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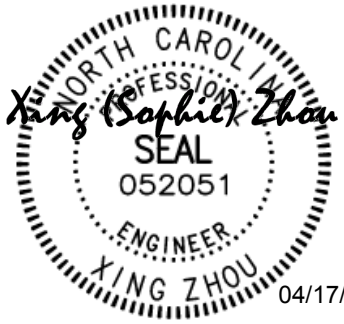
PROJECT MANUAL
including
SPECIFICATIONS
for

CAMPUS FIRE ALARM REPLACEMENTS

PITT COMMUNTITY COLLEGE

WINTERVILLE, NC



Xing (Sophie) Zhou

04/17/2026

Divisions 00, 01, 26 and 28

DATE: 04/02/2026

SET:

PROJECT NUMBERS

SO: 2572-00123

SCO: 25-30379-01A

Owner: Pitt Community College

Send all project communication to:
Salas O'Brien

Salas O'Brien
North Carolina, Inc.
702 Oberlin Road
Suite 300
Raleigh, NC 27605
919-832-8118
salasobrien.com
license (NC): F-1434

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DIVISION 00 - GENERAL CONDITIONS

DIVISION 01 - GENERAL REQUIREMENTS

DIVISION 26 - ELECTRICAL

DIVISION 28 – ELECTRONIC SAFETY AND SECURITY

DIVISION 00 – PROPOSAL PACKAGE

Title

END OF TABLE OF CONTENTS

ADVERTISEMENT FOR BIDS

Sealed proposals for Pitt CC Campus Fire Alarm Replacement SCO#25-30379-01A Prime bids will be received until 2:00 PM on May 20, 2026, in Office of Glenn Sheppard, Asst VP of Facilities and Construction, Pitt Community College 2064 Warren Drive Facility Services Room 118 Winterville, NC 28590 for construction of Campus Fire Alarm Replacement SCO#25-30379-01A at which time and place bids will be opened and read.

A pre-bid meeting will be held at the Office of Glenn Sheppard, Asst VP of Facilities and Construction, Pitt Community College 2064 Warren Drive Facility Services Room 118 Winterville, NC 28590 starting at 2:00 PM on April 21, 2026.

All interested contractors are encouraged to attend.

Complete plans and specifications for this project can be obtained from

Wanda Hill wanda.hill@salasobrien.com
Salas O'Brien North Carolina, Inc.
702 Oberlin Road, Suite 300
Raleigh, NC 27605

during normal office hours after Friday, April 17,-2026.

Plans and Specifications are available electronically (Bid Deposit not required). Hard copies are available upon a Plan Deposit of $250.00 in cash or check.

The Owner reserves the unqualified right to waive any informalities or reject any and all proposals. All inquires should be directed to:

Signed:

Glenn Sheppard FMP, PEM
Asst. VP of Facilities and Construction
Pitt Community College
2064 Warren Drive
Winterville, NC 28590
252-493-7i593

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

Sealed proposals will be received by the Pitt Community College in Winterville, NC, in the office of Glenn Sheppard, Asst VP of Facilities and Construction, Pitt Community College 2064 Warren Drive Facility Services Room 118 Winterville, NC 28590 up to 2:00 PM, May 20, 2026 and immediately thereafter publicly opened and read for the furnishing of labor, material and equipment entering into the construction of:

Campus Fire Alarm Replacement
Pitt Community College
SCO#25-30379-01A

Replace existing fire alarm systems or provide new fire alarm systems in buildings: AB Whitley, Leslie, Whichard, Greenville Center Annex, and Law Enforcement Training (LET).

Bids will be received for Single Prime. All proposals shall be lump sum.

Pre-Bid Meeting

An open pre-bid meeting will be held for all interested bidders on April 21, 2026, at 2:00 PM in the office of Glenn Sheppard, Asst VP of Facilities and Construction, Pitt Community College 2064 Warren Drive Facility Services Room 118 Winterville, NC 28590 up. The meeting will address project specific questions, issues, bidding procedures and bid forms.

The meeting is also to identify preferred brand alternates and their performance standards that the owner will consider for approval on this project.

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

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

A. Johnson Controls (JCI) / Simplex

Justification of any approvals will be made available to the public in writing no later than seven (7) days prior to bid date.

Complete plans, specifications and contract documents will be open for inspection in the offices of Salas O'Brien, North Carolina, Inc. They can also be obtained online at the following plan rooms:

Dodge Data & Analytics
(formerly McGraw Hill Dodge Corporation)
http://construction.com/dodge/

Associated General Contractors, (AGC)
Carolina Branch (through partnership with (iSqFt)
http://www.isqft.com/

CMD Group
(formerly Reed Construction Data)
http://www.cmdgroup.com/

Hispanic Contractors Association of the Carolinas
(HCAC) (through partnership with (iSqFt)
http://www.isqft.com/

The Institute
(formerly NCIMED Plan & Resource Center)
https://www.theinstitutenc.org/

East Coast Digital – Minority Plan Room Provider 703 SE Greenville Blvd, Greenville, NC 27858, 252-758-1616

Complete plans, specifications and contract documents can be obtained by those qualified as prime bidders from Salas O'Brien 702 Oberlin Rd, Suite 300, Raleigh, NC 27605 (919-832-8118) during normal office hours after April 17, 2026, upon a Plan Deposit of $250 in cash or certified check. The full plan deposit will be returned to those bidders provided all documents are returned in good, usable condition within ten (10) days after the bid date.

Plans and Specifications are also available electronically from Salas O'Brien. (Bid deposit not required).

If a contractor is bidding under the dual system both as a single prime contractor and as a separate prime contractor, he must submit the bids on separate forms and in separate envelopes. Bidders should clearly indicate on the outside of the bid envelope which contract(s) they are bidding.

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

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

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

> NOTE--SINGLE PRIME CONTRACTS: 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. **EXCEPT**: On public buildings being bid single prime, where the total value of the general construction does not exceed 25% of the total construction value, contractors under GS87- Arts 2 and 4 (Plumbing, Mechanical & Electrical) may bid and contract directly with the Owner as the SINGLE PRIME CONTRACTOR and may subcontract to other properly licensed trades. GS87-1.1- Rules .0210

Electrical prime contractors are notified that General Statutes Chapter 87, Articles 2 & 4, will be observed in receiving and awarding plumbing, mechanical and electrical contracts.

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

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

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

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

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

Designer:	Owner:
Salas O'Brien, North Carolina, Inc.	*Pitt Community College*
702 Oberlin Rd, Suite 300, Raleigh, NC 27605	*1986 Pitt Tech Rd, Winterville, NC 28590*
919-832-8118	*252-493-7593*

GENERAL CONDITIONS OF THE CONTRACT

STANDARD FORM FOR DESIGN-BUILD PROJECTS

NORTH CAROLINA

DEPARTMENT OF ADMINISTRATION

STATE CONSTRUCTION OFFICE

Form OC-15DB

This document is a public document, but it is intended for use in State capital construction projects. It shall not be binding on the State Construction Office if 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.

Second Edition, Revision 2 - September 2025
Articles: 2.c, 20.a, 31.h, 31.i, 32.d, 33.b, 34, 52.b - h

GENERAL CONDITIONS OF THE CONTRACT

The use or reproduction of this document or any part thereof is authorized for and limited to use on projects of the State of North Carolina, and is distributed by, through and at the discretion of the State Construction Office, Raleigh, North Carolina, for that distinct and sole purpose.

TABLE OF CONTENTS

ARTICLE TITLE PAGE

ARTICLE 1 – DEFINITIONS

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

b. **Authority Having Jurisdiction (AHJ)** shall mean the agency or office responsible for approving layout drawings, enforcing the requirements of the North Carolina Building Code and its referenced standards, and issuing building permits. The State Construction Office is the AHJ for State agencies and universities projects. The city or county building department is the AHJ for community college projects.

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

d. **Change Order**, as used herein, shall mean a written order to the Design-Builder from the Owner subsequent to the signing of the contract authorizing a change in the design fees, contract time, and/or contract amount relating to the costs of construction as defined in the contract. The change order shall be signed by the Design-Builder, and the Owner, and approved by the State Construction Office, in that order per Article 19 herein.

e. **Clarification or Request for Information (RFI)** is a request from the Design-Builder seeking an interpretation or clarification by the Design Professional relative to the Contract Documents. The RFI shall be labeled RFI and 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 Design-Builder's interpretation or understanding of the Contract Documents requirements in question, along with reasons for such an understanding.

f. **Clarification or Request for Owner Information (RFOI)** is a request from the Design-Builder seeking an interpretation or clarification by the Owner relative to the Contract Documents. The RFOI, which shall be labeled RFOI, shall clearly and concisely set forth the issue or item requiring clarification or interpretation, and why the response is needed. The RFOI must set forth the Design-Builder's interpretation or understanding of the Contract Documents requirements in question, along with reasons for such an understanding.

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

h. **Construction Change Directive,** as used herein, a written order prepared by the Design-Builder and signed by the Design-Builder, Owner, and State Construction Office directing a change in the Work prior to agreement on adjustment, if any, in the Contact Sum or Contract Time, or both. All Construction Change Directives shall be followed by a Change Order.

i. The **Construction Contract and Contract Documents** consists of the General Conditions of the Contract; the State Construction Manual, the General Provisions of

the Design-Build Contract, special conditions if applicable; the request for qualifications document and the Design-Builder's response; Supplementary General Conditions; the drawings and specifications, including all bulletins, addenda or other modifications of the drawings and specifications incorporated into the documents prior to their execution; 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.

j. **Design-Builder** - An appropriately licensed person, corporation, or entity that, under a single contract, offers to provide or provides design and construction services, which includes general, mechanical, electrical, plumbing and/or sprinkler contracting services where services within the scope of the practice of professional engineering or architecture are performed respectively by a licensed engineer or licensed architect and where services within the scope of the practice of contracting are performed by a licensed general, mechanical, electrical, plumbing, and/or sprinkler contractor.

k. **Design-Builder Construction Fee** shall be an all-inclusive lump sum fee which includes all the Design-Builder's home office, general conditions, overhead costs, and profit. The Design-Builder Construction Fee does not include the Design Professional's construction phase fee.

l. The **Design Professional** means any firm or firms of architects or engineers or both, and their consultants, professionally licensed under Chapters 83A, 89A, or 89C of the North Carolina General Statutes which have undertaken to design the Project pursuant to a contract as part of the Design-Builder. A **Design Professional** may be an employee of the Design-Builder only if the Design-Build firm itself is properly licensed by the appropriate board to provide architectural, engineering, landscape architecture, or land surveying services as required by Chapters 83A, 89A, or 89C of the North Carolina General Statutes.

m. **Design Professional Final Inspection** is the inspection performed by the Design Professional to determine the completeness of the Project in accordance with approved plans and specifications. This inspection occurs prior to SCO final inspection.

n. **"Equal to" or "approved equal"** shall mean materials, products, equipment, assemblies, or installation methods considered equal by the Design-Builder in all characteristics (physical, functional, and aesthetic) to those specified in the Contract Documents.

o. **Field Change,** as used herein shall mean a written approval from the Owner for the Design-Builder to proceed with work requested by the Owner to be paid for from the Design-Builder Contingency or Owner's Project Reserve within the GMP.

p. **Final Acceptance** is the date the State Construction Office accepts the construction as totally complete. This includes the SCO Final Inspection and certification by the design professional that all punch lists are completed.

q. **First-tier Subcontractor** – A subcontractor who contracts directly with the design-builder, excluding design professionals.

r. **Guaranteed Maximum Price (GMP)** is the highest amount the Owner will pay to the Design-Builder for the completion of the Project. The GMP consists of all construction costs, all design costs, and all other projected costs including without limitation the Design-Builder fee and Contingency but does not include the Owner's Construction Contingency.

s. **Indicated** and **Shown** shall mean provide as detailed, or called for, and reasonably implied in the Contract Documents.

t. **Inspection** shall mean examination of work completed or in progress to determine its compliance with Contract Documents.

u. **Licensed Subcontractor** - A person or entity, not including design professionals or employees of the design-builder, that will be performing work under the design-builder and whose scope of work proposed for the Project requires that it be licensed in accordance with Article 1, Article 2, or Article 4 of Chapter 87 of the North Carolina General Statutes.

v. **Liquidated Damages** 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 Design-Builder 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, penalties and violations with environmental laws and regulations, etc.) or consequential damages that the Owner identified in the bid documents that may be impacted by any delay caused solely by the Design-Builder (e.g., if a multi-phased project-subsequent phases, delays in start of other projects that are dependent on the completion of this Project, extension of leases and/or maintenance agreements for other facilities).

w. The **Owner** (Governmental Entity) is the State of North Carolina by and through the agency or institution named on the cover sheet of the Construction Contract, where the Project is being built, and shall include every officer, board, department, commission, or commissions charged with responsibility of preparation of specifications or entering into contracts for the erection, construction, alteration, or repair of any buildings for the State or for any county, municipality, or other public body.

x. The **Project** is the total design and construction work to be performed under the Contract Documents.

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

z. **Routine written communications between the Design-Builder and the Owner** are any communication other than a "request for owner information" provided in letter, memo, or transmittal format, sent by mail, courier, electronic mail, or facsimile. Such communications cannot be identified as "request for owner information".

aa. **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.

bb. **Special Inspector** is one who inspects materials, installation, fabrication, erection or placement of components and connections defined by the Statement of Special Inspections to ensure compliance with the approved construction documents and referenced standards.

cc. **State Construction** or **SCO** shall mean the North Carolina Department of Administration's State Construction Office.

dd. A **subcontractor** shall be any licensed or unlicensed subcontractor.

ee. **"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 Design-Builder would improve competition and/or enhance the finished installation.

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

gg. **Unlicensed Subcontractor** - A person or entity, not including design professionals or employees of the design-builder, that will be performing work under the design-builder and whose scope of work proposed for the Project does not require that it be licensed in accordance with Article 1, Article 2, or Article 4 of Chapter 87 of the North Carolina General Statutes.

hh. **Work**, as used herein as a noun, is intended to include materials, labor, and workmanship of the appropriate contractor or subcontractor as supervised or performed by or on behalf of the Design-Builder.

ii. **Written notice** shall be defined as notice in writing delivered in person or by verified mail, return receipt requested, 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.

ARTICLE 2 - INTENT AND EXECUTION OF DOCUMENTS

a. The drawings and specifications are complementary, one to the other. 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 complete Project. 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 Design-Builder shall execute each copy of the response to RFQ, 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 the title of the office of such persons shall appear after their signatures.

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 member.

5. 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.

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

7. The date of the 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 Design Professional, such clarification shall be furnished by the Design Professional by means of written instructions or detail drawings, or both. Clarifications and drawings shall be consistent with the intent of the Contract Documents and shall become a part thereof.

b. The Design Professional shall submit and obtain approval from the AHJ any clarifications pertaining to life safety systems prior to implementation by the Design-Builder. Life safety items include but are not limited to fire alarm, sprinkler, egress and exit lighting, fire rated walls, egress paths, and security.

ARTICLE 4 - COPIES OF DRAWINGS AND SPECIFICATIONS

a. The Design-Builder shall furnish the reviewing agencies with an electronic copy of design documents for each design milestone. A set of clean black line prints shall be provided upon request.

b. The Design-Builder shall furnish SCO and the Owner an electronic copy of the final documents that make up the Construction Contract.

ARTICLE 5 - SHOP DRAWINGS, SUBMITTALS, SAMPLES, DATA

a. A schedule for anticipated submission of all shop drawings, product data, samples, and similar submittals shall be prepared by the Design-Builder and provided to the Design Professional and Owner. This schedule shall indicate the items, relevant specification sections, other related submittal data, and the date when these items will be furnished to the Design Professional. The Owner in conjunction with the Design-Builder will identify all submittals that will be reviewed by the Owner.

b. The Design-Builder will be responsible for logging, reviewing, and approval of all shop drawings/submittals prior to submission to the Owner. The Design-Builder shall ensure that the shop drawings/submittal packages are submitted in an appropriate manner and, if not, return them to the subcontractor for proper submission.

c. The Design Professional shall review required submittals promptly, noting desired corrections if any, for the Design-Builder's use or for corrections and resubmittal as noted by the Design Professional. When resubmittals are required, the submittal procedure shall be the same as for the original submittals.

d. Submittals approved by the Design Professional shall be distributed to the Owner when required. The Owner shall return the submittal to the Design Professional within 7 calendar days. When resubmittals are required, the submittal procedure shall be the same as for the original submittals.

e. The Design-Builder shall develop and implement a system for processing all shop drawings/submittals and shall be responsible for tracking and monitoring all shop drawings/submittals until all have been approved by the Owner.

ARTICLE 6 - WORKING DRAWINGS AND SPECIFICATIONS AT THE JOB SITE

a. The Design-Builder 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 Owner or his authorized representative.

b. The Design-Builder may incorporate some shop drawings into the Contract Documents during the design of the Project

c. The Design-Builder shall maintain at the job office, a day-to-day record of work-in-place that is at variance with the Contract Documents. All variations must be approved by the Design Professional and the Owner. Approved variations shall be fully noted on project drawings by the Design-Builder and submitted to the Owner upon Project completion and no later than ninety (90) days after acceptance of the Project.

d. The Design-Builder 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 designs, drawings, specifications, design calculations, notes and other works developed in the performance of this contract is the sole property of the State of North

Carolina and may be used on any other project, design, or construction without additional compensation to the Design-Builder. The use of the design, including tracings and specifications, by any person or entity, for the purpose other than the Project, shall be at such person or entity's own risk and the Design Professional shall not be liable to such person or entity for any claim arising from the use of the design, tracings, or specifications, including claims for personal injury, property damage, or death as a result of such other use.

ARTICLE 8 - MATERIALS, EQUIPMENT, EMPLOYEES

a. The Design-Builder shall, unless otherwise specified, supply & pay for all lighting, power, heat, sanitary facilities & water, and shall require the subcontractors to supply and pay for all labor, transportation, materials, tools, apparatus, scaffolding, and incidentals necessary for the completion of his work, and to 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. The Design-Builder 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 there from, all in accordance with the Contract Documents.

b. All materials shall be new and of quality specified by the contract documents, except where reclaimed material is authorized herein and approved for use. Workmanship shall, at all times, be free from defects and in accordance with the construction documents. If the construction documents do not define the quality of workmanship for a given material, samples, product data sheets, mock-ups, and applicable industry standards will be used to evaluate workmanship.

c. Upon notice, the Design-Builder shall require the subcontractors to 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 Design-Builder through the subcontractor may select any product meeting this standard, by any manufacturer. When several products or manufacturers are specified as being equally acceptable, the Design-Builder through the subcontractor has the option of using any product and manufacturer combination listed. However, the Design-Builder through the subcontractor 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. The Design-Builder will be responsible for reviewing all substitution requests from subcontractors prior to submission to the Design Professional and Owner and shall track & monitor all such requests.

e. The Design-Builder shall obtain written approval from the Design Professional, in consultation with the Owner, for the use of products, materials**,** equipment**,** assemblies, or installation methods claimed as equal to those specified. Such approvals must be obtained as soon after contract awards as possible and before any materials are ordered.

f. Substitution materials, products, equipment, assemblies, or installation methods proposed by the Design-Builder shall be approved by the Design Professional, in consultation with and approval by the owner.

g. If at any time during the construction and completion of the work covered by these Contract Documents, the conduct of any workman of the various crafts be adjudged a nuisance to the Owner or Design-Builder, or if any workman be considered detrimental to the work, the Design-Builder 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 Design-Builder shall protect and save harmless the Owner against suit on account of alleged or actual infringement. The Design-Builder 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 Design-Builder shall give all notices and comply with all laws, ordinances, codes, rules, and regulations bearing on the conduct of the work under this contract. Any necessary changes required after contract award shall be made by change order in accordance with Article 19. If the Design-Builder performs any work or authorizes any work to be performed knowing it to be contrary to such laws, ordinances, codes, rules, and regulations, he shall bear all cost arising there from. 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 Design-Builder unless otherwise specified.

c. 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 Design-Builder shall, however, cooperate with the county or municipal authorities by obtaining building permits. Any permits pertaining to the project are the responsibility of the Design-Builder.

d. Projects involving local funding (Community Colleges) are also subject to county and municipal building codes and inspection by local authorities. The Design-Builder shall pay the cost of these permits and inspections unless otherwise specified.

ARTICLE 11 - PROTECTION OF WORK, PROPERTY AND THE PUBLIC

a. The Design-Builder shall be responsible for the entire site and the building or construction of the same and provide all the necessary protections, as required by the Owner, and by laws or ordinances governing such conditions. The Design-Builder shall be responsible for any damage to the Owner or the Owner's property caused by the Design-Builder or others on the job for whom the Design-Builder is responsible, by them, their personnel, or their subcontractors, or any failure by them to secure or protect the Project, and shall pay for or make good any such damages. The Design-Builder shall have access to the Project site at all times.

b. The Design-Builder 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. 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 are allowed inside or around the construction without special permission from the Owner.

d. The Design-Builder shall ensure that all trees and shrubs designated to remain in the vicinity of the construction are protected in accordance with the requirements of the plans and specifications. All walks, roads, etc., shall be barricaded to keep the public away from the construction while maintaining required paths of travel. All trenches, excavations, or other hazards in the vicinity of the work shall be well barricaded and properly lighted at night.

e. The Design-Builder shall develop and implement a Project safety plan that provides all necessary safety measures for the protection of all persons on the Project, 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. The Design-Builder shall clearly mark or post signs warning of hazards existing, and shall barricade excavations, elevator shafts, stairwells, and similar hazards. The Design-Builder shall ensure that protection is provided against damage or injury resulting from falling materials and that all protective devices and signs be maintained throughout the progress of the work.

f. The Design-Builder 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 N.C. Gen. Stat. §§ 95-126 through 155.

g. The Design-Builder shall designate a responsible person of his organization as safety officer/inspector to inspect the Project site for 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 Design-Builder shall provide the name of the Project's safety inspector to the Design Professional and Owner at the time of the preconstruction conference and prior to any work starting on the Project.

h. In the event of an emergency affecting the safety of life, the protection of work, or the safety of adjoining-properties, the Design-Builder 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 Design-Builder on account of such action shall be determined as provided for under Article 19(b).

i. All costs associated with correcting damage caused by the Design-Builder, their personnel, or their subcontractors, or their failure to secure or protect the Project, to adjacent properties of the construction site or staging area shall be borne by the Design-Builder. 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 Design-Builder or any subcontractor 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 Design-Builder 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 Design-Builder shall be responsible for defending any legal actions instituted pursuant to N.C. Gen. Stat. § 113A-64 against any party or persons described in this article.

d. To the fullest extent permitted by law, the Design-Builder shall indemnify and hold harmless the Owner and the consultants and employees of the Owner, 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 by the Owner’s designated representatives, Special Inspector, State Construction Office, and those persons required by state law to test special work for official approval. The Design-Builder shall provide all necessary equipment and safe access to the work at all times for such inspections.

b. The Design Professional shall inspect the work to ensure compliance with the approved plans and specifications.

c. Observations made by the Owner’s designated representatives shall be conveyed to the Design-Builder in writing.

d. The Design-Builder shall perform quality control inspections on the work of subcontractors to guard the Owner against defects and deficiencies in the work. The Design-Builder shall advise the Design Professional and owner of any apparent variation or deviation from the intent of the Contract Documents and shall take the necessary action to correct such variations and deviations.

e. Where special inspection or testing is required by any state laws, instructions of the Design Professional, specifications or codes, the Design-Builder shall give adequate notice to the Design Professional and Owner of the time set for such inspection or test. The Design Professional shall report on special inspections and testing at monthly job site progress conferences.

f. All laboratory tests shall be paid by the Design-Builder including but not limited to laboratory tests for hazardous materials and to establish design mix for concrete and for additional tests to prove compliance with the Contract Documents where materials have tested deficient except when the testing laboratory did not follow the appropriate ASTM testing procedures. All laboratory test results shall be approved by the Design Professional. The Design Professional shall report on laboratory tests at monthly job site progress conferences. Approved tests shall be submitted to the Owner and SCO Monitor upon request.

g. Should any work be covered up or concealed prior to inspection and approval by the Design Professional or State Construction Office, such work shall be uncovered or exposed for inspection. Inspection of the work will be made promptly upon notice from the Design-Builder. 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 Design-Builder.

ARTICLE 14 - CONSTRUCTION SUPERVISION AND SCHEDULE

a. On-site representatives of the Design-Builder shall manage the work of the subcontractors and coordinate the work with the activities of the Owner to complete the Project with the Owner's objectives of cost, time, and quality. Throughout the progress of the work, the Design-Builder shall maintain a competent and adequate full-time staff approved by the Owner. It is understood that the designated and approved on-site representatives of the Design-Builder will remain assigned to the Project and in responsible charge so long as those persons remain employed by the Design-Builder unless otherwise requested or agreed to by the Owner. The Design-Builder shall establish an on-site organization with appropriate lines of authority to act on behalf of the Design-Builder. Instructions, directions, or notices given to the designated on-site authority shall be as binding as if given to the Design-Builder. However, directions, instructions, and notices shall be confirmed in writing.

b. The Design-Builder shall call, hold, and preside over monthly Project progress conferences. All subcontractors, as well as the Design Professional and all subconsultants, shall be represented at these progress conferences by both home office and Project personnel. The Design-Builder shall require attendance from other subcontractors and material suppliers who can contribute toward maintaining required 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. The Design-Builder shall be prepared to assess progress of the work and to recommend remedial measures for correction of progress as may be appropriate.

c. The Design-Builder shall, if required, employ an engineer or a land surveyor licensed in the State of North Carolina to lay out the work and to establish a benchmark nearby in a location where same will not be disturbed and where direct instruments sights may be taken.

d. A final critical path method (CPM) schedule shall be submitted to the Owner for approval with the GMP proposal. The CPM schedule shall show all salient features of the work required for construction of the Project from start to finish within the time allotted by the contract. The time in days between the Design-Builder's early

completion date and the contractual completion date is Project float time and shall be used as such by the Design-Builder unless amended by change order. No application for Construction Phase payment will be processed until the Project CPM schedule is approved by the Owner. No monthly application for payment will be processed without the submission of an electronic and paper copy of the CPM schedule attached.

e. The CPM schedule shall be a complete computer-generated network analysis showing the complete sequence of construction activities, identifying the work of separate stages and other logically grouped activities, indicating early and late start and early and late finish dates, float duration and a complete logic. Monthly updates are required and shall show the estimated completion of each activity.

f. The Design-Builder shall distribute to the subcontractors the approved Project CPM schedule and shall display the same at the job site.

g. The Design-Builder shall maintain the Project CPM schedule, making monthly adjustments, updates, corrections, etc., which are necessary to finish the Project within the time allotted by the contract. In doing so, the Design-Builder shall keep the designer as well as all subcontractors fully informed as to all changes and updates to the schedule. The Design-Builder shall submit to the Owner a monthly report of the status of all work activities. The monthly status report shall show the actual work completed to date in comparison with the original amount of work scheduled. If the work is behind schedule, the Design-Builder must indicate in writing what measures are being taken to bring the work back on schedule and ensure that the contract completion date is not exceeded. If the work is greater than thirty (30) days behind schedule and no legitimate requests for time extensions are in process, then the Design-Builder shall prepare and submit to the Owner a recovery schedule for review and approval. Failure of the Design-Builder to abide by the directives in this paragraph will give the Owner cause to exercise the remedies set forth in Article 29 of the General Conditions and pursue any other legal remedies allowed it by law.

