALLATION

- A. Install in accordance with manufacturer's instructions.
- B. Provide level housekeeping pad or base as indicated.
- C. Pipe refrigerant piping from interior unit to exterior unit; refer to section 23 2300.
- D. Check and verify location of wired remote controller with plans and room details before construction of wall assemblies. Locate between 42 to 48 inches above finished floor.
- E. Infrastructure for connection to building data network provided under Div 26. Coordinate with IT Staff for IP addresses and access to network.

3.3 STARTING EQUIPMENT

- A. Provide manufacturer's field representative to prepare and start equipment.
- B. Adjust for proper operation within manufacturer's published tolerances.
- C. Demonstrate proper operation of equipment to the Owner's designated representative.
- D. Provide start-up certificate in accordance with the General Conditions.

END OF SECTION

**SECTION 23 8200
CONVECTION HEATING AND COOLING UNITS**

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Electric heaters.

1.2 RELATED REQUIREMENTS

- A. Section 23 0510 - GENERAL MECHANICAL REQUIREMENTS - Submittals
- B. Section 26 0583 - Wiring Connections: Electrical characteristics and wiring connections. Installation of room thermostats. Electrical supply to units.

1.3 SUBMITTALS

- A. Refer to Section 23 0510 - General HVAC Requirements for submittal procedures.
- B. Product Data: Provide typical catalog of information including arrangements.
- C. Refer to Submittals in Section 23 0510 for requirements regarding Tabulation of Power Wiring Requirements.
- D. Manufacturer's Instructions: Indicate installation instructions and recommendations.
- E. Operation and Maintenance Data: Include manufacturer's descriptive literature, operating instructions, installation instructions, maintenance and repair data, and parts listings.

1.4 QUALITY ASSURANCE

- A. Products Requiring Electrical Connection: Listed and classified by Underwriters Laboratories Inc. as suitable for the purpose specified and indicated.

1.5 DELIVERY, STORAGE, AND PROTECTION

- A. Refer to Section 23 0510 - General HVAC Requirements for general delivery, storage and protection requirements.
- B. Do not operate duct mounted equipment until ductwork is clean, filters are in place, bearings lubricated, and fan has been test run under observation.

PART 2 PRODUCTS

2.1 ELECTRIC WALL HEATERS(EWH)

- A. Manufacturer: Qmark Model AWH-4000.
- B. Other acceptable manufacturers offering equivalent products: Berko FRC, Electromode RFAC, Erincraft AWH, Markel 3400, Raywall AFA, Singer Series 5900.

- C. Assembly: UL listed and labelled with terminal box and cover, and built-in controls.
- D. Heating Elements: Enclosed copper tube, aluminum finned element of coiled nickel-chrome resistance wire centered in tubes and embedded in refractory material.
- E. Enclosure: Minimum 0.030 inch steel box for recessed mounting with removable 16 gauge steel bar grille with satin finished aluminum frame.
- F. Fan: Direct drive propeller type, statically and dynamically balanced.
- G. Motor: Permanently lubricated, sleeve bearings.
- H. Built-in Controls:
 - 1. Power disconnect switch.
 - 2. Automatic reset thermal overload protector.
 - 3. Tamper-proof bi-metal thermostat with 40-90 Degree F range adjustable through grille face.

PART 3 EXECUTION

3.1 INSTALLATION

- A. Install in accordance with manufacturer's recommendations.
- B. Install equipment in a readily accessible location.
- C. Install equipment exposed to finished areas after walls and ceilings are finished and painted. Do not damage equipment or finishes.
- D. Units with Electric Heating Elements:
 - 1. Install as indicated including electrical devices furnished by manufacturer but not factory installed.

3.2 CLEANING

- A. After construction and painting is completed, clean exposed surfaces of units.
- B. Vacuum clean coils and inside of units.

3.3 EQUIPMENT SCHEDULES

- A. Refer to Schedules on the Drawings.

