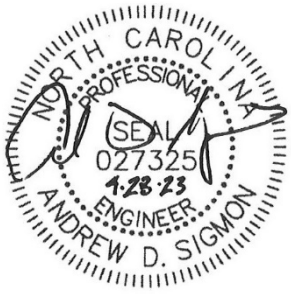
The University of North Carolina at Greensboro

COLEMAN BUILDING
FIRE ALARM SYSTEM UPGRADES

SCO ID#17-18200-01
CODE: 41725 ITEM: 323
AUTHORIZATION NO.: 1636
DATE: April 28, 2023



McKIM&CREED
1730 Varsity Drive, Venture IV, Suite 500
Raleigh, North Carolina 27606
919-233-8091
NC License # F1222
M&C Project No. 07144-0003

Advertisement For Bids

Sealed proposals will be received until 2:00 PM on Tuesday, May 30, 2023 in Gray Home Management House, 105 Gray Drive Greensboro, NC 27412, for the construction of **Coleman Building Fire Alarm System Upgrades**, at which time and place bids will be opened and read.

Complete plans and specifications will be open for inspection in the office of McKim & Creed and can also be obtained electronically from McKim & Creed using the following contact information:

Senior Project Coordinator: Allison Jurgens
Address: 1730 Varsity Drive, Suite 500, Raleigh, NC 27606
E-Mail: ajurgens@mckimcreed.com
Phone: 919-233-8091 (252-248-3192 Direct)

Bid documents will also be available for examination in the plan rooms of Associated General Contractors, Reed Construction Data, McGraw Hill Construction Dodge, the offices of the Designer: McKim & Creed, Venture IV Building, Suite 500, 1730 Varsity Drive, Raleigh, NC 27606; NC Institute of Minority Economic Development, Inc., 114 W. Parrish St., 4th Floor, Durham, NC; Hispanic Contractors Association of the Carolinas, Winston-Salem, Charlotte and Raleigh Areas – 704-583-4184.

Pre-Bid Meeting and Notice of Public Meeting for Proposed Alternate Bids for Preferred Products

A pre-bid and public meeting will be held for all interested bidders at 1:00 PM on Tuesday, May 16, 2023 at Gray Home Management House, 105 Gray Drive Greensboro, NC 27412. Contractors attending shall park at the McIver Street Parking Deck. Attendance is strongly encouraged.

In accordance with GS133-3, Section 64. (C) and State Construction Office procedures, the following preferred brand items are being considered as Alternates by the owner for this project:

Alternate FA-1: EST Fire Alarm/Mass Notification System

A copy of pertinent sections of the performance standards may be obtained by contacting the designer at the address or phone number noted above.

The State reserves the unqualified right to reject any and all proposals.

Nida DeBusk, AIA
Capital Project Manager
University of North Carolina – Greensboro
Facilities Design & Construction
gndebusk@uncg.edu
336.334.5323

N O T I C E TO B I D D E R S

Sealed proposals will be received by the University of North Carolina at Greensboro until 2:00 PM on Tuesday, May 30, 2023 at Gray Home Management House, 105 Gray Drive Greensboro, NC 27412 and immediately thereafter publicly opened and read for the furnishing of labor, material and equipment entering into the construction of:

UNC Greensboro Coleman Building Fire Alarm System Upgrades

The Work consists of the following: New addressable fire alarm/mass notification system; Demolition of the existing fire alarm system.

Bids will be received for single prime contract. All proposals shall be lump sum.

Pre-Bid Meeting and Notice of Public Meeting for Proposed Alternate Bids for Preferred Products

An open pre-bid meeting will be held for contractors at 1:00 PM on Tuesday, May 16, 2023 at Gray Home Management House, 105 Gray Drive Greensboro, NC 27412. The meeting will address project specific questions, issues, bidding procedures and bid forms.

The meeting will also include identifying preferred brand alternates and their performance standards that the Owner will consider for approval on this project.

In accordance with General Statute GS 133-3, Specifications may list one or more preferred brands as an alternate to the base bid in limited circumstances. Specifications containing a preferred brand alternate under this section must identify the performance standards that support the preference. Performance standards for the preference must be approved in advance by the Owner in an open meeting. Any alternate approved by the Owner shall be approved only where (i) the preferred alternate will provide cost savings, maintain or improve the functioning of any process or system affected by the preferred item or items, or both, and (ii) a justification identifying these criteria is made available in writing to the public.

In accordance with GS133-3 and SCO procedures the following preferred brand items are being considered as Alternates by the Owner for this project:

- *Alternate FA-1: Provide EST Fire Alarm/Mass Notification System*
- *Alternate FA-2: Space Age Electronics Fireray 5000 Preferred Brand Alternate for optical beam detectors.*

Complete plans, specifications and contract documents will be open for inspection in the offices of McKim & Creed, 1730 Varsity Drive, Suite 500 Building IV Raleigh, NC 27606 and in the plan rooms of the Associated General Contractors, in the local North Carolina offices of McGraw-Hill Dodge Corporation, Reed Construction Data, and in following Minority Plan Rooms:

Hispanic Contractors Association of the Carolinas (HCAC) in Winston-Salem, Charlotte and Raleigh Areas – 877-227-1680

MCTAP/NCIMED Plan & Resource Center, 114 West Parrish Street, 4th Floor, Durham, NC 27701, 919-956-8889

or may be obtained electronically from McKim & Creed using the following contact information:

Senior Project Coordinator: Allison Jurgens
Address: 1730 Varsity Drive, Suite 500, Raleigh, NC 27606
E-Mail: ajurgens@mckimcreed.com
Phone: 919-233-8091 (252-248-3192 Direct)

The bidder shall include with the bid proposal the form *Identification of Minority Business Participation* identifying the minority business participation it will use on the project and shall include either *Affidavit **A*** or *Affidavit **B*** as applicable. Forms and instructions are included within the Proposal Form in the bid documents. Failure to complete these forms is grounds for rejection of the bid. (GS143-128.2c Effective 1/1/2002)

All contractors are hereby notified that they must have proper license as required under the state laws governing their respective trades.

General contractors are notified that Chapter 87, Article 1, General Statutes of North Carolina, will be observed in receiving and awarding general contracts. General contractors submitting bids on this project must have license classification for General Contractor.

Under GS 87-1, a contractor that superintends or manages construction of any building, highway, public utility, grading, structure or improvement shall be deemed a "general contractor" and shall be so licensed. Therefore a single prime project that involves other trades will require the single prime contractor to hold a proper General Contractors license. On public buildings being bid single prime, where the total value of the general construction does not exceed 25% of the total construction value, contractors under GS87- Arts 2 and 4 (Plumbing, Mechanical & Electrical) may bid and contract directly with the Owner as the SINGLE PRIME CONTRACTOR and may subcontract to other properly licensed trades. GS87-1.1- Rules .0210

Each proposal shall be accompanied by a cash deposit or a certified check drawn on some bank or trust company, insured by the Federal Deposit Insurance Corporation, of an amount equal to not less than five percent (5%) of the proposal, or in lieu thereof a bidder may offer a bid bond of five percent (5%) of the bid executed by a surety company licensed under the laws of North Carolina to execute the contract in accordance with the bid bond. Said deposit shall be retained by the Owner as liquidated damages in event of failure of the successful bidder to execute the contract within ten days after the award or to give satisfactory surety as required by law.

A performance bond and a payment bond will be required for one hundred percent (100%) of the contract price.

Payment will be made based on ninety-five percent (95%) of monthly estimates and final payment made upon completion and acceptance of work.

No bid may be withdrawn after the scheduled closing time for the receipt of bids for a period of 30 days.

The Owner reserves the right to reject any or all bids and to waive informalities.

Designer:
Mckim & Creed
Raleigh, NC 27606
919-233-8091

Owner:
University of North Carolina at Greensboro

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STANDARD FORM FOR CONSTRUCTION PROJECTS

STATE CONSTRUCTION OFFICE

NORTH CAROLINA

DEPARTMENT OF ADMINISTRATION

Form OC-15

This document is intended for use on State capital construction projects and shall not be used on any project that is not reviewed and approved by the State Construction Office. Extensive modification to the General Conditions by means of "Supplementary General Conditions" is strongly discouraged. State agencies and institutions may include special requirements in "Division 1 – General Requirements" of the specifications, where they do not conflict with the General Conditions.

Twenty Fourth Edition January 2013

INSTRUCTIONS TO BIDDERS

For a proposal to be considered it must be in accordance with the following instructions:

1. **PROPOSALS**

Proposals must be made in strict accordance with the Form of Proposal provided therefor, and all blank spaces for bids, alternates, and unit prices applicable to bidder's work shall be properly filled in. When requested alternates are not bid, the proposer shall so indicate by the words "No Bid". Any blanks shall also be interpreted as "No Bid".The bidder agrees that bid on Form of Proposal detached from specifications will be considered and will have the same force and effect as if attached thereto. Photocopied or faxed proposals will not be considered. Numbers shall be stated both in writing and in figures for the base bids and alternates. If figures and writing differ, the written number will supersede the figures.

Any modifications to the Form of Proposal (including alternates and/or unit prices) will disqualify the bid and may cause the bid to be rejected.

The bidder shall fill in the Form of Proposal as follows:

a. If the documents are executed by a sole owner, that fact shall be evidenced by the word "Owner" appearing after the name of the person executing them.

b. If the documents are executed by a partnership, that fact shall be evidenced by the word "Co-Partner" appearing after the name of the partner executing them.

c. If the documents are executed on the part of a corporation, they shall be executed by either the president or the vice president and attested by the secretary or assistant secretary in either case, and the title of the office of such persons shall appear after their signatures. The seal of the corporation shall be impressed on each signature page of the documents.

d. If the proposal is made by a joint venture, it shall be executed by each member of the joint venture in the above form for sole owner, partnership or corporation, whichever form is applicable.

e. All signatures shall be properly witnessed.

f. If the contractor's license of a bidder is held by a person other than an owner, partner or officer of a firm, then the licensee shall also sign and be a party to the proposal. The title "Licensee" shall appear under his/her signature.

Proposals should be addressed as indicated in the Advertisement for Bids and be delivered, enclosed in an opaque sealed envelope, marked "Proposal" and bearing the title of the work, name of the bidder, and the contractor's license number of the bidder. Bidders should clearly mark on the outside of the bid envelope which contract(s) they are bidding.

Bidder shall identify on the bid**,** the minority businesses that will be utilized on the project with corresponding total dollar value of the bid and affidavit listing good faith efforts or an affidavit indicating work under contract will be self-performed, as required by G.S. 143-128.2(c) and G.S. 143-128.2(f). Failure to comply with these requirements is grounds for rejection of the bid.

For projects bid in the single-prime alternative, the names and license numbers of major subcontractors shall be listed on the proposal form.

It shall be the specific responsibility of the bidder to deliver his bid to the proper official at the selected place and prior to the announced time for the opening of bids. Later delivery of a bid for any reason, including delivery by any delivery service, shall disqualify the bid.

Unit prices quoted in the proposal shall include overhead and profit and shall be the full compensation for the contractor's cost involved in the work. See General Conditions, Article 19c-1.

2. EXAMINATION OF CONDITIONS

It is understood and mutually agreed that by submitting a bid the bidder acknowledges that he has carefully examined all documents pertaining to the work, the location, accessibility and general character of the site of the work and all existing buildings and structures within and adjacent to the site, and has satisfied himself as to the nature of the work, the condition of existing buildings and structures, the conformation of the ground, the character, quality and quantity of the material to be encountered, the character of the equipment, machinery, plant and any other facilities needed preliminary to and during prosecution of the work, the general and local conditions, the construction hazards, and all other matters, including, but not limited to, the labor situation which can in any way affect the work under the contract, and including all safety measures required by the Occupational Safety and Health Act of 1970 and all rules and regulations issued pursuant thereto. It is further mutually agreed that by submitting a proposal the bidder acknowledges that he has satisfied himself as to the feasibility and meaning of the plans, drawings, specifications and other contract documents for the construction of the work and that he accepts all the terms, conditions and stipulations contained therein; and that he is prepared to work in cooperation with other contractors performing work on the site.

Reference is made to contract documents for the identification of those surveys and investigation reports of subsurface or latent physical conditions at the site or otherwise affecting performance of the work which have been relied upon by the designer in preparing the documents. The owner will make copies of all such surveys and reports available to the bidder upon request.

Each bidder may, at his own expense, make such additional surveys and investigations as he may deem necessary to determine his bid price for the performance of the work. Any on-site investigation shall be done at the convenience of the owner. Any reasonable request for access to the site will be honored by the owner.

3. BULLETINS AND ADDENDA

Any addenda to specifications issued during the time of bidding are to be considered covered in the proposal and in closing a contract they will become a part thereof. It shall be the bidder’s responsibility to ascertain prior to bid time the addenda issued and to see that his bid includes any changes thereby required.

Should the bidder find discrepancies in, or omission from, the drawings or documents or should he be in doubt as to their meaning, he shall at once notify the designer who will send written instructions in the form of addenda to all bidders. Notification should be no later than seven (7) days prior to the date set for receipt of bids. Neither the owner nor the designer will be responsible for any oral instructions.

All addenda should be acknowledged by the bidder(s) on the Form of Proposal. However, even if not acknowledged, by submitting a bid, the bidder has certified that he has reviewed all issued addenda and has included all costs associated within his bid.

4. **BID SECURITY**

Each proposal shall be accompanied by a cash deposit or a certified check drawn on some bank or trust company insured by the Federal Deposit Insurance Corporation, or a bid bond in an amount equal to not less than five percent (5%) of the proposal, said deposit to be retained by the owner as liquidated damages in event of failure of the successful bidder to execute the contract within ten (10) days after the award or to give satisfactory surety as required by law (G.S. 143-129).

Bid bond shall be conditioned that the surety will, upon demand, forthwith make payment to the obligee upon said bond if the bidder fails to execute the contract. The owner may retain bid securities of any bidder(s) who may have a reasonable chance of award of contract for the full duration of time stated in the Notice to Bidders. Other bid securities may be released sooner, at the discretion of the owner. All bid securities (cash or certified checks) shall be returned to the bidders promptly after award of contracts, and no later then seven (7) days after expiration of the holding period stated in the Notice to Bidders. Standard Form of Bid Bond is included in these specifications and shall be used.

5. **RECEIPT OF BIDS**

Bids shall be received in strict accordance with requirements of the General Statutes of North Carolina. Bid security shall be required as prescribed by statute. Prior to the closing of the bid, the bidder will be permitted to change or withdraw his bid. Guidelines for opening of public construction bids are available from the State Construction Office.

6. **OPENING OF BIDS**

Upon opening, all bids shall be read aloud. Once bidding is closed, there shall not be any withdrawal of bids by any bidder and no bids may be returned by the designer to any bidder. After the opening of bids, no bid may be withdrawn, except under the provisions of General Statute 143-129.1, for a period of thirty days unless otherwise specified. Should the successful bidder default and fail to execute a contract, the contract may be awarded to the next lowest and responsible bidder. The owner reserves the unqualified right to reject any and all bids. Reasons for rejection may include, but shall not be limited to, the following:

a. If the Form of Proposal furnished to the bidder is not used or is altered.

b. If the bidder fails to insert a price for all bid items, alternate and unit prices requested.

c. If the bidder adds any provisions reserving the right to accept or reject any award.

d. If there are unauthorized additions or conditional bids, or irregularities of any kind which tend to make the proposal incomplete, indefinite or ambiguous as to its meaning.

e. If the bidder fails to complete the proposal form where information is requested so the bid may be properly evaluated by the owner.

f. If the unit prices contained in the bid schedule are unacceptable to the owner and the State Construction Office.

g. If the bidder fails to comply with other instructions stated herein.

7. **BID EVALUATION**

The award of the contract will be made to the lowest responsible bidder as soon as practical. The owner may award on the basis of the base bid and any alternates the owner chooses.

Before awarding a contract, the owner may require the apparent low bidder to qualify himself to be a responsible bidder by furnishing any or all of the following data:

a. The latest financial statement showing assets and liabilities of the company or other information satisfactory to the owner.

b. A listing of completed projects of similar size.

c. Permanent name and address of place of business.

d. The number of regular employees of the organization and length of time the organization has been in business under present name.

e. The name and home office address of the surety proposed and the name and address of the responsible local claim agent.

f. The names of members of the firms who hold appropriate trade licenses, together with license numbers.

g. If prequalified, contractor info will be reviewed and evaluated comparatively to submitted prequalification package.

Failure or refusal to furnish any of the above information, if requested, shall constitute a basis for disqualification of any bidder.

In determining the lowest responsible, responsive bidder, the owner shall take into consideration the bidder's compliance with the requirements of G.S. 143-128.2(c), the past performance of the bidder on construction contracts for the State with particular concern given to completion times, quality of work, cooperation with other contractors, and cooperation with the designer and owner. Failure of the low bidder to furnish affidavit and/or documentation as required by G.S. 143-128.2(c) shall constitute a basis for disqualification of the bid.

Should the owner adjudge that the apparent low bidder is not the lowest responsible, responsive bidder by virtue of the above information, said apparent low bidder will be so notified and his bid security shall be returned to him.

8. **PERFORMANCE BOND**

The successful bidder, upon award of contract, shall furnish a performance bond in an amount equal to 100 percent of the contract price. See Article 35, General Conditions.

9. **PAYMENT BOND**

The successful bidder, upon award of contract, shall furnish a payment bond in an amount equal to 100 percent of the contract price. See Article 35, General Conditions.

10. **PAYMENTS**

Payments to the successful bidders (contractors) will be made on the basis of monthly estimates. See Article 31, General Conditions.

11. **PRE-BID CONFERENCE**

Prior to the date set for receiving bids, the Designer may arrange and conduct a Pre-Bid Conference for all prospective bidders. The purpose of this conference is to review project requirements and to respond to questions from prospective bidders and their subcontractors or material suppliers related to the intent of bid documents. Attendance by prospective bidders shall be as required by the "Notice to Bidders".

12. **SUBSTITUTIONS**

In accordance with the provisions of G.S. 133-3, material, product, or equipment substitutions proposed by the bidders to those specified herein can only be considered during the bidding phase until ten (10) days prior to the receipt of bids when submitted to the Designer with sufficient data to confirm material, product, or equipment equality. Proposed substitutions submitted after this time will be considered only as potential change order.

Submittals for proposed substitutions shall include the following information:

a. Name, address, and telephone number of manufacturer and supplier as appropriate.

b. Trade name, model or catalog designation.

c. Product data including performance and test data, reference standards, and technical descriptions of material, product, or equipment. Include color samples and samples of available finishes as appropriate.

d. Detailed comparison with specified products including performance capabilities, warranties, and test results.

e. Other pertinent data including data requested by the Designer to confirm product equality.

If a proposed material, product, or equipment substitution is deemed equal by the Designer to those specified, all bidders of record will be notified by Addendum**.**

GENERAL CONDITIONS OF THE CONTRACT

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ARTICLE 1 - DEFINITIONS

a. The **contract documents** consist of the Notice to Bidders; Instructions to Bidders; General Conditions of the Contract; special conditions if applicable; Supplementary General Conditions; the drawing and specifications, including all bulletins, addenda or other modifications of the drawings and specifications incorporated into the documents prior to their execution; the proposal; the contract; the performance bond; the payment bond; insurance certificates; the approval of the attorney general; and the certificate of the Office of State Budget and Management. All of these items together form the contract.

b. The **owner** is the State of North Carolina through the agency named in the contract.

c. The **designer(s)** are those referred to within this contract, or their authorized representatives. The Designer(s), as referred to herein, shall mean architect and/or engineer. They will be referred to hereinafter as if each were of the singular number, masculine gender.

d. The **contractor**, as referred to hereinafter, shall be deemed to be either of the several contracting parties called the "Party of the First Part" in either of the several contracts in connection with the total project. Where, in special instances hereinafter, a particular contractor is intended, an adjective precedes the word "contractor," as "general," "heating," etc. For the purposes of a single prime contract, the term Contractor shall be deemed to be the single contracting entity identified as the “Party of the First Part” in the single Construction Contract. Any references or adjectives that name or infer multiple prime contractors shall be interpreted to mean the single prime Contractor.

e. A **subcontractor**, as the term is used herein, shall be understood to be one who has entered into a direct contract with a contractor, and includes one who furnishes materials worked to a special design in accordance with plans and specifications covered by the contract, but does not include one who only sells or furnishes materials not requiring work so described or detailed.

f. **Written notice** shall be defined as notice in writing delivered in person to the contractor, or to a partner of the firm in the case of a partnership, or to a member of the contracting organization, or to an officer of the organization in the case of a corporation, or sent to the last known business address of the contracting organization by registered mail.

g. **Work**, as used herein as a noun, is intended to include materials, labor, and workmanship of the appropriate contractor.

h. The **project** is the total construction work to be performed under the contract documents by the several contractors.

i. **Project Expediter,** as used herein, is an entity stated in the contract documents, designated to effectively facilitate scheduling and coordination of work activities. See Article 14(f) for responsibilities of a Project Expediter. **For the purposes of a single prime contract, the single prime contractor shall be designated as the Project Expediter.**

j. **Change order**, as used herein, shall mean a written order to the contractor subsequent to the signing of the contract authorizing a change in the contract. The change order shall be signed by the contractor, designer and the owner, and approved by the State Construction Office, in that order (Article 19).

k. **Field Order,** as used herein, shall mean a written approval for the contractor to proceed with the work requested by owner prior to issuance of a formal Change Order. The field order shall be signed by the contractor, designer, owner, and State Construction Office.

l. **Time of completion**, as stated in the contract documents, is to be interpreted as consecutive calendar days measured from the date established in the written Notice to Proceed, or such other date as may be established herein (Article 23).

m. **Liquidated damages,** as stated in the contract documents [, is an amount reasonably estimated in advance to cover the consequential damages associated with the Owner's economic loss in not being able to use the Project for its intended purposes at the end of the contract's completion date as amended by change order, if any, by reason of failure of the contractor(s) to complete the work within the time specified. Liquidated damages does not include the Owner's extended contract administration costs (including but not limited to additional fees for architectural and engineering services, testing services, inspection services, commissioning services, etc.), such other damages directly resulting from delays caused solely by the contractor, or consequential damages that the Owner identified in the bid documents that may be impacted by any delay caused soley by the Contractor (e.g., if a multi-phased project-subsequent phases, delays in start other projects that are dependent on the completion of this Project, extension of leases and/or maintenance agreements for other facilities).

n. **Surety**, as used herein, shall mean the bonding company or corporate body which is bound with and for the contractor, and which engages to be responsible for the contractor and his acceptable performance of the work.

o. **Routine written communications between the Designer and the Contractor** are any communication other than a "request for information" provided in letter, memo, or transmittal format, sent by mail, courier, electronic mail, or facsimile. Such communications can not be identified as "request for information".

p. **Clarification or Request for information (RFI)** is a request from the Contractor seeking an interpretation or clarification by the Designer relative to the contract documents. The RFI, which shall be labeled (RFI), shall clearly and concisely set forth the issue or item requiring clarification or interpretation and why the response is needed. The RFI must set forth the Contractor's interpretation or understanding of the contract documents requirements in question, along with reasons for such an understanding.

q. **Approval** means written or imprinted acknowledgement that materials, equipment or methods of construction are acceptable for use in the work**.**

r. **Inspection** shall mean examination or observation of work completed or in progress to determine its compliance with contract documents.

s. **"Equal to" or "approved equal"** shall mean materials, products, equipment, assemblies, or installation methods considered equal by the bidder in all characteristics (physical, functional, and aesthetic) to those specified in the contract documents. Acceptance of equal is subject to approval of Designer and owner.

t. **"Substitution" or "substitute"** shall mean materials, products, equipment, assemblies, or installation methods deviating in at least one characteristic (physical, functional, or aesthetic) from those specified, but which in the opinion of the bidder would improve competition and/or enhance the finished installation. Acceptance of substitution is subject to the approval of the Designer and owner.

u. **Provide** shall mean furnish and install complete in place, new, clean, operational, and ready for use.

v. **Indicated and shown** shall mean provide as detailed, or called for, and reasonably implied in the contract documents.

w. **Special inspector** is one who inspects materials, installation, fabrication, erection or placement of components and connections requiring special expertise to ensure compliance with the approved construction documents and referenced standards.

x. **Commissioning** is a quality assurance process that verifies and documents that building components and systems operate in accordance to the owner's project requirements and the project design documents.

y. **Designer Final Inspection** is the inspection performed by the design team to determine the completeness of the project in accordance with approved plans and specifications. This inspection occurs prior to SCO final inspection.

z. **SCO Final Inspection** is the inspection performed by the State Construction Office to determine the completeness of the project in accordance with NC Building Codes and approved plans and specifications.

aa. **Beneficial Occupancy** is requested by the owner and is occupancy or partial occupancy of the building after all life safety items have been completed as determined by the State Construction Office. Life safety items include but not limited to fire alarm, sprinkler, egress and exit lighting, fire rated walls, egress paths and security.

bb. Final Acceptance is the date in which the State Construction Office accepts the construction as totally complete. This includes the SCO Final Inspection and certification by the designer that all punch lists are completed.

ARTICLE 2 - INTENT AND EXECUTION OF DOCUMENTS

a. The drawings and specifications are complementary, one to the other, and that which is shown on the drawings or called for in the specifications shall be as binding as if it were both called for and shown. The intent of the drawings and specifications is to establish the scope of all labor, materials, transportation, equipment, and any and all other things necessary to provide a bid for a complete job. In case of discrepancy or disagreement in the contract documents, the order of precedence shall be: Form of Contract, specifications, large-scale detail drawings, small-scale drawings.

b. The wording of the specifications shall be interpreted in accordance with common usage of the language except that words having a commonly used technical or trade meaning shall be so interpreted in preference to other meanings.

c. The contractor shall execute each copy of the proposal, contract, performance bond and payment bond as follows:

1. If the documents are executed by a sole owner, that fact shall be evidenced by the word "Owner" appearing after the name of the person executing them.

2. If the documents are executed by a partnership, that fact shall be evidenced by the word "Co-Partner" appearing after the name of the partner executing them.

3. If the documents are executed on the part of a corporation, they shall be executed by either the president or the vice president and attested by the secretary or assistant secretary in either case, and the title of the office of such persons shall appear after their signatures. The seal of the corporation shall be impressed on each signature page of the documents.

4. If the documents are made by a joint venture, they shall be executed by each member of the joint venture in the above form for sole owner, partnership or corporation, whichever form is applicable to each particular member.

5. All signatures shall be properly witnessed.

6. If the contractor's license is held by a person other than an owner, partner or officer of a firm, then the licensee shall also sign and be a party to the contract. The title "Licensee" shall appear under his/her signature.

7. The bonds shall be executed by an attorney-in-fact. There shall be attached to each copy of the bond a certified copy of power of attorney properly executed and dated.

8. Each copy of the bonds shall be countersigned by an authorized individual agent of the bonding company licensed to do business in North Carolina. The title "Licensed Resident Agent" shall appear after the signature.

9. The seal of the bonding company shall be impressed on each signature page of the bonds.

10. The contractor's signature on the performance bond and the payment bond shall correspond with that on the contract. The date of performance and payment bond shall not be prior to the date of the contract.

ARTICLE 3 - CLARIFICATIONS AND DETAIL DRAWINGS

a. In such cases where the nature of the work requires clarification by the designer, such clarification shall be furnished by the designer with reasonable promptness by means of written instructions or detail drawings, or both. Clarifications and drawings shall be consistent with the intent of contract documents, and shall become a part thereof.

b. The contractor(s) and the designer shall prepare, if deemed necessary, a schedule fixing dates upon which foreseeable clarifications will be required. The schedule will be subject to addition or change in accordance with progress of the work. The designer shall furnish drawings or clarifications in accordance with that schedule. The contractor shall not proceed with the work without such detail drawings and/or written clarifications.

ARTICLE 4 - COPIES OF DRAWINGS AND SPECIFICATIONS

The designer or Owner shall furnish free of charge to the contractors electronic copies of plans and specifications. If requested by the contractor, paper copies of plans and specifications shall be furnished free of charge as follows:

a. General contractor - Up to twelve (12) sets of general contractor drawings and specifications, up to six (6) sets of which shall include drawings and specifications of all other contracts, plus a clean set of black line prints on white paper of all appropriate drawings, upon which the contractor shall clearly and legibly record all work-in-place that is at variance with the contract documents.

b. Each other contractor - Up to six (6) sets of the appropriate drawings and specifications, up to three (3) sets of which shall include drawings and specifications of all other contracts, plus a clean set of black line prints on white paper of all appropriate drawings, upon which the contractor shall clearly and legibly record all work-in-place that is at variance with the contract documents.

c. Additional sets shall be furnished at cost, including mailing, to the contractor upon request by the contractor. This cost shall be stated in the bidding documents.

d. For the purposes of a single-prime contract, the contractor shall receive up to 30 sets of drawings and specifications, plus a clean set of black line prints on white paper of all appropriate drawings, upon which the contractor shall clearly and legibly record all work-in-place that is at variance with the contract documents.

ARTICLE 5 - SHOP DRAWINGS, SUBMITTALS, SAMPLES, DATA

a. Within 15 consecutive calendar days after the notice to proceed, each prime contractor shall submit a schedule for submission of all shop drawings, product data, samples, and similar submittals through the Project Expediter to the Designer. This schedule shall indicate the items, relevant specification sections, other related submittal, data, and the date when these items will be furnished to the designer.

b. The Contractor(s) shall review, approve and submit to the Designer all Shop Drawings, Coordination Drawings, Product Data, Samples, Color Charts, and similar submittal data required or reasonably implied by the Contract Documents. Required Submittals shall bear the Contractor's stamp of approval, any exceptions to the Contract Documents shall be noted on the submittals, and copies of all submittals shall be of sufficient quantity for the Designer to retain up to three (3) copies of each submittal for his own use plus additional copies as may be required by the Contractor. Submittals shall be presented to the Designer in accordance with the schedule submitted in paragraph (a). so as to cause no delay in the activities of the Owner or of separate Contractors.

c. The Designer shall review required submittals promptly, noting desired corrections if any, and retaining three (3) copies (1 for the Designer, 1 for the owner and 1 for SCO) for his use. The remaining copies of each submittal shall be returned to the Contractor not later than twenty (20) days from the date of receipt by the Designer, for the Contractor's use or for corrections and resubmittal as noted by the Designer. When resubmittals are required, the submittal procedure shall be the same as for the original submittal**s.**

d. Approval of shop drawings/submittals by the Designer shall not be construed as relieving the Contractor from responsibility for compliance with the design or terms of the contract documents nor from responsibility of errors of any sort in the shop drawings, unless such lack of compliance or errors first have been called in writing to the attention of the Designer by the Contractor.

ARTICLE 6 - WORKING DRAWINGS AND SPECIFICATIONS AT THE JOB SITE

a. The contractor shall maintain, in readable condition at his job office, one complete set of working drawings and specifications for his work including all shop drawings. Such drawings and specifications shall be available for use by the designer, his authorized representative, owner or State Construction Office.

b. The contractor shall maintain at the job office, a day-to-day record of work-in-place that is at variance with the contract documents. Such variations shall be fully noted on project drawings by the contractor and submitted to the designer upon project completion and no later than 30 days after final acceptance of the project.

c. The contractor shall maintain at the job office a record of all required tests that have been performed, clearly indicating the scope of work inspected and the date of approval or rejection.

ARTICLE 7 - OWNERSHIP OF DRAWINGS AND SPECIFICATIONS

All drawings and specifications are instruments of service and remain the property of the owner. The use of these instruments on work other than this contract without permission of the owner is prohibited. All copies of drawings and specifications other than contract copies shall be returned to the owner upon request after completion of the work.

ARTICLE 8 - MATERIALS, EQUIPMENT, EMPLOYEES

a. The contractor shall, unless otherwise specified, supply and pay for all labor, transportation, materials, tools, apparatus, lights, power, heat, sanitary facilities, water, scaffolding and incidentals necessary for the completion of his work, and shall install, maintain and remove all equipment of the construction, other utensils or things, and be responsible for the safe, proper and lawful construction, maintenance and use of same, and shall construct in the best and most workmanlike manner, a complete job and everything incidental thereto, as shown on the plans, stated in the specifications, or reasonably implied therefrom, all in accordance with the contract documents.

b. All materials shall be new and of quality specified, except where reclaimed material is authorized herein and approved for use. Workmanship shall at all times be of a grade accepted as the best practice of the particular trade involved, and as stipulated in written standards of recognized organizations or institutes of the respective trades except as exceeded or qualified by the specifications.

c. Upon notice, the contractor shall furnish evidence as to quality of materials.

d. Products are generally specified by ASTM or other reference standard and/or by manufacturer's name and model number or trade name. When specified only by reference standard, the Contractor may select any product meeting this standard, by any manufacturer. When several products or manufacturers are specified as being equally acceptable, the Contractor has the option of using any product and manufacturer combination listed. However, the contractor shall be aware that the cited examples are used only to denote the quality standard of product desired and that they do not restrict bidders to a specific brand, make, manufacturer or specific name; that they are used only to set forth and convey to bidders the general style, type, character and quality of product desired; and that equivalent products will be acceptable. Request for substitution of materials, items, or equipment shall be submitted to the designer for approval or disapproval; such approval or disapproval shall be made by the designer prior to the opening of bids. Alternate materials may be requested after the award if it can clearly be demonstrated that it is an added benefit to the owner and the designer and owner approves.

e. The designer is the judge of equality for proposed substitution of products, materials or equipment.

g. If at any time during the construction and completion of the work covered by these contract documents, the language, conduct, or attire of any workman of the various crafts be adjudged a nuisance to the owner or designer, or if any workman be considered detrimental to the work, the contractor shall order such parties removed immediately from grounds.

ARTICLE 9 - ROYALTIES, LICENSES AND PATENTS

It is the intention of the contract documents that the work covered herein will not constitute in any way infringement of any patent whatsoever unless the fact of such patent is clearly evidenced herein. The contractor shall protect and save harmless the owner against suit on account of alleged or actual infringement. The contractor shall pay all royalties and/or license fees required on account of patented articles or processes, whether the patent rights are evidenced hereinafter.

ARTICLE 10 - PERMITS, INSPECTIONS, FEES, REGULATIONS

a. The contractor shall give all notices and comply with all laws, ordinances, codes, rules and regulations bearing on the conduct of the work under this contract. If the contractor observes that the drawings and specifications are at variance therewith, he shall promptly notify the designer in writing. See Instructions to Bidders, Paragraph 3, Bulletins and Addenda. Any necessary changes required after contract award shall be made by change order in accordance with Article 19. If the contractor performs any work knowing it to be contrary to such laws, ordinances, codes, rules and regulations, and without such notice to the designer, he shall bear all cost arising therefrom. Additional requirements implemented after bidding will be subject to equitable negotiations.

b. All work under this contract shall conform to the North Carolina State Building Code and other State, local and national codes as are applicable. The cost of all required inspections and permits shall be the responsibility of the contractor and included within the bid proposal. All water taps, meter barrels, vaults and impact fees shall be paid by the contractor unless otherwise noted.

d. Projects constructed by the State of North Carolina or by any agency or institution of the State are not subject to inspection by any county or municipal authorities and are not subject to county or municipal building codes. The contractor shall, however, cooperate with the county or municipal authorities by obtaining building permits. Permits shall be obtained at no cost.

e. Projects involving local funding (community colleges) are subject also to county and municipal building codes and inspection by local authorities. The contractor shall pay the cost of these permits and inspections.

ARTICLE 11 - PROTECTION OF WORK, PROPERTY AND THE PUBLIC

a. The contractors shall be jointly responsible for the entire site and the building or construction of the same and provide all the necessary protections, as required by the owner or designer, and by laws or ordinances governing such conditions. They shall be responsible for any damage to the owner's property, or of that of others on the job, by them, their personnel, or their subcontractors, and shall make good such damages. They shall be responsible for and pay for any damages caused to the owner. All contractors shall have access to the project at all times.

b. The contractor shall provide cover and protect all portions of the structure when the work is not in progress, provide and set all temporary roofs, covers for doorways, sash and windows, and all other materials necessary to protect all the work on the building, whether set by him, or any of the subcontractors. Any work damaged through the lack of proper protection or from any other cause, shall be repaired or replaced without extra cost to the owner.

c. No fires of any kind will be allowed inside or around the operations during the course of construction without special permission from the designer and owner.

d. The contractor shall protect all trees and shrubs designated to remain in the vicinity of the operations by building substantial boxes around same. He shall barricade all walks, roads, etc., as directed by the designer to keep the public away from the construction. All trenches, excavations or other hazards in the vicinity of the work shall be well barricaded and properly lighted at night.

e. The contractor shall provide all necessary safety measures for the protection of all persons on the job, including the requirements of the A.G.C. *Accident Prevention Manual in Construction*, as amended, and shall fully comply with all state laws or regulations and North Carolina State Building Code requirements to prevent accident or injury to persons on or about the location of the work. He shall clearly mark or post signs warning of hazards existing, and shall barricade excavations, elevator shafts, stairwells and similar hazards. He shall protect against damage or injury resulting from falling materials and he shall maintain all protective devices and signs throughout the progress of the work.

f. The contractor shall adhere to the rules, regulations and interpretations of the North Carolina Department of Labor relating to Occupational Safety and Health Standards for the Construction Industry (Title 29, Code of Federal Regulations, Part 1926, published in Volume 39, Number 122, Part II, June 24, 1974, *Federal Register*), and revisions thereto as adopted by General Statutes of North Carolina 95-126 through 155.

g. The contractor shall designate a responsible person of his organization as safety officer/inspector to inspect the project site for unsafe health and safety hazards, to report these hazards to the contractor for correction, and whose duties also include accident prevention on the project, and to provide other safety and health measures on the project site as required by the terms and conditions of the contract.The name of the safety inspector shall be made known to the designer and owner at the time of the preconstruction conference and in all cases prior to any work starting on the project.

h. In the event of emergency affecting the safety of life, the protection of work, or the safety of adjoining properties, the contractor is hereby authorized to act at his own discretion, without further authorization from anyone, to prevent such threatened injury or damage.

Any compensation claimed by the contractor on account of such action shall be determined as provided for under Article 19(b).

i. Any and all costs associated with correcting damage caused to adjacent properties of the construction site or staging area shall be borne by the contractor. These costs shall include but not be limited to flooding, mud, sand, stone, debris, and discharging of waste products.

ARTICLE 12 - SEDIMENTATION POLLUTION CONTROL ACT OF 1973

a. Any land-disturbing activity performed by the contractor(s) in connection with the project shall comply with all erosion control measures set forth in the contract documents and any additional measures which may be required in order to ensure that the project is in full compliance with the Sedimentation Pollution Control Act of 1973, as implemented by Title 15, North Carolina Administrative Code, Chapter 4, Sedimentation Control, Subchapters 4A, 4B and 4C, as amended (15 N.C.A.C. 4A, 4B and 4C).

b. Upon receipt of notice that a land-disturbing activity is in violation of said act, the contractor(s) shall be responsible for ensuring that all steps or actions necessary to bring the project in compliance with said act are promptly taken.

c. The contractor(s) shall be responsible for defending any legal actions instituted pursuant to N.C.G.S. 113A-64 against any party or persons described in this article.

d. To the fullest extent permitted by law, the contractor(s) shall indemnify and hold harmless the owner, the designer and the agents, consultants and employees of the owner and designer, from and against all claims, damages, civil penalties, losses and expenses, including, but not limited to, attorneys' fees, arising out of or resulting from the performance of work or failure of performance of work, provided that any such claim, damage, civil penalty, loss or expense is attributable to a violation of the Sedimentation Pollution Control Act. Such obligation shall not be construed to negate, abridge or otherwise reduced any other right or obligation of indemnity which would otherwise exist as to any party or persons described in this article.

ARTICLE 13 - INSPECTION OF THE WORK

a. It is a condition of this contract that the work shall be subject to inspection during normal working hours and during any time work is in preparation and progress by the designer, designated official representatives of the owner, State Construction Office and those persons required by state law to test special work for official approval. The contractor shall therefore provide safe access to the work at all times for such inspections.

b. All instructions to the contractor will be made only by or through the designer or his designated project representative. Observations made by official representatives of the owner shall be conveyed to the designer for review and coordination prior to issuance to the contractor.

c. All work shall be inspected by designer, special inspector and/or State Construction Office prior to being covered by the contractor. Contractor shall give a minimum two weeks notice unless otherwise agreed to by all parties. If inspection fails, after the first reinspection all costs associated with additional reinspections shall be borne by the contractor.

d. Where special inspection or testing is required by virtue of any state laws, instructions of the designer, specifications or codes, the contractor shall give adequate notice to the designer of the time set for such inspection or test, if the inspection or test will be conducted by a party other than the designer. Such special tests or inspections will be made in the presence of the designer, or his authorized representative, and it shall be the contractor's responsibility to serve ample notice of such tests.

e. All laboratory tests shall be paid by the owner unless provided otherwise in the contract documents except the general contractor shall pay for laboratory tests to establish design mix for concrete, and for additional tests to prove compliance with contract documents where materials have tested deficient except when the testing laboratory did not follow the appropriate ASTM testing procedures.

f. Should any work be covered up or concealed prior to inspection and approval by the designer, special inspector, and/or State Construction Office such work shall be uncovered or exposed for inspection, if so requested by the designer in writing. Inspection of the work will be made upon notice from the contractor. All cost involved in uncovering, repairing, replacing, recovering and restoring to design condition, the work that has been covered or concealed will be paid by the contractor involved.

ARTICLE 14 - CONSTRUCTION SUPERVISION AND SCHEDULE

a. Throughout the progress of the work, each contractor shall keep at the job site**,** a competent superintendent and supervisory staff satisfactory to the designer and the owner. The superintendent and supervisory staff shall not be changed without the consent of the designer and owner unless said superintendent ceases to be employed by the contractor or ceases to be competent as determined by the contractor, designer or owner. The superintendent and other staff designated by the contractor in writing shall have authority to act on behalf of the contractor, and instructions, directions or notices given to him shall be as binding as if given to the contractor. However, directions, instructions, and notices shall be confirmed in writing.

b. The contractor shall examine and study the drawings and specifications and fully understand the project design, and shall provide constant and efficient supervision to the work. Should he discover any discrepancies of any sort in the drawings or specifications, he shall report them to the designer without delay. He will not be held responsible for discrepancies in the drawings and/or specifications, but shall be held responsible to report them should they become known to him.

c. All contractors shall be required to cooperate and consult with each other during the construction of this project. Prior to installation of work, all contractors shall jointly prepare coordination drawings, showing locations of various ductworks, piping, motors, pumps, and other mechanical or electrical equipment, in relation to the structure, walls and ceilings. These drawings shall be submitted to the designer through the Project Expediter for information only**.** Each contractor shall lay out and execute his work to cause the least delay to other contractors. Each contractor shall be financially responsible for any damage to other contractor's work and for undue delay caused to other contractors on the project.

d. The contractor is required to attend job site progress conferences as called by the designer. The contractor shall be represented at these job progress conferences by both home office and project personnel. These representatives shall have authority to act on behalf of the contractor. These meetings shall be open to subcontractors, material

suppliers and any others who can contribute toward maintaining required job progress. It shall be the principal purpose of these meetings, or conferences, to effect coordination, cooperation and assistance in every practical way toward the end of maintaining progress of the project on schedule and to complete the project within the specified contract time. Each contractor shall be prepared to assess progress of the work as required in his particular contract and to recommend remedial measures for correction of progress as may be appropriate. The designer or his authorized representative shall be the coordinator of the conferences and shall preside as chairman. The contractor shall turn over a copy of his daily reports to the Designer and Owner at the job site progress conference. Owner will determine daily report format.

e The contractor(s) shall, employ an engineer or a land surveyor licensed in the State of North Carolina to lay out the work and to establish a bench mark in a location where same will not be disturbed and where direct instruments sights may be taken.

f. The designer shall designate a Project Expediter on projects involving two or more prime contracts. The Project Expediter shall be designated in the Supplementary General Conditions. The Project Expediter shall have at a minimum the following responsibilities**.**

1. Prepare the project construction schedule and shall allow all prime contractors (multi-prime contract) and subcontractors (single-prime contract) performing general, plumbing, HVAC, and electrical work equal input into the preparation of the initial construction schedule.

2. Maintain a project progress schedule for all contractors.

3. Give adequate notice to all contractors to ensure efficient continuity of all phases of the work.

4. Notify the designer of any changes in the project schedule.

5. Recommend to the owner whether payment to a contractor shall be approved**.**

g. It shall be the responsibility of the Project Expediter to cooperate with and obtain from several prime contractors and subcontractors on the job, their respective work activities and integrate these activities into a project construction schedule in form of a detailed bar chart or Critical Path Method (CPM), schedule. Each prime contractor shall provide work activities within fourteen (14) days of request by the Project Expediter. A "work activity", for scheduling purposes, shall be any component or contractual requirement of the project requiring at least one (1) day, but not more than fourteen (14) days, to complete or fulfill**.** The project construction schedule shall graphically show all salient features of the work required to construct the project from start to finish and within the allotted time established in the contract. The time (in days) between the contractor's early completion and contractual completion dates is part of the project total float time; and shall be used as such, unless amended by a change order**.** On a multi-prime project, each prime contractor shall review the proposed construction schedule and approve same in writing**.** The Project Expediter shall submit the proposed construction schedule to the designer for comments. The complete Project construction schedule shall be of the type set forth in the Supplementary General Condition or subparagraph (1) or (2) below, as appropriate:

1. For a project with total contracts of $500,000 or less, a bar chart schedule will satisfy the above requirement. The schedule shall indicate the estimated starting and completion dates for each major element of the work.

2. For a project with total contracts over $500,000, a Critical Path Method (CPM) schedule shall be utilized to control the planning and scheduling of the Work. The CPM schedule shall be the responsibility of the Project Expediter and shall be paid for by the Project Expediter.

Bar Chart Schedule: Where a bar chart schedule is required, it shall be time-scaled in weekly increments, shall indicate the estimated starting and completion dates for each major element of the work by trade and by area, level, or zone, and shall schedule dates for all salient features, including but not limited to the placing of orders for materials, submission of shop drawings and other Submittals for approval, approval of shop drawings by designers, the manufacture and delivery of material, the testing and the installation of materials, supplies and equipment, and all Work activities to be performed by the Contractor. The Contractor shall allow sufficient time in his schedule for all commissioning, required inspections and completion of final punchlist(s). Each Work activity will be assigned a time estimate by the Contractor. One day shall be the smallest time unit used.

CPM Schedule: Where a CPM schedule is required, it shall be in time-scaled precedence format using the Project Expediter's logic and time estimates. The CPM schedule shall be drawn or plotted with activities grouped or zoned by Work area or subcontract as opposed to a random (or scattered) format. The CPM schedule shall be time-scaled on a weekly basis and shall be drawn or plotted at a level of detail and logic which will schedule all salient features of the work to be performed by the Contractor. The Contractor shall allow sufficient time in his schedule for all commissioning, required inspections and completion of final punchlist(s).. Each Work activity will be assigned a time estimate by the Contractor. One day shall be the smallest time unit used.

The CPM schedule will identify and describe each activity, state the duration of each activity, the calendar dates for the early and late start and the early and late finish of each activity, and clearly highlight all activities on the critical path. "Total float" and "free float" shall be indicated for all activities. Float time shall not be considered for the exclusive use or benefit of either the Owner or the Contractor, but must be allocated in the best interest of completing the Work within the Contract time. Extensions to the Contract time, when granted by Change Order, will be granted only when equitable time adjustment exceeds the Total Float in the activity or path of activities affected by the change. On contracts with a price over $2,500,000, the CPM schedule shall also show what part of the Contract Price is attributable to each activity on the schedule, the sum of which for all activities shall equal the total Contract Price.

Early Completion of Project: The Contractor may attempt to complete the project prior to the Contract Completion Date. However, such planned early completion shall be for the Contractor's convenience only and shall not create any additional rights of the Contractor or obligations of the Owner under this Contract, nor shall it change the Time

for Completion or the Contract Completion Date. The Contractor shall not be required to pay liquidated damages to the Owner because of its failure to complete by its planned earlier date. Likewise, the Owner shall not pay the Contractor any additional compensation for early completion nor will the Owner owe the Contractor any compensation should the Owner, its officers, employees, or agents cause the Contractor not to complete earlier than the date required by the Contract Documents.

h. The proposed project construction schedule shall be presented to the designer no later than fifteen (15) days after written notice to proceed. No application for payment will be processed until this schedule is accepted by the designer and owner.

i. The approved project construction schedule shall be distributed to all contractors and displayed at the job site by the Project Expediter.

j. The several contractors shall be responsible for their work activities and shall notify the Project Expediter of any necessary changes or adjustments to their work. The Project Expediter shall maintain the project construction schedule, making biweekly adjustments, updates, corrections, etc., that are necessary to finish the project within the Contract time, keeping all contractors and the designer fully informed. Copy of a bar chart schedule annotated to show the current progress shall be submitted by the Contractor(s) to the designer, along with monthly request for payment. For project requiring CPM schedule, the Contractor shall submit a biweekly report of the status of all activities. The bar chart schedule or status report shall show the actual Work completed to date in comparison with the original Work scheduled for all activities. If any activities of the work of several contractors are behind schedule, the contractor must indicate in writing, what measures will be taken to bring each such activity back on schedule and to ensure that the Contract Completion Date is not exceeded. A plan of action and recovery schedule shall be developed and submitted to the designer by the Project Expediter, when (1) the contractor's report indicates delays, that are in the opinion of the designer or the owner, of sufficient magnitude that the contractor's ability to complete the work by the scheduled completion is brought into question; (2) the updated construction schedule is thirty (30) days behind the planned or baseline schedule and no legitimate time extensions, as determined by the Designer, are in process; and (3) the contractor desires to make changes in the logic (sequencing of work) or the planned duration of future activities of the CPM schedule which, in the opinion of the designer or the owner, are of a major nature. The plan of action, when required shall be submitted to the Owner for review within two (2) business days of the Contractor receiving the Owner's written demand. The recovery schedule, when required, shall be submitted to the Owner within five (5) calendar days of the Contractor's receiving the Owner's written demand. Failure to provide an updated construction schedule or a recovery schedule may be grounds for rejection of payment applications or withholding of funds as set forth in Article 33.

k. The Project Expediter shall notify each contractor of such events or time frames that are critical to the progress of the job. Such notice shall be timely and reasonable. Should the progress be delayed due to the work of any of the several contractors, it shall be the duty of the Project Expediter to immediately notify the contractor(s) responsible for such delay, the designer, the State Construction Office and other prime contractors. The designer shall determine the contractor(s) who caused the delays and notify the bonding company of the responsible contractor(s) of the delays; and shall make a recommendation to the owner regarding further action.

l. Designation as Project Expediter entails an additional project control responsibility and does not alter in any way the responsibility of the contractor so designated, nor the

responsibility of the other contractors involved in the project. The project expeditor's Superintendent(s) shall be in attendance at the Project site at all times when work is in progress unless conditions are beyond the control of the Contractor or until termination of the Contract in accordance with the Contract Documents. It is understood that such Superintendent shall be acceptable to the Owner and Designer and shall be the one who will be continued in that capacity for the duration of the project unless he ceases to be on the Contractor's payroll or the Owner otherwise agrees. The Superintendent shall not be employed on any other project for or by the Contractor or by any other entity during the course of the Work. If the Superintendent is employed by the Contractor on another project without the Owner's approval, then the Owner may deduct from the Contractor's monthly general condition costs and amount representing the Superintendent's cost and shall deduct that amount for each month thereafter until the Contractor has the Superintendent back on the Owner's Project full-time.

ARTICLE 15 - SEPARATE CONTRACTS AND CONTRACTOR RELATIONSHIPS

a. Effective from January 1, 2002, Chapter 143, Article 8, was amended, to allow public contracts to be delivered by the following delivery methods: single-prime, dual (single-prime and separate-prime), construction manager at risk, and alternative contracting method as approved by the State Building Commission. The owner reserves the right to prepare separate specifications, receive separate bids, and award separate contracts for such other major items of work as may be in the best interest of the State. For the purposes of a single prime contract, refer to Article 1 – Definitions.

b. All contractors shall cooperate with each other in the execution of their work, and shall plan their work in such manner as to avoid conflicting schedules or delay of the work. See Article 14, Construction Supervision.

c. If any part of contractor's work depends upon the work of another contractor, defects which may affect that work shall be reported to the designer in order that prompt inspection may be made and the defects corrected. Commencement of work by a contractor where such condition exists will constitute acceptance of the other contractor's work as being satisfactory in all respects to receive the work commenced, except as to defects which may later develop. The designer shall be the judge as to the quality of work and shall settle all disputes on the matter between contractors.

d. Any mechanical or electrical work such as sleeves, inserts, chases, openings, penetrations, etc., which is located in the work of the general contractor shall be built in by the general contractor. The respective mechanical and electrical contractors shall set all sleeves, inserts and other devices that are to be incorporated into the structure in cooperation and under the supervision of the general contractor. The responsibility for the exact location of such items shall be that of the mechanical and/or electrical contractor.

e. The designer and the owner shall have access to the work whenever it is in preparation and progress and during normal working hours. The contractor shall provide facilities for such access so the designer may perform his functions under the contract documents.

f. Should a contractor cause damage to the work or property of another contractor, he shall be directly responsible, and upon notice, shall promptly settle the claim or otherwise resolve the dispute.