ARTICLE 15 – DESIGN REQUIREMENTS OF THE DESIGN-BUILDER

a. The Design Professional shall provide professional services for the Project in accordance with the Contract Documents and the latest edition of the document entitled "State Construction Manual."

b. The total Project cost, as indicated in the contract, is derived from a specific appropriation or funds specifically provided for the Project. Accordingly, the Design-Builder shall conform his plans to a design, the construction cost of which together with the addition of design fees and any other associated Project costs, shall not exceed the total Project cost.

c. The Design Professional agrees that his representatives on the construction Project shall be qualified by training and experience to make decisions and interpretations of plans and specifications, and shall be empowered by the Design Professional to do so; such decisions and interpretations shall be binding upon the Design Professional as if made by him; all such decisions shall be confirmed in writing at the earliest reasonable date, with copies to the Owner and the State Construction Office, conditioned that such decisions and interpretations shall not modify adversely the requirements of the Contract Documents; the Design Professional's representatives shall be replaced promptly and without protest at the request of the Owner, if in the opinion of the Owner

and the State Construction Office, such representatives are either negligent or unqualified to perform their duties.

d. The Design-Builder agrees to begin the Design Phase of the work promptly upon receipt of a fully executed copy of the Form of Design-Build Construction Contract.

e. The Design-Builder shall provide the following services during the Schematic Design Phase.

1. The Design Professional shall consult with the Owner to ascertain the requirements of the Project and shall confirm such requirements to the Owner.

2. The Design Professional shall prepare schematic design studies in accordance with the State Construction Manual, leading to a recommended solution together with a general description of the Project for approval by the Owner.

3. The Design-Builder shall submit to the Owner a statement of probable construction cost based on the area, volume, or other current unit costs.

4. The Design-Builder shall submit to the Owner a preliminary schedule and logistics plan.

f. The Design-Builder shall provide the following services during the Design Development Phase.

1. The Designer Professional shall prepare from the approved schematic design studies, for approval by the Owner, the design development documents which shall include site and floor plans, elevations and other drawings, and outline specifications as are necessary to fix and illustrate the size and character of the entire Project in its essentials as to kinds of material, type of structure, mechanical and electrical systems, and such other work as may be required, including site and utility requirements.

2. The Design-Builder shall submit to the Owner a statement of construction cost establishing a construction phase Guaranteed Maximum Price.

3. The Design-Builder shall submit to the Owner a CPM schedule and logistics plan.

g. The Design-Builder shall provide the following services during the Construction Document Phase.

1. The Design Professional shall prepare from the approved design development documents, working drawings and specifications setting forth in detail and prescribing the work to be done and the materials, workmanship, finishes and equipment required for the engineering, architectural, structural, mechanical, electrical and the site work, and for service-connected equipment; and assemble the necessary bidding information, proposal and contract forms, and conditions of the contract, for approval by the Owner.

2. The Design-Builder shall submit to the Owner a further statement of probable construction cost as indicated by fully developed requirements and current market conditions.

3. The Design-Builder shall prepare and file the required documents for the approval of governmental authorities having jurisdiction over the Project.

h. In the event that during the several stages of design, the Design-Builder's Statement of Probable Construction Cost together with design fees exceeds the limitations set forth, the Owner shall have the right to require the Design-Builder, without any additional cost to the Owner, to modify his plans and specifications or redesign the Project as may be necessary to bring the construction cost plus design fees within the Total Project Cost.

i. The Design-Builder shall provide the following services during the Construction Phase.

1. The Design Professional shall process and approve, or take other appropriate action in respect of, progress schedules, shop drawings and other required submissions of contractors promptly.

2. The Design Professional shall process the Design-Builder's applications for payment promptly for authorized work and issue certificates of payment.

3. The Design Professional shall 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.

4. The Design Professional shall provide general administration of the performance of the construction contract, including inspection and continuous liaison of the work to ensure full compliance with plans and specifications. All inspections shall be by qualified and mutually agreed upon representatives of the Design Professionals' firm(s) not less than once per week while work related to their design is in progress, and as often as necessary to ensure compliance with the approved plans and specifications. The Design Professional will inspect the progress, the quality, and the quantity of the work.

5. The Design Professional shall schedule and conduct final inspection of the Project, coordinating the date for such inspection with the Owner and with the State Construction Office.

6. The Design-Builder shall assemble written guarantees, affidavits, manuals of instruction for operation, and other required and closing papers of the contractors; issue certificates of final completion, certificates of compliance from various in-house and contract consultants as required by N.C. Gen. Stat. § 133-1.1, final certificates for payment; and set date for beginning of the guarantee period, forwarding all closing papers to the Owner.

j. The Design Professional shall provide the following services during the Post-Construction Phase.

1. Upon completion of the Project, the Design Professional shall correct the drawings to conform to the Project as finally constructed and shall deliver to the Owner and to the State Construction Office corrected record drawings.

2. Prior to final payment to the Design-Builder, the Design Professional shall prepare and deliver to the Owner and to the State Construction Office a final report.

3. The retainage, as defined by Article 31, shall be retained until approval of the record drawings and final report by the State Construction Office and the Owner. Final payment can be made after letter of approval is received by the Owner from the State Construction Office.

k. It is the responsibility of the Designer-Builder to maintain the design schedule documented by the Form of Design Build Construction Contract. If for any reason it appears any phase of the Project will be delayed, the Design-Builder shall notify the Owner and the State Construction Office, in writing, prior to the due date of that phase with an explanation of the reason for the delay. If the delay is approved by the Owner, in consultation with the State Construction Office, the design schedule may be modified, and the agreement amended. Both failure to give the required notification of delay and failure to meet the production schedule constitute failure to perform in accordance with the terms of this contract and the contract may be terminated in accordance with Article 54.a.

l. In the event the Owner, with the approval of the State Construction Office, requests in writing that the Design-Builder provide services beyond the basic design services described in the Request for Qualifications document and the Form of Design-Build Construction Contract, then the Design-Builder may be paid for such additional design services as herein before provided. Additional services, for which additional compensation may be allowed, are as described hereinafter.

1. Revising previously approved design development or working drawings or specifications to accomplish changes ordered by the Owner, except where required to get the cost within the total Project budget.

2. Preparing drawings and specifications for alternate bids for work beyond the scope of that originally contemplated in this Agreement. No additional fee shall apply when alternates are used to ensure the Project is kept within the total Project budget.

3. Other services as may be required will be negotiated.

ARTICLE 16 – DESIGN-BUILD TEAM COMPOSITION

a. The Design-Builder, as part of their formal response to the Request for Qualifications, has identified the Design Professional that will design the Project as part of the Design-Build team. The Design-Builder may not change the Design Professional without the approval of the Owner and the State Construction Office. The Design-Builder shall submit in writing all reasons for changing the Design Professional.

b. As part of the response to the Request for Qualifications, the Design-Builder has clearly outlined which method they will implement for the procurement of subcontractors as identified in N.C. Gen. Stat. § 143-128.1A(c)(8)(a) (hereby defined as “Option A”) or N.C. Gen. Stat. § 143-128.1A(c)(8)(b) (herby defined as “Option B”). The method may not be changed. Methods shall not be combined.

1. Option A: Where the Design-Builder, as part of their formal response to the Request for Qualifications, asserts they will complete the Project’s construction in

accordance with N.C. Gen. Stat. § 143-128.1A(c)(8)(a), the work shall be prosecuted as follows:

i. Using the licensed or unlicensed subcontractors identified in the formal response to the Request of Qualifications. These entities may not change without the approval of the Owner and the State Construction Office. The Design-Builder shall submit in writing all reasons for changing a subcontractor.

ii. Using licensed subcontractors not identified by the formal response to the Request for Qualifications.

iii. Using unlicensed subcontractors not identified in the formal response to the Request for Qualifications.

iv. The Design-Builder may self-perform some or all of the work with employees of the Design-Builder.

v. The Design-Builder may enter into negotiated contracts or accept bids for the selection of one or more of its first-tier subcontractors.

2. Option B: Where the Design-Builder, as part of their formal response to the Request for Qualifications, asserts they will complete the Project's construction in accordance with N.C. Gen. Stat. § 143-128.1A(c)(8)(b), the work shall be prosecuted as follows:

i. The Design-Builder may self-perform some of the work with employees of the Design-Builder.

ii. Using subcontractors selected by a method approved by the Owner and the State Construction Office. The approved method must be based upon the outline strategy provided by the Design-Builder as part of their formal response to the Request for Qualifications and shall be based upon the provisions of Article 8 of Chapter 143 of the North Carolina General Statutes. The Design-Builder shall not enter into negotiated contracts with first-tier subcontractors.

c. When Option A is selected, any negotiated contracts with subcontractors shall be based on their fixed price proposal and taking into consideration the quality, performance, time specified in the proposal, and other factors deemed appropriate by the Owner.

d. When Option A or Option B is selected, any subcontracts that will be bid must comply with N.C. Gen. Stat. § 143-129 and shall be publicly advertised and opened publicly, and once opened, shall be public records under N.C. Gen. Stat. § 132. The Design-Builder shall award the contract to the lowest responsible, responsive bidder, taking into consideration quality, performance, the time specified in the bids for performance of the contract, the time for completion, compliance with N.C. Gen. Stat. § 143-128.2, and other factors deemed appropriate by the Owner and advertised as part of the bid solicitation.

e. When contracts are awarded pursuant to this section, the Owner shall provide for a dispute resolution procedure as provided by N.C. Gen. Stat. § 143-128(f1). This dispute resolution procedure is available to all parties involved in the construction of the Project.

f. The Design-Builder will furnish to the Design Professional or any subcontractor, upon request, evidence regarding amounts of money paid to the Design-Builder on account of the work of the Design Professional or subcontractor.

g. The Design-Builder is and remains fully responsible for his own acts or omissions as well as those of the Design Professional and all subcontractors, or any employee of either. The Design-Builder agrees that no contractual relationship exists between the Design Professional and subcontractors and the Owner in regard to the contract.

ARTICLE 17 – DESIGN-BUILDER AND SUBCONTRACTOR RELATIONSHIPS

a. The Design-Builder agrees that the terms of these Contract Documents shall apply equally to each subcontractor as to the Design-Builder, and the Design-Builder agrees to take such action as may be necessary to bind each subcontractor to these terms. The Design-Builder further agrees to conform to the Code of Ethical Conduct as adopted by the Associated General Contractors of America, Inc., with respect to Design-Builder-subcontractor relationships, and that payments to subcontractors shall be made in accordance with the provisions of N.C. Gen. Stat. § 143-134.1 titled Interest on final payments due to prime contractors: payments to subcontractors.

b. 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 N.C. Gen. Stat. § 136-28.1, the balance due the Design-Builder shall be paid in full within forty-five (45) days after respective contracts of the Project have been accepted by the Owner, certified by the Design Professional 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 Owner and State Construction Office determine that delay in completion of the Project in accordance with terms of the plans and specifications is the fault of the Design-Builder, 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 forty-five (45) day limit. Should final payment to the Design-Builder beyond the date the 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 forty-five (45) days, the Design-Builder shall be paid interest, beginning on the forty-sixth (46^{th}) 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 the Design-Builder during construction shall be paid in accordance with the payment provisions of the Contract Documents or the Design-Builder 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.

c. Within seven (7) days of receipt by the Design-Builder of each periodic or final payment, the Design-Builder shall pay the subcontractors based on work completed or service provided under their contract with the Design-Builder. Should any periodic or final payment to a subcontractor be delayed by more than seven days after receipt of

periodic or final payment by the Design-Builder, the Design-Builder 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.

d. The percentage of retainage on payments made by the Design-Builder to the subcontractors shall not exceed the percentage of retainage on payments made by the Owner to the Design-Builder as outlined by Article 31. Any percentage of retainage on payments made by the Design-Builder to the subcontractor that exceeds the percentage of retainage on payments made by the Owner to the Design-Builder shall be subject to interest to be paid by the Design-Builder to the subcontractor at the rate of one percent (1%) per month or fraction thereof.

e. Nothing in this section shall prevent the Design-Builder at the time of application and certification to the Owner from withholding application and certification to the Owner for payment to a 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 the subcontractor to make timely payments for labor, equipment and materials; damage to Design-Builder or another subcontractor; reasonable evidence that a subcontractor 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 – DESIGN-BUILDER AND DESIGN PROFESSIONAL RELATIONSHIP

a. The Design-Builder shall contract with the licensed Design Professional identified in their formal response to the Request for Qualifications. The Design Professional has authority to notify the Design-Builder and the Owner of work that needs to be removed, corrections to faulty work or other such actions that may be necessary to assure successful completion of the work.

b. The Design Professional, even while contracted for services with the Design-Builder, shall maintain a position of an 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 Design-Builder, taking sides with neither.

c. The Design Professional and the Owner shall have access to the work whenever it is in preparation and progress during normal working hours. The Design-Builder shall provide facilities for such access so the Design Professional and Owner may perform their functions under the Contract Documents.

d. Based on inspections and evaluations, the Design Professional shall issue interpretations, directives, and decisions to ensure the full compliance with the Contract Documents.

e. The Owner’s decisions relating to artistic effect and technical matters shall be final, provided such decisions are within the limitations of the contract. The Design-Builder’s decisions, however, relating to means and methods, and administration of the contracts the Design-Builder holds are final.

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 Design-Builder 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 in the GMP contract shall be made by the Design-Builder except upon receipt of approved change order or written construction change directive generated by the Design-Builder, 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.

   1. A construction change directive, transmitted digitally or hand delivered may be used where the change involved impacts the critical path of the work. A formal Change Order shall be issued within the time stated on the construction change directive.

   2. The Design-Builder may be requested to make a change to the work by the Owner where such work is to be funded by the Design-Builder Contingency or Project Reserve that is part of the GMP contract. Such a change must be documented in the same manner as a Change Order and must be authorized in writing by the Owner by a Field Change document.

   3. In the event of emergency endangering life or property, the Design-Builder may be directed to proceed on a time and material basis whereupon the Design-Builder shall proceed and keep accurately on such form as may be required, 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, the Design-Builder and subcontractors are restricted to the use of the following methods:

   1. Where the extra work involved is covered by unit prices quoted in the proposal, 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. Otherwise, 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 Method "c(2)" above, the allowances for overhead and profit combined shall be as follows: the Design-Builder, his subcontractors (1st tier subs), or their sub-subcontractors (2nd tier subs, 3rd tier subs, etc.) shall be allowed a maximum of ten percent (10%) on work they each self-perform; the Design-Builder shall be allowed a maximum of five percent (5%) on contracted work of his 1st tier sub; 1st tier, 2nd tier, 3rd tier, etc. contractors shall be allowed a maximum of two and one half percent (2.5%) on the contracted work of their subs. In no instance shall the total payments for overhead and profit on a single change order exceed fifteen percent (15%). No additional allowances for overhead and profit shall be allowed. 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 Project;
2. The actual costs of labor expended 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 forty percent (40%) 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 Project;
5. The actual costs of premiums for bonds, insurance, permit fees and sales or use taxes related to the Project.

Overtime and extra pay for holidays and weekends may be a cost item only to the extent approved by the Owner. A cost for acceleration shall only be considered in specialty cases and must be approved by the Owner and State Construction Office.

f. Should reasonably unforeseeable 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 breakdown showing method of arriving at net cost as defined above.

g. In all change orders, the procedure will be for the Design-Builder or the Owner to request proposals for the change order work in writing. The Design-Builder will require the subcontractors to provide such proposals and supporting data in suitable format and will review and approve such change orders prior to submission to the Owner. The Design Professional shall verify correctness and make a recommendation to the Owner. If the Owner agrees with the Design Professional's recommendation, they shall execute the change order and forward to the State Construction Office for final approval**,** within fourteen (14) days of receipt or forward a response to the Design-Builder within the same time period. The State Construction Office shall act on the change order within seven (7) days. Upon approval by the State Construction Office, the State Construction Office shall distribute to the Owner for distribution to the Design-Builder and the surety. 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 Design-Builder 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 Design-Builder's terms are unacceptable, the Owner**,** with the approval of the State Construction Office, may require the Design-Builder to perform such work on a time and material basis in accordance with paragraph "b" 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 Design-Builder consider that as a result of any instructions given in any form by the Owner, he is entitled to extra cost above that stated in the contract, he shall give written notice thereof to the Owner within seven (7) days without delay. The written notice shall be a stand-alone document, shall clearly state that a claim for extra cost is being made, and shall provide a detailed justification for the extra cost. The Design-Builder 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 will be considered unless the claim is so made. The Owner shall render a written decision within fourteen (14) days of receipt of claim.

b. The Design-Builder shall not act on instructions received from persons other than the Owner, and any claims for extra compensation or extension of time on account of such instruction will not be honored. The Owner will not be responsible for misunderstandings claimed by the Design-Builder 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 by the Design-Builder be denied by the Owner, the Design-Builder shall request informal mediation by a representative of the State Construction Office. If the claim remains unresolved, the Design-Builder shall request a formal mediation with an independent mediator as provided by N.C. Gen. Stat. § 143-128(f1) and 1 N.C. Admin. Code 30H.0101 *et. seq.*, the dispute resolution rules adopted by the State Building Commission. If the Design-Builder is unable to resolve its claims as a result of mediation, then the Design-Builder shall pursue his claim in accordance with the provisions of N.C. Gen. Stat. § 143-135.3 and the following:

1. A Design-Builder who has not completed a contract with a state agency or institution 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 Design-Builder 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 N.C. Gen. Stat. § Chapter 150B.

2. Design-Builder who has completed a contract with a State agency or institution 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 Design-Builder claims is due. The verified written claim shall be submitted within sixty (60) days after the Design-Builder receives a final statement of the Owner's decision of his claim and shall state the factual basis for the claim.

3. The Design-Builder may appear before the Director, either in person or through counsel, to present facts and arguments in support of the verified written claim. The Director may allow, deny, or compromise the verified written claim, in whole or in part. The Director shall give the contractor a final written decision, allowing or denying those portions of the contractor's claim that have not been previously compromised.

   i. If the verified written claim was originally for an amount less than one hundred thousand dollars ($100,000), the Director shall investigate and issue a final written decision allowing or denying the verified written claim, in whole or in part, within 120 days of receipt of the contractor's verified written claim.

   ii. If the verified written claim was originally for an amount of at least one hundred thousand dollars ($100,000) but less than five million dollars ($5,000,000), the Director shall investigate and issue a final written decision allowing or denying the verified claim, in whole or in part, within 180 days of receipt of the contractor's verified written claim.

   iii. If the verified written claim was originally for an amount of five million dollars ($5,000,000) or more, the Director shall investigate and issue a final written decision allowing or denying the verified written claim, in whole or in part, within 270 days of receipt of the contractor's verified written claim.

   Prior to the expiration of the time periods provided in this section, the Director and Design-Builder may, in writing, extend the time in which the Director shall issue a final written decision. The Director's failure to issue a final written decision as provided in this section, or at the expiration of the agreed-upon extended time, shall be deemed a denial of the portions of the verified written claim not previously compromised.

4. A Design-Builder who is dissatisfied with the Director's final written decision on a verified claim, or any portion of a verified written claim, submitted under this section may commence a contested case on the claim under Chapter 150B of the North Carolina General Statutes. The contested case shall be commenced within sixty (60) days of receiving the Director's written statement of the decision.

5. As to any portion of a verified claim that is denied by the Director, the Design-Builder may, in lieu of filing a contested case under Chapter 150B of the North Carolina General Statutes, within six (6) months of receipt of the Director's final written 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 Owner 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 affected by written order, copied to the State Construction Office, and shall be binding on the Owner and the Design-Builder.

ARTICLE 22 - UNCORRECTED FAULTY WORK

Should the correction of faulty or damaged work be considered inadvisable or inexpedient by the Owner, in consultation with the State Construction Office, the Owner shall be reimbursed by the Design-Builder. 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 Design-Builder shall commence Design Phase work to be performed under its agreement upon execution of the Design-Build Construction Contract. The Design-Builder shall commence Construction Phase work to be performed upon acceptance of the GMP by the Owner. The Design-Builder may not begin construction efforts until after corresponding construction documents have been approved by the State Construction Office.

b. The Contract Completion date will be determined by the Owner and Design-Builder and recorded by the Design-Build Construction Contract. If the Project is delayed, for each day in excess of Contract Completion date, the Design-Builder shall pay the Owner the sum stated as liquidated damages reasonably estimated in advance to cover the loses to be incurred by the Owner by reason of failure of the Design-Builder to complete the work within the time specified, such time being in the essence of this contract and a material consideration thereof.

c. If the Design-Builder is delayed at any time in the progress of his work by any act or negligence of 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 Design-Builder's control; or by any other causes which the Owner determines may justify the delay, then the contract time may be extended by change order for the time which Owner, in consultation with State Construction, may determine is reasonable and is supported by schedule analysis from the Design-Builder demonstrating delays/impacts to completing critical path activities in the schedule submitted under Article 14 (including but not limited to delayed starts, finishes and/or extended durations, etc.)

   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 Design-Builder reflecting the effect of the weather on progress of the work and initialed by the Owner. Time extensions for weather delays do not entitle the Design-Builder to "extended overhead" recovery. No

weather delays will be considered after the building is dried in unless work claimed to be delayed is on the critical path of the approved baseline schedule or approved updated schedule. Time extensions for acts of God, pandemics, epidemics, government ordered shutdowns or lockdowns, labor disputes, fire, delays in transportation, unavoidable casualties or other delays which are beyond the control of the Owner do not entitle the Design-Builder to compensable damages for delays. Any claim for compensable damages for delays is limited to delays caused solely by the Owner. In the case of concurrent delays, Design-Builder caused delays shall be accounted for before Owner caused delays.

d. Request for extension of time shall be made in writing within twenty (20) days following cause of delay and shall include supporting schedule analysis referenced in paragraph (c) above and as required by the specifications. In case of continuing cause for delay, the Design-Builder shall notify the Owner of the delay within twenty (20) days of the beginning of the delay and only one claim is necessary.

e. The Design-Builder shall notify his surety in writing of extension of time granted.

ARTICLE 24 - PARTIAL UTILIZATION/BENEFICIAL OCCUPANCY

a. The Owner may desire to occupy or utilize all or a portion of the Project when the work is substantially complete.

b. The Owner, with the approval of the State Construction Office, may request the Design-Builder in writing, to permit him to use a specified part of the Project which may be used without significant interference with construction of the other parts of the Project. If the Design-Builder agrees, and after the Design Professional has confirmed in a written statement to the Owner that the work in the specified area is complete, the Design-Builder will schedule a beneficial occupancy inspection at a time and date acceptable to the Design Professional, Owner, and State Construction. The Design-Builder shall prepare a certificate of partial utilization prior to the beneficial occupancy inspection establishing, among other things, the following:

1. Date of beneficial occupancy.

2. A tentative list of items to be completed or corrected before final payment.

3. Establishing responsibility between the Design-Builder and Owner for maintenance, heat, utilities, and insurance.
4. Establishing the date for guarantees and warranties under terms of the contract.

5. Consent of surety.

6. Endorsement from insurance company permitting occupancy.

c. The Owner shall have the right to exclude the Design-Builder from any part of the Project which the Project Designer has so certified to be substantially complete, but the Owner will allow the Design-Builder 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 Design-Builder from his contractual requirement to complete the Project within the specified time. The Design-Builder will not be relieved of liquidated damages because of beneficial

occupancy. The Owner may prorate liquidated damages based on the percentage of Project occupied.

ARTICLE 25 - FINAL INSPECTION, ACCEPTANCE, AND PROJECT CLOSEOUT

a. Upon notification from the Design-Builder that the Project is complete and ready for inspection, the Design Professional shall make a preliminary final inspection to verify that the Project is complete and ready for final inspection. Prior to final inspection, the Design-Builder shall ensure that all items requiring corrective measures noted at the preliminary inspection are complete. After the Design Professional has confirmed that the work is complete in a written statement to the Owner, the Design-Builder shall schedule a final inspection at a time and date acceptable to the Owner, the Design Professional, and the State Construction Office.

b. At the final inspection, the Design Professional 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 final inspection, the Design Professional and State Construction Office representative shall make the following determinations:

    1. That the Project is completed and accepted.

    2. That the Project is accepted subject to the list of discrepancies (punch list). All punch list items must be completed within thirty (30) days of acceptance, or the Owner may invoke Article 28, Owner's Right to Do Work.

    3. That the Project is not complete and another date for a final inspection will be established.

c. Within fourteen (14) days of acceptance per Paragraph b.1 or within fourteen (14) days after completion of punch list per Paragraph b.2 above, the Design Professional shall certify the work and issue applicable certificate(s) of compliance.

d. Any discrepancies listed or discovered after the date of final inspection and acceptance under Paragraphs b.1 or b.2 above shall be handled in accordance with Article 42.

e. The date of acceptance will establish the following:

    1. The beginning of guarantees and warranties period.

    2. The date on which the Design-Builder’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 Design-Builder (if applicable).

