ELEVATOR MODERNIZATION:
LUMBEE HALL / OLD MAIN

The University of North Carolina Pembroke
Pembroke, North Carolina

PROJECT MANUAL
October 10, 2022
SCO ID: 22-24699-01A
Code: 42131 Item: 322

architect:

John B. Hawkins ▪ AIA ▪ Architect
210 N. Columbia Street
Chapel Hill, North Carolina 27514

mechanical / electrical / fire alarm engineer:
Dewberry Engineers, Inc.
2610 Wycliff Road – Suite 410
Raleigh, North Carolina 27607

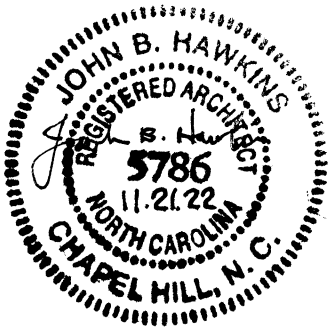
CONSTRUCTION SET

ELEVATOR MODERNIZATION –
LUMBEE HALL AND OLD MAIN

THE UNIVERSITY OF NORTH CAROLINA AT PEMBROKE
PEMBROKE, NORTH CAROLINA

PROJECT MANUAL

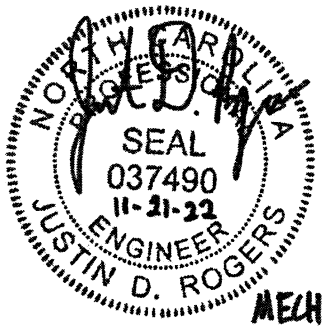
JOHN B. HAWKINS • AIA • ARCHITECT
312 WEST FRANKLIN STREET
CHAPEL HILL, NORTH CAROLINA 27516



DEWBERRY ENGINEERS, INC.
2610 WYCLIFF ROAD – SUITE 410
RALEIGH, NORTH CAROLINA 27602

SCO ID # 22-24699-01

NOVEMBER 21, 2022



SECTION 00100
NOTICE TO BIDDERS

Sealed proposals will be received by the University of North Carolina Pembroke, in Room 141, Pinchbeck Facilities Building, 128A Facilities Drive, Pembroke, NC 28372 up to 3:00 P.M., Tuesday, December 20, 2022 and immediately thereafter publicly opened and read for the furnishing of labor, material and equipment entering into the construction of the Elevator Modernization – Lumbee Hall and Old Main. Proposals must be delivered in person to that office by 3:00 PM, or be received by U.S. mail before that time at the address listed above.

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

Pre-Bid Meeting

A **non-mandatory** open pre-bid meeting will be held for all interested bidders and vendors at the Pinchbeck Facilities Building at 128A Facilties Drive, Pembroke, NC, 28372, meeting in Room 141 on Tuesday, December 6, 2022 at 10:00 AM.

Complete plans, specifications and contract documents will be available for review in the office of the Architect – John B. Hawkins . AIA . Architect (919) 929-0039. Electronic files of the drawings and specifications may be ordered from the Architect at no cost at the same phone number. The construction documents may also be viewed in the online plans rooms of ConstructConnect (877-794-6051), Dodge Data & Analytics (877-784-9556), and in the Minority Plans Room of the NC Institute of Minority Economic Development, Inc. at NCIMED, Inc. 114 West Parrish St., 4th Floor, Durham, NC 27701 (919-956-8889.) Complete paper sets of drawings and specifications may be purchased by prime bidders upon request from ARC Document Solutions (Morrisville, NC; 919-388-9900) at cost on a non-refundable basis; all shipping costs are to be borne by bidders. All contractors are hereby notified that they must have proper license under the state laws governing their respective trades.

NOTE: The bidder shall identify on its bid proposal the minority business participation it will use on the project (Identification of Minority Business Participation) form and shall include either *Affidavit* **A** or *Affidavit* **B** as applicable. Forms and instructions are included with 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.)

Only bids from General Contractors will be accepted. 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 "Building" required by the NC General Contractors Licensing Board under G.S. 87-1.

NOTE: 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.

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 that 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 on the basis of 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 **60** days.

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

Designer:
John B. Hawkins • AIA • Architect
312 West Franklin Street
Chapel Hill, NC 27516

Owner:
The University of North Carolina
at Pembroke
1 University Drive
Pembroke, NC 28372

SECTION 00105
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INSTRUCTIONS TO BIDDERS

AND

GENERAL CONDITIONS OF THE CONTRACT

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.

SECTION 00700
SUPPLEMENTARY GENERAL CONDITIONS

ARTICLE I -DEFINITIONS

Paragraph "u": Add the following new paragraph: “Provide”shall mean furnish and install complete in place, new, clean, operational, and ready for use.

Paragraph "v": Add the following new paragraph: “Indicated” and "shown" shall mean provide as detailed, or called for, and reasonably implied in the contract documents.

Paragraph "w": Add the following new paragraph: “Latest edition”shall mean the current printed version of the referenced document issued up to 30 calendar days prior to date ofreceipt of bids, unless specified otherwise.

Paragraph "·x": Add the following new paragraph: “Drawings” or "plans" shall mean the drawings enumerated in the contract documents, as well as all the information in the detail manual (when applicable), addenda, and designer-prepared field drawings and clarification drawings.

Paragraph "-y": Add the following new paragraph: “Specifications” mean this project manual and addenda thereto.

ARTICLE 2- INTENT AND EXECUTION OF THE DOCUMENTS

Paragraph "a": Add the following new sub-paragraphs:

1. “These drawings and specifications represent the general dimensional and aesthetic requirements for various "in place" materials required to produce a building acceptable to the owner for his intended use.
2. It is the intent of these drawings and specifications to provide a building that is structurally sound, water and weather tight, environmentally controllable and conforming to at least the minimum requirements of the North Carolina State Building Code.
3. The Contractor shall make all reasonable efforts to achieve this intent. If any detail shown on these drawings appears inconsistent with this intent, in the opinion of the Contractor, he shall notify the Architect in writing of his opinion, and await instructions from the Architect before proceeding with the work.
4. Where more detailed information is needed, or when an interpretation of the contract documents is required, the Contractor shall refer the matter in writing to the designer prior to proceeding with the work. The designer shall furnish the Contractor an interpretation in writing.
5. If the Contractor discovers errors, inconsistencies, discrepancies or omissions in the contract documents, the Contractor shall inform the designer of such condition prior to proceeding with the work.
6. If the Contractor discovers errors, inconsistencies, discrepancies or omissions in the contract documents prior to bid, the Contractor shall request clarifications from the designer and shall include in the bid price all work required to deliver a fully operational and ready to use system.
7. If inconsistencies, discrepancies or contradictions in the Contract Documents are discovered after the bid, the Contractor shall be deemed by submittal of his bid, to have bid the most costly as to labor, materials, duration, sequence and method of construction to provide the work.”

ARTICLE 3 - CLARIFICATION AND DETAIL DRAWINGS

Paragraph "a": Add the following to the end of the paragraph: "If errors, inconsistencies or discrepancies in the contract documents are discovered by the Contractor, the Contractor shall inform the designer of such condition prior to proceeding with the work. The designer shall furnish the Contractor written clarification in a reasonable time, so as not to impact the progress of the work.

ARTICLE 5 - SHOP DRAWINGS, SUBMITTALS, SAMPLE DATA

Paragraph "c": Add the following new paragraph: "This schedule must account for any resubmittals required to obtain approval from the Project Designer and Owner."

Paragraph "d": Add the following new paragraph: "No time extension will be granted for delays caused due to failure of the Contractor to properly review shop drawings prior to submittal to the Project Designer. All shop drawings shall indicate how materials relate to conditions of the project. Standard manufacturer's drawings that do not show how and where material is to be used will not be reviewed by the Project Designer. Shop drawings shall not be reproductions of contract documents. Coordination drawings are required in accordance with **Article 14**."

ARTICLE 8 - MATERIALS, EQUIPMENT, EMPLOYEES

Paragraph "e": Delete the paragraph in its entirety and replace with the following: "The Contractor shall obtain written approval from the Project Designer for the use of products, materials, or equipment claimed as equal to those listed in the specifications. Such approvals shall be obtained prior to the opening of the bids. The Contractor shall submit within twenty (20) calendar days following award of contract a complete list of materials to be used for the project for review and approval by the Project Designer. The list shall consist of materials, products and equipment as listed in the specifications, equals, or approved equals. When this list is approved by the Project Designer, no substitution will be permitted except in unusual or extenuating circumstances. If no list is submitted, the Contractor shall supply only materials, products, or equipment required by the specifications."

ARTICLE 11- PROTECTION OF WORK, PROPERTY, AND THE PUBLIC

Paragraph "j": Add the following paragraph: "In case emergency contact is required, the Contractor shall furnish the Owner with names, pager numbers, and telephone numbers (day and night) of the project manager and superintendent. The numbers shall remain current for the duration of the project, and shall be updated as required."

ARTICLE 23 - TIME OF COMPLETION DELAYS, EXTENSION OF TIME

Paragraph "a": Add the following to the end of the paragraph:

"The Contractor shall commence work to be performed under this Contract on a date designated by the designer, whereupon the production and review of shop drawings shall begin, to be followed by the fabrication of elevator equipment. The modernization work onsite must begin on or shortly after May 8, 2023 and be fully complete by June 23, 2023 (if base bid only – Lumbee Hall) - or be fully complete at both buildings by August 4, 2023 (if alternate # 1 – Old Main – is accepted). For each day beyond these completion dates in which the work is not complete, the Contractor shall pay the Owner **$1,000.00** as liquidated damages reasonably estimated in advance to cover the losses to be incurred by the owner should the Contractor fail to complete the Work within the time specified."

DRAWING LIST

C-1: Key Plan; Vicinity Map; Index of Drawings; Building Code Summary – Lumbee Hall
C-2: Building Code Summary – Old Main

ARCHITECTURAL

A-1.1: Lumbee Hall (Base Bid): Partial 1st Floor Plan; Partial 2nd Floor Plan
A-1.2: Lumbee Hall (Base Bid): Partial 3rd Floor Plan; Partial 4th Floor Plan
A-2.1: Old Main (Alternate # 1): Partial 1st Floor Plan; Partial 2nd Floor Plan

MECHANICAL

M-0.1: Mechanical Legend, Notes, Symbols and Schedules
M-1.1: Lumbee Hall (Base Bid): Partial 1st Floor Plan
M-1.2: Lumbee Hall (Base Bid): Partial 2nd Floor Plan
M-2.1: Old Main (Alternate # 1): Partial 1st Floor Plan

ELECTRICAL

E-0.1: Electrical Legend, Abbreviations, Notes and Fixture Schedule
E-1.1: Lumbee Hall (Base Bid): Partial 1st Floor Plan
E-1.2: Lumbee Hall (Base Bid): Partial 2nd Floor Plan; Partial 3rd Floor Plan; Partial 4th Floor Plan
E-1.3: Lumbee Hall FACP (Alternate # 2): Partial 1st Floor Plan
E-1.4: Lumbee Hall FACP (Alternate # 2): Partial 2nd Floor Plan; Partial 3rd Floor Plan; Partial 4th Floor Plan
E-2.1: Old Main (Alternate # 1): Partial 1st Floor Plan
E-2.2: Old Main (Alternate # 1): Partial 2nd Floor Plan
E-3.1: Lumbee Hall (Base Bid): Electrical Riser Diagram
E-3.2: Old Main (Alternate # 1): Electrical Riser Diagram
E-4.1: Lumbee Hall FACP (Alternate # 2): Fire Alarm Riser Diagram
E-4.2: Old Main (Alternate # 1): Fire Alarm Riser Diagram
E-5.1: Electrical Details

End of Section 00700

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)

SECTION 01030
ALTERNATES

1.0 GENERAL

1.1 DESCRIPTION OF THE WORK

A. Schedule of Alternates.

1.2 ALTERNATES

A. The Alternates quoted on Bid Forms will be reviewed and accepted or rejected at the Owner's option.

B. Coordinate related Work and modify surrounding work as required. See drawings for extent of Alternates.

C. Schedule of Alternates:

1. Alternate # 1: Provide all labor and materials required to complete the elevator modernization of the single hydraulic elevator in Old Main with all associated general, electrical and mechanical work as shown on the drawings and as specified in section 14211. (Base bid = modernization of single hydraulic elevator in Lumbee Hall.)

2. Alternate # 2: Provide all labor and materials required to complete the replacement of the existing fire alarm panel at Lumbee Hall with a new Head End FACP. See electrical drawings.

2.0 PRODUCTS

NOT USED

3.0 EXECUTION

NOT USED

END OF SECTION 01030

SECTION 01040
PROJECT COORDINATION

1.0 GENERAL

1.1 ADMINISTRATION AND SUPERVISION

A. Coordinate various elements of the work and entities engaged to perform work. Coordinate the work with existing facilities and / or conditions and with work by separate contractors and by the Owner.

1.2 CONSTRUCTION METHODS

A. The Contractor shall exercise care during construction to keep all project areas clean and tidy, free from dust, mud and debris.

1.3 OWNER OCCUPANCY

A. Lumbee Hall and Old Main will be in use by UNCP students, faculty, staff and visitors continuously throughout the construction of this project. All reasonable measures must be utilized to minimize noise and other disruption to the normal activities of these occupants.

B. Barriers: Erect hard construction barriers around the elevator entrances in the elevator lobbies while any work is being done by workers on those elevators in those lobbies or elevator pits (such as work on hoistway doors, installation of new elevator lobby fixtures, painting, installation of ladders or lights in pits, etc.) Barriers are not required for work being done exclusively in the hoistways or machine rooms.

1.4 CONSTRUCTION ACCESS

A. The project site will be available to the Contractor for construction work Monday through Friday from 8:00 AM until 5:00 PM or as negotiated between University representatives and the Contractor.

B. Construction materials are to be brought to the elevator machine room at Lumbee Hall via the rear (west) lobby entrance on the 1st floor. Materials are to be brought into the machine room at Old Main via the entrance on the southeast side of the building on the 1st floor. The timing of these deliveries must be coordinated and approved in advance with University representatives.

1.5 PARKING / STAGING

A. Several parking spaces for parking and limited lay-down area during construction will be provided in lot 14 on the UNCP campus. These areas will be reviewed at the pre-construction conference.

B. All roadways and vehicular access in the vicinity of the project area must be kept open and continuously maintained. Delivery or construction personnel vehicles may not block such access by other vehicles to parking areas or normal vehicular routes at any time.

C. All existing pedestrian walkways around the two subject buildings must remain open and unobstructed to pedestrian traffic at all times during the project.

1.6 PROJECT PHASING

A. The work of the contract will be completed in a single (1) construction phase during the summer break of 2023, whether it includes only the base bid elevator (Lumbee Hall) or both elevators (Lumbee Hall – base bid, and Old Main – Alternate # 1.)

If Alternate # 1 is **NOT** accepted, the work onsite shall begin on or after **May 8, 2023** (5.8.23) on the replacement of the Lumbee Hall elevator and this elevator shall be fully completed, inspected by NCDoL and the design team and returned to service no later than **June 23, 2023** (6.23.23).

If Alternate # 1 **is** accepted (Old Main elevator mod), the modernization of both elevators (in both buildings) shall begin on or after **May 8, 2023** (5.8.23), and be fully completed, inspected by NCDoL and the design team, and returned to service by **August 4, 2023** (8.4.22).

Within two weeks of the issuance of the Notice to Proceed after execution of of the construction contract, the contractor shall submit a project construction schedule which includes a timeline for all steps in the fabrication and construction process. Sufficient time must also be shown to be allocated at the end of the contract period for inspections and correction of punch list items – *within that contract period.*

1.7 TOILET FACILITIES

A. The contractors may use the 1st floor toilet rooms near the elevators in Lumbee Hall and Old Main, provided that they are kept clean and tidy. This privilege will be revoked if abused.

1.8 PREPARATION FOR INSTALLATION

A. Pre-installation conference: Prior to starting installation of each major component of the work, hold a pre-installation conference, attended by each entity involved or affected by planned installation.

Review significant aspects of requirements for the work. Record discussion, and distribute as plan of action.

B. Installer inspections: Require Installer of each major unit of work to inspect substrate and conditions for installation, and to report unsatisfactory conditions in writing. Correct unsatisfactory conditions

before proceeding. Inspect each product immediately before installation. Do not install damaged or defective products, materials, or equipment.

1.9 HAZARDOUS CONSTRUCTION MATERIALS

A. Only asbestos-free materials may be used in this project.

B. All construction primers and finishes must be lead, cadmium, and chromium-free.

C. The contractors shall be vigilant during demolition, patching, or exploratory activities and provide notice to the Architect if any materials or installations are observed which may contain asbestos or other hazardous materials. Obtain direction from the Architect prior to disturbing these materials or installations.

1.10 SERVICE CONTINUITY

A. Utilities and services at Lumbee Hall and Old Main shall not be interrupted without the Owner's approval as to time and duration. No utilities and services serving existing facilities shall be discontinued until the new service connections are installed, unless temporary connections are installed to serve the existing facilities. Owner's representative shall be present at all service interruptions.

1.11 UTILITIES DURING CONSTRUCTION

A. Building electrical power and water will be available for use by the Contractor at the project site.

1.12 EXISTING RECYCLING FACILITIES

A. The building dumpsters and recycling carts in Lumbee Hall and Old Main must remain accessible at all times during construction and must not be used by construction personnel.

2.0 INSTALLATION

2.1 GENERAL

A. Comply with manufacturer's instructions and recommendations to the extent printed information is more detailed or stringent than requirements contained directly in the contract documents.

B. Timing: Install work during time and under conditions which will ensure the best possible result, coordinated with required inspections and testing.

C. Anchor work securely in place, properly located by measured line and level, organized for best possible uniformity, visual effect, operational efficiency, durability, and similar benefit to Owner's use. Isolate non-compatible materials from contact, sufficiently to prevent deterioration.

D. Mount individual units of work at industry- recognized mounting heights, unless otherwise indicated; refer uncertainties to architect before proceeding.

3.0 CLEANING AND PROTECTION

3.1 GENERAL

A. The contractor shall be responsible for thorough cleaning of the project site at the completion of construction.

END OF SECTION 01040

SECTION 01045
CUTTING AND PATCHING

1.0 GENERAL

1.1 DEFINITION

A. "Cutting and Patching" includes cutting into existing construction to provide for the installation or performance of other work, and subsequent fitting and patching required to restore surfaces to their original condition.

1.2 REQUIREMENTS AND LIMITATIONS

A. Visual /quality limitations: Do not cut-and-patch work exposed to view, either exterior or interior, in a manner resulting in noticeable reduction of aesthetic and similar qualities, as judged by the Architect.

B. Structural work: Do not cut and patch structural work in a manner resulting in a reduction of load-carrying capacity or load / deflection ratio. Submit proposal and request and obtain Architect's approval before proceeding with cut and patch of structural work.

C. Limitation on approvals: Architect's approval to proceed with cutting and patching does not waive the right to later require removal / replacement of work found to be cut / patched in an unsatisfactory manner, as judged by Architect.

2.0 MATERIALS

2.1 GENERAL

A. Use materials for cutting and patching that are identical to existing materials. If identical materials are not available, or cannot be used, use materials that match existing adjacent surfaces to the fullest extent possible with regard to visual effect. Use materials for cutting and patching that will result in equal or better performance characteristics.

3.0 EXECUTION

3.1 GENERAL

A. Before cutting, inspect surfaces to be cut and patched, and conditions under which the work is to be performed. If unsafe or otherwise unsatisfactory conditions are found, take corrective action before proceeding with the work.

B. To prevent failure, provide temporary support of work to be cut.

C. Protect other work during cutting and patching, to prevent damage. Provide protection from adverse weather conditions for that part of the project that may be exposed during cutting and patching operations.

D. Avoid interference with the use of adjoining areas or interruption of free passage to adjoining areas.

E. Take precautions not to cut existing pipe, conduit, or duct serving the building but scheduled to be relocated, until provisions have been made to bypass them.

3.2 CUTTING

A. Cut the work using methods that are least likely to damage work to be retained or adjoining work. Where possible, review proposed procedures with the original installer, and comply with his recommendations.

B. Where cutting is required, use hand or small power tools designed for sawing or grinding, not hammering and chopping. Cut through concrete and masonry using a cutting machine such as a carborendum saw or core drill. Cut holes and slots neatly to size required with minimum disturbance of adjacent work. To avoid marring existing finished surfaces, cut and drill from the exposed or finished side into concealed surfaces. Temporarily cover openings when not in use.

3.3 PATCHING

A. Patch with seams which are durable and as invisible as possible. Comply with specified tolerances for the work.

B. Restore exposed finishes of patched areas and where necessary, extend finish restoration into retained adjoining work in a manner which will eliminate evidence of patching and refinishing.

END OF SECTION 01045

SECTION 01200
PROJECT MEETINGS

1.0 GENERAL

1.1 DESCRIPTION OF THE WORK

A. Preconstruction conference; progress meetings; pre-installation conference.

1.2 PRECONSTRUCTION CONFERENCE

A. The Architect will schedule a preconstruction conference after Notice of award for all affected parties. A University representative will be in attendance.

B. Agenda items will include procedures and processing of field decisions, submittals, applications for payments, Change Orders and scheduling.

1.3 PROGRESS MEETINGS

A. The Architect shall schedule and administer meetings throughout the progress of the work. Formal monthly meetings shall occur each month at the same designated interval (ex.: second Tuesday of each month, etc.) All major subcontractors or suppliers should be represented at the monthly meetings. Other informal meetings shall occur on a bi-weekly basis or as otherwise agreed between the Architect, Owner, and Contractor.

B. The Architect shall preside at meetings, record minutes (monthly meetings), and distribute copies within two days to those affected by decisions made.

1.4 PREINSTALLATION CONFERENCE

A. When required in individual specification sections, convene a pre-installation conference at project site prior to commencing work of the section. See also spec section 01040, paragraph 1.8.A.

2.0 PRODUCTS

NOT USED

3.0 EXECUTION

NOT USED

END OF SECTION 01200

SECTION 01340
SUBMITTALS

1.0 GENERAL

1.1 WORK-RELATED SUBMITTALS

A. The provisions of this section apply to those required submittals that are related to individual units of work, not to administrative submittals, such as payment requests, insurance certificates, and progress reports.

B. In addition to specific provisions of the General Conditions and Supplementary Conditions regarding work-related submittals, specification sections in Divisions 2 through 16 contain submittal requirements. Specific requirements in other specification sections have precedence over the general requirements contained in this section.

C. Within thirty days of the Notice to Proceed, and before the first Application for Payment, submit to the Architect a complete schedule of submittals that will be provided for the project, showing the projected date on which each item will be submitted. Provide an updated submittal log at each monthly meeting showing the status of each item (actual dates of submission and return, approved or rejected, etc.)

1.2 MISCELLANEOUS SUBMITTALS

A. In addition to the specific categories of shop drawings, product data, and samples, as defined in the General Conditions, a category of miscellaneous submittals is required. This includes, but is not limited to, the following:

1. Warranties
2. Workmanship Bonds
3. Maintenance Manuals
4. Inspection and Test Reports
5. Closeout Submittals

1.3 SUBMITTAL PROCEDURES

A. Submittal form is to identify project, Contractor, subcontractor or supplier, and pertinent contract document references.

B. Apply Contractor's stamp or seal, signed or initialed, certifying that review, verification of products required, field dimensions, adjacent construction work, and coordination of information is in accordance with the requirements of the work and contract documents. Any submittals not bearing Contractor's signed stamp will be returned unreviewed for stamp and signature. Responsibility for any time lost due to lack of Contractor's review and stamp will be borne by Contractor.

C. Identify variations from contract documents and product or system limitations which may be detrimental to successful performance of the completed work.

D. Revise and resubmit submittals as required; identify all changes made since previous submittal.

E. After the submittal schedule has been drafted, a UNCP Facilities representative shall identify from that schedule the submittals that they are to receive. A copy of those selected submittals shall be sent to that person when the other submittal copies are sent to the design team for review.

1.4 SHOP DRAWINGS

A. Submittals are to be submitted electronically unless otherwise directed. If paper versions are requested, submit (3) copies.

1.5 PRODUCT DATA

A. Mark each copy to identify applicable products, models, options and other data. Supplement manufacturer's standard data to provide information unique to this project.

1.6 SAMPLES

A. Submit samples to illustrate the functional and aesthetic characteristics of submittals for interfacing work.

B. Submit samples of finishes from the full range of manufacturer's standard colors, textures, and patterns for Architect / Engineer's selection.

C. Include identification on each sample, with full project information.

D. Submit the number of samples specified in individual specification sections; one will be returned by the Architect or Engineer.

1.7 MANUFACTURER'S INSTRUCTIONS

A. When specified in individual specification sections, submit manufacturer's printed instructions for delivery, storage, assembly, installation, adjusting and finishing.

B. Identify conflicts between manufacturer's instructions and Contract documents.

1.8 MANUFACTURER'S CERTIFICATES

A. When specified in individual specification sections, submit manufacturer's certificate to Architect / Engineer for review.

B. Indicate material or product conforms to or exceeds specified requirements.

2.0 PRODUCTS

NOT USED

3.0 EXECUTION

NOT USED

END OF SECTION 01340

SECTION 01700
PROJECT CLOSEOUT

1.0 GENERAL

1.1 DESCRIPTION OF REQUIREMENTS

A. Definitions: Closeout is hereby defined to include general requirements near end of contract time, in preparation for final acceptance, final payment, normal termination of contract, occupancy by Owner, and similar actions evidencing completion of the work.

1.2 CONTRACT CLOSEOUT PROCEDURES

A. Submit written certification that Contract documents have been reviewed, work has been inspected, and Work is complete in accordance with Contract Documents and ready for Architect / Engineer's inspection. Provide all close-out documentation required by the General Conditions and the specifications, and secure approval of this information prior to submission of final application for payment.

B. Submit final Application for Payment identifying total adjusted Contract Sum / Price, previous payments, and amount remaining due.

C. Required Closeout Documents (include items required by Owner)
1. Copy of Final Punch List with certification that all items are complete.
2. Final Application for Payment (certified by Architect.)
3. Consent of Surety to Final Payment
4. Warranties, Guarantees, and Manuals of Operating Instructions (See below.)
5. Contractor’s Affidavit of Release of Liens
6. Contractor’s Affidavit of Payment of Debts and Claims
7. Marked up as-built drawings (See below.)

1.3 PROJECT RECORD DOCUMENTS

A. Maintain on site, one set of Contract Documents to be utilized for record documents.

B. Record actual revisions to the Work in red. Record any information concurrent with construction progress.

C. Specifications: Legibly mark and record at each Product section a description of actual products installed.

D. Record Documents and Shop Drawings: legibly mark each item to record actual construction.

E. Submit documents to Architect with final Application for Payment.

1.4 OPERATION AND MAINTENANCE DATA

A. Unless different requirements are described in other specific technical specification sections, provide three (3) copies of operation and maintenance instructions bound into three side ring binders.

1.5 WARRANTIES

A. Provide warranties from all applicable subcontractors.

B. Execute and assemble documents from subcontractors, suppliers, and manufacturers and submit prior to final Payment Application.

1.6 FINAL CLEANING

A. Provide final cleaning of the work to normal "clean" condition expected for a first-class building cleaning and maintenance program. Comply with manufacturer's instructions for cleanng operations. The following are examples, but not by way of limitation, of cleaning levels required:
   1. Remove labels which are not required as permanent labels.
   2. Clean transparent materials, including mirrors and window / door glass, to a polished condition. Replace broken glass and damaged transparent materials.
   3. Wipe surfaces of mechanical and electrical equipment clean.
   4. Clean new flooring according to manufacturer's guidelines.
   5. Clean plumbing fixtures to a sanitary condition, free of stains including those resulting from water exposure.
   6. Clean light fixtures and lamps, to function with full efficiency.

1.7 CERTIFICATES OF OCCUPANCY

A. Provide owner with all local and state certificates, including written approvals from the NC State Construction Office and the NC Department of Labor - Elevator Division, for assuming occupancy of the building or portions of the building, or use of renovated elevators.

2.0 PRODUCTS

NOT USED

3.0 EXECUTION

NOT USED

END OF SECTION 01700

SECTION 05515
METAL FABRICATIONS

1.0 GENERAL

1.1 DESCRIPTION OF THE WORK

A. The extent of metal fabrication work is shown on the drawings and includes new steel elevator pit ladders.

1.2 RELATED SECTIONS

A. Section 09900 - Painting

1.3 SUBMITTALS

A. Submit in accordance with Section 01340.

B. Shop Drawings: Steel ladders-indicate profiles, sizes, connection attachments, reinforcing, anchorage, size and type of fasteners, and accessories. Include erection drawings, elevations, and details where applicable.

C. Indicate welded connections using standard AWS A2.0 welding symbols. Indicate net weld lengths.

2.0 PRODUCTS

2.1 MATERIALS

A. Rolled Steel Plates, Shapes, and Bars: ASTM A36.

B. Steel Plate: ASTM A283

C. Bolts, nuts and washers: ASTM A325

D. Welding Materials: AWS D1.1.

E. Shop and touch-up Primer: SSPC 15, Type 1, red oxide.

2.2 FABRICATION - GENERAL

A. Fit and shop assemble in largest practical sections, for delivery to site.

B. Continuously seal joined members by intermittent welds and plastic filler.

C. Grind exposed joints flush and smooth with adjacent finish surface. Make exposed joints butt-tight, flush, and hairline. Ease exposed edges to small uniform radius.

D. Supply components required for anchorage of fabrications. Fabricate anchors and related components of same material and finish as fabrication.

E. Form ladders to profiles shown on drawings. Ladders shall meet all NC State Building Code and Elevator Code (ASME A17.1) requirements.

2.3 FINISHES

A. Clean surfaces of rust, scale, grease, and foreign matter prior to finishing.

B. Shop prime items with one coat. Do not prime surfaces in direct contact with concrete or where field welding is required.

3.0 EXECUTION

3.1 EXAMINATION AND PREPARATION

A. Verify that field conditions are acceptable and are ready to receive work.

B. Make provisions for erection loads with temporary bracing. Keep work in alignment.

3.2 INSTALLATION

A. Install items plumb and level, accurately fitted, free from distortion or defects.

B. Allow for erection loads and provide temporary bracing to maintain true alignment until completion of erection and installation of permanent attachments.

C. Field weld components as indicated. Perform field welding in accordance with AWS D1.1.

D. Obtain Architect / Engineer approval prior to site cutting.

E. After erection, prime welds, abrasions, and surfaces not shop primed, except surfaces to be in contact with concrete.

END OF SECTION 05515

SECTION 09260
GYPSUM BOARD SYSTEMS

1.0 GENERAL

1.1 DESCRIPTION OF THE WORK

A. Gypsum Board with taped and sanded joint treatment – for patching existing gypsum board ceilings (both Lumbee Hall and Old Main).

1.2 RELATED SECTIONS

A. Section 09900 - Painting

1.3 QUALITY ASSURANCE

A. Perform work in accordance with ASTM C840.

1.4 DELIVERY, STORAGE, AND HANDLING.

A. Store wallboard delivered prior to use in a completely enclosed structure, or off the ground and completely enclosed within a weather-tight covering. Keep wallboard dry and warp-free, and leave bundling tape intact until use. Start application only after the structure is weathertight.

1.5 JOB CONDITIONS

A. Environmental Requirements

1. Temperature - During cold weather, in areas receiving wallboard installation, maintain temperature range between 55 and 70 degrees F. for 24 hours before, during, and after gypsum wallboard and joint treatment application.
2. Ventilation - Provide ventilation during and following joint treatment applications. Use temporary air circulators in enclosed areas lacking natural ventilation. Under slow drying conditions, allow additional drying time between coats of joint treatment. Protect installed materials from drafts during hot, dry weather.