ARTICLE 16 - SUBCONTRACTS AND SUBCONTRACTORS

a. Within thirty (30) days after award of the contract, the contractor shall submit to the designer, owner and to the State Construction Office a list giving the names and addresses of subcontractors and equipment and material suppliers he proposes to use, together with the scope of their respective parts of the work. Should any subcontractor be disapproved by the designer or owner, the designer or owner shall submit his reasons for disapproval in writing to the State Construction Office for its consideration with a copy to the contractor. If the State Construction Office concurs with the designer's or owner's recommendation, the contractor shall submit a substitute for approval. The designer and owner shall act promptly in the approval of subcontractors, and when approval of the list is given, no changes of subcontractors will be permitted except for cause or reason considered justifiable by the designer or owner.

b. The designer will furnish to any subcontractor, upon request, evidence regarding amounts of money paid to the contractor on account of the subcontractor's work.

c. The contractor is and remains fully responsible for his own acts or omissions as well as those of any subcontractor or of any employee of either. The contractor agrees that no contractual relationship exists between the subcontractor and the owner in regard to the contract, and that the subcontractor acts on this work as an agent or employee of the contractor.

d. The owner reserves the right to limit the amount of portions of work to be subcontracted as hereinafter specified.

ARTICLE 17 - CONTRACTOR AND SUBCONTRACTOR RELATIONSHIPS

The contractor agrees that the terms of these contract documents shall apply equally to each subcontractor as to the contractor, and the contractor agrees to take such action as may be necessary to bind each subcontractor to these terms. The contractor further agrees to conform to the Code of Ethical Conduct as adopted by the Associated General Contractors of America, Inc., with respect to contractor-subcontractor relationships, and that payments to subcontractors shall be made in accordance with the provisions of G.S. 143-134.1 titled Interest on final payments due to prime contractors: payments to subcontractors.

a. On all public construction contracts which are let by a board or governing body of the state government or any political subdivision thereof, except contracts let by the Department of Transportation pursuant to G.S. 136-28.1, the balance due prime contractors shall be paid in full within 45 days after respective prime contracts of the project have been accepted by the owner, certified by the architect, engineer or designer to be completed in accordance with terms of the plans and specifications, or occupied by the owner and used for the purpose for which the project was constructed, whichever occurs first. Provided, however, that whenever the architect or consulting engineer in charge of the project determines that delay in completion of the project in accordance with terms of the plans and specifications is the fault of the contractor, the project may be occupied and used for the purposes for which it was constructed without payment of any interest on amounts withheld past the 45 day limit. No payment shall be delayed because of the failure of another prime contractor on such project to complete his contract. Should final payment to any prime contractor beyond the date such contracts have been certified to be completed by the designer or architect, accepted by the owner, or occupied by the owner and used for the purposes for which the project was constructed, be delayed by more than 45 days, said prime contractor shall be paid interest, beginning on the 46th day, at the rate of one percent (1%) per month or fraction thereof unless a lower rate is

agreed upon on such unpaid balance as may be due. In addition to the above final payment provisions, periodic payments due a prime contractor during construction shall be paid in accordance with the payment provisions of the contract documents or said prime contractor shall be paid interest on any such unpaid amount at the rate stipulated above for delayed final payments. Such interest shall begin on the date the payment is due and continue until the date on which payment is made. Such due date may be established by the terms of the contract. Funds for payment of such interest on state-owned projects shall be obtained from the current budget of the owning department, institution or agency. Where a conditional acceptance of a contract exists, and where the owner is retaining a reasonable sum pending correction of such conditions, interest on such reasonable sum shall not apply.

b. Within seven days of receipt by the prime contractor of each periodic or final payment, the prime contractor shall pay the subcontractor based on work completed or service provided under the subcontract. Should any periodic or final payment to the subcontractor be delayed by more than seven days after receipt of periodic or final payment by the prime contractor, the prime contractor shall pay the subcontractor interest, beginning on the eighth day, at the rate of one percent (1%) per month or fraction thereof on such unpaid balance as may be due.

c. The percentage of retainage on payments made by the prime contractor to the subcontractor shall not exceed the percentage of retainage on payments made by the owner to the prime contractor. Any percentage of retainage on payments made by the prime contractor to the subcontractor that exceeds the percentage of retainage on payments made by the owner to the prime contractor shall be subject to interest to be paid by the prime contractor to the subcontractor at the rate of one percent (1%) per month or fraction thereof.

d. Nothing in this section shall prevent the prime contractor at the time of application and certification to the owner from withholding application and certification to the owner for payment to the subcontractor for unsatisfactory job progress; defective construction not remedied; disputed work; third-party claims filed or reasonable evidence that claim will be filed; failure of subcontractor to make timely payments for labor, equipment and materials; damage to prime contractor or another subcontractor; reasonable evidence that subcontract cannot be completed for the unpaid balance of the subcontract sum; or a reasonable amount for retainage not to exceed the initial percentage retained by owner.

ARTICLE 18 - DESIGNER'S STATUS

a. The designer shall provide general administration of the performance of construction contracts, including liaison and necessary inspection of the work to ensure compliance with plans and specifications. He is the agent of the owner only for the purpose of constructing this work and to the extent stipulated in the contract documents. He has authority to direct work to be performed, to stop work, to order work removed, or to order corrections of faulty work, where any such action by the designer may be necessary to assure successful completion of the work.

b. The designer is the impartial interpreter of the contract documents, and, as such, he shall exercise his powers under the contract to enforce faithful performance by both the owner and the contractor, taking sides with neither.

c. Should the designer cease to be employed on the work for any reason whatsoever, then the owner shall employ a competent replacement who shall assume the status of the former designer.

d. The designer and his consultants will make inspections of the project. He will inspect the progress, the quality and the quantity of the work.

e. The designer and the owner shall have access to the work whenever it is in preparation and progress during normal working hours. The contractor shall provide facilities for such access so the designer and owner may perform their functions under the contract documents.

f. Based on the designer's inspections and evaluations of the project, the designer shall issue interpretations, directives and decisions as may be necessary to administer the project. His decisions relating to artistic effect and technical matters shall be final, provided such decisions are within the limitations of the contract.

ARTICLE 19 - CHANGES IN THE WORK

a. The owner may have changes made in the work covered by the contract. These changes will not invalidate and will not relieve or release the contractor from any guarantee given by him pertinent to the contract provisions. These changes will not affect the validity of the guarantee bond and will not relieve the surety or sureties of said bond. All extra work shall be executed under conditions of the original contract.

b. Except in an emergency endangering life or property, no change shall be made by the contractor except upon receipt of approved change order or written field order from the designer, countersigned by the owner and the state construction office authorizing such change. No claim for adjustments of the contract price shall be valid unless this procedure is followed.

A field order, transmitted by fax, electronically, or hand delivered, may be used where the change involved impacts the critical path of the work. A formal change order shall be issued as expeditiously as possible.

In the event of emergency endangering life or property, the contractor may be directed to proceed on a time and material basis whereupon the contractor shall proceed and keep accurately on such form as specified by the designer or owner, a correct account of costs together with all proper invoices, payrolls and supporting data. Upon completion of the work the change order will be prepared as outlined under either Method "c(1)" or Method "c(2)" or both.

c. In determining the values of changes, either additive or deductive, contractors are restricted to the use of the following methods:

1. Where the extra work involved is covered by unit prices quoted in the proposal, or subsequently agreed to by the Contractor, Designer, Owner and State Construction Office the value of the change shall be computed by application of unit prices based on quantities, estimated or actual as agreed of the items involved, except is such cases where a quantity exceeds the estimated quantity allowance in the contract by one hundred percent (100%) or more. In such cases, either party may elect to proceed under subparagraph c2 herein. If neither party elects to proceed under c2, then unit prices shall apply.

2. The contracting parties shall negotiate and agree upon the equitable value of the change prior to issuance of the change order, and the change order shall stipulate the corresponding lump sum adjustment to the contract price.

d. Under Paragraph “b” and Methods "c(2)" above, the allowances for overhead and profit combined shall be as follows: all contractors (the single contracting entity (prime), his subcontractors(1st tier subs), or their sub-subcontractors (2nd tier subs, 3rd tier subs, etc)) shall be allowed a maximum of 10% on work they each self-perform; the prime contractor shall be allowed a maximum of 5% on contracted work of his 1st tier sub; 1st tier, 2nd tier, 3rd tier, etc contractors shall be allowed a maximum of 2.5% on the contracted workof their subs. ; Under Method "c(1)", no additional allowances shall be made for overhead and profit. In the case of deductible change orders, under Method "c(2)" and Paragraph (b) above, the contractor shall include no less than five percent (5%***)*** profit, but no allowances for overhead.

e. The term "net cost" as used herein shall mean the difference between all proper cost additions and deductions. The "cost" as used herein shall be limited to the following:

1. The actual costs of materials and supplies incorporated or consumed as part of the work;

2. The actual costs of labor expended on the project site; labor expended in coordination, change order negotiation, record document maintenance, shop drawing revision or other tasks necessary to the administration of the project are considered overhead whether they take place in an office or on the project site.

3. The actual costs of labor burden, limited to the costs of social security (FICA) and Medicare/Medicaid taxes; unemployment insurance costs; health/dental/vision insurance premiums; paid employee leave for holidays, vacation, sick leave, and/or petty leave, not to exceed a total of 30 days per year; retirement contributions; worker’s compensation insurance premiums; and the costs of general liability insurance when premiums are computed based on payroll amounts; the total of which shall not exceed thirty percent (30%) of the actual costs of labor;

4. The actual costs of rental for tools, excluding hand tools; equipment; machinery; and temporary facilities required for the work;

5. The actual costs of premiums for bonds, insurance, permit fees, and sales or use taxes related to the work.

Overtime and extra pay for holidays and weekends may be a cost item only to the extent approved by the owner.

f. Should concealed conditions be encountered in the performance of the work below grade, or should concealed or unknown conditions in an existing structure be at variance with the conditions indicated by the contract documents, the contract sum and time for completion may be equitably adjusted by change order upon claim by either party made within thirty (30) days after the condition has been identified. The cost of such change shall be arrived at by one of the foregoing methods. All change orders shall be supported by a unit cost breakdown showing method of arriving at net cost as defined above.

g. In all change orders, the procedure will be for the designer to request proposals for the change order work in writing. The contractor will provide such proposal and supporting data in suitable format. The designer shall verify correctness. Delay in the processing of the change order due to lack of proper submittal by the contractor of all required supporting data shall not constitute grounds for a time extension or basis of a claim. Within fourteen (14) days after receipt of the contractor’s accepted proposal including all supporting documentation required by the designer**,** the designer shall prepare the change order and forward to the contractor for his signature or otherwise respond, in writing, to

the contractor's proposal. Within seven (7) days after receipt of the change order executed by the contractor, the designer shall, certify the change order by his signature, and forward the change order and all supporting data to the owner for the owner's signature. The owner shall execute the change order and forward to the State Construction Office for final approval**,** within seven (7) days of receipt. The State Construction Office shall act on the change order within seven (7) days. In case of emergency or extenuating circumstances, approval of changes may be obtained verbally by telephone or field orders approved by all parties, then shall be substantiated in writing as outlined under normal procedure.

h. At the time of signing a change order, the contractor shall be required to certify as follows:

"I certify that my bonding company will be notified forthwith that my contract has been changed by the amount of this change order, and that a copy of the approved change order will be mailed upon receipt by me to my surety."

i. A change order, when issued, shall be full compensation, or credit, for the work included, omitted or substituted. It shall show on its face the adjustment in time for completion of the project as a result of the change in the work.

j. If, during the progress of the work, the owner requests a change order and the contractor's terms are unacceptable, the owner**,** with the approval of the State Construction Office, may require the contractor to perform such work on a time and material basis whereupon the contractor shall proceed and keep accurately on such form as specified by the Designer or owner, a correct account of cost together with all proper invoices, payrolls and supporting data. Upon completion of the work a change order will be prepared with allowances for overhead and profit per paragraph d. above and "net cost" and "cost" per paragraph e. above. Without prejudice, nothing in this paragraph shall preclude the owner from performing or to have performed that portion of the work requested in the change order.

ARTICLE 20 - CLAIMS FOR EXTRA COST

a. Should the contractor consider that as a result of instructions given by the designer, he is entitled to extra cost above that stated in the contract, he shall give written notice thereof to the designer within seven (7) days without delay. The written notice shall clearly state that a claim for extra cost is being made and shall provide a detailed justification for the extra cost. The contractor shall not proceed with the work affected until further advised, except in emergency involving the safety of life or property, which condition is covered in Article 19(b) and Article 11(h). No claims for extra compensation shall be considered unless the claim is so made. The designer shall render a written decision within seven (7) days of receipt of claim.

b. The contractor shall not act on instructions received by him from persons other than the designer, and any claims for extra compensation or extension of time on account of such instruction will not be honored. The designer shall not be responsible for misunderstandings claimed by the contractor of verbal instructions which have not been confirmed in writing, and in no case shall instructions be interpreted as permitting a departure from the contract documents unless such instruction is confirmed in writing and supported by a properly authorized change order.

c. Should a claim for extra compensation that complies with the requirements of (a) above by the contractor and is denied by the designer or owner, and cannot be resolved by a

representative of the State Construction Office, the contractor may request a mediation in connection with GS 143-128(f1) in the dispute resolution rules adopted by the State Building Commission (1 N.C.A.C. 30H .0101 through .1001). If the contractor is unable to resolve its claim as a result of mediation, the contractor may pursue the claim in accordance with the provisions of G.S. 143-135.3, or G.S. 143-135.6 where Community Colleges are the owner,and the following:

1. A contractor who has not completed a contract with a board for construction or repair work and who has not received the amount he claims is due under the contract may submit a verified written claim to the director of the State Construction Office of the Department of Administration for the amount the contractor claims is due. The director may deny, allow or compromise the claim, in whole or in part. A claim under this subsection is not a contested case under Chapter 150B of the General Statutes.

2. (a) A contractor who has completed a contract with a board for construction or repair work and who has not received the amount he claims is due under the contract may submit a verified written claim to the director of the State Construction Office of the Department of Administration for the amount the contractor claims is due. The claim shall be submitted within sixty (60) days after the contractor receives a final statement of the board's disposition of his claim and shall state the factual basis for the claim.

   (b) The director shall investigate a submitted claim within ninety (90) days of receiving the claim, or within any longer time period upon which the director and the contractor agree. The contractor may appear before the director, either in person or through counsel, to present facts and arguments in support of his claim. The director may allow, deny or compromise the claim, in whole or in part. The director shall give the contractor a written statement of the director's decision on the contractor's claim.

   (c) A contractor who is dissatisfied with the director's decision on a claim submitted under this subsection may commence a contested case on the claim under Chapter 150B of the General Statutes. The contested case shall be commenced within sixty (60) days of receiving the director's written statement of the decision.

   (d) As to any portion of a claim that is denied by the director, the contractor may, in lieu of the procedures set forth in the preceding subsection of this section, within six (6) months of receipt of the director's final decision, institute a civil action for the sum he claims to be entitled to under the contract by filing a verified complaint and the issuance of a summons in the Superior Court of Wake County or in the superior court of any county where the work under the contract was performed. The procedure shall be the same as in all civil actions except that all issues shall be tried by the judge, without a jury.

ARTICLE 21 - MINOR CHANGES IN THE WORK

The designer will have the authority to order minor changes in the work not involving an adjustment in the contract sum or time for completion, and not inconsistent with the intent of the contract documents. Such changes shall be effected by written order, copied to the State Construction Office, and shall be binding on the owner and the contractor.

ARTICLE 22 - UNCORRECTED FAULTY WORK

Should the correction of faulty or damaged work be considered inadvisable or inexpedient by the owner and the designer, the owner shall be reimbursed by the contractor. A change order will be issued to reflect a reduction in the contract sum.

ARTICLE 23 - TIME OF COMPLETION, DELAYS, EXTENSION OF TIME

a. The time of completion is stated in the Supplementary General Conditions and in the Form of Construction Contract. The Project Expediter, upon notice of award of contract, shall prepare a construction schedule to complete the project within the time of completion as required by Article 14.

b. The contractors shall commence work to be performed under this agreement on a date to be specified in a written Notice to Proceed from the designer and shall fully complete all work hereunder within the time of completion stated. Time is of the essence and the contractor acknowledges the Owner will likely suffer financial damage for failure to complete the work within the time of completion. For each day in excess of the above number of days, the contractor(s) shall pay the owner the sum stated as liquidated damages reasonably estimated in advance to cover the losses to be incurred by the owner by reason of failure of said contractor(s) to complete the work within the time specified, such time being in the essence of this contract and a material consideration thereof.

c. In the event of multiple prime contractors, the designer shall be the judge as to the division of responsibility between the contractor(s), based on the construction schedule, weekly reports and job records, and shall apportion the amount of liquidated damages to be paid by each of them, according to delay caused by any or all of them.

d. If the contractor is delayed at any time in the progress of his work solely by any act or negligence of the owner, the designer, or by any employee of either; by any separate contractor employed by the owner; by changes ordered in the work; by labor disputes at the project site; by abnormal weather conditions not reasonably anticipated for the locality where the work is performed; by unavoidable casualties; by any causes beyond the contractor's control; or by any other causes which the designer and owner determine may justify the delay, then the contract time may be extended by change order only for the time which the designer and owner may determine is reasonable.

   Time extensions will not be granted for rain, wind, snow or other natural phenomena of normal intensity for the locality where work is performed. For purpose of determining extent of delay attributable to unusual weather phenomena, a determination shall be made by comparing the weather for the contract period involved with the average of the preceding five (5) year climatic range during the same time interval based on the National Oceanic and Atmospheric Administration National Weather Service statistics for the locality where work is performed and on daily weather logs kept on the job site by the contractor reflecting the effect of the weather on progress of the work and initialed by the designer's representative. No weather delays shall be considered after the building is dried in unless work claimed to be delayed is on the critical path of the baseline schedule or approved updated schedule. Time extensions for weather delays, acts of God, labor disputes, fire, delays in transportation, unavoidable casualties or other delays which are beyond the control of the Owner do not entitle the Contractor to compensable damages for delays. Any contractor claim for compensable damages for delays is limited to delays caused solely by the owner or its agents. Contractor caused delays shall be accounted for before owner or designer caused delays in the case of concurrent delays.

e. Request for extension of time shall be made in writing to the designer, copies to the owner and SCO, within twenty (20) days following cause of delay. In case of continuing cause for delay, the Contractor shall notify the_Designer to the designer, copies to the owner and SCO, of the delay within 20 days of the beginning of the delay and only one claim is necessary.

f. The contractor shall notify his surety in writing of extension of time granted.

g. No claim for time extension shall be allowed on account of failure of the designer to furnish drawings or instructions until twenty (20) days after demand for such drawings and/or instructions. See Article 5c. Demand must be in written form clearly stating the potential for delay unless the drawings or instructions are provided. Any delay granted will begin after the twenty (20) day demand period is concluded.

ARTICLE 24 - PARTIAL UTILIZATION/BENEFICIAL OCCUPANCY

a. The owner may desire to occupy or utilize all or a portion of the project prior to the completion of the project.

b. Should the owner request a utilization of a building or portion thereof, the designer shall perform a designer final inspection of area after being notified by the contractor that the area is ready for such. After the contractor has completed designer final inspection punch list and the designer has verified, then the designer shall schedule a beneficial occupancy inspection at a time and date acceptable to the owner, contractor(s) and State Construction Office. If beneficial occupancy is granted by the State Construction Office, in such areas the following will be established:

1. The beginning of guarantees and warranties period for the equipment necessary to support. in the area.

2. The owner assumes all responsibiliites for utility costs for entire building.

2. Contractor will obtain consent of surety.

3. Contractor will obtain endorsement from insurance company permitting beneficial occupancy.

c. The owner shall have the right to exclude the contractor from any part of the project which the designer has so certified to be substantially complete, but the owner will allow the contractor reasonable access to complete or correct work to bring it into compliance with the contract.

d. Occupancy by the owner under this article will in no way relieve the contractor from his contractual requirement to complete the project within the specified time. The contractor will not be relieved of liquidated damages because of beneficial occupancy. The designer may prorate liquidated damages based on the percentage of project occupied.

ARTICLE 25 - FINAL INSPECTION, ACCEPTANCE, AND PROJECT CLOSEOUT

a. Upon notification from the contractor(s) that the project is complete and ready for inspection, the designer shall make a Designer final inspection to verify that the project is complete and ready for SCO final inspection. Prior to SCO final inspection, the contractor(s) shall complete all items requiring corrective measures noted at the Designer

final inspection**.** The designer shall schedule a SCO final inspection at a time and date acceptable to the owner, contractor(s) and State Construction Office.

b. At the SCO final inspection, the designer and his consultants shall, if job conditions warrant, record a list of items that are found to be incomplete or not in accordance with the contract documents. At the conclusion of the SCO final inspection, the designer and State Construction Office representative shall make one of the following determinations:

   1. That the project is completed and accepted.

   2. That the project will be accepted subject to the correction of the list of discrepancies (punch list). All punch list items must be completed within thirty (30) days of SCO final inspection or the owner may invoke Article 28, Owner's Right to Do Work.

   4. That the project is not complete and another date for a SCO final inspection will be established.

c. Within fourteen (14) days of final acceptance per Paragraph b1 or within fourteen (14) days after completion of punch list per Paragraph b2 above, the designer shall certify the work and issue applicable certificate(s) of compliance.

d. Any discrepancies listed or discovered after the date of SCO final inspection and acceptance under Paragraphs b1 or b2 above shall be handled in accordance with Article 42, Guarantee.

f. The final acceptance date will establish the following:

   1. The beginning of guarantees and warranties period.

   2. The date on which the contractor's insurance coverage for public liability, property damage and builder's risk may be terminated.

   3. That no liquidated damages (if applicable) shall be assessed after this date.

   4. The termination date of utility cost to the contractor.

g. Prior to issuance of final acceptance date, the contractor shall have his authorized representatives visit the project and give full instructions to the designated personnel regarding operating, maintenance, care, and adjustment of all equipment and special construction elements. In addition, the contractor shall provide to the owner a complete instructional video (media format acceptable to the owner) on the operation, maintenance, care and adjustment of all equipment and special construction elements.

ARTICLE 26 - CORRECTION OF WORK BEFORE FINAL PAYMENT

a. Any work, materials, fabricated items or other parts of the work which have been condemned or declared not in accordance with the contract by the designer shall be promptly removed from the work site by the contractor, and shall be immediately replaced by new work in accordance with the contract at no additional cost to the owner. Work or property of other contractors or the owner, damaged or destroyed by virtue of such faulty work, shall be made good at the expense of the contractor whose work is faulty.

b. Correction of condemned work described above shall commence within twenty-four (24) hours after receipt of notice from the designer, and shall make satisfactory progress, as determined by the designer, until completed.

c. Should the contractor fail to proceed with the required corrections, then the owner may complete the work in accordance with the provisions of Article 28.

ARTICLE 27 - CORRECTION OF WORK AFTER FINAL PAYMENT

See Article 35, Performance Bond and Payment Bond, and Article 42, Guarantee**.** Neither the final certificate, final payment, occupancy of the premises by the owner, nor any provision of the contract, nor any other act or instrument of the owner, nor the designer, shall relieve the contractor from responsibility for negligence, or faulty material or workmanship, or failure to comply with the drawings and specifications. Contractor shall correct or make good any defects due thereto and repair any damage resulting there from, which may appear during the guarantee period following final acceptance of the work except as stated otherwise under Article 42, Guarantee. The owner will report any defects as they may appear to the contractor and establish a time limit for completion of corrections by the contractor. The owner will be the judge as to the responsibility for correction of defects.

ARTICLE 28 - OWNER'S RIGHT TO DO WORK

If, during the progress of the work or during the period of guarantee, the contractor fails to prosecute the work properly or to perform any provision of the contract, the owner, after seven (7) days' written notice sent by certified mail, return receipt requested, to the contractor from the designer, may perform or have performed that portion of the work. The cost of the work may be deducted from any amounts due or to become due to the contractor, such action and cost of same having been first approved by the designer. Should the cost of such action of the owner exceed the amount due or to become due the contractor, then the contractor or his surety, or both, shall be liable for and shall pay to the owner the amount of said excess.

ARTICLE 29 - ANNULMENT OF CONTRACT

If the contractor fails to begin the work under the contract within the time specified, or the progress of the work is not maintained on schedule, or the work is not completed within the time above specified, or fails to perform the work with sufficient workmen and equipment or with sufficient materials to ensure the prompt completion of said work, or shall perform the work unsuitably or shall discontinue the prosecution of the work, or if the contractor shall become insolvent or be declared bankrupt or commit any act of bankruptcy or insolvency, or allow any final judgment to stand against him unsatisfied for a period of forty-eight (48) hours, or shall make an assignment for the benefit of creditors, or for any other cause whatsoever shall not carry on the work in an acceptable manner, the owner may give notice in writing, sent by certified mail, return receipt requested, to the contractor and his surety of such delay, neglect or default, specifying the same, and if the contractor within a period of seven (7) days after such notice shall not proceed in accordance therewith, then the owner shall, declare this contract in default, and, thereupon, the surety shall promptly take over the work and complete the performance of this contract in the manner and within the time frame specified. In the event the surety shall fail to take over the work to be done under this contract within seven (7) days after being so notified and notify the owner in writing, sent by certified mail, return receipt requested, that he is taking the same over and stating that he will diligently pursue and complete the same, the owner shall have full power and authority, without violating the contract, to take the prosecution of the work out of the hands of said contractor, to appropriate or use any or all contract materials and equipment on the grounds as may be suitable and acceptable and may enter into an agreement, either by public letting or negotiation, for the completion of said contract according to the terms and provisions thereof

or use such other methods as in his opinion shall be required for the completion of said contract in an acceptable manner. All costs and charges incurred by the owner, together with the costs of completing the work under contract, shall be deducted from any monies due or which may become due said contractor and surety. In case the expense so incurred by the owner shall be less than the sum which would have been payable under the contract, if it had been completed by said contractor, then the said contractor and surety shall be entitled to receive the difference, but in case such expense shall exceed the sum which would have been payable under the contract, then the contractor and the surety shall be liable and shall pay to the owner the amount of said excess.

ARTICLE 30 - CONTRACTOR'S RIGHT TO STOP WORK OR TERMINATE THE CONTRACT

a. Should the work be stopped by order of a court having jurisdiction, or by order of any other public authority for a period of three months, due to cause beyond the fault or control of the contractor, or if the owner should fail or refuse to make payment on account of a certificate issued by the designer within forty-five (45) days after receipt of same, then the contractor, after fifteen (15) days' written notice sent by certified mail, return receipt requested, to the owner and the designer, may suspend operations on the work or terminate the contract.

b. The owner shall be liable to the contractor for the cost of all materials delivered and work performed on this contract plus 10 percent overhead and profit and shall make such payment. The designer shall be the judge as to the correctness of such payment.

ARTICLE 31 - REQUEST FOR PAYMENT

a. Not later than the fifth day of the month, the contractor shall submit to the designer a request for payment for work done during the previous month. The request shall be in the form agreed upon between the contractor and the designer, but shall show substantially the value of work done and materials delivered to the site during the period since the last payment, and shall sum up the financial status of the contract with the following information:

    1. Total of contract including change orders.

    2. Value of work completed to date.

    3. Less five percent (5%) retainage, provided however, that after fifty percent (50%) of the contractor’s work has been satisfactorily completed on schedule, with approval of the owner and the State Construction Office and written consent of the surety, further requirements for retainage will be waived only so long as work continues to be completed satisfactorily and on schedule.

    4. Less previous payments.

    5. Current amount due.

b. The contractor, upon request of the designer, shall substantiate the request with invoices of vouchers or payrolls or other evidence.

c. Prior to submitting the first request, the contractor shall prepare for the designer a schedule showing a breakdown of the contract price into values of the various parts of the work, so arranged as to facilitate payments to subcontractors in accordance with Article 17, Contractor and Subcontractor Relationships. The contractor(s) shall list the

value of each subcontractor and supplier, identifying each minority business subcontractor and supplier as listed in Affidavit C, if applicable.

d. When payment is made on account of stored materials and equipment, such materials must be stored on the owner's property, and the requests for payments shall be accompanied by invoices or bills of sale or other evidence to establish the owner's title to such materials and equipment. Such payments will be made only for materials that have been customized or fabricated specifically for this project. Raw materials or commodity products including but not limited to piping, conduit, CMU, metal studs and gypsum board may not be submitted. Responsibility for such stored materials and equipment shall remain with the contractor regardless of ownership title. Such stored materials and equipment shall not be removed from the owner's property. Should the space for storage on-site be limited, the contractor, at his option, shall be permitted to store such materials and/or equipment in a suitable space off-site. Should the contractor desire to include any such materials or equipment in his application for payment, they must be stored in the name of the owner in an independent, licensed, bonded warehouse approved by the designer, owner and the State Construction Office and located as close to the site as possible. The warehouse selected must be approved by the contractor's bonding and insurance companies; the material to be paid for shall be assigned to the owner and shall be inspected by the designer. Upon approval by the designer, owner and SCO of the storage facilities and materials and equipment, payment therefore will be certified. Responsibility for such stored materials and equipment shall remain with the contractor. Such stored materials and equipment shall not be moved except for transportation to the project site. Under certain conditions, the designer may approve storage of materials at the point of manufacture, which conditions shall be approved by the designer, the owner and the State Construction Office prior to approval for the storage and shall include an agreement by the storing party which unconditionally gives the State absolute right to possession of the materials at anytime. Bond, security and insurance protection shall continue to be the responsibility of the contractor(s).

e. In the event of beneficial occupancy, retainage of funds due the contractor(s) may be reduced with the approval of the State Construction Office to an equitable amount to cover the list of items to be completed or corrected. Retainage may not be reduced to less than two and one-half (2 1/2) times the estimated value of the work to be completed or corrected. Reduction of retainage must be with the consent and approval of the contractor's bonding company.

ARTICLE 32 - CERTIFICATES OF PAYMENT AND FINAL PAYMENT

a. Within five (5) days from receipt of request for payment from the contractor, the designer shall issue and forward to the owner a certificate for payment. This certificate shall indicate the amount requested or as approved by the designer. If the certificate is not approved by the designer, he shall state in writing to the contractor and the owner his reasons for withholding payment.

b. No certificate issued or payment made shall constitute an acceptance of the work or any part thereof. The making and acceptance of final payment shall constitute a waiver of all claims by the owner except:

   1. Claims arising from unsettled liens or claims against the contractor.

   2. Faulty work or materials appearing after final payment.

   3. Failure of the contractor to perform the work in accordance with drawings and specifications, such failure appearing after payment.

4. As conditioned in the performance bond and payment bond.

c. The making and acceptance of final payment shall constitute a waiver of all claims by the contractor except those claims previously made and remaining unsettled (Article 20(c)).

d. Prior to submitting request for final payment to the designer for approval, the contractor shall fully comply with all requirements specified in the" project closeout" section of the specifications. These requirements include but not limited to the following:

1. Submittal of Product and Operating Manuals, Warranties and Bonds, Guarantees, Maintenance Agreements, As-Built Drawings, Certificates of Inspection or Approval from agencies having jurisdiction. (The designer must approve the Manuals prior to delivery to the owner).

2. Transfer of Required attic stock material and all keys in an organized manner.

3. Record of Owner's training.

4. Resolution of any final inspection discrepancies.

5. Granting access to Contractor's records, if Owner's internal auditors have made a request for such access pursuant to Article 52.

e. The contractor shall forward to the designer, the final application for payment along with the following documents:

1. List of minority business subcontractors and material suppliers showing breakdown of contract amounts and total actual payments to subs and material suppliers.

2. Affidavit of Release of Liens.

3. Affidavit of contractors of payment to material suppliers and subcontractors. (See Article 36).

4. Consent of Surety to Final Payment**.**

5. Certificates of state agencies required by state law.

f. The designer will not authorize final payment until the work under contract has been certified by designer, certificates of compliance issued, and the contractor has complied with the closeout requirements. The designer shall forward the contractor's final application for payment to the owner along with respective certificate(s) of compliance required by law.

ARTICLE 33 - PAYMENTS WITHHELD

a. The designer with the approval of the State Construction Office may withhold payment for the following reasons:

1. Faulty work not corrected.

2. The unpaid balance on the contract is insufficient to complete the work in the judgment of the designer.

3. To provide for sufficient contract balance to cover liquidated damages that will be assessed.

b. The secretary of the Department of Administration may authorize the withholding of payment for the following reasons:

1. Claims filed against the contractor or evidence that a claim will be filed.

2. Evidence that subcontractors have not been paid.

c. The Owner may withhold all or a portion of Contractor's general conditions costs set forth in the approved schedule of values, if Contractor has failed to comply with: (1) a request to access its records by Owner's internal auditors pursuant to Article 52; (2) a request for a plan of action and/or recovery schedule under Article 14.j or provide The Owner; (3) a request to provide an electronic copies of Contractor's baseline schedule, updates with all logic used to create the schedules in the original format of the scheduling software; and (4) Contractor's failure to have its Superintendent on the Project full-time; (

d. When grounds for withholding payments have been removed, payment will be released. Delay of payment due the contractor without cause will make owner liable for payment of interest to the contractor in accordance with G.S. 143-134.1. As provided in G.S.143-134.1(e) the owner shall not be liable for interest on payments withheld by the owner for unsatisfactory job progess, defective construction not remedied, disputed work, or third-party claims filed against the owner or reasonable evidence that a third-party claim will be filed.

ARTICLE 34 - MINIMUM INSURANCE REQUIREMENTS

The work under this contract shall not commence until the contractor has obtained all required insurance and verifying certificates of insurance have been approved in writing by the owner. These certificates shall document that coverages afforded under the policies will not be cancelled, reduced in amount or coverages eliminated until at least thirty (30) days after mailing written notice, by certified mail, return receipt requested, to the insured and the owner of such alteration or cancellation. If endorsements are needed to comply with the notification or other requirements of this article copies of the endorsements shall be submitted with the certificates.

a. **Worker's Compensation and Employer's Liability**

The contractor shall provide and maintain, until final acceptance, workmen's compensation insurance, as required by law, as well as employer's liability coverage with minimum limits of $100,000.

b. **Public Liability and Property Damage**

The contractor shall provide and maintain, until final acceptance, comprehensive general liability insurance, including coverage for premises operations, independent contractors, completed operations, products and contractual exposures, as shall protect such contractors from claims arising out of any bodily injury, including accidental death, as well as from claims for property damages which may arise from operations under this contract, whether such operations be by the contractor or by any subcontractor, or by

anyone directly or indirectly employed by either of them and the minimum limits of such insurance shall be as follows:

Bodily Injury:	$500,000 per occurrence
Property Damage:	$100,000 per occurrence / $300,000 aggregate

In lieu of limits listed above, a $500,000 combined single limit shall satisfy both conditions.

Such coverage for completed operations must be maintained for at least two (2) years following final acceptance of the work performed under the contract.

c. **Property Insurance (Builder's Risk/Installation Floater)**

The contractor shall purchase and maintain property insurance until final acceptance, upon the entire work at the site to the full insurable value thereof. This insurance shall include the interests of the owner, the contractor, the subcontractors and sub-subcontractors in the work and shall insure against the perils of fire, wind, rain, flood, extended coverage, and vandalism and malicious mischief. If the owner is damaged by failure of the contractor to purchase or maintain such insurance, then the contractor shall bear all reasonable costs properly attributable thereto; the contractor shall effect and maintain similar property insurance on portions of the work stored off the site when request for payment per articles so includes such portions.

d. **Deductible**

Any deductible, if applicable to loss covered by insurance provided, is to be borne by the contractor.

e. **Other Insurance**

The contractor shall obtain such additional insurance as may be required by the owner or by the General Statutes of North Carolina including motor vehicle insurance, in amounts not less than the statutory limits.

f. **Proof of Carriage**

The contractor shall furnish the owner with satisfactory proof of carriage of the insurance required before written approval is granted by the owner.

ARTICLE 35 - PERFORMANCE BOND AND PAYMENT BOND

a. Each contractor shall furnish a performance bond and payment bond executed by a surety company authorized to do business in North Carolina. The bonds shall be in the full contract amount. Bonds shall be executed in the form bound with these specifications.

b. All bonds shall be countersigned by an authorized agent of the bonding company who is licensed to do business in North Carolina.

ARTICLE 36 - CONTRACTOR'S AFFIDAVIT

The final payment of retained amount due the contractor on account of the contract shall not become due until the contractor has furnished to the owner through the designer an affidavit signed, sworn and notarized to the effect that all payments for materials, services or subcontracted work in connection with his contract have been satisfied, and that no claims or

liens exist against the contractor in connection with this contract. In the event that the contractor cannot obtain similar affidavits from subcontractors to protect the contractor and the owner from possible liens or claims against the subcontractor, the contractor shall state in his affidavit that no claims or liens exist against any subcontractor to the best of his (the contractor's) knowledge, and if any appear afterward, the contractor shall save the owner harmless.

ARTICLE 37 - ASSIGNMENTS

The contractor shall not assign any portion of this contract nor subcontract in its entirety. Except as may be required under terms of the performance bond or payment bond, no funds or sums of money due or become due the contractor under the contract may be assigned.

ARTICLE 38 - USE OF PREMISES

a. The contractor(s) shall confine his apparatus, the storage of materials and the operations of his workmen to limits indicated by law, ordinances, permits or directions of the designer and owner and shall not exceed those established limits in his operations.

b. The contractor(s) shall not load or permit any part of the structure to be loaded with a weight that will endanger its safety.

c. The contractor(s) shall enforce the designer's and owner’s instructions regarding signs, advertisements, fires and smoking.

d. No firearms, any type of alcoholic beverages, or drugs (other than those prescribed by a physician) will be permitted at the job site.

ARTICLE 39 - CUTTING, PATCHING AND DIGGING

a. The contractor shall do all cutting, fitting or patching of his work that may be required to make its several parts come together properly and fit it to receive or be received by work of other contractors shown upon or reasonably implied by the drawings and specifications for the completed structure, as the designer may direct.

b. Any cost brought about by defective or ill-timed work shall be borne by the party responsible therefor.

c. No contractor shall endanger any work of another contractor by cutting, digging or other means. No contractor shall cut or alter the work of any other contractor without the consent of the designer and the affected contractor(s).

ARTICLE 40 - UTILITIES, STRUCTURES, SIGNS

a. The contractor shall provide necessary and adequate facilities for water, electricity, gas, oil, sewer and other utility services which maybe necessary and required for completion of the project including all utilities required for testing, cleaning, balancing, and sterilization of designated plumbing, mechanical and electrical systems. Any permanent meters installed shall be listed in the contractor’s name until work has a final acceptance. The contractor will be solely responsible for all utility costs prior to final acceptance. Contractor shall contact all affected utility companies prior to bid to determine their requirements to provide temporary and permanent service and include all costs associated with providing those services in their bid. Coordination of the work of the utility companies during construction is the sole responsibility of the contractor.

b. Meters shall be relisted in the owner's name on the day following final acceptance of the Project Expediter's work, and the owner shall pay for services used after that date.

c. The owner shall be reimbursed for all metered utility charges after the meter is relisted in the owner's name and prior to completion and acceptance of the work of **all** contractors. Reimbursement shall be made by the contractor whose work has not been completed and accepted. If the work of two or more contractors has not been completed and accepted, reimbursement to the owner shall be paid by the contractors involved on the basis of assessments by the designer.

d Prior to the operation of permanent systems, the Project Expediter will provide temporary power, lighting, water, and heat to maintain space temperature above freezing, as required for construction operations.

e. All contractors shall have the permanent building systems in sufficient readiness for furnishing temporary climatic control at the time a building is enclosed and secured. The HVAC systems shall maintain climatic control throughout the enclosed portion of the building sufficient to allow completion of the interior finishes of the building. A building shall be considered enclosed and secured when windows**,** doorways (exterior, mechanical, and electrical equipment rooms), and hardware are installed**;** and other openings have protection which will provide reasonable climatic control. The appropriate time to start the mechanical systems and climatic condition shall be jointly determined by the contractor(s), the designer and owner. Use of the equipment in this manner shall be subject to the approval of the Designer and owner and shall in no way affect the warranty requirements of the contractor(s).

f. The electrical contractor shall have the building's permanent power wiring distribution system in sufficient readiness to provide power as required by the HVAC contractor for temporary climatic control.

g. The electrical contractor shall have the building's permanent lighting system ready at the time the general contractor begins interior painting and shall provide adequate lighting in those areas where interior painting and finishing is being performed.

h. Each prime contractor shall be responsible for his permanently fixed service facilities and systems in use during progress of the work. The following procedures shall be strictly adhered to:

1. Prior to final acceptance of work by the State Construction Office, each contractor shall remove and replace any parts of the permanent building systems damaged through use during construction.

2. Temporary filters as recommended by the equipment manufacturer in order to keep the equipment and ductwork clean and free of dust and debris shall be installed in each of the heating and air conditioning units and at each return grille during construction. New filters shall be installed in each unit prior to the owner's acceptance of the work.

3. Extra effort shall be maintained to keep the building and the site adjacent to the building clean and under no circumstances shall air systems be operated if finishing and site work operations are creating dust in excess of what would be considered normal if the building were occupied.

4. It shall be understood that any warranty on equipment presented to the owner shall extend from the day of final acceptance by the owner. The cost of warranting the

equipment during operation in the finishing stages of construction shall be borne by the contractor whose system is utilized.

5. The electrical contractor shall have all lamps in proper working condition at the time of final project acceptance.

i. The Project Expediter shall provide, if required and where directed, a shed for toilet facilities and shall furnish and install in this shed all water closets required for a complete and adequate sanitary arrangement. These facilities will be available to other contractors on the job and shall be kept in a neat and sanitary condition at all times. Chemical toilets are acceptable.

j. The Project Expediter shall, if required by the Supplementary General Conditions and where directed, erect a temporary field office, complete with lights, telephone, heat and air conditioning. A portion of this office shall be partitioned off, of sufficient size, for the use of a resident inspector, should the designer so direct.

k. On multi-story construction projects, the Project Expediter shall provide temporary elevators, lifts, or other special equipment for the general use of all contractors. The cost for such elevators, lifts or other special equipment and the operation thereof shall be included in the Project Expediter's bid.

l. The Project Expediter will erect one sign on the project if required. The sign shall be of sound construction, and shall be neatly lettered with black letters on white background. The sign shall bear the name of the project, and the names of prime contractors on the project, and the name of the designer and consultants. Directional signs may be erected on the owner's property subject to approval of the owner with respect to size, style and location of such directional signs. Such signs may bear the name of the contractor and a directional symbol. No other signs will be permitted except by permission of the owner.

ARTICLE 41 - CLEANING UP

a. The contractors shall keep the building and surrounding area reasonably free from rubbish at all times, and shall remove debris from the site on a timely basis or when directed to do so by the designer or Project Expediter. The Project Expediter shall provide an on site refuse container(s) for the use of all contractors. Each contractor shall remove their rubbish and debris from the building on a daily basis. The Project Expediter shall broom clean the building as required to minimize dust and dirt accumulation.

b. The Project Expediter shall provide and maintain suitable all-weather access to the building**.**

c. Before final inspection and acceptance of the building, each contractor shall clean his portion of the work, including glass, hardware, fixtures, masonry, tile and marble (using no acid), clean and wax all floors as specified, and completely prepare the building for use by the owner, with no cleaning required by the owner.

ARTICLE 42 - GUARANTEE

a. The contractor shall unconditionally guarantee materials and workmanship against patent defects arising from faulty materials, faulty workmanship or negligence for a period of twelve (12) months following the date of final acceptance of the work or beneficial occupancy and shall replace such defective materials or workmanship without cost to the owner.

b. Where items of equipment or material carry a manufacturer's warranty for any period in excess of twelve (12) months, then the manufacturer's warranty shall apply for that particular piece of equipment or material. The contractor shall replace such defective equipment or materials, without cost to the owner, within the manufacturer's warranty period.

c. Additionally, the owner may bring an action for latent defects caused by the negligence of the contractor which is hidden or not readily apparent to the owner at the time of beneficial occupancy or final acceptance, whichever occurred first, in accordance with applicable law.

d. Guarantees for roof, equipment, materials, and supplies shall be stipulated in the specifications sections governing such roof, equipment, materials, or supplies.

ARTICLE 43 - CODES AND STANDARDS

Wherever reference is given to codes, standard specifications or other data published by regulating agencies including, but not limited to, national electrical codes, North Carolina state building codes, federal specifications, ASTM specifications, various institute specifications, etc., it shall be understood that such reference is to the latest edition including addenda published prior to the date of the contract documents.

ARTICLE 44 - INDEMNIFICATION

To the fullest extent permitted by law, the contractor shall indemnify and hold harmless the owner, the designer and the agents, consultants and employees of the owner and designer, from and against all claims, damages, losses and expenses, including, but not limited to, attorneys' fees, arising out of or resulting from the performance or failure of performance of the work, provided that any such claim, damage, loss or expense (1) is attributable to bodily injury, sickness, disease or death, or to injury to or destruction of tangible property (other than the work itself) including the loss of use resulting there from, and (2) is caused in whole or in part by any negligent act or omission of the contractor, the contractor's subcontractor, or the agents of either the contractor or the contractor's subcontractor. Such obligation shall not be construed to negate, abridge or otherwise reduce any other right or obligation of indemnity which would otherwise exist as to any party or person described in this article.

ARTICLE 45 - TAXES

a. Federal excise taxes do not apply to materials entering into state work (Internal Revenue Code, Section 3442(3)).

b. Federal transportation taxes do not apply to materials entering into state work (Internal Revenue Code, Section 3475(b) as amended).

c. North Carolina sales tax and use tax, as required by law, do apply to materials entering into state work and such costs shall be included in the bid proposal and contract sum.

d. Local option sales and use taxes, as required by law, do apply to materials entering into state work as applicable and such costs shall be included in the bid proposal and contract sum.

e. **Accounting Procedures for Refund of County Sales & Use Tax**

Amount of county sales and use tax paid per contractor's statements:

Contractors performing contracts for state agencies shall give the state agency for whose project the property was purchased a signed statement containing the information listed in G.S. 105-164.14(e).

The Department of Revenue has agreed that in lieu of obtaining copies of sales receipts from contractors, an agency may obtain a certified statement as of April 1, 1991 from the contractor setting forth the date, the type of property and the cost of the property purchased from each vendor, the county in which the vendor made the sale and the amount of local sales and use taxes paid thereon. If the property was purchased out-of-state, the county in which the property was delivered should be listed. The contractor should also be notified that the certified statement may be subject to audit.

In the event the contractors make several purchases from the same vendor, such certified statement must indicate the invoice numbers, the inclusive dates of the invoices, the total amount of the invoices, the counties, and the county sales and use taxes paid thereon.

Name of taxing county: The position of a sale is the retailer's place of business located within a taxing county where the vendor becomes contractually obligated to make the sale. Therefore, it is important that the county tax be reported for the county of sale rather than the county of use.

When property is purchased from out-of-state vendors and the county tax is charged, the county should be identified where delivery is made when reporting the county tax.

Such statement must also include the cost of any tangible personal property withdrawn from the contractor's warehouse stock and the amount of county sales or use tax paid thereon by the contractor.

Similar certified statements by his subcontractors must be obtained by the general contractor and furnished to the claimant.
Contractors are not to include any tax paid on supplies, tools and equipment which they use to perform their contracts and should include only those building materials, supplies, fixtures and equipment which actually become a part of or annexed to the building or structure.

ARTICLE 46 - EQUAL OPPORTUNITY CLAUSE

The non-discrimination clause contained in Section 202 (Federal) Executive Order 11246, as amended by Executive Order 11375, relative to equal employment opportunity for all persons without regard to race, color, religion, sex or national origin, and the implementing rules and regulations prescribed by the secretary of Labor, are incorporated herein.

ARTICLE 47 - EMPLOYMENT OF INDIVIDUALS WITH DISABILITIES

The contractor(s) agree not to discriminate against any employee or applicant for employment because of physical or mental disabilities in regard to any position for which the employee or applicant is qualified. The contractor agrees to take affirmative action to employ, advance in employment and otherwise treat qualified individuals with such disabilities without discrimination based upon their physical or mental disability in all employment practices.

ARTICLE 48 - ASBESTOS-CONTAINING MATERIALS (ACM)

The State of North Carolina has attempted to address all asbestos-containing materials that are to be disturbed in the project. However, there may be other asbestos-containing materials in the work areas that are not to be disturbed and do not create an exposure hazard.

Contractors are reminded of the requirements of instructions under Instructions to Bidders and General Conditions of the Contract, titled Examination of Conditions. Statute 130A, Article 19, amended August 3, 1989, established the Asbestos Hazard Management Program that controls asbestos abatement in North Carolina. The latest edition of *Guideline Criteria for Asbestos Abatement* from the State Construction Office is to be incorporated in all asbestos abatement projects for the Capital Improvement Program.

ARTICLE 49 - MINORITY BUSINESS PARTICIPATION

GS 143-128.2 establishes a ten percent (10%) goal for participation by minority businesses in total value of work for each State building project. The document, *Guidelines for Recruitment and Selection of Minority Businesses for Participation in State Construction Contracts* including Affidavits and Appendix E are hereby incorporated into and made a part of this contract.

ARTICLE 50 – CONTRACTOR EVALUATION

The contractor's overall work performance on the project shall be fairly evaluated in accordance with the State Building Commission policy and procedures, for determining qualifications to bid on future State capital improvement projects. In addition to final evaluation, interim evaluation may be prepared during the progress of project. The document, Contractor Evaluation Procedures, is hereby incorporated and made a part of this contract. The owner may request the contractor's comments to evaluate the designer.

ARTICLE 51 – GIFTS

Pursuant to N.C. Gen. Stat. § 133-32, it is unlawful for any vendor or contractor (i.e. architect, bidder, contractor, construction manager, design professional, engineer, subcontractor, supplier, vendor, etc.), to make gifts or to give favors to any State employee. This prohibition covers those vendors and contractors who: (1) have a contract with a governmental agency; or (2) have performed under such a contract within the past year; or (3) anticipate bidding on such a contract in the future. For additional information regarding the specific requirements and exemptions, vendors and contractors are encouraged to review G.S. Sec. 133-32.

During the construction of the Project, the Contractor is prohibited from making gifts to any of the Owner's employees, Owner's project representatives (architect, engineers, construction manager and their employees), employees of the State Construction Office and/or any other State employee that may have any involvement, influence, responsibilities, oversight, management and/or duties that pertain to and/or relate to the contract administration, financial administration and/or disposition of claims arising from and/or relating to the Contract and/or Project.

ARTICLE 52 – AUDITING-ACCESS TO PERSONS AND RECORDS

In accordance with N.C. General Statute 147-64.7, the State Auditor shall have access to Contractor's officers, employees, agents and/or other persons in control of and/or responsible for the Contractor's records that relate to this Contracts for purposes of conducting audits under the referenced statute. The Owner's internal auditors shall also have the right to access and copy the Contractor's records relating to the Contract and Project during the term of the Contract and within two years following the completion of the Project/close-out of the Contract to verify accounts, accuracy, information, calculations and/or data affecting and/or

relating to Contractor's requests for payment, requests for change orders, change orders, claims for extra work, requests for time extensions and related claims for delay/extended general conditions costs, claims for lost productivity, claims for loss efficiency, claims for idle equipment or labor, claims for price/cost escalation, pass-through claims of subcontractors and/or suppliers, and/or any other type of claim for payment or damages from Owner and/or its project representatives.

ARTICLE 53 – NORTH CAROLINA FALSE CLAIMS ACT

The North Carolina False Claims Act ("NCFCA"), N.C Gen. Stat. § 1-605 through 1-618, applies to this Contract. The Contractor should familiarize itself with the entire NCFCA and should seek the assistance of an attorney if it has any questions regarding the NCFCA and its applicability to any requests, demands and/or claims for payment its submits to the State through the contracting state agency, institution, university or community college.

The purpose of the NCFCA "is to deter persons from knowingly causing or assisting in causing the State to pay claims that are false or fraudulent and to provide remedies in the form of treble damages and civil penalties when money is obtained from the State by reason of a false or fraudulent claim." (Section 1-605(b).) A contractor's liability under the NCFCA may arise from, but is not limited to: requests for payment, invoices, billing, claims for extra work, requests for change orders, requests for time extensions, claims for delay damages/extended general conditions costs, claims for loss productivity, claims for loss efficiency, claims for idle equipment or labor, claims for price/cost escalation, pass-through claims of subcontractors and/or suppliers, documentation used to support any of the foregoing requests or claims, and/or any other request for payment from the State through the contracting state agency, institution, university or community college. The parts of the NCFCA that are most likely to be enforced with respect to this type of contract are as follows:

- A "claim" is "[a]ny request or demand, whether under a contract or otherwise, for money or property and whether or not the State has title to the money or property that (i) is presented to an officer, employee, or agent of the State or (ii) is made to a contractor … if the money or property is to be spent or used on the State's behalf or to advance a State program or interest and if the State government: (a) provides or has provided any portion of the money or property that is requested or demanded; or (b) will reimburse such contractor … for any portion of the money or property which is requested or demanded." (Section 1-606(2).)