END OF SECTION

**SECTION 26 0002
ELECTRICAL SPECIFICATIONS**

PART 1 GENERAL

1.1 26 0501 EXISTING CONDITIONS

- A. The demolition plan (where shown) has been prepared to assist the Contractor in determining the scope of demolition work and should not be construed to be all of the demolition required. The Contractor shall visit job site (after carefully reviewing the contract documents) and determine exact areas and quantities of existing materials to be removed to accomplish new construction.
- B. Notice of Outages: Notify the Architect and Owner, at least seven working days in advance, before partially or completely disabling a system. The Owner needs time to coordinate outages with the Owner's departments and personnel. If the Contractor requests outage with less advance notice, the Owner may assist the Contractor at the Owner's option.
- C. Where existing circuits to remain are inadvertently damaged or disturbed, replace or repair the damaged portion of the circuit. The finished work shall conform to this specification for new work between remaining portions of the work around the removed work. Where circuit portions are removed by this work, reconnect circuits, re-route circuits, and provide circuit portions as required to maintain circuit continuity. Provide new conduit between remaining portions of the circuit. Provide new conductor of the same description between the first existing boxes, or provide boxes in accessible locations.
- D. Conduit to be demolished shall be removed in its entirety from accessible locations. Inaccessible conduit shall be cut and plugged and the adjacent surface patched to match adjacent surface. Disconnect abandoned outlets and remove devices and circuiting. Remove abandoned outlets. In remaining walls, patch and finish the outlet to match the surrounding wall. Disconnect and remove electrical devices serving equipment that has been removed. Disconnect and remove abandoned luminaries. Remove brackets, stems, hangers, and other accessories.
- E. Remove out-of-service communications cables including but not limited to telephone, computer, TV, antenna. Out-of-Service shall be defined as follows: Cables which have one or both ends disconnected from jacks or equipment. Cables which the Owner has tagged as "DEMOLISH", and the Owner has disconnected or cut the cable.
- F. Hazardous Materials:
 - 1. A/E's Responsibility: Plans and specifications have been prepared by the A/E for the Owner without the A/E having conducted investigation as to the presence of asbestos or hazardous waste on the project. Not being a part of this contract, the A/E has not charged any fees and has not and will not advise the Owner with regard to the detection and/or removal of asbestos or hazardous waste. The Owner is aware that asbestos or hazardous waste could be present and will make all decisions with regard to its removal. The removal of all hazardous materials and encapsulation of remaining surfaces is the sole responsibility of the Owner.

2. If the Contractor observes the existence of a friable material which must be disturbed during the course of his work, the Contractor shall promptly notify the Owner and the Architect. The Owner shall make all arrangements regarding testing and removal or encapsulation of asbestos material if present. The Contractor shall not perform any work pertinent to the friable material prior to receipt of special instructions from the Owner through the Architect.
3. "Friable Material" is any material which can be crumbled, pulverized or reduced to a powder by hand pressure when dry.

1.2 26 0510 GENERAL ELECTRICAL REQUIREMENTS

A. General Items:

1. Drawings are diagrammatic and show the general location of the equipment, raceway, and equipment, but are not to be scaled. All dimensions shall be verified at the building site. Prefabrication and/or installation of work from drawings shall be at the Contractor's risk. Refer to Architectural plans and sections for exact building dimensions and details.
2. Provide housekeeping and equipment pads where penetrations occur through any slab in the electrical rooms. Any conduit that penetrates the slab and is exposed in the space shall be wrapped in a housekeeping pad. All electrical items that sit on the slab shall have housekeeping pads below. Rough up slab under bases before pouring concrete.
3. Where penetrations are made in fire rated partitions, walls, floors or ceilings during the course of electrical installation, these penetrations shall be restored to their intended fire ratings by the use of fittings or materials as approved by Underwriter's Laboratories for this purpose.
4. Instruct operating personnel designated by the Owner in operation and maintenance of the fire alarm system prior to the request for final inspection. A manufacturer's service representative shall provide the instructions (Instructor shall not be a sales person, but shall be one with service experience on a continuing basis, knowledgeable about the subject equipment.) The Owner will record (audio or video/audio) operating instructions given by the Contractor to the operating personnel.
5. Regulatory Requirements
 - a. Where requirements of these specifications exceed specified codes and ordinances, conform to these specifications.
 - b. Materials and equipment included in Underwriters Label Service shall bear that label. Electrical equipment shall be U.L. approved as installed.
 - c. Jurisdiction: Where codes or guides refer jurisdiction to local governing code officials, such official in this procedure shall be the State Fire Marshal.
 - d. Permits: Obtain all permits, paying all fees in connection therewith. At completion, have work inspected by proper authorities and furnish the Design Professional an inspection certificate showing approval of installation.