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 Design Professional or Owner, in consultation with the State Construction Office, shall be promptly removed from the work site by the Design-Builder, and shall be immediately replaced by new work in accordance with the contract at no additional cost to the Owner. Work

or property of the Owner, damaged or destroyed by virtue of such faulty work, shall be made good at the expense of the Design-Builder.

b. Correction of condemned work described above shall commence within twenty-four (24) hours after receipt of notice from the Design Professional or Owner and shall make satisfactory progress until completed.

c. Should the Design-Builder 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, shall relieve the Design-Builder from responsibility for negligence, or faulty material or workmanship, or failure to comply with the drawings and specifications. The Design-Builder shall correct or make good any defects due thereto and repair any damage resulting therefrom, 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 Design-Builder and establish a time limit for completion of corrections by the Design-Builder. The Owner will determine 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 Design-Builder fails to prosecute the work properly or to perform any provision of the contract, the Owner, after seven (7) days written notice delivered in person to the Design-Builder or sent by certified mail, return receipt requested, to the Design-Builder, 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 Design-Builder, such action and cost of same having been first approved by the Owner, in consultation with the State Construction Office. Should the cost of such action of the Owner exceed the amount due or to become due to the Design-Builder, then the Design-Builder 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 Design-Builder fails:

1. to begin the work under the contract within the time specified;
2. to establish a GMP;
3. to obtain bids from or enter into contracts with qualified subcontractors within the GMP;
4. to progress the work or maintain the schedule;
5. to complete the work within the time above specified;
6. to perform the work with sufficient workmen and equipment or with sufficient materials to ensure the prompt completion of said work;
7. to perform the work suitably;
8. to continue the prosecution of the work; or
9. to carry on the work in an acceptable manner for any other cause whatsoever.

Then the Owner may give notice in writing of its intent to annul the Construction Contract, sent by certified mail, return receipt requested, to the Design-Builder and its surety, due to the delay, neglect, or default of the Design-Builder specified in the notice.

The Design-Builder shall have a period of seven (7) days after such Notice of Intent to resolve, or to propose a plan to resolve, to the satisfaction of the Owner, the delay, neglect, or default identified in the Notice of Intent. If a resolution is not forthcoming from the Design-Builder to the satisfaction of the Owner within the time allowed, then the Owner shall issue a written Notice of Annulment, sent by certified mail, return receipt requested, to the Design-Builder and his surety, declaring the Construction Contract in default and demanding the surety to promptly take over the work within seven (7) days after the Notice of Annulment and complete the performance of this contract, with other forces than that of the Design-Builder, in the manner specified and within a time frame agreed upon by the surety and the Owner.

In the event the surety fails to take over the work to be done within the time provided, fails to notify the Owner in writing, sent by certified mail, return receipt requested, that the surety is taking over the work, and fails to agree upon a timeframe for the completion of the Project, 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 Design-Builder, to appropriate or use any or all contract materials and equipment on the Project site 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 the 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 to said Design-Builder and surety. If the expense so incurred by the Owner is less than the sum which would have been payable under the contract if it had been completed by said Design-Builder, then the said Design-Builder and surety shall be entitled to receive the difference. If the expense exceeds the sum which would have been payable under the contract, then the Design-Builder and the surety shall be liable to the Owner for the excess and shall pay to the Owner the amount of said excess.

ARTICLE 30 – DESIGN-BUILDER'S RIGHT TO STOP WORK OR TERMINATE THE CONTRACT

a. If the Owner should fail or refuse to make payment on account of a certificate issued within forty-five (45) days after receipt of same, then the Design-Builder, after fifteen (15) days' written notice sent by certified mail, return receipt requested, to the Owner, may suspend operations on the work or terminate the contract.
b. The Owner shall be liable to the Design-Builder for the cost of all materials delivered and work performed on this contract plus ten (10) percent overhead and profit and shall make such payment.

ARTICLE 31 - REQUEST FOR PAYMENT

a. Based on applications for payment submitted to the Design Professional by the Design-Builder and certificates for payment issued by the Design Professional, the Owner shall make progress payments on account of the contract sum to the Design-Builder as provided below and elsewhere in the Contract Documents. The period covered by each application for payment shall be one calendar month ending on the last day of the month.

b. Not later than the fifth (5th) day of the month, the Design-Builder shall submit to the Owner a request for payment for work done during the previous month. The Owner shall make payment to the Design-Builder within thirty (30) calendar days.

c. Prior to submitting the first construction phase payment request, the Design-Builder shall prepare a schedule showing a breakdown of the contract price into values of the various parts of the GMP contract. This schedule of values will be submitted to and approved by the Project Designer and Owner within 30 days. The Cost of the Work breakdown will be arranged to facilitate payments to the subcontractors in accordance with Article 17. The combined Design-Builder Construction Fee, remaining Design Phase fees, Bonds & Insurance, Design-Builder Contingency, and Project Reserve (if any) will be shown on the Schedule of values as separate lines. The values for the Design-Builder Contingency and Project Reserve (if any) will move to appropriate lines within the Cost of the Work as those funds are committed and expended. The schedule of values shall be prepared in such form and supported by such data to substantiate its accuracy as the Owner may require.

d. The Design Professionals certification for payment shall be based upon their on-site inspection and the documentation submitted by the Design-Builder with the application for payment. Applications for payment shall be in a form agreed upon by the Design-Builder, and Owner and shall be prepared and supported by such data to substantiate the accuracy of the request as the Owner may require.

e. Subject to other provisions of the Contract Documents, the amount of each progress payment shall be computed as follows:

    1. Take that portion of the GMP properly allocable to completed work as determined by multiplying the percentage completion of each portion Cost of the Work by the share of the GMP allocated to that portion of the work in the schedule of values.

    2. Add that portion of the GMP properly allocable to materials and equipment delivered and suitably stored at the site for subsequent incorporation in the work or if approved in advance by the Owner, suitably stored off site at a location agreed upon in writing.

    3. Subtract the aggregate of previous payments made by the Owner.

    4. Subtract the amount, in any, by which the Design-Builder has been previously overpaid, as evidenced by the Owner's review of the Design-Builder's documentation.

    5. Subtract amounts, if any, for which the Owner has withheld or nullified a certificate of payment.

    6. Subtract retainage as per paragraph (f) or (g) below.

    7. Add the amount due for the Design-Builder Fees calculated on the basis the percentage completion of the Project or on a schedule of payment negotiated with the Owner less fifteen percent (15%) and less previous payments for Design-Builder Fee.

f. Payment allocated to subcontractors shall be subject to five percent (5%) retainage, provided, however that after fifty percent (50%) of the Cost of the Work has been

satisfactorily completed on schedule, with the approval of the Owner and the State Construction Office and with 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. The balance of the Design-Builder Fee, withheld in accordance with Subsection e.7 above, shall be held by the Owner until satisfactory completion and close out of the Project. Satisfactory completion and close out of the Project means that the Owner and Design-Builder are satisfied that the Project has been completed in accordance with the plans and specifications and within the GMP, all general conditions of the contract pertaining to close out have been satisfied, and all subcontractors have satisfactorily completed their respective contracts. No retainage will be held for the cost of Bonds and Insurance.

g. Notwithstanding Article 31.f, full payment, less authorized deductions, shall be made for subcontractors that have reached one hundred percent (100%) completion of their contract by or before the Project is fifty percent (50%) complete if the contractor has performed satisfactorily as judged by the Design-Builder and Owner. Payment to the early finishing trades is contingent upon the surety's consent and the Owner's receipt of a trade specific Certificate of Compliance from the Design Professional, co-signed by the State Construction Office, documenting that the contractors work is complete, acceptable, and in full compliance with the Contract Documents. At that time, the owner shall reduce the retainage for the trade to five-tenths percent (0.5%) of the contract. Early finishing trades under this subsection shall be identified by the Design-Builder's GMP contract and may include, but are not limited to, structural steel, piling, caisson, aggregate piers, and demolition. The Design-Builder shall provide milestone dates on their schedule identifying when Owner and/or State Construction inspections are required prior to officially accepting the early trade work.

h. Payment may be sought for materials or equipment that have been customized or fabricated specifically for this project ("Stored Materials") as provided herein.

    1. When payment is made on account of Stored Materials, such materials must be stored on the project site or on the Owner's property. The request for payment shall be accompanied by invoices or bills of sale or other evidence to establish the owner's title to such materials and equipment. Such Stored Materials shall not be removed from the owner's property.

    2. Should the space for storage on the project site or on the Owner's property be limited, the Design-Builder, at their option, shall be permitted to store such materials or equipment in a warehouse, or warehouses upon special approval, located in North Carolina within one hundred and twenty (120) miles of the project site or at the point of manufacture if located in the United States. Raw materials or commodity products including but not limited to piping, conduit, CMU, metal studs, tile, and gypsum board may not be submitted. To utilize this storage option:

        (a) The need for offsite stored materials shall be presented by the Design-Builder, and approved by the Owner in writing, during the design / preconstruction phase of the project. The Design-Builder shall include the stored materials plan in their GMP proposal (i.e. construction phase) for SCO approval. Unique circumstances requiring offsite Stored Materials that

arise during the construction phase may be considered with approval by the Owner and the State Construction Office.

(b) The Design-Builder shall obtain the written consent of their bonding and insurance companies, designer, Owner, and the State Construction Office as to the specific storage facility to be used.

(c) The Design-Builder shall establish title to the Stored Materials in the name of the Owner, supported by a warehouse receipt, which shall unconditionally give the Owner the right to remove the Stored Materials at any time.

(d) The warehouse receipt shall contain an inventory of the Stored Materials. Additionally, the Design-Builder shall provide the Owner with a detailed inventory of all materials stored, including invoices, and a detailed description sufficient to identify the Stored Materials, including the location in the storage facility, such that the Owner can confirm the location and condition of the Stored Materials at any time.

(e) The Design-Builder shall establish and verify that the Stored Materials are not being commingled with materials from other projects or any other materials.

(f) The Design-Builder shall provide proof of insurance covering the Stored Materials against casualty, inclement weather, and theft, including but not limited to damage and loss in transit, which shall identify the Owner as a beneficiary.

(g) The Design-Builder shall provide evidence that satisfactory measures are being taken by the storage facility to protect against theft, casualty, or deterioration of the Stored Materials.

(h) Stored Materials shall not be stored more than 180 calendar days between purchase and incorporation into the project. Special circumstances may be considered with approval by the Owner and the State Construction Office.

(i) The total aggregate value of Stored Materials in storage at any time shall not exceed 25% of the CM's contracted cost of work amount for the project.

(j) Stored Materials shall not be moved except for transportation to the project site, or with written consent of the Owner.

3. In all instances, responsibility for Stored Materials shall remain with the Design-Builder regardless of ownership or title until the Project has been accepted. Any delays associated with the storage or transport of the Stored Materials, including but not limited to damage, fire, flood, theft, and bankruptcy, are the responsibility of the Design-Builder.

4. Payment for Stored Materials shall be conditioned on the Designer's representation to the Owner that it has inspected the materials and equipment and found it to be free of defects and otherwise in conformity with the

Specifications and Contract Documents, and on satisfactory evidence of the Design-Builder's compliance with this Article. The means and methods of the Designer's inspection under this Article shall be jointly determined by the Design-Builder and Owner.

i. In the event of beneficial occupancy, retainage of funds due the Design-Builder 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 Design-Builder's bonding company.

ARTICLE 32 - CERTIFICATES OF PAYMENT AND FINAL PAYMENT

a. Within five (5) days from receipt of request for payment from the Design-Builder, the Design Professional shall issue and forward to the Owner a certificate for payment. This certificate shall indicate the amount requested or as approved by the Design Professional. If the certificate is not approved by the Design Professional, he shall state in writing to the Design-Builder 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 Design-Builder.

   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 Design-Builder except those claims previously made and remaining unsettled (Article 20.c).

d. Prior to submitting request for final payment to the Design Professional for approval, the Design-Builder shall fully comply with all requirements specified in the "Project closeout" section of the specifications. These requirements include but are 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 Project 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 the Design Builder's records, if the State Auditor, the Owner's internal auditors, or the Joint Legislative Commission on Governmental Operations have made a request for such access pursuant to Article 52.

e. The Design-Builder shall submit the final application for payment along with the following documents:

1. List of minority business subcontractors and material suppliers showing breakdown of contracts amount.

2. Affidavit of Release of Liens.

3. Affidavit from Design-Builder 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 Owner will not authorize final payment until the work under contract has been certified by the Design Professional, certificates of compliance issued, and the Design-Builder has complied with the closeout requirements.

ARTICLE 33 - PAYMENTS WITHHELD

a. The Owner 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 Owner, in consultation with State Construction.

3. To provide for sufficient contract balance to cover liquidated damages that will be assessed against the Design-Builder.

b. The Owner may withhold all or a portion of Design-Builder Construction Fee costs set forth in the approved schedule of values, if the Design-Builder has failed to comply with: (1) a request to access its records by the State Auditor, the Owner's internal auditors, or the Joint Legislative Commission on Governmental Operations pursuant to Article 52; (2) a request for a plan of action and/or recovery schedule under Article 14.g; (3) a request to provide an electronic copies of Design-Builder's baseline schedule, updates with all logic used to create the schedules in the original format of the scheduling software; (4) the Design-Builder's failure to have its Superintendent on the Project full-time; or (5) the Design-Builder changes Project Superintendents and fails to notify the owner in writing of the change.

c. The Secretary of the Department of Administration may authorize the withholding of payment for the following reasons:

1. Claims files against the Design-Builder or evidence that a claim will be filed.

2. Evidence that a subcontract has not been paid.

d. When grounds for withholding payments have been removed, payment will be released. Delay of payment due the Design-Builder without cause will make Owner liable for payment of interest to the contractor as provided in N.C. Gen. Stat. § 143-134.1. As provided in N.C. Gen. Stat. § 143- 134.1(e) the owner shall not be liable for interest on payments withheld by the owner for unsatisfactory job progress, 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 Design-Builder has verified to the Owner that all required insurance and verifying certificates of insurance have been obtained and approved in writing by the Owner. A cancellation endorsement shall be provided for all required policies that contains a provision that coverages afforded under the policy will not be cancelled, reduced in amount or coverages eliminated until at least thirty (30) days after giving written notice, has been delivered or mailed to the insured and the Owner, of such alteration or cancellation.

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

The Design-Builder shall ensure that it and all subcontractors shall provide and maintain, during the life of the contract, 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 Design-Builder shall ensure that it and all subcontractors shall provide and maintain, during the life of the contract, 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 Liability: $1,000,000 for each person and $1,000,000 for each accident
Property Damage Liability: $1,000,000 for each accident and $3,000,000 for the aggregate of operations

In lieu of limits listed above, a $3,000,000 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 Design-Builder shall ensure that it and all subcontractors shall purchase and maintain property insurance during the life of this contract, upon the entire work at the site to the full insurable value thereof. This insurance shall include the interests of the Owner, the Design-Builder, and subcontractors in the work and shall insure against the

perils of fire, extended coverage, and vandalism and malicious mischief. If the Owner is damaged by failure of the Design-Builder to purchase or maintain such insurance, then the Design-Builder shall bear all reasonable costs properly attributable thereto; the Design-Builder 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. **Automobile Liability Insurance**

Automobile Liability covering vehicles owned, and non-owned vehicles used, by the Design-Builder with policy limits of not less than One Million ($1,000,000.00) per accident, for bodily injury, death of any person, and property damage arising out of the ownership, maintenance, and use of those motor vehicles along with any other statutorily required automobile coverage.

e. **Professional Liability**

The Design-Builder, which includes the prime designer and all his consultants on the Design-Build team, shall each carry a minimum of $1,000,000 of professional liability.

f. **Deductible**

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

g. **Other Insurance**

The Design-Builder shall ensure that it and all subcontractors shall obtain such additional insurance as may be required by the Owner or by the North Carolina General Statutes including motor vehicle insurance, in amounts not less than the statutory limits.

h. **Proof of Carriage**

The Design-Builder shall ensure that it and all subcontractors 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. The Design-Builder 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, which shall be in the amount of the GMP for the entire Project. Bonds shall be executed in the form bound with the 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 – DESIGN-BUILDER'S AFFIDAVIT

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

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

ARTICLE 37 - ASSIGNMENTS

The Design-Builder 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 Design-Builder under the contract may be assigned.

ARTICLE 38 - USE OF PREMISES

a. The Design-Builder 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 Owner and shall not exceed those established limits in his operations per the Owner approved Design-Builder's logistics plan.

b. The Design-Builder shall not load or permit any part of the structure to be loaded with a weight that will endanger its safety.

c. The Design-Builder shall enforce the 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 Design-Builder shall ensure that all cutting, fitting, or patching that may be required to make the work 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 Design Professional may direct.

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

c. No subcontractor shall endanger any work of another subcontractor by cutting, digging or other means, nor shall they cut or alter the work of any other subcontractor without the consent of the Design-Builder and the affected subcontractor(s).

ARTICLE 40 - UTILITIES, STRUCTURES, SIGNS

a. The Design-Builder shall provide necessary and adequate facilities for water, electricity, gas, oil, sewer, and other utility services, which may be necessary and required for completion of the Project. If the Owner specifies that the Design-Builder is to pay all utilities, any permanent meters installed shall be listed in the Design-Builder's name until his work is fully accepted by the Owner. The Design-Builder shall pay all utilities cost unless agreed otherwise by the Owner and Design-Builder in writing. The Owner or Design-Builder, as applicable, may recover actual costs of metered utilities from the responsible party should delays occur in Project completion.

b. If applicable, meters shall be relisted in the Owner's name on the day following completion and acceptance of the Design-Builder's work, and the Owner shall pay for services used after that date.

c. Prior to the operation of permanent systems, the Design-Builder will provide temporary power, lighting, water, and heat to maintain space temperature above freezing, as required for construction operations.

d. The Design-Builder 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 Design-Builder and the owner. Use of the equipment in this manner shall in no way affect the warranty requirements of the Design-Builder.

e. The Design-Builder shall coordinate the work so that the building's permanent power wiring distribution system shall be in sufficient readiness to provide power as required by the HVAC contractor for temporary climatic control.

f. The Design-Builder shall coordinate the work so that the building's permanent lighting system shall be ready at the time interior painting and finishing begins and shall provide adequate lighting in those areas where interior painting and finishing is being performed.

g. The Design-Builder 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 acceptance of work by the Owner, the Design-Builder shall coordinate the removal and replacement of any parts of the permanent building systems damaged through use during construction.
    2. Temporary filters 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 Design-Builder shall ensure that all lamps are in proper working condition at the time of final Project acceptance.

h. The Design-Builder 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.

i. Where directed, the Design-Builder shall 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 Design Professional so direct.

j. On multi-story construction projects, the Design-Builder shall either provide or ensure that temporary elevators, lifts, or other necessary special equipment is available for the general use of all contractors. The cost for such elevators, lifts or other special equipment and the operation thereof shall be included as part of the work of a Principal Trade or Specialty Contractor and paid for as a part of the Cost of the Work.

k. The Design-Builder 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 Design-Builder's name, and the name of the Design Professional. 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 Design-Builder shall ensure that the building and surrounding area is 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 Owner. The Design-Builder shall provide an on-site refuse container(s) for the use of all subcontractors. The Design-Builder shall ensure that each subcontractor removes their rubbish and debris from the building on a daily basis. The Design-Builder shall ensure that the building is broom cleaned as required to minimize dust and dirt accumulation.

b. The Design-Builder shall provide and maintain suitable all-weather access to the building.

c. Before final inspection and acceptance of the building, or partial beneficial acceptance of an identified area within the building, the Design-Builder shall ensure that all portions of the work are clean, 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 Design-Builder shall unconditionally guarantee materials and workmanship against any 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 and shall replace such defective materials or workmanship without cost to the Owner. The Owner and Design-Builder shall conduct a formal walk of the project around the 11-month warranty period dated from Beneficial or Final Completion date(s) to establish an agreeable warranty list to be completed within the warranty period.

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.

c. The Owner may seek legal and equitable remedies for defects that were hidden or not readily apparent to the Owner (i.e. latent) 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 specification 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 Design-Builder shall indemnify and hold harmless the Owner, and the agents, consultants and employees of the Owner, 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 therefrom, and (2) is caused in whole or in part by any negligent act or omission of the Design-Builder, the Design-Builder's subcontractor, or the agents of the Design-Builder . 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 Design-Builder's statements:

Design-Builders performing contracts for state agencies shall ensure that the subcontractors provide information to allow the Design-Builder to give the state agency for whose project the materials, supplies, fixtures and/or equipment was purchased a signed statement containing the information listed in N.C. Gen. Stat. § 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 subcontractors 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 subcontractor's warehouse stock and the amount of county sales or use tax paid thereon by the Design-Builder.

Subcontractors 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 THE HANDICAPPED

The Design-Builder agrees not to discriminate against any employee or applicant for employment because of physical or mental handicap in regard to any position for which the employee or applicant is qualified. The Design-Builder agrees to take affirmative action to employ, advance in employment and otherwise treat qualified handicapped individuals without discrimination based upon their physical or mental handicap 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. N.C. Gen. Stat. § 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. Design-Builder shall be responsible to have all areas that will be impacted by the construction tested for ACM and removed per federal and state laws, criteria, and guidelines.

ARTICLE 49 - MINORITY BUSINESS PARTICIPATION

N.C. Gen. Stat. § 143-128.2 establishes a ten percent (10%) goal for participation by minority businesses in total value of work for each State building project and requires documentation of good faith efforts for meeting that goal. The document, *Guidelines for Recruitment and Selection of Minority Businesses for Participation in State Construction Contracts* including Affidavits and Appendix F are hereby incorporated into and made a part of this contract.

When Article 16 requires subcontracts be publicly bid, the Owner shall require the Design-Builder to submit a plan for compliance with N.C. Gen. Stat. § 143-128.2 by approval by the Owner prior to soliciting bids for the subcontractors. The Design-Builder and subcontractors shall make a good faith effort to recruit and select minority businesses for participation in contracts pursuant to N.C. Gen. Stat. § 143-128.2.

ARTICLE 50 – DESIGN-BUILDER EVALUATION

The Design-Builder'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 compete for future capital improvement projects for institutions and agencies of the State of North Carolina. In addition to final evaluation, an interim evaluation may be prepared during the progress of the Project. The documents, Contractor Evaluation Procedures and Designer Evaluation Procedures, are hereby incorporated and made a part of this contract. The Owner may request the Design-Builder's comments to evaluate the Design Professional. The Owner may request the Design Professional's comments to evaluate the Design-Builder.

ARTICLE 51 – GIFTS

N.C. Gen. Stat. § 133-32 and Executive Order 24 prohibit the offer to, or acceptance by, any state employee of any gift from anyone with a contract with the state, or from any person seeking to do business with the State. By execution of any response in this contract, you attest, for your entire organization and its employees or agents, that you are not aware that any such gift has been offered, accepted, or promised by any employees of your organization.

ARTICLE 52 – AUDITING-ACCESS TO PERSONS AND RECORDS

a. In accordance with N.C. Gen. Stat. § 147-64.7, the State Auditor shall have access to Design-Builder's officers, employees, agents and/or other persons in control of and/or responsible for the Design-Builder's records that relate to this contract for purposes of conducting audits under the referenced statute. The Owner's internal auditors shall also have the right to access and copy the Design-Builder's records relating to the contract and the 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 Design-Builder'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.

b. The following entities may audit the records of this contract during and after the term of the contract to verify accounts and data affecting fees or performance:

   1. The State Auditor.

   2. The internal auditors of the affected department, agency or institution.

   3. The Joint Legislative Commission on Governmental Operations and legislative employees whose primary responsibility is to provide professional or administrative services to the Commission.

c. The Joint Legislative Commission on Governmental Operations has the authority to:

   1. Study the efficiency, economy and effectiveness of any non-State entity receiving public funds.

   2. Evaluate the implementation of public policies, as articulated by enacted law, administrative rule, executive order, policy, or local ordinance, by any non-State entity receiving public funds.

   3. Investigate possible instances of misfeasance, malfeasance, nonfeasance, mismanagement, waste, abuse, or illegal conduct by officers and employees of a non-State entity receiving, directly or indirectly, public funds, as it relates to the officer's or employee's responsibilities regarding the receipt of public funds.

   4. Receive reports as required by law or as requested by the Commission.

   5. Access and review:

      (a) Any documents or records related to any contract awarded by a State agency, including the documents and records of the contractor, that the Commission determines will assist in verifying accounts or will contain data affecting fees or performance; and

      (b) Any records related to any subcontract of a contract awarded by a State agency that is utilized to fulfill the contract, including, but not limited to (i) records related to the drafting and approval of the subcontract, and (ii) documents and records of the contractor or subcontractor that the Commission determines will assist in verifying accounts or will contain data affecting fees or performance.

d. The Joint Legislative Commission on Governmental Operations has the power to:

   1. Compel access to any document or system of records held by a non-State entity receiving, directly or indirectly, public funds, to the extent the documents relate to the receipt, purpose or implementation of a program or service paid for with public funds.

2. Compel attendance of any officer or employee of any non-State entity receiving public funds, provided the officer or employee is responsible for implementing a program or providing a service paid for with public funds.

e. Unless prohibited by federal law, the Commission and Commission staff in the discharge of their duties under this Article shall be provided access to any building or facility owned or leased by a non-State entity receiving public funds provided (i) the building or facility is used to implement a program or provide a service paid for with public funds and (ii) the access is reasonably related to the receipt, purpose, or implementation of a program or service paid for with public funds.

f. Any confidential information obtained by the Commission shall remain confidential and is not a public record as defined in G.S. 132-1.

g. Any document or information obtained or produced by Commission staff in furtherance of staff's duties to the Commission is confidential and is not a public record as defined in G.S. 132-1.

h. A person who conceals, falsifies, or refuses to provide to the Commission any document, information, or access to any building or facility as required by this Article with the intent to mislead, impede, or interfere with the Commission's discharge of its duties under this Article shall be guilty of a Class 2 misdemeanor.

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 Design-Builder 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 it 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 Design-Builder'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 Design-Builder 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 Design-Builder 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

a. The Owner may terminate the Design-Builder's Design Phase services for any reason upon ten (10) calendar days written notice (delivered by certified mail, return receipt requested). In the event of termination, the Design-Builder shall receive payment for services rendered prior to receipt of the written termination notice. Payments may not exceed the Design Phase limits defined by the Form of Design Build Construction Contract. Any work done by the Design-Builder prior to termination shall become the property of the Owner.

b. The Owner may at any time and for any reason terminate Design-Builder's Construction Phase services and work at Owner's convenience. Upon receipt of such notice, Design-Builder 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, the Design-Builder shall submit a break-down of their costs within forty-five (45) days, failing which those costs may be forfeited. Design-Builder 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 Design-Builder 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 Design-Builder prior to the date of the termination of this Agreement. Design-Builder 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.

c. 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 or more, due to cause beyond the fault or control of either party, then this agreement may be terminated by either party upon seven (7) calendar days written notice (delivered by certified mail, return receipt requested) to the other party.

d. If so terminated during the Design Phase, the Design-Builder shall receive payment for services rendered prior to receipt of the written termination notice. Payments may not exceed the Design Phase limits defined by the Form of Design Build Construction Contract. Any work done by the Design-Builder prior to termination shall become the property of the Owner.

e. If so terminated during the Construction Phase, the Design-Builder shall submit a break-down of their costs within forty-five (45) days, failing which those costs will be forfeited. Design-Builder 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 Design-Builder as are permitted by the prime contract and approved by Owner. There shall be deducted from such sums as provided in this subparagraph the amount of any payments made to Design-Builder prior to the date of the termination of this Agreement. Design-Builder shall not be entitled to any claim or claim of lien against Owner for any additional compensation or damages in the event of such termination and payment.