- "Knowing" and "knowingly." – Whenever a person, with respect to information, does any of the following: (a) Has actual knowledge of the information; (b) Acts in deliberate ignorance of the truth or falsity of the information; and/or (c) Acts in reckless disregard of the truth or falsity of the information. (Section 1-606(4).) Proof of specific intent to defraud is not required. (Section 1-606(4).)

- "Material" means having a natural tendency to influence, or be capable of influencing, the payment or receipt of money or property. (Section 1-606(4).)

- Liability. – "Any person who commits any of the following acts shall be liable to the State for three times the amount of damages that the State sustains because of the act of that person[:] … (1) Knowingly presents or causes to be presented a false or fraudulent claim for payment or approval. (2) Knowingly makes, uses, or causes to be made or used, a false record or statement material to a false or fraudulent claim. (3) Conspires to commit a violation of subdivision (1), (2) …" (Section 1-607(a)(1), (2).)

- The NCFCA shall be interpreted and construed so as to be consistent with the federal False Claims Act, 31 U.S.C. § 3729, et seq., and any subsequent amendments to that act. (Section 1-616(c).)

Finally, the contracting state agency, institution, university or community college may refer any suspected violation of the NCFCA by the Contractor to the Attorney General's Office for investigation. Under Section 1-608(a), the Attorney General is responsible for investigating any violation of NCFCA, and may bring a civil action against the Contractor under the NCFCA. The Attorney General's investigation and any civil action relating thereto are independent and not subject to any dispute resolution provision set forth in this Contract. (See Section 1-608(a).)

ARTICLE 54 – TERMINATION FOR CONVENIENCE

Owner may at any time and for any reason terminate Contractor's services and work at Owner's convenience. Upon receipt of such notice, Contractor shall, unless the notice directs otherwise, immediately discontinue the work and placing of orders for materials, facilities and supplies in connection with the performance of this Agreement.

Upon such termination, Contractor shall be entitled to payment only as follows: (1) the actual cost of the work completed in conformity with this Agreement; plus, (2) such other costs actually incurred by Contractor as are permitted by the prime contract and approved by Owner; (3) plus ten percent (10%) of the cost of the work referred to in subparagraph (1) above for overhead and profit. There shall be deducted from such sums as provided in this subparagraph the amount of any payments made to Contractor prior to the date of the termination of this Agreement. Contractor shall not be entitled to any claim or claim of lien against Owner for any additional compensation or damages in the event of such termination and payment.

SUPPLEMENTARY GENERAL CONDITIONS (SGC's) OF THE CONTRACT

STANDARD FORM FOR CONSTRUCTION CONTRACTS

UNIVERSITY OF NORTH CAROLINA AT GREENSBORO

SUPPLEMENTARY GENERAL CONDITIONS (SGC's) OF THE CONTRACT

This document supplements but does not alter in any way the requirements of the General Conditions of the Contract.

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1.0 SGC Article 1 – Definitions

A. As defined in Article 1 of the General Conditions, the Supplementary General Conditions are considered part of the contract documents.

B. The Owner is the State of North Carolina through University of North Carolina at Greensboro.

C. Provide shall mean purchase, deliver, install, new, clean, completely operational, fully tested and ready for use.

2.0 SGC Article 8 – Materials, Equipment, Employees

A. Substitutions shall be submitted 15 days prior to receipt of bids.

3.0 SGC Article 11 – Utility Interruptions

A. Any necessary shutdowns of electrical or other utilities shall be approved at least 48 hours in advance with UNCG FDC at 336-334-5269 and the University's Facilities Operations personnel. It is imperative that adjacent utilities and other existing services be maintained at all times except for scheduled interruptions.

B. The University's personnel will perform certain functions in connection with utility outages, such as operating electrical switches, operating water valves, etc. The Owner will bear the expenses; however, when contractor requires extra outages because of shortage of material, improper material, shortage of labor, poor conditions, etc., the contractor shall pay the Owner all expenses incurred in the use of University personnel for the extra outages. It is imperative that campus utilities and other campus services be maintained at all times except for scheduled interruptions.

4.0 SGC Article 23 - Time of Completion, Delays, Extension of Time

A. The Contractor shall commence work to be performed under this Contract on the date to be specified in the Notice to Proceed from the Designer and shall be substantially complete with all work hereunder within 379 days. Substantial completion is the stage in the progress of Work when the Work or designated portion thereof is sufficiently complete in accordance with Contract Documents so that the Owner can occupy or utilize the Work for its intended use. This requirement includes completed testing and inspections of the Work by the AHJ. Liquidated damages: For each day in excess of the stated substantial completion date of the project, the Contractor shall pay applicable liquidated damages stated by the University to be $250.00 per day.

5.0 SGC Article 38 – Use of Premises

A. Storage/Laydown/Staging Area: A six (6) foot tall steel chain-link fence with privacy screening shall be constructed around the laydown/staging area. Contractors shall confine their storage to within the limits of the staging area fence. Parking for storage trailers is also limited to within the laydown/staging area. Security of stored items is the responsibility of the contractor.

B. Construction Parking: Parking is extremely limited at UNCG. All contactors are hereby notified that non-permitted parking will be restricted to the area within the project fence. The University Parking Services Department will ticket any vehicles parked outside of the construction fence without a parking permit. Parking permits can be purchased by the contractor.

6.0 SGC Article 40 – Utilities, Structures, Signs

A. The Owner will pay for all temporary utilities during the construction of the project. The contractor shall pay for any required connections. The contractor shall connect to existing University power and water services on site as required. If the contactor connects to City-owned utilities, it will be the responsibility of the contractor to pay for those utilities and obtain and coordinate all that is required.

B. Removal of Temporary Utilities and Facilities: General Contractor shall remove all temporary utilities and facilities at the end of the construction period, earlier with Engineer's approval.

GUIDELINES FOR RECRUITMENT AND SELECTION OF MINORITY BUSINESSES FOR PARTICIPATION IN STATE CONSTRUCTION CONTRACTS

In accordance with G.S. 143-128.2 (effective January 1, 2002) these guidelines establish goals for minority participation in single-prime bidding, separate-prime bidding, construction manager at risk, and alternative contracting methods, on State construction projects in the amount of $300,000 or more. The legislation provides that the State shall have a verifiable ten percent (10%) goal for participation by minority businesses in the total value of work for each project for which a contract or contracts are awarded. These requirements are published to accomplish that end.

SECTION A: INTENT

It is the intent of these guidelines that the State of North Carolina, as awarding authority for construction projects, and the contractors and subcontractors performing the construction contracts awarded shall cooperate and in good faith do all things legal, proper and reasonable to achieve the statutory goal of ten percent (10%) for participation by minority businesses in each construction project as mandated by GS 143-128.2. Nothing in these guidelines shall be construed to require contractors or awarding authorities to award contracts or subcontracts to or to make purchases of materials or equipment from minority-business contractors or minority-business subcontractors who do not submit the lowest responsible, responsive bid or bids.

SECTION B: DEFINITIONS

1. Minority - a person who is a citizen or lawful permanent resident of the United States and who is:
   a. Black, that is, a person having origins in any of the black racial groups in Africa;
   b. Hispanic, that is, a person of Spanish or Portuguese culture with origins in Mexico, South or Central America, or the Caribbean Islands, regardless of race;
   c. Asian American, that is, a person having origins in any of the original peoples of the Far East, Southeast Asia and Asia, the Indian subcontinent, the Pacific Islands;
   d. American Indian, that is, a person having origins in any of the original peoples of North America; or
   e. Female

2. Minority Business - means a business:
   a. In which at least fifty-one percent (51%) is owned by one or more minority persons, or in the case of a corporation, in which at least fifty-one percent (51%) of the stock is owned by one or more minority persons or socially and economically disadvantaged individuals; and
   b. Of which the management and daily business operations are controlled by one or more of the minority persons or socially and economically disadvantaged individuals who own it.

3. Socially and economically disadvantaged individual - means the same as defined in 15 U.S.C. 637. "Socially disadvantaged individuals are those who have been subjected to racial or ethnic prejudice or cultural bias because of their identity as a member of a group without regard to their individual qualities". "Economically disadvantaged individuals are those socially disadvantaged individuals whose ability to compete in the free enterprise system has been impaired due to diminished capital and credit opportunities as compared to others in the same business area who are not socially disadvantaged".

4. Public Entity - means State and all public subdivisions and local governmental units.

5. Owner - The State of North Carolina, through the Agency/Institution named in the contract.

6. Designer – Any person, firm, partnership, or corporation, which has contracted with the State of North Carolina to perform architectural or engineering, work.

7. Bidder - Any person, firm, partnership, corporation, association, or joint venture seeking to be awarded a public contract or subcontract.

8. Contract - A mutually binding legal relationship or any modification thereof obligating the seller to furnish equipment, materials or services, including construction, and obligating the buyer to pay for them.

9. Contractor - Any person, firm, partnership, corporation, association, or joint venture which has contracted with the State of North Carolina to perform construction work or repair.

10. Subcontractor - A firm under contract with the prime contractor or construction manager at risk for supplying materials or labor and materials and/or installation. The subcontractor may or may not provide materials in his subcontract.

SECTION C: RESPONSIBILITIES

1. Office for Historically Underutilized Businesses, Department of Administration (hereinafter referred to as HUB Office).

   The HUB Office has established a program, which allows interested persons or businesses qualifying as a minority business under G.S. 143-128.2, to obtain certification in the State of North Carolina procurement system. The information provided by the minority businesses will be used by the HUB Office to:
   a. Identify those areas of work for which there are minority businesses, as requested.
   b. Make available to interested parties a list of prospective minority business contractors and subcontractors.
   c. Assist in the determination of technical assistance needed by minority business contractors.

   In addition to being responsible for the certification/verification of minority businesses that want to participate in the State construction program, the HUB Office will:
   (1) Maintain a current list of minority businesses. The list shall include the areas of work in which each minority business is interested.
   (2) Inform minority businesses on how to identify and obtain contracting and subcontracting opportunities through the State Construction Office and other public entities.
   (3) Inform minority businesses of the contracting and subcontracting process for public construction building projects.
   (4) Work with the North Carolina trade and professional organizations to improve the ability of minority businesses to compete in the State construction projects.
   (5) The HUB Office also oversees the minority business program by:
      a. Monitoring compliance with the program requirements.
      b. Assisting in the implementation of training and technical assistance programs.
      c. Identifying and implementing outreach efforts to increase the utilization of minority businesses.
      d. Reporting the results of minority business utilization to the Secretary of the Department of Administration, the Governor, and the General Assembly.

2. State Construction Office
   The State Construction Office will be responsible for the following:

   a. Furnish to the HUB Office a minimum of twenty-one days prior to the bid opening the following:
      (1) Project description and location;
      (2) Locations where bidding documents may be reviewed;
      (3) Name of a representative of the owner who can be contacted during the advertising period to advise who the prospective bidders are;
      (4) Date, time and location of the bid opening.
      (5) Date, time and location of prebid conference, if scheduled.

   b. Attending scheduled prebid conference, if necessary, to clarify requirements of the general statutes regarding minority-business participation, including the bidders' responsibilities.

c. Reviewing the apparent low bidders' statutory compliance with the requirements listed in the proposal, that must be complied with, if the bid is to be considered as responsive, prior to award of contracts. The State reserves the right to reject any or all bids and to waive informalities.
d. Reviewing of minority business requirements at Preconstruction conference**.**
e. Monitoring of contractors' compliance with minority business requirements in the contract documents during construction.
f. Provide statistical data and required reports to the HUB Office.
g. Resolve any protest and disputes arising after implementation of the plan, in conjunction with the HUB Office.

3. Owner
Before awarding a contract, owner shall do the following:

a. Develop and implement a minority business participation outreach plan to identify minority businesses that can perform public building projects and to implement outreach efforts to encourage minority business participation in these projects to include education, recruitment, and interaction between minority businesses and non-minority businesses.
b. Attend the scheduled prebid conference.
c. At least 10 days prior to the scheduled day of bid opening, notify minority businesses that have requested notices from the public entity for public construction or repair work and minority businesses that otherwise indicated to the Office for Historically Underutilized Businesses an interest in the type of work being bid or the potential contracting opportunities listed in the proposal. The notification shall include the following:
    1. A description of the work for which the bid is being solicited.
    2. The date, time, and location where bids are to be submitted.
    3. The name of the individual within the owner's organization who will be available to answer questions about the project.
    4. Where bid documents may be reviewed.
    5. Any special requirements that may exist.
d. Utilize other media, as appropriate, likely to inform potential minority businesses of the bid being sought.
e. Maintain documentation of any contacts, correspondence, or conversation with minority business firms made in an attempt to meet the goals.
f. Review, jointly with the designer, all requirements of G.S. 143-128.2(c) and G.S. 143-128.2(f) – (i.e. bidders' proposals for identification of the minority businesses that will be utilized with corresponding total dollar value of the bid and affidavit listing good faith efforts, or affidavit of self-performance of work, if the contractor will perform work under contract by its own workforce) - prior to recommendation of award to the State Construction Office.
g. Evaluate documentation to determine good faith effort has been achieved for minority business utilization prior to recommendation of award to State Construction Office.
h. Review prime contractors' pay applications for compliance with minority business utilization commitments prior to payment**.**
i. Make documentation showing evidence of implementation of Owner's responsibilities available for review by State Construction Office and HUB Office, upon request

4. Designer
Under the single-prime bidding, separate prime bidding, construction manager at risk, or alternative contracting method, the designer will:

a. Attend the scheduled prebid conference to explain minority business requirements to the prospective bidders.
b. Assist the owner to identify and notify prospective minority business prime and subcontractors of potential contracting opportunities.
c. Maintain documentation of any contacts, correspondence, or conversation with minority business firms made in an attempt to meet the goals.
d. Review jointly with the owner, all requirements of G.S. 143-128.2(c) and G.S.143-128.2(f) – (i.e. bidders' proposals for identification of the minority businesses that will be utilized with

corresponding total dollar value of the bid and affidavit listing Good Faith Efforts, or affidavit of self-performance of work, if the contractor will perform work under contract by its own workforce) - prior to recommendation of award.

e. During construction phase of the project, review "MBE Documentation for Contract Payment" – (Appendix E) for compliance with minority business utilization commitments. Submit Appendix E form with monthly pay applications to the owner and forward copies to the State Construction Office.
f. Make documentation showing evidence of implementation of Designer's responsibilities available for review by State Construction Office and HUB Office, upon request.

5. Prime Contractor(s), CM at Risk, and Its First-Tier Subcontractors
Under the single-prime bidding, the separate-prime biding, construction manager at risk and alternative contracting methods, contractor(s) will:

a. Attend the scheduled prebid conference.
b. Identify or determine those work areas of a subcontract where minority businesses may have an interest in performing subcontract work.
c. At least ten (10) days prior to the scheduled day of bid opening, notify minority businesses of potential subcontracting opportunities listed in the proposal. The notification will include the following:
   (1) A description of the work for which the subbid is being solicited.
   (2) The date, time and location where subbids are to be submitted.
   (3) The name of the individual within the company who will be available to answer questions about the project.
   (4) Where bid documents may be reviewed.
   (5) Any special requirements that may exist, such as insurance, licenses, bonds and financial arrangements.

   If there are more than three (3) minority businesses in the general locality of the project who offer similar contracting or subcontracting services in the specific trade, the contractor(s) shall notify three (3), but may contact more, if the contractor(s) so desires.
d. During the bidding process, comply with the contractor(s) requirements listed in the proposal for minority participation.
e. Identify on the bid**,** the minority businesses that will be utilized on the project with corresponding total dollar value of the bid and affidavit listing good faith efforts as required by G.S. 143-128.2(c) and G.S. 143-128.2(f).
f. Make documentation showing evidence of implementation of PM, CM-at-Risk and First-Tier Subcontractor responsibilities available for review by State Construction Office and HUB Office, upon request.
g. Upon being named the apparent low bidder, the Bidder shall provide one of the following: (1) an affidavit (Affidavit C) that includes a description of the portion of work to be executed by minority businesses, expressed as a percentage of the total contract price, which is equal to or more than the applicable goal; (2) if the percentage is not equal to the applicable goal, then documentation of all good faith efforts taken to meet the goal. Failure to comply with these requirements is grounds for rejection of the bid and award to the next lowest responsible and responsive bidder.
h. The contractor(s) shall identify the name(s) of minority business subcontractor(s) and corresponding dollar amount of work on the schedule of values. The schedule of values shall be provided as required in Article 31 of the General Conditions of the Contract to facilitate payments to the subcontractors.
i. The contractor(s) shall submit with each monthly pay request(s) and final payment(s), "MBE Documentation for Contract Payment" – (Appendix E), for designer's review.
j. During the construction of a project, at any time**,** if it becomes necessary to replace a minority business subcontractor, immediately advise the owner, State Construction Office, and the Director of the HUB Office in writing**,** of the circumstances involved. The prime contractor shall make a good faith effort to replace a minority business subcontractor with another minority business subcontractor.

k. If during the construction of a project additional subcontracting opportunities become available, make a good faith effort to solicit subbids from minority businesses.
l. It is the intent of these requirements apply to all contractors performing as prime contractor and first tier subcontractor under construction manager at risk on state projects.

6. Minority Business Responsibilities
While minority businesses are not required to become certified in order to participate in the State construction projects, it is recommended that they become certified and should take advantage of the appropriate technical assistance that is made available. In addition, minority businesses who are contacted by owners or bidders must respond promptly whether or not they wish to submit a bid.

SECTION 4: DISPUTE PROCEDURES
It is the policy of this state that disputes that involves a person's rights, duties or privileges, should be settled through informal procedures. To that end, minority business disputes arising under these guidelines should be resolved as governed under G.S. 143-128(g).

SECTION 5: These guidelines shall apply upon promulgation on state construction projects. Copies of these guidelines may be obtained from the Department of Administration, State Construction Office, (physical address) 301 North Wilmington Street, Suite 450, NC Education Building, Raleigh, North Carolina, 27601-2827, (mail address) 1307 Mail Service Center, Raleigh, North Carolina, 27699-1307, phone (919) 807-4100, Website: www.nc-sco.com

SECTION 6: In addition to these guidelines, there will be issued with each construction bid package provisions for contractual compliance providing minority business participation in the state construction program.

MINORITY BUSINESS CONTRACT PROVISIONS (CONSTRUCTION)

APPLICATION:

The **Guidelines for Recruitment and Selection of Minority Businesses for Participation in State Construction Contracts** are hereby made a part of these contract documents. These guidelines shall apply to all contractors regardless of ownership. Copies of these guidelines may be obtained from the Department of Administration, State Construction Office, (physical address) 301 North Wilmington Street, Suite 450, NC Education Building, Raleigh, North Carolina, 27601-2827, (mail address) 1307 Mail Service Center, Raleigh, North Carolina, 27699-1307, phone (919) 807-4100, Website: http://www.nc-sco.com

MINORITY BUSINESS SUBCONTRACT GOALS:

The goals for participation by minority firms as subcontractors on this project have been set at 10%.

The bidder must identify on its bid, the minority businesses that will be utilized on the project with corresponding total dollar value of the bid and affidavit (Affidavit A) listing good faith efforts **or** affidavit (Affidavit B) of self-performance of work, if the bidder will perform work under contract by its own workforce, as required by G.S. 143-128.2(c) and G.S. 143-128.2(f).

The lowest responsible, responsive bidder must provide Affidavit C, that includes a description of the portion of work to be executed by minority businesses, expressed as a percentage of the total contract price, which is equal to or more than the applicable goal.

OR

Provide Affidavit D, that includes a description of the portion of work to be executed by minority businesses, expressed as a percentage of the total contract price, **with documentation of Good Faith Effort, if the percentage is not equal to the applicable goal.**

OR

Provide Affidavit B, which includes sufficient information for the State to determine that the bidder does not customarily subcontract work on this type project.

The above information must be provided as required. Failure to submit these documents is grounds for rejection of the bid.

MINIMUM COMPLIANCE REQUIREMENTS:

All written statements, affidavits or intentions made by the Bidder shall become a part of the agreement between the Contractor and the State for performance of this contract. Failure to comply with any of these statements, affidavits or intentions, or with the minority business Guidelines shall constitute a breach of the contract. A finding by the State that any information submitted either prior to award of the contract or during the performance of the contract is inaccurate, false or incomplete, shall also constitute a breach of the contract. Any such breach may result in termination of the contract in accordance with the termination provisions contained in the contract. It shall be solely at the option of the State whether to terminate the contract for breach.

In determining whether a contractor has made Good Faith Efforts, the State will evaluate all efforts made by the Contractor and will determine compliance in regard to quantity, intensity, and results of these efforts. Good Faith Efforts include:

(1) Contacting minority businesses that reasonably could have been expected to submit a quote and that were known to the contractor or available on State or local government maintained lists at least 10 days before the bid or proposal date and notifying them of the nature and scope of the work to be performed.

(2) Making the construction plans, specifications and requirements available for review by prospective minority businesses, or providing these documents to them at least 10 days before the bid or proposals are due.

(3) Breaking down or combining elements of work into economically feasible units to facilitate minority participation.

(4) Working with minority trade, community, or contractor organizations identified by the Office for Historically Underutilized Businesses and included in the bid documents that provide assistance in recruitment of minority businesses.

(5) Attending any prebid meetings scheduled by the public owner.

(6) Providing assistance in getting required bonding or insurance or providing alternatives to bonding or insurance for subcontractors.

(7) Negotiating in good faith with interested minority businesses and not rejecting them as unqualified without sound reasons based on their capabilities. Any rejection of a minority business based on lack of qualification should have the reasons documented in writing.

(8) Providing assistance to an otherwise qualified minority business in need of equipment, loan capital, lines of credit, or joint pay agreements to secure loans, supplies, or letters of credit, including waiving credit that is ordinarily required. Assisting minority businesses in obtaining the same unit pricing with the bidder's suppliers in order to help minority businesses in establishing credit.

(9) Negotiating joint venture and partnership arrangements with minority businesses in order to increase opportunities for minority business participation on a public construction or repair project when possible.

(10) Providing quick pay agreements and policies to enable minority contractors and suppliers to meet cash-flow demands.

APPENDIX E

MBE DOCUMENTATION FOR CONTRACT PAYMENTS

Prime Contractor/Architect: _____

Address & Phone: _____

Project Name: _____

Pay Application #: _____ Period: _____

The following is a list of payments made to Minority Business Enterprises on this project for the above-mentioned period.

MBE FIRM NAME	* INDICATE TYPE OF MBE	AMOUNT PAID THIS MONTH	TOTAL PAYMENTS TO DATE	TOTAL AMOUNT COMMITTED

*Minority categories: Black, African American (B), Hispanic (H), Asian American (A), American Indian (I), Female (F), Social and Economically Disadvantage (D)

Date: _____ Approved/Certified By: _____
Name

_____
Title

_____
Signature

SUBMIT WITH EACH PAY REQUEST & FINAL PAYMENT

(Revised on 3/14/2003)

F O R M OF P R O P O S A L

University of North Carolina at
Greesboro – Coleman Building
Fire Alarm System Upgrades
SCO-ID 17-18200-01A

Contract: _____

Bidder: _____

Date: _____

The undersigned, as bidder, hereby declares that the only person or persons interested in this proposal as principal or principals is or are named herein and that no other person than herein mentioned has any interest in this proposal or in the contract to be entered into; that this proposal is made without connection with any other person, company or parties making a bid or proposal; and that it is in all respects fair and in good faith without collusion or fraud. The bidder further declares that he has examined the site of the work and the contract documents relative thereto, and has read all special provisions furnished prior to the opening of bids; that he has satisfied himself relative to the work to be performed. The bidder further declares that he and his subcontractors have fully complied with NCGS 64, Article 2 in regards to E-Verification as required by Section 2.(c) of Session Law 2013-418, codified as N.C. Gen. Stat. § 143-129(j).

.

The Bidder proposes and agrees if this proposal is accepted to contract with the State of North Carolina through University of North Carolina in the form of contract specified below, to furnish all necessary materials, equipment, machinery, tools, apparatus, means of transportation and labor necessary to complete the construction of UNC Greensboro Coleman Building Fire Alarm System Upgrades in full in complete accordance with the plans, specifications and contract documents, to the full and entire satisfaction of the State of North Carolina, and the University of North Carolina at Greensboro with a definite understanding that no money will be allowed for extra work except as set forth in the General Conditions and the contract documents, for the sum of:

SINGLE PRIME CONTRACT: _____

Base Bid:

_____ Dollars($) _____

General Subcontractor:

_____ Lic _____

Plumbing Subcontractor:

_____ Lic _____

Mechanical Subcontractor:

_____ Lic _____

Electrical Subcontractor:

_____ Lic _____

GS143-128(d) requires all single prime bidders to identify their subcontractors for the above subdivisions of work. A contractor whose bid is accepted shall not substitute any person as subcontractor in the place of the subcontractor listed in the original bid, except (i) if the listed subcontractor's bid is later determined by the contractor to be non-responsible or non-responsive or the listed subcontractor refuses to enter into a contract for the complete performance of the bid work, or (ii) with the approval of the awarding authority for good cause shown by the contractor.

ALTERNATES:

Should any of the alternates as described in the contract documents be accepted, the amount written below shall be the amount to be "added to" or "deducted from" the base bid.

Alternate No. FA-1: EST Preferred Brand Alternate for fire alarm/mass notification system.

(Add) Dollars($)

Alternate No. FA-2: Space Age Electronics Fireray 5000 Preferred Brand Alternate for optical beam detectors.

(Add) Dollars($)

UNIT PRICES

Unit prices quoted and accepted shall apply throughout the life of the contract, except as otherwise specifically noted. Unit prices shall be applied, as appropriate, to compute the total value of changes in the base bid quantity of the work all in accordance with the contract documents.

No. 1 Replacement of existing ceiling tile necessary for tiles with existing devices being removed, tiles damaged during construction, etc. New tile shall match current finishes in the building.

Unit Price ($)

No. 2 Repair of existing fire rated penetrations in fire rated assemblies.

Unit Price ($)

No. 3 Addition of an initiation device (ceiling mounted photoelectric smoke, ionization smoke, or heat detector) including base, boxes and accessories, and 30' of SLC in painted EMT conduit per unit.

Unit Price ($)

No. 4 Addition of notification device (ceiling or wall mounted strobe or combination horn /strobe) including boxes and accessories, and 30' of wiring in painted EMT conduit per unit.

Unit Price ($)

No. 5 Addition of a manual pull station including boxes and accessories, and 30' of SLC in painted EMT conduit per unit.

Unit Price ($)

No. 6 Addition of duct detector and RAIL including boxes and accessories, and 30' of wiring (SLC, etc.) in painted EMT conduit per unit.

Unit Price ($)

No. 7 Addition of fire alarm relay, monitor or control device (ceiling or wall mounted) including boxes and accessories, and 30' of wiring (SLC, etc.) in painted EMT conduit per unit.

Unit Price ($)

No. 8 Price per location (various locations throughout Coleman Building – exact locations for disturbance to be verified in the field during renovations) of hazardous floor tile/mastic/carpet mastic spot removal.

Unit Price ($)_____

No. 9 Price per location (potentially present in Rooms 163 and 163E) removal of hazardous ceiling tile (1'x1' two different size holes random spacing).

Unit Price ($)_____

No. 10 Price per location (potentially present in Room 300D) of hazardous cement wall board panel removal.

Unit Price ($)_____

No. 11 Price per location (potentially present in various locations in the building, disturbance is not expected) of hazardous pipe/fitting insulation removal.

Unit Price ($)_____

No. 12 Price per location (potentially present on metal HVAC ducts throughout building, disturbance is not expected) of hazardous duct sealant removal.

Unit Price ($)_____

No. 13 Price per location (potentially present in Rooms 201, 300D, and 304D (may be part of the roof system), disturbance is not expected) of hazardous roof/ceiling board removal/disturbance.

Unit Price ($)_____

No. 14 Price per location (various locations throughout Coleman Building, disturbance is not expected) of hazardous baseboard/mastic removal/disturbance.

Unit Price ($)_____

No. 15 Price for the addition of a 24"x24" ceiling access panel and installation in hard ceiling location.

Unit Price ($)_____

The bidder further proposes and agrees hereby to commence work under this contract on a date to be specified in a written order of the designer and shall fully complete all work thereunder within the time specified in the Supplementary General Conditions Article 23. Applicable liquidated damages amount is also stated in the Supplementary General Conditions Article 23.

MINORITY BUSINESS PARTICIPATION REQUIREMENTS

Provide with the bid - Under GS 143-128.2(c) the undersigned bidder shall identify **on its bid** (Identification of Minority Business Participation Form) the minority businesses that it will use on the project with the total dollar value of the bids that will be performed by the minority businesses. **Also** list the good faith efforts (Affidavit **A**) made to solicit minority participation in the bid effort.

NOTE: A contractor that performs all of the work with its own workforce may submit an Affidavit (**B)** to that effect in lieu of Affidavit (**A)** required above. The MB Participation Form must still be submitted even if there is zero participation.

After the bid opening - The Owner will consider all bids and alternates and determine the lowest responsible, responsive bidder. Upon notification of being the apparent low bidder, the bidder shall then file within 72 hours of the notification of being the apparent lowest bidder, the following:

An Affidavit (**C**) that includes a description of the portion of work to be executed by minority businesses, expressed as a percentage of the total contract price, which is equal to or more than the 10% goal established. This affidavit shall give rise to the presumption that the bidder has made the required good faith effort and Affidavit **D** is not necessary;

*** OR ***

If less than the 10% goal, Affidavit (**D**) of its good faith effort to meet the goal shall be provided. The document must include evidence of all good faith efforts that were implemented, including any advertisements, solicitations and other specific actions demonstrating recruitment and selection of minority businesses for participation in the contract.

Note: Bidders must always submit **with their bid** the Identification of Minority Business Participation Form listing all MB contractors, vendors and suppliers that will be used. If there is no MB participation, then enter none or zero on the form. Affidavit A **or** Affidavit B, as applicable, also must be submitted with the bid. Failure to file a required affidavit or documentation with the bid or after being notified apparent low bidder is grounds for rejection of the bid.

Proposal Signature Page

The undersigned further agrees that in the case of failure on his part to execute the said contract and the bonds within ten (10) consecutive calendar days after being given written notice of the award of contract, the certified check, cash or bid bond accompanying this bid shall be paid into the funds of the owner's account set aside for the project, as liquidated damages for such failure; otherwise the certified check, cash or bid bond accompanying this proposal shall be returned to the undersigned.

Respectfully submitted this day of _____

_____
(Name of firm or corporation making bid)

WITNESS:

_____
(Proprietorship or Partnership)

By:_____
Signature

Name: _____
Print or type

Title_____
(Owner/Partner/Pres./V.Pres)

Address_____

_____

ATTEST:

By:_____

Title:_____
(Corp. Sec. or Asst. Sec. only)

License No._____

Federal I.D. No. _____

Email Address: _____

(CORPORATE SEAL)

Addendum received and used in computing bid:

Addendum No. 1 _____ Addendum No. 3 _____ Addendum No. 5_____ Addendum No. 6_____

Addendum No. 2 _____ Addendum No. 4 _____ Addendum No. 6 _____ Addendum No. 7 _____

Identification of HUB Certified/ Minority Business Participation

I,_____,
(Name of Bidder)
do hereby certify that on this project, we will use the following HUB Certified/ minority business as construction subcontractors, vendors, suppliers or providers of professional services.

Firm Name, Address and Phone #	Work Type	*Minority Category	**HUB Certified (Y/N)

*Minority categories: Black, African American (**B**), Hispanic (**H**), Asian American (**A**) American Indian (**I**), Female (**F**) Socially and Economically Disadvantaged (**D**)

**** HUB Certification with the state HUB Office required to be counted toward state participation goals.**

The total value of minority business contracting will be ($)_____.

State of North Carolina AFFIDAVIT A – Listing of Good Faith Efforts

County of _____

(Name of Bidder)

Affidavit of_____

I have made a good faith effort to comply under the following areas checked:

Bidders must earn at least 50 points from the good faith efforts listed for their bid to be considered responsive. (1 NC Administrative Code 30 I.0101)

- ❑ **1 – (10 pts)** Contacted minority businesses that reasonably could have been expected to submit a quote and that were known to the contractor, or available on State or local government maintained lists, at least 10 days before the bid date and notified them of the nature and scope of the work to be performed.
- ❑ **2 --(10 pts)** Made the construction plans, specifications and requirements available for review by prospective minority businesses, or providing these documents to them at least 10 days before the bids are due.
- ❑ **3** – **(15 pts)** Broken down or combined elements of work into economically feasible units to facilitate minority participation.
- ❑ **4 – (10 pts)** Worked with minority trade, community, or contractor organizations identified by the Office of Historically Underutilized Businesses and included in the bid documents that provide assistance in recruitment of minority businesses.
- ❑ **5** – **(10 pts)** Attended prebid meetings scheduled by the public owner.
- ❑ **6** – **(20 pts)** Provided assistance in getting required bonding or insurance or provided alternatives to bonding or insurance for subcontractors.
- ❑ **7 – (15 pts)** Negotiated in good faith with interested minority businesses and did not reject them as unqualified without sound reasons based on their capabilities. Any rejection of a minority business based on lack of qualification should have the reasons documented in writing.
- ❑ **8** – **(25 pts)** Provided assistance to an otherwise qualified minority business in need of equipment, loan capital, lines of credit, or joint pay agreements to secure loans, supplies, or letters of credit, including waiving credit that is ordinarily required. Assisted minority businesses in obtaining the same unit pricing with the bidder's suppliers in order to help minority businesses in establishing credit.
- ❑ **9** – **(20 pts)** Negotiated joint venture and partnership arrangements with minority businesses in order to increase opportunities for minority business participation on a public construction or repair project when possible.
- ❑ **10** - **(20 pts)** Provided quick pay agreements and policies to enable minority contractors and suppliers to meet cash-flow demands.

The undersigned, if apparent low bidder, will enter into a formal agreement with the firms listed in the Identification of Minority Business Participation schedule conditional upon scope of contract to be executed with the Owner. Substitution of contractors must be in accordance with GS143-128.2(d) Failure to abide by this statutory provision will constitute a breach of the contract.

The undersigned hereby certifies that he or she has read the terms of the minority business commitment and is authorized to bind the bidder to the commitment herein set forth.

Date:_____ Name of Authorized Officer:_____

Signature:_____

Title:_____

SEAL

State of_____, County of_____

Subscribed and sworn to before me this _____day of _____20____

Notary Public_____

My commission expires _____

State of North Carolina --AFFIDAVIT B-- Intent to Perform Contract with Own Workforce.

County of _____

Affidavit of_____
(Name of Bidder)

I hereby certify that it is our intent to perform 100% of the work required for the _____

_____contract.
(Name of Project)

In making this certification, the Bidder states that the Bidder does not customarily subcontract elements of this type project, and normally performs and has the capability to perform and will perform all elements of the work on this project with his/her own current work forces; and

The Bidder agrees to provide any additional information or documentation requested by the owner in support of the above statement. The Bidder agrees to make a Good Faith Effort to utilize minority suppliers where possible.

The undersigned hereby certifies that he or she has read this certification and is authorized to bind the Bidder to the commitments herein contained.

Date:_____Name of Authorized Officer:_____

Signature:_____

Title:_____

SEAL

State of _____, County of_____

Subscribed and sworn to before me this _____day of _____20___

Notary Public _____

My commission expires_____

State of North Carolina - AFFIDAVIT C - Portion of the Work to be Performed by HUB Certified/Minority Businesses

County of _____

(Note this form is to be submitted only by the apparent lowest responsible, responsive bidder.)

If the portion of the work to be executed by HUB certified/minority businesses as defined in GS143-128.2(g) and 128.4(a),(b),(e) is equal to or greater than 10% of the bidders total contract price, then the bidder must complete this affidavit.
This affidavit shall be provided by the apparent lowest responsible, responsive bidder within **72 hours** after notification of being low bidder.

Affidavit of _____ I do hereby certify that on the
(Name of Bidder)

_____
(Project Name)

Project ID#_____ Amount of Bid $_____

I will expend a minimum of _____% of the total dollar amount of the contract with minority business enterprises. Minority businesses will be employed as construction subcontractors, vendors, suppliers or providers of professional services. Such work will be subcontracted to the following firms listed below. Attach additional sheets if required

Name and Phone Number	*Minority Category	**HUB Certified Y/N	Work Description	Dollar Value

*Minority categories: Black, African American (**B**), Hispanic (**H**), Asian American (**A**) American Indian (**I**), Female (**F**) Socially and Economically Disadvantaged (**D**)

**** HUB Certification with the state HUB Office required to be counted toward state participation goals.**

Pursuant to GS143-128.2(d), the undersigned will enter into a formal agreement with Minority Firms for work listed in this schedule conditional upon execution of a contract with the Owner. Failure to fulfill this commitment may constitute a breach of the contract.

The undersigned hereby certifies that he or she has read the terms of this commitment and is authorized to bind the bidder to the commitment herein set forth.

Date:_____ Name of Authorized Officer:_____

SEAL

Signature:_____

Title:_____

State of _____, County of _____
Subscribed and sworn to before me this _____day of _____20____
Notary Public_____
My commission expires_____

State of North Carolina AFFIDAVIT D – Good Faith Efforts

County of _____

(Note this form is to be submitted only by the apparent lowest responsible, responsive bidder.)

If the goal of 10% participation by HUB Certified/ minority business **is not** achieved, the Bidder shall provide the following documentation to the Owner of his good faith efforts:

Affidavit of _____ I do hereby certify that on the
(Name of Bidder)

_____
(Project Name)

Project ID#_____ Amount of Bid $_____

I will expend a minimum of _____% of the total dollar amount of the contract with HUB certified/ minority business enterprises. Minority businesses will be employed as construction subcontractors, vendors, suppliers or providers of professional services. Such work will be subcontracted to the following firms listed below. (Attach additional sheets if required)

Name and Phone Number	*Minority Category	**HUB Certified Y/N	Work Description	Dollar Value

***Minority categories: Black, African American (**B**), Hispanic (**H**), Asian American (**A**) American Indian (**I**), Female (**F**) Socially and Economically Disadvantaged (**D**)

****** HUB Certification with the state HUB Office required to be counted toward state participation goals.**

Examples of documentation that may be required to demonstrate the Bidder's good faith efforts to meet the goals set forth in these provisions include, but are not necessarily limited to, the following:

A. Copies of solicitations for quotes to at least three (3) minority business firms from the source list provided by the State for each subcontract to be let under this contract (if 3 or more firms are shown on the source list). Each solicitation shall contain a specific description of the work to be subcontracted, location where bid documents can be reviewed, representative of the Prime Bidder to contact, and location, date and time when quotes must be received.

B. Copies of quotes or responses received from each firm responding to the solicitation.

C. A telephone log of follow-up calls to each firm sent a solicitation.

D. For subcontracts where a minority business firm is not considered the lowest responsible sub-bidder, copies of quotes received from all firms submitting quotes for that particular subcontract.

E. Documentation of any contacts or correspondence to minority business, community, or contractor organizations in an attempt to meet the goal.

F. Copy of pre-bid roster

G. Letter documenting efforts to provide assistance in obtaining required bonding or insurance for minority business.

H. Letter detailing reasons for rejection of minority business due to lack of qualification.

I. Letter documenting proposed assistance offered to minority business in need of equipment, loan capital, lines of credit, or joint pay agreements to secure loans, supplies, or letter of credit, including waiving credit that is ordinarily required.

Failure to provide the documentation as listed in these provisions may result in rejection of the bid and award to the next lowest responsible and responsive bidder.

Pursuant to GS143-128.2(d), the undersigned will enter into a formal agreement with Minority Firms for work listed in this schedule conditional upon execution of a contract with the Owner. Failure to fulfill this commitment may constitute a breach of the contract.

The undersigned hereby certifies that he or she has read the terms of this commitment and is authorized to bind the bidder to the commitment herein set forth.

Date:_____ Name of Authorized Officer:_____

Signature:_____

Title:_____

SEAL

State of _____, County of _____

Subscribed and sworn to before me this _____ day of _____ 20____

Notary Public_____

My commission expires _____

FORM OF BID BOND

KNOW ALL MEN BY THESE PRESENTS THAT _____ _____ as principal, and _____, as surety, who is duly licensed to act as surety in North Carolina, are held and firmly bound unto the State of North Carolina* through _____ as obligee, in the penal sum of _____ DOLLARS, lawful money of the United States of America, for the payment of which, well and truly to be made, we bind ourselves, our heirs, executors, administrators, successors and assigns, jointly and severally, firmly by these presents.

Signed, sealed and dated this ____ day of _____ 20__

WHEREAS, the said principal is herewith submitting proposal for and the principal desires to file this bid bond in lieu of making the cash deposit as required by G.S. 143-129.

NOW, THEREFORE, THE CONDITION OF THE ABOVE OBLIGATION is such, that if the principal shall be awarded the contract for which the bid is submitted and shall execute the contract and give bond for the faithful performance thereof within ten days after the award of same to the principal, then this obligation shall be null and void; but if the principal fails to so execute such contract and give performance bond as required by G.S. 143-129, the surety shall, upon demand, forthwith pay to the obligee the amount set forth in the first paragraph hereof. Provided further, that the bid may be withdrawn as provided by G.S. 143-129.1

_____(SEAL)

_____(SEAL)

_____(SEAL)

_____(SEAL)

_____(SEAL)

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FORM OF CONSTRUCTION CONTRACT

(ALL PRIME CONTRACTS)

THIS AGREEMENT, made the _____ day of _____ in the year of 20__ by and between _____

_____

hereinafter called the Party of the First Part and the *State of North Carolina, through the

_____

hereinafter called the Party of the Second Part.

WITNESSETH:

That the Party of the First Part and the Party of the Second Part for the consideration herein named agree as follows:

1. Scope of Work: The Party of the First Part shall furnish and deliver all of the materials, and perform all of the work in the manner and form as provided by the following enumerated plans, specifications and documents, which are attached hereto and made a part thereof as if fully contained herein: advertisement; Instructions to Bidders; General Conditions; Supplementary General Conditions; specifications; accepted proposal; contract; performance bond; payment bond; power of attorney; workmen's compensation; public liability; property damage and builder's risk insurance certificates; approval of attorney general; certificate by the Office of State Budget and Management, and drawings, titled:

_____

_____

Consisting of the following sheets:

_____

_____

Dated: _____ and the following addenda:

Addendum No _____ Dated: _____ Addendum No. _____ Dated: _____

Addendum No _____ Dated: _____ Addendum No. _____ Dated: _____

Addendum No _____ Dated: _____ Addendum No. _____ Dated: _____

Addendum No _____ Dated: _____ Addendum No. _____ Dated: _____

2. That the Party of the First Part shall commence work to be performed under this agreement on a date to be specified in a written order of the Party of the Second Part and shall fully complete all work hereunder within _____ consecutive calendar days from said date. For each day in excess thereof, liquidated damages shall be as stated in Supplementary General Conditions. The Party of the First Part, as one of the

considerations for the awarding of this contract, shall furnish to the Party of the Second Part a construction schedule setting forth planned progress of the project broken down by the various divisions or part of the work and by calendar days as outlined in Article 14 of the General Conditions of the Contract.

3. The Party of the Second Part hereby agrees to pay to the Party of the First Part for the faithful performance of this agreement, subject to additions and deductions as provided in the specifications or proposal, in lawful money of the United States as follows:

_____($ _____).

Summary of Contract Award:

4. In accordance with Article 31 and Article 32 of the General Conditions of the Contract, the Party of the Second Part shall review, and if approved, process the Party of the First Party's pay request within 30 days upon receipt from the Designer. The Party of the Second Part, after reviewing and approving said pay request, shall make payments to the Party of the First Part on the basis of a duly certified and approved estimate of work performed during the preceding calendar month by the First Party, less five percent (5%) of the amount of such estimate which is to be retained by the Second Party until all work has been performed strictly in accordance with this agreement and until such work has been accepted by the Second Party. The Second Party may elect to waive retainage requirements after 50 percent of the work has been satisfactorily completed on schedule as referred to in Article 31 of the General Conditions.

5. Upon submission by the First Party of evidence satisfactory to the Second Party that all payrolls, material bills and other costs incurred by the First Party in connection with the construction of the work have been paid in full, final payment on account of this agreement shall be made within thirty (30) days after the completion by the First Party of all work covered by this agreement and the acceptance of such work by the Second Party.

6. It is further mutually agreed between the parties hereto that if at any time after the execution of this agreement and the surety bonds hereto attached for its faithful performance, the Second Party shall deem the surety or sureties upon such bonds to be unsatisfactory, or if, for any reason, such bonds cease to be adequate to cover the performance of the work, the First Party shall, at its expense, within five (5) days after the receipt of notice from the Second Party so to do, furnish an additional bond or bonds in such form and amount, and with such surety or sureties as shall be satisfactory to the Second Party. In such event no further payment to the First Party shall be deemed to be due under this agreement until such new or additional security for the faithful performance of the work shall be furnished in manner and form satisfactory to the Second Party.

7. The Party of the First Part attest that it and all of its subcontractors have fully complied with all requirements of NCGS 64 Article 2 in regards to E-Verification as required by Section 2.(c) of Session Law 2013-418, codified as N.C. Gen. Stat. § 143-129(j).

IN WITNESS WHEREOF, the Parties hereto have executed this agreement on the day and date first above written in _____counterparts, each of which shall without proof or accounting for other counterparts, be deemed an original contract.

Witness:

_____
Contractor: (Trade or Corporate Name)

_____
(Proprietorship or Partnership)

By: _____

Title: _____
(Owner, Partner, or Corp. Pres. or Vice Pres. only)

Attest: (Corporation)

By: _____

Title: _____
(Corp. Sec. or Asst. Sec. only)

The State of North Carolina through*

(CORPORATE SEAL)

_____
(Agency, Department or Institution)

Witness:

_____

By:_____

Title: _____

FORM OF PERFORMANCE BOND

Date of Contract: _____

Date of Execution: _____

Name of Principal (Contractor) _____

Name of Surety: _____

Name of Contracting Body: _____

Amount of Bond: _____

Project

KNOW ALL MEN BY THESE PRESENTS, that we, the principal and surety above named, are held and firmly bound unto the above named contracting body, hereinafter called the contracting body, in the penal sum of the amount stated above for the payment of which sum well and truly to be made, we bind, ourselves, our heirs, executors, administrators, and successors, jointly and severally, firmly by these presents.

THE CONDITION OF THIS OBLIGATION IS SUCH, that whereas the principal entered into a certain contract with the contracting body, identified as shown above and hereto attached:

NOW, THEREFORE, if the principal shall well and truly perform and fulfill all the undertakings, covenants, terms, conditions and agreements of said contract during the original term of said contract and any extensions thereof that may be granted by the contracting body, with or without notice to the surety, and during the life of any guaranty required under the contract, and shall also well and truly perform and fulfill all the undertakings, covenants, terms, conditions and agreements of any and all duly authorized modifications of said contract that may hereafter be made, notice of which modifications to the surety being hereby waived, then, this obligation to be void; otherwise to remain in full force and virtue.

IN WITNESS WHEREOF, the above-bounden parties have executed this instrument under their several seals on the date indicated above, the name and corporate seal of each corporate party being hereto affixed and these presents duly signed by its undersigned representative, pursuant to authority of its governing body.

Executed in _____ counterparts.

Witness:

_____
(Proprietorship or Partnership)

Attest: (Corporation)

By: _____

Title: _____
(Corp. Sec. or Asst. Sec. only)

(Corporate Seal)

_____
Contractor: (Trade or Corporate Name)

By: _____

Title: _____
(Owner, Partner, or Corp. Pres. or Vice Pres. only)

_____
(Surety Company)

Witness:

_____

By: _____

Title: _____
(Attorney in Fact)

Countersigned:

_____

_____
(N.C. Licensed Resident Agent)

_____

_____
Name and Address-Surety Agency

_____

_____
Surety Company Name and N.C. Regional or Branch Office Address

(Surety Corporate Seal)

FORM OF PAYMENT BOND

Date of Contract: _____

Date of Execution: _____

Name of Principal (Contractor) _____

Name of Surety: _____

Name of Contracting Body: _____

Amount of Bond: _____

Project _____

KNOW ALL MEN BY THESE PRESENTS, that we, the principal and surety above named, are held and firmly bound unto the above named contracting body, hereinafter called the contracting body, in the penal sum of the amount stated above for the payment of which sum well and truly to be made, we bind ourselves, our heirs, executors, administrators, and successors, jointly and severally, firmly by these presents.

THE CONDITION OF THIS OBLIGATION IS SUCH, that whereas the principal entered into a certain contract with the contracting body identified as shown above and hereto attached:

NOW, THEREFORE, if the principal shall promptly make payment to all persons supplying labor/material in the prosecution of the work provided for in said contract, and any and all duly authorized modifications of said contract that may hereafter be made, notice of which modifications to the surety being hereby waived, then this obligation to be void; otherwise to remain in full force and virtue.

IN WITNESS WHEREOF, the above-bounden parties have executed this instrument under their several seals on the date indicated above, the name and corporate seal of each corporate party being hereto affixed and these presents duly signed by its undersigned representative, pursuant to authority of its governing body.

Executed in _____ counterparts.

Witness:

_____
Contractor: (Trade or Corporate Name)

_____
(Proprietorship or Partnership)

By: _____

Attest: (Corporation)

Title_____
(Owner, Partner, or Corp. Pres. or Vice Pres. only)

By: _____

Title: _____
(Corp. Sec. or Asst. Sec.. only)

(Corporate Seal)

_____
(Surety Company)

Witness:

By: _____

_____

Title: _____
(Attorney in Fact)

Countersigned:

_____

(Surety Corporate Seal)

_____
(N.C. Licensed Resident Agent)

_____

_____
Name and Address-Surety Agency

_____

_____
Surety Company Name and N.C.
Regional or Branch Office Address

Sheet for Attaching Power of Attorney

Sheet for Attaching Insurance Certificates

APPROVAL OF THE ATTORNEY GENERAL

CERTIFICATION BY THE OFFICE OF STATE BUDGET AND MANAGEMENT

Provision for the payment of money to fall due and payable by the

_____

under this agreement has been provided for by allocation made and is available for the purpose of carrying out this agreement.

This _____day of _____ 20___.

Signed _____
Budget Officer

SECTION 01 05 00 - GENERAL CONSTRUCTION GUIDELINES AND REQUIREMENTS

1.0 PURPOSE

A. The following guidelines apply to University of North Carolina at Greensboro ("UNCG") requirements specific to the needs of UNCG. It is the goal of UNCG to identify specific needs relevant to working on a public university campus or satellite facility that will help the Contractor gain more knowledge and be fully aware of UNCG's expectations while working on campus or satellite facility.

2.0 GENERAL REQUIREMENTS

A. The Owner's Representative - UNCG will designate a Construction Manager to act as the Owner's Representative in all matters pertaining to construction contracts. All official contacts, decisions, directions, problem resolution, coordination and other liaison activities required from UNCG will be through the Construction Manager. This requirement does not modify the responsibilities of the Designer as stated in the General Conditions of the Contract.

B. Behavior policy - All construction personnel shall be respectful of all members of the UNCG community. Any incidents of disrespect, verbal abuse, threatening statements, unwelcome comments, unwelcome interaction or any form of harassment from any construction personnel toward any member of UNCG community is strictly prohibited. Any such act shall constitute sufficient cause for UNCG to remove any individual permanently from the project and all UNCG property. In addition, any of the Contractor(s) project personnel who ignore or refuse to take action on any requirements of the contract documents or ignore or refuse to take immediate action to correct any endangerment to the health and safety of the public (as solely determined by UNCG) shall be permanently removed from the project and UNCG property. If in the sole determination of UNCG it is in the best interest of the project and UNCG to have any of the Contractor(s) personnel removed from the project, then the Contractor shall do so upon request by UNCG. Such actions taken by UNCG shall not constitute grounds for a delay claim. UNCG will not be responsible for any delays caused to the project due to any individual being removed from the project by UNCG.