- e. The Code currently adopted and presently in effect is the 2015 International Energy Conservation Code with all Georgia State Amendments.
 - f. Fire Prevention: Conform to 2019 International Fire Code with all Georgia State Amendments.
 - g. Building Code: Conform to the 2018 International Building Code with all Georgia State Amendments.
 - h. Electrical: Conform to the 2023 National Electrical Code (NEC), NFPA, and the National Electrical Safety Code.
 - i. Accessibility: Americans with Disability Act.
- B. Attic Stock - Provide Attic Stock for the following items:
- 1. One set of spare fuses for each type used for the outdoor air units.
- C. Submittals: Submit electrical items prior to purchase, for confirmation of acceptance. The purpose of submittals is to demonstrate that the Contractor understands the design concept of the project by indicating the equipment and materials he intends to furnish and install, and by detailing the installation he intends to achieve. The review by the Design Professional shall NOT be construed to be for the purpose of "approving" equipment or drawings. Items to submit (not all inclusive - see individual sections for additional requirements):
- 1. Submit a power wiring letter indicating coordination between the mechanical equipment to be purchased and the electrical breaker shown powering it. Failure to submit this letter will require the Contractor to assume responsibility for any required changes to the electrical design attributed to mechanical equipment. Include a copy of the Tabulated List of Power Wiring Requirements with the letter. The electrical requirements for the mechanical equipment is based on the best information available at the time of design.
 - 2. Operating and Maintenance manuals: at the end of the project provide a binder that contains shop drawings, wiring diagrams, as builts, warranty information and sign in sheets for all owner training sessions.

1.3 26 0519 LOW VOLTAGE POWER CONDUCTORS

- A. Design Intent:
- 1. Provide copper conductors, THHN/THWN insulation.
 - 2. All conductors shall be made in the USA.
 - 3. Provide solid conductors for circuits #10 AWG and smaller, stranded for larger.
 - 4. MC cable (steel jacketed) is allowed for 20a circuits when run in a concealed manner.
 - 5. Provide a dedicated neutral conductor for all branch circuits. THERE SHALL BE NO SHARED NEUTRAL CONDUCTORS.

B. MC Cable Installation:

1. Install MC cable with minimum 12 inches of slack cable per run at each end of each cable, accessible for future use at the boxes.
2. MC cable two feet or shorter may be supported at boxes only. Support MC cable longer than two feet within 12 inches of each end of cable, and at maximum 5 foot intervals along the cable.
3. Route MC cable parallel with building walls and structure, and neatly support MC cable from them. Utilize conduit clamps or unistrut support to hold one, two or three MC cables. Utilize unistrut support to hold more than three MC cables.
4. Conform to the requirements of conduit routing and clearances from other utilities. Support MC cable according to N.E.C.
5. Provide manufacturer's compatible fittings meeting U.L. at boxes.
6. Provide metal clips or clamps within two feet of cable ends and maximum six feet intervals.
7. Conform to NEC bend radius.
8. Route MC cable parallel with building walls and structure, and neatly support MC cable from them. Do not "Beeline".
9. At turns in the MC cable, conform to NEC bend radius and provide slack. Do not pull MC cable tight around corners or other utilities.

C. Color Code:

1. 208Y/120 V, 3 Phase, 4 Wire System:
 - a. Phase A: Black.
 - b. Phase B: Red.
 - c. Phase C: Blue.
 - d. Neutral/Grounded: White.
2. Equipment Ground, All Systems: Green.

D. Submittal Requirements: NONE

1.4 26 0534 CONDUIT

A. Design Intent:

1. All ceilings are exposed in this portion of the building. It is critical that hard pipe conduit be installed in a neat manner, tight to structure, following building lines parallel and

perpendicular. Any work that is deemed unacceptable or unsightly by the Design Professional shall be reworked by the Contractor without charge.

2. All conduit shall be made in the USA.
3. All new conduit must be painted to match the surrounding wall or ceiling color.
4. Use EMT conduit where located above 6 feet in dry spaces inside the building. All exposed conduit installed below 6 feet shall be Rigid Metal Steel (RMS) or Intermediate Metallic Conduit (IMC). Conduit installed below slab shall be PVC. Use Rigid Steel long radius elbows where emerging from the slab. Extend RMS conduit above slab. All exposed conduit located on building exterior shall be RMS. Conduits shall be trade size one-half inch minimum. Where conflicting conduit sizes are shown, install the larger size.
5. Transition to Rigid Metal Conduit for devices on the roof.
6. Liquid tite flex may be used where noted on the drawings.