SUPPLEMENTARY GENERAL CONDITIONS

GENERAL

The following SUPPLEMENTARY GENERAL CONDITIONS modify, delete and/or add to the "Instructions to Bidders and General Conditions of the Contract", Form OC-15, Twenty Fourth Edition, January, 2013 Revision 2 – September 2025) Articles 1 through 54 inclusive. Where any original article, paragraph, subparagraph, or clause is supplemented, the provisions of such article, paragraph, subparagraph, or clause shall remain in effect and the supplemental provisions shall be considered as added thereto. Where any original article, paragraph, subparagraph, or clause is amended, voided, or superseded by any of the following paragraphs, the provisions of such article, paragraph, subparagraph, or clause not so amended, voided or superseded shall remain in effect.

INSTRUCTIONS TO BIDDERS

Add the following subparagraph at the end of paragraph 2:

"By submitting a bid, the Bidder represents that the has reviewed all Contract Documents and that the cost of all materials and equipment shown or indicated in the Contract Documents have been included in the Bid Sum(s) and that all costs for materials and labor associated with the installation of such equipment have been included in the Bid Sum(s)."

GENERAL CONDITIONS OF THE CONTRACT

ARTICLE 1 - DEFINITIONS

Add the following at the end of paragraph c:

"The terms designer, A-E, architect, architect-engineer, engineer, and engineer-architect, etc., when used in these Contract Documents, shall, unless otherwise specifically defined, mean **Salas O'Brien North Carolina, Inc.**

Revise paragraph r to read as follows:

"**Inspection** shall mean observation by the designer(s) of the work completed or in progress only to determine if such work is generally in accordance with the requirements of the Contract Documents."

ARTICLE 2 – INTENT AND EXECUTION OF DOCUMENTS

Add the following at the end of paragraph a:

"The language of the Contract Documents is American English. The Contractor(s) may request clarification, by the designer, of any words and/or terms whose meaning(s) or use may be unclear or ambiguous. Contractor(s) supervisory personnel, including supervisory personnel of subcontractors, shall be sufficiently knowledgeable and proficient in the use of the American English language to read, understand, and comply with the requirements of the Contract Documents and communicate, using American English, with the Owner and Designer."

ARTICLE 5 - SHOP DRAWINGS, SUBMITTALS, SAMPLES, DATA

Revise paragraph d to read as follows:

"d. Submittal review by the designer shall be only for the limited purpose of checking for conformance with the design concept and the information expressed in the Contract Documents. This review shall not include review of the accuracy or completeness of details, such as quantities, dimensions, weights or gauges, fabrication processes, construction means or methods, coordination of the work with other trades or construction safety precautions, all of which shall be the sole responsibility of the Contractor. Review of a specific item shall not indicate that the designer has reviewed the entire assembly of which the item is a component. The designer shall not be required to review partial submissions or those for which submissions of correlated items have not been received."

ARTICLE 10 - PERMITS, INSPECTIONS, FEES, REGULATIONS

Add new paragraph f as follows:

"f. The cost for connection fees, tap fees, impact fees, and all other governmental levies imposed on the project shall be the responsibility of the Contractor."

ARTICLE 11 - PROTECTION OF WORK, PROPERTY AND THE PUBLIC

Add new paragraph j:

"j. In the event the Contractor encounters on the site material reasonably believed to be asbestos (see Article 48), polychlorinated biphenyl (PCB), or any other material deemed 'hazardous' by the U.S. Environmental Protection Agency, which has not been rendered harmless, the Contractor shall immediately stop Work in the area affected and report the condition to the Owner and designer in writing. The Work in the affected area shall not thereafter be resumed except by written agreement of the Owner and Contractor if in fact the material is 'hazardous' and has not been rendered harmless. The Work in the affected area shall be resumed in the absence of 'hazardous materials', or when it has been rendered harmless, by written agreement of the Owner and Contractor. Lead and/or lead based paint is hereby specifically excluded from this section. The Contractor may be required to work with lead and/or lead based paint as a normal part of the construction process."

Add new paragraph k:

k. Neither the professional activities of the Designer, nor the presence of the Designer or the Designer's employees and subconsultants at a construction site, shall relieve the Contractor(s) and any other entity of their obligations, duties, and responsibilities including, but not limited to, construction means, methods, sequences, techniques, or procedures necessary for performing, superintending, or coordinating all portions of the work of construction in accordance with the contract documents and any health or safety precautions required by any regulatory agencies. The Designer and Designer's personnel have no authority to exercise any control over any construction contractor or other entity or their employees in connection with their work or any health or safety precautions. The Contractor(s) is solely responsible for jobsite safety. The Designer and the Designer's consultants shall be indemnified and shall be made additional insureds under the Contractor's general liability insurance policy."

ARTICLE 14 - CONSTRUCTION SUPERVISION AND SCHEDULE

Add new paragraph m as follows:

"m. The project expediter shall be the single prime Contractor."

ARTICLE 18 – DESIGNER'S STATUS

Delete the second sentence of paragraph d.

Add new paragraph g as follows:

"g. The Designer reserves the right to petition the Owner for compensation of additional services due to the Contractor submitting: 1) more than two submittals for any shop drawing or other submittal; 2) an extensive number of claims and the majority of such claims are rejected. The Contractor is hereby advised of this condition in the event that the Owner elects to adjust the Contractor's compensation as a result thereof."

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

Add the following sentence after the first sentence of paragraph a:

"The Contractor shall achieve Final Completion of the entire Work not later than one hundred eighty (180) consecutive calendar days after the date of the Notice to Proceed, subject to adjustments of this Contract time as provided in the Contract Documents.

Add the following sentence at the end of paragraph b:

"The sum of liquidated damages shall be $1000 per day."

ARTICLE 25 – FINAL INSPECTION, ACCEPTANCE AND PROJECT CLOSEOUT

Append the following to paragraph b2:

"A subsequent review shall be scheduled by the designer upon Contractor's notification to the designer that the discrepancies listed in the punch list have been corrected in their entirety by the contractor."

ARTICLE 38 - USE OF PREMISES

Add the following new paragraph e:

"e. The Contractor shall strictly adhere to the Owner's rules, regulations, and required standards of behavior for workmen defined by the 'Owner's Requirements' included at the end of these Supplementary Conditions."

ARTICLE 40 - UTILITIES, STRUCTURES, SIGNS

Add new paragraph m:

"m. The project expediter shall, in accordance with paragraphs i, j, and l, provide the following:

Toilets
Temporary Field Office
Project Sign"

LIST OF PROJECT DRAWINGS

G001 COVER SHEET
G111 AB WHITLEY - CODE SUMMARY
G121 LESLIE - CODE SUMMARY
G131 WHICHARD - CODE SUMMARY
G141 GREENVILLE CENTER ANNEX - CODE SUMMARY
G151 VERNON WHITE - CODE SUMMARY
G161 LET - CODE SUMMARY
FA001 STANDARDS, SYMBOLS & ABBREVIATIONS
FA111 LEVEL 1 - AB WHITLEY
FA112 LEVEL 2 - AB WHITLEY
FA113 LEVEL 3 - AB WHITLEY
FA121 LEVEL 1 - LESLIE
FA122 LEVEL 2 - LESLIE
FA123 LEVEL 3 - LESLIE
FA131 LEVEL 1 - WHICHARD
FA132 LEVEL 2 - WHICHARD
FA141 LEVEL 1 - GREENVILLE CENTER ANNEX
FA151 LEVEL 1 - VERNON WHITE DEMOLITION
FA152 LEVEL 1 - VERNON WHITE NEW WORK
FA161 LEVEL 1 - LET
FA211 FIRE ALARM SYSTEM
FA212 FIRE ALARM SYSTEM DETAILS

END OF SUPPLEMENTARY CONDITIONS

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 011100 - SUMMARY OF THE WORK

RELATED DOCUMENTS

Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification sections, apply to this section.

WORK COVERED BY CONTRACT DOCUMENTS

The Work of the Project is defined by the Contract Documents and generally consists of the following:

Upgrade existing fire alarm systems in multiple buildings to new fire alarm systems, including new fire alarm central panel (FACP) and providing new fire alarm devices to provide adequate coverage in the buildings to meet current NFPA 72 and NC building code requirements: AB Whitley, Leslie Continuing Education, Greenville Center Annex, Vernon White and LET (Law Enforcement Training) building.

PHASED CONSTRUCTION

The Work shall be conducted in phases, with each phase substantially complete as indicated:

Demolition of existing systems shall be performed after new systems are put in the buildings, tested, accepted, and placed into service.

Before commencing Work of each phase, submit an updated copy of Contractor's construction schedule showing the sequence, commencement and completion dates for all phases of the Work. Include projected dates and durations for Owner to move out and into areas of work.

ACCESS TO SITE

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

WORK RESTRICTIONS

General Work Restrictions: Comply with limitations on use of public streets and with other requirements of authorities having jurisdiction.

Owner' work rules and/or restrictions on construction operations, as appended at the end of this Section, must be adhered to by all Contractor personnel.

Controlled Substances: Use of tobacco products and other controlled substances on Project site is not permitted.

Employee Identification: Provide identification tags for Contractor personnel working on Project site. Require personnel to use identification tags at all times.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 011000

SECTION 012300 - ALTERNATES

PART 1 – GENERAL

RELATED DOCUMENTS

Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification sections, apply to this section.

SUMMARY

This section includes administrative and procedural requirements for alternates.

DEFINITION

Alternate: An amount proposed by bidders and stated on the Form of Proposal for certain work defined in the bidding requirements that may be added to or deducted from the base bid amount if Owner decides to accept a corresponding change either in the amount of construction to be completed or in the products, materials, equipment, systems, or installation methods described in the Contract Documents.

Alternates described in this Section are part of the Work only if enumerated in the Agreement. The cost or credit for each alternate is the net addition to or deduction from the Contract Sum to incorporate alternate into the Work. No other adjustments are made to the Contract Sum.

PROCEDURES

Revise or adjust affected adjacent work as necessary to completely integrate work of the alternate into Project.

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

Immediately following award of the Contract, notify each party involved, in writing, of the status of each alternate. Indicate if alternates have been accepted, rejected, or deferred for later consideration. Include a complete description of negotiated revisions to alternates.

Execute accepted alternates under the same conditions as other work of the Contract.

A schedule of alternates is included at the end of this Section. Specification Sections referenced in schedule contain requirements for materials necessary to achieve the work described under each alternate.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

SCHEDULE OF ALTERNATES

Alternate No. 1: Preferred brand alternate for Johnson Controls / Simplex fire alarm systems.

END OF SECTION 012300

SECTION 019913 - GENERAL REQUIREMENTS

The “Engineer of Record” for the work defined by Division 01 Sections 011100, 019913 and 019916 is Salas O’Brien, North Carolina, LLC, 702 Oberlin Road, Suite 300, Raleigh, NC 27605 (919) 832-8118. The term “engineer,” “architect-engineer,” “engineer-architect,” “A-E,” “E-A,” etc., when used in these Sections shall reference Salas O’Brien.

The “Engineer of Record” for the work defined by Divisions 26-28 is Salas O’Brien North Carolina, LLC, 702 Oberlin Road, Suite 300, Raleigh, NC 27605 (919) 832-8118. The term “engineer,” “architect-engineer,” “engineer-architect,” “A-E,” “E-A,” etc., when used in Divisions 26-28 Drawings and Specifications shall reference Salas O’Brien.

PART 1 - GENERAL

RELATED DOCUMENTS

Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification sections, apply to this section.

The requirements specified herein shall govern all Sections in Divisions 26-28, whether stated therein or not.

Where items specified in the other sections of this Division conflict with requirements of this Section, the former shall govern.

REVIEW OF CONTRACT DOCUMENTS

The Contract Documents may represent imperfect data and may contain errors, omissions, conflicts, inconsistencies, code violations and improper use of materials. Such deficiencies will be corrected by the A-E when identified. The Contractor shall carefully study and compare the individual Contract Documents with each other and report at once in writing to the A-E any deficiencies the Contractor may discover. The Contractor shall require each subcontractor to likewise study the documents and report at once any deficiencies discovered. The Contractor shall resolve all reported deficiencies with the A-E prior to starting any work. **Any work performed prior to receipt of instructions from the A-E will be done at the Contractor's risk.** If the Contractor performs any construction activity knowing it involves a recognized error, inconsistency, or omission in the Contract Documents without such notice to the A-E, the Contractor shall assume appropriate responsibility for such performance and shall bear an appropriate amount of the attributable costs for correction.

The Contractor shall be responsible for maintaining habitable structures under this Contract rainproof, and for making equipment and utility installations properly perform the intended function. If he is prevented from so doing by any limitations of the drawings or specifications, the Contractor shall immediately notify the A-E in writing of such limitations before proceeding with construction in the area where the problem or limitation exists.

DEFINITIONS

Electrical Work: Work required by this Contract as defined by specification Divisions 26-28.

Labeled: Appliances, equipment, materials or products to which has been attached a label, symbol, or other identifying mark of an organization acceptable to the North Carolina Building Code Council and concerned with product evaluation, that maintains periodic inspection of production of labeled equipment or materials and by whose labeling the manufacturer indicates compliance with identified standards or has been tested and found suitable for a specified purpose.

Listed: Appliances, equipment, materials or products included in a list published by an organization acceptable to the North Carolina Building Code Council and concerned with product evaluation, that maintains periodic inspection of production of listed equipment or materials, and whose listing states either that the equipment or material meets appropriate designated standards or has been tested and found suitable for a specified purpose.

Concealed: Work within or behind various construction elements or in crawl spaces or trenches that is not exposed to view when the project is complete.

Exposed: Not "concealed" as defined above, or anything exposed to view when the project is complete.

Wiring: Cable, raceways, fittings, mechanical supports, wire, junction boxes, device boxes, outlet boxes, switches, cutouts, and related items.

CODES, LAWS, REGULATIONS, AND STANDARDS

Work on and for the project shall conform to requirements of each applicable volume of the *North Carolina Building Code*; shall comply with the regulations of the N.C. Department of Labor, including the latest revisions and interpretations of the *Occupational Safety and Health Act of North Carolina;* and be in accordance with all other codes, laws, rules and regulations that apply to this project.

"Confined spaces" and "permit-requiring confined spaces", as defined by U.S. Occupational Safety and Health Administration (USOSHA) may exist in the work area or may be created by the construction of this Project. The Contractor shall be responsible for identification of any permit-requiring confined spaces and for establishing all required procedures for meeting the requirements of USOSHA relative to these spaces, including written confined space entry program(s).

Codes, laws, regulations, and/or industry standards referenced in the Specification or on the Drawings shall be considered to be part of the Project requirements. Applicable edition of the referenced volume is the edition that is/was in effect at the time the construction permit was issued or at the time of approval of the Contract Documents by the Authority Having Jurisdiction.

INTENT AND WORKMANSHIP

The words "furnish," "furnish and install," "install," and "provide" or words with similar meaning shall be interpreted, unless otherwise specifically stated, to mean "furnish and install complete in-place and ready for service."

The work of all trades under this Contract shall be coordinated in such a manner as to obtain the best workmanship possible.

Miscellaneous items and accessories that are not specifically shown on the drawings or specified herein, but which are essential to produce a complete and properly operating installation, or usable structure or plant, providing the indicated function, shall be furnished and installed without change in the Contract price. Such miscellaneous items and accessories shall be of the same quality standards, including material, style, finish, strength, class, weight and other applicable characteristics, as specific for the major component of which the miscellaneous item or accessory is an essential part. The above requirement, however, is not intended to include major components not covered by or inferable from the drawings and specifications.

WELDER QUALIFICATION

Where welding is required on vessels or piping with an ASME P- or S- stamp, qualify welders for welding procedures complying with ASME *Boiler and Pressure Vessel Code*, Section IX. Submit *Welder's Performance Qualification Record* required by the ASME *Boiler and Pressure Vessel Code*.

For piping and structural supports welding, qualify welders in accordance with AWS QC7 *Standard for AWS Certified Welders* for welding procedures complying with ASME B31.1 or ASME B31.9, as applicable. Submit *Welder's Performance Qualification Record* required by ASME B31.1 or B31.9 and a copy of the most recent *Maintenance of Welder Certification* form submitted to AWS.

In addition, submit each welder's assigned number, letter, or symbol used to identify the work of the welder. This symbol shall be stamped in or adjacent to each completed weld.

QUALITY ASSURANCE

The Contract Drawings indicate the extent and general arrangement of the Work. The Contractor shall coordinate the Work under his Contract so as to avoid conflicts between his work and the work of other trades. He shall carefully examine the Drawings and shall be responsible for the proper fitting of materials and equipment into the space provided. If any departures from the Contract Drawings are deemed necessary by the Contractor, detail drawings of such departures and the reasons therefore shall be submitted as soon as practicable to the A-E for his review. No such departures shall be made without this review and written clarification or change order.

If manufacturer recommended details or installation instructions differ from the contract drawings or specifications, then the contractor shall notify the A-E immediately of any discrepancies.

The Drawings and Specifications shall be considered supplementary, one to the other, so that materials and/or labor indicated, called for, or implied by one and not the other shall be provided as though specifically called for in both.

Firestop Materials Codes and Standards: Comply with ASTM Standard E814 and applicable categories of UL's current *Fire Resistance Directory*, Vol. I and II, for compliance with ANSI/UL Standard 1479.

Access Doors Fire-Resistance Ratings: Where fire-resistance rating is indicated for construction penetrated by access units, provide Listed and Labeled units.

OBSERVATION

All work shall be done by skilled technicians, continuously supervised by the Contractor and subject to observation and final acceptance by the A-E. Such final acceptance shall in no way relieve the Contractor from responsibility for defects in either workmanship or material that may subsequently develop.

SUBMITTALS

Submittals shall demonstrate compliance with technical requirements by reference to each subsection of this specification. Material and equipment schedules, catalog cuts, manufacturers' data and shop drawings, and field working drawings as required by individual Sections shall be provided.

Shop drawings, technical data and other such submittals required by individual Sections of the Divisions listed above shall be provided.

Equipment drawings, manufacturer's installation instructions as shipped with the equipment, field working and location drawings, wiring diagrams, and coordination drawings shall be provided by the Contractor for items of equipment, sleeves, foundations, curbs, wiring, ductwork, piping, etc., as necessary for information and coordination of all trades. These drawings shall be provided sufficiently in advance of installation to avoid delays and removal and reworking of installed work, and so as to provide information to other trades when and as required. No work shall be done until these drawings have been coordinated by the Contractor.

Submittals shall be checked before submission by technically qualified employees of Contractor for accuracy, completeness and compliance with Contract requirement. **All submittals shall be accompanied by the "Submittal Cover Form" provided at the end of this Section, signed by Contractor**.

Contractor shall submit complete lists or schedules of all proposed sub-contractors and material suppliers, and of all proposed construction materials and equipment. Materials and equipment lists shall be complete with trade names and/or catalog numbers of each item. Processing of the second and subsequent Certificate for Payment will be withheld until substantial portions of these lists have been submitted.

Products furnished shall be essentially the standard product of the manufacturer. Where two or more units of the same class of equipment are required, these units shall be products of a single manufacturer.

Products proposed by the Contractor shall be new except where specifically noted otherwise. Contractor(s) shall provide products only from manufacturers who have published data showing compliance with specified requirements or who certify in writing to such compliance (including laboratory and/or in-place testing, if applicable). All electrical products shall be both labeled and listed, as defined above. **Prior to purchase of major materials, equipment or systems, submit manufacturer's data to the A-E for review as hereinafter specified.**

Products of the specified type and for the specified application offered by the Contractor(s) for use on this Project shall comply with the following requirements:

Product shall have had satisfactory performance in applications of similar character to that specified for a period of at least three (3) years.

Product shall be from an established national or regional manufacturer. The A-E's experience with the manufacturer on prior projects relative to product performance, technical support, etc. may be taken into account to establish suitability of the offered product for this Project.

Product shall be provided through an authorized representative of the manufacturer. The representative shall be capable of providing technical support relative to the installation, operation, and maintenance of the product. The A-E's experience with the representative on prior projects relative to product performance, technical support, etc. may be taken into account to establish suitability of the offered product for this Project.

Repair parts and service for the product shall be available within twenty-four (24) hours of notice.

The manufacturer and his authorized representative shall furnish satisfactory evidence in support of these conditions when requested. The A-E's decision relative to the suitability and acceptability of any product is final and acceptance of this limitation is implicitly acknowledged by the contractor and the manufacturer and/or his representative offering the product for use on this Project.

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 by being marked "**NON-COMPLYING FEATURE**." This indication shall be applied to the submittals at the appropriate location in a color contrasting with the remainder of the submittal. Additional information that might assist the Engineer in product evaluation may be included with the submittal. This information should indicate how a specific non-complying feature is believed by the Contractor to meet the intent of the specification.

It is the Contractor's responsibility to demonstrate compliance with the specifications and to clearly indicate any features that do not meet the specifications. It is not the Engineer's responsibility to identify non-compliance. Substantial non-compliance, as determined by the Engineer, is grounds for rejection of the submittal. Discovery of non-complying features that have not been properly identified as such on submittals may require, at any stage of construction, the removal and replacement of the non-complying item(s).

The A-E will review shop drawings, manufacturer's data, and samples with reasonable promptness. This review is only for general conformance with the design concept of the project and general compliance with the information given in the Contract Documents. Corrections or comments made on the shop drawings during this review do not relieve contractor from compliance with the requirements of the plans and specifications. Approval of a specific item shall not include approval of an assembly of which the item is a component. Contractor is responsible for dimensions to be confirmed and correlated at the jobsite; information that pertains solely to the fabrication processes or to the means, methods, techniques, sequences and procedures of construction; coordination of his or her Work with that of all other trades; and for performing all work in a safe and satisfactory manner. The Contractor is responsible for any delay caused by his failure to observe submittals requirements and the time for completion of his Contract will not be extended because of such delays.

The A-E's submittals review stamp categories shall be interpreted as follows:

Reviewed: Fabrication and installation or erection may be undertaken.

Exceptions indicated, revise and proceed: Fabrication and installation of erection may be undertaken.

However, Contractor shall comply with all notes or corrections indicated.

Exceptions indicated, revise and re-submit: Neither fabrication, installation, nor erection shall be undertaken. Re-submit corrected copies for review. Corrections shall be limited to items marked, except that changes required in order to coordinate the corrections indicated shall be made. All changes, other than those indicated, shall be called specifically to the A-E's attention.

Rejected, re-submit: Neither fabrication, installation, nor erection shall be undertaken. Revise entire submission to comply with information given in the Contract Documents and re-submit.

Submittals returned to the Contractor with the A-E's "reviewed" or "exceptions indicated, revise and proceed" stamp need not be resubmitted, except that corrected copies of "exceptions indicated, revise and proceed" submittals shall be furnished for record when requested.

Submittals returned to the Contractor with the A-E's "revise and re-submit" or "rejected, re-submit" stamp shall be corrected to comply with Contract requirements and re-submitted to the A-E for review. The Contractor shall direct specific attention, in writing or on re-submitted shop drawings, product data or samples, to revisions other than those requested by the A-E on previous submittals.

Shop drawings of work that involves more than one subcontractor shall be coordinated by the Contractor and submitted to A-E under one cover. No items shall be fabricated, nor any portion thereof shipped to site, prior to receipt by the Contractor of all applicable submittals, including manufacturer's data, samples and shop drawings bearing the A-E's "reviewed" or "exceptions indicated" stamp only.

Manufacturer's data submitted as required by the technical specifications sections or requested by A-E shall consist of four (4) copies of certificates, schedules, catalog cuts, manufacturer's specifications and installation instructions for each type of product or material. Include maintenance recommendations, fire ratings and other reports when applicable to show compliance with the Specifications. When catalog cuts are submitted, the specific item to be considered shall be identified. Items that are not so identified will be returned to the Contractor without action.

Firestop Systems: Submit data on products. Provide manufacturer's certification of UL classification(s) required, including copies of UL systems listings and schedule defining each UL system proposed and the applicable type of penetration.

Access Units: Submit manufacturer's technical data and installation instructions for each type of access door assembly, including setting drawings, templates, instructions and directions for installation of anchorage devices.

Contractor shall submit for review any samples required by the technical specification sections or that may be requested by the A-E.

With each electrical testing and compliance submittal, Contractor shall submit evidence of compliance that each manufactured item or component of electrically-operated equipment and that each fabricated assembly of electrically operated equipment furnished complies with the testing requirements.

FIRE RATINGS

Fire rating of walls and floors, as indicated on the Drawings, are for reference only. Refer to Construction Documents for exact construction and fire ratings.

Where fire resistive insulation or other coverings have been applied to a structural element to obtain a fire rating and this insulation or covering is removed or otherwise disturbed, the Contractor shall be responsible for restoring the material to a condition that matches the original fire protective ability.

USE OF BRAND NAMES

Brand names, where scheduled as “basis of design,” are to be considered for information purposes and are not intended to be a product specification.

Where the Contractor proposes to use an item of equipment other than that indicated as basis of design that may require redesign of the structure, partitions, foundations, piping, wiring, or any other part of the mechanical, electrical, or architectural layout, all such redesign and all new drawings and detailing required shall be prepared by the Contractor at his own expense and submitted for review by the A-E.

Where such deviation requires a different quantity and arrangement of ductwork, piping, wiring, raceway, or equipment from that specified or indicated on the Drawings, the Contractor shall furnish and install any such ductwork, piping, structural supports, insulation, controllers, motors, starters, electrical wiring and raceway, and any other additional equipment required by the system, at no additional cost.

Brand names, where used as a product specification, are intended to denote the standard of quality required for the particular material or product.

Where the term “equal” or “equivalent” is present, such specification does not restrict the Contractor to a specific brand and equivalent products by other manufacturers may be acceptable. The term "equal" or "equivalent" shall be interpreted to mean a material or product that is similar and equal in type, quality, size, capacity, composition, finish, color, and other performance characteristics to the material or product specified by brand name, and that, **in the opinion of the A-E**, is suitable for the same use and capable of performing the same function as the material or product specified. **Proposed equivalent items must be reviewed by the A-E before they are purchased or incorporated into the work**.