C. Protection of Work, Property, and Public:

1. The single prime Contractor, henceforth referred to as "the Contractor," shall ensure that campus streets connecting to the project are protected from mud, sand, and stones/gravel. Streets and adjacent property sites shall be kept free from run-off, litter and/or debris in any form from the project site. Mud, litter and/or debris from the construction site that appears on adjacent property sites shall be removed immediately. All mud collected on vehicle tires shall be removed before leaving the construction area. Should any mud or debris from the project site collect on the streets, it shall be removed immediately to prevent any hazards to vehicular or pedestrian traffic as well as from entering the storm sewer system. In any event, all streets and property sites adjacent to the project site shall be cleaned of construction related debris, dust, litter and mud daily. The Contractor, in the preparation of bids, shall account for the daily cleaning of

adjacent streets and property sites. The Contractor(s) is prohibited from discharging any waste products from concrete trucks or from concrete coring work, or any other unsuitable materials, fluids or other products on the site or into the storm sewer system. Should the Contractor fail to comply with these requirements, UNCG reserves the right, with twenty-four (24) hours prior notice to the Contractor, to clean and or remove mud, trash, litter, debris or any unauthorized discharge from the project site and/or the adjacent streets or properties. In such case, the cost of the cleaning and/or removal or mobilization for cleaning and/or removal shall be deducted from the Contractor's contract.

2. The Contractor shall repair any damage (including but not limited to: scratches, cuts, dings, holes, track marks, etc.) of any kind made to existing hardscapes (asphalt/concrete roadway and drives, curb and gutter, brick sidewalks, etc.) by heavy equipment or other causes. Repairs shall consist of a complete, full depth removal and replacement of the affected asphalt, concrete or brick hardscapes at the Contractor’s expense, or as otherwise determined by the Owner, to include the full width of the road, parking lot, walk or curb that is affected. The Contractor is strongly encouraged to be mindful of this while working around and off-loading equipment in areas of new construction adjacent to existing areas, which are not in the original scope of work to be renovated or repaved. In general, equipment shall be off-loaded inside of assigned staging areas, and the Contractor shall take protective measures as needed, including protective plywood or other means to prevent damage of the hardscape surface. The slightest damage will result in full hardscape replacement at the Contractor's expense.
3. Blasting on UNCG property is prohibited.
4. Each Contractor doing excavation work is responsible for locating all existing underground utilities prior to commencing excavation. The Contractor shall be responsible for the associated cost of any utility interruption and repair due to his excavation if utility location was not requested, location procedures performed and followed prior to commencing excavation. The Contractor shall immediately notify UNCG and restore the service of any utility disrupted due to excavation or any Contractor action whatever the circumstance. UNCG reserves the right to immediately restore the service of any utility disrupted due to actions of the Contractor and deduct the cost of such restoration from the Contractor’s contract.
5. For emergency situations during construction, the Contractor shall furnish UNCG with the names, pager numbers, and telephone numbers (day and night) of the Contractor’s project manager and superintendent prior to beginning work. The numbers shall remain current or be updated as required for the duration of the project. The Contractor shall contact UNCG via cell phone immediately in the event of an emergency. UNCG will only provide security, as it deems prudent and necessary for its own protection. The Contractor shall be responsible for the security and safety of the project within the project limits. UNCG must approve any "watchman" service instituted by the Contractor.
6. UNCG will conduct normal operations during the duration of the project. The Contractor shall coordinate with UNCG to minimize any disruptions to the functions of UNCG.

D. Working Hours – See Specification Section 011000. After hours and weekend work may be in best interest of the University when the area affected is public or office space. The Contractor shall submit to UNCG and to the Designer his regular daily work schedule and shall notify UNCG in writing one (1) week in advance of any deviations from the schedule. UNCG reserves the right to limit the Contractor's activities when they conflict with UNCG operations. During these times, the Contractor may be required to cease all construction activities, limit activities to on-site only, modify working hours or restrict noise-making activities as determined by UNCG.

E. Deliveries shall be between 8A-4P.

F. Contractors will not have access to facility restrooms. Contractor shall provide porta-johns as necessary.

G. Notify Facility Manager 72 hours in advance for work inside buildings. Coordinate all building entry with Facility Manager.

H. Meetings - The contractor shall at a minimum conduct weekly coordination meeting to review construction progress and any issues that need to be resolved. Contractor shall invite UNCG and Designer as well as any required subcontractors.

Inspection of the work - UNCG will conduct the following inspections, as applicable, which shall be included in the construction schedule: in-wall inspections, above ceiling inspections, pre-final inspections, and a final inspection for project acceptance. Any inspections that are not satisfactory shall be repeated at no cost to UNCG and shall not be cause for a time extension. All inspections will be conducted by UNCG at the same time as the Designer's inspection and a punch list generated. The Contractor shall give the Designer and UNCG a minimum of fourteen (14) calendar days prior notice that the systems have been verified by the Contractor to be complete, fully functional and ready for inspection. All punch list items generated from the inspections shall be completed by the Contractor and verified by the Designer and UNCG. Any re-inspection costs, including but not limited to Designer, UNCG, State Construction Office (SCO) or third party personnel, that result from punch list items not being 100% complete shall be at the expense of the Contractor.

I. Parking - Contractor service permits are $5 per day or $35 per month. Complimentary parking for contractors during summer projects May 15 - August 10 may be designated in remote parking areas determined by UNCG POCAM.

J. Utilities - It is imperative that all campus utilities and all other campus services are maintained at all times except for scheduled interruptions. Required utility interruptions shall be scheduled with and requested through UNCG at least fourteen (14) days in advance for minor outages and thirty (30) days in advance for major outages. UNCG is the sole determiner of the utility outage being major or minor. Major outages include but are not limited to those that affect an entire floor of a building, all of a building, all or parts of several buildings, all or parts of an area, and any high voltage outage. No utility interruption, regardless of the advance notice given, shall be undertaken without expressed, specific approval from UNCG. If requested by UNCG, utility outages shall be performed after hours and/or at night, or over the weekend, or during holidays. No extra

payment will be made for such work. UNCG personnel will perform certain activities in connection with utility outages such as operating existing electrical switches, turning existing water and steam valves, placing existing building systems back in operation, operating existing fire alarm systems, etc. UNCG will bear the expense of the work of their personnel. When the Contractor requires an additional or extra outage to complete their work because of a shortage of or improper materials, shortage of labor, poor coordination, failure to finish the work during the outage scheduled length of time, the Contractor will pay all expenses incurred for UNCG's services for an additional outage(s). No service disruptions shall take place until barricades (if applicable) and signs are in place to notify and/or protect the public. Barricades must be maintained at all times and signs shall be neat and legible, hand-made signs are not acceptable. Signs for utility outage notice shall be written and placed as directed by UNCG seven (7) workdays prior to the outage. UNCG may determine the utility service cannot be interrupted for the length of time or frequency requested by the Contractor. In such case the Contractor shall include in his bid provisions for temporary utility services for the duration of the outage at no cost to UNCG.

K. Survey of New and Existing Sub-surface Utilities - Perform field location surveys of new utilities installed as well as existing utilities uncovered during the construction phase. Conventional survey standards are to be utilized during the collection of field data. All work shall be performed by qualified personnel under the supervision of a Professional Land Surveyor, and the documents submitted shall bear the Surveyors seal and certification. Accuracy Standards: horizontal and vertical location shall be +/- 0.25'. Survey (NAD83-North Carolina State Plane Coordinates) shall tie to UNCG's horizontal & vertical control monuments. A Mylar copy and digital file of the location surveys are to be provided in AutoCAD 2008 or later format and a PDF file format. Use AutoCAD layers, line types, layer names, symbols, scale, etc. as directed by owner (a spreadsheet can be provided for required layer naming conventions and their descriptions. Line types, colors, symbols, etc. can be provider standard practices. All lines shall be continuous poly-lines (no splines), and all polygons (building footprints, etc.) need to be closed poly-lines. No custom SHX features in CAD files. AutoCAD blocks can be used for point features and paper space title blocks only). Drawing shall note all dimensions and elevations in feet and hundredths of feet. Angular measurements will be in degrees, minutes, and seconds. Drawing sheet shall be trim size 24" x 36" unless otherwise authorized by owner. Computer file shall be at 1 to 1 (example 10.75 = 10'- 9"). X, Y, Z coordinates at points where shots were taken on utility structures. Provide owner with a excel file of point numbers, and the associated coordinates. Locations shall be taken at the center of a utility structure where possible. When locating piping, note size and the materials used. North shall be N C Grid. Locate North at the top of the page. Media for all electronic files shall be CD or DVD and shall be labeled with UNCG Project Number and short description of contents.

L. The following outline lists the utilities to be located and the data to be collected.

1. Water Lines - (Domestic, Fire Main, Chilled & Hot Water)
    a) Locations, size and elevations at the top of installed water lines, including changes in direction.

b) Locations of valves and a valve type designation, meters, fire department connections, post indicator valves, hydrants, reducers, manholes, and backflow device.

c) Provide digital photographs of bends and valves.

2. Electric and Communication Duct Banks and Direct Buried Conduit

a) Location and elevations of the duct bank top and bottom.

b) Location and elevations of conduit runs in the duct bank.

c) Location and elevations of any direct buried conduit.

d) Location and elevations of manhole rims, transformers, pedestals, switches, poles, overhead lines, junction boxes, panels, generators, and meter boxes.

3. Gas

a) Location and elevations of top of pipe and any change in direction.

b) Location and elevations of meters, pressure reducing stations, test stations, generators, and valves.

4. Storm and Sanitary Sewer

a) Provide invert elevations for incoming and outgoing piping at manholes.

b) Provide top elevation of manhole cover.

c) Note if manhole rims are in the center of the structure or not. Measure the offset, pipe sizes, material types and the direction of the flow.

d) Provide digital photographs of structures if needed for clarification.

5. Existing Utilities

a) Locate and provide elevations consistent with new utility requirements of any existing utilities exposed during excavation of trenches for new utilities.

b) Provide digital photographs of the crossing or conflict.

6. Deliverables for Surveys

a) The subsurface location data and platting shall be continuous throughout the project.

b) All data and plats are due to UNCG within two-weeks of the backfilling of utilities or completion of the associated construction task.

M. Traffic Movement and Interruptions - Road and sidewalk blockages shall be scheduled fourteen (14) days in advance and made only after UNCG has approved them. Appropriate detours shall be planned, subject to approval by UNCG, giving consideration to the handicapped access. No excavations shall take place prior to placing proper barricades, lighting, and other devices as shall be required. The Contractor shall install warning signs, barricades and detour information signs to maintain traffic flow as directed by UNCG. If required, flagmen shall direct traffic around the construction area or detour area. Contractors are reminded of the presence on campus of handicapped students, staff and faculty. All barricades, temporary walkways, excavations, and stockpiled materials shall be placed and/or constructed in such a manner as to accommodate, adequately warn, and protect this segment of the campus population. The Contractor shall make requests for approval for any street, alley, driveway or any access

way to be closed at least ten (10) work days prior to the date for the desired closing. The Contractor shall close no street, alley, driveway or access-way without prior approval by UNCG. Pedestrian and vehicle traffic way-finding around the construction limits must be maintained in a clean and safe condition at all times.

N. Cleanliness and Site Maintenance - The Contractor(s) shall be responsible for keeping the project limits area, the project site, and the project itself clean and free of accumulated construction debris and trash. To that extent, the Contractor(s) shall be responsible for cleaning their work areas weekly at a minimum and the proper disposal of their construction debris and trash. The construction site and staging areas shall be cleaned as previously noted; however, should trash, litter or debris from the project site migrate to any adjacent campus areas it shall be removed immediately. Grass in the construction site shall be mowed as often as required to maintain a neat appearance or as requested by UNCG but in no case less than once per month. Should the Contractor(s), in the sole judgment of UNCG fail to comply with these requirements, then UNCG reserves the right to proceed with cleaning within the project limits area, immediate project site, the interior of the project or, if applicable, the adjacent areas to the project as it deems necessary. The cost of the cleaning and/or the mobilization cost of cleaning will be deducted from the Contractor(s) contract.

O. Storage of construction materials and equipment - Storage of construction materials and equipment shall be limited to the staging area. Should the Contractor fail to remove any material stored or equipment outside the staging area within twenty-four (24) hours of notification received from UNCG, UNCG shall have the right to remove and dispose of such materials from the campus. UNCG will deduct the cost of such removal and disposal from the Contractor(s) contract. The offending Contractor(s) shall be responsible for any delay to the project resulting from UNCG having to remove and dispose of such materials or equipment.

P. Inspection and Audit - Contractor's "records" shall, upon reasonable notice, be open to inspection and subject to audit and/or reproduction during normal business working hours. An UNCG representative or an outside representative engaged by UNCG may perform such audits. UNCG or its designee may conduct such audits or inspections throughout the term of this contract and for a period of three years after final payment or longer if required by law.

1. Contractor's records as referred to in this contract shall include any and all information, materials and data of every kind and character, including without limitation, records, books, documents, subscriptions, recordings, agreements, purchase orders, leases, contracts, commitments, arrangements, notes, daily diaries, superintendent reports, drawings, receipts, vouchers and memoranda, and any and all other agreements, sources of information and matters that may in UNCG's judgment have any bearing on or pertain to any matters, rights, duties or obligations under or covered by any Contract Document. Such records shall include (hard copy, as well as computer readable data if it can be made available): written policies and procedures; time sheets; payroll registers; payroll records; cancelled payroll checks; subcontract files (including proposals of successful and unsuccessful bidders, bid recaps, etc.); original estimates; estimating work sheets; correspondence; change order files (including

documentation covering negotiated settlements); back charge logs and supporting documentation; invoices and related payment documentation; general ledger entries detailing cash and trade discounts earned; insurance rebates and dividends; and any other Contractor records which may have a bearing on matters of interest to UNCG in connection with the Contractor's dealings with UNCG (all foregoing hereinafter referred to as "records") to the extent necessary to adequately permit evaluation and verification of:

a) Contractor compliance with contract requirements,

b) Compliance with UNCG's business ethics policies, and

c) Compliance with provisions for pricing change orders, invoices or claims submitted by the Contractor or any of his payees.

Q. Changes in the Work - Overhead shall also include all general conditions of the contract and all general requirements such as project management, scheduling, home office expense, engineering and layout, reproduction expenses, shop drawing processing and coordination, supervision, coordination, small tools, all vehicle expenses, temporary facilities, safety provisions, as built drawings, estimating, and general overhead.

1. The change order cost break down shall include: labor (number of hours and $/hr) and material (quantity and $/unit), including such breakdowns for work performed by the general contractor and all subcontractors. Unit prices shall only be allowed as stipulated in Article 19 of the contract General Conditions. Cost extensions shall be clearly shown for the labor and material prior to any mark-ups. The cost extensions shall be added into a labor and material subtotal. The labor shall then show a percentage for labor burden, while the materials shall show the applicable sales tax. These subtotals shall then be shown as a total for labor and material costs. The labor and material cost shall then show the allowed mark-up, and a final total. Subcontractor quotes shall be presented in the same format on the subcontractor's letterhead. Each item totaled on the Contractor's summary sheet shall be separated in the back up documentation by a colored sheet of paper. For change orders that delete any part of the work within the change order and/or contain deductive costs, the back up shall show the original material and labor for the deleted work or costs. If the change order contains both adds and deducts for the same type of work then the material unit and labor unit costs shown on the back up for the deleted work and the added work shall be the same and the net difference shown. Deductive change orders shall show the proper reduction in OH&P and the bond. The Contractor shall also provide HUB utilization information on UNCG's Hub Utilization form. Failure by the Contractor to provide the information requested in this paragraph shall result in rejection of the change order by the designer and a request for re-submittal. Delay in the processing of the change order due to lack of proper submittal by the Contractor in accordance with this paragraph, or due to errors in the change order calculations shall not constitute grounds for a time extension or basis for a claim.

2. For all proposed change orders, the procedure will be for the designer to request proposals for the change order work in writing. The Contractor will provide such proposal and supporting data in suitable format and as required in General Condition Article 19 – Changes in the Work, paragraph "c", "d", and "e". The designer shall verify correctness and determine that the Contractor's proposed

costs are equitable. After receipt of the Contractor's proposal and if the proposal is correct and it is agreed to by the designer and UNCG that the cost is equitable then UNCG shall prepare a change order and forward it to the Contractor for his signature. If the change order proposal is incorrect, or the cost has not been agreed upon by the designer and UNCG then the designer shall notify the Contractor that the proposal is rejected and the proposal shall be re-submitted. If the proposal is rejected because the cost are deemed not to be equitable then the contracting parties shall negotiate and agree upon the equitable value of the change and the proposal shall be resubmitted with costs determined under General Condition Article 19 – Changes in the Work Paragraph "e".

3. Once proposed change orders have been reviewed and approved by the Contractor, Designer and UNCG, the change order shall be processed for signatures electronically through the State Construction Office (SCO) web-based Interscope program. Directions for using Interscope shall be provided at the Pre-construction Conference.

4. If for whatever reason Interscope cannot be used for processing change orders, change orders shall be processed in hard copy format in accordance with General Condition Article 19 – Changes in the Work. The change order shall contain a brief description of the work on the 1st page of the SCO form and again on the second sheet of the form under "DESCRIPTION OF CHANGE". On the second sheet there shall also be a brief description of the reason for the change along with a cause code listed. Each item totaled on the Contractor's summary sheet shall be separated in the back up documentation by a colored sheet of paper. After receipt of the change order executed by the Contractor, the designer shall, certify the change order by his signature and forward the change order and all supporting data to UNCG for signature. UNCG shall execute the change order and forward to the State Construction Office for final approval. The State Construction Office shall review and upon approval execute the change order and keep one copy. The remaining copies are sent to the designer for distribution to UNCG (two copies with original signatures) and to the Contractor (two copies). The Contractor shall forward a copy to his Surety. In the case of an emergency or extenuating circumstances, the approval of the changes may be obtained verbally by telephone or field order approved by all parties.

5. The Contractor shall also provide HUB utilization information on UNCG's Hub Utilization form.

6. Failure by the Contractor to provide the information requested in this paragraph shall result in rejection of the change order by the designer and a request for re-submittal. Delay in the processing of the change order due to lack of proper submittal by the Contractor in accordance with this paragraph or due to errors in the change order calculations shall not constitute grounds for a time extension or basis for a claim.

R. Time extensions due to Weather - A rain day is defined as any day that rain exceeds one tenth of one inch (0.1"). The Contractor may only be entitled to extension of the contract period for the number of rain days that exceed the normal number of rain days for any given month. For the purpose of determining extent of delay attributable to unusual weather, a determination shall be made by comparing the weather for the contract period with the preceding five (5) year climatic range average during the same time interval

based on statistics kept at UNCG's Marine, Earth and Atmospheric Sciences department located on UNCG's campus and on daily weather logs kept on the jobsite by the Contractor, reflecting the effect of the weather on progress of the work and initialed by the designer's representative. Time extensions for weather delays do not entitle the Contractor to "extended overhead" recovery and are in all other ways non-compensable.

Notwithstanding the immediately proceeding paragraph, not all rain days above the normal number of rain days will warrant a contract time extension. Justification for the request for rain related contract time extensions must also be based on the effect of the rain on critical path work activity in progress during the period of the request and additionally be predicated on the Contractor's diligent prosecution of the work. No additional rain days shall be granted for building projects after the building has been "dried-in" as determined by the designer. The contract time extension request must incorporate work logs kept at the jobsite by the project superintendent showing the effect of the weather on the progress of the critical path work and the critical path schedule, both initialed by the designer's project representative.

Requests for contract time extensions based on rain days must be received by the designer on or before the 20th day of the month immediately following the month in which the rain occurred. The request must include all required documentation. All parties to this contract agree that the Contractor has no right to claim a contract time extension if the request is not received by the designer in strict accordance with the procedure set forth in this paragraph.

For other types of weather delays, the Contractor is granted one (1) day of contract extension for each day UNCG is closed due to weather.

S. Final Inspection and Acceptance

1. In addition to all other contract inspection requirements, the following items shall be completed prior to scheduling a final inspection:
    a) Training of UNCG's Facilities Operations personnel shall be conducted with approved Operation and Maintenance Manuals (O&M's) provided at the training sessions.
    b) Deliver to UNCG one copy of all approved shop drawings (submittals) for the project.

T. Request for Payment – In addition to General Conditions Article 31 – Requests for Payments, Contractor payment applications shall have the following information clearly shown on the front page: UNCG project number, Code & Item, State Construction Office Project Identification Number. No payment may be made for stored materials that are not stored within the project limits or on property owned by the State of North Carolina. Exception may be considered for material stored in a third-party, bonded warehouse with all appropriate documentation provided to UNCG. Designer must verify that material is stored in a bonded warehouse and that the stored material is identified as UNCG property. No payment shall be certified/approved by the Designer and forwarded to UNCG for payment if not accompanied by the following:

1. A letter from the surety company consenting to the progress payment in the amount requested. The amount of the payment shall be shown on the letter.
2. A completed sales tax statement and form.

3. MBE Appendix “E” Form with accurate subcontract amounts and amounts paid.
4. UNCG project code, item number, project number and the State Construction Office ID number on the 1st sheet.
5. Pay applications without the information listed shown shall be considered incomplete and cannot be approved.
6. "Schedule of values" shall include payment line items for various commissioning activities.

No final payment shall be approved by the Designer and/or forwarded to UNCG if not accompanied by the following:

7. Certificate of Compliance signed by the Designer of Record.
8. Certificate of Completion signed by the Designer of Record.
9. Completed Tax Statement and Form.
10. Consent of Surety for Final Payment.
11. Contractor’s Affidavit of Payment of Debts and Claims.
12. Contractor’s Affidavit for Release of Liens.
13. Contractor’s General Guarantee.
14. Contractor’s statement of any special or extended warranties.
15. MBE Appendix “E” Form with accurate subcontract amounts and amounts paid.

* UNCG shall have 30 days from the time that correct and complete payment requests are received to pay the Contractor.

END OF SECTION

SECTION 01 10 00 – SUMMARY OF WORK

PART 1 - GENERAL

1.1 SUMMARY

A. The goal of the project is to replace the existing fire alarm system in the Coleman Building with a new Class "A" Addressable Fire Alarm System and New Mass Notification System.

B. All work is to be accomplished as stated in the Supplementary General Conditions. Liquidated damages shall be assessed as stated in the Supplementary General Conditions.

C. There are also two (2) additive scope alternates associated with the project, including FA-1 Owner Preferred Alternate for EST and FA-2 Owner Preferred Alternate for Space Age Fireray-5000 optical beam detectors. If accepted, it is intended to complete the work of these alternates during the same construction schedule.

D. The following is a general summary of work in tabulated form:
1. Existing fire alarm system shall remain active until new system is on-line.
2. Provide submittals for review and approval and procure all materials for project for construction.
3. Provide inventory of any existing damaged corridor or vestibule grid or ceiling prior to removal.
4. Complete new fire alarm installation.
5. Complete 100 percent contractor testing.
6. Complete 100 percent engineer/owner testing.
7. Complete testing with State Construction Office Inspections.
8. Demolish existing system, retaining pathways needed for reuse.

E. The noted summary is an outline of major work components. It does not include all testing, safety precautions and does not represent the schedule for which work is to be performed.

1.2 WORK COVERED BY CONTRACT DOCUMENTS

A. Project Identification: **UNC Greensboro Coleman Building Fire Alarm System Upgrades**
1. Code No: **41725**
2. Item No: **323**
3. SCO ID: **17-18200-01**
4. Project Location: **University of North Carolina at Greensboro, Greensboro, NC**

B. Owner: **University of North Carolina at Greensboro**

C. Owner's Representative:

1. **Nida DeBusk**

D. Engineer (Prime Designer): McKim & Creed, 1730 Varsity Drive, Suite 500, Raleigh, N.C. 27606

E. Project will be constructed under a single prime General Contractor contract. The contract shall be for General Construction, Electrical, Mechanical, Fire Protection, Hazardous Materials, etc.

F. The Work consists of the following: new addressable fire alarm/mass notification system; Demolition of the existing fire alarm system.

1.3 USE OF PREMISES

A. General: The building will remain occupied during construction. Contractor shall have limited use of premises for construction operations as indicated in the Drawings and Specifications.

B. Use of Site: Limit use of premises to areas within the Contract limits indicated. Do not disturb portions of Project site beyond areas in which the Work is indicated.

1. Owner Occupancy: The building will be occupied during construction. Contractor shall take all precautions and safe-guards to assure the well-being of the occupants at all times. The public will be permitted to access the building.

2. Driveways and Entrances: Keep driveways, streets, and entrances serving premises clear and available to Owner, Owner's employees, and emergency vehicles at all times. Do not use these areas for parking or storage of materials.

C. Access for Deliveries: Schedule deliveries to minimize use of driveways and entrances. Road and sidewalk blockages shall not be allowed. Access is available thru the South entrance for all deliveries. If necessary for larger truck traffic, provide warning signs, barricades, and detour information as needed to accommodate, adequately warn, and protect campus pedestrians, including the handicapped. If required, flagmen shall direct traffic around the construction or detour area. Schedule deliveries to minimize space and time requirements for storage of materials and equipment on-site. Coleman Building houses multiple departments. These functions shall remain operational during the Fire Alarm System Upgrades Project. Work associated with the Fire Alarm System Upgrades Project shall not impede the ongoing operations of the owner. In addition, all deliveries shall be clearly labeled “Coleman Building Fire Alarm System Upgrades Project”. Receipt of deliveries shall be coordinated through contractor’s staff at South entry of project site.

D. Street Maintenance: Streets and adjacent property sites shall be kept free from run-off, litter and/or debris in any form from the project site and any that should appear shall be removed immediately. All mud collected on vehicle tires shall be removed before leaving the construction area. Adjacent roadways must be cleaned daily, if required, to prevent mud or dust from coating existing roadways. Contractors are prohibited from discharging any waste products from concrete trucks, concrete coring work, or any other unsuitable materials, fluids, or other products on the site, streets, or into the storm sewer system. Should the contractor fail to comply with these requirements, the University reserves the right, with twenty-four (24) hours’ prior notice, to clean the offending area and deduct the cost from the Contractor’s next application for payment.

1. Parking: See Supplemental General Conditions.

2. Use of Existing Building: Maintain existing building in a weather tight condition throughout construction period. Repair damage caused by construction operations. Protect building and its occupants during construction period.

1.4 OWNER'S OCCUPANCY REQUIREMENTS

A. Owner Occupancy: Owner will occupy site and building. Cooperate with Owner during construction operations to minimize conflicts and facilitate Owner usage. Perform the Work so as not to interfere with Owner's day-to-day operations. Maintain existing exits, unless otherwise indicated.
   1. Maintain access to existing walkways, corridors, and other adjacent occupied or used facilities. Do not close or obstruct walkways, corridors, or other occupied or used facilities without written permission from Owner and authorities having jurisdiction.
   2. Provide not less than fourteen (14) days notice to Owner of activities that will affect Owner's operation.

1.5 SPECIFICATION FORMATS AND CONVENTIONS

A. Specification Content: The Specifications use certain conventions for the style of language and the intended meaning of certain terms, words, and phrases when used in particular situations. These conventions are as follows:

   1. Abbreviated Language: Language used in the Specifications and other Contract Documents is abbreviated. Words and meanings shall be interpreted as appropriate. Words implied, but not stated, shall be inferred as the sense requires. Singular words shall be interpreted as plural, and plural words shall be interpreted as singular where applicable as the context of the Contract Documents indicates.

   2. Imperative mood and streamlined language are generally used in the Specifications. Requirements expressed in the imperative mood are to be performed by Contractor. Occasionally, the indicative or subjunctive mood may be used in the Section Text for clarity to describe responsibilities that must be fulfilled indirectly by Contractor or by others when so noted.

      a. The words "shall," "shall be," or "shall comply with," depending on the context, are implied where a colon (:) is used within a sentence or phrase.

1.6 WORK RESTRICTIONS/REQUIREMENTS

A. On-Site Work Hours Restrictions shall be closely coordinated with Owner. The facility is home to the athletics program among others. Schedules shall be coordinated with all activities in the building.
   1. Weekend Hours: None unless specifically coordinated due to scheduled events.
   2. Early Morning Hours: None unless specifically coordinated due to scheduled events.
   3. Hours for Utility Shutdowns: As agreed upon by owner.
   4. Prohibited Working Hours: Construction activities are not allowed on the dates of Reading Day (April 30, 2020) through Graduation (May 8, 2020).

1.7 MISCELLANEOUS PROVISIONS

A. Fire Arms: No fire arms, concealed or otherwise, are permitted on campus.

B. Drug Free Workplace Requirement: The University is a drug-free work place. No drugs or alcohol are permitted on campus and employees on the work site under the influence of such substances shall be deemed sufficient cause for the University to permanently remove that individual from the project and University property. Such action shall not constitute grounds for a delay claim.

C. Blasting: Blasting on University property is prohibited.

D. Construction Site Fencing: A construction fence shall be installed around the perimeter of the project limits. The fence shall be constructed of heavy-duty chain link material, have a minimum height of six feet and shall have a continuous top tubular rail. Swing gates shall be included at every access to the enclosed area. The fence shall have an integral visual barrier or shading type material applied and maintained for the duration of the project. Gates will be interlocked with padlocks for which the University retains keys in order to allow access in case of an emergency. When the project is complete, fencing must be removed and ground contours restored to original condition or adjusted to coordinate with new construction. Upon project completion, grass must be mowed to a height to match adjacent grass height and damage to asphalt or striping within the site must be repaired.

E. Tree and landscape protection: All areas within tree and landscape protection areas as shown in the plans and specifications are off limits to vehicular traffic, material storage, soil stockpiles, pedestrian access, pathways, parking, etc. and shall be inviolate.

F. Site Maintenance: Contractor is responsible for maintaining a clean, organized, safe job site, free of accumulated construction debris and trash. To that end, Contractor shall be responsible for cleaning their work areas weekly at a minimum and the proper disposal of construction debris and trash. Debris shall be secured in trucks so that material cannot fall or be blown from trucks during transportation. Grass must be mowed or trimmed to keep height below 6" maximum length both within and within 24" of the construction limits. Demolition debris is not to remain on the project site. Contractors or subcontractors must provide their own dumpsters and provide for periodic dumping for demolition debris. Storm water runoff cannot adversely affect adjacent areas for the life of the project. Contractor must comply with the "Sedimentation Pollution Control Act of 1973" and ensure that erosion control measures are maintained for the duration of the project, until final ground cover is established.

G. Materials/Equipment Storage: Storage of construction materials and equipment shall be limited to the project staging area unless otherwise agreed to, in writing, in advance. Should the Contractor fail to remove any material or equipment stored outside the staging area within twenty-four (24) hours of notification from the University, the University shall have the right to remove and dispose of such materials from the campus and deduct the cost of such removal and disposition from the Contractor's next application for payment.

H. Security: The University will only provide security it deems prudent and necessary for its own protection. The Contractor shall be responsible for the security and safety of the project within the project limits. The University must approve any security service instituted by the contractor.

I. Emergency Contacts: The contractor shall furnish the University with names, telephone numbers (day and night), and pager numbers of the project manager and superintendent prior to beginning work and maintain current information for the project duration. In the event of an emergency identified by the Contractor, the designated University representative will be contacted – Tim Rouse.

J. Hot Work: When the Contractor is performing work that produces heat, flame, or sparks on or in an existing building or other structure, the Contractor is required to obtain a "hot work" permit from EHS.

K. Protection of the Work: The Contractor shall protect all work in place. All materials, equipment, furnishings and finishes that are required to be new shall be in "new condition" at the time of final acceptance. Those that are deemed as not in "new condition" at the discretion of the Designer or Owner shall be removed and replaced at no additional cost to the Owner. In addition, where the project involves existing materials remaining in place, the Contractor must ensure these materials are adequately protected throughout the construction period. If damage occurs, Contractor shall repair damage to original condition to the Owner's satisfaction or replace damaged materials. Contractor shall not track dust or dirt into any occupied portions of buildings.

L. Contractor's Employees – Respectful Behavior: All construction personnel shall be respectful of all members of the University community. Any incidents of disrespect, verbal abuse, threatening statements, unwelcome comments, unwelcome interaction or any form of harassment from any construction personnel toward any member of the University community is strictly prohibited. Any such act shall be deemed sufficient cause for the University to permanently remove any individual from the project and University property. Such action shall not constitute grounds for a delay claim.

M. Contractor's Employees – Responsive Behavior: All construction personnel shall be responsive to requests to take action on any requirements of the contract documents and/or to correct any endangerment to the health and safety of the public. Any individual employee who ignores or refuses to take immediate action shall be identified as generating sufficient cause for the University to permanently remove them from the project and University property. Such action shall not constitute grounds for a delay claim.

N. Utilities:

1. Provisions for Utilities:
    a. Utilities provided by Owner for Contractor's project use:
    Telephone exchange for FACP. Ethernet access for FACP. Connection to Campus Police for FACP monitor and alarm. Owner will maintain utility energy cost in building during the contract period.
    b. Utilities to be obtained and paid for directly by the Contractor:
    Although the Contractor is not asked to pay for building utilities, the existing utilities shall remain operational during the construction period. Contractor will be required to responsibly maintain temperature set points of HVAC systems in rooms and suites, keep doors and windows closed to outdoors, etc.

2. Existing Utility Scheduled Interruptions: Do not interrupt utilities serving facilities occupied by Owner or others unless permitted under the following conditions and then only after arranging to provide temporary utility services according to requirements indicated:

a. Notify Engineer and Owner not less than seven (7) days in advance of proposed utility interruptions.
b. Do not proceed with utility interruptions without Owner's written permission.

3. Utility Location/Interruptions: Each contractor doing excavation work is responsible for locating all existing underground utilities prior to commencing excavation. The Contractor shall be responsible for the associated cost of any utility interruption and repair due to his excavation if utility location was not requested, location procedures performed and followed prior to commencing excavation. The Contractor shall immediately notify the University and restore the service of any utility disrupted due to excavation or any contractor action whatever the circumstance. The University reserves the right to immediately restore the service of any utility disrupted due to actions of the contractor and deduct the cost of such restoration from the contractor's contract.

O. Signage: Job site trailer may display Contractor's logo sign. Job site signage shall be as agreed upon with owner.

P. Liquidated Damages: See Supplementary General Conditions.

Q. Payments:

1. No payment will be made for stored materials which are stored off-site. Payment Requests shall use Form AIA G702, fully completed and executed, submitted in six duplicate copies, including attachment of waivers, statement of purchased property and associated sales tax similar documentation with one copy. The Contractor shall allow 10 working days for the Engineer's review and approval of cost estimates and ten days for the Owner's review, approval and payment.

2. Executed contract documents, insurance certifications and, upon completion and acceptance of the work, invoices and other information requested are to be sent to:

   Nida DeBusk - Construction Project Manager
   Facilities Design and Construction
   UNC Greensboro
   105 Gray Drive
   Greensboro, NC 27412
   Ph: (336) 334-5323 Fax: (336) 334-3212

R. Sales Tax Reporting

1. With each Application for Payment submitted, Contractors must provide a statement of materials purchased for and/or used in the University project. Included shall be the purchase date, type of property, University project name, North Carolina County of purchase, cost of property and county sales and use tax paid. Forms shall include the period of time covered and shall be signed and dated. You may use the form entitled "UNCG Contractor Statement of Property Purchased", or a comparable one, so long as all information listed above is provided. This form is available for download from the "Resources" section of the FDC website.
2. Only those building materials, supplies, fixtures and equipment which actually become part of the building or structure are to be included on this form. The statement must also include the cost of any tangible personal property withdrawn from the Contractor's warehouse stock and the amount of county sales or use tax paid thereon by the Contractor. Similar statements by subcontractors must be obtained by the General

Contractor and furnished to the University. In the event that several purchases are made from the same vendor, the certified statement must indicate invoice numbers. This statement of property and county tax paid is required by General Statute 105-164.14 (e).

3. The statement SHALL NOT INCLUDE tax paid on supplies, tools and equipment used to perform contracts.
4. If no taxable materials have been used during the period, submit a form stating "No Taxable Materials This Period". Give all other information regarding project name and period covered and sign and date the form.

S. No Smoking Policy

1. Smoking is prohibited inside, and within twenty-five (25) feet of any building.

T. CONSTRUCTION WASTE REDUCTION

1. The contractor will employ processes that reduce waste generation to the greatest extent possible due to errors, poor planning, breakage, mishandling, contamination, or other factors. Of the non-hazardous construction waste that is generated, a minimum of 75% by weight should be reused, salvaged, or recycled. Waste disposal in landfills should be minimized. Document the disposal/disposition of waste materials and provide to the Owner, prior to or with each application for payment, waste, salvaged and recycled material manifest(s).

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION

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SECTION 01 21 00 - ALLOWANCES

PART 1 - GENERAL

1.1 WORK INCLUDED

A. The Contractor shall include in the base Contract Sum the following allowances. Unless otherwise indicated, the allowance shall include all costs for labor, material, taxes, overhead, profit, fees and associated costs. The Contract sum shall be adjusted when the actual cost of work is determined by Change Order issued by the Architect/Engineer in accordance with the Supplementary General Conditions. Unit Prices, indicated on the Form of Proposal, shall be used as a basis to calculate adjustments to the contract amount. The unused portion of all allowances shall be credited to the Owner at the completion of the work.

B. Refer to Section 01 22 00 “Unit Prices” for descriptions of unit prices referenced in this section.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 SCHEDULE OF ALLOWANCES

A. Allowances:

1. Allowance No. 1**:** Replacement of existing ceiling tile: 20,000 SF (square feet)

2. Allowance No. 2**:** Repair of existing fire rated penetrations in fire rated assemblies: 50 SF (square feet)

3. Allowance No. 3: Additional devices and associated work based on the following quantities of Unit Price No. 3 as noted in Section 01 22 00: Five (5)

4. Allowance No. 4: Additional devices and associated work based on the following quantities of Unit Price No. 4 as noted in Section 01 22 00: Five (5)

5. Allowance No. 5: Additional devices and associated work based on the following quantities of Unit Price No. 5 as noted in Section 01 22 00: Two (2)

6. Allowance No. 6: Additional devices and associated work based on the following quantities of Unit Price No. 6 as noted in Section 01 22 00: Two (2)

7. Allowance No. 7: Additional devices and associated work based on the following quantities of Unit Price No. 7 as noted in Section 01 22 00: Five (5)

8. Allowance No. 8: Additional work based on the following quantities of Unit Price No. 8 as noted in Section 01 22 00: Estimated not to exceed 50 locations.

9. Allowance No. 9: Additional devices and associated work based on the following quantities of Unit Price No. 9 as noted in Section 01 22 00: Estimated not to exceed 25 square feet at 2 locations.

10. Allowance No. 10: Additional devices and associated work based on the following quantities of Unit Price No. 10 as noted in Section 01 22 00: Estimated not to exceed 50 square feet at one location.

11. Allowance No. 11: Additional devices and associated work based on the following quantities of Unit Price No. 11 as noted in Section 01 22 00: Estimated not to exceed 20 linear feet at 10 locations.

12. Allowance No. 12: Additional devices and associated work based on the following quantities of Unit Price No. 12 as noted in Section 01 22 00: Estimated not to exceed 20 square feet at 5 locations.

13. Allowance No. 13: Additional devices and associated work based on the following quantities of Unit Price No. 13 as noted in Section 01 22 00: Estimated not to exceed 30 square feet of disturbance/removal at 3 locations (disturbance includes drilling/fastening into, spot removal, etc.).

14. Allowance No. 14: Additional devices and associated work based on the following quantities of Unit Price No. 14 as noted in Section 01 22 00: Estimated not to exceed 30 square feet of disturbance/removal at 30 locations (disturbance includes drilling/fastening into, spot removal, etc.).

15. Allowance No. 15: Additional equipment and associated work based on the following quantities of Unit Price No. 15 as noted in Section 01 22 00: Twenty (20)

END OF SECTION

SECTION 01 22 00 - UNIT PRICES

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes administrative and procedural requirements for unit prices.

B. See Division 1 Section "Allowances" for procedures for using unit prices to adjust quantity allowances.

1.2 DEFINITIONS

A. Unit price is an amount proposed by bidders, stated on the Bid Form, as a price per unit of measurement for materials or services added to or deducted from the Contract Sum by appropriate modification, if estimated quantities of Work required by the Contract Documents are increased or decreased.

1.3 PROCEDURES

A. Unit prices include all necessary material, plus cost for delivery, installation, insurance, applicable taxes, overhead, and profit.

B. Measurement and Payment: Refer to individual Specification Sections for work that requires establishment of unit prices. Methods of measurement and payment for unit prices are specified in those Sections.

C. Owner reserves the right to reject Contractor's measurement of work-in-place that involves use of established unit prices and to have this work measured, at Owner's expense, by an independent surveyor acceptable to Contractor.

D. List of Unit Prices: A list of unit prices is included in Part 3. Specification Sections referenced in the schedule contain requirements for materials described under each unit price.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 LIST OF UNIT PRICES

No. 1 Provide a price per square foot of replacement of existing ceiling tile necessary for tiles with existing devices being removed, tiles damaged during construction, etc. New tile shall match current finishes in the building. Refer to Section 01 21 00 “Allowances” for estimated quantities.

No. 2 Provide a price per square foot to repair existing penetrations in fire rated assemblies (shall include floors and walls). Repairs shall be provided in accordance with UL details and the requirements of the specifications. Refer to Section 01 21 00 "Allowances" for estimated quantities.

No. 3 Provide a price for the addition of an initiation device (ceiling mounted photoelectric smoke, ionization smoke, or heat detector) including base, boxes and accessories, and 30' of SLC in painted EMT conduit per unit. Refer to Section 01 21 00 "Allowances" for estimated quantities.

No. 4 Provide a price for the addition of notification device (ceiling or wall mounted strobe or combination horn /strobe) including boxes and accessories, and 30' of wiring in painted EMT conduit per unit. Refer to Section 01 21 00 "Allowances" for estimated quantities.

No. 5 Provide a price for the addition of a manual pull station including boxes and accessories, and 30' of SLC in painted EMT conduit per unit. Refer to Section 01 21 00 "Allowances" for estimated quantities.

No. 6 Provide a price for the addition of duct detector and RAIL including boxes and accessories, and 30' of wiring (SLC, etc.) in painted EMT conduit per unit. Refer to Section 01 21 00 "Allowances" for estimated quantities.

No. 7 Provide a price for the addition of fire alarm relay, monitor or control device (ceiling or wall mounted) including boxes and accessories, and 30' of wiring (SLC, etc.) in painted EMT conduit per unit. Refer to Section 01 21 00 "Allowances" for estimated quantities.

No. 8 Provide a price per location (various locations throughout Coleman Building – exact locations for disturbance to be verified in the field during renovations) of hazardous floor tile/mastic/carpet mastic spot removal. Refer to Section 01 21 00 "Allowances" for estimated quantities.

No. 9 Provide a price per location (potentially present in Rooms 163 and 163E) removal of hazardous ceiling tile (1'x1' two different size holes random spacing). Refer to Section 01 21 00 "Allowances" for estimated quantities.

No. 10 Provide a price per location (potentially present in Room 300D) of hazardous cement wall board panel removal. Refer to Section 01 21 00 "Allowances" for estimated quantities.

No. 11 Provide a price per location (potentially present in various locations in the building, disturbance is not expected) of hazardous pipe/fitting insulation removal. Refer to Section 01 21 00 "Allowances" for estimated quantities.

No. 12 Provide a price per location (potentially present on metal HVAC ducts throughout building, disturbance is not expected) of hazardous duct sealant removal. Refer to Section 01 21 00 "Allowances" for estimated quantities.

No. 13 Provide a price per location (potentially present in Rooms 201, 300D, and 304D (may be part of the roof system), disturbance is not expected) of hazardous roof/ceiling board removal/disturbance. Refer to Section 01 21 00 "Allowances" for estimated quantities.

No. 14 Provide a price per location (various locations throughout Coleman Building, disturbance is not expected) of hazardous baseboard/mastic removal/disturbance. Refer to Section 01 21 00 "Allowances" for estimated quantities.

No. 15 Provide a price for the addition of a 24" x 24" ceiling access panel and installation in hard ceiling location(s) required as part of the construction required to provide sufficient access to electrical boxes and fire alarm devices. Refer to Section 01 21 00 "Allowances" for estimated quantities.

END OF SECTION

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SECTION 01 23 00 - ALTERNATES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division-1 specification sections, apply to work of this section.

1.2 SUMMARY

This section specifies administrative and procedural requirements for Alternates.

A. GENERAL NOTE: The drawings generally indicate the work which will be included if the alternate bids are accepted. These portions of the work described in the alternates will not be included in the base bid.

B. Definition: An Alternate is an amount proposed by Bidders and stated on the Bid form for certain construction activities defined in the Bidding Requirements that may be added to the Base bid amount if the Owner decides to accept a corresponding change in either the amount of construction to be completed, or in the products, materials, equipment, systems or installation methods described in Contract Documents.

C. Coordination: Coordinate related Work and modify or adjust adjacent work as necessary to ensure that Work affected by each accepted alternate is complete and fully integrated into the project.

D. Notification: Immediately following the award of the Contract, prepare and distribute to each party involved notification of the status of each alternate. Indicate whether alternates have been accepted, rejected, modified or deferred for consideration at a later date. Include a complete description of negotiated modifications to alternates and other contract documents. Record this information on the project set of drawings in the job site construction trailer.

E. Schedule: A "Schedule of Alternates" is included at the end of this Section. Specification Sections referenced in the Schedule contain requirements for materials and methods necessary to achieve the Work described under each alternate.

    a. Include as part of each Alternate, miscellaneous devices, accessory objects and similar items incidental to or required for a complete installation whether or not mentioned as part of the alternate.

PART 2 - PRODUCTS

(Not Applicable)

PART 3 - EXECUTION

SCHEDULE OF ALTERNATES

Alternate No. FA-1: EST Preferred Brand Alternate for fire alarm/mass notification system.

Alternate No. FA-2: Space Age Electronics Fireray 5000 Preferred Brand Alternate for fire alarm photo beam detectors and accessories.

END OF SECTION

SECTION 01 26 00 – CONTRACT MODIFICATION PROCEDURES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division-1 specification sections, apply to work of this section.

1.2 SUMMARY

Not Used.

1.3 PROPOSAL REQUESTS

A. Owner-Initiated Proposal Requests: Architect will issue a detailed description of proposed changes in the Work that may require adjustment to the Contract Sum or the Contract Time. If necessary, the description will include supplemental or revised Drawings and Specifications.
   1. Work Change Proposal Requests issued by Architect are not instructions either to stop work in progress or to execute the proposed change.
      a. After the construction contract has been awarded, the Contractor will submit a list of Raw Labor Rates that will be used to calculate Change Orders. The Raw Labor Rates will be reviewed by the Designer and UNCG, and should reasonably match the current prevailing rates in this area for each trade involved on this project.
   2. Within seven days, when not otherwise specified, after receipt of Proposal Request, submit a quotation estimating cost adjustments to the Contract Sum and the Contract Time necessary to execute the change.
      a. Include a list of quantities of products required or eliminated and unit costs, with total amount of purchases and credits to be made. If requested, furnish survey data to substantiate quantities.
      b. Indicate applicable taxes, delivery charges, equipment rental, and amounts of trade discounts.
      c. Include costs of labor and supervision directly attributable to the change. Submit raw labor rates (prior to burden, overhead, profit, etc.) for levels of self-performed work by major subcontractors prior to submission of the first change proposal. Use these rates for the duration of the project.
      d. Include an updated Contractor's construction schedule that indicates the effect of the change, including, but not limited to, changes in activity duration, start and finish times, and activity relationship. Use available total float before requesting an extension of the Contract Time.
      e. Quotation Form: Use forms included at the end of this Section.
B. Contractor-Initiated Work Change Proposals: If latent or changed conditions require modifications to the Contract, Contractor may initiate a claim by submitting a request for a change to Architect.
   1. Include a statement outlining reasons for the change and the effect of the change on the Work. Provide a complete description of the proposed change. Indicate the effect of the proposed change on the Contract Sum and the Contract Time.
      a. After the construction contract has been awarded, the Contractor will submit a list of Raw Labor Rates that will be used to calculate Change Orders. The Raw Labor Rates will be reviewed by the Designer, and UNCG and should reasonably match the current prevailing rates in this area for each trade involved on this project. Use form included at the end of this Section.

2. Include a list of quantities of products required or eliminated and unit costs, with total amount of purchases and credits to be made. If requested, furnish survey data to substantiate quantities.
3. Indicate applicable taxes, delivery charges, equipment rental, and amounts of trade discounts.
4. Include costs of labor and supervision directly attributable to the change.
5. Include an updated Contractor's construction schedule that indicates the effect of the change, including, but not limited to, changes in activity duration, start and finish times, and activity relationship. Use available total float before requesting an extension of the Contract Time.
6. Work Change Proposal Request Form: Use forms included at the end of this Section.

END

PART 2 - PRODUCTS

Not Applicable.

PART 3 - EXECUTION

Not Used.

END OF SECTION

SECTION 01 33 00 - SUBMITTAL PROCEDURES

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes administrative and procedural requirements for submitting Shop Drawings, Product Data, Samples, and other submittals.

B. See Division 1 Section "Closeout Procedures" for submitting warranties.

1.2 DEFINITIONS

A. Action Submittals: Written and graphic information that requires Engineer's responsive action.

B. Informational Submittals: Written information that does not require Engineer's responsive action. Submittals may be rejected for not complying with requirements.

1.3 SUBMITTAL PROCEDURES

A. Coordination: Coordinate preparation and processing of submittals with performance of construction activities.

1. Coordinate each submittal with fabrication, purchasing, testing, delivery, other submittals, and related activities that require sequential activity.
2. Coordinate transmittal of different types of submittals for related parts of the Work so processing will not be delayed because of need to review submittals concurrently for coordination.

    a. Engineer reserves the right to withhold action on a submittal requiring coordination with other submittals until related submittals are received.

B. Submittals Schedule: Comply with requirements in Division 1 Section "Construction Progress Documentation" for list of submittals and time requirements for scheduled performance of related construction activities.

C. Processing Time: Allow enough time for submittal review, including time for resubmittals, as follows. Time for review shall commence on Engineer's receipt of submittal. No extension of the Contract Time will be authorized because of failure to transmit submittals enough in advance of the Work to permit processing, including resubmittals.

1. Initial Review: Allow 20 days for initial review of each submittal. Allow additional time if coordination with subsequent submittals is required. Engineer will advise Contractor when a submittal being processed must be delayed for coordination.
2. Intermediate Review: If intermediate submittal is necessary, process it in same manner as initial submittal.
3. Resubmittal Review: Allow 14 days for review of each resubmittal.

D. Identification: Place a permanent label or title block on each submittal for identification.

1. Indicate name of firm or entity that prepared each submittal on label or title block.
2. Provide a space approximately 6 by 8 inches on label or beside title block to record Contractor's review and approval markings and action taken by Engineer.
3. Include the following information on label for processing and recording action taken:

    a. Project name.
    b. Date.
    c. Name and address of Engineer.
    d. Name and address of Contractor.
    e. Name and address of subcontractor.
    f. Name and address of supplier.
    g. Name of manufacturer.
    h. Submittal number or other unique identifier, including revision identifier.
    i. Number and title of appropriate Specification Section.
    j. Drawing number and detail references, as appropriate.
    k. Other necessary identification.

E. Deviations: Highlight, encircle, or otherwise specifically identify deviations from the Contract Documents on submittals.

F. Additional Copies: Unless additional copies are required for final submittal, and unless Engineer observes noncompliance with provisions in the Contract Documents, initial submittal may serve as final submittal.

1. Additional copies submitted for maintenance manuals will be marked with action taken and will be returned.

G. Transmittal: Package each submittal individually and appropriately for transmittal and handling. Transmit each submittal using a transmittal form. Engineer will discard submittals received from sources other than Contractor.

H. Resubmittals: Make resubmittals in same form and number of copies as initial submittal.

1. Note date and content of previous submittal.
2. Note date and content of revision in label or title block and clearly indicate extent of revision.
3. Resubmit submittals until they are marked "No Exception Taken**"** by Engineer.

I. Distribution: Furnish copies of final submittals to manufacturers, subcontractors, suppliers, fabricators, installers, authorities having jurisdiction, and others as necessary for performance of construction activities. Show distribution on transmittal forms.

J. Use for Construction: Use only final submittals with mark indicating "No Exception Taken**"** by Engineer.

PART 2 - PRODUCTS

2.1 ACTION SUBMITTALS

A. General: Prepare and submit Action Submittals required by individual Specification Sections.

B. Product Data: Collect information into a single submittal for each element of construction and type of product or equipment.

1. If information must be specially prepared for submittal because standard printed data are not suitable for use, submit as Shop Drawings, not as Product Data.
2. Mark each copy of each submittal to show which products and options are applicable.
3. Include the following information, as applicable:

    a. Manufacturer's written recommendations.
    b. Manufacturer's product specifications.
    c. Manufacturer's installation instructions.
    d. Manufacturer's catalog cuts.
    e. Wiring diagrams showing factory-installed wiring.
    f. Printed performance curves.
    g. Operational range diagrams.
    h. Compliance with specified referenced standards.
    i. Testing by recognized testing agency.

C. Shop Drawings: Prepare Project-specific information, drawn accurately to scale. Do not base Shop Drawings on reproductions of the Contract Documents or standard printed data.