2.0 PRODUCTS

2.1 INTERIOR GYPSUM BOARD SYSTEM

A. Gypsum Board types: Maximum permissible lengths; edge: SW style; thickness: 5/8"; ASTM C36 by U.S.G. Company or by one of two other manufacturers listed below. Unless noted otherwise, boards are to be standard type. Provide 5/8" type "X" fire-rated boards where indicated on the drawings (new one or two-hour rated partitions.)

B. Acceptable Manufacturers:
1. United States Gypsum Company
2. Gold Bond Building Products Div., National Gypsum Co.
3. Milcor Division, Inyco Inc.

2.2 ACCESSORIES

A. Metal trim: Form from 26 gage galvanized steel, including casing beads, corner beads, edge beads, and control joints. Furnish items standard with the wallboard manufacturer.

B. Gypsum Board Suspension system: For new drywall ceilings. To include: steel Main Tees, Cross Tees, Wall Moldings, Hanger Wire, accessories and clips.

C. Joint Materials: ASTM C475-75, "Durabond-Easy Sand" by USG or equal by Gold Bond or Milcor, reinforcing tape, adhesive and water.

D. Sound Attenuation Blankets: ASTM C665, preformed mineral wool, friction fit type, unfaced, 3-1/2 inch thick. Provide in all new walls.

3.0 EXECUTION

3.1 INSTALLATION - WALL AND CEILING SUPPORT SYSTEMS

A. Secure runner tracks and partition stud system, spaced as recommended by manufacturer and extended above suspended ceiling system, to give proper support for covering materials.

B. Frame door openings to comply with recommendations of "Gypsum Construction Handbook". Securely brace frame head and sides where stud system does not connect to rated ceiling assembly.

3.2 INSTALLATION - GYPSUM BOARDS

A. Install boards in accordance with "Gypsum Construction Handbook" and complying with ASTM C 840.

B. Install boards in the direction and manner which will minimize the number of end-butt joints.

C. Locate either edge or end joints over supports, except in horizontal applications or where intermediate supports or gypsum boards back-blocking is provided behind end joints. Position boards so that like edges abut, tapered edges against tapered edges, and mill-cut or field-cut ends against mill-cut or field-cut ends. Stagger vertical joints over different studs on opposite sides of partitions.

D. Install metal corner beads at external corners.

E. Install metal edge trim wherever edge of gypsum board would otherwise be exposed or semi-exposed.

F. Finishing: Apply treatment at board joints (both directions), flanges of trim accessories, penetrations, fastener heads, surface defects and elsewhere as required to prepare work for finishing. Pre-fill open joints and beveled edges, using type of compound recommended by manufacturer.
1. Apply joint tape at joint between gypsum boards, except where trim accessories are indicated.
2. Apply joint compound in 3 coats and sand between last two coats and after last coat.

G. Tolerances: Maximum variation from True Flatness: 1/8" in ten feet in any direction.

END OF SECTION 09260

SECTION 09670 - RESILIENT TERRAZO FLOORING

1.0 GENERAL

1.1 DESCRIPTION OF THE WORK

A. Resilient terrazzo tile flooring and accessories for installation in elevator cabs.

1.2 QUALITY ASSURANCE

A. Provide each type of resilient flooring and accessories as produced by a single manufacturer.

1.3 SUBMITTALS

A. Product data: Submit two copies of manufacturer's technical data and installation instructions.

B. Samples: Provide samples of the full range of manufacturer's colors within the series specified for selection by the architect. Provide one full-size sample of each type of tile flooring.

1.4 JOB CONDITIONS

A. Maintain minimum temperature of 65 degrees F. in spaces to receive resilient flooring for at least 48 hours prior to, during, and at least 48 hours after installation. Store material in installation space during this period. Maintain minimum temperature of 55 degrees F. in areas where work is completed.

B. Install resilient flooring and accessories only after other finishing operations, including painting have been completed. Do not install resilient flooring over concrete and underlayment surfaces until they have been fully cured and moisture content is as acceptable to manufacturer.

2.0 PRODUCTS

2.1 RESILIENT TERRAZO TILE

A. Provide “Nurazzo Tile” terrazzo tile. Terrazzo Tile shall be recycled marble and glass chips embedded in epoxy resin matrix, with random distribution of chips.

B. Color: As selected by Architect from full line of colors.

C. Size: 12” x 12”; thickness: 1/4”

D. Other acceptable manufacturers:
1. Floorazo
2. Fritz

2.2 ADHESIVES

A. Manufacturer's recommended pre-mixed wet set floor adhesive (for wood and any non-porous substrate.)

2.3 SEALER

A. Product: "Nuseal" by Nurazzo; Hi-gloss finish. Strip and clean floors prior to applying the finish sealer. Apply sealer in strict accordance with manufacturer's instructions. Provide a minimum of three (3) coats of sealer.

3.0 EXECUTION

3.1 PREPARATION

A. Broom clean or vacuum surfaces to be covered, and inspect subfloor. Start of flooring installation indicates acceptance of subfloor conditions and full responsibility for completed work.

B. Remove existing floor covering and condition existing subfloor to provide smooth, clean continuous surface. Remove deleterious coatings from subfloor surfaces that would prevent a positive adhesive bond. Level subfloor as required with self-leveling compound in compliance with tile manufacturer's instructions. If existing subfloor is inadequate, remove it and replace it with a suitable board product acceptable to tile manufacturer.

3.2 INSTALLATION

A. General:

1. Install flooring using method indicated in strict compliance with manufacturer's recommendations.

2. Tightly cement flooring to sub-base without open cracks, voids, raising and puckering at joints, telegraphing of adhesive spreader marks, or other surface imperfections. Adhere tile flooring to substrate using full spread of adhesive. Roll and cross roll floor with 150 pound sectional roller continuously while tile is being laid.

B. Tile floors:

1. Lay tile from corner marks established with principal walls, discounting minor offsets, so that tile at opposite edges of room area are of equal width. Adjust as necessary to avoid use of cut widths less than 1/2 tile at room perimeters. Lay tile square to room axis, unless otherwise shown.

2. Cut tile neatly around all fixtures. Lipped, cupped, curved, broken, cracked, chipped, or deformed tiles are not acceptable.

3. Adhere tile flooring to substrates using full spread of adhesive applied in compliance with flooring manufacturer's directions.

4. Apply Floor Sealer and gloss finish coat in strict compliance with manufacturer's instructions.

C. Cleaning and Protection:

1. Remove any excess adhesive or other surface blemishes, using neutral type cleaners as recommended by flooring manufacturer. Protect installed flooring with heavy Kraft paper or other covering.

2. After completion of project and just prior to final inspection work, thoroughly clean floors and accessories. Buff / polish as recommended by manufacturer.

END OF SECTION 09650

SECTION 09900
PAINTING

1.0 GENERAL

1.1 DESCRIPTION OF THE WORK

A. Subsurface preparation, painting, and finishing of interior items and surfaces, unless otherwise indicated.

B. Existing concrete floors, CMU and concrete walls, existing gypsum board walls and ceilings, existing hoistway doors and entrance frames (Old Main), existing steel buffers and frame, and new steel pit ladders shall be painted as shown on the drawings. (See spec section 14211 for painting to be completed by elevator contractor.) Colors shall be selected by the Architect from standard colors available for the coatings required.

1.2 RELATED SECTIONS

A. Section 05515 - Metal Fabrications

B. Section 09260 – Gypsum Board Systems

B. Section 14211 – Hydraulic Passenger Elevators

1.3 SUBMITTALS

A. Product Data: Submit manufacturer's technical information for each material used.

B. Samples: If requested, submit paint manufacturer's full color line for selection by Architect and Owner.

1.4 DELIVERY AND STORAGE

A. Deliver materials to job site in original, new and unopened packages and containers bearing manufacturer's name and label. All materials shall be stored in a single place designated by the Owner or Architect. Such storage place shall be kept neat and clean. Soiled rags, waste, and trash must be removed from the building every night.

1.5 INSPECTION OF SURFACES

A. Examine all surfaces to receive paint for defects. Work shall not proceed until such damages are corrected. The commencing of work in a specific area shall be construed as acceptance of these surfaces and Contractor shall be fully responsible for satisfactory work as required herein.

1.6 JOB WEATHER AND TEMPERATURE CONDITIONS

A. Maintain temperature in building at constant 65 degrees F. or above during painting work. Provide adequate ventilation for escape of moisture.

2.0 PRODUCTS

2.1 Paint Materials

A. Provide best quality grade of various types of coatings as regularly manufactured by acceptable paint manufacturers. Materials not displaying manufacturer's identification as a standard, best-grade product will not be acceptable.

B. Provide undercoat paint produced by the same manufacturer as finish coats. Use only thinners approved by paint manufacturer, and use only within recommended limits.

2.2 ACCEPTABLE MANUFACTURERS

A. Sherwin-Williams

B. Glidden-Durkee

C. Benjamin Moore

2.3 PAINTING SCHEDULE

A. Paint finish type # 1 - Gypsum Wallboard and Plaster - Satin Finish:

1 Coat - Primer
2 Coats - Alkyd Eggshell Enamel

B. Paint finish type # 2 – Concrete:

1 Coat - Pratt & Lambert Primofill 200 or equal
2 Coats - Alkyd Eggshell Enamel

C. Paint finish type # 2 - Ferrous Metal Work (doors, frames, pit ladders)- Satin Finish :

1 Coat - Metal Primer
2 Coats - Alkyd Eggshell Enamel

3.0 EXECUTION

3.1 INSPECTION

A. Applicator must notify contractor in writing of any conditions detrimental to proper and timely completion of work prior to commencement of that work.

B. Do not paint over dirt, rust, scale, grease, moisture, scuffed surfaces or other detrimental conditions.

3.2 SURFACE PREPARATION

A. Remove hardware, hardware accessories, machined surfaces, plates, lighting fixtures, and similar wall-mounted items in place and not to be finish-painted. Following completion of painting of each space or area, reinstall removed items.

B. Clean surfaces to be painted before applying paint or surface treatments. Prevent cleaning components from falling onto wet, newly-painted surfaces.

3.3 MATERIALS PREPARATION

A. Mix and prepare painting materials in accordance with manufacturer's directions.

B. Store materials not in actual use in tightly covered containers. Maintain containers used in storage, mixing, and application of paint in a clean condition, free of foreign materials and residue.

C. Stir materials before application to produce a mixture of uniform density, and stir as required during application.

3.4 APPLICATION

A. General: Apply paint in accordance with manufacturer's directions. Use applicators and techniques best suited for substrate and type of material being used.

B. Apply additional coats when undercoats, stains, or other conditions show through final coat of paint, until paint film is of uniform finish, color, and appearance.

C. Allow sufficient time between successive coating to permit proper drying. Do not recoat until paint has dried to where it feels firm, does not deform or feel sticky under moderate thumb pressure, and application of another coat of paint does not cause lifting or loss of adhesion of the undercoat.

D. Painting must be accomplished after hours or at a time when no perceptible paint odors are evident in the public areas of the Clinic.

3.5 COMPLETED WORK

A. Match approved samples for color, texture, and coverage. Remove, refinish or repaint work not in compliance with specified requirements.

3.6 CLEAN-UP AND PROTECTION

A. Clean-up: during progress of work, remove from owner's property discarded paint materials, rubbish, cans and rags at end of each work day.

B. Upon completion of painting work, clean window-glass and other paint-spattered surfaces. Remove spattered paint by proper methods of washing and scraping, using care not to scratch or otherwise damage finished surfaces.

3.7 PROTECTION

A. Protect work of other trades, whether to be painted or not, against damage by painting and finishing work. Correct any damage by cleaning, repairing or replacing, and repainting, as acceptable to the Architect.

B. Provide "Wet Paint" signs as required to protect newly painted finishes. Remove temporary protective wrappings provided by others for protection of their work, after completion of painting operations.

C. At the completion of work of other trades, touch-up and restore all damages or defaced painted surfaces.

END OF SECTION 09900

SECTION 14211
HYDRAULIC PASSENGER ELEVATORS

1.0 GENERAL

1.1 DESCRIPTION OF THE WORK

A. The work includes the modernization of two (2) existing passenger hydraulic elevators in two separate buildings: Lumbee Hall (416 Braves Drive, Pembroke, NC 28372) – and – Old Main (1369 Old Main Road, Pembroke, NC 28372) on the campus of The University of North Carolina Pembroke. The elevators each have a capacity of 2,500 pounds. The Lumbee Hall elevator was installed by Otis Elevator Co. in 1995, and the Old Main elevator was installed by Southern Elevator Co. in 1979.

B. This specification is intended to cover the alterations/ modernization as shown on the drawings and specified herein.

C. The major elevator components shall be the products of one or more manufacturers of established reputation provided such items are engineered and produced to operate in a proper coordinated manner. All major components to be furnished shall have performed satisfactorily in combination under conditions of normal use in not less than twenty (20) other elevator modernization projects of similar scope and building type in North Carolina – completed by the elevator contracting company submitting a bid for this project. If requested, complete information about these projects, including names and addresses of the building and names and contact information for the Owners and manager thereof shall be provided to the Architect by the low bidder for review and approval, prior to an execution of a contract.

1. The term “major elevator components” refers to such items as the hydraulic pumping units, pumps, motors, valve(s), jack assembly, controllers, door operators, and related equipment.

2. The major components shall be installed and so arranged that parts may be removed for repairs or replacement by conventional means, without dismantling or removing other equipment and components. Sufficient workspace for maintenance and repair operations shall be provided around the elevator equipment in the machine room with clear passage to any access or trap doors.

1.2 PROJECT PHASING

A. The work of the contract will be completed in a single (1) construction phase during the summer break of 2023, whether it includes only the base bid elevator (Lumbee Hall) or both elevators (Lumbee Hall – base bid, and Old Main – Alternate # 1.)

If Alternate # 1 is **NOT** accepted, the work onsite shall begin on or after **May 8, 2023** (5.8.23) on the replacement of the Lumbee Hall elevator and this elevator shall be fully completed, inspected by NCDoL and the design team and returned to service no later than **June 23, 2023** (6.23.23).

If Alternate # 1 **is** accepted (Old Main elevator mod), the modernization of both elevators (in both buildings) shall begin on or after **May 8, 2023** (5.8.23), and be fully completed, inspected by NCDoL and the design team, and returned to service by **August 4, 2023** (8.4.22).

Within two weeks of the issuance of the Notice to Proceed after execution of of the construction contract, the contractor shall submit a project construction schedule which includes a timeline for all steps in the fabrication and construction process.

B. The contract time periods listed above must include all of the tasks outlined above, **as well as** allow reasonable time for inspection of the work by the Department of the Labor and the design team, and the completion of all punch list items that are documented.

1.3 RELATED DOCUMENTS

A. See "Appendix A" at the end of this section for use in preparing pricing and staffing requirements for the required interim maintenance of the elevator(s) (during construction) and warranty maintenance (12 months following construction).

B. Refer to general and special conditions sections and any additional documents included in the bid package.

1.4 RELATED WORK BY OTHERS

A. The work outlined below is to be completed by subcontractors other than the Elevator Contractor under the guidance of the General Contractor. All contractors are to coordinate their respective tasks to execute the work of the entire project correctly in accordance with the drawings and specifications, and as necessary to cause minimum disruption to tenants and employees working in the building.

1. Provide separate branch circuits for each elevator cab lighting and a disconnect for each elevator. Disconnects are to be either the fused or breaker type and capable of being locked in the open position. Pipe and wire to the elevator controller.
2. Provide smoke sensors at each elevator lobby and elevator machine room with signals to elevator controller as per NGPA 72. Wiring is to be routed in conduit to elevator controllers.
3. Provide light fixtures with guard in pit with switch located adjacent to each pit access ladders. Provide additional lighting as per code, 100 (lx) at floor level. Provide lighting in the elevator machine room as per code, 200 (lx) at floor level.

4. Provide GFCI type convenience outlets in each elevator machine room and elevator pit.
5. Provide machine room ventilation (HVAC) in the existing elevator machine room capable of maintaining a temperature range of 65°F to 90°F, or as required by the elevator controller manufacturer.

1.5 SUBMITTALS

A. Shop Drawings, Descriptive Data: Submit accurately dimensioned drawings prepared for this project detailing all fabrication of custom assemblies and layouts of standard items. Unless noted otherwise, submittals shall be submitted and reviewed electronically. Shop drawings shall include but not be limited to the following:

1. Dimensioned Layouts: Show the position of the Hydraulic Tank & Controller locations in machine rooms.
2. Design Information: Provide detailed illustrated product literature and illustrations of all pieces of equipment to be provided. Indicate equipment lists and design information on layouts.
3. Design of car enclosure and fixtures, showing elevations and details.
4. Power Confirmation Sheets: Include KVA, starting current, full load running current and demand factor for applicable static control devices.
5. Certificates: Submit certificate of elevator performance with contract closure documents upon completion of the work. After adjustment tests and inspection are performed, forward certificate signed by elevator manufacturer stating that the equipment and controls provide elevator service as specified.
6. At project closeout, submit Information for Operation and Maintenance:
   a. Three (3) sets of wiring diagrams with field changes.
   b. Three (3) sets of parts manuals for all components.
   c. Three (3) sets of trouble shooting manuals.

   These shall include:
   a. Description of the elevator system's sequence of operation and control including the functions of signals, door devices and other features. Provide any special tools needed to maintain or trouble shoot equipment.
   b. Written instructions for the trouble shooting, adjustment and care of the entire equipment.
   c. Electrical prints shall be reproducible type, non-fading.
   d. One set shall be sealed in a clear material and mounted in the elevator machine room.
   e. All electrical wiring diagrams shall be "as built" drawings. If standard drawings are used they shall be marked up according to the installation for which they apply.
   f. Provide two sets of keys – keyed to UNC-G standard system - for every key switch applicable to the elevators, including the controller cabinets if required. Provide two (2) elevator door emergency unlocking device keys.
   g. The identification label for each diagram and manual shall include the subject, building name, location, contract number,

the specified state assigned elevator number to which the diagrams and manuals apply.

h. Three set of diagrams and manuals shall be delivered to the general contractor, who shall submit them to the designer who – in turn - will deliver them to the engineering officer of the facility.

i. The elevator contractor shall notify the North Carolina Department of Labor for scheduling of a final inspection as per code and specifications. Approval must be given that all code requirements have been met and that installation complies with the specifications before final payment will be made.

7. Provide any tools and/or diagnostic equipment and software required to adjust, troubleshoot, and maintain the elevator control system. Any cost to keep tools updated and operable are to be included in the base bid. Provide instruction manuals in the operation of these special tools. If a special agreement is required, provide a copy with your bid.

1.5 CERTIFICATIONS

A. Provide reports on in-place testing of elevators which are in conformity with Rules of the latest edition of the ASME Code and Current Supplements.

B. Material Certification: Provide written certification that the materials used meet specified requirements.

C. Installation of Certification: The Elevator Contractor shall provide written certification stating that elevators are completed and operational per specifications.

1.6 PERMITS, CODE, INSPECTION CERTIFICATES

A. Make application for, secure, and pay for all necessary permits and Certificates of inspection for all equipment included herein, as required by the various departments of the Local and State Authorities.

B. All work, material, fabrication, design and equipment shall comply with the requirements, rules and latest approved practices of the National Electrical Code, latest edition of the ASME A17.1 Code applicable requirements of Sections 8.6 and 8.7, latest edition of the ASME A17.3 Code, the Americans with Disabilities Act and the rules and regulations of all other governing bodies which may have jurisdiction where the equipment is to be installed.

C. Before final acceptance of the work, furnish to the Owner certificates of inspection and approval as required by the authorities having jurisdiction. Make tests as specified and as required by the regulations and in the presence of the proper authorities or Owner’s representative.

D. In addition to the permits, inspections and tests specified and the governing codes, the Elevator Contractor will be required to have performed speed and load carrying capacity and heat tests at his own expense. Elevator Contractor shall

participate in fire service tests to assure that equipment operates as required in emergencies.

1.7 MAINTENANCE

A. Provide full service maintenance for the two elevators (or one, if alternate # 1 is note accepted) starting at the time the first elevator is removed from service for replacement work. This maintenance shall continue for 12 months after both elevators are fully complete, inspected, and accepted. See requirements for typical elevator maintenance contract in the attached "Appendix A" following this spec section. This document is to be utilized as a guide to the services required in this specification during the modernization period, and during the 12 month post-construction maintenance period.

B. All modernization elevator work shall be performed by the Elevator Contractor with qualified personnel.

C. Provide a 24-hour emergency call-back service during the construction and 12 month warranty periods at no cost to the Owner. Respond within one (1) hour of notification.

1.8 WARRANTY

A. Provide warranty to replace, repair, or restore parts or components that fail or do not operate properly for a period of 12 months from the date of signed final acceptance by the Owner. The warranty period shall begin at such time that ALL of the elevators modernized under this contract are completed and accepted.

B. Elevator Contractor shall provide all necessary maintenance, replacement of parts, repairs and alterations to existing equipment that is specified to be retained, in order to maintain it in first quality operating condition, in accordance with the attached "Appendix A" for a period of 12 months from the date of signed final acceptance by the Owner.

1.9 MANUFACTURER

A. The Elevator Controllers, Controls and Equipment shall be NON-PROPRIETARY.

B. Controller Manufacturers: The following manufacturers – *only* - are approved and accepted as equals for the elevator controller components:
Motion Control
GAL Controls
SmartRise

C. In the interest of unified responsibility, the elevator contractor shall be one regularly engaged in the business of installing and servicing elevators of the type and character described in these specifications.

1.10 BIDDER'S QUALIFICATIONS

A. The Bidding Elevator Company shall have clearly demonstrated technical qualifications as an elevator company specializing in passenger elevator modernization projects similar to the subject project – and with a Company office that has been based in NC and performing these modernization projects in the State for **at least five (5) years**.

B. Any manufacturer's product submitted shall have been in satisfactory and efficient operation on not less than twenty installations similar to this project, and for not less than one and one-half years.

C. If requested, Contractor shall submit a list of ten (10) installations by the contractor of the control system and pump proposed for use on this project.

D. The Contractor shall have available under his direct employment and supervision the necessary personnel, organization and facilities to properly fulfill all the service and conditions required under these specifications.

E. Contractor must have access to necessary tools, diagnostic equipment and software to maintain the solid state controlled equipment included in the specification. Evidence of this requirement shall be submitted with the bid and shall include references from customers with full service maintenance on solid state controlled elevator equipment of the same make and model as bid.

F. If requested, the Bidder shall be required to submit to the Owner's representative a resume of experience of the assigned foreman and mechanics, names and addresses of persons intended to perform work under this contract - and written evidence of a financial capacity to perform this contract (Dunn Rating or equal).

G. The maintenance of this elevator equipment in safe condition, within proper operating limits in accordance with original manufacturer's equipment specifications is of paramount importance.

H. Requests for information may occur at any time during the effective period of this contract, or any extension/renewal thereof.

1.11 CONTRACTOR RESPONSIBILITY

A. The Contractor shall carefully review these specifications and existing building conditions as they may affect the design, installation, use, and maintenance of the hydraulic elevators. The completed elevator installation shall be complete, workable, and in full compliance with all applicable codes.

B. The electrical design for the hydraulic elevators will be based on the power feeders and disconnect devices as specified in the electrical specification sections.

C. The Elevator Contractor shall remove all existing equipment specified herein to be replaced with new equipment. This material must be disposed of legally offsite.

D. Elevator Contractor shall coordinate their work and cooperate with the Owner and/or their contractor responsible for performing work under paragraph 1.3. above.

E. Elevator Contractor shall be responsible for all cutting and patching required by their work. Elevator Contractor shall provide fire stops as required by code for all wiring, etc. that penetrates fire rated walls.

2.0 PRODUCTS

2.1 GENERAL

A. All new elevator equipment shall be, in general, the manufacturer's top of the line products, modified as required to operate with existing components.

2.2 EQUIPMENT SCHEDULE

A. **Modernization Summary for Lumbee Hall and Old Main Elevators.** Unless noted otherwise, all information below applies to both elevators. (Where new equipment is noted below, remove - and legally dispose offsite - the corresponding *existing* elevator equipment items that are being replaced.)

1. MACHINE ROOM

Complete Pumping Unit: (Including Pump, Motor, Valves & Tank); Include In-line Silencer unit by MEI or equal.	New
Controller:	New
Operational Controller:	New
Leveling Devices:	New
Hydraulic Fluid Piping:	New
Hydraulic Fluid	New

2. HOISTWAY

Normal & Final Limit Switches:	New
H/W Door Interlocks:	New
H/W Door Closers:	New

H/W Door Panels:	Lumbee Hall: Reuse existing s.s. hoistway door panels and transoms. Refurbish stainless steel finish. Old Main: Reuse existing hoistway door panels. Provide new Paint finish All hoistway doors: Provide new hangers, tracks and all new operational hardware.
H/W Fascias & Toe Guards:	Reuse existing. Paint matte black color.
H/W Door Hangers, Hanger Tracks & Rollers:	New
H/W Door Frames:	Lumbee Hall: Reuse Existing. Refurbish stainless steel finish. Old Main: Reuse existing. Provide new paint finish
Unlocking Devices:	New
Guide Rails:	Reuse existing. Tighten connections
Car Guide Shoes:	New.
Buffers and buffer frames:	Reuse existing. Clean and provide new paint finish.
Pit Ladder:	New
Emergency Stop Switch:	New, in pit.
Traveling Cables:	New. Provide cables with 20 G shielded wire Pairs. Route these directly from car to Controllers in machine room, without Splices. Provide dedicated single twisted pair 18-20 AWG (shielded) for new video camera / text message display per 2019 ASME A17.1 communications requirements. Provide 10%, but not less than 2 (two) spare conductors in traveling cables.
Hoistway Wiring:	New

3. CAR

Car Frame, Platform, Shell: & Sling	Reuse existing.
Top of Car Inspection Station:	New
Car Interior:	New car interior finish to include hi-pressure laminate faced steel wall panels, suspended # 4 stainless steel ceilings with recessed LED lighting, s.s. tubular handrails, and s.s. front return panels, headers and jambs – and all templates and fasteners. See the attached "Exhibit LH/OM" at the end of this specification section, and paragraph 2.27 below for additional info, and spec section 09650 for cab flooring by others.
Return Panels, Headers Jambs:	New, # 4 stainless steel
Protection Pads and posts:	New, fire-resistant quilted canvas conforming to the ASME A17.1 requirements including but not limited to flame spread, smoke development. Pads shall be provided for the rear walls, side walls and car front returns and shall have openings for the car operating panels. The protective pad posts shall be #4 stainless steel, vandal-resistant type and permanently mounted by the elevator contractor at the sides, rear and fronts of the car enclosure
Car Door Sills:	New, Aluminum
Handrails:	New, brushed stainless steel, round tubular type, at side and rear walls
Certificate Frames:	New, stainless steel, vandal resistant.
Emergency Lighting:	New, located at top of car operating panel
Emergency Alarm Bell:	New

Car Operating Panel:	New, brushed stainless steel finish w/ required communication devices. Provide all required buttons and keyed switches. Buttons to be vandal-resistant type. (See also par. 2.28.)
Keyed Stop Switch:	New, in COP
Keyed Inspection Switch:	New, in COP
Car Position Indicator:	New, digital type with directional arrows (lantern) mounted in COP
Ventilation Fan:	New
Car Door Hangers & Tracks:	New
Car Doors:	New, # 4 stainless steel, with all new hangers, tracks, and operational hardware.
Door Operators:	New, digital closed loop type
Door Protection:	New, Full height electronic infrared 2D curtains and microwave 3E protection. See par. 2.25.A below.
Resilient Floor finish:	New. See spec section 09670.

4. ELEVATOR LOBBIES

Hall Station Fixtures:	New, extender type, with push button(s), and combination digital Position Indicators / Directional Lantern display at each landing. Provide firefighters' keyed switches in hall station fixtures at primary access landing. Provide Elevator Inspection keyed Switches for Hoistway Access at terminal landings (see also par.2.28.) (See drawings – Existing Position Indicator fixture [1st floor landing] and Hall Lantern fixtures [upper floor landings] at Lumbee Hall are to be removed.
Braille Door Jamb Markings:	New- provide at hoistway entrance frame jambs.

2.3 PERFORMANCE

A. Rated Speed: +/- 5% under any loading condition.

B. Capacity: Safety lower, stop and hold rated load.

C. Leveling: +/- ¼" with rated load and under normal operating conditions.

D. Door Closing Time, Thrust and Kinetic Energy shall comply with ASME A17.1 Code.

2.4 PUMPING UNITS COMPLETE WITH TANK, PUMP, MOTOR & VALVE (NEW)

A. Provide manufacturer's standard submersible or dry belt type unit. Provide sound isolation mounting designed to effectively prevent transmission of vibrations to structure and thereby eliminate sources of structural-borne noise from the elevator system. Provide also In-line Silencer unit by MEI or equal.

B. Provide a low oil control circuit to allow the elevator to function as required should a low oil condition or malfunction occur.

C. Provide all new hydraulic lines from the pits to the machine rooms. Provide new shut-off valves in the machine room and pit.

2.5 CONTROLLERS (NON-PROPRIETARY TYPE) (NEW)

A. Microprocessor Control System: Provide manufacturer's standard non-proprietary solid state microprocessor-based control system for the elevator with automatic operation. Controllers shall be mounted on the hydraulic pumping units, unless an alternative configuration is approved by Architect. Provide electronic "soft" starter contactor. **See paragraph 1.9 above for acceptable controller manufacturers.**

B. Microprocessor based control system shall perform the functions of safe elevator motion, car operational and supervisory control and elevator door control. System shall allow for reprogramming of software to suit the individual requirements and changing operational requirements of the facility, based upon the parameters of the operational system(s) specified. "Across the line starting" is not acceptable.

C. The controller system shall include the hardware required to connect, transfer and interrupt power, and protect the motor against overloading, and perform operation control.

D. Controller cabinet containing memory equipment shall be properly shielded. The controller shall accept reprogramming with minimum system down time, and shall not lose memory from a power failure.

E. Equipment Enclosures: Install control system in cabinets of steel with hinged doors or panels arranged for easy removal of components. The cabinet panels shall be of a gauge and be properly grounded as required by National Electrical Code. Mount equipment in racks to permit easy access to components. Provide doors with recessed ring-pulls or handles and ventilation grill at top and bottom.

2.6 NORMAL STOPPING DEVICES AND FINAL LIMIT SWITCHES (NEW)

A. Provide slow-down and normal stopping devices.

B. In addition to the normal limit stops, a hoistway final limit switch shall be installed at the top and at the bottom of each hoistway.

2.7 AUTOMATIC TWO-WAY LEVELING (NEW)

A. The elevator system shall have two-way leveling to automatically bring the car to a stop approximately level with any floor for which a stop has been initiated, regardless of load, rope stretch or direction of travel. Maximum level variation = ¼".

B. Automatic leveling control shall permit the synchronization of door opening with the stopping of the car at a floor.

2.8 GUIDE RAILS (REUSE)

A. Realign rails and file joints as required to provide a smooth ride.

2.9 HYDRAULIC JACK ASSEMBLY (REUSE)

A. Provide a new hydraulic jack packing assembly for each elevator at the end of the construction work.

2.10 HYDRAULIC CYLINDER / PLUNGER / HYDRAULIC PIPING

A. Provide all new hydraulic piping from elevator pit to machine room. Provide new shutoff valves in the pit and machine room.