EQUIPMENT SUBSTITUTIONS AND CHANGES/EXTRA COSTS FOR CHANGES IN BUILDING SERVICES

Where the Contractor proposes to use an item of equipment other than that specified or detailed on the Drawings, requiring any redesign of the structure, partitions, foundations, piping, wiring, or any other part of the mechanical, electrical, or architectural layout, all such redesign and all new drawings and detailing required shall be prepared by the Contractor at his own expense and submitted for review by the A-E.

Where such approved deviation requires a different quantity and arrangement of ductwork, piping, wiring, raceway, or equipment from that specified or indicated on the Drawings, the Contractor shall furnish and install any such ductwork, piping, structural supports, insulation, controllers, motors, starters, electrical wiring and raceway, and any other additional equipment required by the system, at no additional cost.

It is the responsibility of the Contractor to notify the A-E in all cases where the requirements of proposed equipment differ from the requirements specified, shown, or implied on the Drawings or within the Specifications. **Failure of the Contractor to notify the A-E shall not relieve the Contractor of the responsibility of providing compatible equipment at no additional cost as described above**.

OPERATION AND MAINTENANCE DATA

For each Division of the Work, provide four (4) copies of Operating Manuals, Maintenance Manuals, and Test Reports, bound in suitable covers, to the A-E at least two (2) weeks **prior** to the final inspection of the project.

Each manual shall include a cover sheet listing the following:

Project name and location.

Division of Work covered by the manual.
Contractor data, including name, address, phone and fax numbers, and service contact information (24-hour number, email address, etc.)

Date of project completion.

Each manual shall include a table of contents.

Operating manual: Provide all relevant information needed for day-to-day operation and management of the building systems. Include the following for each system:

System Description: Identify the areas of the building the system serves, the locations of performance checkpoints, the expected performance readings at the design load conditions and, where applicable, at part-load conditions. The system's operation during the day, night, and weekend, as well as seasonal start-up and shutdown, safety devices and their function, control devices and their function, pollution control devices, etc., also shall be described. The function of the controls for individual systems shall be described alongside the description of the system function.

Operating Routines and Procedures: Identify activities associated with the normal operation of systems and equipment. Operating checklists and operating logs shall be provided for each system and all performance standards shall be identified.

Seasonal Start-Up and Shutdown: List seasonal start-up and shutdown procedures, including any "mothballing" procedures required.

Special Procedures: Special procedures related to environmental control, health and safety, productive work environment, etc., shall be codified.

Troubleshooting Procedures: This section shall include questionnaires and diagnostics to allow users to isolate probable causes of operating problems in an efficient manner.

Maintenance manual: The maintenance manual shall be divided into two parts:

Part I shall contain information related to the equipment data sheets, nameplate data, operating data, etc. Include the original purchase order number; date of purchase; name, address, and phone number of vendor; and warranty information.

Part II shall support a maintenance program. The manual shall contain information prepared by the equipment manufacturers, but shall be supplemented by information provided by the Contractor. Each item of equipment shall be identified and an individual "Equipment Maintenance Sheet" shall be prepared for each, with the following information:

Description each system and system component, consisting of easily read schematic drawings showing all components, identified to match Part I data, that requires maintenance.

Recommended preventative and predictive maintenance procedures and their recommended frequency of application for each system component.

Recommended list of spare parts with part numbers and place(s) they can be obtained.

Copy of manufacturer's Installation instructions for each component.

Any other information requested by the A/E to support the operation and maintenance of the equipment.

Test reports: Provide copies of the test protocols used in the construction and commissioning of the systems. Arrange data so as to allow the results of ensuing tests to be easily added.

PART 2 - PRODUCTS

MACHINERY DRIVES

V-Belt Drives: Provide ANSI/Rubber Manufacturers Association (RMA) standard or raw edge cogged V-belts with properly-selected motor pulley and driven sheave. Belts shall be constructed of reinforced cord and rubber.

The drive shall be rated for the motor horsepower indicated on the Drawings, plus the recommended ANSI/RMA service factor (but, not less than 20%), in addition to the ANSI/RMA allowances for pitch diameter, center distance, and arc of contact.

Drives 1 horsepower and smaller may be provided with single standard V-belt. Drives 1-1/2 horsepower and larger shall be provided with raw edge cogged V-belts, the number of belts necessary to transmit the required power with 95% minimum efficiency, but in no case less than 2.

Exception: **Belt drives for fans utilized as part of smoke control and/or smoke venting systems shall be rated for the motor horsepower indicated on the Drawings, plus 50% additional service factor, in addition to the ANSI/RMA allowances for pitch diameter, center distance, and arc of contact, and shall have at least 2 belts.**

Multiple belts shall be matched to ANSI/RMA specified limits by measurement on a belt measuring fixture. Seal matched sets together to prevent mixing or partial loss of sets. Replacement, when necessary, shall be an entire set of new matched belts.

Sheaves and pulleys shall be fixed pitch type, statically and dynamically balanced, and constructed as follows:

Construction of pressed steel or close grained cast iron.

Bore shall be fixed or bushing type for securing to shaft with keys.

Groove spacing for driving and driven pulleys shall be the same.

Maximum belt speed shall not exceed 5000 feet per minute.

Minimum motor sheave diameter shall comply with ANSI/RMA recommendations as follows:

Shaft Couplings: Shaft couplings for direct drive equipment driven by polyphase motors shall be flexible type capable of absorbing vibration, rated for the motor horsepower indicated on the Drawings plus an additional 50% service factor. Couplings shall be drop-out type to allow disassembly and removal without removing equipment shaft or motor.

Drive Guards: Drive guards shall be provided for belt drives and shaft couplings.

Belt guards shall comply with OSHA and SMACNA requirements of diamond-mesh wire screen welded to steel angle frame or equivalent, prime coated. Secure to fan or fan supports without short circuiting vibration isolation. Include provisions for adjustment of belt tension, lubrication, and use of tachometer with guard in place.

Coupling guards shall be constructed steel and comply with ANSI B15.1, Section 8, and OSHA 1910.219. Guards shall be easily removable for access and service and provided with openings for speed checks, etc. without removal.

FIRESTOPPING SYSTEMS

Firestop systems shall be used in locations including, but not limited to, the following:

Penetrations through fire resistance rated floor assemblies and roof assemblies (where required by code) including both empty openings and openings containing penetrants.

Penetrations through fire resistance rated wall assemblies including both empty openings and openings containing penetrants.

Membrane penetrations in fire resistance rated wall assemblies where items penetrate one side of the barrier.

Membrane penetrations in fire resistance rated ceiling assemblies.

Systems or devices must be listed in the UL Fire Resistance Directory and must conform to construction type, penetrant type, annular space requirements and fire rating involved in each separate instance. System must be symmetrical for wall applications.

Systems or devices must be asbestos-free and all products must be from a single manufacturer.

Products must withstand the passage of cold smoke, either as an inherent property of the system or by the use of a separate product included as part of the UL system or device, and designed to perform this function.

Cracks, Voids, or Holes Up to 4" Diameter: Putty or caulking, one-piece intumescent elastomer, non-corrosive to metal, compatible with synthetic cable jackets, Listed, and capable of expanding 10 times when exposed to flame or heat.

Openings 4" or Greater: Sealing system capable of passing 3-hour fire test in accordance with ASTM E-814, consisting of wall wrap or liner, partitions, and end caps capable of expanding when exposed to temperatures of 250 to 350 deg. F (121 to 177 deg. C), Listed.

Wall Boxes:

Metallic boxes used in fire-rated walls or floors must be listed in the UL Fire Resistance Directory under category CEYY.

Listed single and double gang metallic device and outlet boxes with metallic or nonmetallic cover plates may be used in bearing and nonbearing wood stud and steel stud walls with ratings not exceeding 2 hours. The metallic outlet or switch boxes shall be securely fastened to the studs and the opening in the wallboard facing shall be cut so that the clearance between the box and the wallboard does not exceed 1/8 in. The surface area of individual metallic outlet or switch boxes shall not exceed 16 sq. in. The aggregate surface area of the boxes shall not exceed 100 sq. in. per 100 sq. ft. of wall surface.

Metallic boxes located on opposite sides of walls or partitions shall be separated by a minimum horizontal distance of 24 in. This minimum separation distance between metallic boxes may be reduced when “Wall Opening Protective Materials” listed in the UL Fire Resistance Directory under category CLIV are installed according to the requirements of the Classification.

Metallic boxes shall not be installed on opposite sides of walls or partitions of staggered stud construction unless “Wall Opening Protective Materials” are installed with the metallic boxes in accordance with Classification requirements for the protective materials.

WALL AND FLOOR ACCESS DOORS

Where floors, walls and ceilings must be penetrated for access to engineering work, provide types of access doors indicated, including floor doors if any. Furnish sizes indicated or, where not otherwise indicated, furnish 24" x 24" panels. Furnish manufacturer's complete units, of type recommended for application in indicated substrate construction, in each case, complete with anchorages and hardware.

Except as otherwise indicated, fabricate wall/ceiling door units of welded steel construction with welds ground smooth, 16-gage frames and 14-gage flush panel doors, 175 deg. swing with concealed spring hinges, flush screw-driver-operated cam locks, factory-applied rust-inhibitive prime-coat paint finish.

Provide rated access doors where installed in fire resistance rated floor and wall assemblies to meet fire rating.

PART 3 – EXECUTION

GENERAL

Comply with NFPA 241, *Standard for Safeguarding Construction, Alterations, and Demolition Operations*; ANSI A10 Series standards for *Safety Requirements for Construction and Demolition*; and Chapter 14 of the *North Carolina State Building Code: Fire Code*.

FIRE PROTECTION DURING CONSTRUCTION

Building contents and all elements of new and/or existing construction must be thoroughly protected from construction procedures that produce sparks, flames, or excessive heat. Such procedures include, but are not limited to, welding, soldering, flame-cutting, using grinders or metal cutting saws, and heating of work spaces. Contractor shall maintain fire watch and/or portable fire-suppression devices, as required, during these operations.

The Contractor shall develop, provide, and post a written plan in compliance with NFPA 241 and Chapter 14 of the *North Carolina State Building Code: Fire Code*.

Develop and supervise an overall fire-prevention and -protection program for personnel at Project site. Review needs with local fire department and establish procedures to be followed. Instruct personnel in methods and procedures required to prevent fires and how to deal with them if they occur.

Provide and maintain portable, UL rated fire extinguishers with class and extinguishing agent as required by locations and classes of fire exposures. Comply with NFPA 10 *Standard for Portable Fire Extinguishers.* Locate fire extinguishers where convenient and effective for their intended purpose, but not less than one extinguisher on each floor or area at or near each usable stairwell.

SECURITY AND SAFETY DURING CONSTRUCTION

Barricades, Warning Signs, and Lights: Comply with requirements of authorities having jurisdiction for erecting structurally adequate barricades, including warning signs and lighting.

Temporary Egress: Maintain temporary egress from existing occupied facilities as indicated and as required by authorities having jurisdiction.

Temporary Enclosures: Provide temporary enclosures for protection of construction, in progress and completed, from exposure, foul weather, other construction operations, and similar activities. Provide temporary weathertight enclosure for building exterior. Where heating or cooling is needed and permanent enclosure is incomplete, insulate temporary enclosures.

MOISTURE AND MOLD CONTROL DURING CONSTRUCTION

Exposed Construction Phase: Before installation of weather barriers, when materials are subject to wetting and exposure and to airborne mold spores, protect as follows:

Protect porous materials from water damage.
Protect stored and installed material from flowing or standing water.

Keep porous and organic materials from coming into prolonged contact with concrete.

Keep roof, wall, and/or openings covered or dammed.

Partially Enclosed Construction Phase: After installation of weather barriers, but before full enclosure and conditioning of building, when installed materials are still subject to infiltration of moisture and ambient mold spores, protect as follows:

Do not load or install porous materials or components, or items with high organic content, into partially enclosed building.

Keep interior spaces reasonably clean and protected from water damage.

Periodically collect and remove waste containing cellulose or other organic matter.

Discard or replace water-damaged material.

Do not install material that is wet.

Discard, replace, or clean stored or installed material that begins to grow mold.

Perform work in a sequence that allows any wet materials adequate time to dry before enclosing the material in drywall or other interior finishes.

Controlled Construction Phase of Construction: After completing and sealing of the building enclosure, maintain as follows:

Control moisture and humidity inside building by maintaining effective dry-in conditions.

Use **temporary** HVAC units or system to control humidity.

Comply with manufacturer's written instructions for temperature, relative humidity, and exposure to water limits.

Hygroscopic materials that may support mold growth that become wet during the course of construction and remain wet for 48 hours are considered defective and must be replaced.

DUST AND CONTAMINATION CONTROL DURING CONSTRUCTION

Prevent dust, fumes, and odors from entering occupied areas or areas in which construction work is more advanced

Provide floor-to-ceiling dustproof partitions to limit dust and dirt migration and to separate areas occupied by Owner from fumes and noise. Construct dustproof partitions with two layers of 6-mil polyethylene sheet on each side. Cover floor with two layers of 6-mil polyethylene sheet, extending sheets 18 inches up the sidewalls. Overlap and tape full length of joints. Cover floor with fire-retardant-treated plywood.

Maintain negative air pressure within the work area using HEPA-equipped air-filtration units, starting with commencement of temporary partition construction, and continuing until removal of temporary partitions is complete.

Use vacuum collection attachments on dust-producing equipment. Isolate limited work areas using portable dust-containment devices.

Perform daily construction cleanup and final cleanup using approved, HEPA-filter-equipped vacuum equipment.

Coordinate general construction activities with the work of Divisions 21-28 to avoid contamination and/or degradation of building engineered systems by dust, over-spray of insulation or paint, etc. **Costs for the cleaning and/or component replacement of engineered systems required by contamination and/or degradation by general construction activities shall be assigned to the General Contractor.**

TEMPORARY HVAC SYSTEMS USE DURING CONSTRUCTION

The use of permanent HVAC systems to support construction activities is prohibited. The need for heating, cooling, dehumidification, and/or ventilation during construction shall be met via use of temporary HVAC units or systems as follows:

Heating: Provide vented, self-contained, liquid-propane-gas or fuel-oil heaters with individual space thermostatic control. Use of gasoline-burning space heaters, open-flame heaters, or salamander-type heating units is prohibited.

Cooling: Provide modular, portable stand-alone direct expansion cooling units with condensers vented to the outdoors.

Ventilation and Humidity Control: Provide temporary ventilation required by construction activities for curing or drying of completed installations or for protecting installed construction from adverse effects of high humidity. Select equipment that will not have a harmful effect on completed installations or elements being installed. Coordinate ventilation requirements to produce ambient condition required and minimize energy consumption.

COOPERATION WITH OTHER TRADES

The Contractor shall give full cooperation to other trades and shall furnish any and all information necessary to permit the work of other trades. Information to be provided by the Contractor includes, but is not limited to templates, patterns, setting plans, and shop details as may be necessary for the proper installation of work and for the purpose of coordinating adjacent work. Information required by other trades shall be provided in a timely manner and shall be sufficient to allow the work of such other trades to proceed with the least possible interference or delay.

Where the work of the Contractor will be installed in close proximity to, or may interfere with work of other trades, the Contractor shall assist in working out space conditions to make a satisfactory adjustment. **If the Contractor installs his work before coordination with other trades, he shall make the necessary changes in his work to correct the condition without extra charge.**

MISCELLANEOUS CONCRETE AND STEEL SUPPORTS

All concrete curbs, bases, etc., required for mechanical or electrical equipment and components shall be provided under the Division requiring them except where specifically indicated and/or specified to be provided under a different Division.

"Housekeeping pads", constructed of 3000 psi concrete doweled to floor slab, shall be provided for each floor-mounted component. Pads for air-handling units shall, unless indicated otherwise on the drawings, be 6" high, while pads for all other equipment shall be 4" high. Pads shall be finished smooth with chamfered top edges and corners. Equipment and other floor-mounted elements shall be installed and shall be anchored and grouted to housekeeping pads.

Miscellaneous steel for equipment, pipe, duct, raceway, etc. installation required by the work in any Division shall be provided and placed under that Division except where specifically indicated and/or specified to be provided under a different Division.

Anchors, inserts, supports, attachments, etc., required and but not indicated on the Drawings shall be provided under this Contract.

FIRESTOPPING

Installer should be experienced in installing or applying similar systems, plus: be acceptable to or licensed by manufacturer, state or local authority where applicable; have at least five years experience; and have successfully completed at least five comparable projects using this system.

Firestop systems or devices installation must meet requirements of ASTM E-814, UL 1479 or UL 2079 tested assemblies that provide a fire rating equal to that of construction being penetrated.

Install only after substrate penetrations and supporting brackets have been installed. Do not install firestopping when ambient or substrate temperatures are outside limits permitted by manufacturers or when substrates are wet. Where floor openings without penetrating items are more than 4 inches wide and subject to traffic or loading, install firestopping materials capable of supporting same loading as floor. Protect materials on surfaces subject to traffic.

SMOKE-RESISTIVE SYSTEMS

The space around items penetrating non-fire rated walls and floors shall be filled with an approved material to limit the free passage of smoke, heat and flame in locations including, but not limited to, the following:

Penetrations through non-rated floors including both empty openings and openings containing penetrants.

Penetrations through non-rated smoke partitions and wall assemblies including both empty openings and openings containing penetrants.

WALL AND FLOOR ACCESS DOORS

Comply with manufacturer's instructions for installation of access doors, floor doors, and removable access plates.

Set frames accurately in position and securely attach to supports with face panels plumb or level in relation to adjacent finish surfaces.

Adjust hardware and panels after installation for proper operation.
Remove or replace panels or frames that are warped, bowed, or otherwise damaged.

PATCHING

Repair, patching, and finishing of walls, floors, and/or ceilings affected by demolition, cutting after installation of new work, etc. shall be done by technicians skilled in the applicable trades and shall match surrounding or adjoining materials in composition, texture, color, and finish.

CONTRACTOR AS-BUILT DRAWINGS

Maintain one set of marked-up paper copies of the Contract Drawings and Shop Drawings, incorporating new and revised drawings as modifications are issued.

Mark record prints to show the actual installation where installation varies from that shown originally. Require individual or entity who obtained record data, whether individual or entity is Installer, subcontractor, or similar entity, to provide information for preparation of corresponding marked-up record prints.

Give particular attention to information on concealed elements that would be difficult to identify or measure and record later.

Accurately record information in an acceptable drawing technique.

Record data as soon as possible after obtaining it.

Record and check the markup before enclosing concealed installations.

Cross-reference record prints to corresponding archive photographic documentation.

Types of items requiring marking include, but are not limited to, the following:

Dimensional changes.

Revisions to details.

Locations and depths of underground utilities.

Revisions to routing of piping and conduits.

Revisions to electrical circuitry.

Actual equipment locations.

Duct size and routing.

Locations of concealed internal utilities.

Additional information that was either shown schematically or omitted from original Drawings.

Note Construction Change Directive numbers, alternate numbers, Change Order numbers, and similar identification, where applicable.

Submit Contractor As-built Drawings to A/E for review **at least two (2) weeks prior to Project final inspection**.

END SECTION 019913

SUBMITTAL COVER FORM

PROJECT: Campus Fire Alarm Replacements
Pitt Community College
Winterville, NC

PROJECT NO.: Salas O'Brien 2572-00123 SCO#25-30761-01A

TO: SALAS O'BRIEN, NORTH CAROLINA, LLC.
702 Oberlin Road, Suite 300
Raleigh, NC 27605

FROM: _____

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_____

_____ CONTRACTOR _____ SUBCONTRACTOR

We submit for your consideration the following product for the above project:

SPECIFICATION SECTION	SPECIFICATION PARAGRAPH	DESCRIPTION

TYPE OF SUBMITTAL:

_____ Specified Brand Product
_____ Proposed Equivalent Product to Specified Brand
_____ Product Meeting Performance Specification (No Brand Specified)

We warrant the following:

a. We have personally investigated the proposed product, and determined that it is equal in all respects to that specified and/or performance specification requirements;

b. We will provide the specified guarantee for this product;

c. We will coordinate installation of this product into the work, making such changes as may be required for the work to be complete in all respects;

d. We have clearly indicated by marking as "Non-Complying Feature" each and every requirement of the Specifications that this product does not meet;

e. And, we waive all claims for additional costs related to this product which subsequently become apparent.

Attached hereto are complete technical data, including applicable laboratory reports, to demonstrate compliance with project requirements.

SUBMITTED BY:

_____ _____
SIGNATURE DATE

SUBMITTAL REVIEW

(SAMPLE FORM - ORIGINAL WITH COMMENTS WILL BE ATTACHED TO SUBMITTAL BY A/E)

PROJECT:

PROJECT #:

SUBMITTAL ID#:

SPECIFICATION PARAGRAPH:

DESCRIPTION:

Submittal has been reviewed only for conformance with design intent of the contract documents. See Section 019913 "GENERAL REQUIREMENTS FOR ENGINEERED WORK" for complete definition of Submittal Review.

☐ Reviewed

☐ Exceptions Noted - Revise & Proceed

☐ Exceptions Noted - Revise & Resubmit

☐ Rejected

DATE:

BY:

REVIEW COMMENTS:

THESE COMMENTS SHALL NOT BE REMOVED FROM THIS DOCUMENT

SECTION 019916 - WORK IN EXISTING BUILDINGS

PART 1 - GENERAL

RELATED DOCUMENTS

Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification sections, apply to this section.

SUMMARY

Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification sections, apply to this section.

The requirements specified herein shall govern all Sections, whether stated therein or not.

Where items specified in the other sections of this Division conflict with requirements of this Section, the former shall govern.

SUBMITTALS

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. See Section 019913 for exact requirements.

Submit a written description of each roof covering system to be disturbed and/or repaired. Description shall include each type of roofing material that will be required for repair, including but not limited to decking, membrane, insulation, substrate and flashing, and a repair sequence for each. Submit Manufacturer's warranty for each type of material to be used for repair of each roof covering system. Submit letter of qualification for each roofing contractor.

Submit data for acoustical unit type indicated. Submit the following samples:

Acoustical ceiling units: 12-inch-square samples of each type required.

Submit manufacturer's technical data sheets for each vinyl wall covering, complete with material analysis. Provide samples of each proposed wall covering, along with samples of *adjacent existing wall covering.*

DEFINITIONS

Remove: Detach items from existing construction and legally dispose of them off-site unless indicated to be removed and salvaged or removed and reinstalled.

Remove and Salvage: Carefully detach from existing construction, in a manner to prevent damage, and deliver to Owner.

Remove and Reinstall: Detach items from existing construction, prepare for reuse, and reinstall where indicated.

Existing to Remain: Existing items of construction that are not to be permanently removed and that are not otherwise indicated to be removed, removed and salvaged, or removed and reinstalled.

MATERIALS OWNERSHIP

Unless otherwise indicated, demolition waste becomes property of Contractor. Materials removed during demolition shall be accumulated in the demolition area for examination by the Owner. The Owner may choose to retain selected items. Items not selected to be retained by the Owner become the property of the Contractor and shall be removed from the site in a timely manner. All disposal fees and/or permits shall be the responsibility of the Contractor.

QUALITY ASSURANCE

Refrigerant Recovery Technician Qualifications: Certified by an EPA-approved Section 608 certification program.

FIELD CONDITIONS

Existing facilities shall remain in use during all phases of construction under this Contract. **All and any of existing building safeties such as exit signage, exit lights, fire alarm, fire sprinkler etc., must remain operational CONTINUOUSLY in order to retain building occupancy status. All required exits and exit signs must be kept available and free of obstruction at all times.** The Contractor shall cooperate with the Owner in every way possible to keep interruption of, and interference with, normal functions, activities, and operations to a minimum.

Where construction or attendant work interrupts normal functions in any area, a schedule of work shall be submitted for approval of the Owner and after approval, strictly followed. Modification to existing work shall be done as required. All work shall be performed in such a manner as to prevent any interruption of any service or utility. Where it is necessary to interrupt service for demolition, cut-in, or changeover, the work shall be scheduled well in advance of the interruption and the interruption approved by the Owner. As required by the Owner, such work shall be done during night, weekends, holidays, or other off peak period as approved.

Existing piping, ductwork, raceway and wiring, etc., shall be modified as indicated on the Drawings and/or as required by new and modified construction. Existing piping, ductwork, raceway and wiring, etc., shall be modified as required and put in first class operating condition. No equipment shall be disconnected without approval of the Owner's Representative. Temporary relocation of equipment and temporary piping, ductwork, wiring and raceway, etc., required for continued operation of the facility shall be provided as required.

ASBESTOS WARNING

Asbestos and asbestos containing materials are often encountered during the process of renovations or in the performance of site work in or in the vicinity of existing structures. Under no circumstances will the Contractor disturb asbestos or asbestos containing material.

Suspect Materials - Contractor to Notify: It is the Contractor’s responsibility to notify the Owner and the A/E immediately should suspect materials be encountered during construction activities. In the event suspect asbestos or asbestos containing materials are encountered, the Contractor shall immediately cease all work in the area and secure the involved area to prevent inadvertent contamination or exposure. The Owner or the Owner’s agent will conduct testing of suspect materials and notify the Contractor in writing when work in the affected area may resume.

Contractor Responsible for Contamination: The Contractor is enjoined to use extreme caution in the performance of construction activities in the vicinity of asbestos or asbestos containing materials. The Contractor shall bear the total and complete expense, including expenses incurred for decontamination, fines, penalties and incidental expense due to loss of use of the facility resulting from any improper work involving asbestos or asbestos containing materials.

LEAD BASED PAINT WARNING

Lead based paint and/or other lead containing materials are often encountered during the process of renovations or in the performance of site work in or in the vicinity of existing structures. The Contractor may be required to work with these materials during the normal course of the construction process.

OSHA Compliance is Contractor's Responsibility: It is the Contractor's responsibility to comply with all OSHA requirements during the construction process. Specific attention is drawn to OSHA Standard 1926.62, Subpart D, titled "LEAD" (29 CFR 1910) during work with all lead-containing materials.

Testing by Contractor: The Contractor is hereby notified that lead based paint testing may be necessary to comply with OSHA requirements.

The determination of the need for testing and the cost associated with such testing as necessary to comply with OSHA requirements is a construction activity and shall be provided by the Contactor at no additional cost to the Owner.

Contractor Responsible for Contamination: The Contractor is enjoined to **use extreme caution** in the performance of construction activities in the vicinity of lead-based paint, lead-containing paint, or lead-containing materials. The Contractor shall bear the total and complete expense, including expenses incurred for decontamination, fines, penalties and incidental expense due to loss of use of the facility resulting from any improper work involving lead or lead containing materials.