1. Preparation: Fully illustrate requirements in the Contract Documents. Include the following information, as applicable:

    a. Dimensions.
    b. Identification of products.
    c. Fabrication and installation drawings.
    d. Roughing-in and setting diagrams.
    e. Wiring diagrams showing field-installed wiring, including power, signal, and control wiring.
    f. Shopwork manufacturing instructions.
    g. Templates and patterns.
    h. Schedules.
    i. Notation of coordination requirements.
    j. Notation of dimensions established by field measurement.
    k. Seal and signature of professional engineer if specified.
    l. Wiring Diagrams: Differentiate between manufacturer-installed and field-installed wiring.

2. Sheet Size: Except for templates, patterns, and similar full-size drawings, submit Shop Drawings on sheets at least 8-1/2 by 11 inches but no larger than 30 by 40 inches.
3. Number of Copies: Submit four opaque (bond) copies of each submittal. Engineer will return three copies. Electronic submittals are acceptable and preferred.

D. Product Schedule or List: As required in individual Specification Sections, prepare a written summary indicating types of products required for the Work and their intended location.

E. Application for Payment: Comply with requirements per general conditions of the contract.

F. Schedule of Values: Comply with requirements per general conditions of the contract

G. Subcontract List: Prepare a written summary identifying individuals or firms proposed for each portion of the Work, including those who are to furnish products or equipment fabricated to a special design.

2.2 INFORMATIONAL SUBMITTALS

A. General: Prepare and submit Informational Submittals required by other Specification Sections.

1. Number of Copies: Submit four copies of each submittal, unless otherwise indicated. Engineer will not return copies. Electronic submittals are acceptable and preferred.
2. Certificates and Certifications: Provide a notarized statement that includes signature of entity responsible for preparing certification. Certificates and certifications shall be signed by an officer or other individual authorized to sign documents on behalf of that entity.

B. Contractor's Construction Schedule: Comply with requirements per general conditions of the contract.

C. Qualification Data: Prepare written information that demonstrates capabilities and experience of firm or person. Include lists of completed projects with project names and addresses, names and addresses of Engineers and owners, and other information specified.

D. Welding Certificates: Prepare written certification that welding procedures and personnel comply with requirements in the Contract Documents. Submit record of Welding Procedure Specification (WPS) and Procedure Qualification Record (PQR) on AWS forms. Include names of firms and personnel certified.

E. Installer Certificates: Prepare written statements on manufacturer's letterhead certifying that Installer complies with requirements in the Contract Documents and, where required, is authorized by manufacturer for this specific Project.

F. Manufacturer Certificates: Prepare written statements on manufacturer's letterhead certifying that manufacturer complies with requirements in the Contract Documents. Include evidence of manufacturing experience where required.

G. Product Certificates: Prepare written statements on manufacturer's letterhead certifying that product complies with requirements in the Contract Documents.

H. Material Certificates: Prepare written statements on manufacturer's letterhead certifying that material complies with requirements in the Contract Documents.

I. Material Test Reports: Prepare reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting test results of material for compliance with requirements in the Contract Documents.

J. Research/Evaluation Reports: Prepare written evidence, from a model code organization acceptable to authorities having jurisdiction, that product complies with building code in effect for Project.

K. Preconstruction Test Reports: Prepare reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting results of tests performed before installation of product, for compliance with performance requirements in the Contract Documents.

L. Compatibility Test Reports: Prepare reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting results of compatibility tests performed before installation of product. Include written recommendations for primers and substrate preparation needed for adhesion.

M. Field Test Reports: Prepare reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting results of field tests performed either during installation of product or after product is installed in its final location, for compliance with requirements in the Contract Documents.

N. Maintenance Data: Prepare written and graphic instructions and procedures for operation and normal maintenance of products and equipment. Comply with requirements specified in separate divisions.

O. Design Data: Prepare written and graphic information, including, but not limited to, performance and design criteria, list of applicable codes and regulations, and calculations. Include list of assumptions and other performance and design criteria and a summary of loads. Include load diagrams if applicable. Provide name and version of software, if any, used for calculations. Include page numbers.

P. Manufacturer's Instructions: Prepare written or published information that documents manufacturer's recommendations, guidelines, and procedures for installing or operating a product or equipment. Include name of product and name, address, and telephone number of manufacturer.

Q. Manufacturer's Field Reports: Prepare written information documenting factory-authorized service representative's tests and inspections. Include the following, as applicable:

R. Insurance Certificates and Bonds: Prepare written information indicating current status of insurance or bonding coverage. Include name of entity covered by insurance or bond, limits of coverage, amounts of deductibles, if any, and term of the coverage.

PART 3 - EXECUTION

3.1 CONTRACTOR'S REVIEW

A. Review each submittal and check for coordination with other Work of the Contract and for compliance with the Contract Documents. Note corrections and field dimensions. Mark with approval stamp before submitting to Engineer.

B. Approval Stamp: Stamp each submittal with a uniform, approval stamp. Include Project name and location, submittal number, Specification Section title and number, name of reviewer, date of Contractor's approval, and statement certifying that submittal has been reviewed, checked, and approved for compliance with the Contract Documents.

3.2 ENGINEER'S ACTION

A. General: Engineer will not review submittals that do not bear Contractor's approval stamp and will return them without action.

B. Action Submittals: Engineer will review each submittal, make marks to indicate corrections or modifications required, and return it. Engineer will stamp each submittal with an action stamp and will mark stamp appropriately to indicate action taken.

C. Informational Submittals: Engineer will review each submittal and will not return it, or will return it if it does not comply with requirements. Engineer will forward each submittal to appropriate party.

D. Submittals not required by the Contract Documents may not be reviewed and may be discarded.

END OF SECTION

SECTION 01 60 00 - PRODUCT REQUIREMENTS

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes administrative and procedural requirements for selection of products for use in Project; product delivery, storage, and handling; manufacturers' standard warranties on products; special warranties; product substitutions; and comparable products.

B. See Division 1 Section "Closeout Procedures" for submitting warranties for Contract closeout.

C. See Divisions 2 through 26 Sections for specific requirements for warranties on products and installations specified to be warranted.

1.2 DEFINITIONS

A. Products: Items purchased for incorporating into the Work, whether purchased for Project or taken from previously purchased stock. The term "product" includes the terms "material," "equipment," "system," and terms of similar intent.

1. Named Products: Items identified by manufacturer's product name, including make or model number or other designation shown or listed in manufacturer's published product literature that is current as of date of the Contract Documents.
2. New Products: Items that have not previously been incorporated into another project or facility. Products salvaged or recycled from other projects are not considered new products.
3. Comparable Product: Product that is demonstrated and approved through submittal process, or where indicated as a product substitution, to have the indicated qualities related to type, function, dimension, in-service performance, physical properties, appearance, and other characteristics that equal or exceed those of specified product.

B. Substitutions: Changes in products, materials, equipment, and methods of construction from those required by the Contract Documents and proposed by Contractor.

C. Basis-of-Design Product Specification: Where a specific manufacturer's product is named and accompanied by the words "basis of design," including make or model number or other designation, to establish the significant qualities related to type, function, dimension, in-service performance, physical properties, appearance, and other characteristics for purposes of evaluating comparable products of other named manufacturers.

1.3 SUBMITTALS

A. See Instructions to Bidders, Section 12 and Article 5 and 8 of General Conditions and Supplemental General Conditions.

B. Substitution Requests: Submit three copies of each request for consideration. Identify product or fabrication or installation method to be replaced. Include Specification Section number and title and Drawing numbers and titles.

1. Substitution Request Form: Use CSI Form 13.1A.
2. Documentation: Show compliance with requirements for substitutions and the following, as applicable:

    a. Statement indicating why specified material or product cannot be provided.
    b. Coordination information, including a list of changes or modifications needed to other parts of the Work and to construction performed by Owner and separate contractors that will be necessary to accommodate proposed substitution.
    c. Detailed comparison of significant qualities of proposed substitution with those of the Work specified. Significant qualities may include attributes such as performance, weight, size, durability, visual effect, and specific features and requirements indicated.
    d. Product Data, including drawings and descriptions of products and fabrication and installation procedures.
    e. Samples, where applicable or requested.
    f. List of similar installations for completed projects with project names and addresses and names and addresses of Engineers and owners.
    g. Material test reports from a qualified testing agency indicating and interpreting test results for compliance with requirements indicated.
    h. Research/evaluation reports evidencing compliance with building code in effect for Project, from a model code organization acceptable to authorities having jurisdiction.
    i. Detailed comparison of Contractor's Construction Schedule using proposed substitution with products specified for the Work, including effect on the overall Contract Time. If specified product or method of construction cannot be provided within the Contract Time, include letter from manufacturer, on manufacturer's letterhead, stating lack of availability or delays in delivery.
    j. Cost information, including a proposal of change, if any, in the Contract Sum.
    k. Contractor's certification that proposed substitution complies with requirements in the Contract Documents and is appropriate for applications indicated.
    l. Contractor's waiver of rights to additional payment or time that may subsequently become necessary because of failure of proposed substitution to produce indicated results.

3. Engineer's Action: If necessary, Engineer will request additional information or documentation for evaluation within 7 days of receipt of a request for substitution. Engineer will notify Contractor of acceptance or rejection of proposed substitution within 15 days of receipt of request, or 7 days of receipt of additional information or documentation, whichever is later.

    a. Form of Acceptance: Change Order.
    b. Use product specified if Engineer cannot make a decision on use of a proposed substitution within time allocated.

C. Comparable Product Requests: Submit three copies of each request for consideration. Identify product or fabrication or installation method to be replaced. Include Specification Section number and title and Drawing numbers and titles.

1. Engineer's Action: If necessary, Engineer will request additional information or documentation for evaluation within one week of receipt of a comparable product request. Engineer will notify Contractor of approval or rejection of proposed comparable product request within 15 days of receipt of request, or 7 days of receipt of additional information or documentation, whichever is later.

    a. Form of Approval: As specified in Division 1 Section "Submittal Procedures."
    b. Use product specified if Engineer cannot make a decision on use of a comparable product request within time allocated.

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

1.4 QUALITY ASSURANCE

A. Compatibility of Options: If Contractor is given option of selecting between two or more products for use on Project, product selected shall be compatible with products previously selected, even if previously selected products were also options.

1.5 PRODUCT DELIVERY, STORAGE, AND HANDLING

A. Deliver, store, and handle products using means and methods that will prevent damage, deterioration, and loss, including theft. Comply with manufacturer's written instructions.

B. Delivery and Handling:

1. Schedule delivery to minimize long-term storage at Project site and to prevent overcrowding of construction spaces.
2. Coordinate delivery with installation time to ensure minimum holding time for items that are flammable, hazardous, easily damaged, or sensitive to deterioration, theft, and other losses.
3. Deliver products to Project site in an undamaged condition in manufacturer's original sealed container or other packaging system, complete with labels and instructions for handling, storing, unpacking, protecting, and installing.
4. Inspect products on delivery to ensure compliance with the Contract Documents and to ensure that products are undamaged and properly protected.

C. Storage:

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

1.6 PRODUCT WARRANTIES

A. Warranties specified in other Sections shall be in addition to, and run concurrent with, other warranties required by the Contract Documents. Manufacturer's disclaimers and limitations on product warranties do not relieve Contractor of obligations under requirements of the Contract Documents.

1. Manufacturer's Warranty: Preprinted written warranty published by individual manufacturer for a particular product and specifically endorsed by manufacturer to Owner.
2. Special Warranty: Written warranty required by or incorporated into the Contract Documents, either to extend time limit provided by manufacturer's warranty or to provide more rights for Owner.

B. Special Warranties: Prepare a written document that contains appropriate terms and identification, ready for execution. Submit a draft for approval before final execution.

1. Manufacturer's Standard Form: Modified to include Project-specific information and properly executed.
2. Specified Form: When specified forms are included with the Specifications, prepare a written document using appropriate form properly executed.
3. Refer to Divisions 2 through 26 Sections for specific content requirements and particular requirements for submitting special warranties.

C. Submittal Time: Comply with requirements in Division 1 Section "Closeout Procedures."

PART 2 - PRODUCTS

2.1 PRODUCT SELECTION PROCEDURES

A. General Product Requirements: Provide products that comply with the Contract Documents, that are undamaged and, unless otherwise indicated, that are new at time of installation.

1. Provide products complete with accessories, trim, finish, fasteners, and other items needed for a complete installation and indicated use and effect.
2. Standard Products: If available, and unless custom products or nonstandard options are specified, provide standard products of types that have been produced and used successfully in similar situations on other projects.
3. Owner reserves the right to limit selection to products with warranties not in conflict with requirements of the Contract Documents.
4. Where products are accompanied by the term "as selected," Engineer will make selection.
5. Where products are accompanied by the term "match sample," sample to be matched is Engineer's.
6. Descriptive, performance, and reference standard requirements in the Specifications establish "salient characteristics" of products.

B. Product Selection Procedures:

1. Product: Where Specifications name a single product and manufacturer, provide the named product that complies with requirements.
2. Manufacturer/Source: Where Specifications name a single manufacturer or source, provide a product by the named manufacturer or source that complies with requirements.
3. Products: Where Specifications include a list of names of both products and manufacturers, provide one of the products listed that complies with requirements.
4. Manufacturers: Where Specifications include a list of manufacturers' names, provide a product by one of the manufacturers listed that complies with requirements.
5. Available Products: Where Specifications include a list of names of both products and manufacturers, provide one of the products listed, or an unnamed product, that complies with requirements. Comply with provisions in Part 2 "Comparable Products" Article for consideration of an unnamed product.
6. Available Manufacturers: Where Specifications include a list of manufacturers, provide a product by one of the manufacturers listed, or an unnamed manufacturer, that complies with requirements. Comply with provisions in Part 2 "Comparable Products" Article for consideration of an unnamed product.
7. Product Options: Where Specifications indicate that sizes, profiles, and dimensional requirements on Drawings are based on a specific product or system, provide the specified product or system. Comply with provisions in Part 2 "Product Substitutions" Article for consideration of an unnamed product or system.
8. Basis-of-Design Product: Where Specifications name a product and include a list of manufacturers, provide the specified product or a comparable product by one of the other named manufacturers. Drawings and Specifications indicate sizes, profiles, dimensions, and other characteristics that are based on the product named. Comply with provisions in Part 2 "Comparable Products" Article for consideration of an unnamed product by the other named manufacturers.

2.2 PRODUCT SUBSTITUTIONS

A. Timing: Engineer will consider requests for substitution if received within 10 days prior to bid. Requests received after that time may be considered or rejected at discretion of Engineer.

B. The listing of specific manufacturers does not imply acceptance of their products that do not meet the specified ratings, features and functions. Manufacturers listed are not relieved from meeting these specifications in their entirety. Products in compliance with the specification and manufactured by others not named will be considered only if pre-approved by the Engineer 15 days prior to bid date.

C. Conditions: Engineer will consider Contractor's request for substitution when the following conditions are satisfied. If the following conditions are not satisfied, Engineer will return requests without action, except to record noncompliance with these requirements:

1. Requested substitution offers Owner a substantial advantage in cost, time, energy conservation, or other considerations, after deducting additional responsibilities Owner must assume. Owner's additional responsibilities may include compensation to Engineer for redesign and evaluation services, increased cost of other construction by Owner, and similar considerations.
2. Requested substitution does not require extensive revisions to the Contract Documents.
3. Requested substitution is consistent with the Contract Documents and will produce indicated results.

4. Substitution request is fully documented and properly submitted.
5. Requested substitution will not adversely affect Contractor's Construction Schedule.
6. Requested substitution has received necessary approvals of authorities having jurisdiction.
7. Requested substitution is compatible with other portions of the Work.
8. Requested substitution has been coordinated with other portions of the Work.
9. Requested substitution provides specified warranty.

2.3 COMPARABLE PRODUCTS

A. Conditions: Engineer will consider Contractor's request for comparable product when the following conditions are satisfied. If the following conditions are not satisfied, Engineer will return requests without action, except to record noncompliance with these requirements:

1. Evidence that the proposed product does not require extensive revisions to the Contract Documents, that it is consistent with the Contract Documents and will produce the indicated results, and that it is compatible with other portions of the Work.
2. Detailed comparison of significant qualities of proposed product with those named in the Specifications. Significant qualities include attributes such as performance, weight, size, durability, visual effect, and specific features and requirements indicated.
3. Evidence that proposed product provides specified warranty.
4. List of similar installations for completed projects with project names and addresses and names and addresses of Engineers and owners, if requested.
5. Samples, if requested.

PART 3 - EXECUTION (Not Used)

END OF SECTION

SECTION 01 77 00 - CLOSEOUT PROCEDURES

PART 1 - GENERAL

1.1 SUMMARY

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

1. Inspection procedures.
2. Warranties.
3. Final cleaning.

1.2 SUBSTANTIAL COMPLETION

A. Preliminary Procedures: Before requesting inspection for determining date of Substantial Completion, complete the following. List items below that are incomplete in request.

1. Prepare a list of items to be completed and corrected (punch list), the value of items on the list, and reasons why the Work is not complete.
2. Advise Owner of pending insurance changeover requirements.
3. Submit specific warranties, workmanship bonds, maintenance service agreements, final certifications, and similar documents.
4. Obtain and submit releases permitting Owner unrestricted use of the Work and access to services and utilities. Include occupancy permits, operating certificates, and similar releases.
5. Prepare and submit Project Record Documents, operation and maintenance manuals, Final Completion construction photographs, damage or settlement surveys, property surveys, and similar final record information.
6. Deliver tools, spare parts, extra materials, and similar items to location designated by Owner. Label with manufacturer's name and model number where applicable.
7. Make final changeover of permanent locks and deliver keys to Owner. Advise Owner's personnel of changeover in security provisions.
8. Complete startup testing of systems.
9. Submit test/adjust/balance records.
10. Terminate and remove temporary facilities from Project site, along with mockups, construction tools, and similar elements.
11. Advise Owner of changeover in heat and other utilities.
12. Submit changeover information related to Owner's occupancy, use, operation, and maintenance.
13. Complete final cleaning requirements, including touchup painting.
14. Touch up and otherwise repair and restore marred exposed finishes to eliminate visual defects.

B. Inspection: Submit a written request for inspection for Substantial Completion. On receipt of request, Engineer will either proceed with inspection or notify Contractor of unfulfilled requirements. Engineer will prepare the Certificate of Substantial Completion after inspection

or will notify Contractor of items, either on Contractor's list or additional items identified by Engineer, that must be completed or corrected before certificate will be issued.

1. Re-inspection: Request re-inspection when the Work identified in previous inspections as incomplete is completed or corrected.
2. Results of completed inspection will form the basis of requirements for Final Completion.

1.3 FINAL COMPLETION

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

1. Submit a final Application for Payment according to general conditions and including final MBE and tax form documentation.
2. Submit certified copy of Engineer's Substantial Completion inspection list of items to be completed or corrected (punch list), endorsed and dated by Engineer. The certified copy of the list shall state that each item has been completed or otherwise resolved for acceptance.
3. Submit evidence of final, continuing insurance coverage complying with insurance requirements.
4. Instruct Owner's personnel in operation, adjustment, and maintenance of products, equipment, and systems.
5. Submit all closeout materials in accordance with general conditions and State Construction Office Requirements, including but not limited to: operation and maintenance manuals, as-built drawings, consent of surety to final payment, affidavit of release of leans, and affidavit of payment and debt and claims.

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

1. Re-inspection: Request re-inspection when the Work identified in previous inspections as incomplete is completed or corrected.

C. Final Payment: Final payment will not be made until after final set of as-built drawings and zone maps have been approved and zone maps installed.

1.4 LIST OF INCOMPLETE ITEMS (PUNCH LIST)

A. Preparation: Submit three copies of list. Include name and identification of each space and area affected by construction operations for incomplete items and items needing correction including, if necessary, areas disturbed by Contractor that are outside the limits of construction. Use CSI Form 14.1A.

1. Organize list of spaces in sequential order, starting with exterior areas first.
2. Organize items applying to each space by major element, including categories for ceiling, individual walls, floors, equipment, and building systems.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Cleaning Agents: Use cleaning materials and agents recommended by manufacturer or fabricator of the surface to be cleaned. Do not use cleaning agents that are potentially hazardous to health or property or that might damage finished surfaces.

PART 3 - EXECUTION

3.1 FINAL CLEANING

A. General: Provide final cleaning. Conduct cleaning and waste-removal operations to comply with local laws and ordinances and Federal and local environmental and antipollution regulations.

B. Cleaning: Employ experienced workers or professional cleaners for final cleaning. Clean each surface or unit to condition expected in an average commercial building cleaning and maintenance program. Comply with manufacturer's written instructions.

1. Complete the following cleaning operations before requesting inspection for certification of Substantial Completion for entire Project or for a portion of Project:

    a. Clean Project site, yard, and grounds, in areas disturbed by construction activities, including landscape development areas, of rubbish, waste material, litter, and other foreign substances.
    b. Sweep paved areas broom clean. Remove petrochemical spills, stains, and other foreign deposits.
    c. Rake grounds that are neither planted nor paved to a smooth, even-textured surface.
    d. Remove tools, construction equipment, machinery, and surplus material from Project site.
    e. Clean exposed exterior hard-surfaced finishes to a dirt-free condition, free of stains, films, and similar foreign substances. Avoid disturbing natural weathering of exterior surfaces. Restore reflective surfaces to their original condition.
    f. Clean transparent materials, including glass in doors and windows. Replace chipped or broken glass and other damaged transparent materials.

C. Comply with safety standards for cleaning. Do not burn waste materials. Do not bury debris or excess materials on Owner's property. Do not discharge volatile, harmful, or dangerous materials into drainage systems. Remove waste materials from Project site and dispose of lawfully.

END OF SECTION

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SECTION 02 83 00 – LEAD-IN-CONSTRUCTION

PART 1 GENERAL REQUIREMENTS

1.01 SCOPE OF WORK

A. This Lead-In-Construction specification covers the removal and disposal of building materials with lead-based or lead-containing paint and/or surface coatings to be impacted by the renovation activities as previously described.

B. Coleman Hall: No specific testing for lead-based or lead-containing paint and/or surface coatings has been performed for this project. Additionally, no known historical reports pertaining to lead testing are currently available for this building. Based on the age of specific portions of the building, it is presumed that multiple surfaces are coated with lead-based paint. It should be presumed that walls, ceilings, moldings, casings, frames, beams, conduits, trusses/framework, black iron components, etc. may contain lead concentrations above or below the 1.0 mg/cm^2 Action Level (See Paragraph C below). The Contractor shall take the appropriate measures to protect its workers, staff, building occupants, and the environment from lead contamination from disturbances of potential lead-containing surfaces.

C. Painted surfaces or materials with any lead concentrations greater than 0.1 mg/cm^2 may contain sufficient concentrations of lead, which when disturbed, may generate lead dust greater than the "Action Level" concentration of 30 micrograms per cubic meter ($\mu g/m^3$) or greater than the "Permissible Exposure Limit" of 50 micrograms per cubic meter established by the OSHA "Lead Exposure in Construction Rule" (29 CFR 1926.62). The OSHA standard does not define acceptable levels of lead in paint at which no exposure to airborne lead (above the action level) would be expected; however, guidance is available for work practices which present the highest risk for lead exposure to workers. Rather, OSHA defines airborne concentrations and references specific types of work practices and operations from which a lead hazard may be generated (reference 29 CFR 1926.62, section d). Environmental and personnel monitoring should be conducted during any removal or demolition process (as appropriate) to determine actual personal exposure. This monitoring information can be used to determine the levels of personnel protection and environmental controls required for work involving specific removal/demolition processes on specific structures. Under OSHA requirements, the Contractor performing the work will be required to conduct this monitoring. It is important to note that environmental controls will vary dependent upon the content of lead in paint, the process used to remove it, duration of the work, and the amount of paint to be removed.

D. For disposal of construction/demolition debris that contains lead, the Environmental Protection Agency (EPA) requires that testing of lead content be performed to determine proper disposal. EPA regulations require that a generator of waste determine if that waste is hazardous by performing testing in accordance with the requirements of 40 CFR 261.11 or for wastes that may be RCRA hazardous (such as items with high lead content), the generator may assume that the waste is hazardous and comply with the hazardous waste regulation.

E. This specification indicates minimum requirements for the removal and disposal of lead-based and/or lead-containing paint and/or coatings on building materials at the subject site. The below requirements detailed in this specification are intended as a guide and shall not supersede applicable Federal, State, or Local regulations. Requirements are generally based upon

applicable Federal and State Regulations, as well as generally accepted industry standards. Where more stringent requirements exist, such procedures shall be followed.

1.02 PERMITS AND COMPLIANCE

A. The Contractor shall assume full responsibility and liability for compliance with all applicable Federal, State, and local laws, rules, and regulations pertaining to Work practices, protection of Workers, authorized visitors to the site, persons, and property adjacent to the Work.

B. The Contractor shall complete all renovation/demolition work in accordance with the requirements found in 29 CFR 1926.62 and this specification. The Owner may elect to conduct independent air sampling and/or clearance wipe sampling.

C. The Contractor shall pay all fees, royalties, and other costs necessary for the use of any copyrighted or patented product, design, invention, or processing the performance of the job specified in this Section. The Contractor shall be solely responsible for costs, damage or losses resulting from any infringement of these patent rights or copyrights. The Contractor shall hold the Owner, Architect and the Consultant harmless from any costs, damages, and losses resulting from any infringement of these patent rights or copyrights.

D. The Contractor shall be responsible for securing all necessary permits for work under this Section, including hauling, removal, and disposal, fire, and materials usage, or any other permits required to perform the specified work.

E. The Contractor shall make all applicable and necessary notifications to relevant federal, state, and local authorities and shall obtain and comply with the provisions of all permits or applications required by the work specified. The Contractor shall indemnify the Owner, Architect, Engineer, and Consultant from, and pay for all claims resulting from failure to adhere to these provisions. The costs for all permits, applications, and the like, are to be assumed by the Contractor.

F. UNCG's Environmental Health and Safety department must be notified of intended activities that may disturb lead-based paints or coatings within the Coleman Building (Contact Mr. Tim Slone tjslone@uncg.edu, Director of EHS, UNC Greensboro).

1.03 SUBMITTALS

A. Pre-Job Submittals: The Contractor shall provide copies of the following Pre-Job Submittals at the Pre-Construction Conference.
   1. Copies of all fees, permits, applications and like documents required by federal, state, or local regulations obtained or submitted in proper fashion.
   2. Appropriate documentation of OSHA-required medical evaluation.
   3. Copies of OSHA Lead in Construction training as specified in 29 CFR 1926.62.
   4. Copies of respiratory fit test (if applicable).
   5. Copies of Respiratory Protection Program.
   6. A detailed Project Compliance Program as described in 29 CFR 1926.62(e)(2).
   7. Written plan, for the Owner's review and acceptance, of all proposed procedures, methods, and equipment to be utilized to fulfill the testing and work requirements of the Contract Specification.
   8. Proposed worker orientation plan which at a minimum includes a description of lead hazards, review of worker protection requirements, and the outline of safety procedures.
   9. Safety Data Sheets (SDS) on all materials and chemicals to be used on the Project.

B. On-Site Submittals: Refer to Part 3.01.C for all submittals, documentation, and postings required to be maintained on-site during removal activities.

C. Project Close-out Submittals: Within 30 days of the completion of work, the Contractor shall submit copies of the documents listed below. One set of the documents shall be transmitted to the Owner and one set to the Owner's representative for review and approval.
   1. Waste disposal manifests.
   2. OSHA compliance air monitoring records conducted during the Work, as applicable.
   3. Daily progress log.
   4. A list of all Workers used in the performance of the Project.
   5. Project notifications, if required.
   6. Visit Logs
   7. Incident Investigation Reports

1.04 APPLICABLE STANDARDS AND REGULATIONS

A. The Contractor shall comply with the following codes and standards, except where more stringent requirements are shown or specified:

B. Federal Regulations:
   1. 29 CFR 1926.62 "Lead In Construction" (OSHA)
   2. 29 CFR 1926.21 "Safety Training and Education (OSHA)
   3. 29 CFR 1926.33 "Access to Employee Exposure and Medical Records" (OSHA)
   4. 29 CFR 1926.55 "Gasses, Vapors, Fumes, Dusts, and Mists" (OSHA)
   5. 29 CFR 1926.59 "Hazard Communication" (OSHA)
   6. 29 CFR 1926.65 "Hazardous Waste Operations and Emergency Response" (OSHA)
   7. 29 CFR 1926.103 "Respiratory Protection" (OSHA)
   8. 40 CFR 260 "Hazardous Waste Management Systems: General" (EPA)
   9. 40 CFR 261 "Identification and Listing of Hazardous Waste (EPA)
   10. 40 CFR 262 "Generators of Hazardous Waste (EPA)
   11. 40 CFR 263 "Transporters of Hazardous Waste (EPA)
   12. 40 CFR 264 "Owners and Operators of hazardous Waste Treatment, Storage, and Disposal Facilities" (EPA)
   13. 40 CFR 265 "Interim Status Standard for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities" (EPA)
   14. 40 CFR 268 "Land Disposal Restrictions" (EPA)
   15. 40 CFR 172 "Hazardous Materials, Tables, and Hazardous Materials Communications Regulations" (DOT)
   16. 49 CFR 171-178 "Transportation Standards" (DOT)

C. North Carolina Regulations:
   1. DOL Chapter 7, Title 13 of the North Carolina Administrative Code
   2. DOT Title 19A of the North Carolina Administrative Code
   3. Solid Waste Management Chapter 13, Title 15A of the North Carolina Administrative Code

D. Standards and Guidance Documents:
   1. American National Standard Institute (ANSI) Z88.2-80, Practices for Respiratory Protection
   2. ANSI Z9.2-79, Fundamentals Governing the Design and Operation of Local Exhaust Systems

1.05 NOTICES

A. The Contractor shall be responsible for maintaining current project filings with regulatory agencies for the duration of the project.

1.06 PROJECT MONITORING AND AIR SAMPLING

A. The Owner may elect to engage the services of an Environmental Consultant (the Consultant) who would serve as the Owner's Representative with regard to the performance of the Project and provide guidance as required throughout the Project period.

B. The Contractor is required to ensure cooperation of its personnel with the Consultant.

1.07 CONTRACTOR AIR SAMPLING

A. The Contractor should make allowances in the bid price for the cost of all environmental and personnel monitoring, along with costs for provision of all other related services, monitoring, and/or equipment needed to comply with requirements found within 29 CFR 1926.62

B. The Contractor's laboratory analysis of air samples shall be conducted by an appropriate laboratory accredited under the EPA National Lead Laboratory Accreditation Program (NLLP) by either the American Association for Laboratory Accreditation or the American Industrial Hygiene Association (AIHA) and that is successfully participating in the Environmental Lead Proficiency Analytical Testing (ELPAT) program to perform sample analysis.

C. Results of personnel air sample analyses shall be available, verbally, within twenty-four (24) hours of sampling and shall be posted upon receipt. Written laboratory reports shall be delivered and posted at the Subject site within five (5) days. Failure to comply with these requirements may result in a temporary work stoppage until compliance is achieved.

PART 2 PRODUCTS

2.01 PROTECTIVE CLOTHING

A. The Contractor shall provide adequate personal protective equipment (PPE) to any employees working on lead coated surfaces <u>if there is a potential for generation of airborne lead dust or fumes (e.g., through scraping, striping, grinding, cutting, sanding, removal, demolition, etc.) above the Permissible Exposure Limit</u> (29 CFR 1926.62). Note: The standard does not reference a specific level of lead in paint at which a hazard exists. Rather, OSHA defines airborne concentrations, and references specific types of work practices and operations from which a lead hazard may be generated (29 CFR 1926.62, paragraph d).

B. Provide sufficient quantities of protective clothing to assure a minimum of four (4) complete disposable outfits per day for each individual performing the Work.

C. Eye protection and hard hats shall be provided and made available for all personnel entering any Work Area.

D. Authorized visitors shall be provided with suitable protective clothing, headgear, eye protection, and footwear whenever they enter the Work Area.

PART 3 EXECUTION

3.01 GENERAL REQUIREMENTS

A. Should visible emissions which can reasonably be considered to contain lead in concentrations that would result in contamination above relevant thresholds (either in settled dust or airborne) be observed outside the Work Area, immediately stop Work and correct procedures as necessary. All costs incurred in decontaminating such non-Work Areas and the contents thereof shall be borne by the Contractor, at no additional cost to the Owner.

B. Medical approval and fit test reports shall be on site prior to admittance of any Contractor's employees to the Work Area where respiratory protection is required.

C. The following submittals, documentation, and postings shall be maintained on-site by the Contractor during renovation/demolition activities:
   1. Accreditation, Worker Training, Medical Surveillance:
      a. Evidence that Workers have received appropriate training required by OSHA 1926.62.
      b. Documentation that Workers have been fit tested specifically for respirators used on the Project.
   2. Daily OSHA personal air monitoring results, as necessary.
   3. Project documents (specifications and drawings.)
   4. Applicable regulations.
   5. Safety Data Sheets of supplies/chemicals used on the Project.
   6. List of emergency telephone numbers.

D. The following documentation shall be maintained on-site by the Project Monitor, if retained, during renovation/demolition activities:
   1. Project Monitor Daily Log.
   2. Survey Report.

3.02 REMOVAL OF LEAD-BASED OR LEAD-CONTAINING MATERIALS

A. The Contractor shall be required to comply with the project specifications concerning lead-containing paint and all applicable regulations when disturbing any painted surface where work is anticipated to result in exceedance of relevant thresholds. The Contractor shall complete all work in accordance with the requirements found in 29 CFR 1926.62 and this specification.

3.03 RESTORATION OF UTILITIES, FIRESTOPPING, AND FINISHES

A. Finishes and penetrations damaged by removal activities shall be restored prior to final payment, as applicable and as outlined in the scope of work for which the Contractor was retained.

PART 4 DISPOSAL OF LBP WASTE

4.01 DISPOSAL

A. As warranted, collect lead-contaminated waste, scrap, debris, bags, containers, equipment, and lead-contaminated clothing, which may produce airborne concentrations of lead particles. Label the containers in accordance with 29 CFR 1926.62 and 40 CFR 261. Dispose of lead-contaminated waste material at an EPA or State approved hazardous waste treatment, storage, or disposal facility.

B. As warranted, store waste materials in U.S. Department of Transportation (49 CFR 178) approved containers. Properly label each container to identify the type of waste (49 CFR 172) and the date the container was filled. Do not store hazardous waste containers in interim storage longer than 90 calendar days from the date affixed to each container.

C. Handle, store, transport, and dispose lead or lead-contaminated waste in accordance with 40 CFR 260, 40 CFR 261, 40 CFR 262, 40 CFR 263, 40 CFR 264, and 40 CFR 265. The Contractor shall provide documentation the transporter is authorized to transport the waste, authorized to deliver the waste to the treatment, storage, or disposal facility and the treatment, storage, or disposal facility is authorized to accept the waste. Comply with land disposal restriction notification requirements as required by 40 CFR 268

D. All material, whether hazardous or non-hazardous shall be disposed in accordance with laws and provisions and federal, State, or local regulations. Ensure waste is properly characterized. The result of each waste characterization (TCLP for RCRA materials) will dictate disposal requirements.

E. Submit written evidence the hazardous waste treatment, storage, or disposal facility (TSD) is approved for lead disposal by the EPA and State or local regulatory agencies, as warranted. Submit one copy of the completed manifest, signed and dated by the initial transporter in accordance with 40 CFR 262.

F. The cost of disposal is the responsibility of the Contractor.

4.02 CHARACTERIZATION OF WASTE

A. The Contractor shall arrange to conduct Toxicity Characteristic Leaching Procedure (TCLP) testing to characterize the waste stream with regards to lead. TCLP testing shall be performed in accordance with EPA hazardous waste disposal requirements found in 40 CFR 260-264. Alternately, collection for total lead content may be conducted and, if the total concentration for lead contains less than 100 ppm, the material may be considered non-hazardous and a TCLP test may be omitted.

B. Sample collection for testing shall be performed in situ and will consider the aggregate of all materials within the waste stream at proportions representative of their volume. Composite samples shall be obtained by taking sub-samples of each building component, which will then be proportionately combined into one composite sample for the TCLP analysis. Sample selection of waste stream debris shall be performed in accordance with ASTM Designation E 1908-03 *Standard Guide for Sample Selection of Debris Waste From A Building Project for Toxicity Characteristic Leaching Procedures (TCLP) Testing for Leachable Lead (Pb)*.

C. TCLP Testing Results:

1. If TCLP testing results indicate that the concentration of lead in the materials in the aggregate of the waste stream is less than 5 mg/L (milligram per Liter), below the threshold for determination of hazardous lead waste, then all of the debris generated during demolition can be disposed as general construction waste.
2. If TCLP testing results indicate that the concentration of lead in the materials in the aggregate of the waste stream is 5 mg/L or greater, at or above the threshold for determination of hazardous lead waste, then segregation of materials shall performed.

END OF SECTION

SECTION 02 90 00 – UNIVERSAL WASTE & OTHER REGULATED MATERIALS REMOVAL

PART 1 GENERAL REQUIREMENTS

1.01 SCOPE OF WORK

A. This Project shall consist of the removal and disposal/recycling of materials with regard to identified Universal Waste including but not limited to: fluorescent lamps, batteries, and electronic waste to be impacted by the previously stated renovation activities.

B. Coleman Hall: Identified Universal Waste and Other Regulated Materials associated with the aforementioned scope of work include the following:

UNIVERSAL WASTE & OTHER REGULATED MATERIALS REMOVAL		
Material Description	**Material Location(s)**	**Estimated Quantity**
Fluorescent Lamps	Throughout (if required)	TBD
Remnant Electronics	Throughout – Potentially associated with Fire Alarm System (Exit Signs, Smoke Detectors, etc.)	TBD
Batteries	Throughout – Potentially associated with Fire Alarm System (Exit Signs, Smoke Detectors, etc.)	TBD

TBD - To Be Determined

C. The Contractor shall be aware of all conditions of the Project and is responsible for verifying quantities and locations of all work to be performed. Failure to do so shall not relieve the Contractor of its obligation to furnish all labor and materials necessary to perform the Work.

D. This specification indicates minimum requirements for the removal and disposal of universal waste and other regulated materials at the subject site. The below requirements detailed in this specification are intended as a guide and shall not supersede applicable Federal, State, or Local regulations. Requirements are generally based upon applicable Federal and State Regulations, as well as generally accepted industry standards. Where more stringent requirements exist, such procedures shall be followed.

D. Working hours shall be as required and approved by the Owner. The Contractor shall coordinate and schedule all Work with the facility and Owner's representative.

E. The Contractor shall coordinate the removal, handling, and temporary storage of Universal Waste and Other Regulated Materials within the Coleman Building with UNCG's Environmental Health and Safety department (Contact Mr. Tim Slone tjslone@uncg.edu, Director of EHS, UNC Greensboro).

1.02 DEFINITIONS

A. Mercury Lamps: The bulb or tube portion of an electric lighting device. Examples of common universal waste electric lamps include, but are not limited to, fluorescent, high intensity discharge, neon, mercury vapor, high pressure sodium, and metal halide lamps. Newer lamps sold as low-mercury which are identified by green end caps (often referred to as "green-tipped") still contain 3-4 milligrams of Mercury; these lamps shall be included in this Project.

B. Mercury-Containing Equipment: A device or part of a device (including thermostats, but excluding batteries and lamps) that contains elemental mercury integral to its function.

C. Battery: A device consisting of one or more electrically connected electrochemical cells which is designed to receive, store, and deliver electric energy.

D. Pesticide: Any substance or mixture of substances intended for preventing, destroying, repelling, or mitigating any pest, or intended for use as a plant regulator, defoliant, or desiccant, with the exception of any that is (a) a new animal drug under FFDCA section 201(w), or (b) an animal drug that has been determined by regulation of the Secretary of Health and Human Services not to be a new animal drug, or (c) an animal feed under FFDCA section 201(x) that bears or contains any substances described by either (a) or (b).

E. Ozone Depleting Substances (ODS): Regulated under the Clean Air Act, ODS include Chlorofluorocarbons (CFCs) and Hydrochlorofluorocarbons (HCFCs). CFCs and HCFCs are organic compounds comprising carbon, fluorine, and chlorine utilized as refrigerants, blowing agents, propellants, and degreasers.

F. Electronic Waste: As regulated by the North Carolina Department of Environmental Quality (NC DEQ) Solid Waste Section defines electronic waste as televisions, computers, monitors, printers, scanners, and computer peripherals such as keyboards and mice.

G. Large Quantity Handler (LQH) of Universal Waste shall be a waste handler who accumulates 5,000 kilograms or more of universal waste (batteries, pesticides, thermostats, or lamps, calculated collectively) at any time. This designation as a large quantity handler of universal waste is retained through the end of the calendar year in which 5,000 kilograms (11,000 pounds) or more total of universal waste is accumulated. The LQH shall notify the EPA, acquire or co-ordinate with a facility regarding an EPA identification number, and provide records for each shipment. The LQH shall ensure all employees are thoroughly familiar with proper waste handling and emergency procedures, relative to their responsibilities during normal facility operations and emergencies.

H. Small Quantity Handler of Universal Waste (SQH) shall be a waste handler who does not accumulate 5,000 kilograms (11,000 pounds) or more of total universal waste (batteries, pesticides, thermostats, or lamps, calculated collectively) at any time.

I. Destination Facility shall be a facility that legitimately and can legally accept universal waste from offsite so that the universal waste can be treated, disposed, or recycled in accordance with the regulatory requirements.

J. Hazardous waste shall be any materials to be disposed that possess at least one of four characteristics, ignitability, corrosivity, reactivity or toxicity, as defined and regulated by the Resource Conservation and Recovery Act (RCRA) and applicable state and federal regulations, or a material specifically identified as hazardous waste by applicable Federal or State lists.

K. A Very Small Quantity Generator (VSQG) of hazardous waste shall be a waste handler who generates no more than 100 kilograms per month of listed and/or characteristic hazardous waste, generates no more than 1 kilogram of acute hazardous waste in any calendar month, and stores no more than 1000 kilograms of listed and/or characteristic hazardous waste or more than 1 kilogram of acutely hazardous waste.

L. A Small Quantity Generator (SQG) of hazardous waste shall be a waste handler who generates no more than 1000 kilograms per month of listed and/or characteristic hazardous waste, generates no more than 1 kilogram of acute hazardous waste per month, and stores no more than 6000 kilograms of listed and/or characteristic hazardous waste or more than 1 kilogram of acutely hazardous waste.

M. Large Quantity Generator (LQG) of hazardous waste shall be a waste handler who generates more than 1000 kilograms per month of listed and/or characteristic hazardous waste, generates more than 1 kilogram of acute hazardous waste per month, or stores more than 6000 kilograms of hazardous waste or 1 kilogram of acutely hazardous waste.

1.03 PERMITS AND COMPLIANCE

A. The Contractor shall assume full responsibility and liability for compliance with all applicable Federal, State, and local laws, rules, and regulations pertaining to Work practices, protection of Workers, authorized visitors to the site, persons, and property adjacent to the Work.

B. The Contractor shall make and obtain all appropriate notices and permits required by the EPA and State / Local entities as required. The Contractor shall be responsible for maintaining current project filings with regulatory agencies for the duration of the project

C. The Contractor shall maintain on-site for inspection: Notices and Permits, Health and Safety Plan; Material Safety Data Sheets (SDS) for any chemicals that will be utilized during the Project; any other documentation deemed appropriate by the Contractor.

1.04 SUBMITTALS

A. Pre-Work Submittals: Prior to the start of work, submit the following to the Owner and/or Owner's Representative for review, as applicable.
   1. Copy of State or local license for hazardous waste hauler.
   2. Certification of at least one on-site supervisor which has satisfactorily completed the OSHA 40 Hour Health and Safety Course for Handling Hazardous Materials.
   3. Certificates of workers which have successfully completed at least the OSHA 40-Hour Health and Safety Course for Hazardous Materials
   4. Name and address of the universal waste handler or a destination facility where the waste material is to be treated, deposited or recycled in accordance with all regulatory requirements (include contact person and telephone numbers), if the universal waste meets the definition of hazardous waste, the name and address of the hazardous waste treatment, storage and disposal (TSD) facility, the name and address of the mercury thermostat recycling collection site;
   5. Material Safety Data Sheets for all materials requiring removal;
   6. Contingency Plan for handling emergency spills or leaks;
   7. Project Notifications and Permits.

B. On-Site Submittals: Refer to Part 3.01.A for all submittals, documentation, and postings required to be maintained on-site during abatement activities.

C. Project Close-out Submittals: Within 30 days of the completion of the work, the Contractor shall submit copies of the documents listed below, as applicable. One set of the documents shall be transmitted to the Owner and one set to the Owner's representative for review and approval.
   1. Waste disposal manifests.
   2. Daily progress log.

3. A list of all Workers used in the performance of the Project.
4. Project notifications and Permits.
5. Visit Logs
6. Incident Investigation Reports

1.05 APPLICABLE STANDARDS AND REGULATIONS

A. The Contractor shall, at a minimum, comply with the following codes and standards, except where more stringent requirements are shown or specified:

B. Federal Regulations:
1. 29 CFR 1910.1000 “Air Contaminants” (OSHA)
2. 29 CFR 1910.120 “Hazardous Waste Operations and Emergency Response” (OSHA)
3. 40 CFR Part 261-271 “Hazardous Waste” (EPA)
4. 40 CFR Part 273 “Universal Waste” (EPA)
5. 49 CFR 171-172 “Transportation Standards” (DOT)
6. 49 CFR 171-178 “Shipping Container Specification” (DOT)

C. North Carolina Regulations:
1. 15A NCAC 13A Hazardous and Universal Waste Management
2. DOL Chapter 7, Title 13 of the North Carolina Administrative Code
3. DOT Title 19A of the North Carolina Administrative Code

1.06 PROJECT MONITORING

A. The Owner may elect to engage the services of an Environmental Consultant (the Consultant) who would serve as the Owner's Representative with regard to the performance of the Project and provide guidance as required throughout the entire Project period.

B. The Contractor is required to ensure cooperation of its personnel with the Consultant.

PART 2 PRODUCTS

2.01 PROTECTIVE CLOTHING

A. Where warranted, provide personnel utilized during the Project with disposable protective whole body clothing, head coverings, gloves and foot coverings. Provide disposable plastic or rubber gloves to protect hands. Cloth gloves may be worn inside the plastic or rubber for comfort, but shall not be used alone. Make sleeves secure at the wrists and make foot coverings secure at the ankles by the use of tape, or provide disposable coverings with elastic wrists or tops. For handling of commercially available materials in good condition such as fluorescent bulbs, fire extinguishers, batteries, et cetera, PPE can be reduced.

B. Provide sufficient quantities of protective clothing to assure a minimum of four (4) complete disposable outfits per day for each individual performing the Work, as warranted.

C. Eye protection and hard hats shall be provided and made available for all personnel entering any Work Area.

D. Authorized visitors shall be provided with suitable protective clothing, headgear, eye protection, and footwear whenever they enter the Work Area, as warranted.

2.02 SIGNS AND LABELS

A. Labels: As required by the EPA and OSHA for handling, transportation, and disposal of hazardous waste.

B. Drums: Recovery or salvage drums acceptable for disposal of hazardous waste. Prior approval of drums is required. Drums or containers must meet the required OSHA EPA (40 CFR Parts 264, 265 and 300), and DOT regulations (49 CFR Parts 171-178). Use of damaged drums will not be allowed.

PART 3 EXECUTION

3.01 GENERAL REQUIREMENTS

A. The following submittals, documentation, and postings shall be maintained on-site by the Contractor during renovation/demolition activities:
   1. Proof that Workers have been appropriately trained as per 29 CFR 1910.120.
   3. Project documents.
   4. Notifications and Permits, as applicable. Ensure that the most up-to-date notifications are on-site.
   5. Applicable regulations.
   6. Safety Data Sheets of supplies/chemicals used on the Project.
   7. List of emergency telephone numbers.
   8. Daily Project Log.

B. The following documentation shall be maintained on-site by the Project Monitor, if retained, during renovation/demolition activities:
   1. Project Monitor Daily Log.
   2. Survey Report.

3.02 REMOVAL OF UNIVERSAL WASTE & OTHER REGULATED MATERIALS

A. Employee training shall ensure that all employees are thoroughly familiar with proper waste handling and emergency procedures, relative to their responsibilities during normal operations and emergencies and to the type of waste they are handling.

B. Remove lighting tubes/lamps from the lighting fixture and carefully place (unbroken) into appropriate containers (original transport boxes or equivalent). In the event of a breakage, use and approved absorbent and clean the affected area. Place waste in double plastic taped bags and dispose of as hazardous waste as specified herein.

C. Once the properly labeled containers holding the waste have been filled and sealed, they shall be stored in designated accumulation areas as agreed upon by the Owners Representative and Contractor. Waste shall not be stored in transportation vehicles or onsite for longer than one year and shall be removed from the site prior to project completion.

D. Documentation when a waste in storage was first accumulated shall be provided. This is to be done by dating and labeling the waste with the date of the earliest accumulation that can document the length of time the universal waste has been accumulated.

E. Maintenance of an inventory system on-site that identifies the earliest date that any universal waste in a group of universal waste items or a group of containers of universal waste became a waste was received.

F. Any waste developed from the work that exhibits one or more characteristics of hazardous waste, that are not specifically identified by EPA or NC DEQ as Universal Waste, must be handled accordingly and not as a universal waste.

3.03 RESTORATION OF UTILITIES, FIRESTOPPING, AND FINISHES

A. Finishes and penetrations damaged by removal activities shall be restored prior to final payment, as applicable.

PART 4 DISPOSAL OF UNIVERSAL WASTE & OTHER REGULATED MATERIALS

4.01 TRANSPORTATION AND DISPOSAL SITE

A. The Contractor's Hauler and Disposal Site shall be approved by the Owner and/or Owner's Representative.

B. The Contractor shall give twenty-four (24) hour notification prior to removing any waste from the site. Waste shall be removed from the site only during normal working hours unless otherwise specified. No waste may be taken from the site unless the Contractor is present authorizes the release of the waste as described herein.

C. The Hauler, with the Contractor and the Environmental Consultant, shall inspect all material in the transport container prior to taking possession.

D. Unless specifically approved by the Owner, the Contractor shall not permit any off-site transfers of the waste or allow the waste to be transported or combined with any other material. The Hauler must travel directly to the disposal site with no unauthorized stops.

E. Off-Site Shipment of Universal Waste

1. Off-Site shipments shall meet the requirements for offsite shipments and the Contractor is prohibited from sending or taking universal waste to a place other than a designated universal waste handler or a universal waste destination facility.
2. LQH's of universal waste must notify EPA in writing and develop an EPA identification number or co-ordinate with the facility regarding use of their EPA identification number, prior to exceeding 5,000 kilograms of universal waste onsite.
3. SQH's do not need to notify EPA, receive an EPA identification number or keep records of shipments of universal waste.
4. LQH's must keep a record of all universal waste shipments received or sent offsite, and must retain those records for at least three years from the date of receipt or shipment. Records may include invoices, manifests, logs, bills of lading, or other shipping documents.
5. The Contractor shall provide certified copies of all receipts obtained from designated mercury thermostat recycling collection sites within 30 days of thermostat acceptance by collection site.
6. The Contractor shall furnish all certified copies of manifests (interim storage and final disposal) within regulatory requirements. Within 30 days from acceptance of the waste by the disposal facility, the Contractor shall provide the Owner with Certificate of Disposal documents, as a requirement for final payment.

F. Hazardous Waste Shipment

1. An appropriate Hazardous Waste Manifest shall be utilized for transportation. A hauler billing form or bill of lading may be used if the hauler needs an independent record, but shall not be used as a shipping document.
2. The Manifest shall be completed by the Contractor.
3. The Manifest shall have the appropriate signatures of the Owner's Representative (the Generator) and the Hauler representative prior to any waste being removed from the site.
4. Copies of the completed Manifest shall be retained by the Contractor which shall remain on site for inspection.
5. Upon arrival at the Disposal Site, the Manifest shall be signed by the Disposal Facility operator to certify receipt of materials covered by the manifest.
6. The Disposal Facility operator shall return the original Manifest to the Owner's Representative (the Generator) within 45 days. The Contractor must call the facility to investigate if not returned within 35 days.
7. The Contractor shall prepare and utilize a Waste Disposal Log. This log shall be maintained by the Project Supervisor and shall be kept on site at all times.
8. Originals of all waste disposal manifests disposal logs shall be submitted by the Contractor to the Owner with the final close-out documentation.

END OF SECTION

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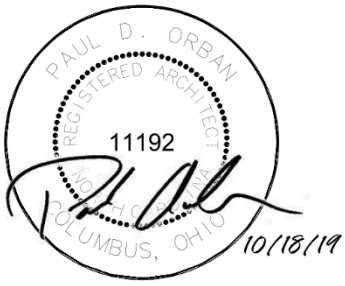

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SECTION 08 31 13 - ACCESS DOORS AND FRAMES

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes exterior access doors and frames for penthouse parapet walls.

1.2 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Product Schedule: For access doors and frames. Use same designations indicated on Drawings.