B. Installation:

1. Unless dimensioned, conduit routing indicated is diagrammatic.
2. When conduit destination is indicated and routing is not shown, determine exact routing required.
3. Arrange conduit to provide no more than the equivalent of four 90 degree bends between pull points.
4. Join EMT conduit together with set screw connectors.
5. Provide insulating bushings or insulated throats at all conduit terminations to protect conductors.
6. Provide #16 galvanized pullwire or minimum 200 lb. polyolefin pull cord in each empty conduit except sleeves and nipples.
7. Install firestopping to preserve fire resistance rating of partitions and other elements.

C. Submittal Requirements: NONE

1.5 26 0537 BOXES

- A. Design Intent: All boxes used in dry interior spaces shall be stamped metal type unless otherwise noted. Coordinate the size of the backbox required for the fire alarm devices with the manufacturer prior to purchase and rough in.
- B. Installation:
 1. Typical backbox mounting heights include:
 - a. Receptacles: 18" AFF

b. Light Switches: 42" AFF

2. Boxes in fire rated walls: Install boxes to preserve fire resistance rating of partitions and other elements, using materials and methods specified. Where boxes are located in fire rated walls the wall opening area shall be limited as required by NFPA. Where box openings exceed NFPA limits provide a two hour fire rated barrier around the back and sides of boxes, inside the wall. Construct the barrier with two hour rated material of the board type joined with two hour fire rated material of the caulk type.
3. Support boxes independently of conduit. Provide threaded rods, screws, bolts, toggle bolts, etc. for support. Do not use clips or other hardware to attach boxes to ceiling grids.

C. Submittal Requirements: NONE

1.6 26 0553 IDENTIFICATION OF ELECTRICAL SYSTEMS

A. Design Intent: Labeling circuits and panels is critical when renovating a space. There cannot be too much labeling.

B. Devices to be labelled include:

1. Receptacles, Light switches: Tape type, black on clear lettering of circuit number serving as in "LR1-3". Located on the front face.
2. Panels, Transformers, Disconnects: Engraved type, white on black, indicating "Name" and "Fed by Panel-Circuit".
3. New panel directories will be required on any panel that any new work is performed. Where existing work is demolished, the breakers shall be labeled as "spare". If at any time an existing circuit has to be traced to find its origin and the device(s) that it serves; once this information is gathered, the circuit shall be clearly and permanently labeled in the existing panel and on the device in the method described by the detail on the sheet. New work indicated on the panel schedule shall be identified with the load and the room number.

C. Submittal Requirements: NONE

1.7 26 2726 WIRING DEVICES

A. Provide the following:

1. Receptacles: NEMA 5-20, Heavy Duty, Tamper Resistant. Match color of existing to remain receptacles. GFI type where indicated.
2. Wall plates: Jumbo size, Brushed satin finish, Type 302 stainless steel.

B. Installation:

1. Provide GFI receptacles with integral GFI protection at each location indicated. Do not use feed-through wiring to protect downstream devices.

2. Where two or more devices are shown adjacent, they shall be mounted in ganged boxes and covered with one faceplate.
- C. Submittal Requirements: Provide submittal data indicating device model number and color prior to purchasing.

1.8 26 2818 ENCLOSED SAFETY SWITCHES

- A. Design Intent: Provide Heavy Duty type with Externally operable handle interlocked to prevent opening front cover with switch in ON position. Provide fuses to match manufacturer's instructions. Label as described in the drawings. Provide NEMA 1 rating indoor, NEMA 3R outdoor.
- B. Submittal Requirements: NONE

1.9 26 5100 INTERIOR LIGHTING

- A. Design Intent: Furnish products as indicated on drawings and in specifications
- B. Installation:
1. Wall mounted exit signs shall be mounted such that the bottom edge of the fixture is located a minimum of 7'6". Coordinate the location of the backbox with the ceiling and the top of the door frames. Locate the exit sign in the center of the space between the ceiling and the door frame where possible in areas where the ceiling is 12' and less. Areas where the ceiling is greater than 12' shall place the bottom of the exit sign at 7'6". Conditions on storefront at main lobby areas may require different heights. Coordinate with the architectural elevations prior to rough-in in finished spaces.
 2. Grid Troffers: Provide two minimum 18 gauge galvanized steel hangar wires from diagonal corners of each fixture to structure.
- C. Submittal Requirements: Submit fixtures for review prior to purchase.

END OF SECTION