PART 2 - PRODUCTS

GYPSUM WALLBOARD

Interior gypsum wallboard walls or ceilings affected by demolition or new work shall be repaired or patched to match adjacent materials, in compliance with the following:

Gypsum Board: Comply with ASTM C 840 and GA-216.

Joint Treatment Materials: Comply with ASTM C 475.

Joint Tape: Fiberglass.

Joint Compound for Interior Gypsum Wallboard: For each coat use formulation that is compatible with other compounds applied on previous or for successive coats.

Pre-filling: At open joints, beveled panel edges**,** and damaged surface areas, use setting-type taping compound.

Embedding and First Coat: For embedding tape and first coat on joints, flanges of trim accessories, and fasteners, use setting-type taping compound.

Fill Coat: For second coat, use drying-type, all-purpose compound.

Finish Coat: For third coat, use drying-type, all-purpose compound.

Where indicated, new GWB walls, partitions, and/or ceilings shall be provided, framed with the following material(s) to match adjacent existing:

Wood framing:

All lumber shall be graded to comply with the rules of applicable grading agencies. Provide lumber graded by an agency certified by the ALSC Board of Review to inspect and grade lumber under the rules indicated. Factory mark each piece of lumber with grade stamp of grading agency.

Where nominal sizes are indicated, provide actual sizes for moisture content not to exceed 15 percent. Provide dressed lumber, S4S, unless otherwise indicated.

Provide engineered wood products, as indicated, acceptable to authorities having jurisdiction.

Pressure-treated wood:

Comply with AWPA U1. Use Category UC2 for interior construction not in contact with the ground.

Preservative chemicals shall be acceptable to authorities having jurisdiction and containing no arsenic, inorganic boron, or chromium.

Kiln-dry lumber after treatment to a maximum moisture content of 15 percent. Do not use material that is warped or that does not comply with requirements for untreated material.

Fasteners:

Where rough carpentry is exposed to weather, in ground contact, pressure-preservative treated, or in area of high relative humidity, provide fasteners of Type 304 stainless steel.

Provide fasteners in compliance with the following:

Nails, Brads, and Staples: ASTM F 1667.

Power-Driven Fasteners: NES NER-272.

Wood Screws: ASME B18.6.1.

Lag Bolts: ASME B18.2.1.

Bolts: Steel bolts complying with ASTM A 307, Grade A; with ASTM A 563 hex nuts and, where indicated, flat washers.

Expansion Anchors: Anchor bolt and sleeve assembly of stainless steel with bolts and nuts complying with ASTM F 593 and ASTM F 594, Alloy Group 1 or 2 with capability to sustain, without failure, a load equal to six times the load imposed when installed in unit masonry assemblies and equal to four times the load imposed when installed in concrete as determined by testing per ASTM E 488 conducted by a qualified independent testing and inspecting agency.

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Metal framing anchors:

Interior Anchors: Fabricate from hot-dip, heavy-galvanized steel sheet complying with ASTM A 653/A 653M; structural steel (SS), high-strength low-alloy steel Type A (HSLAS Type A), or high-strength low-alloy steel Type B (HSLAS Type B); G185 coating designation; and not less than 0.036 inch thick.

Anchors For Use In Wood-Preservative-Treated Lumber: Stainless-steel sheet complying with ASTM A 666, Type 304 for used in indoor treated lumber and Type 316 for use in outdoor treated lumber in coastal regions.
Use for exterior locations and where indicated.

Miscellaneous materials:

Sill-Sealer Gaskets: Glass-fiber-resilient insulation, fabricated in strip form, for use as a sill sealer; 1-inch nominal thickness, compressible to 1/32 inch; selected from manufacturer's standard widths to suit width of sill members indicated.

Flexible Flashing: Composite, self-adhesive, flashing product consisting of a pliable, butyl rubber or rubberized-asphalt compound, bonded to a high-density polyethylene film, aluminum foil, or spun-bonded polyolefin to produce an overall thickness of not less than 0.025 inch.

Metal framing members:

Provide light gauge metal framing shall consist of pre-formed galvanized steel studs and tracks conforming to ASTM C 645 for non-structural steel framing members or to ASTM C 955 for load-bearing steel framing.

Metal framing members shall be manufacturers' standard load-bearing steel studs and joists of type, size, shape, and gauge as indicated. With each type of metal framing required, provide manufacturer's standard steel runners (tracks), blocking, lintels, reinforcements, shoes, clip angles, fasteners, and accessories for applications indicated, as needed to provide a complete metal framing system.

Materials and finishes:

For 16 gauge and heavier units, fabricate metal framing components of structural quality steel sheet with a minimum yield point of 40,000 psi, ASTM A 446 Grade C.

For 18 and 20 gauge units, fabricate metal framing components of commercial quality steel sheet with a minimum yield point of 33,000 psi, ASTM A 446 Grade A.

Provide galvanized finish to metal framing components complying with ASTM A 525 for minimum G 60 coating.

Finish of installation accessories to match that of main framing components, unless otherwise indicated.

Provide nuts, bolts, washers, screws, and other fasteners with corrosion-resistant plated finish.

Where galvanized surfaces are damaged, prepare surfaces and repair in accordance with procedures specified in ASTM A 780.

Framing components may be prefabricated into assemblies before erection.

Fabricate panels plumb, square, true-to-line, and braced against racking with joints welded. Perform lifting of prefabricated units to prevent damage or distortion.

Fabricate units in jig templates to hold members in proper alignment and position and to assure consistent component placement.

INTERIOR PAINTING

Where required, provide new interior paint systems to match existing type, thickness, color, and pattern.

Contractor shall verify compatibility of new paint systems which are to be applied over existing systems prior to commencing work. All paints and coatings shall be low VOC types. All color(s) shall match adjacent existing color(s) unless otherwise directed by the A/E.

Work includes painting and finishing of exposed interior items and surfaces, including but not limited to the following:

Building surfaces left exposed after installation or removal of conduit, panels, piping, ductwork, equipment, etc. Any work associated with project work.

Areas of patched/repaired walls, ceilings, and structure.

All coating materials required by this section shall be provided by a single manufacturer, unless otherwise required or approved. Subject to compliance with requirements, provide products by one of the following:

Benjamin Moore & Co.
Duron, Inc.

ICI Paints.
Sherwin-Williams Company (The).

For each individual paint system, provide primer and other undercoat paint produced by the same manufacturer as finish coat.

Painting shall be provided by a firm with not less than 5 years of successful experience in painting work similar in scope to work of this project. Maintain throughout duration of the work a crew of painters who are fully qualified to satisfy requirements of the specifications.

Paint products shall comply with MPI standards indicated below and listed in MPI *Approved Products List*.

Material Compatibility: Provide materials for use within each paint system that are compatible with one another and substrates, under conditions of service and application as demonstrated by manufacturer, based on testing and field experience.

For each coat in a paint system, provide products recommended in writing by manufacturers of topcoat for use in paint system and on substrate indicated.

Paints and primers shall comply with the following:

Metal Primers:

Rust-Inhibitive Primer (water-based): MPI #107.
VOC Content: E Range of E1.
Environmental Performance Rating: EPR 1.

Waterborne Galvanized-Metal Primer: MPI #134.
VOC Content: E Range of E1.
Environmental Performance Rating: EPR 1.

Latex Paints:

Latex Primer/Sealer: MPI #50.
VOC Content: E Range of E1.
Environmental Performance Rating: EPR 1.

Institutional Low-Odor/VOC Latex (Eggshell): MPI #145 (Gloss Level 3).
VOC Content: E Range of E3.
Environmental Performance Rating: EPR 4.5.

Institutional Low-Odor/VOC Latex (Semigloss): MPI #147 (Gloss Level 5).
VOC Content: E Range of E3.
Environmental Performance Rating: EPR 3.

ACOUSTICAL LAY-IN CEILING MATERIALS

Where required, provide new lay-in acoustical tile ceilings to match existing type, size, thickness, color, and pattern, in compliance with ASTM E 1264 for Class A materials.

Fire Performance Characteristics:

Surface burning characteristics: Provide products having the following characteristics when tested in accordance with ASTM E 84:

Maximum flame spread: 25
Maximum smoke developed: 50

Fire-resistant (time-rated) assemblies: Provide acoustical ceiling products and installation accessories labeled and listed by Underwriters Laboratories Inc. for assemblies indicated, by reference to the Fire Resistance Directory design numbers.

PART 3 - EXECUTION

PERFORMANCE REQUIREMENTS

Comply with governing EPA notification regulations before beginning selective demolition.

Comply with hauling and disposal regulations of authorities having jurisdiction.

EXISTING FACILITY ACCESS

Existing Elevator Use: Use of Owner's existing elevators will be permitted, provided elevators are cleaned and maintained in a condition acceptable to Owner. At Substantial Completion, restore elevators to condition existing before initial use, including replacing worn cables, guide shoes, and similar items of limited life.

Do not load elevators beyond their rated weight capacity.

Provide protective coverings, barriers, devices, signs, or other procedures to protect elevator car and entrance doors and frame. If, despite such protection, elevators become damaged, engage elevator Installer to restore damaged work so no evidence remains of correction work. Return items that cannot be refinished in field to the shop, make required repairs and refinish entire unit, or provide new units as required.

Existing Stair Use: Use of Owner's existing stairs will be permitted, provided stairs are cleaned and maintained in a condition acceptable to Owner. At Substantial Completion, restore stairs to condition existing before initial use.

Provide protective coverings, barriers, devices, signs, or other procedures to protect stairs and to maintain means of egress. If stairs become damaged, restore damaged areas so no evidence remains of correction work.

EXAMINATION AND PREPARATION

Verify that utilities have been disconnected and capped, valved off, or otherwise secured before starting demolition.

Survey existing conditions and correlate with requirements indicated to determine extent of selective demolition required.

When unanticipated mechanical, electrical, or structural elements that conflict with intended function or design are encountered, investigate and measure the nature and extent of conflict. Promptly submit a written report to the A/E.

Provide temporary barricades and other protection required to prevent injury to people and damage to adjacent buildings and facilities to remain. As necessary, provide dust barriers, noise control, etc. to minimize impact of demolition on adjacent occupied areas.

Provide protection to ensure safe passage of people around demolition area and to and from occupied portions of building.

Provide temporary weather protection, during interval between demolition of existing construction on exterior surfaces and new construction, to prevent water leakage and damage to structure and interior areas.

Provide heating, cooling, dehumidification, and ventilation as necessary to protect the existing building materials and finishes during the demolition period.

Where existing plumbing, fire protection, HVAC, or electrical services in demolition areas must be shutdown, temporary plumbing, fire protection, heating, cooling, dehumidification, ventilation, lighting, and electrical power shall be provided as needed to maintain use of adjacent occupied areas that are negatively impacted by the shutdown.

Protect walls, ceilings, floors, and other existing finish work that are to remain or that are exposed during selective demolition operations.

Cover and protect furniture, furnishings, and equipment that have not been removed.

Provide and maintain shoring, bracing, and structural supports as required to preserve stability and prevent movement, settlement, or collapse of construction and finishes to remain, and to prevent unexpected or uncontrolled movement or collapse of construction being demolished.

GENERAL CONSTRUCTION DEMOLITION

Demolish and remove existing construction only to the extent required by new construction and as indicated. Use methods required to complete the Work within limitations of governing regulations and as follows:

Neatly cut openings and holes plumb, square, and true to dimensions required. Use cutting methods least likely to damage construction to remain or adjoining construction. Use hand tools or small power tools designed for sawing or grinding, not hammering and chopping, to minimize disturbance of adjacent surfaces. Temporarily cover openings to remain.

Cut or drill from the exposed or finished side into concealed surfaces to avoid marring existing finished surfaces.

Do not use cutting torches until work area is cleared of flammable materials. At concealed spaces, such as duct and pipe interiors, verify condition and contents of hidden space before starting flame-cutting operations. Maintain fire watch and/or portable fire-suppression devices, as required, during flame-cutting operations.

Maintain adequate ventilation when using cutting torches.

Remove decayed, vermin-infested, or otherwise dangerous or unsuitable materials and promptly dispose of off-site.

Remove structural framing members and lower to ground by method suitable to avoid free fall and to prevent ground impact or dust generation.

Locate selective demolition equipment and remove debris and materials so as not to impose excessive loads on supporting walls, floors, or framing.

Dispose of demolished items and materials promptly.

Protect construction indicated to remain against damage and soiling during demolition.

ELECTRICAL DEMOLITION

Coordinate all electrical outages with the Owner to facilitate reworking of existing system. No service, feeder, or branch circuit may be de-energized unless specific approval has been obtained from the Owner's representative.

Dispose of Removed Equipment and Material: Materials removed and not indicated by Drawings to be reinstalled, stored, or retained by the Owner, shall be removed from the site in a timely manner at the Contractor's expense.

> The Owner may choose to retain selected items or equipment. The Contractor shall remove and deliver such items and/or equipment to a location on site as requested by the Owner.

Thoroughly inspect electrical systems in reworked areas and bring to the attention of the A-E all defective or unserviceable material not scheduled for removal or replacement.

Remove all abandoned wiring, both exposed and concealed.

Remove all abandoned raceway and any related items, both exposed and concealed. Where existing raceway is concealed in concrete or masonry, remove wiring as required above and abandon in place. Cut abandoned raceway off ½" into wall, ceiling, or floor to allow patching to completely cover cut off end of raceway.

Repair surfaces and finishes to match existing surrounding surfaces or finish in all areas where items are removed. After repairs are made no evidence of previous use of surfaces shall be visible.

Provide touch-up painting as required where new items are installed adjacent to existing items to remain.

Clean new, damaged, and/or disturbed areas and apply primer, intermediate, and finish coats at each location.

Surface preparation and timing of application of successive coats of paint shall be in accordance with paint manufacturer's instructions.

Use zinc-rich paint to repair damage to galvanized finishes. Follow written instructions of paint manufacturer.

Repair paint finishes for other items, surfaces, or equipment as necessary. Follow written instructions of paint manufacturer.

Provide blank cover plates to match device plates used in the adjoining areas where outlet, device, junction, or other boxes are to remain,

Perform the electrical demolition as described below:

Remove all electrical raceway, cable, wiring, devices, junction boxes, fittings, and related items from all locations indicated on the Drawings as being renovated. Existing raceway, junction boxes, fittings, and similar items may only be reused for the present project where explicitly indicated on the Drawings, provided:

The existing item is in good condition and is suitable for reuse.

The existing items meets the requirements of the Specifications for similar items which might be provided new in other locations on the project. Additional support and/or fire stopping may be required to meet this condition.

The existing item is located in the same position as required in the new configuration as shown on the Drawings.

Extend or relocate all existing circuits and related items serving existing utilization or other equipment where such circuits or items are disrupted due to demolition activities of any division of the Contract Documents. Relocate all existing junction boxes or similar items that will be rendered inaccessible by new construction furnished under any division of the Contract Documents. Provide any and all temporary electrical supply (supplies) as needed to meet this requirement.

Remove all abandoned circuits back to the point of supply or back to the point where other remaining loads are connected. Label any unused overcurrent devices as "SPARE". Circuits supplying equipment which is removed or demolished by any division of the Contract Documents is considered as "abandoned" for purposes of this requirement.

Revise existing panel directories to reflect modifications made as a part of the project. All directory revisions shall be typed.

GYPSUM WALL BOARD INSTALLATION

Framing for new GWB walls, partitions, and/or ceilings:

Wood framing:

Set carpentry to required levels and lines, with members plumb, true to line, cut, and fitted. Fit carpentry to other construction; scribe and cope as needed for accurate fit. Locate furring, nailers, blocking, and similar supports to comply with requirements for attaching other construction.

Comply with AF&PA's WCD 1, "Details for Conventional Wood Frame Construction," unless otherwise indicated.

Install engineered wood products to comply with manufacturer's written instructions.

Install plywood backing panels by fastening to studs; coordinate locations with utilities requiring backing panels. Where required, install fire-retardant treated plywood backing panels with classification marking of testing agency exposed to view.]

Install metal framing anchors to comply with manufacturer's written instructions. Install fasteners through each fastener hole.

Install sill sealer gasket to form continuous seal between sill plates and foundation walls.

Do not splice structural members between supports unless otherwise indicated.

Provide blocking and framing as indicated and as required to support facing materials, fixtures, specialty items, and trim.

Provide metal clips for fastening gypsum board or lath at corners and intersections where framing or blocking does not provide a surface for fastening edges of panels. Space clips not more than 16 inches o.c.

Provide fire blocking in furred spaces, stud spaces, and other concealed cavities as indicated and as follows:

Fire block furred spaces of walls, at each floor level, at ceiling, and at not more than 96 inches o.c. with solid wood blocking or noncombustible materials accurately fitted to close furred spaces.

Fire block concealed spaces of wood-framed walls and partitions at each floor level, at ceiling line of top story, and at not more than 96 inches o.c. Where fire blocking is not inherent in framing system used, provide closely fitted solid wood blocks of same width as framing members and 2-inch nominal-thickness.

Fire block concealed spaces between floor sleepers with same material as sleepers to limit concealed spaces to not more than 100 sq. ft. and to solidly fill space below partitions.

Fire block concealed spaces behind combustible cornices and exterior trim at not more than 20 feet o.c.

Sort and select lumber so that natural characteristics will not interfere with installation or with fastening other materials to lumber. Do not use materials with defects that interfere with function of member or pieces that are too small to use with minimum number of joints or optimum joint arrangement.

Comply with AWPA M4 for applying field treatment to cut surfaces of preservative-treated lumber.

Use inorganic boron for items that are continuously protected from liquid water.

Use copper naphthenate for items not continuously protected from liquid water.

Securely attach carpentry work to substrate by anchoring and fastening as indicated, complying with the following:

Use steel common nails unless otherwise indicated. Select fasteners of size that will not fully penetrate members where opposite side will be exposed to view or will receive finish materials. Make tight connections between members. Install fasteners without splitting wood. Drive nails snug but do not countersink nail heads unless otherwise indicated.

Wood sleeper, blocking, and nailer Installation:

Install where required for attaching other work. Form to shapes and cut as required for true line and level of attached work. Coordinate locations with other work involved.

Attach items to substrates to support applied loading. Recess bolts and nuts flush with surfaces unless otherwise indicated.

Where wood-preservative-treated lumber is installed adjacent to metal decking, install continuous flexible flashing separator between wood and metal decking.

Wall and partition framing installation:

Provide single bottom plate and double top plates using members of 2-inch nominal thickness whose widths equal that of studs, except single top plate may be used for non-load-bearing partitions and for load-bearing partitions where framing members bearing on partition are located directly over studs. Fasten plates to supporting construction unless otherwise indicated.

Provide wood studs sized to match adjacent existing, spaced 16 inches o.c. unless otherwise indicated.

Provide continuous horizontal blocking at mid-height of partitions more than 96 inches high, using members of 2-inch nominal thickness and of same width as wall or partitions.

Construct corners and intersections with three or more studs, except that two studs may be used for interior non-load-bearing partitions.

Frame openings with multiple studs and headers. Provide nailed header members of thickness equal to width of studs. Support headers on jamb studs.

For non-load-bearing partitions, provide double-jamb studs and headers not less than 4-inch nominal depth for openings 48 inches and less in width, 6-inch nominal depth for openings 48 to 72 inches in width, 8-inch nominal depth for openings 72 to 120 inches in width, and not less than 10-inch nominal depth for openings 10 to 12 feet in width. For load-bearing walls, provide double-jamb studs for openings 60 inches and less in width, and triple-jamb studs for wider openings. Provide headers of depth required the *North Carolina State Building Code: Building Code*.

Floor joist framing installation:

Install floor joists with crown edge up and support ends of each member with not less than 1-1/2 inches of bearing on wood or metal, or 3 inches on masonry. Attach floor joists as follows:

Where supported on wood members, by using metal framing anchors.

Where framed into wood supporting members, by using wood ledgers as indicated or, if not indicated, by using metal joist hangers.

At joists built into masonry, bevel cut ends 3 inches and do not embed more than 4 inches.

Frame openings with headers and trimmers supported by metal joist hangers; double headers and trimmers where span of header exceeds 48 inches.

Do not notch in middle third of joists; limit notches to one-sixth depth of joist, one-third at ends. Do not bore holes larger than 1/3 depth of joist; do not locate closer than 2 inches from top or bottom.

Provide solid blocking of 2-inch nominal thickness by depth of joist at ends of joists unless nailed to header or band.

Lap members framing from opposite sides of beams, girders, or partitions not less than 4 inches or securely tie opposing members together. Provide solid blocking of 2-inch nominal thickness by depth of joist over supports.

Anchor members paralleling masonry with 1/4-by-1-1/4-inch metal strap anchors spaced not more than 96 inches o.c., extending over and fastening to three joists. Embed anchors at least 4 inches into grouted masonry with ends bent at right angles and extending 4 inches beyond bend.

Provide solid blocking between joists under jamb studs for openings.

Under non-load-bearing partitions, provide double joists separated by solid blocking equal to depth of studs above.

Provide triple joists separated as above, under partitions receiving ceramic tile and similar heavy finishes or fixtures.

Provide steel bridging installed to comply with bridging manufacturer's written instructions, at intervals of 96 inches o.c., between joists.

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Ceiling Joist Framing Installation: Install ceiling joists with crown edge up and complying with requirements specified above for floor joists. Face nail to ends of parallel rafters.

INTERIOR PAINTING

Store materials not in use in tightly covered containers in well-ventilated areas with ambient temperatures continuously maintained at not less than 45 deg F.

Maintain containers in clean condition, free of foreign materials and residue.

Remove rags and waste from storage areas daily.

Apply paints only when temperature of surfaces to be painted and ambient air temperatures are between 50 and 95 deg F.

Do not apply paints when relative humidity exceeds 85 percent; at temperatures less than 5 deg F above the dew point; or to damp or wet surfaces.

Examine substrates and conditions for compliance with requirements for maximum moisture content and other conditions affecting performance of work.

Verify suitability of substrates, including surface conditions and compatibility with existing finishes and primers.

Begin coating application only after unsatisfactory conditions have been corrected and surfaces are dry. *Beginning coating application signifies Contractor acceptance of substrates and their conditions.*

Preparation:

Comply with manufacturer's written installation instructions and recommendations in MPI *Architectural Painting Specification Manual* applicable to substrates indicated.

Remove plates, machined surfaces, and similar items already in place that are not to be painted. If removal is impractical or impossible because of size or weight of item, provide surface-applied protection before surface preparation and painting.

Do not paint over labels of independent testing agencies or equipment name, identification, performance rating, or nomenclature plates.

Remove incompatible primers and reprime substrate with compatible primers as required to produce paint systems indicated.

Steel Substrates: Remove rust and loose mill scale. Clean using methods recommended in writing by paint manufacturer.

Galvanized-Metal Substrates: Remove grease and oil residue from galvanized sheet metal fabricated from coil stock by mechanical methods to produce clean, lightly etched surfaces that promote adhesion of subsequently applied paints.

Gypsum Board Substrates: Do not begin paint application until finishing compound is dry and sanded smooth.

Apply paints according to manufacturer's written instructions.

Use applicators and techniques suited for paint and substrate indicated.

Paint surfaces behind movable equipment and furniture same as similar exposed surfaces. Before final installation, paint surfaces behind permanently fixed equipment or furniture with prime coat only.

Paint front and backsides of access panels, removable or hinged covers, and similar hinged items to match exposed surfaces.

Tint each undercoat a lighter shade to facilitate identification of each coat if multiple coats of same material are to be applied. Tint undercoats to match color of topcoat, but provide sufficient difference in shade of undercoats to distinguish each separate coat.

If undercoats or other conditions show through topcoat, apply additional coats until cured film has a uniform paint finish, color, and appearance.

Apply paints to produce surface films without cloudiness, spotting, holidays, laps, brush marks, roller tracking, runs, sags, ropiness, or other surface imperfections. Cut in sharp lines and color breaks.

Cleaning and Protection:

At end of each workday, remove rubbish, empty cans, rags, and other discarded materials from Project site.

After completing paint application, clean spattered surfaces. Remove spattered paints by washing, scraping, or other methods. Do not scratch or damage adjacent finished surfaces.

Protect work of other trades against damage from paint application. Correct damage to work of other trades by cleaning, repairing, replacing, and refinishing, as approved by Architect, and leave in an undamaged condition.

At completion of construction activities of other trades, touch up and restore damaged or defaced painted surfaces.

Interior Painting Schedule:

Substrate	Paint System	Prime Coat	Intermediate Coat	Topcoat
Concrete/ Masonry (Non-Traffic Surfaces)	Institutional Low-Odor/VOC Latex: MPI INT 3.1M	Institutional low-odor/VOC interior latex matching topcoat	Institutional low-odor/VOC interior latex matching topcoat	Institutional low-odor/VOC interior latex (flat) (eggshell)
Black Steel	Institutional Low-Odor/VOC Latex: MPI INT 5.1S	Rust-inhibitive primer (water based)	Institutional low-odor/VOC interior latex matching topcoat	Institutional low-odor/VOC interior latex (semigloss)
Galvanized Steel	Institutional Low-Odor/VOC Latex: MPI INT 5.3N	Waterborne galvanized-metal primer.	Institutional low-odor/VOC interior latex matching topcoat	Institutional low-odor/VOC interior latex (semigloss)
Gypsum Wall Board	Institutional Low-Odor/VOC Latex: MPI INT 9.2M	Interior latex primer/sealer	Institutional low-odor/VOC interior latex matching topcoat	Institutional low-odor/VOC interior latex (eggshell)

Painting Completion: After completing painting operations, use workers skilled in the trades involved to reinstall items that were removed. Remove surface-applied protection if any.

ACOUSTICAL LAY-IN CEILING REPLACEMENT AND REPAIR

Prepare and distribute to affected installers, data necessary for coordination with related work. Include setting diagrams showing placement of attachment devices for acoustical ceiling hangers.

Coordinate ceiling system installation with work of other sections as required, including the following:

Light fixtures.
HVAC equipment.
Partitions.

Within each space to receive specified products, do not begin installation until the following conditions are met:

Work above ceilings has been finished, tested, and approved.
Space to receive ceiling system is properly enclosed and protected from weather.

Any wet work within the space is dry.

Do not begin installation of ceiling system until building's normal operating temperature and humidity levels have been reached and will be maintained.

Examine substrates and conditions under which products of this section are to be installed and verify that the work properly may commence.

Position ceiling components to maximize use of full-sized acoustical units and to provide border units which are equal in size and shape at opposing ceiling edges. Use of acoustical units which are smaller than 1/2 full-width is prohibited at ceiling perimeters. Conform to reflected ceiling plans to greatest extent possible.