PART 2 - PRODUCTS

2.1 ACCESS DOORS AND FRAMES

A. Exterior Flush Access Doors:
   1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
      a. Babcock-Davis.
      b. JL Industries, Inc.; a division of the Activar Construction Products Group.
      c. Karp Associates, Inc.
      d. Larsens Manufacturing Company.
      e. MIFAB, Inc.
      f. Nystrom, Inc.
   2. Description: Weatherproof assembly, with face of door fit flush with frame and with exposed frame. Include extruded door gaskets and minimum 2-inch-thick fiberglass insulation.
   3. Locations: Penthouse parapet wall.
   4. Door Size: As indicated in Door Schedule.
   5. Metallic-Coated Steel Sheet for Door: Nominal 0.064 inch, 16 gage, factory finished.
   6. Latch and Lock: Cam latch operated by handle, with keyed lock in handle or with separate mortise lock.

2.2 MATERIALS

A. Metallic-Coated Steel Sheet: ASTM A 653/A 653M, Commercial Steel (CS), Type B; with minimum G60 or A60 metallic coating.

B. Frame Anchors: Same material as door face.

C. Inserts, Bolts, and Anchor Fasteners: Hot-dip galvanized steel according to ASTM A 153/A 153M or ASTM F 2329.

2.3 FABRICATION

A. General: Provide access door and frame assemblies manufactured as integral units ready for installation.

B. Metal Surfaces: For metal surfaces exposed to view in the completed Work, provide materials with smooth, flat surfaces without blemishes. Do not use materials with exposed pitting, seam marks, roller marks, rolled trade names, or roughness.

C. Doors and Frames: Grind exposed welds smooth and flush with adjacent surfaces. Furnish mounting holes, attachment devices and fasteners of type required to secure access doors to types of supports indicated.

D. Latch and Lock Hardware:
1. Quantity: Furnish number of latches and locks required to hold doors tightly closed.
2. Keys: Furnish two keys per lock and key all locks alike.

2.4 FINISHES

A. Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.

B. Protect mechanical finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.

C. Appearance of Finished Work: Noticeable variations in same piece are not acceptable. Variations in appearance of adjoining components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

D. Painted Finishes: Comply with coating manufacturer's written instructions for cleaning, conversion coating, and applying and baking finish.
1. Factory Finished: Apply manufacturer's standard baked-enamel or powder-coat finish immediately after cleaning and pretreating, with minimum dry-film thickness of 1 mil for topcoat.
a. Color: As selected by Architect from full range of industry colors.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

A. Comply with manufacturer's written instructions for installing access doors and frames.

3.3 ADJUSTING

A. Adjust doors and hardware, after installation, for proper operation.

END OF SECTION

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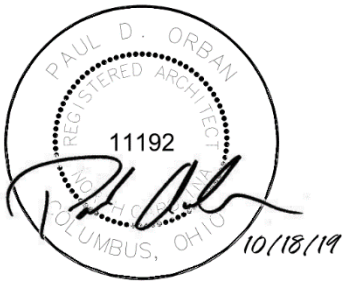

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SECTION 095113 - ACOUSTICAL PANEL CEILINGS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section includes acoustical ceiling panels and suspension systems for interior ceilings.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of product.

1.4 CLOSEOUT SUBMITTALS

A. Maintenance Data: For finishes to include in maintenance manuals.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Deliver acoustical panels, suspension-system components, and accessories to Project site and store them in a fully enclosed, conditioned space where they will be protected against damage from moisture, humidity, temperature extremes, direct sunlight, surface contamination, and other causes.

B. Before installing acoustical panels, permit them to reach room temperature and a stabilized moisture content.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Source Limitations: Obtain each type of acoustical ceiling panel and its supporting suspension system from single source from single manufacturer.

2.2 PERFORMANCE REQUIREMENTS

A. Surface-Burning Characteristics: Comply with ASTM E 84; testing by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.
   1. Flame-Spread Index: Class A according to ASTM E 1264.
   2. Smoke-Developed Index: 50 or less.

2.3 ACOUSTICAL PANELS

A. Basis-of-Design Product: Subject to compliance with requirements, provide Armstrong Optima or similar to match existing finishes.

2.4 SUSPENSION SYSTEM

A. Basis of Design Product: Subject to compliance with requirements, provide Armstrong Prelude 15/16” Exposed Tee suspension system.

2.5 ACCESSORIES

A. Attachment Devices: Size for five times the design load indicated in ASTM C 635/C 635M, Table 1, "Direct Hung," unless otherwise indicated. Comply with seismic design requirements.
   1. Power-Actuated Fasteners in Concrete: Fastener system of type suitable for application indicated, fabricated from corrosion-resistant materials, with clips or other accessory devices for attaching hangers of type indicated and with capability to sustain, without failure, a load equal to 10 times that imposed by ceiling construction, as determined by testing according to ASTM E 1190, conducted by a qualified testing and inspecting agency.

B. Wire Hangers, Braces, and Ties: Provide wires as follows:
   1. Zinc-Coated, Carbon-Steel Wire: ASTM A 641/A 641M, Class 1 zinc coating, soft temper.
   2. Size: Wire diameter sufficient for its stress at three times hanger design load (ASTM C 635/C 635M, Table 1, "Direct Hung") will be less than yield stress of wire, but not less than 0.106-inch- diameter wire.

2.6 EDGE MOLDINGS AND TRIM

A. Edge Moldings and Trim: Type and profile indicated or, if not indicated, manufacturer's standard moldings for edges and penetrations that comply with seismic design requirements; formed from same material, finish, and color as that used for exposed flanges of suspension-system runners.

1. Edge moldings shall fit acoustical panel edge details and suspension systems indicated and match width and configuration of exposed runners unless otherwise indicated.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, areas, and conditions, including structural framing to which acoustical panel ceilings attach or abut, with Installer present, for compliance with requirements specified in this and other Sections that affect ceiling installation and anchorage and with requirements for installation tolerances and other conditions affecting performance of acoustical panel ceilings.

B. Examine acoustical panels before installation. Reject acoustical panels that are wet, moisture damaged, or mold damaged.

C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Measure each ceiling area and establish layout of acoustical panels to balance border widths at opposite edges of each ceiling. Avoid using less-than-half-width panels at borders unless otherwise indicated, and comply with layout shown on reflected ceiling plans.

B. Layout openings for penetrations centered on the penetrating items.

3.3 INSTALLATION

A. Install acoustical panel ceilings according to ASTM C 636/C 636M and manufacturer's written instructions.

B. Suspend ceiling hangers from building's structural members and as follows:
   1. Install hangers plumb and free from contact with insulation or other objects within ceiling plenum that are not part of supporting structure or of ceiling suspension system.
   2. Splay hangers only where required to miss obstructions; offset resulting horizontal forces by bracing, countersplaying, or other equally effective means.
   3. Where width of ducts and other construction within ceiling plenum produces hanger spacings that interfere with location of hangers at spacings required to support standard suspension-system members, install supplemental suspension members and hangers in form of trapezes or equivalent devices.

4. When steel framing does not permit installation of hanger wires at spacing required, install carrying channels or other supplemental support for attachment of hanger wires.
5. Space hangers not more than 48 inches o.c. along each member supported directly from hangers unless otherwise indicated; provide hangers not more than 8 inches from ends of each member.
6. Size supplemental suspension members and hangers to support ceiling loads within performance limits established by referenced standards.

C. Install edge moldings and trim of type indicated at perimeter of acoustical ceiling area and where necessary to conceal edges of acoustical panels.
1. Apply acoustical sealant in a continuous ribbon concealed on back of vertical legs of moldings before they are installed.
2. Screw attach moldings to substrate at intervals not more than 16 inches o.c. and not more than 3 inches from ends. Miter corners accurately and connect securely.
3. Do not use exposed fasteners, including pop rivets, on moldings and trim.

D. Install suspension-system runners so they are square and securely interlocked with one another. Remove and replace dented, bent, or kinked members.

E. Install acoustical panels with undamaged edges and fit accurately into suspension-system runners and edge moldings. Scribe and cut panels at borders and penetrations to provide precise fit.

3.4 ERECTION TOLERANCES

A. Suspended Ceilings: Install main and cross runners level to a tolerance of 1/8 inch in 12 feet, non-cumulative.

B. Moldings and Trim: Install moldings and trim to substrate and level with ceiling suspension system to a tolerance of 1/8 inch in 12 feet, non-cumulative.

3.5 CLEANING

A. Clean exposed surfaces of acoustical panel ceilings, including trim, edge moldings, and suspension-system members. Comply with manufacturer's written instructions for cleaning and touchup of minor finish damage.

B. Remove and replace ceiling components that cannot be successfully cleaned and repaired to permanently eliminate evidence of damage.

END OF SECTION 095113

DIVISION 23 - TABLE OF CONTENTS

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SECTION 23 01 00 - MECHANICAL GENERAL

PART 1 GENERAL REQUIREMENTS

1.1 DEFINITIONS

A. Piping: Pipe, fittings, flanges, valves, controls, hangers, supports, traps, drains, gauges, insulation, vents and items customarily required in connection with the transfer of fluids.

B. Ductwork: All air distribution, re-circulation and exhaust ducts, whether of sheet metal or other material, and includes all connections, hanger, supports, damper controls, insulation, accessories, fire and smoke control devices, and appurtenances necessary for and incidental to a complete system.

C. Provide: Furnish and install complete ready for use.

D. Furnish: Purchase and deliver to the project site complete with every necessary appurtenance and for installation.

E. Install: Unload at the delivery point and perform every operation necessary to establish secure mounting and correct operation at the proper location in the project.

F. Concealed: Embedded in masonry or other construction, installed behind wall furring, above ceilings, in crawl spaces, in shafts or otherwise not visible.

G. Exposed: Not concealed.

H. By other Trades: Shall mean by persons or parties who are not anticipated to be the Subcontractor for this trade working together with the Prime Contractor. In this context the words “by other trades” shall be interpreted to mean not included in the overall contract.

I. Contractor: As used in this Division of the specification refers to the Mechanical Contractor unless specifically noted otherwise.

1.2 INTERPRETATION OF CONTRACT DOCUMENTS

A. This section of the specifications and related drawings describe general provisions applicable to every section of Division 23.

B. Attention is directed to, General Conditions, which are binding in their entirely on this portion of the work and in particular to paragraphs concerning materials, workmanship and substitutions.

C. Mention in these specifications, indications and reasonable implications on drawings, whereby articles, materials, operation or methods related to execution of the mechanical work are noted, specified, drawing or described, thereby requires execution of each such item of work and provision of all labor, materials, equipment and appurtenances required for execution thereof.

D. Particular attention is directed to the drawings and other contract documents for information pertaining to required items or work which are related to and usually associated with the work of this Division of the specifications, but which are to be provided as part of the work of other Divisions of the specifications.

E. No exclusions from, or limitations in, the language used in the drawings or specifications shall be interpreted as meaning that the appurtenance or accessories necessary to complete any required system or item of equipment are to be omitted.

F. The drawings of necessity utilize symbols and schematic diagrams to indicate various items of work. Neither of these have any dimensional significance nor do they delineate every item required for the intended installations. The work shall be installed, in accordance with the intent diagrammatically expressed on the drawings, and in conformity with the dimensions indicated on final architectural and structural working drawings and on equipment shop drawings. No interpretation shall be made from the limitations of symbols and diagrams that any elements necessary for complete work are excluded. When abbreviations appear on the drawings or specification in lower case letter with or without periods, their meanings shall be the same as stated above.

G. Certain details appear on the drawings which are specific with regard to the dimensioning and positioning of the work. These details are intended only for the purpose of establishing general feasibility. They do no obviate field coordination for the indicated work.

H. Information as to the general construction shall be derived from structural and architectural drawings and specifications only.

I. The use of words in the singular shall be considered as limited where other indications denote that more than one item is referred to.

J. Submission of a proposal and ultimate acceptance of an agreement or contract for execution of this section of work will be construed as evidence that the Prime Contractor, Subcontractor and Vendor has carefully read and accepts all conditions set forth in each division. insofar as such conditions may affect both the bidding for and execution of this section of work.

1.3 QUALITY ASSURANCE AND WARRANTY

A. The Contractor shall guarantee all work, materials and equipment furnished against defects, leaks, performance and non-operation for a period of one (1) year after the date of the Owner's final acceptance, or as indicated in the General Conditions. Warranties to extend past this date are defined in individual equipment specification sections. Defects shall be interpreted as defective materials or equipment or unsatisfactory installation and are not intended to apply to ordinary wear and tear. The Contractor shall pay for any repairs or replacements caused by these defects within the period covered by the guarantee, including all incidental work required to correct the deficiency.

B. All equipment and materials required for installation under these specifications shall be new and without blemish or defect. All equipment shall bear labels attesting to Underwriters Laboratories approval where subject to Underwriters Laboratories label service. Where no specific indication as to the type or quality of material or equipment is indicated, a first-class standard article shall be furnished. All manufacturers of equipment and materials pertinent to these items shall have been engaged in the manufacturers of said equipment a minimum of three (3) years and, if so directed by the Designer, be able to furnish proof of their ability to deliver this equipment by submitting affidavits supporting their claim.

C. Each major component of equipment shall have the manufacturer's name, address, model number and rating on a plate securely affixed in a conspicuous place. The nameplate of a distributing agent will not be acceptable. UL or other label, or other data which is die-stamped into the surface of the equipment shall be stamped in a location easily visible. Performance as delineated in schedules and in the specifications shall be interpreted as minimum performance.

D. All equipment of one type (such as fans, pumps, valves, grilles, etc.) shall be the products of one manufacturer unless specifically stated otherwise.

E. Where the specifications do not list a specific model number for a manufacturer, the construction of a product shall be equal to those models specifically listed.

F. All welders shall be certified by the National Certified Pipe Welding Bureau for the appropriate service, and shall perform all welding in accordance with Welding Bureau's procedures and the ASA Code for pipe welding. Welding and welder qualifications shall be in accordance with ASME Section IX.

1.4 REQUIREMENTS OF REGULATORY AGENCIES

A. Contractors shall submit to the appropriate Regulatory Agencies all items necessary to obtain all required permits obtain such required permits and pay all required fees.

B. All work shall conform to the following Standards and Codes (applicable edition):

1. North Carolina State Building Code.
2. National Fire Protection Association.
3. Uniform Boiler and Pressure Vessel Act of N.C. (Boiler Code)

C. Where applicable, all fixtures, equipment, and materials shall be as approved or listed by the following:

1. Factory Mutual Laboratories (FM).
2. Underwriters Laboratories, Inc. (UL).
3. CSA
4. ETL
5. AGA
6. AWWA

D. All fuel fired equipment shall meet the requirements of the agencies listed and also meet the Owner's insurer requirements.

1.5 STANDARDS AND PROCEDURES:

1. ADC: Air Diffusion Council.
2. AMCA: Air Moving and Conditioning Association, Inc.
3. ANSI: American National Standards Institute.
4. API: American Petroleum Institute.
5. ARI: American Refrigeration Institute.
6. ASHRAE: American Society of Heating, Refrigeration and Air Conditioning Engineers.
7. ASME: American Society of Mechanical Engineers.
8. ASTM: American Society of Testing and Materials.

9. IBR: Institute of Boiler and Radiator Manufacturers.
10. MSS: Manufacturers Standardization Society.
11. NEMA: National Electrical Manufacturer's Association.
12. OSHA: Occupational Safety and Health Administration.
13. SMACNA: Sheet Metal and Air Conditioning Contractors National Association, Inc.

B. Where reference is made to ASA Standards it shall be understood that this reference is to the standards published by ANSI.

C. Include all items of labor and materials required to comply with such standards and codes. Where quantity, sizes or other requirements indicated on the drawings or herein specified are in excess of the standard or code requirements, the specifications or drawings, respectively, shall govern.

1.6 VERIFICATION OF DIMENSIONS AND LOCATIONS:

A. The Contractor shall visit the premises and thoroughly familiarize himself with all details of the work, working conditions, verify all dimensions in the field, advise the Designer of any discrepancy, and submit shop drawings of any changes he proposes to make, in quadruplicate for approval, before starting the work. Contractor shall install all equipment in a manner to avoid building interference.

B. The location of duct, pipe, fixture, equipment and appurtenances for existing facilities are shown on plans to indicate the extent of work required. Exact condition shall be field verified.

1.7 COORDINATION WITH OTHER TRADES:

A. Coordinate all work of each section with work of other sections to avoid interference. Bidders are cautioned to check their equipment against space available as indicated on drawings, and shall make sure that proposed equipment can be accommodated. If interferences occur and clearances cannot be maintained as recommended by manufacturer and as required for maintenance and inspection of equipment, Contractor shall bring them to the attention of Designer, in writing, prior to signing of contract; or, Contractor shall, at his own expense, provide proper materials, equipment, and labor to correct any damage due to defects in his work caused by such interferences.

B. Prepare composite coordination drawings at a scale of ¼" = 1'-0" or larger, detailing major elements, components, and systems of mechanical equipment and materials in relationship with other systems, installations, and building components (For all four floor levels including all mechanical areas (first floor mechanical room, penthouse, and roof plan)). Indicate locations where space is limited for installation and access and where sequencing and coordination of installations are of importance to the efficient flow of the work. The Mechanical Contractor will administer the effort of coordination between various trades. The coordination drawings will be prepared and reviewed approved by Engineer of Record and CxA before installation of any plumbing, sprinkler, mechanical or electrical work and will be shown as a task on the Project Schedule to be prepared by the General Contractor.

1.8 WORKMANSHIP

A. Workmen to be thoroughly experienced and fully capable of installing assigned work. Work to be in accordance with the best standard practice of the trade. Work that is not of good quality will require removal and reinstallation at no additional expense to Owner and as approved.

B. All material and equipment to be installed in accordance with manufacturer's printed recommendations (using recommended accessories) and/or as approved by the Designer. Retain a copy on job site and submit others for approval when required.

PART 2 PRODUCTS

THIS PART NOT USED.

PART 3 EXECUTION

3.1 SURFACE CONDITIONS:

A. Inspection:

1. Prior to any work, the Contractor shall carefully inspect the installed Work of all other Trades and verify that all such Work is complete to the point where his installation may properly commence.

2. Verify that all equipment may be installed in accordance with all pertinent codes and regulations, the original design and the referenced standards.

B. Discrepancies:

1. In the event of discrepancy, immediately notify the Designer.
2. Do not proceed with installation in areas of discrepancy until such discrepancies have been fully resolved.

3.2 INSTALLATION

A. Install all equipment and appurtenances in strict accordance with the manufacturer's recommendations.

3.3 PROTECTION AND CLEANING OF SYSTEMS AND EQUIPMENT

A. Protect all materials and equipment from damage during storage at the Site and throughout the construction period. In the event of damage prior to final inspections, the Contractor shall repair or replace damaged items as determined by the Architect/Engineer, at no cost to the Owner.

B. Damage from rain, dirt, sun, and ground water shall be prevented by storing the equipment on elevated supports and covering them on all sides with securely fastened protective rigid or flexible waterproof coverings.

C. During construction cap the top of all ductwork and piping installed vertically.

D. Periodically during construction and prior to Owner acceptance of the building, Contractor shall remove from the premises and dispose of all packing material and debris. All adjacent occupied areas shall be cleaned daily to remove dirt and debris resulting from this work.

3.4 SUBSTITUTION OF EQUIPMENT

A. Requests for substitutions of products may be made during the bidding period by submitting completed substitution request accompanied by information sufficient for the Engineer to make a determination as to the equivalency of a product.

B. The Engineer will consider requests utilizing this section for substitution of products in place of those specified.

C. Submit 14 calendar days prior to Bid Date. No substitutions will be reviewed or accepted after this date unless there is an obvious advantage to the Owner.

D. Substitution requests may be submitted by U.S. Postal Service or facsimile machine (FAX).

E. Prime Bidders shall request a substitution on the letterhead stationary of the Prime Bidder submitting the request. Requests from individual manufacturers will not be accepted.

F. Submit separate request for each substitution. Support each request with the following information. All items must be addressed.

G. Complete data substantiating compliance of proposed substitutions with requirements stated in Contract Documents:

1. Product identification, including manufacturer's name and address.

2. Manufacturer's literature, identifying:

   a) Product description.
   b) Reference standards.
   c) Performance and test data.

3. Name and address of similar projects on which product has been used and date of each installation.

4. Itemized comparison of the proposed substitution with product specified, listing significant variations.

5. Data relating to changes in construction schedule, if any.

6. All effects of substitution on separate contracts.

7. List of changes required in other work or products.

8. Designation of availability of maintenance services and sources of replacement parts.

H. Substitutions will not be considered for acceptance when:

1. Acceptance will require substantial revision of Contract Documents.

2. In judgment of Engineer, substitution request does not include adequate information for a complete evaluation.

3. Requests for substitutions not submitted by a Prime Bidder.

4. Where the effect on the schedule will be negative.

I. In making formal request for substitution, the Prime Bidder represents that:

1. The Prime Bidder has investigated proposed product and has determined that it is equivalent to or superior in all respects to that specified.

2. The Prime Bidder will provide the same warranties or bonds for substitution as for product specified.

3. The Prime Bidder will coordinate installation of accepted substitution into the Work and will make such changes as may be required for the Work to be complete in all respects.

3.5 SUBMITTALS

A. Refer to Division 1 for information on submittal requirements. When conflicts exist, Division 1 shall apply.

B. The terms “Submittals” can generally be used to indicate any information which is required to be reviewed by the A/E before further action on that product can be taken by the Contractor. This may include product data sheets, shop drawings, and schedules.

C. Submittals generally not required when equipment is purchased exactly as specified and scheduled. Submit list of such equipment only. Equipment data sheets must be included in project manual prepared for Owner.

D. PRODUCT SUBMITTALS

The following product data information shall be submitted:

PRODUCT	SUBMITTED	APPROVED
Dampers	_____	_____
Duct Access Doors	_____	_____
Duct Sealants	_____	_____
Fire and Smoke Dampers	_____	_____
Fire Stop Material	_____	_____
Sheet Metal Specialties	_____	_____
Temperature Controls/BAS	_____	_____

E. TEST AND REPORT SUBMITTALS:

The following list may be used as a checklist for the Contractor and A/E. All tests may not be listed.

1. <u>TEST</u>

a) System start-up
b) Test and Balance Agency Construction report.
c) All required Test Reports.

F. CONTROL SUBMITTAL:

Submit drawings on control systems including the following.

1. All control components
2. All information necessary for a clear representative of the system to be provided.
3. Graphical representative of all systems to be controlled.
4. I/O summary sheets.
5. Floor plan indicating panels.
6. Sequence of operation. All devices referenced in the sequence shall be indicated on graphic representation.
7. Large scale (75% reduction maximum) of a control panel faces.
8. Wiring diagrams including interface with equipment (terminal strip, contactor, etc.)

G. FIRE PENETRATION SYSTEMS SUBMITTAL:

1. Each type system penetrating a fire rated assembly shall be identified by the Contractor. The Contractor shall demonstrate his understanding of fire stop systems by the following:

2. Submit 3/4 inch scale drawings of each assembly indicating type penetrations, slab, floor, wall or roof system, fire stop materials used, thickness and all other pertinent details. Submittal shall be neatly and accurately drafted.

3. Each type system penetrating a fire rated assembly shall be identified by the Contractor. Provide approved installation details with agency approval indicated thereon.

3.6 RECORD DRAWINGS:

A. The Contractor shall keep a record set of drawings on the job and, as construction progresses, shall shown the actual installed location of all items, material and equipment of these job drawings.

B. At the time of final inspection, two corrected sets of prints and sepias shall be delivered to the Designer. All drawing costs to be paid by the Contractor.

C. Sepias shall be corrected deleting incorrect locations and showing installed locations in accordance with information transferred from job drawing.

D. Qualified draftsmen shall perform this task.

3.7 OPERATION AND MAINTENANCE MANUALS:

A. The Contractor shall compile and bind three (3) sets of all manufacturer's instructions and descriptive literature on all items of equipment furnished under this work.

B. Binder shall be hard cover, three-ring notebook, 11" x 8-1/2" with heavy duty rings. Maximum binder size shall be 2-1/2".

C. The front of the binder shall be titled "Mechanical Operating and Maintenance Instructions," with the name of the job and documents date under the title.

D. The following diagrams, schematics and lists shall be framed under glass and hung adjacent to equipment, in mechanical rooms, or where directed by Owner.

1. Automatic control diagrams.
2. Sequence of operation.
3. Valve Tag List

3.8 OPERATIONAL AND MAINTENANCE INSTRUCTION:

A. After all final tests and adjustments have been complete, a competent employee of the Contractor shall be provided to instruct the Owner's Representative in all details of operation and maintenance for equipment installed. Supply qualified personnel to operate equipment for sufficient length of time after instructions to assure that Owner's Representative is qualified to take over operation and maintenance procedures. Instruction periods shall be as designated by the Owner and shall not necessarily be consecutive. Minimum instruction periods shall be a follows:

1. Air handling units, Chilled Water, Hot Water, and Steam Systems (1 working day)
2. Air distribution system and Exhaust Systems (1/2 working day)

B. Instruction period shall be performed during the forty-five (45) days following substantial completion at time periods as approved by Owner.

3.9 CONTROLS OPERATION AND MAINTENANCE INSTRUCTION:

A. Upon completion of Operation and Maintenance instructions, competent employees of the Control Contractor shall be provided to instruct the Owner's representative in all details of operation and maintenance for the controls installed. Supply qualified personnel to operate system for sufficient length of time after instructions to assure the Owner's Representative is qualified to take over operation and maintenance procedures.

B. Controls Operation and Maintenance Instruction shall include the entire control system including control sequences that are inherent to equipment provided by the Equipment Manufacturer including economizer cycles, burner operation, low ambient operation, freezstats and similar sequences. Contractor shall provide sufficient personnel equipment walkie-talkies, gauges, and other accessories for this work.

C. Instruction periods shall be as designated by the Owner and shall not necessarily be consecutive. Minimum instruction periods shall be one (1) working day for on-site training.

D. Instructional period shall be performed during the forty-five (45) days following substantial completion at time periods as approved by Owner. One (1) day of instructions shall be in a formal classroom setting as determined by the owner.

E. Classroom instructions shall be video taped by the Contractor. A copy of each tape shall be provided to the Owner. Contractor shall be responsible for all equipment, tapes, and accessories required.

3.10 GENERAL COMPLETION AND DEMONSTRATION:

A. RESULTS EXPECTED:

1. All systems and controls shall be complete, tested and operational.

2. All start-up and testing and balancing shall be complete.

3. All equipment shall be thoroughly cleaned. All excess materials and all debris shall be removed from the site.

4. All walls, floors, ceilings and other surfaces marred or otherwise damaged as a result of execution of this contract shall be cleaned and repaired to the satisfaction of the Designer and Owner.

END OF SECTION

SECTION 23 03 00 - ELECTRICAL WORK FOR MECHANICAL SYSTEMS

PART 1 GENERAL

1.1 SECTION INCLUDES

A. 120V and 24V control Wiring

B. Electrical wiring.

C. Starters and controllers

1.2 CODES, STANDARDS, QUALIFICATIONS

A. All work shall conform to all sections of the most current North Carolina State Building Codes

B. All work shall conform to all North Carolina Department of Administration State Construction Office Guidelines.

C. Electrical equipment shall be listed and/or labeled by an independent testing agency approved by the State Building Code.

D. Enclosure for electrical equipment and enclosed switches shall meet NEMA standards.

PART 2 PRODUCTS

2.1 WIRING

A. All wiring and conduit shall be in accordance with the requirements of Division 26.

B. Low voltage control wiring shall be not less than #18 gauge copper wire run in metallic conduit.

C. Low voltage shall be defined as a circuit operating at less than 30 volts and meeting the requirements of NEC Section 720 for Class I, power limited circuits.

PART 3 EXECUTION

3.1 WIRING

A. Regardless of voltage, furnish and install all temperature control wiring, and all interlock wiring and equipment control wiring for the equipment furnished.

B. Electrical Contractor will furnish and install all power wiring to load side of starters (see details on plans). The mechanical contractor shall furnish disconnects for equipment. Mechanical contractor shall provide all line side power wiring (see details on plans) and temperature control and interlock wiring. Controllers and controls shall be provided by the Mechanical Contractor.

C. Check with Electrical Contractor on service outlets provided to determine that service, circuit protection, switches and wiring provided are of adequate size to meet Code requirements for equipment provided. Discrepancies shall be brought to the attention of the Designer before work is installed. Cost

for changes not so noted shall be at the expense of this Contractor. Electrical cost increase due to equipment substitution of different electrical characteristics shall be this Contractor's expense.

D. Provide necessary electrical data for all equipment to the Electrical Contractor for proper coordination.

E. Control and interlock wiring shall be run in conduit.

F. Unless otherwise noted or specified, all low voltage and line voltage control and instrumentation wiring and devices for equipment furnished under Division 23 shall be provided as part of this Division 23. Control wiring is considered to be the portion of the wiring which carries the electric signal directing or indicating the performance of a starter, relay, or contactor generally installed between starters, indicators, and remote control devices. All wiring from indicated or available electrical source in the electrical room and/or mechanical room to direct digital control panels shall be provided as part of this Division.

G. Examine the drawings, and in cooperation with the Electrical Contractor, confirm the final location of all electrical equipment to be installed in the vicinity of piping. Plan and arrange all overhead piping to be no closer than 24" from the vertical line to electric motor controllers, switchboards, panelboards, or similar equipment. If the vertical line is less than 24", the installation of piping shall be relocated.

END OF SECTION

DIVISION 26 – TABLE OF CONTENTS

McKIM&CREED

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SECTION 26 05 00 – COMMON WORK RESULTS FOR ELECTRICAL

PART 1 GENERAL

1.1 REQUIREMENTS

A. General Conditions of the Contract, Supplementary General Conditions, Instructions to Bidders, and General Requirements sections contained in the contract documents are a part of these Specifications.

1.2 EXTENT OF THE WORK

A. This Contractor shall furnish all labor, materials, and equipment, and perform all operations necessary for installation of complete electrical work within the intent of, and as indicated on, the drawings and as herein specified.

1.3 REGULATIONS AND COMPLIANCE

A. Latest editions of the National Electrical Code and the North Carolina State Building Code govern this work. All of their requirements shall be satisfied.

B. This Contractor shall secure and pay for all permits, fees, inspections, and licenses required. The electrical contractor shall notify the Office of the State Electrical Inspector at the State Construction Office (SCO) (authority having jurisdiction), to schedule required electrical inspections including, but not limited to, rough-in, above ceiling, and final inspections. Upon completion of the job he shall present to the Engineer a certificate of inspection and approval from the inspection authorities.

PART 2 PRODUCTS

2.1 MATERIALS

A. All materials shall be new, with required Underwriter's Laboratories (or other agency approved by the State) label, and with manufacturer's label or nameplate giving complete electrical data.

B. Where a manufacturer's catalog number is used, all parts shall be furnished to make it complete and to fit the construction intended.

C. Within ten days after award, Contractor shall submit to Engineer a complete list in triplicate of all materials he proposes to use. List shall show a single manufacturer with not only major materials and equipment, but also such items as condulet fittings, raceway supports, conductive pipe thread compound, asphaltum, sealing material, clamps, anchors, outlet boxes, gutters, terminal cabinets, wire-pulling compound, splice connectors, tape, wire markers, lamps, etc.

D. Material shall be the make and number given in these Specifications or shown on Drawings, or equivalent where specifically stated as being allowed. Equivalent items or materials will be subject to acceptance by the Engineer at submittal stage. If Contractor wishes to furnish a substitute for

the item(s) specified (or equivalent where allowed), he shall furnish complete, detailed data and obtain approval of the substitution in writing from the Engineer no later than ten (10) days prior to bid. In some cases, at the request of the Engineer, samples of the substitute items shall be submitted for review. Data (and sample if required) shall be submitted in a timely manner such that approval by Engineer can be returned to Contractor no later than 15 days prior to bid date. Data or sample not submitted in sufficient time to allow evaluation by Engineer will be automatically rejected.

E. Engineer's review of samples, cut sheets, shop drawings, and other matter submitted by the Contractor shall not relieve the Contractor of responsibility for full compliance with the Drawings and Specifications. If a submitted item does not comply in any way (color, style, quality, function, or performance), Contractor shall call the specific non-compliance to the attention of the Engineer in writing in a cover letter to the submittals requesting a deviation from specifications. This does not imply that approval of requested deviation will be given, only that it will be reviewed.

F. Engineer's review of submittals is not intended to confirm quantity counts of materials and equipment made by Contractor. Contractor is required to provide quantities of items as necessary for systems to function as described and shown on the plans and in these specifications.

G. Specialty systems such as fire alarm systems, etc., that are included as part of the Electrical Contract shall be furnished and installed by an authorized representative of the manufacturer of the equipment supplied. This includes use of factory trained and authorized installers where required to fulfill manufacturer's warranty provisions.

H. Submit cuts of fixtures, shop drawings on panels, and other descriptive materials requested, in six copies, or as required by the General Requirements section. Submittals will not be accepted or reviewed by the Engineer unless the electrical contractor's stamp signifying his review and approval is evident on the submittals.

I. Materials should be inspected upon their arrival at the site to be sure they are correct. No extension of time for completion will be allowed because materials received are wrong. Completely adequate housing shall be provided on the site for orderly and careful storage of all materials and equipment. Nothing shall be stored outside except conduit, which may be stored in racks so it is at least twelve (12) inches above ground and not subject to mud being spattered on it.

2.2 PAINTING

A. Suitable finish coatings shall be provided under this section of the Specifications on all items of electrical equipment and wiring which are exposed. This shall consist of either an approved factory applied finish or an acceptable finish applied during or after installation. Equipment which is furnished in finishes such as stainless steel or satin aluminum are not to be painted. Exposed equipment and/or wiring in finished areas such as panel covers or surface raceway shall be supplied with factory applied prime coat and shall be professionally painted or enameled as directed to result in a completely coated and attractively finished manner. All such finishing shall be as directed by and shall be satisfactory to the Architect and Engineer.

PART 3 EXECUTION

3.1 GENERAL INSTALLATION

A. The electrical drawings are diagrammatic only, and are intended to explain system function and define quality of materials and installation. They are not intended to define construction methods.

B. Contractor shall keep on the site at all times one set of electrical drawings and specifications, and one set of drawings and specifications on the work of other trades. In addition, one complete set of all electrical submittals and shop drawings shall be maintained at the site by the electrical contractor.

C. The electrician shall check other trades' drawings, specifications, and shop drawings to see if there are any conflicts or discrepancies. If so, he shall contact the Engineer for instructions.

D. The Contractor shall properly protect his work against damage by weather or other trades. All work shall be left well cleaned, and damaged finishes shall be restored to original condition.

E. The Contractor shall place his own sleeves and notify other trades of chases and openings far enough ahead so they can be properly built in. Where any raceways, supports, etc., installed under the contract pierce the roof, suitable pitch pockets shall be provided and coordinated with the roofing contractor as necessary to be acceptable to the Engineer. Provide suitable fittings where any raceways or equipment cross expansion joints.

F. This contractor shall be responsible for all trenching, backfilling, cutting, core drilling, and patching related to his work.

G. Contractor shall provide firestops and smoke seals per Project Specifications and UL Details shown on drawings. All penetrations shall be sealed accordingly.

H. Contractor should not scale drawings for outlet and equipment locations. Unless specifically dimensioned on drawings or defined in specifications, outlets and equipment shall be located as evidently intended or as detailed on Architectural drawings. Lighting outlets are to be centered or spaced symmetrically unless they are dimensioned. Any dimensions shown on the drawings shall be verified in the field by the contractor prior to roughing. All outlet and equipment locations shall be coordinated with the other trades. If any doubt arises, contact the Engineer prior to roughing.

I. Contractor shall keep premises free of debris resulting from this work.

3.2 TESTS AND GUARANTEES

A. All current-carrying phase conductors and neutrals shall be tested as installed, and before connections are made, for insulation resistance and accidental grounds. Each fixture and item of equipment for connection under the Contract shall be tested for insulation resistance from its conductors to its grounded surface or contact. These tests shall be done with a 500 volt (minimum) high voltage "megger."

1. Minimum readings shall be one million (1,000,000) or more ohms for #6 AWG and smaller wire, 250,000 ohms or more for #4 AWG and larger wire, between conductors and between conductor and the grounding conductor.

2. After all fixtures, devices, and equipment are installed and all connections completed to each panel, the contractor shall disconnect the neutral feeder conductor from the neutral bar and take a megger reading between the neutral bar and the grounded enclosure or ground bar. If this reading in less than 250,000 ohms, the contractor shall disconnect the branch circuit

neutral wires from this neutral bar. He shall then test each one separately to the panel and until the low readings are found. The contractor shall correct troubles, reconnect and retest until at least 250,000 ohms from the neutral bar to the grounded panel can be achieved with only the neutral feeder disconnected.

3. The Contractor shall send a letter to the engineer certifying that the above has been done and showing the tabulation of the megger readings for each panel or feeder. This shall be done at least four (4) days prior to final walk-through by engineer and SCO.

4. At final walk-through by the engineer and SCO, the contractor shall furnish a megger and demonstrate that the panels comply with the above requirements. He shall also furnish a clamp-on type ammeter and a voltmeter to take current and voltage readings as directed by the engineer, or SCO representatives.

B. Validity of the ground path shall be assured by constant and careful attention to the thorough tightening of all couplings, connectors, locknuts, screws, bolts, etc., and by frequent checking of the path resistance with a quality low-range ohmmeter. Resistance of the path should not exceed one ohm between any two points. If a reading in excess of this is observed, it shall be discussed with the Engineer for an appraisal of the condition.

C. Contractor shall guarantee that the work is done in accordance with drawings and specifications, and that it is free of imperfect materials or defective workmanship. Anything unsatisfactory shall be corrected immediately and at Contractor's expense.

D. For the period of one year after acceptance by the Owner, the Contractor shall replace, without any expense to the Owner, any imperfect materials or defective workmanship.

3.3 RECORD DRAWINGS/MANUALS

A. Upon completion of the installation, Contractor shall submit to the Engineer marked prints of Drawings showing any changes made in circuits, location of equipment, panelboards, or any other revision in the Contract Drawings, for the Owner's use in maintenance work and for future additions and expansions. Marked changes shall also include changes due to change orders unless already recorded by revised drawing or bulletin drawing.

B. These record drawings shall be submitted in one of two formats: either a clean, legible, marked set of prints with all markings in distinguishable colored pencil such as red; or a set of reverse-run reproducible sepia prints marked in soft pencil so that blue-line prints can be reproduced as required. The format to be used shall be as defined in the General Requirements section of the contract documents. If no format is defined, the marked blue-line prints shall be submitted.

C. Operation and Maintenance manuals shall be submitted to the Engineer at the end of the project prior to closeout of the project. Information included shall be a copy of all submittal data, shop drawings, and necessary operating and maintenance instructions and wiring diagrams on all major items of equipment and all special systems (fire alarm, intercom, etc.). Submit these manuals in the quantities and format described in the General Requirements Section.

END OF SECTION 260500

SECTION 26 05 19 – LOW-VOLTAGE ELECTRICAL POWER CONDUCTORS AND CABLES

PART 1 GENERAL

1.1 REQUIREMENTS

A. All material shall be U.L. listed and shall be installed in conformance with the National Electrical Code.

PART 2 PRODUCTS

2.1 MATERIALS

A. Manufactured by Southwire, Rome, or Triangle.

B. Normal trade standard "building wire" of copper.

C. Power and lighting circuits #10 AWG and smaller shall have solid copper conductors. Conductor sizes #8 AWG and larger shall have Class B stranded copper conductors. Maximum conductor size shall be 500 Kcmil.

D. All sizes shall bear easily readable size and insulation grade marking along entire length.

E. Insulation on #6 and smaller shall be suitably colored in manufacturing. Conductors #4 and larger may be identified with bands of proper color plastic tape near each termination and in each junction box.

F. Insulation on service and feeders shall be 600 volt Type XHHW or THHN/THWN unless shown otherwise on the drawings.

G. Branch circuits shall be a minimum of #12, with 600 volt THHN/THWN insulation unless Code requires another type. Circuit wires carried through rows of fluorescent fixtures shall be at least Type THHN.

H. Conductors in any location subject to temperatures higher than 60^{O}C shall have insulation of a type approved by NEC for temperature encountered.

I. Control and signal conductors shall be type and size indicated in those sections of the Specifications, or as indicated on drawings.

J. Conductors for branch circuits shall be sized to prevent a voltage drop exceeding three percent (3%) at the farthest outlet of power, heating and lighting loads, or any combination of such loads. The maximum total voltage drop on both feeders and branch circuits combined to the farthest outlet shall not exceed five percent (5%). Where the conductor length from the panel to the first outlet on a 277V circuit exceeds 125 feet, the branch circuit conductors from the panel to the first outlet shall not be smaller than #10 AWG. Where the conductor length form the panel to the first outlet on a 120 volt circuit exceeds 50 feet, the branch circuit conductors from panel to the first outlet shall not

be smaller than #10 AWG. Where ungrounded conductors are increased in size from the minimum size that has sufficient ampacity for the intended installation, wire-type equipment grounding conductors, where installed, shall be increased in size proportionately according to the circular mil area of the ungrounded conductors

PART 3 EXECUTION

3.1 INSTALLATION

A. All wiring shall be color coded:

1. On 120/208 volt, 3 phase, 4 wire systems - phase A, black; phase B, red; phase C, blue; neutral, white. On 277/480 volt, 3 phase, 4 wire systems - phase A, brown; phase B, orange; phase C, yellow; neutral, natural gray. Ground conductor on all systems shall be green.

2. Unless noted or accepted otherwise, busses in panels and switchgear shall be considered "A", "B", and "C" from left to right, top to bottom, or front to back when facing equipment.

3. Control wiring shall not use black, red, or blue; but shall use white for neutrals and green for grounding. Any other colors may be used but the coding shall provide same color between any two terminals being joined.

4. Switchlegs, including "travelers" in 3-way and 4-way switching systems, shall be same color as phase leg.

B. Joints in #10 and smaller wire may be either made with approved twist-type connectors such as Ideal, Buchanan, T&B, Scotch, etc. “Stakon” or other permanent type crimp connectors shall not be used for branch circuit wiring.

C. Joints in #8 and larger wire shall be made with approved Burndy, T&B, or O.Z. Manufacturing Co., mechanical pressure type connectors or lugs along with their UL approved insulating covers.

D. Manufactured insulators for connectors may be used, provided they cover completely and securely all exposed metal. If joints and splices are taped, they shall be carefully covered with top-grade Okonite, Scotch Brand, or approved equivalent plastic or rubber and friction, laid on with half laps to result in a joint insulation equivalent to that of the conductor insulation.

E. Circuit joints shall not be made on twin screws of convenience receptacles. Make joints as described above and run single leads to receptacle.

F. All wiring lugs throughout the project, including, but not limited to, breakers, panelboard/switchboard lugs, safety switch lugs, and transformers lugs, shall be rated for use with 75 degree conductors sized in accordance with NEC Table 310.15(B)(16).

G. Wm. Brady Co., or approved equivalent, labels or the type made with a punch on plastic tape, giving the circuit number, shall be securely fastened to each branch circuit conductor within panelboards. They shall also be installed on all conductors within junction boxes, pull boxes, gutters, wireways, cabinets, or equipment where two or more wires of the same color occur.

H. Where connected under screw or bolt heads, stranded wire shall be fitted with a lug of proper size. Make solid conductor loops clockwise so as to be forced closed as screw is tightened. Only one solid wire loop may be held under a single screw.

I. Make all connections tight.

J. Wires within panelboards, terminal cabinets, and similar equipment shall be neatly squared.

K. Where paralleling of conductors is shown for feeders or service entrance, it is absolutely required they be exactly the same length between points of bonding together. Lay out side by side and cut to same length before drawing into raceways. Provide for each end of run a Burndy Q2A or W3A lug, or approved equal, and terminate parallels in these without cutting.

L. Individual branch circuits are not to have shared neutrals.

END OF SECTION 260519

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SECTION 26 05 23 – CONTROL-VOLTAGE ELECTRICAL POWER CABLES

PART 1 GENERAL

1.1 REQUIREMENTS

A. Shall conform with Article 725 of NEC.

PART 2 PRODUCTS

2.1 MATERIALS

A. Shall also conform with the following unless noted otherwise on drawings or in other sections of these Specifications:

1. Conductors shall be run in metal conduit, unless specifically stated otherwise. These shall be complete with outlet boxes, junction boxes, fittings, etc., conforming in all respects with Section 26 05 33.

2. Conductors shall be #14 AWG minimum, stranded copper, and insulated with type THHN thermoplastic insulation rated for 600 volts.

3. Conductors shall be colored in manufacture. Black, red, and blue shall be used only for connections of these wiring systems to proper phase in main wiring system. Color code throughout remainder of system shall be other colors selected by This Contractor, but same color shall be used between points of connection. In other words - do not change color at splices, in junction boxes, etc. White shall be reserved for neutral and green for grounding.

4. In lieu of color coding, or in conjunction with, this Contractor shall identify each conductor using a label system, such as Brady labels, or equal. Each conductor shall be individually labeled with a distinctive number or number/letter combination at each termination point, including wire nut connections. A table shall be made identifying each conductor, its function, its origin, its final termination, etc. This table shall be typewritten and included in the final Operation and Maintenance Manuals and with a copy left in the main point of origin cabinet (such as fire alarm panel).

B. Joints and connections shall be made as specified in Section 26 05 19.

PART 3 EXECUTION

THIS SECTION NOT USED

END OF SECTION 260523

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SECTION 26 05 26 – GROUNDING AND BONDING FOR ELECTRICAL SYSTEMS

PART 1 GENERAL

1.1 REQUIREMENTS

A. All systems and equipment shall be grounded in accordance with NEC Article 250.

PART 2 PRODUCTS

2.1 MATERIALS

A. Manufactured by Thomas & Betts, Harger Lightning Protection, Lightning Master Corporation or approved equivalent.

B. Bonding shall be done with #3800 series insulated bonding bushings and compression type lugs.

C. Grounding conductor shall be THHN/THWN run in heavy wall conduit, and of size shown on drawings or required by NEC.

PART 3 EXECUTION

3.1 INSTALLATION

A. Generator Grounding: In addition to the clamp on the water main, a supplemental electrode shall be provided. This supplemental electrode shall consist of the following: three (3) 10 foot minimum copper clad ground rods, 3/4" in diameter, driven to a depth so top of rod is below finished grade. Grounding conductor shall be continuous and sized as shown on plans. The grounding conductor conduit shall be fastened to service enclosure with double locknuts and bonding bushing.

B. Upon completion of installation of the grounding electrode and bonding system, the ground resistance shall be tested with a ground resistance tester. Resistance to ground shall be less than 25 ohms. If test indicates a greater resistance, appropriate measures shall be taken, including driving additional ground rods, to reduce the resistance to less than 25 ohms. Contractor shall send a letter to the engineer and owner certifying that the ground resistance test has been performed and stating the resistance measured.

C. Any raceway anywhere in the system which enters a box or cabinet through part of a concentric or oversized knockout shall be fitted with an insulated bonding bushing and jumper. These bushings shall also be used wherever conduits stub into switchboards or transformer cabinets. Grounding type insulated bushings shall always be used on both ends of conduits feeding panelboards. The bonding jumper shall be sized by NEC Section 250 and lugged to the box.

D. EMT couplings and connectors shall be compression-gland type of malleable steel, galvanized or sherardized. Connectors shall be insulated-throat type. Set screw, indentor, or cast type fittings are not acceptable.

E. Attach rigid metal conduits with double locknuts - one inside and one outside - and fiber bushing, or in a threaded hub.

F. The raceway system shall not be relied on for ground continuity. A green grounding conductor, properly sized per NEC Table 250.122, shall be run in ALL raceways except for telecommunications, data and audio conductors raceway.

G. Ground all fixed and portable appliances and equipment connected under this Contract with a green grounding conductor. This wire shall be carried inside the raceway and flex from equipment to nearest grounded portion of raceway system. Connect at both ends with suitable lugs.

H. All grounding type receptacles shall have a green wire jumper from their grounding terminal to box in which mounted. Attach jumper to box, not plaster ring, with a bolt or grounding clip. Jumper shall be sized by NEC with #12 minimum.

END OF SECTION 260526

SECTION 26 05 33 – RACEWAY AND BOXES FOR ELECTRICAL SYSTEMS

PART 1 GENERAL

1.1 REQUIREMENTS

A. All material shall be UL listed and shall be installed in conformance with the National Electrical Code.

1.2 SUBMITTALS

A. Shop drawings for:

1. Conduits
2. Couplings and fittings
3. Boxes
4. Conduit seals

B. Provide list of conduit types indicating where each type is used.

PART 2 PRODUCTS

2.1 RACEWAYS

A. Galvanized Steel Rigid Metal Conduit (RMC):

1. Heavy wall tubing with hot dipped galvanized coating

2. Connections shall be made with double locknuts and bushings. Bushings to be steel with integral insulator except conduits 2” and below may have high impact thermoplastic Phenolic insulating bushings.

B. Electrical Metallic Tubing (EMT):

1. Thin wall tubing with hot dipped galvanized coating.

2. Couplings and connections shall be threaded steel, watertight gland compression type.

3. All connectors shall have insulated throat.

C. Rigid Nonmetallic Conduit (RNC):

1. Heavy wall rigid, type 40, listed for underground encased or not encased.

2. Heavy wall rigid, type 80, listed for underground encased or not encased.

D. Flexible Metal Conduit (FMC):

1. Electro-galvanized single strip steel.

E. Liquid Tight Flexible Metal Conduit (LFMC):

1. Electro-galvanized single strip steel with PVC coating.

2.2 BOXES

A. Manufactured by Midland Ross/Steel City, T&B, Raco, or Appleton.

B. Galvanized or aluminum of gauge required by NEC.

C. All junction and pull boxes shall be 4 inch square by 2-1/8 inch deep minimum.

D. Stamped steel boxes with knockouts are not acceptable for surface mounting in finished spaces in the building.

2.3 FASTENINGS AND SUPPORTS

A. Shall be of good quality, galvanized steel, stainless steel, or other non-corroding material.

PART 3 EXECUTION

3.1 RACEWAY INSTALLATION

A. Schedule 40 PVC shall be used for underground service entrance feeders, underground feeders and underground branch circuits leaving the main switchboard. Where underground raceways are required to turn up into switchboards, panelboards, cabinets, equipment, etc. the elbow required and stub-out of the slab shall be rigid metal conduit (RMC). RMC shall be used for all other panel feeders. RMC shall also be used for branch circuits run in poured concrete, underground, or exposed to weather unless shown otherwise on plans. RMC shall also be used where specifically indicated on plans.

B. Electric metallic tubing (EMT) may be used for general branch circuits as permitted by the NEC unless indicated otherwise on plans or stated otherwise in these specifications. EMT shall not be used where tubing, couplings, elbows or fittings are in direct contact with the earth or underground (in/below slab-on-grade or in earth), any locations where the tubing, etc. is exposed to weather, any location outdoors, or where exposed to severe corrosion influence and/or physical damage.All wire and cable shall be run in raceway.

C. All wire and cable shall be run in raceway.

D. Minimum raceway size shall be 3/4” (interior) and 1” (below grade) unless noted otherwise. Half inch flexible conduit may be used from junction box to above ceiling light fixtures (6’ maximum length).

E. All runs of empty conduit only shall have a 100# nylon pull rope installed in the conduit.

F. Rigid metal conduit shall be made up with full threads to which T&B "Kopre-Shield" compound has been applied, and butted in couplings.

G. Z. Split or "Erickson" couplings where necessary.

H. No conduit shall be run in poured concrete floors or slabs. Conduit runs shall normally be run overhead. Where it is necessary to run underneath a concrete slab poured on-grade, conduit shall be buried in trench beneath gravel base and turned up through slab. Where it is necessary to run underneath a floor above a crawl space or another floor, conduit shall be run along ceiling space under floor and stubbed through floor using appropriate methods, such as “poke-through” devices or other means U.L. approved for such purpose.

I. Underground runs, except under concrete floor slabs, shall be encased by a minimum of three (3) inches of concrete on all sides and shall have a minimum of eighteen (18) inch (non-roadway) and twenty-four (24) inch (roadway) cover, except for raceways containing circuits above 600V, which shall have a minimum cover of 30”. Backfill shall be made in six (6) inch layers - tamping each layer to a density of 95% of maximum possible. Red dye shall be applied to the top of freshly placed concrete in all underground duct banks as a warning of electrical hazard in the event of future excavation. In addition, all underground raceway shall be identified by underground line marking tape located directly above the raceway at sin (6) to eight (8) inches below finish grade. Tape shall be permanent, bright-colored, continuous printed, plastic tape compound for direct burial not less than 6” wide and 4 mils thick. Printed legend shall be indicative of general type of underground line below.

J. Where passing through a below grade wall from a conditioned interior building space, raceways shall be sealed utilizing fittings similar and equal to OZ/Gedney type “FSK” through wall fitting with “FSKA” membrane clamp adapter if required.