2.11 CAR BUFFERS (REUSE)

A. Existing car spring buffers shall be reused. Clean and paint buffers and steel buffer frames.

2.12 PIT SWITCH AND PIT LADDERS (NEW)

A. New emergency stop switches shall be located in the elevator pits as required by Code.

B. Install new pit ladders to be accessible from the pit access door, extending a minimum of 48" above the sill of the access door, as required by Code.

2.13 HOISTWAY DOOR INTERLOCKS (NEW)

A. Each elevator hoistway door shall be equipped with a hoistway unit system, hoistway door interlock. The interlock shall prevent the operation of the elevator machine by the normal operating device unless the hoistway door is locked in the closed position. The interlocks shall also prevent the opening of a hoistway door from the landing side unless the car is at the landing.

2.14 HOISTWAY DOOR UNLOCKING DEVICES (NEW)

A. Unlocking devices shall be provided at all floors as per Code for all elevators. Provide new escutcheons where missing.

2.15 ELEVATOR CAR SPEED

A. The existing rated elevator car speed shall be maintained in the modernization work.

2.16 ELECTRICAL WIRING (NEW)

A. Electrical wiring shall comply with the ASME and National Electrical Code. All elevator hoistway and machine room wiring and traveling cables shall be new. In the machine room, pipe and wire the power from the load side of the main line fused disconnect switch to the elevator controller. Provide six (6) shielded pair in the traveling cable. Existing conduit and ductwork may be reused if they comply with all current code requirements. Provide a minimum of 10% spare wires.

2.17 GUARDS

A. Provide guard assemblies for the machine room equipment, in compliance with ASME A.17.1, to afford proper protection for exposed gears, sprockets, tape or rope sheaves, drives of selectors, floor controllers, or signal machines, and the ropes, chains, or tapes which drive these assemblies.

2.18 TOP OF CAR OPERATING DEVICE (NEW)

A. The elevator shall be provided with a new operating device / inspection station mounted from or on the car crosshead which will permit slow speed (100 fpm or less) operation for purposes of adjustment, inspection, maintenance, and repair. A transfer switch shall be provided in the top of the car operating device fixture which will permit the disconnecting of hoistway access switch(es) and render top of car operating device operative. The operating device shall be mounted in a metal box and shall be rigidly secured in a position conveniently accessible as required Code. Provide lamp with wire guard and GFCI outlet on top of the car in an easily accessible position.

B. Provide car top escape hatch electrical switches as required by Code.

2.19 LUBRICATION

A. Provide proper lubrication with oil or grease, of all bearing surfaces in connection with the elevator installation. Greased gun fittings, if used, shall be suitable for high pressure guns. Greased guns, if used, shall be automatic feed compression type.

2.20 HOISTWAY ACCESS SWITCHES (NEW)

A. Provide keyed hoistway inspection / access switches in the hall call station fixtures at the top and bottom terminal landings, as required by code.

B. Provide keyed hoistway inspection / access switch in return panel of car.

2.21 PLATFORM AND CAR FRAME (REUSE)

A. The platform and car frame shall be retained and modified as required.

B. All retained equipment shall be inspected and restored as required to provide acceptable operation.

2.22 CAR ROLLER OR SLIDE GUIDES (NEW)

A. Clean car guide rails and provide new roller guides, spring loaded type or new slide guides as needed for proper operation.

2.23 CAR DOOR HANGERS AND TRACKS (NEW)

A. Complete door hangers and tracks shall be provided for the new car doors. Sheaves shall be steel with a flanged groove into which a solid rubber or vulcanized type tire shall be secured. Sheaves shall be a minimum of 2 1/2" diameter. Hangar brackets shall be the applied type.

2.24 DOOR OPERATORS (NEW)

A. Provide new heavy duty type digital closed loop door operators, capable of opening doors at not less than 1-1/2 fps and accomplishing reversal in maximum 2-1/2 inches of door movement. Doors shall open automatically when car arrives at a floor to permit transfer of passengers; after a specific timed interval, doors shall automatically close.

2.25 DOOR RE-OPENING AND CONTROL DEVICES (NEW)

A. Provide solid state Elevator Door Protection System with infrared 2D protection, and microwave radar 3D protection. System shall comply with 2019 ASME A17.

B. Door Opening Timing Feature:

1. Control device shall operate in conjunction with detector device to provide adjustable, reduced hold-open time when light beams are broken and reestablished.
2. When light beams or microwaves are broken beyond a set period of time, a buzzer device shall sound and the doors shall close at reduced speed.
3. There shall be a difference in door hold open times between car and hall calls.
4. Door speed, thrust, and kinetic energy shall comply with the ASME A17.1 Elevator Code.

2.26 HOISTWAY ENTRANCE FRAMES (REUSE EXIST) & HOISTWAY DOORS (REUSE EXISTING)

A. Retain and refurbish the brushed stainless steel finish at all existing entrance frames at Lumbee Hall. Retain and provide new paint finish at all existing entrance frames at Old Main. Remove, refurbish, and reinstall the existing stainless steel hoistway doors at each landing at Lumbee Hall with all new operational hardware (below.) Remove the existing painted steel hoistway doors at each landing at Old Main and reinstall with all new operational hardware (below.) Provide new paint finish at re-installed hatch doors at Old Main.

B. Provide all new door hangers, rollers, tracks, closers and bottom door gibs.

C. New hanger sheaves shall be steel with a flanged groove into which a solid non-metallic tire shall be vulcanized securely. Sheaves shall be a minimum 2 ½" diameter. Bearings for sheaves and rollers shall be ball type, sealed to retain grease lubrication. Hanger brackets shall be the applied type. Steel housing shall be provided for attachment to the door. Rollers, with ball-bearings, shall be provided to remove excessive door up-thrust.

D. Floor Numbers: Provide floor number markings on the hoistway side of the door panels.

E. Provide restricted opening of all hoistway doors and/or car doors of the passenger elevators in compliance with ASME A17.1 Code and supplements.

2.27 CAR ENCLOSURES (NEW)

A. The existing elevator car shell, frame, and platform shall be retained and reused. New car interior renovation materials shall be provided for the elevator. See the attached "Exhibit LH/OM" at the end of this specification section, which provides a typical graphic elevation view of the rear wall of the elevator cabs at Lumbee Hall and Old Main, and illustrates the components and features of the new cab panel design.
The center rear wall panels (only – *not* side wall panels) are to include a UNCP logo, depicted in two (2) laminate colors, as shown on Exhibit LH/OM. An approved .jpeg file of the UNCP logo and laminate color selections will be provided to the elevator contractor for development of complete detailed shop

drawings of the elevator cab interior design – which are to be submitted to the Architect for review and approval prior to fabrication.
The design of the new elevator car interior renovation materials shall be complete and shall include the following minimum requirements:

1. Raised hi-pressure plastic laminate-faced panels shall be provided for the rear and side walls. The panels shall be approximately 3/8 inch thick and approximately equal in width and height. The raised panels shall extend from a point at the top of the existing stainless steel base trim to the area approximately one (1) inch from the bottom of the car ceiling.
2. The raised panels shall be separated by stainless steel reveals. The reveals shall be channel shaped and shall enclose the distance between the panels and shall protrude outward from the base car enclosure walls to be approximately flush with the outer surface of the raised panels. The width of the reveals shall be approximately equal to within a tolerance of +/- 1/16" at the vertical reveal locations. The existing stainless steel base is to be retained, cleaned and polished. Care and caution will require that the elevator contractor not block any ventilation openings in the existing elevator car by the execution of this work unless provision is made to provide new ventilation openings to compensate for those blocked by the installation of the new car enclosure renovation materials.
3. New suspended # 4 stainless steel ceilings and new recessed LED lighting fixtures shall be provided.
4. Care and caution will be exercised to ensure that the access to the car top emergency access is not restricted by any renovation to the elevator car.
5. **New** # 4 stainless steel car returns, headers & strike jambs and transom shall be provided on the front sides of the cabs.
6. New car railings at sides and rear of cabs: 1.5” diameter continuous cylindrical style railings w/ # 4 stainless steel finish.
7. All new elevator car interior renovation materials shall be securely attached to the existing car enclosure walls so that the finished installation shall not have any visible fasteners.
8. All new materials provided in the interior of the elevator car enclosures, shall in their end use configuration, conform with the requirements of ASME A17.1.

B. **New** Return Panels, Headers, and Jambs: # 4, brushed stainless steel.

C. See paragraph 2.2.A.3 above for additional items required in cab interior upgrades.

D. Pads and posts conforming to the following shall be provided:

1. Pads shall be fire-resistant quilted canvas conforming to the ASME A17.1 requirements including but not limited to flame spread, smoke development.
2. Pads shall be provided for the rear walls, side walls and car front returns and shall have openings for the car operating panels.
3. The protective pad posts shall be #4 stainless steel, vandal-resistant type and permanently mounted by the elevator contractor at the sides, rear and fronts of the car enclosure.

2.28 SIGNAL FIXTURES (NEW)

A. Signal Fixtures include car operating panels in the front car returns, combination position indicator / directional lanterns in the COP's, and call stations at each landing. All signal fixtures provided as part of this specification shall be vandal resistant type, stainless steel, illuminated.

B. Provide new car-operating panels in the front car returns. COP's shall contain Push-Button Controls, Door Open / Close Buttons, Keyed Stop Switch, Combination Digital Car Position Indicator / Car Direction Arrow display w/ Gong, Phase I and Phase II Firefighter Keyed Controls, Independent Service Switch, Car Light / Fan Switches, Alarm Bell button, Emergency Light, Fire Hat, and Door Curtain Switch. Hands-off communication devices shall be included. All required audio signals and graphics shall also be included.

The new car operating panel shall include communication devices which comply with section 2.27.1 of the **2019** ASME A17.1 Elevator Safety Code – "Car Emergency Signaling Devices." In addition to the hands free phone device, this includes a new visual screen display for text messages, and a video camera feed to permit authorized responders to view the cab interior. These latter devices must be monitored 24/7. As part of this new Code requirement, provide the following:

1. "Smartview" system by RATH JANUS Co. – or specifically approved equal - to include controller, camera and display, buttons, ethernet extenders, software and any other required accessories.
   The RATH system shall also include the **4G Cellular Gateway** feature (2 Gateways, one for data and one for phone) with RATH SmartPhone VI model.
2. A dedicated single twisted pair 10-20AWG traveling cable (shielded) to serve these devices.
3. An AT&T or Verizon account – or 2-year SIM card (for data Gateway - by Owner.)

The communication devices, upon activation, will dial the UNCP Campus Police or other first responders. The University will provide the required monitoring function for the "Smartview" system.

C. Provide new surface-mount "Extender" type Hall Call Station fixtures at each landing, mounted at locations of existing removed call stations. The fixture panels shall have engraved signage with approved graphics and instructions reading "IN EMERGENCY, DO NOT USE ELEVATOR, USE EXIT STAIR. " The Hall Call stations shall have combination digital Position Indicators / Directional Arrow fixtures at each landing, keyed Hoistway Access Switches at the terminal landings, and firefighters access keyed switches at the primary elevator landing (first floor).

2.29 OPERATION AND CONTROL SYSTEM

A. Manufacturer is to provide and contractor is to install built-in diagnostics for trouble shooting system.

B. Operation: Provide controller manufacturer's standard selective collective operation.

C. Independent service: A key-operated switch shall be provided to select independent service operation. When this switch is in the independent service position, the elevator shall be disconnected from the selective-collective control system. The elevator may then be operated by the car operating panel.

2.30 AUXILARY OPERATION AND CONTROLS

A. General: In addition to primary control system features, provide the following controls or operational features for the passenger elevator, except where otherwise indicated.

B. Provide Fire Fighters Service Phase I and Phase II in accordance with ASME A17.1 Code and all local governing codes. A three-position key-operated switch marked "RESET, OFF & ON" shall be provided in the car operating panels.

C. Emergency Lighting: Provide new emergency lighting fixture in the car operating panels.

D. Provide battery-operated lowering device to automatically lower the elevators to a designated floor in the event of power failure.

2.31 ALARM BELL

A. A new emergency alarm bell (audible signaling device) shall be located on the elevator cars in conformance with ASME A17.1. The alarm bell shall not be connected to the in-car stop switch. The alarm bell shall be electrically connected to a plainly marked illuminated alarm push-button in the car. The existing car alarm bell shall not be reused.

B. A new emergency alarm bell (audible signaling device) shall also be located in the hoistways at approximately the area of the First Floor Level, and shall be electrically connected to a plainly marked illuminated alarm push-button in the car. Existing hoistway alarm bells shall not be reused.

C. The emergency alarm bells shall automatically be connected to a source of standby emergency power in the event of a loss of normal power. The standby power source shall be capable of providing for the operation of these audible signaling devices and illumination of the alarm push-button for not less than 1 hour.

2.32 MACHINE ROOM EQUIPMENT

A. Identification: Provide identifying numbers on the pumping unit, controller, disconnect switch, and code data tags, as required by Code.

B. No conduit shall be fastened to or supported by the controller frame or other machinery except by flexible connections. Screw type connecters are prohibited. Use compression type connecters.

2.33 SMOKE DETECTION (By others – for elevator recall)

A. The smoke detection system shall include smoke sensors – or heat detectors - in the elevator lobbies and machine room. See electrical drawings.

3.0 EXECUTION

3.1 INSTALLATION

A. All modernization work shall meet applicable requirements of the latest edition of the ASME A17.1 Code, including specifically sections 8.6 and 8.7

B. Welding procedures and the appearance and quality of welds, shall Conform to the American Welding Society (AWS) Code.

C. Provide signs for elevator out of service, in format approved by Owner.

D. Provide approved barricades at all openings where open hoistways are open to view.

3.2 HOISTWAYS

A. All hoistway equipment shall be cleaned and painted. Any conduit, duct or equipment which is replaced or abandoned by the modernization work shall be removed and disposed of legally offsite.

3.3 PAINTING OF ELEVATOR EQUIPMENT

A. All elevator equipment and miscellaneous iron and steel work located within the machine room, pit and hoistway, including elevator hydraulic pumps, tanks, motors, controllers, sheaves, door operators, car frames and platform, pit equipment and exteriors of elevator cars, hoistway fascias, hanger covers and toe guards shall be painted. All painting described above shall be by Elevator Contractor.

B. Finish coats shall have hard, tough semi-gloss or matte surfaces. Prime coat shall be compatible with finish coats. Any visible equipment in the hoistway shall be painted matte black except hoistway conduit and duct (which is to remain unpainted.)

C. Machine room walls, ceilings and floors, the elevator pit floors and walls, and tops of cars shall be painted (color selection by Architect) and in compliance with paragraph B, above.

3.4 USE OF ELEVATORS

A. The elevator contractor shall provide guard protection at hoistway entrances while hoistway work in underway in accordance with ASME A17.1.

3.5 TESTING

A. Tests shall be performed by the Elevator Contractor in the presence of the Owner, or their designated representative. The elevators shall be subjected to the following tests and inspections:

1. Periodic inspection and tests as required by applicable portions of the ASME A17.1 Code and all current supplements.
2. Inspection and tests required by Federal, State and Local codes and ordinances.
3. A test in which the elevator under full rated load is operated continuously for one (1) hour over its entire operating range, stopping momentarily at all floors. There shall be no operational failure of any component.
4. A test of safety circuit and door lock circuit for proper operation.
5. The Contractor shall present certified copies of the results of tests required by the ASME Code.
6. Test Results: In all test conditions, specified speed and performance time shall be met. Leveling accuracy shall be maintained without re-leveling. General riding quality shall be acceptable to owner. Temporary rise in winding temperature shall not exceed 50 degrees Celsius above ambient temperature.

B. Emergency Systems Testing:

1. The elevator contractor shall participate in the building fire alarm testing, to include a test of the elevator recall system. This test shall verify that the elevator may accept a signal (contact closure from the fire alarm system) and initiate the following sequence:
Upon activation, the elevator shall automatically return to the designated fireman's access floor where they shall park with their doors open. If the alarm signal occurs on the designated floor, the elevator cab(s) shall return automatically to a designated *alternate* floor.

C. Final Adjustment / Setup

1. The final adjustment / setup of elevator controllers shall be performed by an experienced factory-trained adjuster, who is approved by the elevator controller manufacturer.
2. Upon completion of the final adjustment / setup, the manufacturer shall provide certification that the elevator controllers are operating in accordance with the design specifications.
3. Provide a data plate securely attached to the main line disconnect or to the controller which indicates the Code and edition in effect at the time of the Alteration. Data plate shall be in plain view.

D. Diagnostic Tools: The elevator contractor shall provide to the Owner, integral with the elevator controller, door operator (see paragraph 1.22.C), or any other device, as part of this specification any and all diagnostic tools and/or instruments and all written operating and instruction manuals needed to use the

diagnostic tools required by the specification to allow for adjustment of any and all computer parameters and/or troubleshooting the equipment provided. These diagnostic tools shall be provided at no additional cost to the Owner. The Owner shall not be required to execute any type of written agreement in order to obtain said tools.

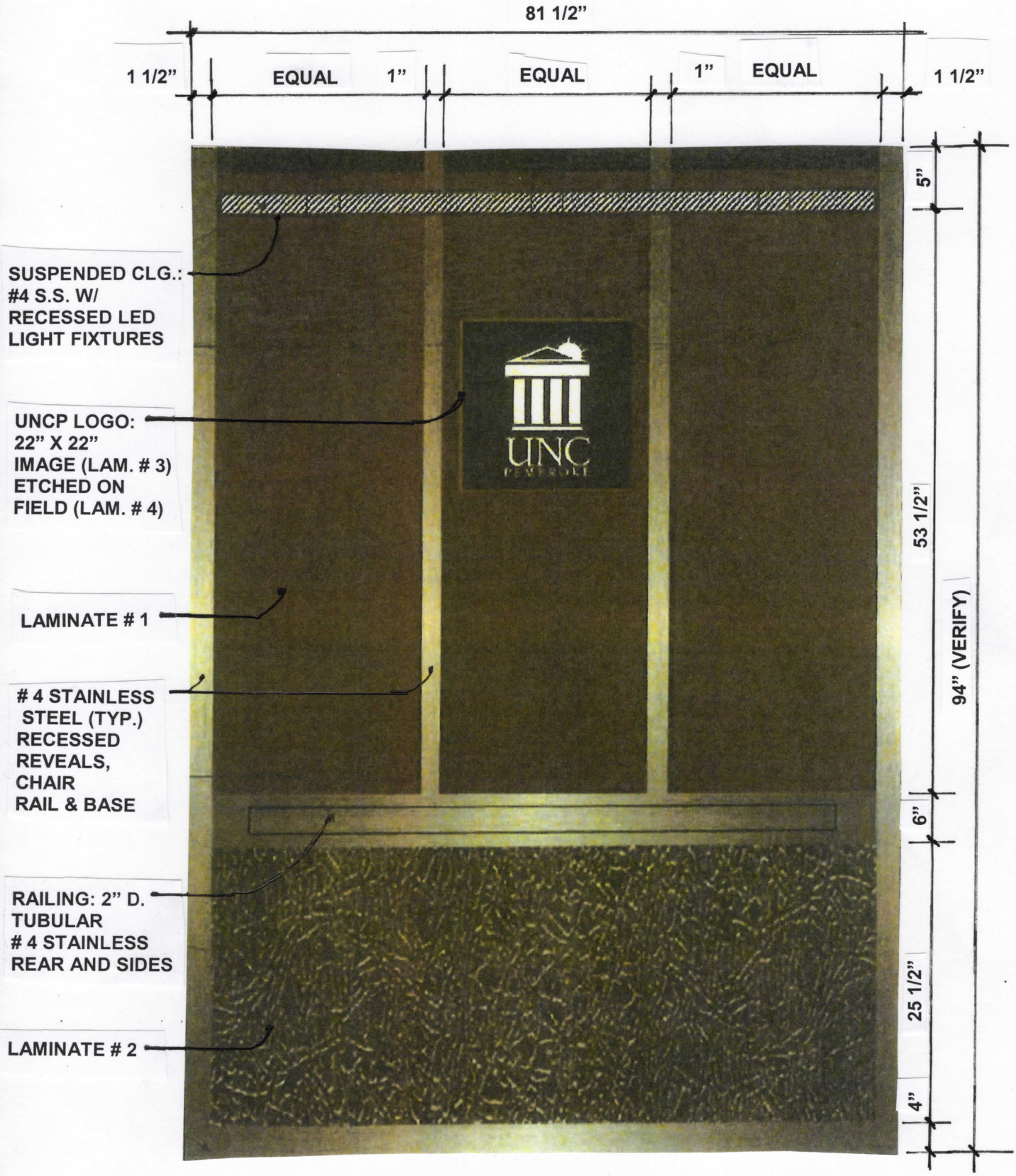
E. The diagnostic tools and/or instruments shall permit the Owner and/or his authorized representative to access, diagnose and/or adjust any and all computer and/or software based variable features and/or parameters for the entire lifespan of the new equipment provided as required by the specification.

3.7 ACCEPTANCE

A. Final acceptance of the installation shall be made after all field quality control inspections and tests are complete. Workmanship, equipment, tested speed, floor to floor performance, acceleration, deceleration, running and leveling must comply with this specification. The elevator contractor shall furnish the personnel, equipment and instruments as needed to perform all required tests.

END OF SECTION 14211

EXHIBIT LH/OM



LUMBEE HALL & OLD MAIN ELEVATOR CABS – REAR WALL ELEVATION

(SIDE WALLS SIMILAR) CABS DIMS. = APPROX. 81 1/2" (REAR) X 51 1/2" (SIDES) – FIELD VERIFY

APPENDIX A

FULL SERVICE, ALL INCLUSIVE ELEVATOR MAINTENANCE AGREEMENT

A. From the date at which the first elevator is removed from passenger service for modernization, the elevator contractor shall begin an interim all-inclusive preventative maintenance service on the existing hydraulic passenger elevators. This interim maintenance service shall be provided in conformance with the specification and this section. The interim maintenance service shall remain in effect until all work required by the specification is completed, and the elevators have been fully modernized and accepted by the owner.

B. Prior to and upon completion and final acceptance of the elevator work required for the modernization of the hydraulic passenger elevators, the elevator contractor shall fully warrant and guarantee all the materials and workmanship against any defect as a result of faulty workmanship, and/or defective materials used, either new or retained, in the completion of the modernization of the elevator. Where items of material or equipment carry a warranty from the manufacturer in excess of the warranty time in the specification, then such warranty shall apply for that piece of material or equipment. Copies of all such warranties from the manufacturers shall be provided prior to final acceptance.

C. The elevator contractor shall provide a first quality all inclusive maintenance service contract with call back service, from the date at which the first elevator is removed from passenger service for modernization and additionally for a period of 12 months after the date of final acceptance of the completed modernized elevator.

    1. This service shall consist of routine examinations of the equipment at intervals necessary to maintain the elevator and all equipment in first quality condition. Such service shall include all cleaning, lubrication, parts and supplies, adjustments and the necessary personnel to keep the equipment in proper operation. In the event of abuse, misuse or other causes beyond the control of the contractor, repair or replacement of parts and adjustments to the elevator equipment, shall not be the responsibility of the elevator contractor. The elevator contractor shall use only genuine, original equipment manufacturer's replacement parts and supplies, unless the owner has authorized approved equal. The elevator contractor shall:

        a. Systematically examine, adjust, lubricate and whenever required by the normal wear and tear of elevator usage, repair or replace: Hydraulic Power / Pump Unit, Controller, including but not limited to Coils, Contacts, Resistors, other parts, including all circuit boards, Door Operator(s), Door Motors and related equipment.
        b. Service the equipment, using trained elevator personnel directly employed and supervised by the elevator contractor to maintain the equipment in first quality operating condition.
        c. Furnish all tools, equipment, cleaning fluids and cleaning equipment, parts, and lubricants.
        d. Keep all areas of the equipment clean at all times, including the machine room, pit, car top, hoistway and doors.

   e. Provide all necessary bulbs, lamps, LED's and any other parts necessary to keep all signal fixtures operating properly.
   f. Periodically test the emergency light and bell system, test the communication system, firefighters recall system and maintain a written log of these tests.
   g. Repair and/or replace all hoistway wiring and travel cables as necessary.
2. The owner shall be responsible for the following:
   a. The owner shall retain possession and exclusive control of all the equipment.
   b. Remove the elevator from service when it becomes unsafe or operates in a manner which might cause harm or injury to a passenger and report such incidents or conditions to the elevator contractor.
   c. Provide reasonable access to the equipment for the contractor.
   d. Keep machine room spaces, pits and hoistway free from water and not allow storage in any of these places.
3. The elevator contractor shall coordinate with the owner to perform all work on the elevators in such a manner as to minimize downtime and disruption.
4. The elevator contractor shall not be required to make any tests other than those outlined in the specification and/or required by the applicable edition of ASME A17.1 code, or the North Carolina State Department of Labor, Elevator Bureau, nor shall he be responsible to install new devices or attachments recommended or directed by insurance companies, or any authority as a result of a change in regulations or code that was not in effect at the time of the acceptance of the modernization.
5. The elevator contractor shall not be responsible or held liable to the owner for any damage, loss, detention or delay caused by fire, flood, strikes, lockouts, or any other cause beyond his reasonable control.
6. Defects found in any equipment, as reported by the North Carolina Department of Labor, Elevator Bureau inspector during any inspection of the equipment, shall be completed by the elevator contractor within the time allotted by the Inspector.
7. The agreement shall not be transferred or assigned by the elevator contractor to any other party without the express written consent of the owner.
8. All work shall be performed during regular working hours.
9. The elevator contractor shall diligently perform the work required to maintain the equipment in first quality condition and minimize downtime. At no time shall the elevator be left shut down for repairs or service for a period longer than 48 hours from the receipt of a request for service without the express written consent of the owner.
10. The following equipment is excluded from the interim, warranty and extended warranty/maintenance agreement. Any equipment not specifically listed as excluded is considered to be included in this agreement:
    a. Elevator car enclosure, walls, ceilings, handrails, car light fixtures, finished floor covering.
    b. Elevator hoistway, entrance frames and sills.
    c. Smoke and fire sensors and other related equipment not specifically a part of the elevator controls.
    d. Communication device in the car and related equipment not specifically a part of the elevator controls, except that the wiring

installed by the elevator contractor in the machine and hoistway and the traveling cables are included in this agreement.

e. Repair or replacement of parts and adjustments due to vandalism, misuse, abuse or accidents caused by events and/or persons unknown beyond the control of the contractor.

11. The repair and replacement of car and hoistway door astragals and sight guards, car fans, emergency lighting units charger and battery, and signal fixtures are covered in this agreement.
12. For any repairs adjustments or replacement of parts required that are not covered by this agreement due to any circumstances, prior to proceeding with the work, a written authorization from the owner is required. Failure to obtain such written authorization from the owner shall relieve the owner from any responsibility for payment of the unauthorized work. At the owner's request, the contractor shall deliver to the owner any damaged parts replaced.
13. The elevator contractor shall notify the owner of any defect or damage to the equipment that the contractor feels is beyond the scope of the agreement immediately. If requested by the owner, such notification shall be written, accompanied by a written estimate of the cost to repair such damage or defect. The owner specifically reserves the right to seek competitive bids for work not included in the agreement.
14. At least 30 days prior to the expiration of the 12-month warranty period, the contractor shall schedule with the Owner, an inspection of the equipment to assure its operating condition. The owner reserves the right to be present during this inspection or have his authorized representative present during this inspection. The elevator contractor shall have a representative accompany the Owner/Representative.

D. Emergency call back service shall be provided at no additional cost and be included for all hours and days during the term of this agreement. The elevator contractor shall respond to all requests for service, and have on site a qualified person within one (1) hour from the receipt of a request for service. This maximum response time shall be applicable at all times.

1. During the interim and warranty maintenance period the elevator contractor shall provide, maintain and keep current a suitable preventative maintenance check chart for the elevator. The check chart shall be posted in the machine room.
2. The elevator contractor shall also provide and maintain a complete, accurate and up to date log of all activities, adjustments, repairs, call backs, and parts replaced during the interim and warranty periods. This logbook shall be kept in the machine room.
3. The elevator contractor shall perform monthly tests of the Firefighters service, and record the results of such tests in the logbook in the machine room. The tests shall be performed in accordance with the applicable edition of the ASME A17.1 code and any supplements. The elevator contractor shall also be responsible to perform any tests as required an/or requested by the North Carolina State Department of Labor, Elevator Bureau, and provide all necessary personnel and equipment to perform these tests.
4. The elevator contractor shall perform routine inspections of all equipment and make all repairs as required to maintain the correct contract speed and

original performance time, which includes acceleration and deceleration. The contractor shall make the necessary repairs and or adjustments as required to maintain the original door opening and closing times, and door closing force, within the limits of the applicable codes.

5. The contractor will keep the guide rails properly secured and aligned at all times and when necessary renew guide rollers in order to assure smooth and quiet operation.
6. The contractor shall periodically examine and test all safety devices and governors and equalize the tension on all hoisting ropes.
7. The contractor shall also examine, lubricate, adjust and repair or replace all interlocks, car and hatch door rollers and hangers, door closers, door operator, car and hoistway door guides.

E. The elevator contractor shall have all licenses and permits required to complete the scope of work as described in this agreement and to conduct business in the State of North Carolina.

F. During the term of the contract, the Elevator Contractor, at its sole cost, shall provide commercial insurance of such type and with such terms and limits as may be reasonably associated with the contract. At a minimum, the contractor shall provide and maintain the following coverage and limits:

1. Workman's Compensation- The contractor shall provide and maintain workman's compensation insurance as required by the laws of the State of North Carolina, as well as employer's liability coverage with minimum limits of One Hundred Fifty Thousand Dollars ($150,000) covering all of the Contractors employees who are engaged in any work under the contract. If any work is subcontracted, the contractor shall require the subcontractor to provide the same coverage for any of its employees engaged in any work under the contract.
2. Commercial General Liability- General Liability coverage on a Comprehensive Broad Form on an occurrence basis in the minimum amount of One Million Dollars ($1,000,000) combined single limit. Defense cost shall be in excess of the limit of liability.
3. Automobile Liability Insurance- To include liability coverage on all owned, hired and non-owned vehicles, used in connection with the contract. The minimum combined single limit shall be Five Hundred Thousand Dollars ($500,000).
4. The contractor shall provide proof of insurance whenever requested by the Owner.

END OF APPENDIX A

SECTION 15000
DUCTLESS MINI-SPLIT SYSTEMS

1.0 GENERAL

1.1. MECHANICAL WORK

A. All work shall be performed in accordance with applicable federal, state and local codes and regulations. Mechanical equipment shall be selected to meet or exceed the requirements of the Energy Conservation Code.

B. Hazardous Materials Warning: If uncovered materials are suspected of containing asbestos, lead-based paint, PCB's, or any other hazardous material, stop work in that area and report the concern to the construction manager, owner and architect/engineer immediately.

C. Furnish and install all incidental accessories required to make the mechanical work complete and operational. If any aspect of the work is undefined or unclear after the final bid addendum, include the cost for the highest quality solution.

D. These drawings are diagrammatic. Exact equipment locations and pipe routing shall be coordinated with the building and site conditions. The actual equipment and minimum clearance dimensions shall be verified with the supplier. Fittings not shown on the drawings might be required.