Suspension System Installation:

Conform to the requirements of ASTM C 636, manufacturer's installation instructions, and governing regulations.

Install hangers plumb and supported solely by building structure or carrying channels. Do not allow hangers to contact any objects or materials in ceiling plenum which are not actual components of ceiling system.

Splay hangers only where necessary to avoid obstacles. Provide counter-splaying, bracing, or other acceptable devices to compensate for lateral stresses caused by splayed hangers.

Install splay hangers or other means of seismic restraint as required to meet the requirements of ASTM E 580.

Do not attach hangers to piping, conduit, or duct. Provide carrying channel trapeze support where obstruction cannot be avoided by splaying hanger 45 degrees from vertical or less.

Space hangers at not more than 48 inches on center and within 6 inches of ends of each direct-hung runner or carrying channel, unless indicated otherwise.

Loop and tie wire hangers securely to building's structural members; to attachment devices indicated; or, where not indicated, to devices suitable for substrate and capable of permanently supporting ceiling weight without failure or deterioration.

Level ceiling suspension system to tolerance of 1/8 inch in 12 feet, with cumulative tolerance not to exceed 1/4 inch. Bending or kinking of hangers is not allowed.

Install grid members square, with ends of members securely interlocked. Remove and replace dented, bent, or kinked members.

Trim Installation:

Install edge moldings and trim units at acoustical ceiling borders, at locations indicated, and where required to cover acoustical unit edges.

Space screws not more than 16 inches on center and within 3 inches of ends of each trim-piece being installed. Install moldings and trim level with suspension system and within tolerance specified for suspension system.

Miter corners and align butt joints carefully to form tight hairline joints.

Face-riveting of trim and moldings is not allowed.

Lay-In Panel Installation: Install acoustical panels for accurate fit with suspension system and trim members. Scribe and cut panels at ceiling perimeter and at obstructions to provide neat, precise fit. Provide installation with panel edges which are hidden from view, by suspension members or trim.

Adjust and Clean:

Use ceiling manufacturer's recommended methods and materials to clean and touch-up exposed components of ceiling system.

Replace existing ceiling system components which are discolored or damaged in any way, in a manner which results in the ceiling system showing no evidence of replacement work.

Patching/Repairing Existing Masonry Construction:

Existing Masonry Unit Removal:

Carefully remove by hand masonry units. Cut out full units from joint to joint and in manner to permit replacement with full size units.

Support and protect masonry to remain that surrounds removal area.

Clean remaining masonry at edges of removal areas by removing mortar, dust, and loose debris in preparation for rebuilding.

Masonry Unit Rebuilding:

Match existing coursing, bonding, color and texture.

Fit replacement units into bonding and coursing pattern of existing. If cutting is required, use motor driven saw designed to cut masonry with clean, sharp unchipped edges.

Lay replacement masonry with completely filled bed, head and collar joints. Butter ends with sufficient mortar to fill head joints and shove into place. Do not wet concrete masonry units. Maintain joint width for replacement units to match existing.

Tool exposed mortar joints in repaired area to match joints of surrounding existing masonry.

Repoint new mortar joints in repaired area to match existing mortar joints.

END OF SECTION 019916

SECTION 019926 - OWNER INSTRUCTION AND TRAINING

PART 1 - GENERAL

RELATED DOCUMENTS

Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification sections, apply to this section.

The requirements specified herein shall govern all Sections, whether stated therein or not.

Where items specified in the other sections of this Division conflict with requirements of this Section, the former shall govern.

QUALITY ASSURANCE

The Owner instruction and training program shall be developed and coordinated by a firm or individual experienced in training or educating maintenance personnel.

Contractor personnel experienced in the systems and components incorporated in this Project, along with factory-authorized service representatives, shall perform the instruction.

COORDINATION

Coordinate instruction schedule with Owner's operations. Adjust schedule as required to minimize disrupting Owner's operations and to ensure availability of Owner's personnel.

Coordinate content of training modules with content of manufacturers' recommended emergency, operation, and maintenance procedures.

SUBMITTALS

General: 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. See Section 019913 for exact requirements.

Instructional Program and Instructional Materials: Submit detailed description of instructional program structure, training modules, and instructional materials.

Instructor Qualifications: Submit curriculum vitae for each instructor, specifically defining the experience of each instructor and the training modules for which he or she shall be responsible.

PART 2 - PRODUCTS

INSTRUCTION PROGRAM

General: **The Contractor(s) for each of Divisions 26-28, as applicable, is responsible for instructing Owner's personnel relative to each Division's work**, including the following:

Instruction in the operation of systems, subsystems, and equipment.

Training in maintenance of systems, subsystems, and equipment.

Program Structure: Develop an instruction and training program that includes individual training modules for each Division 21-28 system, subsystem, and equipment item, including both classroom instruction and "hands-on" demonstrations.

Training Modules: Develop a learning objective and teaching outline for each instruction and training module, taking into consideration the level of proficiency of Owner's maintenance staff. Include a description of specific skills and knowledge that each participant is expected to master.

For each instruction and training module, include instruction for the following, as applicable to the system, subsystem, equipment, or component:

Documentation: Review the following items in detail:

Operations manuals.

Maintenance manuals.

Project record documents.

Warranties, bonds, and guarantees.

Maintenance service agreements and similar continuing commitments.

Emergencies: Include the following, as applicable:

Instructions on meaning of warnings, trouble indications, and error messages.

Shutdown instructions for each type of emergency.

Operating instructions for conditions outside of normal operating limits.

Sequences for electric or electronic control systems.

Special operating instructions and procedures.

Operations: Include the following, as applicable:

Startup procedures.

Equipment or system break-in procedures.

Routine and normal operating instructions.

Regulation and control procedures.

Control sequences.

Safety procedures.

Normal start-up and shutdown instructions.

Operating procedures for emergencies.

Operating procedures for system, subsystem, or equipment failure.

Required sequences for electric or electronic control systems.

Special operating instructions and procedures.

Adjustments: Include the following:

Alignments.

Routine adjustments, tightening, etc.

Noise and vibration adjustments.

Economy and efficiency adjustments.

Maintenance: Demonstrate the following:

Inspection procedures.

Preventative maintenance requirements, consisting of the following:

Routine maintenance, which consists of specific procedures that are performed on a regular schedule and are designed to detect, preclude, or mitigate degradation of a system or its components.

Predictive maintenance, which uses routine inspection and evaluation, testing, and analysis to augment routine maintenance procedures by detecting the onset of component degradation and to address problems as they are identified.

Instruction on use of special tools.

Repairs: Include the following:

Troubleshooting and diagnostic instructions.

Test and inspection procedures.

Repair instructions.

Disassembly; component removal, repair, and replacement; and reassembly instructions.

Review of spare parts needed for operation and maintenance.

PART 3 - EXECUTION

Owner will furnish an instructor to describe Owner's operational philosophy.

Owner will furnish Contractor with names and positions of participants to attend instruction and training, not to exceed 10 individuals.

Confirm Topics and Agenda with owner prior to scheduling.

Provide instruction at mutually agreed on times scheduled at least four (4) weeks in advance through the A/E. For systems, subsystem, and/or equipment that requires seasonal operation, provide required instruction at start of each season.

Conduct training on-site in the completed and fully operational facility in classroom/conference space provided by the Owner and using the actual systems, subsystems, and equipment installed.

Conduct training using final operation and maintenance data submittals as the training reference material. If additional training materials are utilized, they shall be incorporated as an appendix to the operation and maintenance data submittals.

Provide documentation that Owner instruction and training has taken place. Provide record of dates, topics, and duration of each training session, the names of Owner's staff who participated, and a signed review form by each participant.

END OF SECTION 019926

SECTION 260000 - SUMMARY OF ELECTRICAL WORK

Engineer of Record for Electrical work is Xing (Sophie) Zhou, PE, Salas O'Brien North Carolina, Inc., 702 Oberlin Road, Suite 300, Raleigh, NC 27605. Electrical work shall be defined by drawings numbered with the prefix "E", the general provisions of the Contract including General Conditions and Supplementary Conditions, Division 1 Specifications sections, and Division 26-28 Technical Specifications listed below. In addition, Electrical work may be defined by reference to other documents from any of the above-named sources as well as by project addenda.

DIVISION 26 - ELECTRICAL

Section	Title
260000	Summary of Electrical Work
260500	Basic Electrical Requirements
260519	Secondary Voltage Wires and Cables
260526	Grounding
260529	Supporting Devices
260533	Electrical Identification
260534	Raceways
260535	Electrical Boxes and Fittings
260593	Electrical Connections for Equipment
260800	Testing and Placing in Service

DIVISION 28 – ELECTRONIC SAFETY AND SECURITY

Section	Title
283100	Fire Alarm Systems
	Record of Completion Form 2013
	SCO Fire Alarm Check List 2020

END OF SECTION 260000

SECTION 260500 - BASIC ELECTRICAL REQUIREMENTS

PART 1 - GENERAL

RELATED DOCUMENTS

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

SCOPE

The electrical design for this project is based on the requirements of the *National Electrical Code* (NEC), NFPA-70, 2020 Edition. Where not restricted to more stringent requirements by the Drawings and Specifications, the minimum requirements of the NEC shall prevail.

Contractor shall coordinate the work and equipment of this Division with the work and equipment specified elsewhere in order to assure a complete and satisfactory installation.

It is the intention of these Specifications and Drawings to call for finished work, tested and ready for operation. Whenever the words "supply," "provide," or "furnish" are used, it shall mean "furnish and install complete and ready for use at no additional cost."

Minor details not usually shown or specified, but necessary for the proper installation and operation, shall be included in the Work the same as if herein specified or shown.

Some items of equipment are specified in the singular; however, the Contractor shall provide and install the number of items of equipment as indicated on the Drawings, and as required for complete systems. The words “and” and “or” shall be interpreted in both the singular and plural sense (and/or) as appropriate to the use.

Electrical service entrance equipment arrangements for temporary and permanent connections to the Owner's system shall conform to the Owner's requirements. Coordinate circuit breakers with the existing system.

All ampacities or other conductor references where indicated or otherwise specified in the Drawings or Specifications are based on copper conductors. **Aluminum conductors are not acceptable and will not be permitted.**

DEFINITIONS

Definitions for "Concealed" and "Exposed" are provided for the purpose of specifying wiring methods or for defining the appearance of finished work and are not the same as definitions used in the National Electrical Code.

Concealed: Work within or behind various construction elements or in crawl spaces or trenches that is not exposed to view when the project is complete.

Exposed: Not "concealed" as defined above, or anything exposed to view when the project is complete.

Labeled: Equipment or materials to which has been attached a label, symbol, or other identifying mark of an organization accredited by NCBCC (North Carolina Building Code Council) to label electrical equipment and concerned with product evaluation, that maintains periodic inspection of production of labeled equipment or materials and by whose labeling the manufacturer indicates compliance with appropriate standards or performance in a specified manner.

Listed: Equipment or materials included in a list published by an organization accredited by NCBCC (North Carolina Building Code Council) to label electrical equipment and concerned with product evaluation, that maintains periodic inspection of production of listed equipment or materials, and whose listing states either that the equipment or material meets appropriate designated standards or has been tested and found suitable for use in a specified manner.

Wiring: Cable, raceways, fittings, mechanical supports, wire, junction boxes, device boxes, outlet boxes, switches, cutouts, and related items.

PART 2 – PRODUCTS (NOT USED)

PART 3 - EXECUTION

ENERGIZED SYSTEM WARNING

Extreme caution is enjoined with regard to work with and around energized electrical equipment. The Contractor is urged to coordinate all such activities with the Owner or the local electric utility so that electrical equipment may be de-energized as required to safely perform necessary construction activities as defined in the Drawings and Specifications. Suitable OSHA approved lockout-tagout procedures shall be used when circuits or equipment have been de-energized for the purpose of performing construction activities. All work practices related to worker safety are the complete responsibility of the Contractor.

DUTIES OF CONTRACTOR

The Drawings are generally diagrammatic in nature and are neither intended to show each fitting, box, elbow, offset, hanger, *etc.*, nor a complete detail of all work to be done. The Drawings are for the purpose of illustrating the type of system, showing raceway sizes, *etc.*, and special conditions considered necessary for the experienced mechanic to take off materials and lay out work. This Contractor shall be responsible for taking such measurement as may be necessary at the job and adapting his work to local conditions.

Contractor shall furnish and install all materials called for or reasonably implied in these Specifications and accompanying Drawings. Apparatus must be furnished complete and ready for operation in every respect. Materials and equipment called for in the Specifications and not indicated on the Drawings, or indicated on the Drawings and not called for in the Specifications, shall be furnished by the Contractor.

Contractor is responsible for familiarizing himself with the project area and details of the construction of building. Work performed under these Specifications that is installed improperly or which requires modification due to improper reading or interpretation of building plans shall be corrected or otherwise modified as directed by the A-E without additional cost to the Owner.

Contractor shall follow Drawings in laying out work and shall refer to drawings of other trades to verify exact spaces in which work will be installed. Arrange installed items in such a manner as to maintain maximum headroom and space conditions at all points. Where headroom or space conditions appear inadequate, A-E shall be notified before proceeding with installation.

INSPECTIONS

The contractor shall schedule inspections with the State Electrical Inspector through the State Construction Office (SCO), Consulting Services section. This shall include all inspections of concealed work, interior and exterior, as well as intermediate and final reviews. All scheduling of electrical inspections with the SCO electrical inspector shall be Monday thru Friday unless specifically exempted and approved by SCO.

COOPERATION WITH OTHER TRADES

The Contractor shall give full cooperation to other trades and shall furnish any and all information necessary to permit the work of other trades. Information to be provided by the Contractor includes, but is not limited to templates, patterns, setting plans, and shop details as may be necessary for the proper installation of work and for the purpose of coordinating adjacent work. Information required by other trades shall be provided in a timely manner and shall be sufficient to allow the work of such other trades to proceed with the least possible interference or delay.

Where the work of the Contractor will be installed in close proximity to, or may interfere with work of other trades, the Contractor shall assist in working out space conditions to make a satisfactory adjustment. **If the Contractor installs his work before coordination with other trades, he shall make the necessary changes in his work to correct the condition without extra charge.**

Scaled Shop Drawings: If so directed by the A-E, the Contractor shall prepare composite working drawings and sections at a suitable scale not less than 3/8"=1'-0", clearly showing how his work is to be installed in relation to the work of other trades.

SAFETY REQUIREMENTS

All systems shall be installed so as to operate in a safe manner; all moving parts shall be covered where there is any possibility of danger from such moving parts. All rough edges of equipment and materials shall be made smooth.

All safety controls shall be checked under the supervision of the Owner's representative and two (2) copies of test data showing setting and performance of safety controls shall be submitted to the A-E by the Contractor.

During the construction the Contractor shall keep the site reasonably clean of debris and upon completion of construction he shall clean up the premises to remove all evidence of his work. The Contractor shall provide, at no additional cost to the Owner, additional cleaning of the site as directed by the Owner. In addition, upon completion of construction, he shall clean, wash and/or polish all fixtures, equipment and exposed material and leave each item clean, bright, and without blemish. Damaged items shall be replaced or repaired in a manner satisfactory to the Owner by the Contractor at no additional cost to the Owner.

It shall be the responsibility of the Contractor to maintain a safe working environment at all times and to comply with all OSHA regulations for the duration of the project.

SUBMITTALS

Submittals shall be made in strict accordance with the requirements of Section 019913. Specific submittal requirements are defined in each section of this Division.

Manufacturer's Data: Submit manufacturer's technical product data.

NAMEPLATE DATA

Each item of electrical utilization equipment shall be provided with a permanent operational data nameplate that shall, as a minimum, indicate the following: equipment manufacturer, product name, model number, serial number, capacity, voltage requirements, and either full load current or full load volt-amperes. Labels of tested compliances and similar essential data shall be a part of this label or located nearby. All equipment nameplates shall be in an accessible location.

In the event that the installation of equipment renders the manufacturer's nameplate inaccessible, the above information shall be etched onto a laminated plastic nameplate securely fastened to the equipment by no less than two machine screws or by other fastening methods approved by the A-E.

FLASH PROTECTION WARNING

Each piece of new electrical equipment, such as switchboards, parallel switchgear, panelboards, circuit breaker enclosures, control panels, motor control centers, transfer switches, etc. that are likely to require examination, adjustment, servicing or maintenance while energized, shall be field marked in a clearly visible location on the equipment enclosure to warn qualified persons of potential electric arc flash hazards, in accordance with NEC 110.16.

ELECTRICAL DISTRIBUTION SYSTEM ANALYSIS AND DOCUMENTATION

For projects that include the electrical distribution components outlined below, the Contractor shall provide electrical distribution system analysis and documentation. Contractor shall require manufacturer of electrical distribution equipment to develop a project specific short circuit study, coordination study and arc flash hazard study for the complete distribution system. Location specific labels shall be developed for distribution components such as switchboards, parallel switchgear, panelboards, circuit breaker enclosures, control panels, motor control centers, transfer switches, etc. to define nominal system voltage, arc flash boundary, working distance and incident energy.

- Low voltage electrical services 1,000 amperes and larger.
- Generator or inverter source to supply NEC 700 Emergency Systems and NEC 701 Legally Required Standby Systems.
- Medium voltage distribution components.

ACCESSIBILITY

Contractor shall be responsible for the sufficiency of the size of shafts and chases and the adequate clearance in double partitions and hung ceilings for the proper installation of his work. He shall cooperate with all other trades whose work is in the same place and shall advise the General Contractor of his requirements. Such spaces and clearances shall be kept to the minimum size required for such installations.

Contractor shall locate all equipment that must be serviced, operated, or maintained in fully accessible positions and shall coordinate with other trades as necessary to meet the workspace requirements of the National Electrical Code. Equipment where such space is required includes switchboards, motor control centers, panelboards, fire alarm control panels, telephone and data terminal panels and cabinets, and similar items.

Minor deviations from Drawings may be made to allow improved accessibility. Submit requests for all changes to the A-E for approval. Relocation of equipment, should such be required to meet NEC workspace requirements, shall be made by the Contractor at no additional cost.

CONCEALED RACEWAY

In general, all raceway or cable wiring methods in finished spaces shall be run concealed in walls, partitions, structural concrete panels, or above ceilings.

Exterior Raceway: Raceway may not be routed on exterior surfaces of the building or across a building roof (either above, below, or within roof insulation) unless specifically indicated on the Drawings.

Raceway Below Concrete Floor Slabs: Raceway may not be routed below concrete floor slabs unless such is specifically shown on the Drawings.

Concealment of raceway and covering of same shall not be done until authorized by the Authority Having Jurisdiction (AHJ). This applies to all interior work and exterior work.

SLEEVES AND PLATES

Contractor shall provide and locate all sleeves and inserts required, or shall be responsible for the cost of cutting and patching required where sleeves and/or inserts were not installed, or where incorrectly located. The Contractor shall be responsible for all drilling required for the installation of his hangers.

Sleeves shall be provided for all raceway passing through concrete, masonry, or tile wall, floor, or overhead deck construction. Sleeves shall be constructed of Schedule 40 black steel pipe unless otherwise indicated on Drawings. Sleeves through concrete beams shall be constructed as indicated on Drawings.

Fasten sleeves securely in walls so that they will not become displaced when other construction is built around them. Take precautions to prevent concrete, plaster, or other materials being forced into the space between raceway and sleeve during construction.

Escutcheon plates shall be provided for all exposed (where permitted) raceway passing through walls and ceilings. Plates shall be nickel plated, of the split ring type, of size to match the raceway. Where plates are provided for pipes passing through sleeves that extend above the floor surface, provide deep recessed plates to conceal the pipe sleeves.

SUPPORTS, ATTACHMENTS

Contractor shall furnish and install all necessary supports required for all electrical equipment, lighting fixtures, raceway, outlet boxes, panelboards, generators, and for all other equipment furnished under this contract, and shall submit drawings to the A-E for approval before purchase, fabrication, or construction of same.

All equipment, unless otherwise shown, shall be securely attached to the building structure in an approved manner. Attachments shall be of a strong and durable nature; any attachments that are deemed by the A-E to be insufficient due to reasons of strength, location, quality, or appearance shall be replaced as directed at no additional cost to the Owner.

Framing members shall be standard rolled steel shapes, ASTM A36 steel, except that members welded to main structural member shall be of the same specification as the main structural member.

Framing shall be "simple beam" type with end connections welded or bolted for shear loads. Cantilevers may be used when detailed or specifically approved. Location of supplementary framing shall be subject to approval. Welding, where required, shall be performed by certified welders.

Framing members shall be designed for their actual loads with allowable stresses set forth in the AISC Specifications and the AISC Code, without excessive deflection and with consideration for rigidity under vibration, in accordance with standard structural practices. Supplementary framing, including design loads, member size and location shall be clearly shown on shop drawings.

When supplementary framing is indicated, verify that dimensions are suitable and that framing is structurally adequate for the equipment furnished.

FIRE RATED CONSTRUCTION

The fire rating of all floors, ceilings, and partitions shall be maintained. It is the responsibility of this Contractor provide and install any necessary fire resistive components so that the fire integrity of all fire rated structures supporting or containing items required under Divisions 26-28 will not be diminished by the installation of such items. Where device or junction boxes penetrate any fire rated structure, the boxes shall be located in such a manner as not to reduce the fire rating of the structure. Where the Drawings indicate adjacent boxes or devices in rated partitions that would reduce the fire rating of the partition if unprotected, suitable Listed protection methods shall be used to insure the fire rating of the partition will not be decreased by the proximity of other boxes or penetrations.

Where recessed fixtures are used in fire rated ceilings, suitable construction shall be installed above and around the fixture so that the fire rating of the ceiling is maintained. Refer to Architectural Drawings for fire ratings of ceilings.

Where recessed panelboards, recessed cabinets, or other items are located in a fire rated partition, suitable construction behind and around the item shall be used to maintain the fire rating of the partition.

Where fire resistive insulation or other coverings have been applied to a structure or to structural elements to obtain a fire rating and this insulation or covering is removed or otherwise disturbed by the installation of Division 26-28 components or other related items, this Contractor shall be responsible for restoring the material to a condition that matches the original fire protective ability.

Approval must be obtained from the A-E before any boxes, devices, or other components are relocated for the purpose of maintaining fire ratings.

TESTING LABORATORY APPROVAL

All equipment shall be approved for the intended use and shall be Labeled or Listed. In any case where the suitability for a particular application is in question by the A-E or inspection authorities the Contractor shall furnish appropriate standards covering the specific piece of equipment in question. Such standards, if required, shall be requested by the A-E in writing and shall be furnished by the Contractor at no additional cost.

TYPICAL MOUNTING HEIGHTS OF DEVICES

Typical mounting heights for electrical equipment shall be as follows unless otherwise noted on Drawings:

DEVICE	MOUTING HEIGHT ABOVE FINISHED FLOOR (AFF)	TO
Panelboards	6'-6"	Top
Toggle Switches	3'-6"	Center Line
Receptacles	1'-6"	Center Line
Telephone Outlets	1'-6"	Center Line
Telephone Cabinets	6'-6"	Top
Telephone Backboards	6'-6"	Top
Safety Switches	5'-6"	Top
Data Outlets	1'-6"	Center Line

SCAFFOLDING, RIGGING, HOISTING

The Contractor shall furnish all scaffolding, rigging, hoisting and related sub-contract services necessary for equipment delivery and final placement as indicated on the Drawings.

All scaffolding, rigging and hoisting equipment shall be removed from the job site in a timely manner when such equipment is no longer required.

ELECTRICAL CIRCUITS

Circuit designations and connections are shown on the Drawings. Indicated circuit numbers and circuit breaker positions are mandatory unless changes are specifically approved by the A-E in writing.

Electrical neutral connections are indicated on the Drawings. Neutrals may not be reconfigured or otherwise changed without specific approval in writing from the A-E.

Request for circuit or neutral changes **can not be a part of the equipment submittal process.**

EQUIPMENT CONNECTIONS

In general, provide complete electrical power supply system connections to all equipment shown on Drawings. In addition, provide disconnection and re-connection to the power system of any items that are indicated on the Drawings as being moved or relocated.

Control wiring shall be installed in raceways and box system separate from power wiring, unless otherwise indicated on Drawings. Wiring within equipment enclosures shall be in raceways provided under this section of the Specifications unless approved raceway is provided by the manufacturer of the equipment or unless the equipment is listed for use as a raceway.

END OF SECTION 260500

SECTION 260519 - SECONDARY VOLTAGE WIRES AND CABLES

PART 1 - GENERAL

RELATED DOCUMENTS

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

QUALITY ASSURANCE

Manufacturers: Firms regularly engaged in manufacture of electrical products, of types and ratings required in this Section, whose products are Listed and Labeled for the purpose intended. Subject to compliance with requirements provide devices equivalent to one of the following:

Encore Wire Corporation
General Cable Corporation
Southwire Company
Cerro Wire

Codes and Standards:

NEC Compliance: Comply with NEC requirements as applicable to construction, installation and color coding of electrical wires and cables.

Testing Laboratory Compliance: Provide wiring/cabling and connector products that are Listed and Labeled.

SUBMITTALS

Submittals shall be made in strict accordance with the requirements of Section 019913. Specific submittal requirements are defined in each section of this Division.

Product Data: Submit manufacturer's data on electrical wires, cables and connectors.

PART 2 - PRODUCTS

SECONDARY VOLTAGE WIRES, CABLES, AND CONNECTORS

General: Provide electrical wires, cables, and connectors of manufacturer's standard materials, as indicated by published product information. Connections shall be designed and constructed using connectors as recommended by manufacturer for a complete installation for the application indicated. Provide copper conductors with conductivity of not less than 98% at 68° F.

Building Wires: Provide factory-fabricated wires of sizes, ampacity ratings, and materials for applications and services indicated. Where not indicated, provide proper wire selection as determined by Contractor to comply with project's installation requirements, NEC and NEMA standards. Select from the following Listed types those wires with construction features that fulfill project requirements:

Type THWN/THHN: For general use as interior branch circuits and feeders; maximum operating temperature 90° C (194° F). Insulation, flame-retardant, moisture- and heat-resistant, thermoplastic; outer covering, nylon jacket; conductor, annealed copper.

Type XHHW: For general use as exterior feeders and service entrance conductors, as conductors in all underground raceway, as conductors in wet locations and as specifically indicated on the Drawings; maximum operating temperature 90° C (194° F). Insulation, moisture and heat-resistant cross-linked polymer; conductor, annealed copper.