K. Attach rigid metal conduits with double locknuts - one inside and one outside - and fiber bushing.

L. Grounding type insulated bushings shall be used where raceway enters boxes with concentric or oversized knockouts. These bushings shall also be used wherever conduits stub into switchboards or transformer cabinets. Grounding type insulated bushings shall always be used on both ends of conduits feeding panelboards.

M. Provide suitable fittings where raceway crosses building expansion joints.

N. Securely fasten in place using approved strap or hanger within three feet of each termination and not over ten feet apart in runs.

O. Run concealed in finished areas unless otherwise noted.

P. Make all cuts square with hacksaw. Remove any burrs or shoulders by reaming.

Q. All runs exposed and all runs above accessible ceilings shall be neat and square with building structure such as walls and ceiling/roof structures. Multiple parallel runs shall use trapeze supports where possible.

R. "Flex" and "Sealtite" connections with T&B "Tite-Bite" and "Super-Tite" or approved equivalent fittings. Shall have insulated throats.

S. Where installing raceway on interior surface of exterior walls. Mount raceway ¼” from wall with clamp-backs or strut.

3.2 APPLICATION

A. Galvanized Steel Rigid Metal Conduit (RMC) permitted:

1. Installations below grade (and in or under slabs where approved).
2. All locations except corrosive atmospheres.

B. Galvanized Steel Rigid Metal Conduit (RMC) required:

1. Installations exposed to atmosphere (including breezeways and similar locations).

C. Electrical Metallic Tubing (EMT) Conduit permitted:

1. Interior partitions.
2. Above suspended ceilings.
3. Above 6 ft AFF in exposed areas of mechanical equipment rooms, except where specifically noted otherwise.
4. Sizes 2" and smaller except where specifically noted otherwise.

D. Electrical Metallic Tubing (EMT) is prohibited:

1. Installations exposed to atmosphere (including breezeways and similar locations).

E. Nonmetallic Rigid Conduit permitted:

1. Direct burial, concrete encased.
2. Direct burial, in sand fill on bottom and top.
3. Corrosive atmospheres.

F. Liquid Tight Flexible Metal Conduit required, not over 4 ft in length, for final connections to:

1. Equipment in wet locations (including fire protection tamper and flow switches).
2. Equipment with vibration isolation mounting.
3. Equipment housing ferromagnetic cores or with integral moving components, capable of generating noise or vibrations including transformers and motors.
4. Pumps and associated equipment.
5. Instruments and control devices.
6. All flexible connections to equipment in fire pump room below 60” AFF.

G. Flexible Metal Conduit required, not over 4 ft in length, for final connections to:

1. Equipment in dry locations.
2. Equipment in dry locations with vibration isolation mounting.

3.3 BOX INSTALLATION

A. Attach EMT with connector only.

B. Outlet boxes shall be sized in accord with NEC Section 314. All lighting outlet boxes shall have fixture studs. Device boxes shall be sectional type or 4" square equipped with plaster rings as required to mount the device. Set edge flush with finished surface. Boxes may be installed at top or bottom of a masonry course. Raco, or approved equivalent, masonry boxes in sawed block. 1-1/4"

and deeper plaster rings may be of die-cast aluminum of Steel City make, or approved equivalent.

C. Where installed in metal stud partitions, wall boxes shall be supported from two adjacent studs using a system such as Caddy Bar Hanger Assembly, or approved equivalent. Support on a single stud is not acceptable.

D. Fixtures weighing more than six pounds shall be supported from the fixture stud.

E. Where not shown differently on the drawings, mount:

1. Switch boxes 46" from finished floor to center. Boxes beside doors shall be mounted so edge of trim plate is 2" from edge of door trim on strike side.
2. Telephone boxes 18" from finished floor to center and vertical. Boxes for wall phones shall be 46" from finished floor and vertical.
3. Bracket light boxes as indicated on plans or as directed by Engineer.
4. Clock outlet boxes 7'-0" from finished floor, or 6" below finished ceiling, to center.
5. Panel cans 6'-4" ($\pm$4" in concrete block construction) from finished floor to top of can.
6. Fire alarm pull stations 46" from finished floor to center.
7. Fire alarm chimes, horns, strobes, etc., 80" above finished floor or 6" below finished ceiling, whichever is lower, and shall comply with ADA requirements.

F. Where not shown differently on the drawings, mount boxes for receptacles to receive device in a vertical position and be:

1. Centered 18" above finished floor.
2. Centered 6" above counters, shelves, or cabinets where apparently intended to be so placed.
3. Centered 4" above high edge of backsplashes.
4. Where devices are to be ganged, provide boxes to receive devices trimmed with a gang plate.

G. As soon as installed, all raceway openings shall be closed with plastic inserts to prevent entrance of foreign matter during construction. All enclosures shall be kept clean of any foreign matter. Install Jordan "Kover-All" plastic covers over outlet boxes ahead of plastering or painting.

H. Conduit(s) from all boxes installed on exterior walls or in areas going from conditioned to unconditioned space shall have conduit(s) sealed with duct seal or equivalent to prevent moisture formation. Duct seal or equivalent shall also be installed in all raceways entering from exterior of building.

3.4 FASTENINGS AND SUPPORTS INSTALLATION

A. Inserts in masonry shall be lead, fiber, or plastic types installed in drilled holes. Wooden plugs shall not be used. Lead only shall be used on all exterior masonry or interior masonry subject to permanent moisture. Hung raceways shall be supported from the structure with rod supports at least 5/16" in diameter.

B. All equipment and flat raceways attached to outside wall or interior walls subject to permanent moisture shall be shimmed out with non-corrodible material so as to provide 1/4" air space between wall and equipment or raceway.

C. All materials, whether exposed or concealed, shall be firmly and adequately held in place. Fastening and support shall afford safety factor of three or higher.

D. All fixtures, raceways, and equipment shall be supported from the structure. Nothing may be supported on suspended ceilings, including the hanger wires, unless definitely noted so on the drawings or specifically permitted by the Engineer.

E. Recessed fixtures shall be supported at the two (2) opposite ends to the structure. Supports shall be provided with the same type of wire as used to support the lay-in ceiling track. Attach one end of the wire to one corner of the fixture and the other end to the building's structural system. Lay-in fixtures shall also be screwed to the main runners of the lay-in ceiling track at all four corners using sheet metal screws.

F. Recessed ceiling speakers, where specified with an enclosure, shall have the enclosure supported directly from the structure with a minimum of two 10 gauge wires run perpendicular to the ceiling and not pulling to one side. If recessed ceiling speaker is specified without an enclosure and is mounted in a suspended ceiling, the speaker shall be supported using T-Bar bridges such as Soundolier No. 81-8, or other device specifically designed for such support. In addition, each of the four corners of the ceiling grid block enclosing the speaker shall be supported from the structure using 10 gauge steel wire run perpendicular to the ceiling plane.

G. Other devices using octagonal or 4" square ceiling boxes, such as smoke detectors, dome lights, exit signs, etc., where installed in suspended ceilings shall be supported from the ceiling system using Caddy, or other, hangers specifically designed for such support. In addition, each of the four corners of the grid block enclosing the box shall be supported from the structure using 10 gauge steel wires run perpendicular to the ceiling plane.

H. Support for pipe straps or clamps shall be toggle bolts on hollow masonry; metal expansion shields and machine screws, or standard pre-set inserts, on concrete or solid masonry; machine screws or bolts on metal surfaces; and wood screws on wood construction. The resulting fastening shall be completely secure.

END OF SECTION 260533

SECTION 26 05 43 – UNDERGROUND DUCTS AND RACEWAYS FOR ELECTRICAL SYSTEMS

PART 1 GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and General Conditions of the Specification sections apply to work in this section.

B. The requirements of the 26000-Series sections govern the work specified in this section, where applicable.

1.2 DESCRIPTION OF WORK

A. The requirements of this section apply to electrical duct systems work specified herein.

B. The applicable requirements of this section shall apply to the use of existing underground electrical duct systems for the installation of new cable, i.e. cleaning, cable supports, racks, etc.

C. Provide grounding as required on drawings and specified within the 26000-Series specifications.

D. The extent of electrical duct systems work is indicated by drawings, schedules and requirements of this section.

E. The type of electrical duct systems required for the project include concrete encased PVC schedule 40 conduit.

F. The handholes shall be polymer concrete (where required).

1.3 QUALITY ASSURANCE

A. Manufacturers: Firms regularly engaged in manufacture of electrical raceway of types and capacities required, whose products have been in satisfactory use in similar service for not less than 3 years.

B. NEMA Compliance: Comply with applicable portions of National Electrical Manufacturers Association standards pertaining to nonmetallic duct and fittings for underground installation.

C. UL Labels: Provide electrical raceways which have been listed and labeled by Underwriters Laboratories.

D. NEC Compliance: Comply with National Electrical Code as applicable to construction and installation of electrical raceways.

1.4 SUBMITTALS

A. Electrical Duct System: Submit manufacturer's product data on electrical duct system materials including handholes, conduit, supports, spacers, underground marking tape, pull cord, handholes, covers, hardware, etc.

1.5 PRODUCT DELIVERY, STORAGE AND HANDLING

A. Handle conduit and tubing carefully to prevent bending, end-damage and to avoid scoring finish. Conduit and duct shall not be stored directly on ground, provide suitable ground supports for all conduit and duct materials.

B. Handle hand holes to prevent damage to product and damage to site. Storage of hand holes on site prior to installation shall be coordinated with owner and not obstruct normal operations of traffic flow on site.

1.6 UNDERGROUND UTILITY LOCATION

A. Contractor shall contact local underground utility locating company before starting any digging, boring or excavation. All underground utilities shall be marked and identified prior to commencing of any work.

B. Work plan shall consider the locations of all existing utilities. Notify the Engineer immediately regarding any discrepancies in underground utilities as they may affect work scope and schedule.

PART 2 PRODUCTS

2.1 MATERIALS AND COMPONENTS

A. General: Provide underground distribution systems, as shown on the drawings and specified here, for the following systems

1. Power Distribution Systems

B. The raceway and duct systems shall be complete, including, but not necessarily limited to, raceways, ducts, handholes, pull boxes and pull cords along with all accessories to provide a complete operational system.

C. PVC Duct: Concrete encased underground duct systems shall be constructed using UL listed rigid plastic schedule 40 PVC conduit suitable for encasement in concrete.

D. The ductbank shall be constructed of 4” PVC conduit or as noted on the drawings. The PVC conduit shall be rigid plastic conduit Schedule 40 PVC suitable for encasement in concrete.

E. Duct for power circuits shall be not less than 75% polyvinyl chloride, suitable for power service with 90°C Conductors.

F. PVC Fittings: NEMA standard to match duct type and material.

G. Duct Elbows: All factory elbows exceeding 10 degrees shall have a minimum radius of 48 inches where used for underground encasement.

H. Provide conduit, tubing and duct accessories including straps, spacers, expansion and deflection fittings as recommended by duct manufacturers.

I. All power ductbank shall be dyed red.

PART 3 EXECUTION

3.1 INSTALLATION – UNDERGROUND DUCT BANK SYSTEM

A. System shall consist of single, roundbore conduit encased in concrete. The minimum number and size of ducts shall be indicated on the drawings. Changes in direction of runs exceeding 10 degrees shall be accomplished by using special couplings or bends manufactured for this purpose. Duct lines shall be installed so that the top of concrete or future concrete as shown is not less than 30 inches below finished grade or finished grade or finished paving at any point.

B. Ducts should be pitched to drain toward handholes and away from buildings and equipment. Minimum slope shall be 4-inches in 100-feet. Where necessary to achieve this between manholes, ducts should be sloped from a high point in the run to drain in both directions.

C. Concrete encased non-metallic ducts shall be supported on plastic separators coordinated with duct size and spacing. Spacers shall securely support and maintain uniform spacing of the duct assembly. Provide a minimum of 3 inches above bottom of trench during the concrete pour. Support spacing shall not exceed 5 feet along lengths of duct to prevent sagging of ducts. Separators shall be secured to prevent floating during placement of concrete. Provide nonferrous tie wires to prevent displacement of the ducts during concrete pour. Tie wires shall not act as substitute for spacers. Duct separators or spacers shall be of the “Lattice” type so that concrete can flow through the spacer.

D. Conduit shall be thoroughly cleaned before laying. During construction and after the duct line is complete; the ends of the conduit shall be plugged to prevent water washing mud into the conduits. Particular care shall be taken to keep the conduits clean of concrete or any other substance during the course of construction.

E. All underground raceways shall be identified by underground line marking tape located directly above the raceway at 6 to 8 inches below finished grade. Tape shall be permanent, bright-colored, continuous printed, plastic tape compounded for direct burial not less than 6 inches wide and 4 mils thick. Printed legend shall be indicative of general type of underground line below.

F. Where it is necessary to cut a tapered end of a piece of conduit at the site, the cut shall be made with a tool or lathe designed to cut a taper to match the taper of the particular conduit to be used.

G. All ducts should be sealed at terminations, using sealing compound and plugs, as required to withstand 15 psi hydrostatic pressure.

H. Cleaning Ducts: For new and existing ducts to be used for new cables a mandrel not less than 12 inches long, having across section approximately one-fourth inch less than the inside cross section of the conduit shall be pulled through each conduit throughout the entire length, after which a brush with stiff bristles shall be pulled through to make certain that no particles of earth, sand, or gravel have been left in the lines. The Engineer and Owner shall witness the pulling of all mandrels. Provide 7 days notice to the Engineer prior to pulling mandrels.

I. Installation of duct banks: Each single conduit shall be completely encased in concrete with a minimum of 3 inches between conduits and a minimum thickness of concrete encasement of 3 inches which may be increased to fit the actual shape of the trench. All concrete shall be adequately vibrated to insure concrete placement around perimeter of all ducts. Spacing assembly shall be made of non-metallic, non-decaying material. Joints in conduits shall be staggered at least 6 inches. Ducts shall be securely anchored to prevent movement during the placement of concrete.

J. Waterproof, 130 pound tensile test marking cord shall be installed (marked at least every foot), in all ducts, including spares, after thoroughly rodding, clearing and swabbing all lines free of any and all obstructions.

K. Installation of single conduit: Shall be completely encased in concrete. The thickness of concrete shall be not less than 3 inches on the sides, bottom and top of conduit.

L. Concrete: Shall be plain except where reinforced concrete is specified herein or indicated on the drawings. Plain and reinforced concrete shall conform to division 3000 - concrete of these specifications and shall be 3000 psi class. Power ductbank concrete only shall be dyed red throughout.

M. Partially Completed Duct Banks: During construction wherever a construction joint is necessary in a duct bank, prevent debris such as mud and dirt from entering ducts by providing suitable conduit plugs. Fit concrete envelope of a partially completed duct bank with reinforcing steel extending a minimum of 2 feet back into the envelope and a minimum of 2 feet beyond the end of the envelope. Provide one No. 4 steel rebar in each corner minimum and along the edge of each ductbank no further than 12 inches on center, 3 inches from the edge of the envelope. Restrain reinforcing bars from moving during pouring of concrete.

N.

O. HANDHOLES:

1. Workmanship: Underground structures shall be of polymer concrete construction as specified hereinafter. Horizontal concrete surfaces of floors shall have a smooth trowel finish. Covers shall fit the frames without undue play. The words "electric" shall be cast in the top face of all power hand hole covers, respectively. Units shall be the product of a manufacturer regularly engaged in the manufacture of polymer concrete products, including handholes.

2. Provide stainless steel hardware for mounting fasteners. Coat threads of anchor bolts with anti-seize compound immediately prior to installing nuts.

3. Drainage: Drainage sumps shall be provided in all handholes. All handholes shall be positively drained.

4. Handholes Installation: Commercial assembly shall be set on 6 inches of level, 90 percent compacted granular fill, 3/4 inch to one inch size, extending 12 inches beyond the handhole on each side. Granular fill shall be compacted by a minimum of four passes with a plate type vibrator. Drain sumps shall be provided for precast structures.

1.2 CONSTRUCTION RECORD DRAWINGS

A. A clean set of drawings shall be kept on site for the contractor to use for as built drawings. As built drawings shall be certified as to accuracy by the Contractor. See section 260500 for the specific requirements for record drawings.

END OF SECTION 260543

SECTION 26 05 48 - SEISMIC REQUIREMENTS FOR ELECTRICAL EQUIPMENT

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Electrical installation shall meet the seismic requirements as specified by Chapter 16 of the North Carolina State Building Code. Chapter 16 states that the project shall be classified by Seismic Design Category and Seismic Importance Factor and shall meet the requirements of Chapter 16 of the North Carolina State Building Code for seismic design of electrical components. See Appendix B in the set of drawings for references to these criteria and also in the Structural drawings.

PART 2 - PRODUCTS

2.1 MATERIALS

A. All free standing electrical equipment such as switchboards, transformers, generators, cable trays, etc., shall be anchored to the structure in a manner that will satisfy the requirements of the NC State Building Code. Manufacturer of the equipment shall detail methods to be used to meet these requirements on the shop drawings of the equipment. Design calculations for the restraint methods used shall be included with the shop drawings. Drawings with these details, as well as the design calculation sheets, shall carry the seal of a registered Professional Engineer. Manufacturer shall make provisions for a field visit by his Engineer to verify that the installation conforms to the design. A certifying letter shall be sent to the Electrical Engineer stating that the installation does conform to the manufacturer's design and does meet the requirements of the NC State Building Code.

B. Mounting methods of internal components of manufactured equipment shall be certified by the manufacturer that the methods used meet the seismic requirements. Certification compliance information shall be submitted with shop drawings.

C. Raceway, busduct, and other hung or suspended components of the electrical installation shall be installed in compliance with the NC State Building Code. Seismic restraint systems shall be Unistrut, Kindorf, B-Line, or approved equivalent. Seismic restraint systems shall be designed by the vendor. Submit to the Engineer record copies of all calculations and system information. Calculations and details shall be sealed by a registered professional engineer. Where specific pre-engineered systems are not readily available, the contractor may use the latest edition of "Seismic Restraint Manual Guidelines for Mechanical Systems" published by SMACNA for determining correct restraint systems to be used. Submit SMACNA systems to be used at same time as shop drawings of other pre-engineered systems. Either the vendor or the contractor, as applicable, shall make provisions for a field visit by a registered professional engineer to verify that the installation conforms to the vendor's design or the SMACNA design, as appropriate, and that the installation meets the requirements of the State Building Code.

D. Housekeeping pads specified for equipment shall be mechanically connected to the structural floor.

PART 3 - EXECUTION

3.1 GENERAL INSTALLATION

A. Review of the seismic design and shop drawings by the Engineer shall not relieve the Contractor of his responsibility to comply with the seismic or any other requirements of the NC State Building Code.

END OF SECTION 26 05 48

SECTION 26 05 53 – IDENTIFICATION FOR ELECTRICAL SYSTEMS

PART 1 GENERAL

1.1 NAMEPLATES

A. Furnish and install engraved laminated phenolic nameplates for all safety switches, panelboards, transformers, switchboards, motor control centers and other electrical equipment supplied for the project for identification of equipment controlled or served, phase, voltage, etc.

B. Furnish and install permanently mounted label on each device plate for receptacles indicating its panelboard and circuit number. Labels shall be made using electronic labeling system with black letters on clear background. Write-on labels are prohibited.

PART 2 PRODUCTS

2.1 NAMEPLATE MATERIALS

A. Nameplate material colors shall be (conforms with State Construction Office requirements):

1. Blue surface with white core for 120/208 volt equipment.
2. Black surface with white core for 277/480 volt equipment.
3. Bright red surface with white core for all equipment related to fire alarm system.
4. Green surface with white core for all equipment related to "Emergency" systems.
5. Brown surface with white core for all equipment related to data systems.

B. All empty conduit runs and conduit with conductors for future use shall be identified for use and shall indicate where they terminate. Identification shall be by phenolic tags with wire attached to conduit or outlet.

C. All concealed outlet boxes, junction boxes and pull boxes shall have their covers and exterior visible surfaces painted with colors to match color scheme outlined above. This includes covers on boxes above all type ceilings.

PART 3 EXECUTION

3.1 NAMEPLATE INSTALLATION

A. Nameplates shall be securely attached to equipment with self-tapping stainless steel screws, if sharp end is protected; otherwise, rivets shall be used. Nameplates shall identify equipment controlled, attached, etc. Letters shall be ½” high minimum for panel identification. Letters for other information shall be ¼” high minimum. Embossed, self-adhesive plastic tape is NOT acceptable for marking equipment.

END OF SECTION 260553

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SECTION 26 05 93 – ELECTRICAL SYSTEMS FIRESTOPPING

PART 1 GENERAL

1.1 REFERENCE

A. The work under this section is subject to the Contract Documents including General Conditions, Supplementary Conditions, and under Division 1 – General Requirements.

1.2 SCOPE

A. Furnish and install work under this section including bu not limited to the following:

1. Penetrations through fire-resistance-rated floor, roof, walls and partitions including openings containing conduits, cables, cable bundles, cable tray and other penetrating items.

1.3 SYSTEM PERFORMANCE REQUIREMENTS

A. Firestopping systems shall be UL Classified for the application and correspond to those indicated by reference to designations listed by UL Fire Resistance Directory.

B. Firestopping systems and installation shall meet requirements of ASTM E-814, UL 1479 or UL 2079 tested assemblies that provide fire rating equal to that of construction being penetrated.

C. Proposed firestop materials and methods shall conform to applicable code authority having local jurisdiction.

1.4 SUBMITTALS

A. Manufacturer's specifications and technical data for each material including composition and limitations, documentation of UL firestop systems to be used and manufacturer's installation instructions.

B. Material safety data sheets provided with product delivered to job-site.

1.5 QUALITY ASSURANCE

A. Installer Qualifications: Engage an experienced Installer who has completed firestopping that is similar in material, design and intent to that indicated for Project and that has performed successfully.

B. A manufacturer's direct representative to be on-site during initial installation firestop systems to train appropriate contractor personnel in proper selection and installation procedures.

1.6 DELIVERY, STORAGE AND HANDLING

A. Deliver products to Project site in original, unopened containers or packages with intact and legible manufacturers’ labels identifying product, type and UL label where applicable.

B. Store materials to prevent deterioration or damage due to moisture, temperature changes, contaminants or other causes.

C. Handle with recommended procedures, precautions or remedies described in material safety data sheets as applicable.

1.7 PROJECT CONDITIONS

A. Do not install firestopping when ambient or substrate temperatures are outside limits permitted by firestopping manufacturer or when substrates are wet due to rain, frost, condensation or other causes.

B. Ventilate firestopping per manufacturers' instructions by natural means or, where this is inadequate, forced air circulation.

1.8 SEQUENCING AND SCHEDULING

A. Do not cover up those fire stopping installations that will become concealed behind other construction until authorities having jurisdiction, if required, have examined each installation.

PART 2 PRODUCTS

2.1 MANUFACTURERS

A. 3M, Hilti, Tremco, Nelson Firestop Products, Specified Technologies, Inc, or Rectorseal Corp.

2.2 MATERIALS

A. Use only firestop products that have been UL 1479, ASTM E-814 tested for specific firerated construction conditions conforming to construction assembly type, penetrating item type, annular space requirements and fire-rating involved for each separate instance.

B. Materials shall not contain flammable solvents.

PART 3 EXECUTION

3.1 EXAMINATION

A. Examine areas and conditions, for compliance with requirements for opening configurations, penetrating items and other conditions affecting performance of firestopping. Do not proceed with installation until unsatisfactory conditions have been corrected.

3.2 PREPERATION

A. Clean out openings immediately prior to installing firestopping to comply with recommendations of firestopping manufacturer.

B. Provide masking and temporary covering to prevent soiling of adjacent surfaces by firestopping materials.

C. Comply with manufacturer's recommendations for temperature and humidity conditions before, during and after installation of firestopping.

D. Do not proceed until unsatisfactory conditions have been corrected.

3.3 INSTALLATION

A. Comply with "System Performance Requirements" article in Part 1 and manufacturer's installation instructions and drawings.

B. Install forming/backing materials and other accessories of types required to support fill materials during application as required. After installing fill materials, remove forming materials and other accessories no indicated as permanent components of firestop systems.

C. Avoid multiple penetrations of common fire barrier opening. When possible, seal each penetration in accordance with project details. When multiple penetrations are unavoidable, seal openings with appropriate UL Classified firestoppihg systems.

3.4 FIELD QUALITY CONTROL

A. Do not proceed to enclose firestopping with other construction until reports of examinations are issued.

B. Where deficiencies are found, repair or replace firestopping so that it complies with requirements.

3.5 CLEANING

A. Clean surfaces adjacent to sealed holes and joints to be free of excess firestop materials and soiling as work progresses.

END OF SECTION 260593

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SECTION 26 29 00 – MOTORS, CONTROLLERS, AND EQUIPMENT CONNECTIONS

PART 1 GENERAL

1.1 REQUIREMENTS

A. Motors, controllers, and other special equipment are sometimes provided and installed by other trades. This section specifies typical connections to that equipment.

B. All individual motor starters or VFD's for plumbing & mechanical equipment (fans, pumps, etc.) shall be furnished and installed under Divisions 22 & 23 (Plumbing & Mechanical Contractors) unless indicated as a part of a motor control center. Motor starters for mechanical equipment provided in motor control centers shall be furnished under Division 26 (Electrical Contractor). Under Division 26, power wiring shall be provided up to a termination point consisting of a junction box, trough, starter, VFD or disconnect switch. Under Division 26 line side terminations shall be provided. Wiring from the termination point to the plumbing or mechanical equipment, including final connections shall be provided under Divisions 22 & 23.

C. Where electrical wiring is required by trades other than covered by Division 26, the installer shall refer to the wiring materials and methods as specified under Division 26.

PART 2 PRODUCTS

2.1 EXHAUST FANS

A. Exhaust fans are indicated by special symbol on plans. Unless otherwise noted, they will be furnished and set by others and connected by the Mechanical Contractor. Controller will be provided by others unless controller is specified on electrical drawings. Electrical contractor shall provide a local disconnect switch at fan if unit is not provided with one. Where indicated as controlled from several double pole switches, the second pole of each switch shall be connected in parallel so fan will run when any one or more of the switches is on.

2.2 UNIT HEATERS

A. Unit heater, ventilator, cooler, or similar outlets - designated by special symbol - are located approximately on drawings. Exact location of outlet shall be obtained from Heating, Ventilating, and Air Conditioning Contractor. Unless indicated otherwise, outlet shall be a 4" box fitted with an oversized blank cover with 1/2" center knockout, mounted in wall or ceiling, and fed on circuit shown beside symbol. These outlets shall be located behind or within equipment cabinets where possible and still be accessible. Provide local disconnect switch if one is not provided with unit. Unless specified otherwise herein or on drawings, power connection from outlet to equipment will be by Mechanical Contractor. Control wiring will be done by the Mechanical Contractor.

2.3 TROUGHS

A. Electrical troughs, junction boxes, switches, or breakers for air conditioning, heating, or plumbing equipment are indicated on drawings. Exact locations shall be obtained from Heating and Air Conditioning or Plumbing Contractors but Code clearances shall be maintained. Unless

specifically noted otherwise, all power wiring for equipment and controllers beyond these points will be done by Heating and Air Conditioning or Plumbing Contractors. Control wiring will be by Heating and Air Conditioning or Plumbing Contractors.

2.4 OTHER

A. Other equipment connections are generally indicated on drawings by a circled black triangle with a letter suffix. These are then defined in notes or details. Where catalog numbers, models, or types, and manufacturer's name are given, these items of equipment shall be furnished and installed by the Electrical Contractor, unless specifically noted otherwise.

B. Junction box - designated as a circled J. Size of such boxes is generally noted on drawings. Where this is not done, they shall be sized in accord with NEC and purpose evidently intended.

C. Where unscheduled junction boxes are used by Contractor to facilitate wiring or to comply with limits of elbows and bends, they shall be concealed if at all possible to do so and still be left accessible. If this is impossible, they shall be recessed in walls or ceilings and provided with an oversized cover which shall be painted out to match adjacent surfaces. If it is necessary to mount such boxes exposed, the location shall be approved by the Engineer.

D. All contactors, motor starters and combination type starters specified under this contract shall be equipped with Hand-Off-Automatic switches, pilot (run indicating) light, 120 volt control transformer, and two sets of auxiliary contacts. The switch and light shall be located on the unit cover. Starters shall be Square D, Cutler-Hammer, General Electric Co., or equivalent by others.

E. All safety switches shall be heavy-duty type, NEMA 1 for indoor and NEMA 3R for outdoor use unless specifically stated otherwise. They shall be fused type unless specifically indicated otherwise on plans. Fused type (600 volts or less) shall be equipped with the following: Service Entrance and Feeder Circuits over 600A – Class L, UL Listed, current limiting with 200K interrupting rating; Service Entrance and Feeder Circuits 600A and less – Class RK1 or J, UL Listed, current limiting with 200K interrupting rating; Motor, Motor Controller and Transformer Circuits – Class RK5, UL Listed, current limiting time delay with 200K interrupting rating; and individual Equipment where fault current does not exceed 50kA – Class K5, UL Listed, with 50K interrupting rating. Fusible safety switches with short circuit withstand rating of 100K or 200K shall include Class R or Class J rejection fuse block feature. Switches shall be equipped with defeatable door interlocks and padlocking provisions in the on and off positions. Padlocks shall be provided for switches located in public areas. Switches shall be by Square D, Cutler-Hammer, General Electric Co., or equivalent by others. In addition, safety switches shall be provided with the following requirements or features:

1. Safety switches shall be third party listed.
2. Switches shall have door interlocks that prevent the door from opening when the operating handle is in the “on” position.
3. Switches shall have handles whose positions are easily recognizable in the “on” or “off” position. For safety reasons, padlock shall be provided for switches unless they are located in a locked electrical room.
4. Switches shall have positive quick make-quick break mechanisms.
5. Switches shall be properly labeled. Refer to Specification 260553.
6. The Electrical contractor is to provide to the Owner as spares, 10% of the quantity of fuses used of each type and rating, with a minimum of one (1) set of each type.

F. All safety switches, motor starters, or other boxes or panels, designated as NEMA 3R or otherwise intended for outdoor use or use in wet areas, shall use raintight conduit hub fittings with bonding screw.

G. Control wiring shall not be installed in the same raceways as power wiring.

PART 3 EXECUTION

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END OF SECTION 262900

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DIVISION 28 – TABLE OF CONTENTS

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SECTION 28 31 00 - FIRE DETECTION AND ALARM

PART 1 GENERAL

1.1 REQUIREMENTS

A. This Contractor shall furnish and install a complete combination fire alarm, smoke detection, and mass notification system as indicated on drawings and as specified herein. The system shall be electrically supervised with intelligent analog alarm initiation and addressable devices. The system shall comply with applicable provisions of the NC Building Code (available for review at NCDOI website), and the National Fire Alarm Code (NFPA 72). The Contractor shall furnish all parts, materials, and labor customarily required or provided for a completely coordinated, logical, and satisfactorily operating system, in accordance with all requirements applicable, even if every such item is not specifically shown or described in the project plans or specifications.

B. System shall satisfy the requirements of all current State (NC Building Code), NFPA 72 (2013 edition), and local building codes.

C. System shall operate and function in compliance with NFPA 72 and NFPA 101.

D. This specification has been written with the intent of complying with the NC SCO consensus document “Fire Alarm Guidelines and Policies” dated 2020 (available for review at NC SCO website) and SCO Electrical Guidelines and Policies 2020.

E. Approval of samples, cut sheets, shop drawings, and other matter submitted by the contractor shall not relieve the contractor of responsibility for full compliance with project plans and specifications, unless the attention of the engineer is called to each non-complying feature by accompanying letter, and the engineer has given written authorization for the specific deviation(s).

F. Fire Alarm Contractor shall specialize in fire alarm system installation, be factory trained and certified, with a minimum of five (5) years documented experience installing and maintaining fire alarm system for similar installations.

PART 2 PRODUCTS

2.1 MATERIALS

A. The system provided shall be a fully addressable type. The materials and equipment specified herein are that of the EST 4 series system. Similar and equivalent systems by Simplex (4100ES) or Notifier (NFS2-3030). System and components shall be U.L. listed as a fire alarm system. All equipment supplied shall be specifically listed for its intended use and shall be installed in accordance with any instructions included in its listing. System shall use a nominal 24 Vdc operating voltage.

1. Fire Alarm/Mass Notification System Control – EST 4 series fire alarm control panel with all standard features plus the modules necessary to meet the functions specified herein and on the drawings. System shall be equipped with a separate and independent source of

secondary power (battery back-up); 60 hours (24 hours if connected to emergency generator circuiting) in the quiescent mode and 15 minutes of alarm (supplier shall submit calculations on determining battery size to meet this requirement per NFPA 72). System shall be capable of handling initiating zones and control output signals (HVAC shutdown, etc. - not alarm signals) as indicated on the drawings and specified here-in. Shall be equipped with necessary module and contacts for connecting to campus remote communication system. Panel shall have surface mounted steel cabinet with indicator viewing window, hinged door with cylinder lock, dead front construction, and factory baked enamel finish. System display shall have LCD display, and an alphanumeric keypad for programming and operation of panel. Panel memory shall be non-volatile. System shall be field programmable without the use of special hardware or software, and shall be password protected. The system shall have multiple access levels so Owner's authorized personnel can disable individual alarm inputs or normal system responses (outputs) from alarms, without changing the system's executive programming or affecting operation of the rest of the system. How to instructions shall be included in the training required to be given to the Owner's designated personnel, and must also be part of the written documentation provided by the fire alarm equipment supplier. Panel shall be UL 9th Edition compliant.

Each addressable fire alarm system shall include a LCD-type annunciator at (or in) the FA/MNS CU, or in another location if acceptable to the AHJ. Each annunciator shall be monitored individually for power loss, communications loss, etc. Provide bypass switch at FA/MNS CU to silence all annunciators.

FA/MNS CU shall have dual contact time-relay (minimum 60 second capability) installed at the main FA/MNS CU to delay trouble signals to the Emergency Communications Center.

Additional transponder panel(s) shall be provided as necessary.

2. Digital Alarm Communicator Transmitter: System shall be equipped with a 10-channel (minimum) DACT for transmission of fire alarm, supervisory, and trouble signals to a Central or Proprietary Supervising Station or Owner's alarm receiving equipment. DACT shall be compatible with Owner's alarm receiving equipment. Contractor shall confirm compatibility prior to installation. The fire alarm contractor shall program the PROM, connect each DACT to telecommunications line provided, and verify proper signal receipt by supervising station. System shall have two telephone lines for redundant dial out capability. The transmission means shall comply with NFPA 72. Final testing and acceptance of the fire alarm system depends on proper functioning of the interconnection of the fire alarm control panel and the owner's supervising station. The following signals shall be reported in Contact ID format provided by the University (requirements shall be coordinated at part of the fire alarm pre-construction meeting):

   a) Fire alarm (smoke) (Note: Device shall also send separate trouble zone to Campus Police Department)
   b) Sprinkler water-flow alarm (Note: Device shall also send separate trouble zone to Campus Police Department)
   c) Sprinkler valve tamper (closed) supervisory signal (Note: Device shall also send separate trouble zone to Campus Police Department)
   d) Burglary/Intrusion/Duress/Other Security or Emergency Alarm
   e) Fire alarm system AC power trouble (only if 120 VAC interrupted for 8 hours maximum)
   f) Fire alarm system loss of telephone line trouble

Precedence of these signal shall be as follows:

a) Fire Alarm/Water Flow
b) Supervisory Signal
c) Trouble Signal
d) Security

The fire alarm system DACT shall communicate separate signals for:

a) Fire Alarm
b) Fire Alarm Trouble
c) Sprinkler Alarm and Sprinkler Waterflow Alarm
d) Sprinkler Supervisory Trouble
e) All other zones/signals required for specific installations shall be coordinated and approved by UNCG before installation and programming.

The contractor shall provide two (2) RJ31X jacks adjacent to the DACT. Provide a Category 6 plenum rated cable (Yellow) from each jack to the closest telecommunications room (IDF/MDF) (coordinate location with Owner). Cables shall be terminated on a 66 block located on a red backboard or as otherwise directed by the Owner. In addition, the contractor shall provide one (1) Category 6 plenum rated cable (color to be confirmed with the University) from the closest telecommunications room (IDF/MDF) for connection to a WEBS (Wide-Area Emergency Broadcast System) device (Talk A Phone WEBS-CM-2 – WEBS Communications Module) located adjacent to the FA/MNS CU.

3. System event printer: Provide a system event printer that will print out each event showing date and time and event description. Printer shall use non-thermal sprocket-drive paper. Printer shall be furnished with desktop floor stand or wall mounted rack, as appropriate for location that will house printer and paper, including printout copy. Confirm installation location with Owner. The printer shall be operational and tested by the Contractor prior to Contractor, Engineer, and Owner testing. Contractor shall provide a copy of Contractor 100% system testing results to Engineer and Owner prior to Engineer and Owner testing. Contractor shall provide paper for all testing.

4. Each AC input to the system panel and SNAC panel(s) shall be protected by a feed-through (not a shunt type) branch circuit transient arrestor – Basis of Design is DiTek DTK-DF120S1, or equivalent UL 1449 – Third Edition listed device submitted to and approved by the Engineer in writing by others (Transtector, Emerson/Northern Technologies, Leviton). Unit shall be rated for "Lightning Surges" since building is equipped with a lightning protection system. Install suppressor in a listed enclosure near the branch circuit panel, trimming excess lead lengths. Wind a small coil in the branch circuit conductor just downstream of the suppressor connection. Coil to be 5 to 10 turns, about 1" in diameter, and securely tie-wrapped. This series impedance will improve the effectiveness of suppressor on clipping fast rise time voltage transients. All surge protection devices shall be labeled (adhesive printed) with circuit number, panel name, device/equipment being protected and equipment location (i.e. room number). All surge protection devices (120V and 24V) shall be shown on as-built drawings. All 120V surge protectors shall be installed at height not requiring a ladder or at height and location with clear cover and LEDs visible from the ground.

5. Each DC circuit extending outside the building (such as the PIV, etc.) adjacent to FA/MNS CU and also near point of entry to outside building, shall be protected by a "pi"-type filter on

each leg consisting of a primary arrestor, series impedance, and a fast acting secondary arrestor that clamps at no more than 15V above nominal circuit voltage. Model shall Ditek DTK-2MHLP24B (basis of design and preferred) with wired base and receptacle cube or Engineer approved equivalent by Innovative Technologies, Transtector, Citel America, Leviton, or Northern Technologies. Specifications on equivalent models may be submitted to and approval by engineer in writing. UL 497B listing is a prerequisite for consideration. Devices using only MOV active elements are not acceptable. All surge protection devices (120V and 24V) shall be shown on as-built drawings.

6. Two (2) recessed annunciators, designed around EST series type, shall be provided in a location indicated on plans. Final location shall be approved by the owner.

7. Provide laminated drawings with detailed, graphic representation of the building, floor plans, zones, and devices, labeled to match the digital readout on the FA/MNS CU, adjacent to the FA/MNS CU and annunciator(s). Installation shall include hooks, chains, etc. for securing drawings at these locations while also providing ability to easily review. Sizes to be coordinated with Owner prior to installation. Final locations shall be approved by the Owner. In addition, provide a full set of as-built drawings in PVC tube, including cap and tether, mounted on wall.

8. Pull Stations: Pull Stations: EST series addressable type, dual-action, with Lexan cover; flush back-box. Mount at 46" AFF to center. Pull stations shall have clear protective lift covers in locations specifically noted on drawings. All pull stations shall be provided with keyed locks for resetting purposes. Allen key type locks are not acceptable. Two (2) keys for each pull station shall be supplied to UNCG. Pull stations shall be mounted to provide unobstructed access to inset key for resetting (i.e. minimum of 6” clear of any obstruction). Provide STI Stopper II (or Engineer approved equivalent) clear, tamperproof, tough polycarbonate shield and frame without piezo horn.

9. Combination Audio/Visual and Visual Indicating Signals: designed around EST wall-mount series type, 15, 30, 75, 110, or higher candela (as required to comply with ADA) clear and/or amber xenon strobe with 1Hz flash rate, selectable output speaker with ¼, ½, 1, and 2 watt field selectable adjustments, and 25.0 or 70.7V, ADA compliant, white housing. Alarm notification appliances, both audible and visual, shall comply with NFPA 72 requirements for intensity and placement. System shall be equipped with necessary module(s) such that all speakers (on all floors) are synchronized and all strobes (on all floors) are synchronized. The strobe flush-mounted back-boxes shall be mounted so entire lens is between 80 inches to 96 inches AFF or 6” below ceiling, whichever is lower, and meets Accessibility Code. Indicate candela and wattage on submittal building drawings. Note: Intent is for all devices to be mounted at same heights in same spaces (i.e. uniform installation). While intent is for all devices to be recessed mounted, in cases where surface mounting is required, all notification devices shall also include surface skirts to provide clean installation. All notification devices shall be permanently labeled to include: SNAC, SNAC circuit, and device number. These labels shall match labels shown on as-builts.

10. Ceiling Mounted Audio/Visual and Visual Indicating Signals: designed around EST ceiling mount series type; 15, 30, 75, 95, 115, or higher candela (as required to comply with ADA) clear and/or amber xenon strobe with 1Hz flash rate, selectable output speaker with ¼, ½, 1, and 2 watt field selectable adjustments, and 25.0 or 70.7V ADA compliant, white housing. Alarm notification appliances, both audible and visual, shall comply with NFPA 72 requirements for intensity and placement. System shall be equipped with necessary module(s) such that all speakers (on all floor) are synchronized and all strobes (on all floors)

are synchronized. Ceiling mounted. Indicate candela and wattage on submittal building drawings. All notification devices shall be permanently labeled to include: SNAC, SNAC circuit, and device number. These labels shall match labels shown on as-builts.

11. Ceiling Smoke Detector: designed around EST addressable, intelligent, analog, low-profile, multi-sensor detector with base. Ceiling mounted. Covers shall remain on detectors until building is free of dust and dirt. Note: Following Contractor, Engineer, and Owner testing, a 100% sensitivity report shall be provided. Based on the report, any detector with equal to or greater than 3% obscurity shall be replaced. Smoke detectors shall be UL 268 (7th Edition ot latest) compliant.

12. Duct smoke detector: Probe length shall extend through duct and shall be provided with far-end support for stability. Lengths to be determined by Electrical and Mechanical Contractor together. Furnish each duct detector unit with a remote alarm indicator light (RAIL) and remote test station (RTS). Mount remote indicator light/test station on wall at the same height as notification devices in the nearest corridor or public area. Note: In areas with block walls that will require surface mounted conduit, it is acceptable to install the RTS near the entrance in the mechanical room where duct detector is located. Detectors shall be turned over to HVAC Contractor for him to install in ducts. Electrical Contractor shall wire to fire alarm system. Fire alarm AHU shutdown circuits shall be wired from the fire alarm control panel to a termination point, adjacent to the AHU control by fire alarm contractor. Mechanical Contractor shall make all control wiring connections for shutdown of respective AHU via addressable control relay(s) at termination point activated by the fire alarm control panel. Addressable control relays shall be installed within three (3) feet of the controller for the equipment being controlled. All air handling systems shall be shutdown directly by the FACP during alarm shutdowns without delay. Building automation systems shall not be used for alarm shutdowns of air handling systems.

13. Each duct detector installation shall have an access panel for sampling tube inspection and cleaning. All access doors shall close with air pressure. Small doors for access to dampers, etc., shall be 16” x 16” minimum. They shall be held in place with sash type locks. They shall have a flanged frame that overlaps liner or insulation. Ultra-low leakage doors - Nailor Model 0800 Type M1 Double Flange Frame for rectangular duct and Model 0895 for round duct, or equivalent. Knock-over tab frames are not permitted. Maximum leakage shall not exceed British Standard DW144 Class A, B, and C. Provide a safety chain for doors requiring access by ladder. Provide grab handles for doors 18" x 10" and larger when there is a positive pressure greater than 3 i.w.c. Provide long-life closed-cell gaskets. Provide access door at all locations requiring service access. Indicate airflow direction on the duct, adjacent to the detector, using stencil or permanent decal.

14. A supervised “AHU Shutdown Defeat” switch shall be provided in/adjacent to the FA/MNS CU. Provide an informative engraved label at the switch provided in/adjacent to the FA/MNS CU. The switch shall cause a system “trouble” indication when the switch is placed in the off-normal (“Shutdown Defeated”) position.

15. Unless the AHJ requires otherwise, all duct detectors shall be programmed for fire alarm (not supervisory annunciation).

16. Door Release Mechanism: EST series. Provided by Electrical Contractor. E.C. to make all wiring connections except connection to FA/MNS CP. Connection at FA/MNS CP shall be by certified installer. Shall operate on 24 VDC provided by fire alarm control panel or supervised auxiliary power supply. The resulting current drain shall be included in the

standby battery calculations or the system shall be programmed to drop the door hold open magnet load 60 seconds after loss of 120 VAC Coordinate exact holder mounting and requirements with General Contractor. Provide and install appropriate bracing/backing in the wall/floor for mounting box equipment. Flush wall mounting type or floor devices shall be utilized, with all wiring routed concealed in wall unless required otherwise. Provide where shown on engineering drawings and/or where indicated in architectural door schedules. A supervised "Door Release Defeat" switch shall be provided in/adjacent to the FA/MNS CU. Provide an informative engraved label at the switch provided in/adjacent to the FA/MNS CU. The switch shall cause a system "trouble" indication when the switch is placed in the off-normal ("Door Release Defeated") position.

17. Interface devices: Monitor module. Devices shall be used to monitor sprinkler water flow switches, sprinkler tamper switches, etc. Locate these devices in environmentally controlled areas which do not exceed listed parameters. Devices shall have visible LED(s) on cover. All modules shall be clearly labeled with address and description of what is being monitored.

18. Control Relay Device: Addressable relay module with contacts rated for 120vac, 20 amps (or add an auxiliary relay with contacts so rated). Addressable control relays shall be installed within three (3) feet of the controller for the equipment being controlled. Devices shall have visible LED(s) on cover that give indication when active. All relays shall be clearly labeled with address and description of what is being controlled.

19. Heat detectors: ceiling mounted, with fixed temperature and rate-of-rise sensing.

20. The fire alarm system shall monitor 120 VAC power to shunt trip breakers used in conjunction with fire suppression systems. Examples include a shunt trip used for cooking appliance power shut-off when the kitchen hood fire suppression system discharges, or primary elevator power shut-down upon sprinkler water flow in any elevator equipment space or shaft. Use an addressable monitor module to accomplish this supervisory function. Devices used for elevator recall and elevator power shut-down shall be placed within 24" of the sprinkler head in each respective area.

21. Elevator Recall System: Provide two (2) fire alarm control relay devices in each elevator machine room for the purpose of signaling the elevator to home to the designated floors. For Elevator 1 (EL1), any elevator lobby smoke detector(s) on other than the Third Floor, or the smoke detector(s) in the elevator machine room hoistway(s) in alarm shall cause the elevator(s) to return to the Third Floor landing (or primary landing as designated by the Fire Marshall). The smoke detector(s) in the Third Floor elevator lobby in alarm shall cause the elevators to return to the First Floor (or alternate landing as designated by the Fire Marshall). For Elevator 2 (EL2), any elevator lobby smoke detector(s) on other than the First Floor, or the smoke detector(s) in the elevator machine room hoistway(s) in alarm shall cause the elevator(s) to return to the First Floor landing (or primary landing as designated by the Fire Marshall). The smoke detector(s) in the First Floor elevator lobby in alarm shall cause the elevators to return to the Third Floor (or alternate landing as designated by the Fire Marshall). Fire alarm system shall provide logic to operate the control relay devices as described. Elevator control logic for proper homing of the elevators shall be by the elevator supplier. In addition, provide relay(s) for Fire Hat and, if required, battery override. Control relay devices shall be equipped with auxiliary relay with contacts rated 120 volts, 20 amps. All relays shall be clearly labeled with address and description of what is being controlled. A supervised "Elevator Defeat" switch shall be provided in/adjacent to the FA/MNS CU. Provide an informative engraved label at the switch provided in/adjacent to the FA/MNS CU. The switch shall cause a system "trouble" indication when the switch is placed in the

off-normal ("Elevator Defeated") position. The bypass shall override all elevator controls including shunt trip (where applicable).

22. HVAC Controls: Provide control relay devices for each control point as indicated on the plans. In general, each air handler will require a control device relay to shut down unit. All control relay devices shall be equipped with an auxiliary relay with contacts rated for 120 volts, 20 amps. Addressable control relays shall be installed within three (3) feet of the controller for the equipment being controlled. Coordinate all with Mechanical plans and controls contractor. A supervised "HVAC Defeat" switch shall be provided in/adjacent to the FA/MNS CU. Provide an informative engraved label at the switch provided in/adjacent to the FA/MNS CU. The switch shall cause a system "trouble" indication when the switch is placed in the off-normal ("HVAC Defeated") position. The "HVAC Defeat" switch shall be programmed to override the alarm signal to allow units to re-start. All relays shall be clearly labeled with address and description of what is being controlled. All AHUs shall shutdown upon alarm signal from FA/MNS CU (unless delay is required to allow dampers to change positions).

23. Remote terminal cabinets: Size as required to house isolation modules, surge protectors, and wiring terminals. Locate in the individual floor electrical rooms or other convenient locations (confirm locations with Owner). In multi-story buildings, all circuits leaving the riser on each floor shall feed through a labeled terminal block in a hinged enclosure accessible from the floor. Terminal block screws shall have pressure wire connectors of the self-lifting or box lug type. Terminal cabinets shall be mounted so top of cabinet is no more than 72" AFF (unless specifically agreed otherwise by Owner).

24. Fault isolation modules: Provide and install after each 20 devices and control points on any addressable loop, or a lesser number where recommended by manufacturer (confirm with installation instructions); for each addressable circuit that extends outside the building; in or immediately adjacent to the FA/MNS CU, at each end of the addressable loop (shall be in same room and within 15 feet of the FA/MNS CU); and for loops with less than 20 devices and control points, install an isolator at the approximate middle of the loop (in addition to those at the FA/MNS CU). Each isolation module shall be clearly labeled, readily accessible for convenient inspection (not above lay-in ceiling), and shown on the as-built drawings. Devices shall have visible LED(s) on cover. When wall mounted isolation modules are utilized, mount at same height of notification appliances. All isolation modules shall be located in common corridor areas (i.e. no bathrooms, dorm rooms, etc.). Isolation modules shall not be installed inside SNAC panels. Coordinate locations with Owner.

25. Wiring and cabling shall be provided as required by manufacturer for proper function of the system. Addressable loop (signaling line) circuits shall be wired with Type FPL/FPLR/FPLP fire alarm cable, 18 AWG minimum, low capacitance, twisted, shielded copper pair. Cable shield drain wires are to be connected at each device on the loop to maintain continuity, taped to insulate from ground, and terminated at the FA/MNS CU. Acceptable cables include Atlas 228-18-1-1STP, BSCC S1802S19 (same as EEC 7806LC), West Penn D975, D991 (16 AWG), D995 (14 AWG), or equal wire having capacitance of 30 pc per foot maximum between conductors. Belden 5320FJ is acceptable if only FPL rating is required. All other circuits in the system shall be wired with minimum 14 AWG, stranded copper, THHN/THWN conductors. All conductors larger than #18 shall be stranded. All wiring and cabling shall be installed in metal conduit.

Exception #1: Unshielded cable, otherwise equal to the above, is permitted to be used where the manufacturer's installation instructions unequivocally require, or state a preference for, the use of unshielded cable for all systems.

Exception #2: In underground conduit, provide Type TC or PLTC cable (PE insulated) to avoid problems with moisture.

26. Color code for fire alarm wiring shall be as follows (unless specifically required otherwise by manufacturer of the fire alarm system) without color change in any wire run:

    a) Addressable loop – red cable jacket with red(+) and black(-) conductors.
    b) Alarm notification appliance circuits – blue(+) and black(-) conductors.
    c) Separate 24VDC operating power – yellow(+) and brown(-) conductors.
    d) Door control circuits – orange conductors.
    e) Circuits for addressable monitor modules to monitored devices (AWG 14) – violet(+) and grey(-) conductors.

    Note: THHN/THWN conductors only are permitted if greater than AWG 16 (NCSEC 760.49(B)). All conductors larger than #18 shall be stranded. All wiring and cabling shall be installed in metal conduit.

27. Notification Appliance Circuit booster ("SNAC") power supplies shall be individually monitored by the FA/MNS CU and protected by a smoke detector per NFPA 72. They shall not be located above a ceiling, non-conditioned space, or mechanical plenum space (including mechanical rooms used as plenums (unless specific requirements for equipment in plenum spaces). All SNACs shall include an on-board LED to denote ground fault activation, 120V power loss, and SNAC trouble. Power supplies shall be labeled to match as-built documents. All wiring shall be labeled to match as-built documentation. No modules (relay, isolation, etc.) shall be installed inside SNACs.