E. Refrigerant piping shall be Type L copper tubing and wrought-copper fittings with soldered joints. Pre-insulated line sets are acceptable as recommended by the manufacturer. Insulate refrigerant piping with 1-inch thick elastomeric insulation. Provide 2 coats of paintable UV protective coating on outdoor piping insulation

F. Condensate drain piping shall be Type DWV, drawn-temper copper tubing, wrought-copper fittings and soldered joints. Insulate piping with 1-inch elastomeric insulation. Provide 2 coats of paintable UV protective coating on outdoor piping insulation. Piping shall be no less than 3/4-inch and slope at 1/8" per foot.

G. Adhesive and mastics shall meet low VOC requirements of 50 g/L or less.

H. All mechanical work shall be warranted by the contractor for 1 year from the owner's written acceptance of substantial completion. The compressor parts, labor and refrigerant shall be warrantied for 5 years.

I. Provide equipment cut sheets, installation, and operation and maintenance manuals as required by Division 01.

1.2. EXTRA MATERIALS

A. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.

1. Filters: One set for each indoor unit.

2.0 PRODUCTS

2.1. DUCTLESS MINI-SPLIT SYSTEMS

A. Manufacturers: Provide equipment from one of the following manufacturers that meets the requirements of the bid documents: Carrier/Toshiba; Daikin/McQuay; Johnson Controls/York; LG; Mitsubishi; Samsung; or Trane.

B. DMSS shall meet national standards and the requirements of the equipment schedule, including cooling capacities and efficiencies.

C. Indoor unit shall include minimum merv-6 permanent, removable and cleanable air filter and abs plastic or stainless-steel condensate drain pan.

D. Condensing/heat pump units shall include low ambient control devices.

E. Safety Overflow Switch: Electronic water sensor with manual reset switch that senses high water level and sends unit disable signal to prevent further condensate production. Drain line installed devices are not acceptable.

F. System shall have single-point electrical connection at condensing/heat pump units with power and controls circuits to indoor unit. Provide fused disconnect switch in NEMA 3R enclosure sized for condensing unit and motor-rated disconnect switch in NEMA 1 enclosure for indoor unit.

G. Provide programmable solid-state electronic microprocessor-based space thermostat and controls that provides automatic heating / cooling switching, short-cycle protection, and led display. Battery operated wireless remote controls are not acceptable.

3.0 EXECUTION

3.1. DUCTLESS MINI-SPLIT SYSTEM INSTALLATION

A. Comply with manufacturer's installation guidelines.

B. Coordinate the installation of equipment with other trades prior to purchase and installation. Maintain minimum equipment and device maintenance clearances. Installed materials not coordinated shall be removed and reinstalled at no additional cost.

C. Wall mounted control sensors shall be installed at 48-inches above the floor to the top of the back-box. Coordinate exact locations with light switches. When both are indicated adjacent to a door, locate the switch closest to the door and the sensor within 12-inches of the switch.

D. All power and control wiring shall be installed in conduit complying with the strictest requirements of NFPA 70 and Division 16. Extend power conduit and wiring from disconnecting means to equipment connections.

E. Install penetrations of life-safety rated assemblies per approved UL detail in accordance with the building code. Unless otherwise noted, the elevator equipment room walls shall be protected as 2-hour fire and smoke barriers.

F. Install refrigerant piping in compliance with ASHRAE 15 and Mechanical Code Chapter 11 – "Refrigeration".

G. Install factory-fabricated pipe hangers with 12-inch long insulation shields at 5-foot spacings.

H. Control and alarm devices shall be installed in back-boxes within existing walls. Surface-mounted conduit and raceway will not be accepted except for existing solid concrete walls. Device back-boxes in fire-rated walls shall have firestop putty pads or equivalent UL-listed installation.

I. Install indoor cassette and outdoor condensing/heat pump units plumb and level.

J. Install outdoor units on concrete equipment pad or stand as noted, on an all-weather elastomeric vibration isolation pads. Secure unit to pad/stand with stainless steel bolts and hardware.

K. Label indoor cassettes, outdoor condensing/heat pump units and condensate pump with equipment labels. Labels shall be plastic 1/8-inch multilayer, multicolor plastic labels with mechanical engraving suitable for temperatures up to 160 deg F with contact-type permanent adhesive. Labels shall be minimum 2-1/2 inches wide and 3/4-inch tall with 3/8-inch white letters on black background. Confirm equipment numbering with Owner prior to purchase.

L. Perform complete installation, start-up and verification per manufacturer recommendations. Provide a letter to the engineer certifying this was successfully completed and warranting the installation.

END OF SECTION 15000

SECTION 16010
BASIC ELECTRICAL REQUIREMENTS

1.0 GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this and the other sections of Division 16.

1.2 SUMMARY

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

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

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

1. Division 16 Section "Basic Electrical Materials and Methods," for materials and methods common to the remainder of Division 16.

1.3 SUBMITTALS

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

B. Specific Requirements to Electrical Submittals:

1. Submittal Documents Quality: Facsimile documents prohibited. Submittals containing sheets copied from facsimile documents will be automatically Rejected and returned to Contractor without review. Also, submittals containing poor quality copies will be automatically Rejected and returned to Contractor without review.
2. Submittal Document Binding: Use report covers with 3-hole, dual-prong tang fasteners or slide fasteners. Velo- and comb bound documents are also acceptable. Use of 3-ring binders is prohibited and will be automatically Rejected and returned to Contractor without review.

C. Additional copies may be required by individual sections of these Specifications.

1.4 RECORD DOCUMENTS

A. Prepare record documents in accordance with the requirements in Division 1 Section "Project Closeout." In addition to the requirements specified in Division 1, indicate installed conditions for:

B. Major raceway systems, size and location, for both exterior and interior; locations of control devices; distribution and branch electrical circuitry; and fuse and circuit breaker size and arrangements.

1. Equipment locations (exposed and concealed), dimensioned from prominent building lines.
2. Approved substitutions, Contract Modifications, and actual equipment and materials installed.

1.5 MAINTENANCE MANUALS

A. Prepare maintenance manuals in accordance with Division 1 Section "Project Closeout." In addition to the requirements specified in Division 1, include the following information for equipment items:

1. Description of function, normal operating characteristics and limitations, performance curves, engineering data and tests, and complete nomenclature and commercial numbers of replacement parts.
2. Maintenance procedures for routine preventative maintenance and troubleshooting; disassembly, repair, and reassembly; aligning and adjusting instructions.
3. Warranty Information: Copies of documentation for all additional and secondary warranties shall be included.

1.7 DELIVERY, STORAGE, AND HANDLING

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

2.0 PRODUCTS (Not Applicable)

3.0 EXECUTION

3.1 ROUGH-IN

A. Verify final locations for rough-ins with field measurements and with the requirements of the actual equipment to be connected.

B. Refer to equipment specifications in Divisions 16 for rough-in requirements.

3.2 ELECTRICAL INSTALLATIONS

A. General: Sequence, coordinate, and integrate the various elements of electrical systems, materials, and equipment. Comply with the following requirements:

1. Coordinate electrical systems, equipment, and materials installation with other building components.
2. Verify all dimensions by field measurements.
3. Arrange for chases, slots, and openings in other building components during progress of construction, to allow for electrical installations.
4. Coordinate the installation of required supporting devices and sleeves to be set in poured-in-place concrete and other structural components, as they are constructed.
5. Sequence, coordinate, and integrate installations of electrical materials and equipment for efficient flow of the Work. Give particular attention to large equipment requiring positioning prior to closing in the building.
6. Where mounting heights are not detailed or dimensioned, install systems, materials, and equipment to provide the maximum headroom possible.
7. Coordinate connection of electrical systems with exterior underground utilities and services. Comply with requirements of governing regulations, franchised service companies, and controlling agencies. Provide required connection for each service.
8. Install systems, materials, and equipment to conform with approved submittal data, including coordination drawings, to greatest extent possible. Conform to arrangements indicated by the Contract Documents, recognizing that portions of the Work are shown only in diagrammatic form. Where coordination requirements conflict with individual system requirements, refer conflict to the Architect.
9. Install systems, materials, and equipment level and plumb, parallel and perpendicular to other building systems and components, where installed exposed in finished spaces.
10. Install electrical equipment to facilitate servicing, maintenance, and repair or replacement of equipment components. As much as practical, connect equipment for ease of disconnecting, with minimum of interference with other installations.
11. Install access panel or doors where units are concealed behind finished surfaces.
12. Install systems, materials, and equipment giving right-of-way priority to systems required to be installed at a specified slope.

3.3 CUTTING AND PATCHING

A. General: Perform cutting and patching in accordance with the following requirements:

1. Perform cutting, fitting, and patching of electrical equipment and materials required to:

    a. Remove and replace defective Work.
    b. Remove and replace Work not conforming to requirements of the Contract Documents.
    d. Upon written instructions from the Engineer, uncover and restore Work to provide for Engineer observation of concealed Work.

2. Cut, remove, and legally dispose of selected electrical equipment, components, and materials as indicated, including but not limited to removal of electrical items indicated to be removed and items made obsolete by the new Work.

3. Protect the structure, furnishings, finishes, and adjacent materials not indicated or scheduled to be removed.
4. Provide and maintain temporary partitions or dust barriers adequate to prevent the spread of dust and dirt to adjacent areas.
5. Protection of Installed Work: During cutting and patching operations, protect adjacent installations.
6. Patch existing finished surfaces and building components using new materials matching existing materials and experienced Installers. Installers' qualifications refer to the materials and methods required for the surface and building components being patched.

PART 4 - INSPECTIONS

A. Authority Having Jurisdiction: The State Construction Office is the Authority Having Jurisdiction (AHJ) for the Electrical Inspections on this project. It is the responsibility of the Electrical Contractor to notify the State Property Electrical Inspectors in the State Construction Office to schedule the required rough-in, above ceiling, and final inspections between Monday and Friday unless specifically agreed to by the inspector. No work will be covered up until after the inspection has been completed and approved by an authorized SCO inspector.

END OF SECTION 16010

SECTION 16050
BASIC ELECTRICAL MATERIALS AND METHODS

1.0 GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. This Section includes the following:

1. Electrical Equipment Installation.
2. Firestopping.
3. Cutting and patching for electrical construction.
4. Touchup painting.

1.3 QUALITY ASSURANCE

A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a third-party testing agency amongst those accredited by the NCBCC (North Carolina Building Code Council) to label electrical and mechanical equipment.

B. Comply with NFPA 70.

1.4 COORDINATION

A. Coordinate chases, slots, inserts, sleeves, and openings with general construction work and arrange in building structure during progress of construction to facilitate the electrical installations that follow.

B. Sequence, coordinate, and integrate installing electrical materials and equipment for efficient flow of the Work.

2.0 PRODUCTS

2.1 TOUCHUP PAINT

A. For Equipment: Equipment manufacturer's paint selected to match installed equipment finish.

B. Galvanized Surfaces: Zinc-rich paint recommended by item manufacturer.

3.0 EXECUTION

3.1 ELECTRICAL EQUIPMENT INSTALLATION

A. Headroom Maintenance: If mounting heights or other location criteria are not indicated, arrange and install components and equipment to provide the maximum possible headroom.

B. Materials and Components: Install level, plumb, and parallel and perpendicular to other building systems and components, unless otherwise indicated.

C. Equipment: Install to facilitate service, maintenance, and repair or replacement of components. Connect for ease of disconnecting, with minimum interference with other installations.

D. Right of Way: Give to raceways and piping systems installed at a required slope.

3.2 FIRESTOPPING

A. Apply firestopping to cable and raceway penetrations of fire-rated floor and wall assemblies to achieve fire-resistance rating of the assembly.

3.3 CUTTING AND PATCHING

A. Cut, channel, chase, and drill floors, walls, partitions, ceilings, and other surfaces required to permit electrical installations. Perform cutting by skilled mechanics of trades involved.

B. Repair and refinish disturbed finish materials and other surfaces to match adjacent undisturbed surfaces. Install new fireproofing where existing firestopping has been disturbed. Repair and refinish materials and other surfaces by skilled mechanics of trades involved.

3.4 REFINISHING AND TOUCHUP PAINTING

A. Refinish and touch up paint. Paint materials and application requirements are specified in Division 9 Section "Painting."

1. Clean damaged and disturbed areas and apply primer, intermediate, and finish coats to suit the degree of damage at each location.
2. Follow paint manufacturer's written instructions for surface preparation and for timing and application of successive coats.
3. Repair damage to galvanized finishes with zinc-rich paint recommended by manufacturer.
4. Repair damage to PVC or paint finishes with matching touchup coating recommended by manufacturer.

3.5 CLEANING AND PROTECTION

A. On completion of installation, including outlets, fittings, and devices, inspect exposed finish. Remove burrs, dirt, paint spots, and construction debris.

B. Protect equipment and installations and maintain conditions to ensure that coatings, finishes, and cabinets are without damage or deterioration at time of Final Acceptance.

END OF SECTION 16050

SECTION 16060
GROUNDING AND BONDING

1.0 GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. This Section includes grounding of electrical systems and equipment. Grounding requirements specified in this Section may be supplemented by special requirements of systems described in other Sections.

1.3 SUBMITTALS

A. Qualification Data: For firms and persons specified in "Quality Assurance" Article.

B. Field Test Reports: Submit written test reports to include the following:

1. Test procedures used.
2. Test results that comply with requirements.
3. Results of failed tests and corrective action taken to achieve test results that comply with requirements.

1.4 QUALITY ASSURANCE

A. Testing Agency Qualifications: Testing agency as defined by OSHA in 29 CFR 1910.7 or a member company of the InterNational Electrical Testing Association and that is acceptable to authorities having jurisdiction.

1. Testing Agency's Field Supervisor: Person currently certified by the InterNational Electrical Testing Association to supervise on-site testing specified in Part 3.

B. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a third-party testing agency amongst those accredited by the NCBCC (North Carolina Building Code Council) to label electrical and mechanical equipment.

1. Comply with UL 467.

2.0 PRODUCTS

2.1 MANUFACTURERS

A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

1. Grounding Conductors, Cables, Connectors:

a. Apache Grounding/Erico Inc.
b. Boggs, Inc.
c. Chance/Hubbell.
d. Copperweld Corp.
e. Dossert Corp.
f. Erico Inc.; Electrical Products Group.
g. Framatome Connectors/Burndy Electrical.
h. Galvan Industries, Inc.
i. Harger Lightning Protection, Inc.
j. Hastings Fiber Glass Products, Inc.
k. Heary Brothers Lightning Protection Co.
l. Ideal Industries, Inc.
m. ILSCO.
n. Kearney/Cooper Power Systems.
o. Korns: C. C. Korns Co.; Division of Robroy Industries.
p. Lightning Master Corp.
q. Lyncole XIT Grounding.
r. O-Z/Gedney Co.; a business of the EGS Electrical Group.
s. Raco, Inc.; Division of Hubbell.
t. Robbins Lightning, Inc.
u. Salisbury: W. H. Salisbury & Co.
v. Superior Grounding Systems, Inc.
w. Thomas & Betts, Electrical.

2.2 GROUNDING CONDUCTORS

A. For insulated conductors, comply with Division 16 Section "Conductors and Cables."

B. Material: Copper.

C. Equipment Grounding Conductors: Insulated with green-colored insulation.

D. Grounding Electrode Conductors: Stranded cable.

E. Bare Copper Conductors: Comply with the following:

1. Solid Conductors: ASTM B 3.
2. Assembly of Stranded Conductors: ASTM B 8.
3. Tinned Conductors: ASTM B 33.

F. Copper Bonding Conductors: As follows:

1. Bonding Cable: 28 kcmil, 14 strands of No. 17 AWG copper conductor, 1/4 inch (6.4 mm) in diameter.
2. Bonding Conductor: No. 4 or No. 6 AWG, stranded copper conductor.

3. Bonding Jumper: Bare copper tape, braided bare copper conductors, terminated with copper ferrules; 1-5/8 inches (42 mm) wide and 1/16 inch (1.5 mm) thick.
4. Tinned Bonding Jumper: Tinned-copper tape, braided copper conductors, terminated with copper ferrules; 1-5/8 inches (42 mm) wide and 1/16 inch (1.5 mm) thick.

1.5 CONNECTOR PRODUCTS

A. Comply with IEEE 837 and UL 467; listed for use for specific types, sizes, and combinations of conductors and connected items.

B. Bolted Connectors: Bolted-pressure-type connectors, or compression type.

C. Welded Connectors: Exothermic-welded type, in kit form, and selected per manufacturer's written instructions.

3.0 EXECUTION

3.1 APPLICATION

A. In raceways, use insulated equipment grounding conductors.

B. Exothermic-Welded Connections: Use for connections to structural steel and for underground connections, except those at test wells.

C. Equipment Grounding Conductor Terminations: Use bolted pressure clamps.

3.2 EQUIPMENT GROUNDING CONDUCTORS

A. Comply with NFPA 70, Article 250, for types, sizes, and quantities of equipment grounding conductors, unless specific types, larger sizes, or more conductors than required by NFPA 70 are indicated.

B. Install equipment grounding conductors in all feeders and circuits.

3.3 INSTALLATION

A. Grounding Conductors: Route along shortest and straightest paths possible, unless otherwise indicated. Avoid obstructing access or placing conductors where they may be subjected to strain, impact, or damage.

B. Bonding Straps and Jumpers: Install so vibration by equipment mounted on vibration isolation hangers and supports is not transmitted to rigidly mounted equipment. Use exothermic-welded connectors for outdoor locations, unless a disconnect-type connection is required; then, use a bolted clamp. Bond straps directly to the basic structure taking care not to penetrate any adjacent parts. Install straps only in locations accessible for maintenance.

C. Metal Water Service Pipe: Provide insulated copper grounding conductors, in conduit, from building's main service equipment, or grounding bus, to main metal water service entrances to building. Connect grounding conductors to main metal water service pipes by grounding clamp connectors. Where a dielectric main water fitting is installed, connect grounding conductor to street side of fitting. Bond metal grounding conductor conduit or sleeve to conductor at each end.

D. Water Meter Piping: Use braided-type bonding jumpers to electrically bypass water meters. Connect to pipe with grounding clamp connectors.

E. Bond each aboveground portion of gas piping system upstream from equipment shutoff valve.

F. Provide exothermic-welded connection to building structural steel.

3.4 CONNECTIONS

A. General: Make connections so galvanic action or electrolysis possibility is minimized. Select connectors, connection hardware, conductors, and connection methods so metals in direct contact will be galvanically compatible.

1. Use electroplated or hot-tin-coated materials to ensure high conductivity and to make contact points closer to order of galvanic series.
2. Make connections with clean, bare metal at points of contact.
3. Make aluminum-to-steel connections with stainless-steel separators and mechanical clamps.
4. Make aluminum-to-galvanized steel connections with tin-plated copper jumpers and mechanical clamps.
5. Coat and seal connections having dissimilar metals with inert material to prevent future penetration of moisture to contact surfaces.

B. Exothermic-Welded Connections: Comply with manufacturer's written instructions. Welds that are puffed up or that show convex surfaces indicating improper cleaning are not acceptable.

C. Equipment Grounding Conductor Terminations: For No. 8 AWG and larger, use pressure-type grounding lugs. No. 10 AWG and smaller grounding conductors may be terminated with winged pressure-type connectors.

D. Noncontact Metal Raceway Terminations: If metallic raceways terminate at metal housings without mechanical and electrical connection to housing, terminate each conduit with a grounding bushing. Connect grounding bushings with a bare grounding conductor to grounding bus or terminal in housing. Bond electrically noncontinuous conduits at entrances and exits with grounding bushings and bare grounding conductors, unless otherwise indicated.

E. Compression-Type Connections: Use hydraulic compression tools to provide correct circumferential pressure for compression connectors. Use tools and dies recommended by connector manufacturer. Provide embossing die code or other standard method to make a visible indication that a connector has been adequately compressed on grounding conductor.

END OF SECTION 16060

SECTION 16075
ELECTRICAL IDENTIFICATION

1.0 GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. This Section includes electrical identification materials and devices required to comply with ANSI C2, NFPA 70, OSHA standards, and authorities having jurisdiction.

1.3 SUBMITTALS

A. Product Data: For each electrical identification product indicated.

1.4 QUALITY ASSURANCE

A. Comply with ANSI C2.

B. Comply with NFPA 70.

C. Comply with ANSI A13.1 and NFPA 70 for color-coding.

2.0 PRODUCTS

2.1 RACEWAY AND CABLE LABELS

A. Colored Adhesive Tape: Self-adhesive vinyl tape not less than 3 mils thick by 1 to 2 inches wide (0.08 mm thick by 25 to 51 mm wide).

B. Plasticized Card-Stock Tags: Vinyl cloth with preprinted and field-printed legends. Orange background, unless otherwise indicated, with eyelet for fastener.

2.2 NAMEPLATES AND SIGNS

A. Safety Signs: Comply with 29 CFR, Chapter XVII, Part 1910.145.

B. Engraved Plastic Nameplates and Signs: Engraving stock, melamine plastic laminate, minimum 1/16 inch (1.6 mm) thick for signs up to 20 sq. in. (129 sq. cm) and 1/8 inch (3.2 mm) thick for larger sizes. Punched or drilled for mechanical fasteners.

1. 120/208V Equipment: Blue surface with white core.
2. 277/480V Equipment: Black surface with white core.
3. Generator Fed/Fire Alarm Equipment: Red surface with white core.

C. Baked-Enamel Signs for Interior Use: Preprinted aluminum signs, punched or drilled for fasteners, with colors, legend, and size required for the application. 1/4-inch (6.4-mm) grommets in corners for mounting.

D. Exterior, Metal-Backed, Butyrate Signs: Weather-resistant, nonfading, preprinted, cellulose-acetate butyrate signs with 0.0396-inch (1-mm) galvanized-steel backing; and with colors, legend, and size required for the application. 1/4-inch (6.4-mm) grommets in corners for mounting.

E. Fasteners for Nameplates and Signs: Self-tapping, stainless-steel screws.

2.3 MISCELLANEOUS IDENTIFICATION PRODUCTS

A. Cable Ties: Fungus-inert, self-extinguishing, one-piece, self-locking, Type 6/6 nylon cable ties.

1. Minimum Width: 3/16 inch (5 mm).
2. Tensile Strength: 50 lb (22.3 kg) minimum.
3. Temperature Range: Minus 40 to plus 185 deg F (Minus 40 to plus 85 deg C).
4. Color: According to color-coding.

B. Paint: Formulated for the type of surface and intended use.

1. Primer for Galvanized Metal: Single-component acrylic vehicle formulated for galvanized surfaces.
2. Primer for Concrete Masonry Units: Heavy-duty-resin block filler.
3. Primer for Concrete: Clear, alkali-resistant, binder-type sealer.
4. Enamel: Silicone-alkyd or alkyd urethane as recommended by primer manufacturer.

3.0 EXECUTION

3.1 INSTALLATION

A. Identification Materials and Devices: Install at locations for most convenient viewing without interference with operation and maintenance of equipment.

B. Lettering, Colors, and Graphics: Coordinate names, abbreviations, colors, and other designations with corresponding designations in the Contract Documents or with those required by codes and standards. Use consistent designations throughout Project.

C. Sequence of Work: If identification is applied to surfaces that require finish, install identification after completing finish work.

D. Self-Adhesive Identification Products: Clean surfaces before applying.

E. Install painted identification according to manufacturer's written instructions and as follows:

1. Clean surfaces of dust, loose material, and oily films before painting.
2. Prime surfaces using type of primer specified for surface.
3. Apply one intermediate and one finish coat of enamel.

F. Color Banding Raceways and Exposed Cables: Band exposed and accessible raceways of the systems listed below:

1. Bands: Pretensioned, wraparound plastic sleeves; colored adhesive tape; or a combination of both. Make each color band 2 inches (51 mm) wide, completely encircling conduit, and place adjacent bands of two-color markings in contact, side by side.
2. Band Locations: At changes in direction, at penetrations of walls and floors, at 50-foot (15-m) maximum intervals in straight runs, and at 25-foot (7.6-m) maximum intervals in congested areas.
3. Junction Box Covers: Paint concealed junction box covers as listed below.
4. Apply the following colors to the systems listed below:

    a. Fire Alarm System: Red.

G. Caution Labels for Indoor Boxes and Enclosures for Power and Lighting: Install pressure-sensitive, self-adhesive labels identifying system voltage with black letters on orange background. Install on exterior of door or cover.

H. Circuit Identification Labels on Outlet Boxes, Junction Boxes and Pull Boxes: Install labels externally.

1. Exposed Boxes: Pressure-sensitive, self-adhesive plastic label on faceplate. Use clear label with black letters.
2. Concealed Boxes: Plasticized card-stock tags.
3. Labeling Legend: Permanent, waterproof listing of panel and circuit number or equivalent.

I. Secondary Service, Feeder, and Branch-Circuit Conductors: Color-code throughout the secondary electrical system.

1. Color-code 208/120-V system as follows:

    a. Phase A: Black.
    b. Phase B: Red.
    c. Phase C: Blue.
    d. Neutral: White.
    e. Ground: Green.

2. Color-code 480/277-V system as follows:

    a. Phase A: Brown.
    b. Phase B: Orange.
    c. Phase C: Yellow.
    d. Neutral: Gray.
    e. Ground: Green.

3. Factory apply color the entire length of conductors, except the following field-applied, color-coding methods may be used instead of factory-coded wire for sizes larger than No. 10 AWG:

    a. Colored, pressure-sensitive plastic tape in half-lapped turns for a distance of 6 inches (150 mm) from terminal points and in boxes where splices or taps are made. Apply last two turns of tape with no tension to prevent possible unwinding. Use 1-inch- (25-mm-) wide tape in colors specified. Adjust tape bands to avoid obscuring cable identification markings.
    b. Colored cable ties applied in groups of three ties of specified color to each wire at each terminal or splice point starting 3 inches (76 mm) from the terminal and spaced 3 inches (76 mm) apart. Apply with a special tool or pliers, tighten to a snug fit, and cut off excess length.

J. Power-Circuit Identification: Metal tags or aluminum, wraparound marker bands for cables, feeders, and power circuits in vaults, pull and junction boxes, manholes, and switchboard rooms.

1. Legend: 1/4-inch- (6.4-mm-) steel letter and number stamping or embossing with legend corresponding to indicated circuit designations.
2. Tag Fasteners: Nylon cable ties.
3. Band Fasteners: Integral ears.

K. Apply identification to conductors as follows:

1. Conductors to Be Extended in the Future: Indicate source and circuit numbers.
2. Multiple Power or Lighting Circuits in the Same Enclosure: Identify each conductor with source, voltage, circuit number, and phase. Use color-coding to identify circuits' voltage and phase.
3. Multiple Control and Communication Circuits in the Same Enclosure: Identify each conductor by its system and circuit designation. Use a consistent system of tags, color-coding, or cable marking tape.

L. Apply warning, caution, and instruction signs as follows:

1. Warnings, Cautions, and Instructions: Install to ensure safe operation and maintenance of electrical systems and of items to which they connect. Install engraved plastic-laminated instruction signs with approved legend where instructions are needed for system or equipment operation. Install metal-backed butyrate signs for outdoor items.

M. Equipment Identification Labels: Engraved plastic laminate. Install on each unit of equipment, including central or master unit of each system. Locate label on exterior of any enclosure. This includes power, lighting, signal, and alarm systems, unless units are specified with their own self-explanatory identification. Unless otherwise indicated, provide a single line of text with 1/2-inch high lettering minimum on 1-1/2-inch high label; where two lines of text are required, use labels 2 inches high. Use surface and core colors as listed in Part 2 above. Provide labels for all electrical equipment listed below. In general, all labels shall include riser diagram ID, amperage, voltage, number of phases/poles, and equipment served from (source). Provide additional information as listed below:

1. Panelboards: MCB/MLO.

2. Disconnect switches: equipment served by.
   a. Provide label for all disconnects provided by Division 15 or 16.
3. Enclosed circuit breakers: equipment served by.
   a. Provide label for all disconnects provided by Division 15 or 16.
4. Elevator Recall System Control Panel and auxiliary power supplies and enclosures.

END OF SECTION 16075

SECTION 16120
CONDUCTORS AND CABLES

1.0 GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. This Section includes building wires and cables and associated connectors, splices, and terminations for wiring systems rated 600 V and less.

1.3 SUBMITTALS

A. Field Test Reports: Indicate and interpret test results for compliance with performance requirements.

1.4 QUALITY ASSURANCE

A. Listing and Labeling: Provide wires and cables specified in this Section that are listed and labeled.

1. The Terms "Listed" and "Labeled": As defined in NFPA 70, Article 100.
2. Electrical Components, Devices and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a third-party testing agency amongst those accredited by the NCBCC (North Carolina Building Code Council) to label electrical and mechanical equipment.

B. Comply with NFPA 70.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Deliver wires and cables according to NEMA WC 26.

1.6 COORDINATION

A. Coordinate layout and installation of cables with other installations.

B. Revise locations and elevations from those indicated, as required to suit field conditions and as approved by Architect.

2.0 PRODUCTS

2.1 MANUFACTURERS

A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

1. Wires and Cables:
   a. American Insulated Wire Corp.; Leviton Manufacturing Co.
   b. BICC Brand-Rex Company.
   c. Carol Cable Co., Inc.
   d. Senator Wire & Cable Company.
   e. Southwire Company.

2. Connectors for Wires and Cables:

   a. AMP Incorporated.
   b. General Signal; O-Z/Gedney Unit.
   c. Monogram Co.; AFC.
   d. Square D Co.; Anderson.
   e. 3M Company; Electrical Products Division.

2.2 BUILDING WIRES AND CABLES

A. UL-listed building wires and cables with conductor material, insulation type, cable construction, and rating as specified in Part 3 "Wire and Insulation Applications" Article.

B. Rubber Insulation Material: Comply with NEMA WC 3.

C. Thermoplastic Insulation Material: Comply with NEMA WC 5.

D. Cross-Linked Polyethylene Insulation Material: Comply with NEMA WC 7.

E. Ethylene Propylene Rubber Insulation Material: Comply with NEMA WC 8.

F. Conductor Material: Copper.

G. Stranding: Solid conductor for No. 10 AWG and smaller; Class B stranded conductor for larger than No. 10 AWG.

H. Minimum size: #12AWG for power and lighting circuits.

2.3 CONNECTORS AND SPLICES

A. UL-listed, factory-fabricated wiring connectors of size, ampacity rating, material, type, and class for application and service indicated. Comply with Project's installation requirements and as specified in Part 3 "Wire and Insulation Applications" Article.

1. Push-in type splice connectors are prohibited.

3.0 EXECUTION

3.1 EXAMINATION

A. Examine raceways and building finishes to receive wires and cables for compliance with requirements for installation tolerances and other conditions affecting performance of wires and cables. Do not proceed with installation until unsatisfactory conditions have been corrected.

3.2 WIRE AND INSULATION APPLICATIONS

A. Feeder: Type THHN/THWN or XHHW, in raceway.

B. Branch Circuits: Type THHN/THWN or XHHW, in raceway.

C. Elevator Emergency Recall Circuits: Type THHN/THWN or XHHW, in raceway.

D. Class 2 Control Circuits: Type THHN/THWN or XHHW, in raceway.

3.3 INSTALLATION

A. Install wires and cables as indicated, according to manufacturer's written instructions and NECA's "Standard of Installation."

B. Voltage Drop: Conductor size shall be increased to account for voltage as follows:
1. Where the conductor length from the panel to the first outlet on a 120V circuit exceeds 50’, the branch circuit conductors from the panel to the first outlet shall not be smaller than #10 AWG.
2. Where the conductor length from the panel to the first light fixture on a 277V circuit exceeds 125’, the branch circuit conductors from the panel to the first light fixture shall not be smaller than #10 AWG.
3. Where ungrounded circuit conductors are increased in size, the equipment grounding conductor, where installed, shall be increased proportionately per NEC 250.122(B). Where the size of branch circuit conductors are increased, the size of the ground conductor must be increased proportionately per NEC Article 250.122(B).

C. Pull Conductors: Use manufacturer-approved pulling compound or lubricant where necessary; compound used must not deteriorate conductor or insulation. Do not exceed manufacturer's recommended maximum pulling tensions and sidewall pressure values.

D. Use pulling means, including fish tape, cable, rope, and basket-weave wire/cable grips, that will not damage cables or raceway.

E. Install exposed cables, parallel and perpendicular to surfaces of exposed structural members, and follow surface contours where possible.

F. Support cables according to Division 16 Section "Supporting Devices."

G. Seal around cables penetrating fire-rated elements according to U.L. systems shown on drawings.

H. Identify wires and cables according to Division 16 Section "Electrical Identification."

3.4 CONNECTIONS

A. Conductor Splices: Keep to minimum.

B. All spices are allowed only in accessible junction boxes.

C. Install splices and tapes that possess equivalent or better mechanical strength and insulation ratings than conductors being spliced. Push-in type splice connectors are prohibited.

D. Use splice and tap connectors compatible with conductor material.

E. Wiring at Outlets: Install conductor at each outlet, with at least 12 inches (300 mm) of slack.

F. Connect outlets and components to wiring and to ground as indicated and instructed by manufacturer.

G. Tighten electrical connectors and terminals according to manufacturer's published torque-tightening values. If manufacturer's torque values are not indicated, use those specified in UL 486A and UL 486B.

3.5 FIELD QUALITY CONTROL

A. Testing: On installation of wires and cables and before electrical circuitry has been energized, demonstrate product capability and compliance with requirements.

1. Perform the following feeder insulation resistance testing:
    a. All current carrying phase conductors and neutrals shall be tested as installed, and before connections are made, for insulation resistance and accidental grounds. This shall be performed with a 500 volt megger. The procedures listed below shall be followed:
        1) Minimum readings shall be 1,000,000Ω or more for #6 AWG wire and smaller and 250,000Ω or more for #4 AWG or larger 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. If this reading is less than 250,000 ohms, the contractor shall disconnect the branch circuit neutral wires from this neutral bar. The contractor 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) At final inspection, the contractor shall furnish a megger and show the engineers and State Construction Office representatives that the panels comply with the above requirements. Contractor shall also furnish a hook-on type ammeter and voltmeter to take current and voltage readings as directed by the representatives.

b. Copy of all testing reports shall be included in Record Documents for review upon Final Acceptance.

B. Correct malfunctioning conductors and cables at Project site, where possible, and retest to demonstrate compliance; otherwise, remove and replace with new units and retest.

END OF SECTION 16120

SECTION 16130
RACEWAYS AND BOXES

1.0 GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. This Section includes raceways, fittings, boxes, enclosures, and cabinets for electrical wiring.

1. Raceways include the following:

a. RMC.
b. EMT.
c. FMC.
d. LFMC.
e. RNC.
f. Wireways.
g. Surface raceways.

2. Boxes, enclosures, and cabinets include the following:

a. Device boxes.
b. Outlet boxes.
c. Pull and junction boxes.
d. Cabinets and hinged-cover enclosures.

B. Related Sections include the following:

1. Division 16 Section "Supporting Devices" for raceways and box supports.
2. Division 16 Section "Wiring Devices" for devices installed in boxes and for floor-box service fittings.

1.3 DEFINITIONS

A. EMT: Electrical metallic tubing.

B. FMC: Flexible metal conduit.

C. LFMC: Liquidtight flexible metal conduit.

D. RMC: Rigid metal conduit.

E. RNC: Rigid nonmetallic conduit.

1.4 SUBMITTALS

A. Product Data: For surface raceways, wireways and fittings, floor boxes, hinged-cover enclosures, and cabinets.

B. Shop Drawings: Include layout drawings showing components and wiring for nonstandard boxes, enclosures, and cabinets.

1.5 QUALITY ASSURANCE

A. Listing and Labeling: Provide raceways and boxes specified in this Section that are listed and labeled.

1. The Terms "Listed" and "Labeled": As defined in NFPA 70, Article 100.
1. Electrical Components, Devices and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a third-party testing agency amongst those accredited by the NCBCC (North Carolina Building Code Council) to label electrical and mechanical equipment.

B. Comply with NECA's "Standard of Installation."

C. Comply with NFPA 70.

1.6 COORDINATION

A. Coordinate layout and installation of raceways and boxes with other construction elements to ensure adequate headroom, working clearance, and access.

2.0 PRODUCTS

2.1 MANUFACTURERS

A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

1. Metal Conduit and Tubing:

a. Alflex Corp.
b. Anamet, Inc.; Anaconda Metal Hose.
c. Anixter Brothers, Inc.
d. Carol Cable Co., Inc.
e. Cole-Flex Corp.
f. Electri-Flex Co.
g. Flexcon, Inc.; Coleman Cable Systems, Inc.
h. Grinnell Co.; Allied Tube and Conduit Div.
i. Monogram Co.; AFC.
j. Spiraduct, Inc.
k. Triangle PWC, Inc.
l. Wheatland Tube Co.

2. Nonmetallic Conduit:

    a. Anamet, Inc.; Anaconda Metal Hose.
    b. Arnco Corp.
    c. Breeze-Illinois, Inc.
    d. Cantex Industries; Harsco Corp.
    e. Certainteed Corp.; Pipe & Plastics Group.
    f. Cole-Flex Corp.
    g. Condux International; Electrical Products.
    h. Electri-Flex Co.
    i. George-Ingraham Corp.
    j. Hubbell, Inc.; Raco, Inc.
    k. Lamson & Sessions; Carlon Electrical Products.
    l. R&G Sloan Manufacturing Co., Inc.
    m. Spiraduct, Inc.
    n. Thomas & Betts Corp.

3. Conduit Bodies and Fittings:

    a. American Electric; Construction Materials Group.
    b. Crouse-Hinds; Div. of Cooper Industries.
    c. Emerson Electric Co.; Appleton Electric Co.
    d. Hubbell, Inc.; Killark Electric Manufacturing Co.
    e. Lamson & Sessions; Carlon Electrical Products.
    f. O-Z/Gedney; Unit of General Signal.
    g. Scott Fetzer Co.; Adalet-PLM.
    h. Spring City Electrical Manufacturing Co.

4. Metal Wireways:

    a. Hoffman Engineering Co.
    b. Keystone/Rees, Inc.
    c. Square D Co.

5. Boxes, Enclosures, and Cabinets:

    a. American Electric; FL Industries.
    b. Butler Manufacturing Co.; Walker Division.
    c. Crouse-Hinds; Div. of Cooper Industries.
    d. Electric Panelboard Co., Inc.
    e. Erickson Electrical Equipment Co.
    f. Hoffman Engineering Co.; Federal-Hoffman, Inc.
    g. Hubbell Inc.; Killark Electric Manufacturing Co.
    h. Hubbell Inc.; Raco, Inc.
    i. Lamson & Sessions; Carlon Electrical Products.
    j. O-Z/Gedney; Unit of General Signal.
    k. Parker Electrical Manufacturing Co.
    l. Robroy Industries, Inc.; Electrical Division.
    m. Scott Fetzer Co.; Adalet-PLM.

n. Spring City Electrical Manufacturing Co.
o. Thomas & Betts Corp.
p. Woodhead Industries, Inc.; Daniel Woodhead Co.

2.2 METAL CONDUIT AND TUBING

A. Rigid Steel Conduit: ANSI C80.1.

B. EMT and Fittings: ANSI C80.3.
Fittings: Compression type. Cast, pot metal, set-crew, or crimp type fittings are not acceptable.

C. FMC: Zinc-coated steel.

D. LFMC: Flexible steel conduit with PVC jacket.

E. Fittings: NEMA FB 1; compatible with conduit/tubing materials.

2.3 NONMETALLIC CONDUIT

A. RNC: NEMA TC 2, Schedule 40 or 80 PVC.

2.4 METAL WIREWAYS

A. Material: Sheet metal sized and shaped as indicated.

B. Fittings and Accessories: Include couplings, offsets, elbows, expansion joints, adapters, hold-down straps, end caps, and other fittings to match and mate with wireways as required for complete system.

C. Select features, unless otherwise indicated, as required to complete wiring system and to comply with NFPA 70.

D. Wireway Covers: Hinged type.

E. Finish: Manufacturer’s standard enamel finish.

2.5 OUTLET AND DEVICE BOXES

A. Sheet Metal Boxes: NEMA OS 1.

B. Cast-Metal Boxes: NEMA FB 1, Type FD, cast box with gasketed cover.

2.6 PULL AND JUNCTION BOXES

A. Small Sheet Metal Boxes: NEMA OS 1.

B. Cast-Metal Boxes: NEMA FB 1, cast aluminum with gasketed cover.

2.7 ENCLOSURES AND CABINETS

A. Cabinets: NEMA 250, Type 1, galvanized steel box with removable interior panel and removable front, finished inside and out with manufacturer's standard enamel. Hinged door in front cover with flush latch and concealed hinge. Key latch to match panelboards. Include metal barriers to separate wiring of different systems and voltage, and include accessory feet where required for freestanding equipment.

3.0 EXECUTION

3.1 EXAMINATION

A. Examine surfaces to receive raceways, boxes, enclosures, and cabinets for compliance with installation tolerances and other conditions affecting performance of raceway installation. Do not proceed with installation until unsatisfactory conditions have been corrected.

3.2 WIRING METHODS

A. Outdoors: Use the following wiring methods:

1. Exposed: Rigid galvanized steel.
2. Concealed: Rigid galvanized steel.
3. Underground, Single Run: RNC.
4. Underground, Grouped: RNC.
5. Connection to Vibrating Equipment (Including Transformers and Hydraulic, Pneumatic, Electric Solenoid, or Motor-Driven Equipment): LFMC.
6. Boxes and Enclosures: NEMA 250, Type 3R or Type 4.

B. Indoors: Use the following wiring methods:

1. Exposed:
   a. Rigid galvanized steel, or IMC: All feeders and branch circuits less than 8 ft. above finish floor.
   b. EMT: All feeders and branch circuits 8 ft or more above finish floor. Except where exposed to physical damage, use Rigid galvanized steel.
2. Concealed: EMT.
3. Connection to Vibrating Equipment (Including Motor-Driven Equipment): FMC;
4. Damp or Wet Locations: Rigid steel conduit.
5. Boxes and Enclosures: NEMA 250, Type 1, except as follows:
   a. Damp or Wet Locations: NEMA 250, Type 4X, stainless steel.

3.3 INSTALLATION

A. Install raceways, boxes, enclosures, and cabinets as indicated, according to manufacturer's written instructions.

B. Minimum Raceway Size:

1. Interior: 3/4-inch trade size.
2. Exterior, below grade: 1-inch trade size.

C. Conceal conduit and EMT, unless otherwise indicated, within finished walls, ceilings, and floors.

D. Keep raceways at least 6 inches (150 mm) away from parallel runs of flues and steam or hot-water pipes. Install horizontal raceway runs above water and steam piping.

E. Install raceways level and square and at proper elevations. Provide adequate headroom.

F. Complete raceway installation before starting conductor installation.

G. Support raceways as specified in Division 16 Section "Supporting Devices."

H. Use temporary closures to prevent foreign matter from entering raceways.

I. Protect stub-ups from damage where conduits rise through floor slabs. Arrange so curved portion of bends is not visible above the finished slab.

J. Make bends and offsets so ID is not reduced. Keep legs of bends in the same plane and straight legs of offsets parallel, unless otherwise indicated.

K. Use raceway fittings compatible with raceways and suitable for use and location. For intermediate steel conduit, use threaded rigid steel conduit fittings, unless otherwise indicated.

L. Run concealed raceways, with a minimum of bends, in the shortest practical distance considering the type of building construction and obstructions, unless otherwise indicated.

M. Raceways Embedded in Slabs: Raceway shall not be installed embedded within floor and roof slabs, except where connecting to floor boxes. Install in middle third of slab thickness where practical, and leave at least 1-inch (25-mm) concrete cover.

1. All raceway embedded in slabs shall be rigid galvanized steel conduit.
2. Raceway shall extend a maximum of 24” from floor box before offsetting beneath slab. Raceway shall extend 12” from penetration of floor slab before transitioning back to electrical metallic tubing.
3. Space raceways laterally to prevent voids in concrete.
4. Run conduit parallel to or at right angles to main reinforcement. Where at right angles to reinforcement, place conduit close to slab support.
5. Roofing slab: Raceway shall not be embedded in roofing slabs.

N. Install exposed raceways parallel to or at right angles to nearby surfaces or structural members, and follow the surface contours as much as practical.

1. Run parallel or banked raceways together, on common supports where practical.
2. Make bends in parallel or banked runs from same centerline to make bends parallel. Use factory elbows only where elbows can be installed parallel; otherwise, provide field bends for parallel raceways.

3. Raceways installed on interior face of exterior walls shall be supported with ¼" space from wall with clamp-backs or strut.

O. Join raceways with fittings designed and approved for the purpose and make joints tight.

1. Make raceway terminations tight. Use bonding bushings or wedges at connections subject to vibration. Use bonding jumpers where joints cannot be made tight.
2. Use insulating bushings to protect conductors.

P. Terminations: Where raceways are terminated with locknuts and bushings, align raceways to enter squarely and install locknuts with dished part against the box. Where terminations are not secure with 1 locknut, use 2 locknuts: 1 inside and 1 outside the box.

Q. Where raceways are terminated with threaded hubs, screw raceways or fittings tightly into the hub so the end bears against the wire protection shoulder. Where chase nipples are used, align raceways so the coupling is square to the box and tighten the chase nipple so no threads are exposed.

R. Install pull wires in empty raceways. Use No. 14 AWG zinc-coated steel or monofilament plastic line with not less than 200-lb (90-kg) tensile strength. Leave at least 12 inches (300 mm) of slack at each end of the pull wire.

S. Install raceway sealing fittings according to manufacturer's written instructions. Locate fittings at suitable, approved, and accessible locations and fill them with UL-listed sealing compound. For concealed raceways, install each fitting in a flush steel box with a blank cover plate having a finish similar to that of adjacent plates or surfaces. Install raceway sealing fittings at the following points:

1. Where conduits pass from warm to cold locations, such as the boundaries of refrigerated spaces.
2. Where otherwise required by NFPA 70.

T. Stub-up Connections: Where underground raceways are required to turn up into cabinets, equipment, etc., the elbow and stub-up shall be rigid steel. Install with an adjustable top or coupling threaded inside for plugs set flush with the finished floor. Extend to equipment with rigid steel conduit; FMC may be used 6 inches above the floor. Install screwdriver-operated, threaded flush plugs flush with floor for future equipment connections.

U. Flexible Connections: Use maximum of 6 feet (1830 mm) of flexible conduit for for equipment subject to vibration, noise transmission, or movement; and for all motors. Use liquidtight flexible conduit in wet or damp locations. Install separate ground conductor across flexible connections.

V. Do not install aluminum conduits embedded in or in contact with concrete.

W. Install hinged-cover enclosures and cabinets plumb. Support at each corner.

3.4 PROTECTION

A. Provide final protection and maintain conditions, in a manner acceptable to manufacturer and Installer, that ensure coatings, finishes, and cabinets are without damage or deterioration at the time of Substantial Completion.

1. Repair damage to galvanized finishes with zinc-rich paint recommended by manufacturer.
2. Repair damage to PVC or paint finishes with matching touchup coating recommended by manufacturer.

3.5 CLEANING

A. On completion of installation, including outlet fittings and devices, inspect exposed finish. Remove burrs, dirt, and construction debris and repair damaged finish, including chips, scratches, and abrasions.

END OF SECTION 16130

SECTION 16137
SUPPORTING DEVICES

1.0 GENERAL

1.1 RELATED DOCUMENTS

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

B. Requirements of the following Division 16 Sections apply to the following sections:

1. Division 16 Section "Basic Electrical Requirements."
2. Division 16 Section "Basic Electrical Materials and Methods."

1.2 SUMMARY

A. This Section includes secure support from the building structure for electrical items by means of hangers, supports, anchors, sleeves, inserts, seals, and associated fastenings.

1.3 SUBMITTALS

A. Product data for each type of product specified.

B. Shop drawings indicating details of fabricated products and materials.

1.4 QUALITY ASSURANCE

A. Electrical Component Standard: Components and installation shall comply with NFPA 70 "National Electrical Code."

2.0 PRODUCTS

2.1 COATINGS

A. Coating: Supports, support hardware, and fasteners shall be protected with zinc coating or with treatment of equivalent corrosion resistance using approved alternative treatment, finish, or inherent material characteristic. Products for use outdoors shall be hot-dip galvanized.

2.2 MANUFACTURED SUPPORTING DEVICES

A. Raceway Supports: Clevis hangers, riser clamps, two-hole conduit straps, threaded C-clamps with retainers, ceiling trapeze hangers, wall brackets, and spring steel clamps.

B. Fasteners: Types, materials, and construction features as follows:

1. Expansion Anchors: Carbon steel wedge or sleeve type.

2. Toggle Bolts: All steel springhead type.

C. Conduit Sealing Bushings: Factory-fabricated watertight conduit sealing bushing assemblies suitable for sealing around conduit, or tubing passing through concrete floors and walls. Construct seals with steel sleeve, malleable iron body, neoprene sealing grommets or rings, metal pressure rings, pressure clamps, and cap screws.

D. Cable Supports for Vertical Conduit: Factory-fabricated assembly consisting of threaded body and insulating wedging plug for nonarmored electrical cables in riser conduits. Provide plugs with number and size of conductor gripping holes as required to suit individual risers. Construct body of malleable-iron casting with hot-dip galvanized finish.

E. U-Channel Systems: 16-gage steel channels, with 9/16-inch-diameter holes, at a minimum of 8 inches on center, in top surface. Provide fittings and accessories that mate and match with U-channel and are of the same manufacture.

2.3 FABRICATED SUPPORTING DEVICES

A. General: Shop- or field-fabricated supports or manufactured supports assembled from U-channel components.

B. Steel Brackets: Fabricated of angles, channels, and other standard structural shapes. Connect with welds and machine bolts to form rigid supports.

C. Pipe Sleeves: Provide pipe sleeves of one of the following:

1. Sheet Metal: Fabricate from galvanized sheet metal; round tube closed with snaplock joint, welded spiral seams, or welded longitudinal joint. Fabricate sleeves from the following gage metal for sleeve diameter noted:

a. 3-inch and smaller: 20-gage.
b. 4-inch to 6-inch: 16-gage.
c. over 6-inch: 14-gage.

2. Steel Pipe: Fabricate from Schedule 40 galvanized steel pipe.

3.0 EXECUTION

3.1 INSTALLATION

A. Install supporting devices to fasten electrical components securely and permanently in accordance with NEC requirements.

B. Coordinate with the building structural system and with other electrical installation.

C. Raceway Supports: Comply with the NEC and the following requirements:

1. Conform to manufacturer's recommendations for selection and installation of supports.
2. Strength of each support shall be adequate to carry present and future load multiplied by a safety factor of at least four. Where this determination results in a safety allowance of less

than 200 lbs, provide additional strength until there is a minimum of 200 lbs safety allowance in the strength of each support.

3. Install individual and multiple (trapeze) raceway hangers and riser clamps as necessary to support raceways. Provide U-bolts, clamps, attachments, and other hardware necessary for hanger assembly and for securing hanger rods and conduits.
4. Support parallel runs of horizontal raceways together on trapeze-type hangers.
5. Support individual horizontal raceways by separate pipe hangers. Spring steel fasteners may be used in lieu of hangers only for 1-1/2-inch and smaller raceways serving lighting and receptacle branch circuits above suspended ceilings only. For hanger rods with spring steel fasteners, use 1/4-inch-diameter or larger threaded steel. Use spring steel fasteners that are specifically designed for supporting single conduits or tubing.
6. Space supports for raceways in accordance with Table I of this section. Space supports for raceway types not covered by the above in accordance with NEC.
7. Support exposed and concealed raceway within 1 foot of an unsupported box and access fittings. In horizontal runs, support at the box and access fittings may be omitted where box or access fittings are independently supported and raceway terminals are not made with chase nipples or threadless box connectors.
8. In vertical runs, arrange support so the load produced by the weight of the raceway and the enclosed conductors is carried entirely by the conduit supports with no weight load on raceway terminals. Spring steel fasteners are not permitted for use in vertical runs. Support individual vertical runs using two-hole straps. Support parallel runs of vertical raceway together on channel using bolted clamps.

E. Miscellaneous Supports: Support miscellaneous electrical components as required to produce the same structural safety factors as specified for raceway supports. Install metal channel racks for mounting cabinets, panelboards, disconnects, control enclosures, pull boxes, junction boxes, transformers, and other devices.

F. Conduits installed on the interior of exterior building walls shall be spaced from the wall surface a minimum of 1/4" using "clamp-backs" or unistrut.

G. In open overhead spaces, cast boxes threaded to raceways need not be supported separately except where used for fixture support; support sheet metal boxes directly from the building structure or by bar hangers. Where bar hangers are used, attach the bar to raceways on opposite sides of the box and support the raceway with an approved type of fastener not more than 24 inches from the box.

H. Sleeves: Install in concrete slabs and walls and all other fire- rated floors and walls for raceways and cable installations. For sleeves through fire rated-wall or floor construction, apply UL- listed firestopping sealant in gaps between sleeves and enclosed conduits and cables.

I. Conduit Seals: Install seals for conduit penetrations of slabs on grade and exterior walls below grade and where indicated. Tighten sleeve seal screws until sealing grommets have expanded to form watertight seal.

J. Fastening: Unless otherwise indicated, fasten electrical items and their supporting hardware securely to the building structure, including but not limited to conduits, raceways, cables, cable trays, busways, cabinets, panelboards, transformers, boxes, disconnect switches, and control components in accordance with the following:

1. Fasten by means of wood screws or screw-type nails on wood, toggle bolts on hollow

masonry units, concrete inserts or expansion bolts on concrete or solid masonry, and machine screws, welded threaded studs, or spring-tension clamps on steel. Threaded studs driven by a powder charge and provided with lock washers and nuts may be used instead of expansion bolts and machine or wood screws. Do not weld conduit, pipe straps, or items other than threaded studs to steel structures. In partitions of light steel construction, use sheet metal screws.

2. Holes cut to depth of more than 1-1/2 inches in reinforced concrete beams or to depth of more than 3/4 inch in concrete shall not cut the main reinforcing bars. Fill holes that are not used.
3. Ensure that the load applied to any fastener does not exceed 25 percent of the proof test load. Use vibration- and shock- resistant fasteners for attachments to concrete slabs.

3.2 TABLE I: SPACING FOR RACEWAY SUPPORTS

HORIZONTAL RUNS

Raceway Size (Inches)	No. of Conductors in Run	Location	RMC & IMC (1)	EMT (1)	OFR (1)
1/2,3/4	1 or 2	Flat ceiling or wall.	5	5	5
1/2,3/4	1 or 2	Where it is difficult to provide supports except at intervals fixed by the building construction.	7	7	5
1/2,3/4	3 or more	Any location.	7	7	...
1/2-1	3 or more	Any location.			
1 & larger	1 or 2	Flat ceiling or wall.	6	6	...
1 & larger	1 or 2	Where it is difficult to provide supports except at intervals fixed by the building construction.	10	10	5
1 & larger	3 or more	Any location.	10	10	...
Any	....	Concealed.	10	10	...

VERTICAL RUNS

Raceway Size (Inches)	No. of Conductors in Run	Location	RMC & IMC (1,2)	EMT (1)	OFR (1)
1/2,3/4	....	Exposed.	7	7	...
1,1-1/4	....	Exposed.	8	8	...
1-1/2 and larger	....	Exposed.	10	10	...
Up to 2	....	Shaftway.	14	10	...
2-1/2	....	Shaftway.	16	10	...
3 & larger	....	Shaftway.	20	10	...
Any	....	Concealed.	10	10	5

NOTES:

(1) Maximum spacing of supports 10 feet.
(2) Maximum spacings for IMC above apply to straight runs only. Otherwise the maximums for EMT apply.

Abbreviations: EMT Electrical metallic tubing.
IMC Intermediate metallic conduit.
RMC Rigid metallic conduit.
OFR Optical Fiber Raceway.

END OF SECTION 16137

SECTION 16140
WIRING DEVICES

1.0 GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. This Section includes receptacles, connectors, switches, and finish plates.

1.3 DEFINITIONS

A. GFCI: Ground-fault circuit interrupter.

B. TVSS: Transient voltage surge suppressor.

1.4 SUBMITTALS

A. Product Data: For each product specified.

B. Shop Drawings: Legends for receptacles and switch plates.

C. Maintenance Data: For materials and products to include in maintenance manuals specified in Division 1.

1.5 QUALITY ASSURANCE

A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a third party testing agency amongst those accredited by the NCBCC (North Carolina Building Code Council) to label electrical and mechanical equipment.

B. Comply with NEMA WD 1.

C. Comply with NFPA 70.

2.0 PRODUCTS

2.1 MANUFACTURERS

A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

1. Wiring Devices:

a. Hubbell, Inc.; Wiring Devices Div.
b. Leviton Manufacturing Co., Inc.
c. Pass & Seymour/Legrand; Wiring Devices Div.

2.2 RECEPTACLES

A. Straight-Blade and Locking Receptacles: Heavy-Duty grade.
1. NEMA 5-20R (standard #WDI.101968).
2. Arranged for back and side wiring.
3. Grounding type. Separate single or double grounding terminals with screw lugs and a direct, green insulated conductor connector to system ground. Scre shall be green and hex-headed.
4. Listed by an approved third party agency.

B. GFCI Receptacles: Feed-through type, with integral NEMA WD 6, Configuration 5-20R duplex receptacle arranged to protect connected downstream receptacles on same circuit. Design units for installation in a 2-3/4-inch- (70-mm-) deep outlet box without an adapter.

C. Color: Receptacles connected to Normal Power System: Ivory unless otherwise indicated or required by NFPA 70. Receptacles connected to Standby Power Panel – GP: Red

2.3 SWITCHES

A. Snap Switches: Heavy-duty, quiet type. Color: Ivory.
1. 20A, 120/277v, AC only.
2. Grounding type, with green hex-head grounding screw.
3. Quiet type operating mechanism; shall not utilize mercury switches.
4. Listed by an approved third party agency.

2.4 WALL PLATES

A. Single and combination types match corresponding wiring devices.

1. Plate-Securing Screws: Metal with head color to match plate finish.
2. Material for Finished Spaces: 0.04-inch- (1-mm-) thick, Type 302, satin-finished stainless steel.
3. Material for Unfinished Spaces: Galvanized steel.
4. Wet-Location, Weatherproof Cover Plates: Where installing receptacles in wet locations, provide weatherproof covers closable over attached cords maintaining their weather proof integrity while in use and with listed weather resistant receptacles (NEC 406.9(B)).

3.0 EXECUTION

3.1 INSTALLATION

A. Install devices and assemblies plumb and secure.

B. Install wall plates when painting is complete.

C. Do not share neutral conductor on load side of dimmers.

D. Arrangement of Devices: Unless otherwise indicated, mount flush, with long dimension vertical, and grounding terminal of receptacles on top. Group adjacent switches under single, multigang wall plates.

E. Protect devices and assemblies during painting.

3.2 IDENTIFICATION

A. Comply with Division 16 Section "Electrical Identification."

1. Switches: Where three or more switches are ganged, and elsewhere as indicated, identify each switch with approved legend engraved on wall plate.
2. Receptacles: Identify panelboard and circuit number from which served. Use machine-printed, pressure-sensitive, abrasion-resistant label tape on face of plate and durable wire markers or tags within outlet boxes.

3.3 CONNECTIONS

A. Grounding: Connect wiring device grounding terminal to outlet box with bonding jumper. Connect wiring device grounding terminal to branch-circuit equipment grounding conductor

B. Tighten electrical connectors and terminals according to manufacturers published torque-tightening values. If manufacturers torque values are not indicated, use those specified in UL 486A and UL 486B.

3.4 FIELD QUALITY CONTROL

A. Test wiring devices for proper polarity and ground continuity. Operate each device at least six times.

B. Test GFCI operation with both local and remote fault simulations according to manufacturer's written instructions.

C. Replace damaged or defective components.

3.5 CLEANING

A. Internally clean devices, device outlet boxes, and enclosures. Replace stained or improperly painted wall plates or devices.

END OF SECTION 16140

SECTION 16410
ENCLOSED SWITCHES AND CIRCUIT BREAKERS

1.0 GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. This Section includes individually mounted enclosed switches and circuit breakers used for the following:

1. Feeder and branch-circuit protection.
2. Motor and equipment disconnecting means.
3. Elevator disconnect switch.

B. Related Sections include the following:

1. Division 16 Section "Wiring Devices" for attachment plugs, receptacles, and toggle switches used for disconnecting means.

1.3 DEFINITIONS

A. GFCI: Ground-fault circuit interrupter.

B. RMS: Root mean square.

C. SPDT: Single pole, double throw.

1.4 SUBMITTALS

A. Product Data: For each type of switch, circuit breaker, accessory, and component indicated. Include dimensions and manufacturers' technical data on features, performance, electrical characteristics, ratings, and finishes.

B. Maintenance Data: For enclosed switches and circuit breakers and for components to include in maintenance manuals specified in Division 1. In addition to requirements specified in Division 1 Section "Project Closeout," include the following:

1. Routine maintenance requirements for components.
2. Manufacturer's written instructions for testing and adjusting switches and circuit breakers.

1.5 QUALITY ASSURANCE

A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a third-party testing agency amongst those accredited by the NCBCC (North Carolina Building Code Council) to label electrical and mechanical equipment.

B. Comply with NEMA AB 1 and NEMA KS 1.

C. Comply with NFPA 70.

1.6 COORDINATION

A. Coordinate layout and installation of switches, circuit breakers, and components with other construction, including conduit, piping, equipment, and adjacent surfaces. Maintain required workspace clearances and required clearances for equipment access doors and panels.

2.0 PRODUCTS

2.1 MANUFACTURERS

A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

1. Fusible Switches:

a. Eaton Corp.; Cutler-Hammer Products.
b. General Electric Co.; Electrical Distribution & Control Division.
c. Siemens Energy & Automation, Inc.
d. Square D Co.

2. Molded-Case Circuit Breakers:

a. Eaton Corp.; Cutler-Hammer Products.
b. General Electric Co.; Electrical Distribution & Control Division.
c. Siemens Energy & Automation, Inc.
d. Square D Co.

3. Elevator Disconnect Switches:

a. Mersen-Ferraz
b. Eaton Corp.; Cutler-Hammer Products
c. General Electric Co.; Electrical Distribution & Control Division.
d. Siemens Energy & Automation, Inc.
e. Square D Co.

2.2 ENCLOSED SWITCHES

A. All Switches:

1. Nonteasible, positive, quick make-quick break mechanisms.
2. Handles whose positions are easily recognizable and are padlockable in either the “on” or “off” positions.
3. Defeatable door interlocks that prevent the door from opening when the operating handle is in the “on” position.

B. Enclosed, Nonfusible Switch: NEMA KS 1, Type HD, with lockable handle.

C. Enclosed, Fusible Switch, 800 A and Smaller: NEMA KS 1, Type HD, with clips to accommodate specified fuses, lockable handle with two padlocks, and interlocked with cover in closed position.