28. Emergency Voice/Alarm Communications:

    The system shall have Mass Notification Communications capability. This shall include:

    One-way Voice (PA) Communications System

    The One-way Voice/Alarm (PA) Communications System shall meet the requirements of below:

    Each floor, stairway, elevator bank, and Assembly space (>300) shall be a separate communication zone. Speakers shall be spaced to provide required sound levels. Check audio levels in all areas; adjust taps and/or install additional speakers, as required to meet Code compliant levels. Strobe lights shall not be installed in elevator cars, stairways, or photo darkrooms.

    NOTE: Speakers in stairways shall be installed at every third floor landing, to avoid excessive audio levels and reverberation. Speakers in elevator cars, restrooms, and other very small, confined spaces shall be tapped on very low power levels or, where permitted by the AHJ, muted to reduce sound output. Intelligibility is improved in most building areas by installing speakers closer together and using lower wattage, as opposed to the opposite. Some mechanical spaces (especially chiller rooms) and factory-industrial occupancies may have sound levels that are too high to permit effective audible alarm notification. In those situations, provide visible alarm notification appliances with ratings and spacing selected for compliance with NFPA 72. Large Assembly occupancies generally require special system

design and procedural considerations to assure safe and effective egress of large crowds in a fire (or other) emergency, without causing panic.

Normal audio amplifier power shall be a minimum of 120% of the system design load, per channel. For purposes of this calculation, use the amplifier's continuous two-tone output rating and the designed power setting of each individual speaker**.** Provide a copy of this calculation with the shop drawing submittal to the engineer. Also include on the "calculations" sheet included as part of the as-built drawings.

At least one (1) backup amplifier shall be provided for each channel, equal in power to the largest primary amplifier. For systems with distributed amplifiers, provide one backup at each transponder location. Failure of any amplifier shall automatically result in the defective unit being switched off-line and replaced with the backup.

The audible emergency evacuation signal shall comply with NFPA 72. This does not preclude the system from providing additional (non-evacuation) notification signals, including recorded voice messages, for specific emergency situations. Visible alarm notification appliances shall be provided per NC Code and ADA requirements.

One-way Voice/Alarm digital audio circuits shall be wired with twisted pair copper conductors (AWG 18 minimum) in jacketed cable, or with fiber optic cable. Analog audio circuits shall be wired with AWG 18 minimum twisted pair copper conductors in shielded cable, Belden 8790, West Penn 293, or equal. Cable jacket color shall be gray, with red (+) and black (-) conductor insulation. For shielded cables, the shield shall be continuously connected from the amplifiers to the end of line. Tape the shield splice at each speaker and handset, to insulate from ground. Single point ground the shield at the amplifier or control unit unless prohibited by system manufacturer. All conductors larger than #18 shall be stranded. All wiring and cabling shall be installed in metal conduit.

Provide Talk A Phone WEB-CM-2 – WEBS Communications Module for interconnection to Wide-Area Emergency Broadcast System.

29. 24 VDC power circuits serving addressable control relays shall also be monitored for integrity.

30. A supervised “Visual Test Only” switch shall be provided in/adjacent to the FA/MNS CU. Provide an informative engraved label at the switch provided in/adjacent to the FA/MNS CU. The switch shall cause a system “trouble” indication when the switch is placed in the off-normal (“Visual Test Only Defeated”) position. This switch shall activate both the FA and MNS strobes to flash at the same time for testing purposes only.

31. Reflective Optical Beam Detectors: Basis of design: Space Age Electronics Fireray 5000. Provide all necessary accessories for mounting including, but not limited to, prisms, alignment brackets, wall bracket mounts, controller back boxes, detector mounting boxes/plates, wire covers for detectors and controller, etc.

B. Each individual addressable device (addressable loop number, device number) shall be uniquely identified. Addressable devices shall be numbered to indicate the direction in which the wire was pulled. Each individual notification device (panel, circuit number, device number on circuit) shall also be uniquely identified. This shall be shown on the “as-built” plans and in the System Status and Programming Report. A permanently mounted label shall be placed on each device base or device housing, whichever is appropriate, indicating its address or device number and associated SNAC panel and circuit. On all devices, labels shall be made using electronic labeling system with

black letters on clear background, unless panel color is black. If panel color is black, labels shall be made using electronic labeling system with black letters on white background. Write-on labels are prohibited. These labels shall be such that they can be read when standing on the floor at the device (i.e. label font and size shall be larger for high ceiling areas).

All batteries shall be labeled with the date installed. Labels shall be made using electronic labeling system with black letters on white background. Write-on labels are prohibited.

All tamper and flow switches shall be provided with label permanently attached to device with address from fire alarm program similar to above. Devices shall also be clearly labeled with description of what is being monitored.

Each SNAC panel shall be uniquely identified. Each SNAC shall include a permanently mounted label indicating its name, what it feeds (ie. fire alarm strobes, mass notification strobes, etc.), 120V panelboard name, circuit number, and room name and number of breaker location). These labels shall be such that they can be read when standing on the floor at the device. FA/MNS CU shall be labeled in a similar manner.

Contractor shall label all wires terminating in FA/MNS CU, SNACs, junction boxes and riser boxes. These labels shall be self-adhesive wire numbers. Labels shall clearly identify what wire/cable is connected to including area of coverage.

Each surge protection device shall be uniquely identified. A permanently mounted label shall be placed on each device junction box and housing indicating its device number. These labels shall be such that they can be read when standing on the floor at the device.

Contractor shall provide a typed legend for all SNACs, power supplies, junction boxes and riser boxes corresponding to these labels. Legend shall be mounted in riser boxes. If system does not have riser boxes, contractor shall provide legend to UNCG at time of acceptance.

C. The following spare parts shall be provided, each individually packaged and labeled, and turned over to owner upon acceptance of the system (minimum of two (2) each; otherwise, round fractional quantities to next higher number). All spare parts shall be new and unused.

1. Two (2) fuses of each type and size used in the system.
2. 2% of total installed manual pull stations.
3. 4% of total installed addressable control relays.
4. 4% of total installed speaker/strobes (of both wall and ceiling).
5. 4% of total installed strobes (of both wall and ceiling).
6. 4% of total installed monitor modules (addressable interface).
7. 4% of total installed isolation modules/isolation bases.
8. 4% of total installed addressable heat detectors.
9. 6% of total installed ceiling smoke detectors.
10. Two (2) keys per installed pull station.
11. Two (2) AC surge protection devices.
12. Two (2) DC surge protection devices.
13. Full box of printer paper following Engineer and Owner testing (in addition to paper required for Contractor, Engineer, and Owner testing).
14. One (1) printer ribbon.

D. The contractor shall provide any special equipment, tools, and programming devices required for the operation, maintenance or repair of the installed fire alarm system.

2.2 FUNCTION

A. Activation of any alarm initiating device (detector, pull station, etc.) shall cause the following:

1. Sound audible devices throughout the facility.

2. Strobe lights shall flash.

3. All smoke door release mechanisms shall de-energize, causing all smoke doors throughout the facility to close.

4. An alarm shall sound and a visual signal indication at the fire alarm control panel and at any remote annunciators.

5. The device from which the alarm originated shall be distinctly annunciated at the fire alarm control panel and at any remote annunciator panels. Also the annunciation shall indicate the device type in alarm.

6. The contacts for the remote communications shall be activated.

B. Air handling systems and fans shall be shut down by activation of the fire alarm system. These signals shall be accomplished by relay controls and contacts furnished as part of the fire alarm system. All HVAC control wiring into the relays and contacts shall be by the Mechanical Contractor. Program relays as directed by the Mechanical Contractor. Shut down shall be wired so that there is no delay in the shutdown of unit when fire alarm relay is activated.

C. System trouble shall be indicated audibly and visually at the fire alarm control panel. This shall be a sound that is individually distinguishable from the alarm signal.

D. Alarm initiating loops shall be supervised. Wiring and type devices used shall be such that failure of *any* device on a loop shall cause a distinctive trouble signal at annunciator panels, but failure of any device on a loop shall not preclude initiation of an alarm signal by any other device on the loop. In addition, all loops shall be supervised to provide a trouble indication in case of an open circuit or ground fault in either (or any) conductor. Also provide supervision of annunciator.

E. Alarm notification appliance circuits (NAC) shall be NFPA 72 Style Y (Class B). The load connected to each circuit must not exceed 80% of rated module output and the coverage of each shall be limited to one floor. The NAC voltage drop during alarm shall not exceed 14% of the voltage measured across the batteries at that time. The contractor shall use power outage testing to verify the NAC circuit is designed and installed properly. Shop drawings must show calculated NAC current draw and voltage drop at the EOL.

F. Addressable loop controller (signaling line) circuits shall be fully NFPA Style 6 (Class A) with no "T" taps. Each loop must have a minimum of 20% spare address for future use. At a minimum, provide one addressable loop per floor. The supply and return conduit shall have at least one (1) foot vertically and four (4) feet horizontally of separation between them at all times.

G. All addressable spot type and duct smoke detectors shall be the analog type and the alarm system shall automatically compensate for detector sensitivity changes due to ambient conditions and dust build-up within detectors. This feature shall be armed and sensitivities set prior to acceptance of

the system. Smoke detectors' sensitivity shall be monitored at panel, and alarm threshold for each shall be adjustable. Contractor shall verify sensitivity settings of all devices.

H. *Not applicable on this project:* Dormitory and student apartment sleeping rooms and suite areas shall have smoke detectors with "sounder" based controlled by the FA/MNS CU, to assure audibility, unless the AHJ approves otherwise. The detectors shall be programmed so sleeping room smoke initiates local alarm in room, pre-signal indication at the FACU, and notification at the Supervising Station. Any additional initiating device shall activate a general alarm throughout the building. In suites, the detectors shall be programmed so smoke initiates local alarm in all rooms of the suite (ie. wire in tandem), pre-signal indication at the FACU, and notification at the Supervising Station. Any common area alarm must cause immediate general alarm throughout the building, including all sounder bases in sleeping rooms. All sounder bases shall be capable of being disabled by FA/MNS CU. This requirement includes a bypass switch to accommodate (bypass shall allow testing of room smoke detectors without sounder base activating.)

I. Spot type detector shall be the plug-in type with a separate base (not mounting ring) to facilitate replacement and maintenance. The bases shall have integral terminal strips for circuit connections rather than wire pigtails. Each detector or detector base shall incorporate an LED to indicate alarm.

J. Spot type smoke detectors shall have a built-in locking device to secure the head to the base for tamper resistance. For detectors mounted within 12 feet of the floor, activate this lock after the system has been inspected and given final acceptance.

K. Contractor shall provide electrical circuit(s) from existing emergency panels ("EQL' in Mechanical Room 166", "EAL" in Mechanical Room 150A, and "ERL" in Mechanical Room 105A) for FA/MNS panel(s), SNAC panels, printer (including receptacle) as required including, but not limited to, circuit breaker(s), conduit, wiring, etc. Provide breaker lock(s) for circuit(s) feeding FA/MNS CU, SNAC panels, and other fire alarm related equipment. Breaker lock shall be Space Age Electronics ELOCK-FA kit (or engineer approved equivalent).

L. The following bypass switches shall be programmed into the system: audio/visual bypass; tamper switch bypass; water flow bypass (shall include water flow bell); elevator bypass; MNS activation; HVAC bypass/defeat; door bypass; Visual FA/MNS test, Beam Detector bypass, Annunciator(s) bypass (silence). For all bypasses, FA/MNS CU shall transmit trouble signal to police department (PD) and all by-passes shall indicate a trouble on FA/MNS CU indicating which bypass is active. Only one (1) trouble per bypass shall be sent to FA/MNS CU. Annunciator(s) shall be provided and programmed with by-pass buttons as well. All bypasses shall be programmed prior to doing 100% Contractor testing. Verification that by-passes work properly shall be included as part of Contractor 100% testing.

M. Provide manual button at FA/MNS CU to control smoke purge fans (similar to existing installation).

N. Activation of mass notification shall override fire alarm strobes and speakers. Once mass notification is deactivated, the fire alarm strobes and speakers shall activate as required. All mass notification strobes shall be synchronized.

O. Maintenance alerts and almost dirty conditions shall report as a trouble signal to University Police.

PART 3 EXECUTION

3.1 INSTALLATION

A. All wiring shall be in metal raceway. Metal raceway shall be red (pre-finished by manufacturer) unless installed in finished areas. Raceway installed in finished area shall be painted to match finish/color of surface to which attached. All conduits that penetrate outside walls from air conditioned space must have internal sealing (duct-seal), to prevent condensation from infiltrating humid air.

B. The FA/MNS CU and all other control equipment locations, including any transponders, sub-panels, annunciators, DACT, and booster power supplies, shall be protected by a spot type smoke detector located within 15 feet of the equipment (measured horizontally).

C. At a minimum, provide one (1) loop per floor.

D. All junction and pull boxes shall be painted red prior to pulling wire unless installed in finished areas. Junction boxes and pull boxes installed in finished areas shall be painted to match finish/color of surface to which attached.

E. No T-taps are allowed in system wiring.

F. No splices are allowed in the system wiring. All wiring runs shall be continuous between devices. Use terminals on devices or terminal cabinets on each floor. “Wire nuts” and crimp splices shall not be permitted. Floating terminal strips shall not be permitted.

G. Permanent wire markers shall be used to identify all connections at the FA/MNS CU and other control equipment, at power supplies, and in terminal cabinets. In addition, for wiring inside terminal cabinets, affix typed professional legend to inside of terminal cabinet doors indicating wiring diagrams, line/load direction, etc. All labeling shall match circuit labels on as-builts.

H. Addressable interface modules (used to monitor all contact type initiating devices) shall be located in a conditioned space, unless they are tested, listed, and marked for continuous duty across the range of temperatures and humidity expected at their installed location. With AHJ approval they may be permitted to serve as many as three (3) sprinkler system valve supervisory switches, or six (6) heat detectors, in a single space.

I. On fire alarm notification circuits and end-of-line resistor shall be located as follows:

1. In a location that is accessible to the fire alarm maintenance personnel (i.e. devices or terminal cabinets).
2. In an area where maintenance or testing at the EOL resistor location will not be disruptive to the normal use of the facility.
3. In an area that is not easily accessible to the normal building occupants (objective is to avoid accidental or malicious damage by building occupants).
4. Shall not be located in a stairway, bathroom, or dorm room/suite.
5. Shall include extended (6” minimum) wire leads.

J. No isolation modules, relay modules, interface modules, terminal cabinets, etc. shall be located above drop ceilings.

K. Unless suitably protected against dust, paint, etc., spot type smoke detectors shall not be installed until the final construction clean-up has been completed. In the event of contamination during construction, the detectors shall be replaced at the contractor’s expense. Covers supplied with smoke detector heads do not provide protection against heavy construction dust, spray painting,

etc., and shall not be used for that purpose. These covers are suitable only during final, minor cleanup or touchup operations.

L. Electrical and Mechanical Contractors shall include two (2) relocations per duct detector specified on drawings to assure working placement in ducts. Coordinate with Mechanical Contractor.

M. Notification Appliance Circuit booster ("ADA") power supplies must be individually monitored for integrity and are not permitted to be located above a ceiling, or in non-conditioned space. Any 24vdc power circuits serving, but not limited to, addressable control relays must also be monitored for integrity.

N. Installation shall be performed under the supervision and instruction of the manufacturer or a manufacturer authorized distributor. All connections to FA/MNS CU and system's programming shall be performed only by supervision and the manufacturer or a manufacturer authorized distributor. Manufacturer trained and certified installers shall be used for all connections to the fire alarm control panel and for all system programming. This manufacturer's specific training and certification must have occurred within the most recent 24 months, except NICET Level III Certification will extend to 36 months. Copies of the certifications for the specific FA/MNS CU model/series being installed shall be included with the contractor's submittal package. The submittal package will not be approved without this information. Manufacturer's authorized distributor shall stock a full complement of spare parts locally for the system. The technician who makes the final connections and programs the FA/MNS CU is legally the "installer". The responsibility for assuring a proper installation overall rests with this individual.

O. Programming of the system shall include activating the automatic drift compensation feature for all spot-type smoke detectors. Set smoke detector sensitivities to normal/medium, unless directed otherwise by the Engineer or Owner. Program alarm verification for smoke detectors only. In addition, FA/MNS CU shall have capability to provide report of smoke detectors that are approaching a dirty level or a maintenance alert prior to a system trouble. [1]

P. All intelligent fire alarm systems shall be zoned. Systems shall be zoned first by floor, then by wing (N,S,E,W), if applicable. System shall also be zoned at any fire partitions or identifiable building features. System devices shall be zoned by type (i.e. smoke detectors, pull stations, heat detectors, duct detectors, sprinkler system monitoring components, etc. shall be on separate zones. Combining separate types of devices on the same zone is prohibited. Any LED type annunciators shall have separate zone lights for alarm (red) and trouble (amber). All supervisory LEDs shall be amber in color.

Q. Print-out a complete "System Status and Programming Report" after completing the above. This print out shall include the program settings for each alarm initiating device and for smoke detectors, its current sensitivity.

R. The manufacturer or the authorized distributor shall 100% test all site-specific software functions for the system and then provide a detailed report showing the system's operational matrix. This documentation shall be a part of the "System Status and Programming Report" described herein. Contractor shall provide written notification to engineer of the 100% test one week prior to testing commencement to allow the option of witnessing any or all of the testing.

The Contractor shall submit the System Status and Programming Report to the Engineer and University for review and approval. Modifications shall subsequently be input and a new report provided for review and final approval.

S. After completion of the installation and all programming, the fire alarm technician shall test every alarm initiating device for proper response and indication, and all alarm notification appliance for effectiveness. Also, in coordination with the other building system contractors, all other system functions shall be verified, including (where applicable) elevator recall, control of HVAC systems, release of smoke doors, etc. This final testing of the system shall be under the direct supervision of the manufacturer or the authorized distributor. A print out of all of the above testing shall be provided to the Engineer and Owner.

T. Testing of smoke sensing devices shall be accomplished using manufacturer and NFPA approved methods for all devices.

U. After all tests are complete, the Contractor shall submit the following documentation to the owner, through the engineer, prior to the owner demonstration described below:

1. NFPA 72-2013, Figure 7.8.2(a) "System Record of Completion" Form. No substitutions are acceptable. Form shall confirm (a) it was installed and tested per Code and (b) the Code required 100% test was performed. The fire alarm installer shall sign Form in the applicable locations. If a representative of the AHJ, Owner, or engineer witnesses the tests, they sign the last line of the form to signify that fact only (annotating the form as needed).
2. NFPA 72-2013, Inspection and Testing Form.
3. An HVAC balance report in the smoke control/purge mode (if smoke evacuation system is provided).
4. The fire alarm installer shall provide UNCG a copy of the CMS after all devices are programmed, after the contractor has completed 100% test, and NO less than ten (10) days prior to the Engineer's final inspection and certification of NFPA 72.
5. UNCG requires a minimum of ten (10) days to allow UNCG personnel to program the required contact ID information at the central monitoring station at the UNCG Campus Police Building.
6. The "System Status and Programming Report" described above. This report shall be one generated on the day of the system acceptance inspection.
7. Battery calculations per NFPA 72.
8. Written verification the system was tested and successfully completed the Fire Alarm System Checklist provided in the Appendix (Note: Checklist shall be completed by Contractor as part of initial 100% testing to assure all items have been addressed that will subsequently be tested as part of the Engineer's testing). Engineer will certify the system based on the checklist.

V. Owner shall be thoroughly instructed and trained on the function, use, and maintenance of the system. A minimum of eight (8) hours on-site time will be allocated for this purpose. An additional two (2) hours of instruction shall be individually provided for the second and third shifts. Provide two copies of a written, bound summary of the training for future reference. Written verification of this training shall be forwarded to the Engineer. Training shall include, but not be limited to, the following: how to replace heads and set addresses if not set automatically; how to locate a short in a circuit; how to replace electronic cards (shall be third party listed) and where to mount them in the panel; get familiar with functionality of each electronic card; how to perform/generate dirty head test report and sensitivity test report; how to synchronize stobes for the entire building; how to check circuit ground faults and how to clear them; how to interpret the display field codes (A=Alarm, S=Supervisory, T=Trouble, M=Modules, etc.); and how to locate faulty modules from the trouble display codes. At the completion of training, the contractor shall install a faulty smoke head within the system. The trainees shall then find the fault and correct it under the supervision of the contractor.

On-site training shall also include:

1. variable changes
2. programming changes
3. report creations and changes
4. system functional changes
5. hardware repair and maintenance of all building panels and devices, including but not limited to, diagnostic procedures, system expansion, and maintenance techniques.

W. Contractor shall provide the training, technical manuals, spare parts, and system documentation prior to system acceptance testing by Engineer, Owner and State Construction Office.

X. After completion of the Code required 100% test described above and submission of documentation, training and parts described above, a demonstration of the entire system shall be provided for the Owner and Engineer. System shall have operated for at least two full days prior to this demonstration. Manufacturer's field engineer or technician shall be present for these demonstrations and shall assist the Contractor in performing the demonstration. This demonstration shall consist of functional testing of the system as directed by the owner and engineer.

Y. Contractor shall arrange to have the necessary number of people, 2-way radios, label maker, ladder, compressed air, CO tester (where applicable), test leads for isolation modules, multi-meter, etc. including the manufacturer's representative on hand for these demonstrations of the system. Again, demonstrations shall use approved smoke methods and smoke "bombs", not magnets. Contractor shall furnish a smoke machine and smoke "bombs" as necessary to test system for all testing – Code, Owner/Engineer, and State Construction Office. Contractor shall provide printed copy of as-built drawings prior to inspection.

Z. During the Engineer’s final inspection, UNCG will have Facilities personnel at the central monitoring station confirming that the events at the site accurately reflect the identification number of the device, the location of the device, and the type of communication (fire status, general alarm, and trouble) are reported accurately at each test.

AA. Once system is operational and accepted by the Owner and Engineer, Contractor shall be prepared for a complete demonstration of the system for the State Construction Office during their inspection. The manufacturer's field engineer or technician shall also be present for this demonstration.

3.2 SUBMITTALS

A. Contractor shall submit complete shop drawings to Engineer for approval prior to performing any work. These shall clearly demonstrate compliance with the drawings and specifications. Any non-compliant features shall be fully described.

B. Contractor shall submit a site specific single line riser diagram (manufacturer’s typical wiring diagrams are not acceptable) and site specific building plan drawings showing cabling and wiring requirements, Class A loops, conduit sizes, outlet and equipment locations, device addresses, and color coding of system (fire alarm and mass notification) submitted in electronic format (ACAD 2004). Drawings shall include design ambient sound level, audible alarm device sound power and alarm sound level for each space or Contractor shall certify the design meets NFPA 72 for sound levels. *Any additional devices required while verifying the system shall be at Contractor’s expense.*

C. Submittals shall include a copy of the system battery sizing calculation. Contractor shall use manufacturer's battery discharge curve to determine expected battery voltage after 24 hours of providing standby power. In addition, the contractor shall use the calculated NAC current draw in the alarm mode to determine expected voltage drop at end of line (EOL), based on the conductor resistance per manufacturer's data sheet or latest edition of the NEC. Circuit resistance shall include doubling the ohms per foot to incorporate two conductors required to power circuit. In addition, include any inherent voltage drop caused by the system's power supply.

The voltage drop at EOL shall not exceed 14% of the expected battery voltage, after the required standby time plus alarm time. Contractor shall determine worst case voltage at the far end of each NAC by subtracting the calculated voltage drop from the expected battery voltage. The result shall be no less than the minimum listed operating voltage for the alarm notification appliances being used.

All of the calculation noted above shall be placed on a dedicated sheet of as-built drawings. NAC voltage drops shall be verified during system testing by contractor.

D. A pre-construction meeting shall be mandatory for the electrical contractor and fire alarm sub-contractor to meet with the Owner and Engineer to review the specifications, submittals, items noted in A. above, as well as discuss any other pertinent items.

E. Provide laminated drawings with detailed, graphic representation of the building, floor plans, zones, and devices, labeled to match the digital readout on the FA/MNS CU, adjacent to the FA/MNS CU and annunciator(s). Final locations shall be approved by the Owner. In addition, provide a full set of as-built drawings in PVC tube, including cap and tether, mounted on wall.

F. Upon satisfactory installation and testing, the Contractor shall provide to the engineer two (2) bound copies of the following technical data for transmittal to the Owner:

1. "As-built" site specific single line wiring riser diagram showing all loop numbers and device addresses in the system, plus equipment terminal numbers.
2. "As-built" site specific building plan drawings similar to drawings required per 3.2.B.
3. "As-built" voltage drop and battery sizing calculation sheets.
4. Manufacturer's detailed maintenance requirements.
5. Technical literature on all control equipment, isolation modules, power supplies, alarm/supervisory signal devices, alarm notification appliances, relays, etc.
6. Electronic copies (ACAD 2004) on CD/DVD for items 1, 2, and 3, and PDF's for items 1, 2, 3, 4, and 5.
7. Contractor shall provide all programming and software required for full system maintenance and upgrades to fire alarm and mass notification system including any device changes, additions, or deletions. Programming and software requirements include:
    a) Provide all software, hardware, interfaces, adapters, and cables required for all programming and maintenance functions.
    b) Provide Dell Latitude 5420 Rugged laptop (or engineer approved equivalent) with the following minimum requirements: Windows 10, 8FB RAM, 128BF SSD, serial port, 14" display, backlit keyboard, wireless LAN, battery, power supply, RGB camera.
    c) Contractor shall provide all levels of password access with documentation; Software and Panel passwords.

G. Complete configuration data (site-specific programming) for the system shall be stored on electronic media and archived by the fire alarm system manufacturer or authorized distributor. A

USB flash drive copy of this data shall be submitted to the owner via the engineer prior to acceptance of the system.

H. The manufacturer of authorized distributor shall maintain software version records on the system installed. System software shall be upgraded free of charge during the warranty period if any new versions are released during that time period. If a new upgrade is released to correct operating problems, a free upgrade shall be provided during the entire life of the system.

I. Basic operating instructions shall be framed and permanently mounted at the fire alarm control panel. If owner concurs, they may be affixed to the inside of the control panel door instead. In addition, a copy of the NFPA 72 "Record of Completion" shall be provided at or in the FACP in a rigid pocket provided by the contractor.

J. Provide an engraved label meeting Section 26 05 53 of these specifications on the at each fire alarm system control unit, system sub-panel or data gathering panel, supplementary notification appliance panel, digital alarm communicator panel, etc., identifying the 120VAC power source as follows: panel location (room number), panel identification, and branch circuit number.

K. Contractor shall provide a factory sponsored certified technical training for system installed. This training shall certify two (2) technicians to maintain, service, and program installed system and receive direct manufacturer's technical support for these systems, to include software updates if applicable. All expenses to include tuition, transportation, food, lodging, and $100 per person to cover other incidental travel expenses (airport parking, etc.) for this training shall be the responsibility of the contractor.

3.3 WARRANTY

A. After acceptance by the Owner, a full year of maintenance in perfect operating condition shall be provided by Contractor and supplier at no additional expense to the Owner. This warranty coverage shall include parts, labor and travel to and from job site. The manufacturer shall be able to provide after hours (24 hours a day/ 7 days a week) service in the event of a warranty issue.

B. One annual preventive maintenance (PM) test shall be performed on the entire fire alarm system between six (6) and twelve (12) months after UNCG's acceptance. All system deficiencies found shall be documented and corrected. This PM shall include all items to be annually tested as defined by the edition of NFPA 72 enforced at the time of system acceptance, in addition to the following:

1. A complete software backup.
2. A fifteen work-day notice of testing scheduled by the Contractor through UNCG. Testing shall be witnessed by a representative designated by UNCG.
3. A report consisting of the NFPA Inspection and Testing Form furnished by the contractor, to the Engineer of Record and UNCG within two (2) days after completion of this test.

C. Contractor shall provide all software updates during the warranty period and upgrades to software following the warranty period that address system operating failures or defects during the life of the system.

D. Submit a quote for a maintenance contract to provide all maintenance, test, and repair described below and/or in accordance with NFPA-72, "Guide for Testing Protection Signaling Systems". Include also a quote of unscheduled maintenance/repair, including hourly rates for technicians trained on this equipment, and response travel costs. Submittals that do not identify all post

contract maintenance costs will not be accepted. Rates and costs shall be valid for the period of five (5) years after expiration of the guaranty. Maintenance and testing shall be on a semiannual basis or as required by the local AHJ whichever is the most restrictive. A preventive maintenance schedule shall be provided by the Contractor that shall describe the protocol for preventive maintenance. The schedule shall include:

1. Semi-annual systematic examination, adjustment and cleaning of all detectors, manual fire alarm stations, control panels, power supplies, relays, water flow switches and all accessories of the fire alarm system.
2. Semi-annual testing of each circuit in the fire alarm system.
3. Semi-annual testing of each smoke detector in accordance with the requirements of NFPA 72.

APPENDIX

FIRE ALARM SYSTEM CHECK LIST

BUILDING NAME: _____ LOCATION: _____

DESIGNER: _____ INSTALLER: _____

INSPECTION BY: _____ DATE: _____

Preparation for Acceptance Test

- ☐ Fire authorities have been notified of the system test. Also notify any location where alarms are transmitted. DO NOT ROLL FIRE TRUCKS BY ACCIDENT. All building occupants have been clearly notified of the system test.

All required documents are on site for the SCO inspection and review.

- ☐ A copy of the project plans and specification
- ☐ A copy of the contractor's approved shop drawings including:
  - ○ cut sheets
  - ○ plans
  - ○ battery size calcs
  - ○ Voltage drop calcs
  - ○ Matrix
  - ○ Training Certificates
- ☐ A copy of the Fire Alarm system "as built" drawings showing the routing of circuits installed
- ☐ Final NFPA 72 "Fire Alarm System Record of Completion" form
- ☐ A copy of the System Operation Matrix, giving the FACU response for each initiating device input, has been provided by the fire alarm installer to facilitate testing.
- ☐ A copy of the sensitivity report
- ☐ A copy of the printout generated by the 100% device testing

NFPA 72 "Record of Completion"

- ☐ **NFPA 72 "Record of Completion" Form, filled out, with all signatures and at FACU**
- ☐ Appropriate year of form is used per year of Building Code permit
- ☐ Appropriate chapters must be indicated (see chapter list in the reference section of document)
- ☐ The manufacturer's authorized distributor (by definition the "installer") who made final connections at the FACU and programmed the system gave the owner and AHJ advance notice of the required 100% operational tests, so they could elect to attend.
  NOTE: The required 100% testing cannot properly be done by a single technician without a helper, even if the FACU has Walk-Test or an equivalent feature. Query the tech on how testing was performed.
- ☐ Signatures on the form must match the typed/printed names and each section must be complete. Do not accept a company name in place of the responsible individual. The individual must have a certificate. NOTE: If part or all of the testing was witnessed by a representative of the AHJ, the final line of the form is signed to indicate that. (SCO design contracts give that responsibility to the electrical PE.)
- ☐ Verify the technician who programmed the alarm system was trained and certified by the manufacturer, for the specific FACU model being installed, within the past 2 years. (A copy of the cert. should have been submitted with the Shop Drawings.) NICET Level III certification will extend this to 36 months.

REVIEW THE FOLLOWING ITEMS FROM THE SHOP DRAWING SUBMITTAL:

- ☐ Contractor has submitted battery calculations to the designer, verifying the system meets applicable capacity requirement of NFPA 72. The minimum endurance is 24 hours plus 5 minutes of alarm load. See the specification for additional requirements imposed by the AHJ.
- ☐ Battery sizing calculations verifying adequate Amp-Hour rating, indicating that the worst case NAC voltage on battery is within alarm notification appliance listing, and that NAC alarm load voltage drop at EOL does not exceed **14%** of battery voltage.
- ☐ Notification Appliance Circuit (NAC) calculated current draw, demonstrating that none exceed 80% of rated module output.
- ☐ If system is the Emergency Voice/Alarm type, amplifier load calculations.
- ☐ Copy of factory training certificates for technicians who programed the system.

REVIEW THE FOLLOWING ITEMS FROM 100% Test:

- ☐ **System Status and Programming Report, which includes the following 3 elements:**
  - ☐ Program settings for each alarm initiating device
  - ☐ Current sensitivity reading of each smoke detector
  - ☐ System operational matrix, giving response for each alarm input

- ☐ **If building has smoke purge system, an HVAC balance report in purge mode**
- ☐ **Two bound copies of the following information on the system (may be combined):**
  - ☐ Manufacturer's technical literature (cut sheets) on system components
  - ☐ Required maintenance schedule on system, to comply with NFPA 72
  - ☐ As-built drawings with loop #'s, device addresses, equipment terminals

COMPARE DOCUMENTS TO INSTALLATION

	Shop drawings calcs:	NFPA 72 says:	Installed size is:
FACU batteries	____AHr___@___V each	____AHr___@___V each	____AHr___@___V each
NAC batteries	____AHr___@___V each	____AHr___@___V each	____AHr___@___V each
DACT batteries	____AHr___@___V each	____AHr___@___V each	____AHr___@___V each
SLC loops	_____class_____	_____class_____	_____class_____
NAC Circuits	_____class_____	_____class_____	_____class_____

Check Fire Alarm Control Panel(s)

- ☐ **VERIFY SYSTEM IS IN TEST MODE AND THE FIRE TRUCKS WILL NOT ROLL**.

- ☐ Operating instruction summary is framed and mounted at (or inside) the FACU.

- ☐ Green grounding wire is bonded to FACU cabinet, and also connected to designated terminal on motherboard (if any).

- ☐ AC Power
  - Branch circuit to FACU does not share conduit with 24vdc alarm initiating circuits or notification appliance circuits.
  - Circuit breaker(s) serving FACU (and associated equipment) have lock on clips and red dot at breakers. (Some electricians will not paint the handle to avoid damage to the breaker)
  - Placard inside FACU gives the following info on this circuit: ***Panelboard location, panelboard identification, and branch circuit number (***The same applies to SNAC panels and any other system control equipment)
  - Surge arrestor model listed in project spec (feed-through type with "pi" configuration) is installed at electrical panelboard, on the 120vac branch circuit to FACU. Arrestor leads are trimmed as short as practical. See attached wiring diagram for more info.

- ☐ Fire alarm control unit (FACU) is powered up and clear of alarms, supervisory signals, and trouble conditions.

- ☐ Have ground fault put on any alarm initiating or notification appliance (horn-strobe) circuit. FACU must indicate "ground" and general "trouble." Verify this ordinary "trouble" signal is <u>not</u> sent to any Remote Supervising Station.

- ☐ Record battery size and verify date of installation is marked on each battery (Marking of the date of manufacture of the battery is a code requirement – so you will find 2 dates)

- ☐ Have technician disconnect a battery lead and verify the FACU indicates a local trouble signal within one minute of that action.

- ☐ Reconnect battery, ***then*** turn off 120vac. Batteries should measure approx. 13 volts, and differ <u>≤</u> 0.4 volt. (Also check batteries in any booster power supplies.)

- ☐ If system is connected to Remote Supervising Station, verify the FACU did ***not*** transmit AC Power Failure "trouble" signal, as it was not maintained for 1-3 hours.

- ☐ Have technician confirm FACU is programmed to send an AC power failure trouble signal to Remote Supervising Station if power loss continues for 1 hour minimum to 3 hours maximum. Also, verify that no other types of "trouble" signals are reported.

- ☐ The FACU and any transponders, sub-panels, DACT and "ADA" booster power supplies must be protected by a smoke detector within 15 feet of their location, measured horizontally, as required by Code (NFPA 72).

- ☐ Addressable loop controller circuits are Class “A”, with isolation modules at FACU on the outgoing and return loop, after each 25 addressable devices (max) on the loop, and (if ≤ 25 devices) at midpoint.
  - Have the technician apply a short circuit on the SLC loop. This will force two isolation modules to clamp. The test is to verify their operation and device count between the two that clamp.
  - With AC power off, there will be multiple troubles on the system. The total count will increase during this test. Exclude the count prior to the short.
  - On retrofit and repair work where the AHJ has approved the use of a class B SLC wiring design the isolation modules will not be installed.
  - Verify the number of devices between Isolation modules meets the specification requirement.

- ☐ While on battery power, initiate Alarm. Batteries should remain at 12+ volts each, but dropping slowly. Let alarm continue during next step.

- ☐ Verify the Notification Appliance Circuit (NAC) voltage drop at the EOL is ≤ 3 volts. Do this separately for each NAC. Look at the shop drawing to find the worst case scenarios when spot checking at a final.

- ☐ Silence the alarm and verify that any Remote Supervising Station has received a fire alarm signal. Reset the FACU and verify the Station receives a subsequent "restore" signal, indicating the alarm condition has been cleared.

- ☐ Verify requirements on wire type and gauge were followed and that the color code for circuits is proper throughout the system. (Review specifications and shop drawing requirements.).

- ☐ Have installing technician demonstrate that the system is programmed so all ***spot- type*** smoke detectors have automatic drift compensation and FACU will indicate when prescribed sensitivity limits are reached or exceeded.

- ☐ If system has provisions for “alarm verification" algorithm, arm it only if needed for the environment. Do ***not*** apply it to multi-sensor or multi-criteria smoke detectors.

- ☐ If any addressable control relays are installed, verify their contact ratings are suitable for connected load. (Some are rated for resistive loads only.) Also, if they require separate 24vdc power for operation, verify the circuit is electrically supervised. Compare their installed location to the design intent.

- ☐ All field wiring in the system has wire markers where landed at the FACU, and also in the terminal cabinet(s) on each floor of multistory buildings.

- ☐ If system uses an LED “zone” annunciator to provide a quick visual overview of the fire scenario for responding public safety personnel (general fire area and type of alarms), a framed directory or typed/engraved LED labels provide clear information on "zone" (area) boundaries and the type(s) of alarms (i.e., smoke, waterflow, etc.)

- ☐ During the walk through of the site verity that there are **no** splices in the system wiring other than at terminal blocks which are installed in identified terminal cabinets. "Wire nuts" and butt splices are not permitted on new work.

- ☐ All circuits are properly and securely terminated. Approved terminal fittings are used for any stranded wire terminations at screw posts that lack pressure connectors.

☐ Initiate alarm on a representative sample of devices by operating manual fire alarm box, blowing smoke into detector, flowing water from sprinkler system inspector's test station, etc., except do not test any non-restorable, fixed temperature heat detector. (get total counts from 72 form)

☐ Photo smoke ____/____ ☐ Duct smoke ____/____ ☐ Heat detector____/____
☐ Ionization smoke____/____ ☐ Other detector____/____ ☐ Flow switch ____/____
☐ Pull Station ____/____ ☐ tamper switch____/____ ☐ _____/___

☐ For each device tested have FACU operator read out the FACU display and the LED display. (Radios are very helpful at this point.) There should be a clear indication of device type, device number and location for each device tested. .

- Individual detectors of all types shall be identified on their bases (Loop # **--** Device #), in sequence on the loop from the FACU

☐ While spot testing devices in the facility verify operation of audible-visible alarm notification appliances.

- Audible alarm devices must be 15 dBA above normal ambient sound level in all occupiable areas of building. (Use meter if in doubt.)
- Indoor strobes must flash 60-120 times/minute and those installed in a single space (room, corridor, etc.) must be synchronized and remain synchronized throughout the test.

☐ Also verify HVAC shutdown and closure of (any) smoke doors. These functions must be done by the FACU, rather than by integral smoke detector relay contacts.

- Shutdown must occur within 20 seconds, except gas pack units can be arranged for up to 60 seconds delay before the fan stops, to prevent heat exchanger damage.
- After verifying the HVAC shutdown is operational it is acceptable to activate the HVAC bypass to avoid excessive restarting of large air handler systems.

ELEVATORS

☐ Elevator control key and technician must be on site for the following tests to take place
☐ Elevator lobby detectors must be within 21 feet of each elevator door
☐ Test detector(s) located at elevator lobby that will initiate elevator recall
  - Verify recall to a primary floor
  - Verify recall to alternate floor
  - Verify illumination of “Fire Hat”
☐ Test detector(s) located in shaft & elevator machine room
  - Verify recall to designated floor
  - Verify flashing illumination of “Fire Hat”
☐ Heat Detectors installed in a shaft or machine room and used for shunt trip activation shall be located within 2 feet of each sprinkler head. (Verify heat setting is less than sprinkler setting per code req.)

SPRINKLER SYSTEMS

☐ If a sprinkler system is present, check the operation of the waterflow alarm switches by flowing water from Inspectors Test connection(s), unless dry pipe system. Alarm sounds in 20-45 seconds and any outside water motor gong rings properly in ≤ 300 seconds.

☐ Inspectors Test Connection flow is limited to 1/2" stream (or actual orifice size of the sprinklers in the system, if different) by a valve or sight glass marked accordingly, or by a sprinkler head (minus deflector) mounted at discharge. NOTE: If a pipe union with an internal restrictor plate is used for this purpose, have the sprinkler contractor take at least one apart for inspection, to verify the orifice size.

☐ Close any electrically supervised sprinkler control valves to verify supervisory alarm at FACU within 2 turns of control wheel or, for Post Indicator Valve (PIV), within 1/5 of valve control mechanism’s travel distance. Then reopen to verify “restore” signal.

☐ If dry pipe or pre-action sprinkler system, have contractor demonstrate waterflow alarm functions, and that both high and low air pressure are supervised as required.

☐ Each fire extinguishing system, such as in a kitchen hood, is connected to give building fire alarm. Have contractor demonstrate that this functions properly, by manually operating the monitored switch, without releasing extinguishing agent.

NOTE: Kitchen hood fire extinguishing system activation must shut off the gas, if used, and, for wet chemical type, also operate a shunt trip breaker to shut off the electric power to all protected appliances under the hood. The exhaust fan(s) keep running but the make-up air must shut down. These functions are to be done directly by fire extinguishing system, rather than the FACU, since it is not appropriate to cut off the gas supply or to operate the shunt trip for other types of alarms not involving the kitchen hood extinguishing system (e.g., smoke detectors, fire alarm boxes, etc.).

☐ Verify that fire alarm system monitors power to any fire suppression system shunt trip breakers. (Look for kitchen hood systems and sprinklered elevator spaces.)

☐ If remote alarm annunciator in building, verify proper operation, including the audible “Trouble” signal. Check its "Lamp Test" and “Trouble Silence” features, if provided.

☐ If a Fire Pump is part of the sprinkler system – verify that NFPA 20 certification was provided and testing has been successfully completed

OTHER SUPPRESSION SYSTEMS

☐ Pre-action suppression system – If installed and if it has an independent control panel it will require a separate NFPA 72 certificate from the building Fire Alarm Panel

☐ Dry Chemical suppression system – If installed and if it has an independent control panel it will require a separate NFPA 72 certificate from the building Fire Alarm Panel

PROPER INSTALLATION OF DEVICES

☐ Verify all dust covers have been removed. If still installed how was the 100% test done?

☐ Spot type smoke detectors shall not be located within 3 feet of a supply or return air diffuser, nor in a strong air stream from a supply diffuser at any distance.

☐ Wall-mounted smoke detectors must be installed between 4 and 12 inches from the ceiling (measured to the nearest edge of the detector), as required by NFPA 72.

☐ Wall mounted detectors shall not have wall-mounted luminaires or other obstructions below.

☐ Ceiling mounted smoke detectors shall be at least 4 inches from a wall or ceiling obstruction.

☐ All smoke detectors are analog addressable model(s) having a separate plug-in head, concealed locking device, and terminal strips for circuit connections.

NOTE: Snap-ring mounted models with removable terminal strip plug for connection to loop conductors do not comply with the intent of this requirement and typically do not have a locking device to deter tampering.

☐ Verify that the isolation modules and addressable initiating device interface modules are located in a conditioned space (not attics, boiler rooms, unheated warehouses, damp locations, outside corridors, parking decks, etc.). Exception: Any devices that are specifically listed for the ambient conditions expected (or likely) in the area where installed.

☐ Verify that all detectors, modules and pull stations installed outside or in non-conditioned spaces are listed for use at the both ends of the expected temperature. (eg Typically addressable pull stations are not listed for use in parking decks because the low end is 32 degrees.)

☐ Verify that any strobes in walk-in coolers or freezers are listed for that environment or provided with heated Lexan enclosures for which they are specifically listed.

☐ Check any outside alarm bells and strobes for operation. Verify outside strobe is the weatherproof type with at least 100cd output, double flash, with clear lens.

DUCT SMOKE DETECTORS

☐ Intake tube has its holes /slots facing into the air stream, and a stopper installed to seal its far end.

☐ If the tube is over 36 inches long, the far end must be supported for stability. If support is provided by extending the intake tube through the far side of HVAC duct (best for inspection, cleaning, testing), the duct penetration must be sealed.

☐ Each duct smoke detector has a Remote Alarm Indicator Light (RAIL) in nearest corridor or other public space. (Because addressable, test switch is **not** required.)

☐ At each duct detector a 12”x12” minimum access door, hinged or latched type, is provided to facilitate sampling tube inspection and cleaning.

☐ Air flow direction is permanently indicated on the duct by stencil or decal, to help assure the sampling tubes are installed and maintained in the correct orientation.

DACT

☐ **Verification of the dial out ability** or other means of remote alarm signaling
☐ Verify that DACT it is connected and functioning properly, to transmit fire alarm, supervisory, and trouble signals as separate, distinct events.
☐ Verify two phone lines are present and labeled when sprinkler is installed.
☐ Verify that DACT is programmed for 24-hour silent test call to the supervising station.
☐ Verify each type of signal is properly received and coded at the receiving station. (Supervisory signals include sprinkler valve tamper, fire pump off-normal, hi-low air pressure, etc.)
☐ Inspector is to personally talk to someone at the receiving station to verify alarm receipt

PRINTER

☐ The specification should require that systems with more than 100 addressable points, or in a building that exceeds 3 occupied floors or 60,000SF, an event printer is to be provided which uses ordinary non-thermal paper. In a high rise building, the printer must be FACU-monitored and on a generator-supported circuit.
- NOTE: Printer does not have to be adjacent to FACU and, except for high rise buildings, does not have to be electrically supervised.

OTHER SYSTEMS

☐ For dormitories there will be special testing required for the sounder bases and the handicapped notification which uses higher candela strobes. Even if system is dual event it must dial out on 1st alarm.
☐ For institutions check for keys to the lockable pull stations if they are installed.
☐ Where smoke “sniffer” systems are used - create a test procedure with the help of the designer.
☐ Where beam detectors are used verify they are not on walls subject to movement and are not subject to direct sunlight.
☐ Where smoke evacuation &/or AHU bypass is used verify that the panel can be locked and operation limited to qualified people.
☐ Mass Notification systems require special procedures and testing to verify proper operation.

TRAINING ETC

☐ Verify that the Owner's designated personnel have received training in system operation: How to interpret, silence, and reset FACU signals, how to obtain service, etc.

☐ Verify that when required by specification, owner's personnel have received more thorough, detailed training in system troubleshooting and repair, plus installation manuals and other documentation, as applicable. (This is standard for the UNC-Chapel Hill campus.)

☐ Contractor has provided electronic copy of system's site-specific programming. (CD, flash drive)

☐ Contractor has provided spare parts in accordance with the specification for the project.

REFERENCE INFORMATION TO ASSIST SYSTEM INSPECTION

After the required 100% system operational test the contractor submits a "final" copy of NFPA 72* "Fire Alarm System Record of Completion" form. This form is to verify the proper operation of all (restorable) alarm initiating devices, audible and visible notification appliances, and other system functions including HVAC control, closure of smoke doors and dampers, pressurization fans, remote signaling, etc.
*****Use only the NFPA form, or an identical reprint. The NFPA 72 form will vary with the year the project was permitted. The year required should be listed in the project specification.

NC Building Code, Chapter 35 Referenced Standards set the NFPA 72 version requirements

Projects permitted under NC Building Code 2002 - NFPA72 1999
Projects permitted under NC Building Code 2006 - NFPA72 1999
Projects permitted under NC Building Code 2009 - NFPA72 2002
Projects permitted under NC Building Code 2012 - NFPA72 2007

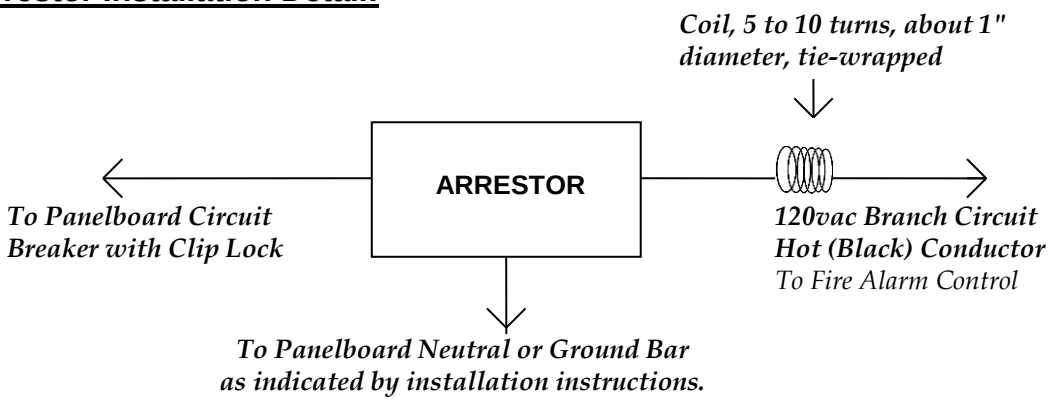
NFPA 72 Chapters (note they vary by version year)

(1999) Chapters: 1-Fundamentals, 2-Initiating Devices, 3- Protected Premises, 4-Notification Appliances, 5- Supervising Station FA system, 6- Public FA reporting systems, 7-Inspection and Testing, 8-FA for Dwelling units, 9-Reference publications_____

(2002) Chapters: 1- Administration, 2-Referenced Publications, 3- Definitions, 4- Fundamentals, 5- Initiating Devices, 6- Protected Premises, 7- Notification Appliances, 8- Supervising Station FA system, 9- Public FA reporting systems, 10- Inspection and Testing, 11- Single and Multiple Station & Household_____

(2007) Chapters: 1- Administration, 2-Referenced Publications, 3- Definitions, 4- Fundamentals, 5- Initiating Devices, 6- Protected Premises, 7- Notification Appliances, 8- Supervising Station FA system, 9- Public FA reporting systems, 10- Inspection and Testing, 11- Single and Multiple Station & Household_____

Transient Arrestor Installation Detail:



NOTE: Securely mount transient arrestor in accessible junction box or other proper metal enclosure adjacent to the panelboard, and provide engraved label indicating its location

REFERENCE INFORMATION TO ASSIST SYSTEM INSPECTION

Wiring: All addressable system wiring shall be color coded in accordance with following scheme, which must be maintained throughout system, without color change in any run:

- Addressable Loop Controller Circuits**:** Cable per spec, with Red Jacket and Red(+) and Black(-) Conductors

- One-way Voice/Alarm and Two-way (Fireman's Telephone)**:** Wire per specifications

The following circuits use THHN / THWN conductors, of the size and color indicated:

- Alarm Notification Appliance Circuits**:** AWG 14, Blue(+) and Black(-) conductors

- AHU Shutdown, Elevator Capture, other control functions**:** These are now done by addressable control relays on the loop. The relays may require separate power circuits, in which case use AWG 14 conductors, with Yellow (+) and Brown (-) color code. **NOTE: Check any power circuits to addressable relays for electrical supervision by disconnecting 1 lead.**

- Circuits that power door magnets from the FACU or SNAC panels**:** AWG 14, Orange

- Circuits from ZAM's to monitored initiating devices**:** AWG 16 or 14, Violet (+), Grey (-)

- NOTE: Most manufacturers either require or recommend low capacitance, twisted, shielded pair cable for Signaling Line Circuits (addressable loops). All shielded cable must have the grounded "drain" wire maintained continuously around the loop. If unshielded cable was used, verify that the manufacturer's installation instructions require or state a preference for use of unshielded cable. For addressable system retrofit when a non-addressable system had previously been in service, if existing single-conductor wiring from the old system was used (sometimes done if in fine condition, properly color coded, with terminal strips, etc.), verify that the manufacturer's installation instructions do not require the use of twisted pair conductors or low capacitance cable and the installer also agreed to replace the existing fire alarm system wiring if unsatisfactory performance is caused by its re-use (e.g., spurious signals, cross-talk, etc.).

  Spares: Provide the following spare parts with the system, each individually packaged and labeled. For multi-building project calculate separately for each building with FACU:

- Fuses (If Used).....2 of each size in system
- Manual Fire Alarm Boxes.....2% of installed quantity
- Addressable Control Relays.....4% of installed quantity
- Indoor Horns/Speakers with Strobes Lights.....4% of installed quantity
- Indoor Strobe-only Notification Appliances.....4% of installed quantity
- Monitor Modules (Addressable Interface).....4% of installed quantity
- Isolation Modules / Isolation Bases.....4% of installed quantity
- Addressable, Electronic Heat Detectors.....4% of installed quantity
- Spot-Type Smoke Detectors / Sounder Bases.....6% of installed quantity

NOTE: Increase decimal quantities of all spare parts to next higher whole number when calculating.

NOTE: No spares are required for projected beam, air sampling, or duct type smoke detectors.

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