2.3 ENCLOSED CIRCUIT BREAKERS

A. Molded-Case Circuit Breaker: NEMA AB 1, with interrupting capacity to meet available fault currents.

1. Thermal-Magnetic Circuit Breakers: Inverse time-current element for low-level overloads, and instantaneous magnetic trip element for short circuits. Adjustable magnetic trip setting for circuit-breaker frame sizes 250 A and larger.
2. Adjustable Instantaneous-Trip Circuit Breakers: Magnetic trip element with front-mounted, field-adjustable trip setting.
3. Electronic Trip Unit Circuit Breakers: RMS sensing; field-replaceable rating plug; with the following field-adjustable settings:

    a. Instantaneous trip.
    b. Long- and short-time pickup levels.
    c. Long- and short-time time adjustments.
    d. Ground-fault pickup level, time delay, and I^2t response.
4. GFCI Circuit Breakers: Single- and two-pole configurations with 5-mA trip sensitivity.

B. Molded-Case Circuit-Breaker Features and Accessories: Standard frame sizes, trip ratings, and number of poles.

1. Lugs: Mechanical style suitable for number, size, trip ratings, and material of conductors.
2. Application Listing: Appropriate for application; Type SWD for switching fluorescent lighting loads; Type HACR for heating, air-conditioning, and refrigerating equipment.
3. Ground-Fault Protection: Integrally mounted relay and trip unit with adjustable pickup and time-delay settings, push-to-test feature, and ground-fault indicator.

2.4 ELEVATOR DISCONNECT SWITCH

A. Elevator Disconnect Switch shall consist of integral fused disconnect switch with shunt trip device. Shunt trip device shall be activated by the closing of a 120VAC dry contact on the Fire Alarm system. Elevator Disconnect switch shall also have a voltage monitoring relay that monitors power to shunt trip device and is supervised by the Fire Alarm system.

B. Provide Elevator Disconnect Switch in a single enclosure with all necessary switching mechanism, shunt-trip device, fuse holders, relay(s), control transformer and other appurtenances for a complete listed system. The switch shall have an ampere rating as shown on the Contract Drawings and shall include a horsepower rated fusible switch with shunt trip capabilities. The fuse rating of the switch shall be based upon elevator manufacturer requirements and utilize Class J Fuses. It shall include as an accessory, a 100VA control power transformer with primary and secondary fuses. It shall also contain an isolation relay with a 120VAC coil. A normally open dry contact shall be provided by the Fire Alarm System to energize the isolation relay and activate the shunt trip solenoid. The module shall contain a Key to Test Switch, a green "ON" Pilot Light, One set of Auxiliary Mechanical Interlocked Form C contacts, and Fire Alarm Voltage Monitoring Relay.

2.5 ENCLOSURES

A. NEMA AB 1 and NEMA KS 1 to meet environmental conditions of installed location.

1. Outdoor Locations: NEMA 250, Type 3R.
2. Other Wet or Damp Indoor Locations: NEMA 250, Type 4.

2.6 FACTORY FINISHES

A. Finish: Manufacturer's standard grey paint applied to factory-assembled and -tested enclosures before shipping.

3.0 EXECUTION

3.1 EXAMINATION

A. Examine elements and surfaces to receive enclosed switches and circuit breakers for compliance with installation tolerances and other conditions affecting performance.

1. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

A. Temporary Lifting Provisions: Remove temporary lifting eyes, channels, and brackets and temporary blocking of moving parts from enclosures and components.

3.3 IDENTIFICATION

A. Identify field-installed conductors, interconnecting wiring, and components; provide warning signs as specified in Division 16 Section "Electrical Identification."

B. Enclosure Nameplates: Label each enclosure with engraved metal or laminated-plastic nameplate mounted with corrosion-resistant screws as specified in Division 16 Section "Electrical Identification."

3.4 CONNECTIONS

A. Install equipment grounding connections for switches and circuit breakers with ground continuity to main electrical ground bus.

B. Install power wiring. Install wiring between switches and circuit breakers, and control and indication devices.

C. Tighten electrical connectors and terminals according to manufacturer's published torque-tightening values. If manufacturer's torque values are not indicated, use those specified in UL 486A and UL 486B.

3.5 FIELD QUALITY CONTROL

A. Prepare for acceptance tests as follows:

1. Test insulation resistance for each enclosed switch, circuit breaker, component, and control circuit.
2. Test continuity of each line- and load-side circuit.

3.6 ADJUSTING

A. Set field-adjustable switches and circuit-breaker trip ranges.

3.7 CLEANING

A. On completion of installation, inspect interior and exterior of enclosures. Remove paint splatters and other spots. Vacuum dirt and debris; do not use compressed air to assist in cleaning. Repair exposed surfaces to match original finish.

END OF SECTION 16410

SECTION 16491
FUSES

1.0 GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. This Section includes cartridge fuses, rated 600 V and less, for use in switches, panelboards, switchboards, controllers, and motor-control centers; and spare fuse cabinets.

1.3 SUBMITTALS

A. Product Data: Include dimensions and manufacturer's technical data on features, performance, electrical characteristics, and ratings for each fuse type indicated.

B. Maintenance Data: For tripping devices to include in maintenance manuals specified in Division 1.

1.4 QUALITY ASSURANCE

A. Source Limitations: Provide fuses from a single manufacturer.

B. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a third party testing agency amongst those accredited by the NCBCC (North Carolina Building Code Council) to label electrical and mechanical equipment.

C. Comply with NEMA FU 1.

D. Comply with NFPA 70.

1.5 PROJECT CONDITIONS

A. Where ambient temperature to which fuses are directly exposed is less than 40 deg F (4.4 deg C) or more than 100 deg F (38 deg C), apply manufacturer's ambient temperature adjustment factors to fuse ratings.

1.6 COORDINATION

A. Coordinate fuse ratings with HVAC equipment nameplate limitations of maximum fuse size.

1.7 EXTRA MATERIALS

A. Furnish extra materials described below that match products installed and that are packaged in original cartons or containers and identified with labels describing contents.

1. Fuses: Quantity equal to 20 percent of each fuse type and size, but not fewer than 1 set of 3 of each type and size.

2.0 PRODUCTS

2.1 MANUFACTURERS

A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

1. Cooper Industries, Inc.; Bussmann Div.
2. Eagle Electric Mfg. Co., Inc.
3. Ferraz Corp.
4. General Electric Co.; Wiring Devices Div.
5. Gould Shawmut.
6. Tracor, Inc.; Littelfuse, Inc. Subsidiary.

2.2 CARTRIDGE FUSES

A. Characteristics: NEMA FU 1, nonrenewable cartridge fuse; class and current rating indicated; voltage rating consistent with circuit voltage.

CIRCUIT TYPE	FUSE TYPE
Feeder Circuits 600A and less	Class RK1 or J, U/L listed, current limiting with 200K Amp interrupting rating.
Motor, Motor Controller & Xfmr Circuits	Class RK5, U/L listed, current limiting time delay, with 200K Amp interrupting rating.
Individual Equipment fault current does not exceed 50KA.	Class 5K, U/L listed, with 50KA interrupting rating.

Fusible safety switches with short-circuit withstand ratings of 100K Amp or 200K Amp require Class R or Class J rejection fuse block feature.

3.0 EXECUTION

3.1 EXAMINATION

A. Examine utilization equipment nameplates and installation instructions. Install fuses of sizes and with characteristics appropriate for each piece of equipment.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 FUSE APPLICATIONS

A. Motor and Motor Controller Branch Circuits: Class RK5, UL listed, current limiting time delay, 200 kA interrupting rating.

B. Other Individual Equipment Branch Circuits: Class RK5, UL listed, non-time delay, 50 kA interrupting rating.

3.3 INSTALLATION

A. Fuses shall be selected as to provide a fully selective system.

B. Install fuses in fusible devices. Arrange fuses so rating information is readable without removing fuse.

C. Fusible safety switches with short-circuit withstand ratings of 100kA or 200kA require Class R or Class J rejection fuse block feature.

3.4 IDENTIFICATION

A. Install labels indicating fuse replacement information on inside door of each fused switch.

END OF SECTION 16491

SECTION 16511
INTERIOR LIGHTING

1.0 GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. This Section includes lighting fixtures, lamps, drivers, and accessories.

1.3 SUBMITTALS

A. Product Data:

1. Light Fixtures: For each type of lighting fixture indicated, arranged in order of fixture designation. Provide manufacturer's published literature which includes data on features, accessories, and the following:
   a. Dimensions of fixtures.
   b. Manufacturer and type of ballasts.
   c. Manufacturer and types of lamps.
   d. For fixtures (non-exit) with LED light source submit the manufacturer's IESNA LM-79 Photometric Report and IESNA LM-80 Lumen Maintenance Report.

B. Warranty Information: Include in submittals warranty information for emergency exit signs, emergency lighting units, and emergency ballasts installed in schedule fixtures.

C. Coordination Drawings: Reflected ceiling plans and sections drawn to scale and coordinating fixture installation with ceiling grid, ceiling-mounted items, and other components in the vicinity. Include work of all trades that is to be installed near lighting equipment.

D. Test Reports: Report of operation test for emergency lighting units, emergency ballasts, and battery-powered exit signs. See Field Quality Control paragraph below. Submit copy to State Construction Office.

E. Maintenance Data: For lighting fixtures to include in maintenance manuals specified in Division 1. Include all warranty information and documentation with maintenance data.

1.4 QUALITY ASSURANCE

A. Fixtures, Emergency Lighting Units, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a third-party testing agency amongst those accredited by the NCBCC (North Carolina Building Code Council) to label electrical and mechanical equipment.

B. Comply with NFPA 70.

C. NFPA 101 Compliance: Comply with visibility and luminance requirements for exit signs.

1.5 COORDINATION

A. Fixtures, Mounting Hardware, and Trim: Coordinate layout and installation of lighting fixtures with ceiling system and other construction.

1.6 WARRANTY

A. All fixtures and workmanship shall be guaranteed free of defects and fully operational for a minimum of 5 years after the acceptance of the project by the Owner. Any fixtures or workmanship found to be defective during the warranty period will be either fixed or replaced by the Contractor at no cost to the Owner.

B. Special Warranty for Emergency Exit Signs, Emergency Lighting Units, and Emergency Ballasts: Written warranty, executed by manufacturer agreeing to replace entire sign/unit/ballast that fails within 3 years from date of Final Acceptance. The batteries within sign/unit/ballast shall be covered for an additional 2 years by a pro-rated warranty.

1.7 EXTRA MATERIALS

A. Furnish extra materials described below that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.

1. Drivers: 2 for each type installed. Furnish at least two of each type driver installed for each elevator modernization.

2.0 PRODUCTS

2.1 MANUFACTURERS

A. Available Manufacturers and Products: Subject to compliance with requirements, manufacturers and respective products that may be incorporated into the Work are indicated on the drawings in Light Fixture Schedule on sheet E-1.

1. It is the intent of the Light Fixture Schedule to denote the quality standard of product desired and not to restrict bidders to a specific brand, make, manufacturer or specific name. The manufacturers and products listed in Schedule are used only to set forth and convey to bidders the general style, type, character, and quality of product desired. Substitution of equivalent products will be acceptable according to the following paragraph.
    a. Where “or Approved Equal” is listed on Schedule substitution of equivalent products will be acceptable according to the following paragraph.

B. Substitution of Equivalent Products: Substitution of manufacturers and products equivalent to those listed in Light Fixture Schedule shall be submitted to the Engineer for approval through the product/shop drawing submittal review process.

2.2 FIXTURES AND FIXTURE COMPONENTS, GENERAL

A. Metal Parts: Free from burrs, sharp corners, and edges.

B. Sheet Metal Components: Steel, unless otherwise indicated. Form and support to prevent warping and sagging.

C. Doors, Frames, and Other Internal Access: Smooth operating, free from light leakage under operating conditions, and arranged to permit relamping without use of tools. Arrange doors, frames, lenses, diffusers, and other pieces to prevent accidental falling during relamping and when secured in operating position.

D. Reflecting Surfaces: Minimum reflectance as follows, unless otherwise indicated:

1. White Surfaces: 85 percent.
2. Specular Surfaces: 83 percent.
3. Diffusing Specular Surfaces: 75 percent.
4. Laminated Silver Metallized Film: 90 percent.

E. Lenses, Diffusers, Covers, and Globes: 100 percent virgin acrylic plastic or annealed crystal glass, unless otherwise indicated.

1. Plastic: High resistance to yellowing and other changes due to aging, exposure to heat, and ultraviolet radiation.
2. Lens Thickness: 0.125 inch (3 mm) minimum, unless greater thickness is indicated.

2.3 LED DRIVERS

A. General:

1. Ten-year operational life while operating with a case temperature range of 0 degrees C to 62 degrees C and 90 percent non-condensing relative humidity.
2. Electrolytic capacitors to operate at least 20 degrees C below the capacitor’s maximum temperature rating when the driver is under fully-loaded conditions and case temperature is 62 degrees C.
3. Designed and tested to withstand electrostatic discharges up to 15,000 V without impairment per IEC 801-2.
4. Maximum inrush current of 2 amperes for 120V and 277 V drivers.
5. Withstand up to a 4,000 volt surge without impairment of performance as defined by ANSI C62.41 Category A.
6. Manufactured in a facility that employ ESD reduction practices in compliance with ANSI/ESD S20.20.
7. Inaudible in a 27 dBA ambient environment.
8. No visible change in light output with a variation of +/- 10 percent line voltage input.

9. Total Harmonic Distortion less than 10 percent and meet ANSI C82.11 maximum allowable THD requirements

B. Compatibility of driver and LED light engine must be tested and ensured by driver manufacturer.

2.4 FIXTURE SUPPORT COMPONENTS

A. Comply with Division 16 Section "Supporting Devices," for channel- and angle-iron supports and nonmetallic channel and angle supports.

2.5 FINISHES

A. Fixtures: Manufacturer's standard, unless otherwise indicated.

1. Paint Finish: Applied over corrosion-resistant treatment or primer, free of defects.

3.0 EXECUTION

3.1 INSTALLATION

A. Fixtures: Set level, plumb, and square with ceiling and walls, and secure according to manufacturer's written instructions and approved submittal materials. Install lamps in each fixture.

3.2 CONNECTIONS

A. Ground equipment.

1. Tighten electrical connectors and terminals according to manufacturer's published torque-tightening values. If manufacturer's torque values are not indicated, use those specified in UL 486A and UL 486B.

3.3 FIELD QUALITY CONTROL

A. Inspect each installed fixture for damage. Replace damaged fixtures and components.

B. Tests: As follows:

1. Verify normal operation of each fixture after installation.

C. Malfunctioning Fixtures and Components: Replace or repair, then retest. Repeat procedure until units operate properly.

D. Corrosive Fixtures: Replace during warranty period.

3.4 CLEANING AND ADJUSTING

A. Clean fixtures internally and externally after installation. Use methods and materials recommended by manufacturer.

3.5 LIGHTING FIXTURE SCHEDULE

1. Fixture Type: Refer to drawings.

END OF SECTION 16511

SECTION 16851
FIRE ALARM – LUMBEE HALL (BASE BID)

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SCOPE

A. This section of the specifications includes the furnishing, installation, and connection of compatible equipment and devices to the existing microprocessor controlled; intelligent fire alarm system required to form a complete coordinated system ready for operation. Devices and equipment shall include, but not be limited to, alarm initiating devices, alarm notification appliances, auxiliary control devices, and wiring as shown on the Drawings and specified herein. Relevant criteria from the North Carolina Department of Insurance's *Fire Detection and Alarm Guidelines* have been incorporated within this section. Relevant criteria from the North Carolina State Construction Office's *Fire Detection Guidelines and Policies* have been incorporated within this section.

B. Base Bid Summary The elevator is being updated. The existing fire alarm control panel (FACP) is a Notifier non-addressable panel. Add the additional detection devices as shown on the drawings, programming and signaling capability into the elevator machine room to activate the hat light on the appropriate detectors. Coordinate with the elevator vendor for sequencing.

1.3 QUALITY ASSURANCE

A. Manufacturer's Qualifications: Firms regularly engaged in manufacture of elevator recall systems of types, sizes, and electrical characteristics required, and whose products are Listed and Labeled. All products, including initiating devices, shall be as produced or supplied by the same manufacturer as the elevator recall system control panel. Products of firms that do not maintain factory authorized service organization and spare parts stock are not acceptable for use on this project.

B. Installer Qualifications: An experienced Installer who is an authorized representative of the control panel manufacturer for both installations and maintenance of all equipment required for this Project. The Installer technicians shall be individually certified NICET Level 2 and by the manufacturer of the equipment and trained and certified on the specific model being installed. Installer shall have at least one technician on staff certified NICET Level 3. Certification shall be current to latest release and must have occurred in the most recent 24 months. All connections to the control panel and the systems programming shall be completed only by Installer technicians compliant with qualifications. Copies of certifications shall be submitted with shop drawings.

C. Codes and Standards:

1. NFPA Compliance: Comply with applicable requirements of NFPA-72, National Fire Alarm Code.
2. NEC Compliance: Comply with applicable requirements of NFPA-70, National Electrical Code (NEC) standards pertaining to elevator recall systems.
3. Testing Laboratory Compliance: comply with provision of UL safety standards pertaining to fire alarm systems. Provide products and components which are Listed and Labeled.
4. FM Compliance: Provide accessories which are FM approved.
5. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a third-party testing agency amongst those accredited by the NCBCC (North Carolina Building Code Council) to label electrical and mechanical equipment.
6. Fire Marshall Compliance: Provide elevator recall systems and accessories which are Fire Marshall approved.
7. Comply with Authority Having Jurisdiction.

1.4 SUBMITTALS - GENERAL

A. Submittals shall demonstrate compliance with technical requirements by reference to each subsection of this specification. Where a submitted item does not comply fully with each and every requirement of the specifications, the submittal shall clearly indicate such deviations. Identification requirements for non-complying features of items are very specific.

1. Installer Certifications: Copies of manufacturer signed certifications and NICET certifications as required above.
2. Product Data: Submit Manufacturer's technical product data, including specifications and installation instructions, for each type of system equipment.
3. Battery Sizing Calculations. Also submit voltage drop and current draw calculations for control panel.
4. Shop Drawings: Submit (2) bound full size sets of shop drawings showing equipment, device locations, and connecting wiring of entire elevator recall system depicted on scaled architectural floor plans with Installer’s border sheet. Include wiring and riser diagrams and battery calculations. Provide distance and proposed route for each notification appliance circuit. Electronic copy of architectural floor plans will be provided by Engineer in format compatible with most recent release of AutoCAD upon request. Copies of Project Construction Documents or details there from may NOT be a part of the shop drawing submittal.
5. Authority Having Jurisdiction Submittal: Submit (1) one copy of Product Data and Shop Drawings as specified above to Authority Having Jurisdiction. Resubmit if required to make clarifications or revisions to obtain approval. Forward all comments and discussions with Authority Having Jurisdiction to Engineer.
6. Maintenance Data: Submit maintenance data and parts lists for each type of elevator recall system equipment installed, including furnished specialties and accessories. Include this data, product data, and shop drawings in maintenance manual.
7. As-Builts: Submit (3) three bound full size sets of scaled architectural floor plans depicting final device and equipment locations, all circuiting, and pathway and terminal cabinet locations. Include wiring and riser diagrams with battery calculations based off of installation. Also submit (3) copies of Product Data, Installation Instructions, Device

Address List, System Status and Programming Report and all other pertinent information specified elsewhere within document.

8. Test Reports: Submit a letter and a copy of the test report indicating proper functioning of the system, and conformance to the requirements of the Contact Documents.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Existing Manufacturer: Notifier

1. The last know revisions to the fire alarm system are undetermined.
2. System is a non-addressable fire alarm system.
3. System has 26 zones.
4. System is not used for mass notification.
5. Existing notification appliances are horn/strobes. Current system technology for supporting similar devices will be compatible with the existing system.

2.2 ALARM APPLIANCES

A. Strobe Lights shall be located as shown on the Drawings. Strobe lights indicated for use at exterior of the building shall be mounted at the indicated elevation and listed for use in wet locations. Strobe lights shall have the following specifications:

1. Voltage: Strobe lights shall operate on 24 VDC nominal.
2. Programming: Strobes shall field programmable without the use of special tools to provide 15/75, 30, 75, and 110 Candela output.
3. Maximum pulse duration: 2/10ths of one second.
4. Mounting: Provide flush mounting devices suitable for mounting in a standard single gang device box unless otherwise indicated on the Drawings. Mount devices at heights indicated on plans or 6” Below Finished Ceiling (BFC), whichever is lower.
5. Strobe intensity and flash rate: Must meet minimum requirements of UL 1971. Provide strobe lights with specific intensity Candela (Cd) rating if such is indicated adjacent to the device symbol on the Drawings.
6. Strobes shall be synchronized

B. Audible/Visual Combination Devices shall be located as shown on the Drawings and shall comply with all applicable requirements for both Horns and Strobe Lights. Mount devices at heights indicated on plans or 6” Below Finished Ceiling (BFC), whichever is lower.

2.3 INITIATING DEVICES

A. Addressable Devices - General: Unless otherwise indicated on the Drawings all initiating devices shall be individually addressable. Addressable devices shall comply with the following requirements:

1. Address Setting: Addressable devices shall provide an address-setting means that use rotary decimal switches configured to provide decade (numbered 1 to 10) type addresses.
2. Connections: Addressable devices shall be connected to a Signaling Line Circuit (SLC) with two (2) wires. Signaling Line Circuits shall originate as indicated on the Riser Diagram shown in the Drawings.
3. Operational Indications: Addressable initiation devices shall provide dual alarm and power LEDs. Both LEDs shall flash under normal conditions, indicating that the device is operational and in regular communication with the control panel. Both LEDs shall be placed into steady illumination by the control panel to indicate that an alarm condition has been detected. The flashing mode operation of the detector LEDs shall be optional through the system field program. An output connection shall also be provided in the device base to connect an external remote alarm LED.
4. Intelligent Initiation Devices: All smoke detectors shall be the "intelligent" in that smoke detector sensitivity shall be set through the control panel and shall be adjustable in the field through the field programming of the system. Sensitivity shall be capable of being automatically adjusted by the control panel on a time-of-day basis. Using software in the control panel, detectors shall be capable of automatically compensating for dust accumulation and other slow environmental changes that may affect performance. The detectors shall be listed by UL as meeting the calibrated sensitivity test requirements of NFPA Standard 72, Chapter.
5. Device mounting Base: Unless otherwise specified all detectors shall be ceiling- mount and shall include a separate twist-lock base with tamper proof feature.
6. Test Means: The detectors shall provide a test means whereby they will simulate an alarm condition and report that condition to the control panel. Such a test may be initiated at the detector itself (by activating a magnetic switch) or initiated remotely on command from the control panel when in the "test" condition.
7. Device Identification: Detectors shall store an internal identifying type code that the control panel shall use to identify the type of device. Device identifications shall be ether PHOTO or THERMAL.

B. Pull Stations: Addressable type, pull stations shall, on command from the Control Panel, send data to the panel representing the state of the manual switch. They shall use a key operated test-reset lock, and shall be designed so that after actual emergency operation, they cannot be restored to normal use except by the use of a key. Pull stations that employ a glass break rod are not acceptable.

C. Photoelectric Smoke Detectors: Photoelectric smoke detectors shall use the photoelectric (light-scattering) principal to measure smoke density and shall, on command from the control panel, send data to the panel representing the analog level of smoke density. Unless otherwise indicated on the Drawings all smoke detectors shall be photoelectric type.

1. Plug-in Arrangement: Detector and associated electronic components are mounted in a module that connects in a tamper-resistant manner to a fixed base with a twist-locking plug connection. Terminals in the fixed base accept building wiring.

2.4 MISCELLANEOUS SYSTEM ITEMS

A. Addressable Dry Contact Monitor Module: Addressable Monitor Modules shall be provided to connect one supervised IDC zone (either Style D or Style B) of conventional Alarm Initiating Devices (any Normally Open [N.O.] dry contact device) to one of the Fire Alarm Control Panel

Signaling Line Circuit Loops. Monitor modules shall be installed as required by the system configuration. All required monitor modules may not be shown on the Drawings.

1. Indication of Operation: Unless otherwise indicated on the Drawings an LED shall be provided that shall flash under normal conditions, indicating that the Monitor Module is operational and in regular communication with the control panel.
2. Mounting Requirements: Monitor Modules shall mount in a standard 4-inch square, 2-1/8" deep electrical boxes.
3. Location Requirements: Monitor Modules shall be located within conditioned space.

B. Two Wire Detector Monitor Module: Addressable Monitor Modules shall be provided to connect one supervised IDC zone, either Class A or B (Style D or Style B operation) of conventional 2- wire smoke detectors or alarm initiating devices (any N.O. dry contact device) to one of the Fire Alarm Control Panel Signaling Line Circuit Loops. Monitor modules shall be installed as required by the system configuration. All required monitor modules may not be shown on the Drawings.

1. Indication of Operation: Unless otherwise indicated on the Drawings an LED shall be provided that shall flash under normal conditions, indicating that the Monitor Module is operational and in regular communication with the control panel.
2. Mounting Requirements: Monitor Modules shall mount in a standard 4-inch square, 2-1/8" deep electrical boxes.
3. Location Requirements: Monitor Modules shall be located within conditioned space.

C. Addressable Control Module: Addressable Control Modules shall be provided to supervise and control the operation of one conventional Notification Appliance Circuit (NAC) of compatible, 24 VDC powered, polarized Audio/Visual (A/V) Notification Appliances. For fan shutdown and other auxiliary control functions, the control module may be set to operate as a dry contract relay. The control module shall provide address-setting means using decimal switches and shall also store an internal identifying code that the control panel shall use to identify the type of device. An LED shall be provided that shall flash under normal conditions, indicating that the control module is operational and is in regular communication with the control panel.

1. Mounting Requirements: Control Modules shall mount in a standard 4-inch square, 2-1/8" deep electrical boxes.
2. Configuration: The control module NAC circuit may be wired for Style Z or Style Y (Class A/B) with up to 1 Amp of inductive A/V signal, or 2 Amps of resistive A/V signal operation, or as a dry contact (Form C) relay. The control module shall be suitable for pilot duty applications and rated for a minimum of 0.6 amps at 30 VDC. The relay coil shall be magnetically latched to reduce wiring connection requirements, and to insure that 100% of all auxiliary relay or NACs may be energized at the same time on the same pair of wires.
3. Location Requirements: Monitor Modules shall be located within conditioned space.
4. Power Source: Audio/visual power shall be provided by a separate supervised power loop from the control panel or from a supervised, UL listed remote power supply. A/V power sources and connections are not shown on the Drawings.
5. Test Switch: A magnetic test switch shall be provided to test the module without opening or shorting its NAC wiring.

D. Isolator Module: Isolator Modules shall be provided to automatically isolate wire-to- wire short circuits on an SLC loop. The Isolator Module shall limit the number of modules or detectors that may be rendered inoperative by a short circuit fault on the SLC Loop.

1. Operation: Isolator Modules shall operate such that if a wire-to-wire short occurs, the Isolator module shall automatically open-circuit (disconnect) the SLC loop. When the short circuit condition is corrected, the Isolator Module shall automatically reconnect the isolated section. The Isolator Module shall not require any address-setting, and its operations shall be totally automatic. It shall not be necessary to replace or reset an Isolator Module after its normal operation.
2. Mounting: The Isolator Module shall mount in standard 4-inch square, 2-1/8" deep electrical boxes. It shall provide a single LED that shall flash to indicate that the Isolator is operational and shall illuminate steadily to indicate that a short circuit condition has been detected and isolated.
3. Isolation Modules shall be mounted at the same height as required for A/V devices.

E. Wire

1. Non-Power-Limited Circuits: Solid-copper conductors with 600-V rated, THHN/THWN, color-coded insulation.
   a. Low-Voltage Circuits: No. 18 AWG, minimum.
   b. Line-Voltage Circuits: No. 12 AWG, minimum.
2. Power-Limited Circuits: NFPA 70, Types FPL, FPLR, or FPLP, as recommended by manufacturer. Data Loop wire shall be shielded pair #18 AWG, 30 pf/ft capacitance or less, unless specifically prohibited by the equipment manufacturer and stated on the wiring submittal

PART 3 - EXECUTION

3.1 FIRE ALARM SYSTEM INSTALLATION AND CONFIGURATION

A. Installation and connection of all circuits shall be performed by person meeting requirements listed in Quality Assurance paragraph.

1. All connections at the control panel must be made by the Manufacturer's authorized, factory trained representative (rather than by the electrical contractor).

B. All equipment and components shall be installed in strict compliance with manufacturers' recommendations. Consult the manufacturer's installation manuals for all wiring diagrams, schematics, physical equipment sizes, etc., before beginning system installation.

1. All system components shall be attached to walls and ceiling/floor assemblies and shall be held firmly in place *(e.g.*, detectors shall not be supported solely by suspended ceilings). Fasteners and supports shall be adequate to support the required load. Adhesives are not permitted to mount system components to building surfaces or structure.

C. All addressable loop controller circuits must be "Class A" and shall have a minimum of 20% spare addresses for future use. "T-taps" from the loop are not permitted. To minimize the impact of a wiring fault on the system, isolation modules must be provided as follows:

1. For each circuit extending outside the building.
2. Within 15 feet of the control panel, at each end of the loop.
3. At the Terminal Cabinet, at each end of the loop.
4. Minimal of (1) midway through the loop address scheme. Additional modules shall be provided after each 25 devices or control points on each addressable circuit.
5. Isolation modules not located at the control panel shall be mounted readily visible in unfinished spaces (i.e. electrical rooms, mechanical rooms, and janitorial closets) only at same height as audio/visual devices.

D. Visible signals must be the strobe (flash discharge) type, with white or clear lens, and shall comply with current ADA requirements for intensity, placement, and synchronization.

E. All supervisory trouble signals shall be different and distinct from a normal system trouble and shall be non-silenceable.

F. Detectors used for elevator capture are located in elevator lobby. Primary recall points shall be the Basement Floor or as designated by the Authority Having Jurisdiction. Elevator capture or control signals must come from the control panel as relayed by control modules. Use of detector auxiliary contacts for elevator capture is not acceptable. Provide necessary contacts and relays to fully integrate with elevator controller to provide elevator capture, elevator recall, and other required functionality.

G. Wiring Method: Install wiring in metal raceway according to Division 16 Section "Conductors and Cables." Conceal raceway except in unfinished spaces and as indicated.

1. The exterior of all junction boxes containing elevator recall conductors shall be painted red; box interiors shall not be painted. Box covers for junction boxes containing elevator recall conductors shall be painted red on both sides. All painting of junction boxes and junction box covers shall be accomplished prior to installation of the boxes to avoid possible problems with overspray.
2. Box covers shall be labeled to indicate the circuit(s) or function of the conductors contained therein. Labels shall be neatly applied black lettering on a clear background. Handwritten labels or labels made from embossed tape are not acceptable.
3. Provide metal back boxes or plastic skirts as manufactured by elevator recall system manufacture for devices installed in a surface mounted application. Boxes shall match device in size and color.

H. All wiring shall be color coded in accordance with the following scheme, which shall be maintained throughout the system, without color change in any wire run:

Signaling Circuits	Overall Red Sheath, Red (+) and Black (-)
Alarm Notification Circuits	Blue (+) and Black (-)
24V System Circuits (HVAC)	Yellow (+) and Brown (-)
Elevator Capture Circuits	Yellow (+) and Brown (-)
Door Control Circuits	Orange

I. Cable Splices: Any and all cable splices shall be in hinged terminal cabinets only. No splicing of conductors in outlet or junction boxes. There shall be NO splices in the system other than at terminal blocks. "Wire nuts," crimp splices, or insulation piercing type connectors are not acceptable. All terminal block screws shall have pressure wire connectors of the self-lifting or box lug type. Permanent wire markers shall be used to identify all splices and terminations for each circuit. For splices, use markers or other means to indicate which conductors leads to the control panel.

J. Detection or alarm circuits shall not be installed in raceways containing AC power or AC control wiring. Within the control panel, any 120 VAC control wiring or other circuits with an externally supplied AC/DC voltage above the nominal 24 VDC system power must be properly separated from other circuits and the enclosure must have an appropriate warning label to alert service personnel to the potential hazard.

K. All wiring shall be checked for grounds, opens, and shorts, prior to termination at panels and installation of detector heads. The minimum resistance to ground or between any two conductors shall be ten megohms (10 Mõ), as verified with a megger. Provide advance notice to the Engineer of these tests.

L. The system shall be electrically supervised for open or (+/-) ground fault conditions in SLC, alarm circuits, and control circuits. Removal of any detection device, alarm appliance, plug-in relay, system module, or standby battery connection shall also result in a trouble signal. Fire alarm signal shall override trouble signals, but any pre-alarm trouble signal shall reappear when the panel is reset.

M. Supervision required: The connection between individual addressable modules and their contract type initiating device(s) must be supervised.

N. Spare Parts: Provide the following spare parts with the system, each individually packaged and labeled. For percentage quantities round number up to the next larger whole number.

Fuses	(2) of each size used in the system
Spot Smoke Detectors	6% of installed quantity
Spot Heat/Thermal Detectors	6% of installed quantity
Spot Smoke Detectors, Bases	2% of installed quantity
Relay Modules	4% of installed quantity
Monitor Modules	4% of installed quantity
Isolation Modules	4% of installed quantity

3.2 SMOKE DETECTORS

A. Do not install detector heads until building is clean. Provide dust covers for bases throughout construction. Unless suitably protected against dust, paint, etc., detectors shall not be installed until the final construction clean-up has been completed. Contaminated detectors must be REPLACED by the Contractor at no additional cost to the Owner.

B. A spot type smoke detector shall be provided within 15’ from control panel, auxiliary panels, power extenders, and other control equipment.

C. When installed in a room, detectors shall be oriented so their alarm light is visible from the nearest door to the corridor, unless Remote Alarm Indicator Light (RAIL) equipped.

D. Ceiling-Mounted Smoke Detectors: Not less than 4 inches (100 mm) from a side wall to the near edge. For exposed solid-joist construction, mount detectors on the bottom of joists. On smooth ceilings, install not more than 30 feet (9 m) apart in any direction.

E. Smoke Detectors near Air Registers: Install no closer than 36 inches (1520 mm).

3.3 FIRE ALARM CONTROL PANEL PROGRAMMING

A. Programming of the control panel and connection of all circuits shall be performed by person meeting requirements listed in Quality Assurance paragraph.

B. The complete configuration data (site-specific programming) for the system must be permanently stored on a computer disk and archived by the manufacturer or authorized distributor. A disk copy of this data must be submitted to the Engineer for transmission to the Owner when the system is commissioned.

C. The Manufacturer or authorized distributor must maintain software version (VER) records on the system installed. The system software shall be upgraded free of charge if a new VER is released for any reason during the warranty period. For any new VER to correct problems, free upgrade shall apply during the entire life of the system.

D. The Fire Alarm System shall have multiple access levels which permit the Owner's authorized personnel to make temporary changes in the system alarm response matrix without actually changing the system programming. This must include the ability to override selected alarm inputs or system responses to alarms without affecting the remaining portions of the system.

E. In addition to the system tests and certification described elsewhere, the Manufacturer or authorized distributor must 100% test all site-specific software functions for the system and provide a written test report or detailed check list. This documentation must include a system operation matrix showing the actual control response for each initiating device input.

3.4 SYSTEM LABELING

A. Detectors and initiating devices: Identification of individual detectors is required by a unique alphanumeric label. These device labels, which must also be shown on the shop drawings, shall be permanently affixed to the detector base. Device labels may not be affixed to the device head. Identification labels must be printed labels with black lettering on a clear background. Handwritten labels or labels made from embossed tape are not acceptable.

1. Loop 1 shall be assigned to the lowest floor devices and loop number shall increase with floor number. Device number starts in the same location on each floor and increase accordingly as circuit location increases.

B. Zone Map: Provide updated framed zone map at control panel and at all remote annunciators.

C. Floor Plans with Device Numbers: A copy of the floor plans shall be provided in the control panel. A separate sheet shall be provided for each updated floor. Plans shall be reduced in size from engineering plans in order to fit on 11x17 sheets. All device addresses shall be clearly labeled on plans. Minimum printed text size shall be 0.75/10". Indicate location of all cabinets, modules, and end of line resistors. Plans shall be laminated and bound in book form. Provide legend for symbols. Provide holder for plan book in panel or in a locked box adjacent to panel keyed to match panel. Provide label for box and book.

3.5 CLEANING AND ADJUSTING

A. Cleaning: Remove paint splatters and other spots, dirt, and debris. Touch up scratches and marred finish to match original finish. Clean unit internally using methods and materials recommended by manufacturer. Replace damaged units.

PART 4 - SYSTEM TESTING & CERTIFICATION

4.1 TESTING

A. Pretesting: After installation, align, adjust, and balance the system and perform reacceptance pretesting. Determine, through pretesting, the compliance of the system with requirements of Drawings and Specifications. Correct deficiencies observed in pretesting. Replace malfunctioning or damaged items with new ones, and retest until satisfactory performance and conditions are achieved. Prepare forms for systematic recording of reacceptance test results.

1. Minimum System Tests: Minimum test shall be reacceptance testing as established in NFPA 72 14.4.2, but not limited to the following-

    a. When an initiating device, notification appliance, or control relay is added, it shall be functionally tested.
    b. When an initiating device, notification appliance, or control relay is deleted, another device, appliance or control relay on the circuit shall be operated.
    c. When modifications to control equipment hardware are made, the control equipment shall be tested in accordance with NFPA 72 Table 14.4.3.2, items 1(a) and 1(d).
    d. When changes are made to site-specific software, the following apply:
        1) All functions known to be affected by the change, or identified by a means that indicates changes, shall be 100 percent tested.
        2) In addition, 10 percent of initiating devices that are not directly affected by the change, up to a maximum of 50 devices, also shall be tested and correct system operation shall be verified.
        3) A revised record of completion in accordance with NFPA 72 7.5.6 shall be prepared to reflect these changes.
    e. Elevator recall function shall be tested to ensure proper recall programming.
    f. Check zone map for proper location of all devices. Verify that devices and wire are properly labeled.

B. Report of Pretesting: After pretesting is complete, provide a letter certifying the installation is complete and fully operable, including the names and titles of witnesses to preliminary tests.

C. Engineer's Test: After the pretest has been completed and the system is clear of trouble all test documentation including a printout of all custom labels and a NFPA 72 "Record of Completion" form (no substitutes) shall be submitted to Engineer for approval. At that time Engineer may, at his discretion, perform a 100% functional test of the elevator recall system. The Contractor and the Manufacturer's authorized representative that installed the system must be present. Should the results of this test not be satisfactory, then corrections will be made and a re-test will be required at the Contractor's expense.

D. Authority Having Jurisdiction Inspection/Test: Only after Engineer has approved the system the design professional will schedule the inspection. The Contractor and the Manufacturer's authorized representative must be present for test. Provide a minimum of 10 days' notice in writing to the Engineer for the Authority Having Jurisdiction Inspection/Test.

E. Retesting: Correct deficiencies indicated by tests and completely retest work affected by such deficiencies. Verify by the system test that the total system meets Specifications and complies with applicable standards.

F. Report of Tests and Inspections: Provide a written record of inspections, tests, and detailed test results in the form of a test log. Submit log on the satisfactory completion of tests.

G. Closeout: After successful completion of inspections and tests, the warranty period begins. In the event of malfunctions or excessive nuisance alarms, the Contractor must take prompt corrective action. The Owner may require a repeat of the Contractor's 100% system test, or other inspections. Continued improper performance during the warranty period shall be cause to require the Contractor to remove and replace the system.

4.2 TEST EQUIPMENT

A. Contractor shall provide two-way radios, ladders, smoke candles or test magnet, and any other materials needed to test the system.

4.3 DOCUMENTATION

A. The Contractor shall provide the Engineer with three (3) copies of the following:

1. As-built floor plans with device numbers, wiring and conduit layout diagrams, including wire color code and/or label numbers, and showing all interconnections in the system. Provide on paper and in AutoCAD 2000 or later electronic media format.
2. Electronic circuit diagrams of all control panels, modules, annunciators, communications panels, etc.
3. Technical literature on all major parts of the updated system, including relays, control panel modifications, detectors, manual stations, and alarm indicating appliances.

B. The Contractor shall provide the Owner with three (3) interconnection cables to connect the elevator recall system to a PC.

END OF SECTION 16851

SECTION 16851
FIRE ALARM – OLD MAIN (ALTERNATE #1)

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SCOPE

A. This section of the specifications includes the furnishing, installation, and connection of compatible equipment and devices to the existing microprocessor controlled; intelligent fire alarm system required to form a complete coordinated system ready for operation. Devices and equipment shall include, but not be limited to, alarm initiating devices, alarm notification appliances, auxiliary control devices, and wiring as shown on the Drawings and specified herein. Relevant criteria from the North Carolina Department of Insurance's *Fire Detection and Alarm Guidelines* have been incorporated within this section. Relevant criteria from the North Carolina State Construction Office's *Fire Detection Guidelines and Policies* have been incorporated within this.

B. The elevator is being updated. The existing fire alarm control panel (FACP) is a Landis and Gyr addressable panel. Provide additional control points and detection devices per the drawings. Provide programming to meet elevator requirements. Coordinate with the elevator vendor for sequencing.

1.3 QUALITY ASSURANCE

A. Manufacturer's Qualifications: Firms regularly engaged in manufacture of elevator recall systems of types, sizes, and electrical characteristics required, and whose products are Listed and Labeled. All products, including initiating devices, shall be as produced or supplied by the same manufacturer as the elevator recall system control panel. Products of firms that do not maintain factory authorized service organization and spare parts stock are not acceptable for use on this project.

B. Installer Qualifications: An experienced Installer who is an authorized representative of the control panel manufacturer for both installations and maintenance of all equipment required for this Project. The Installer technicians shall be individually certified NICET Level 2 and by the manufacturer of the equipment and trained and certified on the specific model being installed. Installer shall have at least one technician on staff certified NICET Level 3. Certification shall be current to latest release and must have occurred in the most recent 24 months. All connections to the control panel and the systems programming shall be completed only by Installer technicians compliant with qualifications. Copies of certifications shall be submitted with shop drawings.

C. Codes and Standards:

1. NFPA Compliance: Comply with applicable requirements of NFPA-72, National Fire Alarm Code.
2. NEC Compliance: Comply with applicable requirements of NFPA-70, National Electrical Code (NEC) standards pertaining to elevator recall systems.
3. Testing Laboratory Compliance: comply with provision of UL safety standards pertaining to fire alarm systems. Provide products and components which are Listed and Labeled.
4. FM Compliance: Provide accessories which are FM approved.
5. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a third-party testing agency amongst those accredited by the NCBCC (North Carolina Building Code Council) to label electrical and mechanical equipment.
6. Fire Marshall Compliance: Provide elevator recall systems and accessories which are Fire Marshall approved.
7. Comply with Authority Having Jurisdiction.

1.4 SUBMITTALS - GENERAL

A. Submittals shall demonstrate compliance with technical requirements by reference to each subsection of this specification. Where a submitted item does not comply fully with each and every requirement of the specifications, the submittal shall clearly indicate such deviations. Identification requirements for non-complying features of items are very specific.

1. Installer Certifications: Copies of manufacturer signed certifications and NICET certifications as required above.
2. Product Data: Submit Manufacturer's technical product data, including specifications and installation instructions, for each type of system equipment.
3. Battery Sizing Calculations. Also submit voltage drop and current draw calculations for control panel.
4. Shop Drawings: Submit (2) bound full size sets of shop drawings showing equipment, device locations, and connecting wiring of entire elevator recall system depicted on scaled architectural floor plans with Installer’s border sheet. Include wiring and riser diagrams and battery calculations. Provide distance and proposed route for each notification appliance circuit. Electronic copy of architectural floor plans will be provided by Engineer in format compatible with most recent release of AutoCAD upon request. Copies of Project Construction Documents or details there from may NOT be a part of the shop drawing submittal.
5. Authority Having Jurisdiction Submittal: Submit (1) one copy of Product Data and Shop Drawings as specified above to Authority Having Jurisdiction. Resubmit if required to make clarifications or revisions to obtain approval. Forward all comments and discussions with Authority Having Jurisdiction to Engineer.
6. Maintenance Data: Submit maintenance data and parts lists for each type of elevator recall system equipment installed, including furnished specialties and accessories. Include this data, product data, and shop drawings in maintenance manual.
7. As-Builts: Submit (3) three bound full size sets of scaled architectural floor plans depicting final device and equipment locations, all circuiting, and pathway and terminal cabinet locations. Include wiring and riser diagrams with battery calculations based off of installation. Also submit (3) copies of Product Data, Installation Instructions, Device

Address List, System Status and Programming Report and all other pertinent information specified elsewhere within document.

8. Test Reports: Submit a letter and a copy of the test report indicating proper functioning of the system, and conformance to the requirements of the Contact Documents.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Existing Manufacturer: Landis and Gyr

1. The last know revisions to the fire alarm system are undetermined.
2. System is an intelligent addressable fire alarm system.
3. System can support addressable points.
4. System is not used for mass notification.
5. Existing notification appliances are horn/strobes. Notification appliances are reported to be fully synchronized. Current system technology for supporting similar devices will be compatible with the existing system and will continue to support building wide synchronization.

2.2 ALARM APPLIANCES

A. Strobe Lights shall be located as shown on the Drawings. Strobe lights indicated for use at exterior of the building shall be mounted at the indicated elevation and listed for use in wet locations. Strobe lights shall have the following specifications:

1. Voltage: Strobe lights shall operate on 24 VDC nominal.
2. Programming: Strobes shall field programmable without the use of special tools to provide 15/75, 30, 75, and 110 Candela output.
3. Maximum pulse duration: 2/10ths of one second.
4. Mounting: Provide flush mounting devices suitable for mounting in a standard single gang device box unless otherwise indicated on the Drawings. Mount devices at heights indicated on plans or 6” Below Finished Ceiling (BFC), whichever is lower.
5. Strobe intensity and flash rate: Must meet minimum requirements of UL 1971. Provide strobe lights with specific intensity Candela (Cd) rating if such is indicated adjacent to the device symbol on the Drawings.
6. Strobes shall be synchronized

B. Audible/Visual Combination Devices shall be located as shown on the Drawings and shall comply with all applicable requirements for both Horns and Strobe Lights. Mount devices at heights indicated on plans or 6” Below Finished Ceiling (BFC), whichever is lower.

2.3 INITIATING DEVICES

A. Addressable Devices - General: Unless otherwise indicated on the Drawings all initiating devices shall be individually addressable. Addressable devices shall comply with the following requirements:

1. Address Setting: Addressable devices shall provide an address-setting means that use rotary decimal switches configured to provide decade (numbered 1 to 10) type addresses.
2. Connections: Addressable devices shall be connected to a Signaling Line Circuit (SLC) with two (2) wires. Signaling Line Circuits shall originate as indicated on the Riser Diagram shown in the Drawings.
3. Operational Indications: Addressable initiation devices shall provide dual alarm and power LEDs. Both LEDs shall flash under normal conditions, indicating that the device is operational and in regular communication with the control panel. Both LEDs shall be placed into steady illumination by the control panel to indicate that an alarm condition has been detected. The flashing mode operation of the detector LEDs shall be optional through the system field program. An output connection shall also be provided in the device base to connect an external remote alarm LED.
4. Intelligent Initiation Devices: All smoke detectors shall be the "intelligent" in that smoke detector sensitivity shall be set through the control panel and shall be adjustable in the field through the field programming of the system. Sensitivity shall be capable of being automatically adjusted by the control panel on a time-of-day basis. Using software in the control panel, detectors shall be capable of automatically compensating for dust accumulation and other slow environmental changes that may affect performance. The detectors shall be listed by UL as meeting the calibrated sensitivity test requirements of NFPA Standard 72, Chapter.
5. Device mounting Base: Unless otherwise specified all detectors shall be ceiling- mount and shall include a separate twist-lock base with tamper proof feature.
6. Test Means: The detectors shall provide a test means whereby they will simulate an alarm condition and report that condition to the control panel. Such a test may be initiated at the detector itself (by activating a magnetic switch) or initiated remotely on command from the control panel when in the "test" condition.
7. Device Identification: Detectors shall store an internal identifying type code that the control panel shall use to identify the type of device. Device identifications shall be ether PHOTO or THERMAL.

B. Pull Stations: Addressable type, pull stations shall, on command from the Control Panel, send data to the panel representing the state of the manual switch. They shall use a key operated test-reset lock, and shall be designed so that after actual emergency operation, they cannot be restored to normal use except by the use of a key. Pull stations that employ a glass break rod are not acceptable.

C. Photoelectric Smoke Detectors: Photoelectric smoke detectors shall use the photoelectric (light-scattering) principal to measure smoke density and shall, on command from the control panel, send data to the panel representing the analog level of smoke density. Unless otherwise indicated on the Drawings all smoke detectors shall be photoelectric type.

1. Plug-in Arrangement: Detector and associated electronic components are mounted in a module that connects in a tamper-resistant manner to a fixed base with a twist-locking plug connection. Terminals in the fixed base accept building wiring.

2.4 MISCELLANEOUS SYSTEM ITEMS

A. Addressable Dry Contact Monitor Module: Addressable Monitor Modules shall be provided to connect one supervised IDC zone (either Style D or Style B) of conventional Alarm Initiating

Devices (any Normally Open [N.O.] dry contact device) to one of the Fire Alarm Control Panel Signaling Line Circuit Loops. Monitor modules shall be installed as required by the system configuration. All required monitor modules may not be shown on the Drawings.

1. Indication of Operation: Unless otherwise indicated on the Drawings an LED shall be provided that shall flash under normal conditions, indicating that the Monitor Module is operational and in regular communication with the control panel.
2. Mounting Requirements: Monitor Modules shall mount in a standard 4-inch square, 2-1/8" deep electrical boxes.
3. Location Requirements: Monitor Modules shall be located within conditioned space.

B. Two Wire Detector Monitor Module: Addressable Monitor Modules shall be provided to connect one supervised IDC zone, either Class A or B (Style D or Style B operation) of conventional 2- wire smoke detectors or alarm initiating devices (any N.O. dry contact device) to one of the Fire Alarm Control Panel Signaling Line Circuit Loops. Monitor modules shall be installed as required by the system configuration. All required monitor modules may not be shown on the Drawings.

1. Indication of Operation: Unless otherwise indicated on the Drawings an LED shall be provided that shall flash under normal conditions, indicating that the Monitor Module is operational and in regular communication with the control panel.
2. Mounting Requirements: Monitor Modules shall mount in a standard 4-inch square, 2-1/8" deep electrical boxes.
3. Location Requirements: Monitor Modules shall be located within conditioned space.

C. Addressable Control Module: Addressable Control Modules shall be provided to supervise and control the operation of one conventional Notification Appliance Circuit (NAC) of compatible, 24 VDC powered, polarized Audio/Visual (A/V) Notification Appliances. For fan shutdown and other auxiliary control functions, the control module may be set to operate as a dry contract relay. The control module shall provide address-setting means using decimal switches and shall also store an internal identifying code that the control panel shall use to identify the type of device. An LED shall be provided that shall flash under normal conditions, indicating that the control module is operational and is in regular communication with the control panel.

1. Mounting Requirements: Control Modules shall mount in a standard 4-inch square, 2-1/8" deep electrical boxes.
2. Configuration: The control module NAC circuit may be wired for Style Z or Style Y (Class A/B) with up to 1 Amp of inductive A/V signal, or 2 Amps of resistive A/V signal operation, or as a dry contact (Form C) relay. The control module shall be suitable for pilot duty applications and rated for a minimum of 0.6 amps at 30 VDC. The relay coil shall be magnetically latched to reduce wiring connection requirements, and to insure that 100% of all auxiliary relay or NACs may be energized at the same time on the same pair of wires.
3. Location Requirements: Monitor Modules shall be located within conditioned space.
4. Power Source: Audio/visual power shall be provided by a separate supervised power loop from the control panel or from a supervised, UL listed remote power supply. A/V power sources and connections are not shown on the Drawings.
5. Test Switch: A magnetic test switch shall be provided to test the module without opening or shorting its NAC wiring.

D. Isolator Module: Isolator Modules shall be provided to automatically isolate wire-to- wire short circuits on an SLC loop. The Isolator Module shall limit the number of modules or detectors that may be rendered inoperative by a short circuit fault on the SLC Loop.

1. Operation: Isolator Modules shall operate such that if a wire-to-wire short occurs, the Isolator module shall automatically open-circuit (disconnect) the SLC loop. When the short circuit condition is corrected, the Isolator Module shall automatically reconnect the isolated section. The Isolator Module shall not require any address-setting, and its operations shall be totally automatic. It shall not be necessary to replace or reset an Isolator Module after its normal operation.
2. Mounting: The Isolator Module shall mount in standard 4-inch square, 2-1/8" deep electrical boxes. It shall provide a single LED that shall flash to indicate that the Isolator is operational and shall illuminate steadily to indicate that a short circuit condition has been detected and isolated.
3. Isolation Modules shall be mounted at the same height as required for A/V devices.

E. Wire

1. Non-Power-Limited Circuits: Solid-copper conductors with 600-V rated, THHN/THWN, color-coded insulation.
   a. Low-Voltage Circuits: No. 18 AWG, minimum.
   b. Line-Voltage Circuits: No. 12 AWG, minimum.
2. Power-Limited Circuits: NFPA 70, Types FPL, FPLR, or FPLP, as recommended by manufacturer. Data Loop wire shall be shielded pair #18 AWG, 30 pf/ft capacitance or less, unless specifically prohibited by the equipment manufacturer and stated on the wiring submittal

PART 3 - EXECUTION

3.1 FIRE ALARM SYSTEM INSTALLATION AND CONFIGURATION

A. Installation and connection of all circuits shall be performed by person meeting requirements listed in Quality Assurance paragraph.

1. All connections at the control panel must be made by the Manufacturer's authorized, factory trained representative (rather than by the electrical contractor).

B. All equipment and components shall be installed in strict compliance with manufacturers' recommendations. Consult the manufacturer's installation manuals for all wiring diagrams, schematics, physical equipment sizes, etc., before beginning system installation.

1. All system components shall be attached to walls and ceiling/floor assemblies and shall be held firmly in place *(e.g.*, detectors shall not be supported solely by suspended ceilings). Fasteners and supports shall be adequate to support the required load. Adhesives are not permitted to mount system components to building surfaces or structure.

C. All addressable loop controller circuits must be "Class A" and shall have a minimum of 20% spare addresses for future use. "T-taps" from the loop are not permitted. To minimize the impact of a wiring fault on the system, isolation modules must be provided as follows:

1. For each circuit extending outside the building.
2. Within 15 feet of the control panel, at each end of the loop.
3. At the Terminal Cabinet, at each end of the loop.
4. Minimal of (1) midway through the loop address scheme. Additional modules shall be provided after each 25 devices or control points on each addressable circuit.
5. Isolation modules not located at the control panel shall be mounted readily visible in unfinished spaces (i.e. electrical rooms, mechanical rooms, and janitorial closets) only at same height as audio/visual devices.

D. Visible signals must be the strobe (flash discharge) type, with white or clear lens, and shall comply with current ADA requirements for intensity, placement, and synchronization.

E. All supervisory trouble signals shall be different and distinct from a normal system trouble and shall be non-silenceable.

F. Detectors used for elevator capture are located in elevator lobby. Primary recall points shall be the Basement Floor or as designated by the Authority Having Jurisdiction. Elevator capture or control signals must come from the control panel as relayed by control modules. Use of detector auxiliary contacts for elevator capture is not acceptable. Provide necessary contacts and relays to fully integrate with elevator controller to provide elevator capture, elevator recall, and other required functionality.

G. Wiring Method: Install wiring in metal raceway according to Division 16 Section "Conductors and Cables." Conceal raceway except in unfinished spaces and as indicated.

1. The exterior of all junction boxes containing elevator recall conductors shall be painted red; box interiors shall not be painted. Box covers for junction boxes containing elevator recall conductors shall be painted red on both sides. All painting of junction boxes and junction box covers shall be accomplished prior to installation of the boxes to avoid possible problems with overspray.
2. Box covers shall be labeled to indicate the circuit(s) or function of the conductors contained therein. Labels shall be neatly applied black lettering on a clear background. Handwritten labels or labels made from embossed tape are not acceptable.
3. Provide metal back boxes or plastic skirts as manufactured by elevator recall system manufacture for devices installed in a surface mounted application. Boxes shall match device in size and color.

H. All wiring shall be color coded in accordance with the following scheme, which shall be maintained throughout the system, without color change in any wire run:

Signaling Circuits	Overall Red Sheath, Red (+) and Black (-)
Alarm Notification Circuits	Blue (+) and Black (-)
24V System Circuits (HVAC)	Yellow (+) and Brown (-)
Elevator Capture Circuits	Yellow (+) and Brown (-)
Door Control Circuits	Orange

I. Cable Splices: Any and all cable splices shall be in hinged terminal cabinets only. No splicing of conductors in outlet or junction boxes. There shall be NO splices in the system other than at terminal blocks. "Wire nuts," crimp splices, or insulation piercing type connectors are not acceptable. All terminal block screws shall have pressure wire connectors of the self-lifting or box lug type. Permanent wire markers shall be used to identify all splices and terminations for each circuit. For splices, use markers or other means to indicate which conductors leads to the control panel.

J. Detection or alarm circuits shall not be installed in raceways containing AC power or AC control wiring. Within the control panel, any 120 VAC control wiring or other circuits with an externally supplied AC/DC voltage above the nominal 24 VDC system power must be properly separated from other circuits and the enclosure must have an appropriate warning label to alert service personnel to the potential hazard.

K. All wiring shall be checked for grounds, opens, and shorts, prior to termination at panels and installation of detector heads. The minimum resistance to ground or between any two conductors shall be ten megohms (10 Mõ), as verified with a megger. Provide advance notice to the Engineer of these tests.

L. The system shall be electrically supervised for open or (+/-) ground fault conditions in SLC, alarm circuits, and control circuits. Removal of any detection device, alarm appliance, plug-in relay, system module, or standby battery connection shall also result in a trouble signal. Fire alarm signal shall override trouble signals, but any pre-alarm trouble signal shall reappear when the panel is reset.

M. Supervision required: The connection between individual addressable modules and their contract type initiating device(s) must be supervised.

N. Spare Parts: Provide the following spare parts with the system, each individually packaged and labeled. For percentage quantities round number up to the next larger whole number.

Fuses	(2) of each size used in the system
Spot Smoke Detectors	6% of installed quantity
Spot Heat/Thermal Detectors	6% of installed quantity
Spot Smoke Detectors, Bases	2% of installed quantity
Relay Modules	4% of installed quantity
Monitor Modules	4% of installed quantity
Isolation Modules	4% of installed quantity

3.2 SMOKE DETECTORS

A. Do not install detector heads until building is clean. Provide dust covers for bases throughout construction. Unless suitably protected against dust, paint, etc., detectors shall not be installed until the final construction clean-up has been completed. Contaminated detectors must be REPLACED by the Contractor at no additional cost to the Owner.

B. A spot type smoke detector shall be provided within 15’ from control panel, auxiliary panels, power extenders, and other control equipment.

C. When installed in a room, detectors shall be oriented so their alarm light is visible from the nearest door to the corridor, unless Remote Alarm Indicator Light (RAIL) equipped.

D. Ceiling-Mounted Smoke Detectors: Not less than 4 inches (100 mm) from a side wall to the near edge. For exposed solid-joist construction, mount detectors on the bottom of joists. On smooth ceilings, install not more than 30 feet (9 m) apart in any direction.

E. Smoke Detectors near Air Registers: Install no closer than 36 inches (1520 mm).

3.3 FIRE ALARM CONTROL PANEL PROGRAMMING

A. Programming of the control panel and connection of all circuits shall be performed by person meeting requirements listed in Quality Assurance paragraph.

B. The complete configuration data (site-specific programming) for the system must be permanently stored on a computer disk and archived by the manufacturer or authorized distributor. A disk copy of this data must be submitted to the Engineer for transmission to the Owner when the system is commissioned.

C. The Manufacturer or authorized distributor must maintain software version (VER) records on the system installed. The system software shall be upgraded free of charge if a new VER is released for any reason during the warranty period. For any new VER to correct problems, free upgrade shall apply during the entire life of the system.

D. The Fire Alarm System shall have multiple access levels which permit the Owner's authorized personnel to make temporary changes in the system alarm response matrix without actually changing the system programming. This must include the ability to override selected alarm inputs or system responses to alarms without affecting the remaining portions of the system.

E. In addition to the system tests and certification described elsewhere, the Manufacturer or authorized distributor must 100% test all site-specific software functions for the system and provide a written test report or detailed check list. This documentation must include a system operation matrix showing the actual control response for each initiating device input.

3.4 SYSTEM LABELING

A. Detectors and initiating devices: Identification of individual detectors is required by a unique alphanumeric label. These device labels, which must also be shown on the shop drawings, shall be permanently affixed to the detector base. Device labels may not be affixed to the device head. Identification labels must be printed labels with black lettering on a clear background. Handwritten labels or labels made from embossed tape are not acceptable.

1. Loop 1 shall be assigned to the lowest floor devices and loop number shall increase with floor number. Device number starts in the same location on each floor and increase accordingly as circuit location increases.

B. Zone Map: Provide updated framed zone map at control panel and at all remote annunciators.

C. Floor Plans with Device Numbers: A copy of the floor plans shall be provided in the control panel. A separate sheet shall be provided for each updated floor. Plans shall be reduced in size from engineering plans in order to fit on 11x17 sheets. All device addresses shall be clearly labeled on plans. Minimum printed text size shall be 0.75/10". Indicate location of all cabinets, modules, and end of line resistors. Plans shall be laminated and bound in book form. Provide legend for symbols. Provide holder for plan book in panel or in a locked box adjacent to panel keyed to match panel. Provide label for box and book.

3.5 CLEANING AND ADJUSTING

A. Cleaning: Remove paint splatters and other spots, dirt, and debris. Touch up scratches and marred finish to match original finish. Clean unit internally using methods and materials recommended by manufacturer. Replace damaged units.

PART 4 - SYSTEM TESTING & CERTIFICATION

4.1 TESTING

A. Pretesting: After installation, align, adjust, and balance the system and perform reacceptance pretesting. Determine, through pretesting, the compliance of the system with requirements of Drawings and Specifications. Correct deficiencies observed in pretesting. Replace malfunctioning or damaged items with new ones, and retest until satisfactory performance and conditions are achieved. Prepare forms for systematic recording of reacceptance test results.

1. Minimum System Tests: Minimum test shall be reacceptance testing as established in NFPA 72 14.4.2, but not limited to the following-

    a. When an initiating device, notification appliance, or control relay is added, it shall be functionally tested.
    b. When an initiating device, notification appliance, or control relay is deleted, another device, appliance or control relay on the circuit shall be operated.
    c. When modifications to control equipment hardware are made, the control equipment shall be tested in accordance with NFPA 72 Table 14.4.3.2, items 1(a) and 1(d).
    d. When changes are made to site-specific software, the following apply:
        1) All functions known to be affected by the change, or identified by a means that indicates changes, shall be 100 percent tested.
        2) In addition, 10 percent of initiating devices that are not directly affected by the change, up to a maximum of 50 devices, also shall be tested and correct system operation shall be verified.
        3) A revised record of completion in accordance with NFPA 72 7.5.6 shall be prepared to reflect these changes.
    e. Elevator recall function shall be tested to ensure proper recall programming.
    f. Check zone map for proper location of all devices. Verify that devices and wire are properly labeled.

B. Report of Pretesting: After pretesting is complete, provide a letter certifying the installation is complete and fully operable, including the names and titles of witnesses to preliminary tests.

C. Engineer's Test: After the pretest has been completed and the system is clear of trouble all test documentation including a printout of all custom labels and a NFPA 72 "Record of Completion" form (no substitutes) shall be submitted to Engineer for approval. At that time Engineer may, at his discretion, perform a 100% functional test of the elevator recall system. The Contractor and the Manufacturer's authorized representative that installed the system must be present. Should the results of this test not be satisfactory, then corrections will be made and a re-test will be required at the Contractor's expense.

D. Authority Having Jurisdiction Inspection/Test: Only after Engineer has approved the system the design professional will schedule the inspection. The Contractor and the Manufacturer's authorized representative must be present for test. Provide a minimum of 10 days' notice in writing to the Engineer for the Authority Having Jurisdiction Inspection/Test.

E. Retesting: Correct deficiencies indicated by tests and completely retest work affected by such deficiencies. Verify by the system test that the total system meets Specifications and complies with applicable standards.

F. Report of Tests and Inspections: Provide a written record of inspections, tests, and detailed test results in the form of a test log. Submit log on the satisfactory completion of tests.

G. Closeout: After successful completion of inspections and tests, the warranty period begins. In the event of malfunctions or excessive nuisance alarms, the Contractor must take prompt corrective action. The Owner may require a repeat of the Contractor's 100% system test, or other inspections. Continued improper performance during the warranty period shall be cause to require the Contractor to remove and replace the system.

4.2 TEST EQUIPMENT

A. Contractor shall provide two-way radios, ladders, smoke candles or test magnet, and any other materials needed to test the system.

4.3 DOCUMENTATION

A. The Contractor shall provide the Engineer with three (3) copies of the following:

1. As-built floor plans with device numbers, wiring and conduit layout diagrams, including wire color code and/or label numbers, and showing all interconnections in the system. Provide on paper and in AutoCAD 2000 or later electronic media format.
2. Electronic circuit diagrams of all control panels, modules, annunciators, communications panels, etc.
3. Technical literature on all major parts of the updated system, including relays, control panel modifications, detectors, manual stations, and alarm indicating appliances.

B. The Contractor shall provide the Owner with three (3) interconnection cables to connect the elevator recall system to a PC.

END OF SECTION 16851

SECTION 16851
FIRE ALARM – LUMBEE HALL FACP (ALTERNATE #2)

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SCOPE

A. This section of the specifications includes the furnishing, installation, and connection of compatible equipment and devices to the existing microprocessor controlled; intelligent fire alarm system required to form a complete coordinated system ready for operation. Devices and equipment shall include, but not be limited to, alarm initiating devices, alarm notification appliances, auxiliary control devices, and wiring as shown on the Drawings and specified herein. Relevant criteria from the North Carolina Department of Insurance's *Fire Detection and Alarm Guidelines* have been incorporated within this section. Relevant criteria from the North Carolina State Construction Office's *Fire Detection Guidelines and Policies* have been incorporated within this section.

B. A new addressable fire alarm control panel (FACP) will be installed for elevator operations in the electrical room where the existing FACP is located. Raceway will be installed, and new addressable smoke and heat detectors will be mounted in the elevator lobbies and shaft adjacent to the existing smoke and heat detectors. The new ones will be used for elevator operations and report as supervisories.

C. The existing smoke and heat detectors on the conventional system will stay intact and provide fire detection at the elevator lobbies for notification and auxiliary functions.

D. The new FACP will have a new DACT reporting off premises using the existing telephone lines as paths.

E. The existing fire alarm panel will supply dry contacts for the new FACP to monitor for alarm, supervisory and trouble to be remotely reported by the new FACP DACT.

F. The new FACP will have a new annunciator located at the entrance adjacent to the existing annunciator. A placard will be mounted advising of the difference between the two annunciators.

G. The existing FCAU DACT will be removed.

1.3 QUALITY ASSURANCE

A. Manufacturer's Qualifications: Firms regularly engaged in manufacture of elevator recall systems of types, sizes, and electrical characteristics required, and whose products are Listed

and Labeled. All products, including initiating devices, shall be as produced or supplied by the same manufacturer as the elevator recall system control panel. Products of firms that do not maintain factory authorized service organization and spare parts stock are not acceptable for use on this project.

B. Installer Qualifications: An experienced Installer who is an authorized representative of the control panel manufacturer for both installations and maintenance of all equipment required for this Project. The Installer technicians shall be individually certified NICET Level 2 and by the manufacturer of the equipment and trained and certified on the specific model being installed. Installer shall have at least one technician on staff certified NICET Level 3. Certification shall be current to latest release and must have occurred in the most recent 24 months. All connections to the control panel and the systems programming shall be completed only by Installer technicians compliant with qualifications. Copies of certifications shall be submitted with shop drawings.

C. Codes and Standards:

1. NFPA Compliance: Comply with applicable requirements of NFPA-72, National Fire Alarm Code.
2. NEC Compliance: Comply with applicable requirements of NFPA-70, National Electrical Code (NEC) standards pertaining to elevator recall systems.
3. Testing Laboratory Compliance: comply with provision of UL safety standards pertaining to fire alarm systems. Provide products and components which are Listed and Labeled.
4. FM Compliance: Provide accessories which are FM approved.
5. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a third-party testing agency amongst those accredited by the NCBCC (North Carolina Building Code Council) to label electrical and mechanical equipment.
6. Fire Marshall Compliance: Provide elevator recall systems and accessories which are Fire Marshall approved.
7. Comply with Authority Having Jurisdiction.

1.4 SUBMITTALS - GENERAL

A. Submittals shall demonstrate compliance with technical requirements by reference to each subsection of this specification. Where a submitted item does not comply fully with each and every requirement of the specifications, the submittal shall clearly indicate such deviations. Identification requirements for non-complying features of items are very specific.

1. Installer Certifications: Copies of manufacturer signed certifications and NICET certifications as required above.
2. Product Data: Submit Manufacturer's technical product data, including specifications and installation instructions, for each type of system equipment.
3. Battery Sizing Calculations. Also submit voltage drop and current draw calculations for control panel.
4. Shop Drawings: Submit (2) bound full size sets of shop drawings showing equipment, device locations, and connecting wiring of entire elevator recall system depicted on scaled architectural floor plans with Installer’s border sheet. Include wiring and riser diagrams and battery calculations. Provide distance and proposed route for each

notification appliance circuit. Electronic copy of architectural floor plans will be provided by Engineer in format compatible with most recent release of AutoCAD upon request. Copies of Project Construction Documents or details there from may NOT be a part of the shop drawing submittal.

5. Authority Having Jurisdiction Submittal: Submit (1) one copy of Product Data and Shop Drawings as specified above to Authority Having Jurisdiction. Resubmit if required to make clarifications or revisions to obtain approval. Forward all comments and discussions with Authority Having Jurisdiction to Engineer.
6. Maintenance Data: Submit maintenance data and parts lists for each type of elevator recall system equipment installed, including furnished specialties and accessories. Include this data, product data, and shop drawings in maintenance manual.
7. As-Builts: Submit (3) three bound full size sets of scaled architectural floor plans depicting final device and equipment locations, all circuiting, and pathway and terminal cabinet locations. Include wiring and riser diagrams with battery calculations based off of installation. Also submit (3) copies of Product Data, Installation Instructions, Device Address List, System Status and Programming Report and all other pertinent information specified elsewhere within document.
8. Test Reports: Submit a letter and a copy of the test report indicating proper functioning of the system, and conformance to the requirements of the Contact Documents.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Existing Manufacturer: Notifier.

1. The last know revisions to the fire alarm system are undetermined.
2. System is an intelligent addressable fire alarm system.
3. System can support up to 2,500 addressable points and can be networked with multiple panels.
4. System meets the UL2572 standard for in-building mass notification.
5. Existing notification appliances are horn/strobes. Notification appliances are reported to be fully synchronized. Current system technology for supporting similar devices will be compatible with the existing system and will continue to support building wide synchronization.

B. New panel manufacturer:
1. Simplex
2. Notifier

2.2 ALARM APPLIANCES

A. Strobe Lights shall be located as shown on the Drawings. Strobe lights indicated for use at exterior of the building shall be mounted at the indicated elevation and listed for use in wet locations. Strobe lights shall have the following specifications:

1. Voltage: Strobe lights shall operate on 24 VDC nominal.

2. Programming: Strobes shall field programmable without the use of special tools to provide 15/75, 30, 75, and 110 Candela output.
3. Maximum pulse duration: 2/10ths of one second.
4. Mounting: Provide flush mounting devices suitable for mounting in a standard single gang device box unless otherwise indicated on the Drawings. Mount devices at heights indicated on plans or 6" Below Finished Ceiling (BFC), whichever is lower.
5. Strobe intensity and flash rate: Must meet minimum requirements of UL 1971. Provide strobe lights with specific intensity Candela (Cd) rating if such is indicated adjacent to the device symbol on the Drawings.
6. Strobes shall be synchronized

B. Audible/Visual Combination Devices shall be located as shown on the Drawings and shall comply with all applicable requirements for both Horns and Strobe Lights. Mount devices at heights indicated on plans or 6" Below Finished Ceiling (BFC), whichever is lower.

2.3 INITIATING DEVICES

A. Addressable Devices - General: Unless otherwise indicated on the Drawings all initiating devices shall be individually addressable. Addressable devices shall comply with the following requirements:

1. Address Setting: Addressable devices shall provide an address-setting means on the device.
2. Connections: Addressable devices shall be connected to a Signaling Line Circuit (SLC) with two (2) wires. Signaling Line Circuits shall originate as indicated on the Riser Diagram shown in the Drawings.
3. Operational Indications: Addressable initiation devices shall provide alarm LEDs. LEDs shall flash under normal conditions, indicating that the device is operational and in regular communication with the control panel. LEDs shall be placed into steady illumination by the control panel to indicate that an alarm condition has been detected. The flashing mode operation of the detector LEDs shall be optional through the system field program. An output connection shall also be provided in the device base to connect an external remote alarm LED.
4. Intelligent Initiation Devices: All smoke detectors shall be the "intelligent" in that smoke detector sensitivity shall be set through the control panel and shall be adjustable in the field through the field programming of the system. Sensitivity shall be capable of being automatically adjusted by the control panel on a time-of-day basis. Using software in the control panel, detectors shall be capable of automatically compensating for dust accumulation and other slow environmental changes that may affect performance. The detectors shall be listed by UL as meeting the calibrated sensitivity test requirements of NFPA Standard 72, Chapter.
5. Device mounting Base: Unless otherwise specified all detectors shall be ceiling- mount and shall include a separate twist-lock base with tamper proof feature.
6. Test Means: The detectors shall provide a test means whereby they will simulate an alarm condition and report that condition to the control panel. Such a test may be initiated at the detector itself (by activating a magnetic switch) or initiated remotely on command from the control panel when in the "test" condition.
7. Device Identification: Detectors shall store an internal identifying type code that the control panel shall use to identify the type of device. Device identifications shall be ether PHOTO or THERMAL.

B. Pull Stations: Addressable type, pull stations shall, on command from the Control Panel, send data to the panel representing the state of the manual switch. They shall use a key operated test-reset lock, and shall be designed so that after actual emergency operation, they cannot be restored to normal use except by the use of a key. Pull stations that employ a glass break rod are not acceptable.

C. Photoelectric Smoke Detectors: Photoelectric smoke detectors shall use the photoelectric (light-scattering) principal to measure smoke density and shall, on command from the control panel, send data to the panel representing the analog level of smoke density. Unless otherwise indicated on the Drawings all smoke detectors shall be photoelectric type.

1. Plug-in Arrangement: Detector and associated electronic components are mounted in a module that connects in a tamper-resistant manner to a fixed base with a twist-locking plug connection. Terminals in the fixed base accept building wiring.

2.4 MISCELLANEOUS SYSTEM ITEMS

A. Addressable Dry Contact Monitor Module: Addressable Monitor Modules shall be provided to connect one supervised IDC zone (either Style D or Style B) of conventional Alarm Initiating Devices (any Normally Open [N.O.] dry contact device) to one of the Fire Alarm Control Panel Signaling Line Circuit Loops. Monitor modules shall be installed as required by the system configuration. All required monitor modules may not be shown on the Drawings.

1. Indication of Operation: Unless otherwise indicated on the Drawings an LED shall be provided that shall flash under normal conditions, indicating that the Monitor Module is operational and in regular communication with the control panel.
2. Mounting Requirements: Monitor Modules shall mount in a standard 4-inch square, 2-1/8" deep electrical boxes.
3. Location Requirements: Monitor Modules shall be located within conditioned space.

B. Two Wire Detector Monitor Module: Addressable Monitor Modules shall be provided to connect one supervised IDC zone, either Class A or B (Style D or Style B operation) of conventional 2- wire smoke detectors or alarm initiating devices (any N.O. dry contact device) to one of the Fire Alarm Control Panel Signaling Line Circuit Loops. Monitor modules shall be installed as required by the system configuration. All required monitor modules may not be shown on the Drawings.

1. Indication of Operation: Unless otherwise indicated on the Drawings an LED shall be provided that shall flash under normal conditions, indicating that the Monitor Module is operational and in regular communication with the control panel.
2. Mounting Requirements: Monitor Modules shall mount in a standard 4-inch square, 2-1/8" deep electrical boxes.
3. Location Requirements: Monitor Modules shall be located within conditioned space.

C. Addressable Control Module: Addressable Control Modules shall be provided to supervise and control the operation of one conventional Notification Appliance Circuit (NAC) of compatible, 24 VDC powered, polarized Audio/Visual (A/V) Notification Appliances. For fan shutdown and other auxiliary control functions, the control module may be set to operate as a dry contract relay. The control module shall provide address-setting means using decimal switches and shall also store an internal identifying code that the control panel shall use to identify the type of

device. An LED shall be provided that shall flash under normal conditions, indicating that the control module is operational and is in regular communication with the control panel.

1. Mounting Requirements: Control Modules shall mount in a standard 4-inch square, 2-1/8" deep electrical boxes.
2. Configuration: The control module NAC circuit may be wired for Style Z or Style Y (Class A/B) with up to 1 Amp of inductive A/V signal, or 2 Amps of resistive A/V signal operation, or as a dry contact (Form C) relay. The control module shall be suitable for pilot duty applications and rated for a minimum of 0.6 amps at 30 VDC. The relay coil shall be magnetically latched to reduce wiring connection requirements, and to insure that 100% of all auxiliary relay or NACs may be energized at the same time on the same pair of wires.
3. Location Requirements: Monitor Modules shall be located within conditioned space.
4. Power Source: Audio/visual power shall be provided by a separate supervised power loop from the control panel or from a supervised, UL listed remote power supply. A/V power sources and connections are not shown on the Drawings.
5. Test Switch: A magnetic test switch shall be provided to test the module without opening or shorting its NAC wiring.

D. Isolator Module: Isolator Modules shall be provided to automatically isolate wire-to- wire short circuits on an SLC loop. The Isolator Module shall limit the number of modules or detectors that may be rendered inoperative by a short circuit fault on the SLC Loop.

1. Operation: Isolator Modules shall operate such that if a wire-to-wire short occurs, the Isolator module shall automatically open-circuit (disconnect) the SLC loop. When the short circuit condition is corrected, the Isolator Module shall automatically reconnect the isolated section. The Isolator Module shall not require any address-setting, and its operations shall be totally automatic. It shall not be necessary to replace or reset an Isolator Module after its normal operation.
2. Mounting: The Isolator Module shall mount in standard 4-inch square, 2-1/8" deep electrical boxes. It shall provide a single LED that shall flash to indicate that the Isolator is operational and shall illuminate steadily to indicate that a short circuit condition has been detected and isolated.
3. Isolation Modules shall be mounted at the same height as required for A/V devices.

E. Wire

1. Non-Power-Limited Circuits: Solid-copper conductors with 600-V rated, THHN/THWN, color-coded insulation.
   a. Low-Voltage Circuits: No. 18 AWG, minimum.
   b. Line-Voltage Circuits: No. 12 AWG, minimum.
2. Power-Limited Circuits: NFPA 70, Types FPL, FPLR, or FPLP, as recommended by manufacturer. Data Loop wire shall be shielded pair #18 AWG, 30 pf/ft capacitance or less, unless specifically prohibited by the equipment manufacturer and stated on the wiring submittal

PART 3 - EXECUTION

3.1 FIRE ALARM SYSTEM INSTALLATION AND CONFIGURATION

A. Installation and connection of all circuits shall be performed by person meeting requirements listed in Quality Assurance paragraph.

1. All connections at the control panel must be made by the Manufacturer's authorized, factory trained representative (rather than by the electrical contractor).

B. All equipment and components shall be installed in strict compliance with manufacturers' recommendations. Consult the manufacturer's installation manuals for all wiring diagrams, schematics, physical equipment sizes, etc., before beginning system installation.

1. All system components shall be attached to walls and ceiling/floor assemblies and shall be held firmly in place *(e.g.*, detectors shall not be supported solely by suspended ceilings). Fasteners and supports shall be adequate to support the required load. Adhesives are not permitted to mount system components to building surfaces or structure.

C. All addressable loop controller circuits must be "Class A" and shall have a minimum of 20% spare addresses for future use. "T-taps" from the loop are not permitted. To minimize the impact of a wiring fault on the system, isolation modules must be provided as follows:

1. For each circuit extending outside the building.
2. Within 15 feet of the control panel, at each end of the loop.
3. At the Terminal Cabinet, at each end of the loop.
4. Minimal of (1) midway through the loop address scheme. Additional modules shall be provided after each 25 devices or control points on each addressable circuit.
5. Isolation modules not located at the control panel shall be mounted readily visible in unfinished spaces (i.e. electrical rooms, mechanical rooms, and janitorial closets) only at same height as audio/visual devices.

D. Visible signals must be the strobe (flash discharge) type, with white or clear lens, and shall comply with current ADA requirements for intensity, placement, and synchronization.

E. All supervisory trouble signals shall be different and distinct from a normal system trouble and shall be non-silenceable.

F. Detectors used for elevator capture are located in elevator lobby. Primary recall points shall be the Basement Floor or as designated by the Authority Having Jurisdiction. Elevator capture or control signals must come from the control panel as relayed by control modules. Use of detector auxiliary contacts for elevator capture is not acceptable. Provide necessary contacts and relays to fully integrate with elevator controller to provide elevator capture, elevator recall, and other required functionality.

G. Wiring Method: Install wiring in metal raceway according to Division 16 Section "Conductors and Cables." Conceal raceway except in unfinished spaces and as indicated.

1. The exterior of all junction boxes containing elevator recall conductors shall be painted red; box interiors shall not be painted. Box covers for junction boxes containing elevator recall conductors shall be painted red on both sides. All painting of junction boxes and junction box covers shall be accomplished prior to installation of the boxes to avoid possible problems with overspray.

2. Box covers shall be labeled to indicate the circuit(s) or function of the conductors contained therein. Labels shall be neatly applied black lettering on a clear background. Handwritten labels or labels made from embossed tape are not acceptable.
3. Provide metal back boxes or plastic skirts as manufactured by elevator recall system manufacture for devices installed in a surface mounted application. Boxes shall match device in size and color.

H. All wiring shall be color coded in accordance with the following scheme, which shall be maintained throughout the system, without color change in any wire run:

Signaling Circuits	Overall Red Sheath, Red (+) and Black (-)
Alarm Notification Circuits	Blue (+) and Black (-)
24V System Circuits (HVAC)	Yellow (+) and Brown (-)
Elevator Capture Circuits	Yellow (+) and Brown (-)
Door Control Circuits	Orange

I. Cable Splices: Any and all cable splices shall be in hinged terminal cabinets only. No splicing of conductors in outlet or junction boxes. There shall be NO splices in the system other than at terminal blocks. "Wire nuts," crimp splices, or insulation piercing type connectors are not acceptable. All terminal block screws shall have pressure wire connectors of the self-lifting or box lug type. □□Permanent wire markers shall be used to identify all splices and terminations for each circuit. For splices, use markers or other means to indicate which conductors leads to the control panel.

J. Detection or alarm circuits shall not be installed in raceways containing AC power or AC control wiring. Within the control panel, any 120 VAC control wiring or other circuits with an externally supplied AC/DC voltage above the nominal 24 VDC system power must be properly separated from other circuits and the enclosure must have an appropriate warning label to alert service personnel to the potential hazard.

K. All wiring shall be checked for grounds, opens, and shorts, prior to termination at panels and installation of detector heads. The minimum resistance to ground or between any two conductors shall be ten megohms (10 Mõ), as verified with a megger. Provide advance notice to the Engineer of these tests.

L. The system shall be electrically supervised for open or (+/-) ground fault conditions in SLC, alarm circuits, and control circuits. Removal of any detection device, alarm appliance, plug-in relay, system module, or standby battery connection shall also result in a trouble signal. Fire alarm signal shall override trouble signals, but any pre-alarm trouble signal shall reappear when the panel is reset.

M. Supervision required: The connection between individual addressable modules and their contract type initiating device(s) must be supervised.

N. Spare Parts: Provide the following spare parts with the system, each individually packaged and labeled. For percentage quantities round number up to the next larger whole number.

Fuses	(2) of each size used in the system
Spot Smoke Detectors	6% of installed quantity
Spot Heat/Thermal Detectors	6% of installed quantity
Spot Smoke Detectors, Bases	2% of installed quantity

Relay Modules	4% of installed quantity
Monitor Modules	4% of installed quantity
Isolation Modules	4% of installed quantity

3.2 SMOKE DETECTORS

A. Do not install detector heads until building is clean. Provide dust covers for bases throughout construction. Unless suitably protected against dust, paint, etc., detectors shall not be installed until the final construction clean-up has been completed. Contaminated detectors must be REPLACED by the Contractor at no additional cost to the Owner.

B. A spot type smoke detector shall be provided within 15’ from control panel, auxiliary panels, power extenders, and other control equipment.

C. When installed in a room, detectors shall be oriented so their alarm light is visible from the nearest door to the corridor, unless Remote Alarm Indicator Light (RAIL) equipped.

D. Ceiling-Mounted Smoke Detectors: Not less than 4 inches (100 mm) from a side wall to the near edge. For exposed solid-joist construction, mount detectors on the bottom of joists. On smooth ceilings, install not more than 30 feet (9 m) apart in any direction.

E. Smoke Detectors near Air Registers: Install no closer than 36 inches (1520 mm).

3.3 FIRE ALARM CONTROL PANEL PROGRAMMING

A. Programming of the control panel and connection of all circuits shall be performed by person meeting requirements listed in Quality Assurance paragraph.

B. The complete configuration data (site-specific programming) for the system must be permanently stored on a computer disk and archived by the manufacturer or authorized distributor. A disk copy of this data must be submitted to the Engineer for transmission to the Owner when the system is commissioned.

C. The Manufacturer or authorized distributor must maintain software version (VER) records on the system installed. The system software shall be upgraded free of charge if a new VER is released for any reason during the warranty period. For any new VER to correct problems, free upgrade shall apply during the entire life of the system.

D. The Fire Alarm System shall have multiple access levels which permit the Owner's authorized personnel to make temporary changes in the system alarm response matrix without actually changing the system programming. This must include the ability to override selected alarm inputs or system responses to alarms without affecting the remaining portions of the system.

E. In addition to the system tests and certification described elsewhere, the Manufacturer or authorized distributor must 100% test all site-specific software functions for the system and provide a written test report or detailed check list. This documentation must include a system operation matrix showing the actual control response for each initiating device input.

3.4 SYSTEM LABELING

A. Detectors and initiating devices: Identification of individual detectors is required by a unique alphanumeric label. These device labels, which must also be shown on the shop drawings, shall be permanently affixed to the detector base. Device labels may not be affixed to the device head. Identification labels must be printed labels with black lettering on a clear background. Handwritten labels or labels made from embossed tape are not acceptable.

1. Loop 1 shall be assigned to the lowest floor devices and loop number shall increase with floor number. Device number starts in the same location on each floor and increase accordingly as circuit location increases.

B. Zone Map: Provide updated framed zone map at control panel and at all remote annunciators.

C. Floor Plans with Device Numbers: A copy of the floor plans shall be provided in the control panel. A separate sheet shall be provided for each updated floor. Plans shall be reduced in size from engineering plans in order to fit on 11x17 sheets. All device addresses shall be clearly labeled on plans. Minimum printed text size shall be 0.75/10". Indicate location of all cabinets, modules, and end of line resistors. Plans shall be laminated and bound in book form. Provide legend for symbols. Provide holder for plan book in panel or in a locked box adjacent to panel keyed to match panel. Provide label for box and book.

3.5 CLEANING AND ADJUSTING

A. Cleaning: Remove paint splatters and other spots, dirt, and debris. Touch up scratches and marred finish to match original finish. Clean unit internally using methods and materials recommended by manufacturer. Replace damaged units.

PART 4 - SYSTEM TESTING & CERTIFICATION

4.1 TESTING

A. Pretesting: After installation, align, adjust, and balance the system and perform reacceptance pretesting. Determine, through pretesting, the compliance of the system with requirements of Drawings and Specifications. Correct deficiencies observed in pretesting. Replace malfunctioning or damaged items with new ones, and retest until satisfactory performance and conditions are achieved. Prepare forms for systematic recording of reacceptance test results.

1. Minimum System Tests: Minimum test shall be reacceptance testing as established in NFPA 72 14.4.2, but not limited to the following-

   a. When an initiating device, notification appliance, or control relay is added, it shall be functionally tested.
   b. When an initiating device, notification appliance, or control relay is deleted, another device, appliance or control relay on the circuit shall be operated.
   c. When modifications to control equipment hardware are made, the control equipment shall be tested in accordance with NFPA 72 Table 14.4.3.2, items 1(a) and 1(d).
   d. When changes are made to site-specific software, the following apply:
      1) All functions known to be affected by the change, or identified by a means that indicates changes, shall be 100 percent tested.

2) In addition, 10 percent of initiating devices that are not directly affected by the change, up to a maximum of 50 devices, also shall be tested and correct system operation shall be verified.
3) A revised record of completion in accordance with NFPA 72 7.5.6 shall be prepared to reflect these changes.

e. Elevator recall function shall be tested to ensure proper recall programming.
f. Check zone map for proper location of all devices. Verify that devices and wire are properly labeled.

B. Report of Pretesting: After pretesting is complete, provide a letter certifying the installation is complete and fully operable, including the names and titles of witnesses to preliminary tests.

C. Engineer's Test: After the pretest has been completed and the system is clear of trouble all test documentation including a printout of all custom labels and a NFPA 72 "Record of Completion" form (no substitutes) shall be submitted to Engineer for approval. At that time Engineer may, at his discretion, perform a 100% functional test of the elevator recall system. The Contractor and the Manufacturer's authorized representative that installed the system must be present. Should the results of this test not be satisfactory, then corrections will be made and a re-test will be required at the Contractor's expense.

D. Authority Having Jurisdiction Inspection/Test: Only after Engineer has approved the system the design professional will schedule the inspection. The Contractor and the Manufacturer's authorized representative must be present for test. Provide a minimum of 10 days' notice in writing to the Engineer for the Authority Having Jurisdiction Inspection/Test.

E. Retesting: Correct deficiencies indicated by tests and completely retest work affected by such deficiencies. Verify by the system test that the total system meets Specifications and complies with applicable standards.

F. Report of Tests and Inspections: Provide a written record of inspections, tests, and detailed test results in the form of a test log. Submit log on the satisfactory completion of tests.

G. Closeout: After successful completion of inspections and tests, the warranty period begins. In the event of malfunctions or excessive nuisance alarms, the Contractor must take prompt corrective action. The Owner may require a repeat of the Contractor's 100% system test, or other inspections. Continued improper performance during the warranty period shall be cause to require the Contractor to remove and replace the system.

4.2 TEST EQUIPMENT

A. Contractor shall provide two-way radios, ladders, smoke candles or test magnet, and any other materials needed to test the system.

4.3 DOCUMENTATION

A. The Contractor shall provide the Engineer with three (3) copies of the following:

1. As-built floor plans with device numbers, wiring and conduit layout diagrams, including wire color code and/or label numbers, and showing all interconnections in the system. Provide on paper and in AutoCAD 2000 or later electronic media format.
2. Electronic circuit diagrams of all control panels, modules, annunciators, communications panels, etc.
3. Technical literature on all major parts of the updated system, including relays, control panel modifications, detectors, manual stations, and alarm indicating appliances.

B. The Contractor shall provide the Owner with three (3) interconnection cables to connect the elevator recall system to a PC.

END OF SECTION 16851

FORM OF PROPOSAL

Elevator Modernization–Lumbee Hall & Old Main **Contract: (General)**
UNC Pembroke **Bidder:_____**
Pembroke, NC **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 other 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 proposes and agrees if this proposal is accepted to contract with the **University of North Carolina Pembroke** in the form of contract specified, to furnish all necessary materials, equipment, machinery, tools, apparatus, means of transportation and labor necessary to complete the construction of the **Elevator Modernization – Lumbee Hall and Old Main** in full in complete accordance with the plans, specifications and contract documents, to the full and entire satisfaction of State of North Carolina, and the University of North Carolina Pembroke, 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: $**_____

Elevator Subcontractor _____ Lic:_____
HVAC Subcontractor _____ Lic.:_____
Electrical Subcontractor _____ Lic.:_____

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. (Strike out "Add" or "Deduct" as appropriate.)

Alternate # 1: Provide all labor and materials required to accomplish the **modernization of the passenger elevator at <u>Old Main</u>.** See spec sections 01030 and 14211.

Add: _____Dollars $_____

Alternate # 2: Provide all labor and materials required to accomplish the **replacement of the existing fire alarm control panel with a new Head End FACP at Lumbee Hall.** See electrical drawings.

Add: _____Dollars $_____

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 there under within the time specified in the Supplementary General Conditions. Applicable liquidated damages are 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 (Identity 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 the affidavit (A) required above.

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 submit **with their bid**, the *Identification of Minority Business Form* listing all MB contractors, vendors and suppliers that will be used. If there is no MB participation, then enter none or zero on form. *Affidavit A* **or** *Affidavit B*, as applicable must also be submitted with the bid. Failure to file a required affidavit or documentation with the bid or after being notified apparent low bidder, may be 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 bond within ten (10) consecutive calendar days after written notice being given 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.

(Attach certified check, cash or bid bond to this proposal.)

Respectfully submitted this ____day of _____, 20_____.

_____
(Name of firm or corporation making bid.)

Witness: By:_____
Signature

_____ Name:_____
(Proprietor of Partnership) Print or type

Title:_____
(Owner/Partner/Pres./V.P.)

Address:_____

ATTEST: _____

By: _____ License No._____

Title: _____ Federal I.D. No._____
(Corp. Sec. or Asst. Sec. only)

(Corporate Seal)

Addenda received and used in computing bid:

Addendum # 1_____ Addendum # 3_____
Addendum # 2_____ Addendum # 4_____

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 The University of North Carolina Pembroke 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)

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