Building wire shall be installed in raceway for all applications. Cables are not approved for use in this project under Division 26.

Building wire shall be installed in raceway for all applications, except as specifically noted below for cables.

Cables: Provide Listed type factory-fabricated cables of sizes, ampacity ratings, and materials and jacketing/sheathing as indicated for services indicated. Where not indicated, provide proper selection as determined by Contractor to comply with installation requirements, NEC and NEMA standards. Select from the following types, those cables with construction features that fulfill project requirements:

Connectors:

General: Provide factory-fabricated, metal connectors of sizes, ampacity ratings, materials, types and classes for applications and for services indicated. Where not indicated, provide proper selection as determined by Installer to comply with project's installation requirements, NEC and NEMA standards. Select from the following, those types, classes, kinds and styles of connectors to fulfill project requirements:

Type: Pressure, threaded

Class: Insulated

Kind: Copper (for Cu to Cu connection)

Style: Wirenut, wingnut, power distribution block

Use power distribution blocks or other splicing device having a minimum of one clamping screw per conductor where conductor size or quantity exceed limits for "wirenut" or "wingnut" type connectors.

Provide power distribution blocks that are attached to the gutter, box, or enclosure into which they are installed. Free-floating, unattached power distribution blocks are not acceptable.

Provide suitable insulating covers for all connection devices where such insulation is not a part of the device design.

Use of split bolt connectors, insulation piercing connectors, or tape as a means of insulating connection devices is not acceptable.

PART 3 - EXECUTION

INSTALLATION OF WIRES AND CABLES

General: Install wires and wiring connectors as indicated, in compliance with applicable requirements of NEC, NEMA, UL, and NECA's "Standard of Installation," and in accordance with recognized industry practices.

Coordinate wire/cable installation work including electrical raceway and equipment installation work, as necessary to properly interface installation of wires/cables with other work.

Circuits of size #8 AWG and larger shall have Class B stranded conductors.

Power and lighting circuits #10 AWG and smaller shall have solid conductors. The minimum size for all power and lighting circuits shall be #12 AWG.

Control wiring shall have stranded conductors and a minimum size of #14 AWG.

Maximum size for feeders and service conductors shall be 500 kcmil.

Increase Drawing indicated size of conductors for ampacity and temperature rating as described below:

Conductor sizes shown on Drawings are based on the use of terminations Listed and Labeled for use at 75° C. (167° F.). Where terminations are not Listed and Labeled for use at 75° C. (167° F.), the Contractor shall increase the size of the conductor as required to meet the temperature rating of the conductor in accordance with NEC Article 110.14(c). Conductor size increases required under this section shall be made without additional cost.

Increase Drawing indicated size of conductors for voltage drop as follows:

Use #10 AWG conductor for 20 Ampere, 120 Volt branch circuit home runs longer than 50 feet, unless otherwise noted on Drawings.

Conduit runs shall contain the number of phase conductors shown on the plans. A dedicated neutral shall be installed for each phase conductor served by single pole, 120 and 277 Volt, 20 Amp circuit breakers. Multi-pole circuit breakers serving 120 and 277 Volt, 20 Amp multi-wire branch circuits with a common neutral shall not be permitted. Conduits runs shall contain related grounding and/or isolated grounding conductors.

Conduit runs that contain more than one neutral shall have each neutral conductor uniquely identified at each termination, splice and where routed through junction or pull boxes. Neutral conductors containing a factory applied, trace line along the length that matches the color of the associated phase conductor shall be used to meet this requirement. Machine printed labels with the panel and associated circuit number shall also be permitted for identifying neutral conductors. Colored tape and pre-printed tags shall not be acceptable.

Feeders and/or branch circuits shall not be combined either with each other or one with another into junction boxes, pull boxes, device boxes, manholes, or other common routing unless such routing is specifically indicated on the Drawings.

Neatly train wiring inside boxes, equipment and panelboards; Avoid bundling conductors with lacing or cable ties so that generated heat may be more easily dissipated.

Conduit runs indicated on the Drawings as composed of parallel runs of conductors shall be made identical with respect to length, conduit size, wire type, insulation type, routing, and terminations at each end.

Conductors Shall Be Color Coded as Follows:

Grounding Conductors: Green

Isolated Grounding Conductors: Green with yellow tracer

Grounded Neutral Conductors: White for 120 V systems, gray for 277 V systems

Ungrounded Phase Conductors for 208Y/120V Systems: Black (phase A), red (phase B), and blue (phase C)

Remarking of insulation colors by use of colored marker tape shall be permitted only as allowed by the NEC.

Install exposed cables (where permitted) parallel and perpendicular to surfaces, or exposed structural members. Cables shall follow surface contours, where possible.

Completely and thoroughly swab raceway system before installing conductors.

Branch circuit wiring shall not loop through receptacle terminals, but shall be connected by means of conductor taps joined to branch circuit conductors. At end of run, branch circuit conductors may terminate on receptacle screw terminals. Quick make, clamp, or push-in type terminations may not be used to make connections to devices.

Position all splices in pull boxes and junction boxes of adequate volume so they are accessible from the removable cover side of the box.

Conductors for signal systems shall be continuous (without splice) and shall be terminated on terminal strips or terminate in a manner approved by the system's manufacturer.

All neutrals and ground wires in panels shall be labeled with cloth wire markers to indicate the circuits being served.

Pull conductors simultaneously where more than one is being installed in same raceway.

Use pulling compound or lubricant, where necessary; compound used must not deteriorate conductor or insulation. After conductors have been pulled, clean exposed conductors and surrounding area to remove all evidence of the use of pulling compound.

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

Keep conductor splices to a minimum.

Install splices and taps that possess equivalent or better mechanical strength and insulation ratings than conductors being spliced.

Use splice and tap connectors that are compatible with conductor material.

Tighten electrical connectors and terminals, including screws and bolts, in accordance with manufacturer's published torque tightening values. Where manufacturer's torque requirements are not indicated, tighten connectors and terminals to comply with tightening torques specified in UL Standard 486A and B.

WIRING CONNECTIONS AND TERMINATIONS

Splices shall be permitted on conductors up to #4 AWG. No splices shall be permitted on conductor #3 AWG and larger without specific approval in writing by the A-E. Splices shall be made in accessible junction boxes; no splices shall be made in conduit bodies.

Splices, taps, and attachments of fittings and lugs shall be electrically and mechanically secure. Connectors and lugs shall be proper size and labeled as suitable for the number and type of conductors joined.

Solid conductors, namely those sized #10 and #12 AWG copper shall be spliced or tapped only by the use of Ideal "Wing-Nuts" or "Wire Nuts", Buchanan's "B-Cap" or 3M Co.'s "Scotchlox" connectors. "Sta-Kon" or other permanent type crimp connectors shall not be used.

Self-stripping electrical pigtail and tap connectors shall not be used.

Stranded conductors, namely #8 AWG to #4 AWG, shall be spliced or tapped by approved mechanical connectors. Insulation for splices or taps shall be obtained by the use of Listed insulating covers designed for use with the particular connector. Quality of insulation at splices shall equal that of the conductor insulation in terms of temperature resistance, covering ability and durability.

Conductors, in all cases, shall be continuous from outlet to outlet, and no splicing shall be made except within outlet or junction boxes, troughs, and gutters. No splices shall be permitted in panel enclosures, disconnects or utilization equipment.

Lugs for conductors #8 through #4 AWG shall be copper, with a direct acting screw. Where permitted, lugs for conductors #3 AWG and larger shall be copper, applied directly to the cable by hydraulic pressure. Lugs shall not be split bolt or screw types.

Tape, where used, shall be made using special oil resistant vinyl plastic tape that is Listed, rated 105° C.

Splices or taps in grounding conductors (where permitted) in sizes #8 AWG and larger shall be by means of exothermic welding and termination shall be by means of approved grounding connectors. As an alternate, connectors using hydraulic compression tools may be used as a contractor selection option. Solder shall not be used as a means of joining grounding conductors.

Thoroughly clean wires before installing lugs and connectors.

Make splices, taps and terminations to carry full ampacity of conductors without perceptible temperature rise.

Terminate spare conductors with electrical tape.

FIELD QUALITY CONTROL

Prior to energizing circuitry, check installed wires and cables with megohm meter to determine insulation resistance levels to insure requirements are fulfilled. Provide additional testing as directed by the A-E in accordance with Section 260800, *TESTING AND PLACING IN SERVICE*.

Prior to energizing circuitry, test wires and cables for electrical continuity and for short circuits. Verify proper phasing connections.

Subsequent to wire and cable hook-ups, energize circuitry and demonstrate functioning in accordance with requirements. Where necessary, correct malfunctioning units, and then retest to demonstrate compliance.

END OF SECTION 260519

SECTION 260526 - GROUNDING

PART 1 - GENERAL

RELATED DOCUMENTS

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

QUALITY ASSURANCE

Manufacturer's Qualifications: Firms regularly engaged in manufacture of grounding and bonding products, of types, and ratings required, and ancillary grounding materials, including stranded cable, grounding rods, and bonding jumpers whose products are Listed and Labeled for their intended usage.

Codes and Standards:

Electrical Code Compliance: Comply with applicable State electrical code requirements and the authority having jurisdiction, and NEC as applicable to electrical grounding and bonding, pertaining to systems, circuits and equipment.

Testing Laboratory Compliance: Comply with applicable requirements of UL Standards No.'s 467, "Electrical Grounding and Bonding Equipment," and 869, "Electrical Service Equipment," pertaining to grounding and bonding of systems, circuits and equipment. In addition, comply with UL Std. 486A, "Wire Connectors and Soldering Lugs for Use with Copper Conductors." Provide grounding and bonding products that are Listed and Labeled for their intended usage.

IEEE Compliance: Comply with applicable requirements of IEEE Standard 142 and 241 pertaining to electrical grounding.

SUBMITTALS

Submittals shall be made in strict accordance with the requirements of Section 019913. Specific submittal requirements are defined in each section of this Division.

Product Data: Submit manufacturer's data on grounding and bonding products and associated accessories.

PART 2 - PRODUCTS

GROUNDING AND BONDING SYSTEMS

Materials and Components:

General: Except as otherwise indicated, provide electrical grounding and bonding systems indicated, assemble materials, including, but not limited to, cables/wires, connectors, solderless lug terminals, grounding rods, bonding jumpers, service arresters, and additional accessories as needed for a complete installation. Where more than one type component product meets indicated requirements, selection is Contractor's option. Where materials or components are not indicated, provide products that comply with NEC and UL requirements and with established industry standards for those applications indicated.

Conductors: Unless otherwise indicated, provide equipment grounding conductors in all conduit and wiring systems. Grounding conductors shall be insulated by the same type insulation as the ungrounded conductors and sized in accordance with NEC Table 250.122 unless otherwise specified.

Bonding Connectors, Terminals and Clamps: Provide electrical bonding connectors, terminals, lugs and clamps as recommended by bonding connector, terminal and clamp manufacturers for indicated applications.

Ground Rods: Provide rods made of steel with copper welded exterior, 3/4" diameter by 10 feet.

Ground Bus Bars: Provide copper bus bars mounted on standoff insulating bushings.

Hardware: Provide hardware for all grounding and bonding applications that consist of Type 300 series stainless steel, silicon bronze or brass. Hardware used for connections to enclosures shall include flat washers and split lock washers.

Electrical Grounding Connection Accessories: Provide electrical insulating tape, bonding straps, as recommended by accessories manufacturers for type service indicated.

PART 3 - EXECUTION

EXAMINATION

Examine areas and conditions under which electrical grounding and bonding connections are to be made and notify A-E in writing of conditions detrimental to proper completion of work. Do not proceed with work until unsatisfactory conditions have been corrected.

INSTALLATION OF ELECTRICAL GROUNDING AND BONDING SYSTEMS

General: Install electrical grounding and bonding systems as indicated, in accordance with manufacturer's instructions and applicable portions of NEC, NECA's "Standard of Installation," and in accordance with recognized industry practices to ensure that products comply with requirements.

Install grounding systems as designed and submit certified test report on grounding system.

Coordinate with other electrical work as necessary to interface installation of electrical grounding and bonding system work with other work.

Ground electrical service system neutral at service entrance equipment to grounding rod(s), grounded copper water pipe, and building steel where effectively grounded. All ground corrections shall be accessible. Provide additional bonding connections to miscellaneous metallic piping systems entering the building such as fire protection and gas piping.

Provide an intersystem ground bus bar adjacent service equipment as shown on the drawings.

Ground each separately-derived system neutral to:

Effectively grounded copper water pipe

Building structural steel

Connect together system neutral, service equipment enclosures, exposed noncurrent carrying metal parts of electrical equipment, metal raceway systems, grounding conductor in raceways and cables, receptacle ground connectors, and cold water systems.

Install direct burial type ground clamps for grounding electrode conductors to underground grounding rods.

Provide a separate, insulated equipment grounding conductor from each device to ground buses in panelboards. Terminate each end on a grounding lug, bus, or insulated grounding bushing.

Provide separate insulated equipment grounding conductor, size to be determined from NEC Table 250.122, for each circuit and in each conduit run. The grounding conductor shall be attached by means of a dedicated green screw to a common point in each junction box, cabinet, device box, enclosure, or utilization equipment to which it runs or through which it passes. Grounding methods depending on the continuity of electrical raceway, clips, or mounting screws are not acceptable. This grounding requirement will be rigidly enforced.

Connect grounding electrode conductors to copper water pipe using a suitable grounding clamp as indicated on drawings. Provide conduit grounding hubs and water pipe ground clamps as required.

Provide copper grounding conductor from supplemental ground bus bar adjacent service equipment to communications (telephone/data or cable TV) backboards where shown on drawings. Terminate conductor on insulated ground bus bar for use by others.

Provide an insulated bonding bushing on all panelboard feeders. Terminate feeder equipment grounding conductor by passing the conductor through the terminal of the insulated bonding bushing and then onward to terminate at the panel ground bus.

Provide an insulated bonding bushing at boxes, enclosures or cabinets with concentric, eccentric or over-sized knockouts. Terminate equipment grounding conductor by passing the conductor through the terminal of the insulated bonding bushing and then onward to terminate at ground bus or lug.

Connect grounding electrode conductors to 1-inch diameter, or greater, metallic cold water pipe using a suitably sized ground clamp.

Tighten grounding and bonding connectors and terminals, including screws and bolts, in accordance with manufacturer's published torque tightening values for connectors and bolts. Where manufacturer's torquing requirements are not indicated, tighten connections to comply with tightening torque values specified in UL 486A to assure permanent and effective grounding.

Apply corrosion-resistant finish to field-connections, buried metallic grounding and bonding products, and places where factory applied protective coatings have been destroyed.

Install clamp-on connectors on clean metal contact surfaces to ensure electrical conductivity and circuit integrity.

Sectionalizing switchgear housing, cable shielding and primary grounding conductors shall be connected to a driven copper ground rod having a maximum resistance of 25 Ohms by means of # 3/0 AWG bare copper stranded conductor.

Service transformer housing, cable shields, primary and secondary neutrals shall be connected to a driven copper ground having a maximum resistance of 25 Ohms using # 3/0 AWG bare stranded copper conductor. Primary neutral conductor shall be unbroken to transformer primary neutral bushing, and thereafter grounded as indicated on the Drawings.

FIELD QUALITY CONTROL

Upon completion of installation of electrical grounding and bonding systems, test ground resistance with ground resistance tester. Where tests show resistance-to-ground is over 25 Ohms, take appropriate action to reduce resistance to 25 Ohms, or less, by driving additional ground rods; then retest to demonstrate compliance.

Provide written certified testing report indicating resistance-to-ground value.

END OF SECTION 260526

SECTION 260529 - SUPPORTING DEVICES

PART 1 - GENERAL

RELATED DOCUMENTS

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

QUALITY ASSURANCE

Manufacturers: Firms regularly engaged in manufacture of supporting devices, of types, sizes, and ratings required.

Codes and Standards:

NEC Compliance: Comply with NEC requirements as applicable to construction and installation of electrical supporting devices.

Testing Laboratory Compliance: Provide electrical components that are Listed and Labeled.

ANSI Compliance: Comply with ANSI/MSS SP-69, Hangers and Supports – Selection and Application for selecting electrical supporting devices.

SUBMITTALS

Submittals shall be made in strict accordance with the requirements of Section 019913. Specific submittal requirements are defined in each section of this Division.

Product Data: Submit manufacturer's data on supporting devices including catalog cuts, specifications, and installation instructions, for each type of support, anchor, sleeve and seal.

PART 2 - PRODUCTS

MANUFACTURED SUPPORTING DEVICES

General: Provide supporting devices as herein specified which comply with manufacturer's standard materials, design and constructed in accordance with published product information and as required for complete installation. Where more than one type of supporting device meets indicated requirements, selection is Installer's option.

Supports: Provide supporting devices of types, sizes and materials indicated that have the following construction features:

Clevis Hangers: For supporting large rigid metal conduit hangers shall be steel with finish appropriate for application and 1/2" diameter hole for round steel rod. Approximate weight is 54 pounds per 100 units.

Reducing Couplings: Steel rod reducing coupling shall be 1/2", 3/8" or ¼" x 5/8" steel, with finish appropriate for application.

C-Clamps: C-clamps shall be ductile iron, with finish appropriate for application and 1/2", 3/8" or ¼" rod size. Approximate weight is 50 pounds per 100 units.

I-Beam Clamps: I-beam clamps shall be steel, with finish appropriate for application. 1-1/4" x 3/16" stock with 3/8" cross bolt. Flange width shall be 2". Approximate weight is 52 pounds per 100 units.

Conduit Hangers: Hangers shall be galvanized steel used for supporting conduit up to 2". Weight varies with conduit size, up to 25 pounds per 100 units for 2" trade size.

One-Hole Conduit Straps: One hole conduit straps used for supporting 1/2" conduit (where such is permitted) and 3/4" conduit, shall be galvanized steel. Approximate weight is 7 pounds per 100 units.

Two-Hole Conduit Straps: Two hole conduit straps, used for supporting conduit larger than 3/4", shall be galvanized steel. Weight varies with conduit size.

Hexagon Nuts: For 1/2", 3/8" or ¼" rod sizes, nuts shall be galvanized steel.

Round Steel Rod: Use black steel for 1/2", 3/8" or ¼" diameter rod.

Anchors: Provide anchors of types, sizes and materials indicated, with the following construction features:

Lead Expansion Anchors: 1/2", approximately 38 pounds per 100 units.

Toggle Bolts: Springhead type, 3/16" x 4", approximately 5 pounds per 100 units.

Powder actuated anchors and fasteners are not permitted.

Watertight Wall and Floor Seals: Provide factory-assembled watertight wall and floor seals of types and sizes indicated. Wall and floor seals shall be suitable for sealing around conduit, pipe, or tubing passing through concrete walls. Construct seals with steel sleeves, malleable iron body, neoprene sealing grommets and rings, metal pressure rings, pressure clamps, and cap screws.

U-Channel Strut Systems: Provide U-channel strut system for supporting electrical equipment and conduit where runs of more than two conduit must be supported from overhead structure. System shall be 12-gage minimum hot-dip galvanized steel of types and sizes indicated. Use 1 1/2" deep channel to support conduit larger than 1 1/2" trade diameter. Furnish with the following fittings that mate and match with U-channel:

Channel hangers

End caps

Beam clamps

Wiring studs

Thinwall conduit clamps

Rigid conduit clamps

Conduit hangers

U-bolts

FABRICATED SUPPORTING DEVICES

Pipe Sleeves: Provide pipe sleeves as follows:

Steel Pipe: Fabricate from Schedule 40 galvanized steel pipe; remove burrs.

Sleeve Seals: Provide sleeves for piping which penetrates foundation walls below grade, or exterior walls. Caulk between sleeve and pipe with non-toxic, UL classified caulking material to ensure watertight seal.

PART 3 - EXECUTION

INSTALLATION OF SUPPORTING DEVICES

Install hangers, anchors, sleeves and seals as indicated, in accordance with manufacturer's written instructions and with recognized industry practices to insure supporting devices comply with requirements. Comply with requirements of NECA and NEC for installation of supporting devices.

Coordinate with other electrical work, including raceway and wiring work, as necessary to interface installation of supporting devices with other work.

Install hangers, supports, clamps and attachments to support conduit properly from building structure. Arrange for grouping of parallel runs of horizontal conduits to be supported together on trapeze type hangers where possible. Install supports with spacings indicated and in compliance with NEC requirements.

Torque sleeve seal nuts, complying with manufacturer's recommended values. Ensure that sealing grommets expand to form water tight seal.

END OF SECTION 260529

SECTION 260533 - ELECTRICAL IDENTIFICATION

PART 1 - GENERAL

RELATED DOCUMENTS

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

QUALITY ASSURANCE

Manufacturers: Firms regularly engaged in manufacture of electrical identification products, of types required.

Codes and Standards:

NEC Compliance: Comply with NEC as applicable to installation of identifying labels and markers for wiring and equipment.

UL Compliance: Comply with applicable requirements of UL Std. 969, "Marking and Labeling Systems," pertaining to electrical identification systems.

NEMA Compliance: Comply with applicable requirements of NEMA Std. No's. WC-1 and WC-2 pertaining to identification of power and control conductors.

SUBMITTALS

Submittals shall be made in strict accordance with the requirements of Section 019913. Specific submittal requirements are defined in each section of this Division.

Product Data: Submit manufacturer's data on electrical identification materials and products.

Label Wording: Submit exact wording for approval prior to the construction of laminated nameplates or specialized signs. Submittal shall show both proposed wording and physical layout of each label, including mounting holes.

PART 2 - PRODUCTS

ELECTRICAL IDENTIFICATION MATERIALS

General: Except as otherwise indicated, provide manufacturer's standard products of categories and types required for each application. Where more than single type is specified for an application, selection is Installer's option, but provide single selection for each application.

Engraved Plastic-Laminate Signs:

General: Provide engraving stock melamine plastic laminate, in sizes and thicknesses indicated, engraved with engraver's standard letter style of sizes and wording indicated or as required to properly identify items installed under this division.

Color scheme shall be as indicated herein or on the Drawings. Signs shall be punched for mechanical fastening.

Thickness: 1/16", for units up to 20 sq. in. or 8" length; 1/8" for larger units.

Fasteners: Self-threading, blunt end, stainless steel machine screws.

Color-Coded Plastic Tape:

General: Provide manufacturer's standard self-adhesive vinyl tape not less than 3 mils. thick by 1-1/2" wide. Tape shall be listed for use at 105°C. or the temperature rating of the conductors to be marked, whichever is higher.

Cable/Conductor Identification Bands:

General: Provide pre-numbered or pre-lettered manufacturer's standard cloth self-adhesive cable/conductor markers of wrap-around type. Printing shall show circuit identification by indicating panel designation and circuit number.

Underground Type Plastic Line Marker:

General: Manufacturer's standard permanent, bright colored, continuous printed plastic tape, intended for direct burial service, not less than 6" wide x 4 mils thick. Provide electrically conductive tape with printing which most accurately indicates type of service of buried conduit or cable.

Place line marker 6" to 8" below finished grade and directly above line to be protected. For multiple conduit or cable runs in the same trench, use multiple line markets, one above each conduit or cable.

Baked Enamel Danger Signs:

General: Provide manufacturer's standard "DANGER" signs of baked enamel finish on 20-gage steel. Signs shall be of standard red, black and white graphics, 14" x 10" size. Where larger size exceeds space available, the 10" x 7" size may be used. Signs shall have recognized standard explanation wording, such as, “HIGH VOLTAGE,” “KEEP AWAY,” “BURIED CABLE,” “DO NOT TOUCH SWITCH,” etc.

Code-Colored Conduit Markers:

General: Provide manufacturer's standard pre-printed, flexible or semi-rigid, permanent, plastic-sheet conduit markers, for feeders extending 360 degrees around conduits. Markers shall be designed for attachment to conduit by adhesive, adhesive lap joint of marker, matching adhesive plastic tape at each end of marker, or pre-tensioned snap-on. Except as otherwise indicated, provide lettering that indicates voltage of conductor(s) in conduit. Provide 8" minimum length for 2" and smaller conduit, 12" length for larger conduit.

Colors: Unless otherwise indicated on the Drawings or required by governing regulations, provide white markers with black letters.

LETTERING AND GRAPHICS

General: Coordinate names, abbreviations and other designations used in electrical identification work, with corresponding designations shown, specified or scheduled. Provide numbers, lettering and wording as indicated or, if not otherwise indicated, as recommended by manufacturer or as required for proper identification and operation/maintenance of electrical systems and equipment.

WIRE COLOR CODE SCHEDULE

Where more than one nominal voltage system exists within a single facility, a schedule of conductor color codes shall be posted at each panelboard that is installed, relocated, renovated, or otherwise modified. The schedule, meeting the requirements of NEC 210.5(C) for branch circuit panelboards, shall be permitted to be either a plastic laminate sign or a printed label with permanent self-adhesive containing the information given in Section 260519, *SECONDARY VOLTAGE WIRES AND CABLES*. The label shall be installed so that it is clearly visible with the panelboard cover removed but with any shields or protective barriers in place. The label shall be installed after the installation of all conductors so that it may be located in an un-obscured location.

EQUIPMENT AVAILABLE FAULT CURRENT LABELS

Based on the short circuit study conducted by the engineer for the distribution system, the Contractor shall prepare phenolic field labels to identify the available fault current at service equipment, panelboards, all industrial control panels, motor controllers of multi-motor and combination load equipment associated with air conditioning and refrigeration and elevator controller disconnects. Labels shall be consistent with the requirements of this Section, with respect to color scheme and size. Labels shall clearly indicate the date in which the calculation was prepared, as indicted by the engineer.

PART 3 - EXECUTION

APPLICATION AND INSTALLATION

General Installation Requirements:

Install electrical identification products as indicated, in accordance with manufacturer's written instructions, and requirements of NEC.

Coordination: Where identification is to be applied to surfaces that require finish, install identification after completion of painting.

Regulations: Comply with governing regulations and requests of governing authorities for identification of electrical work.

Conduit and Box Identification:

General: Apply color-coded identification to match system color code on electrical conduit and junction boxes in accordance with the following:

All empty conduit runs and conduit with conductors for future use shall be identified for such use; identification shall indicate where such conductors or empty conduct terminates. Identification shall be by tags attached to the pull cord or spare conductors. Each end of the pull cord shall be identified.

All outlet boxes, junction boxes and pull boxes, either exposed or concealed, shall have their covers and exterior visible surfaces painted with the field colors described in this section. Boxes shall also be marked to indicate the panelboard and circuit number(s) of the circuits contained within. Lettering may be by hand for concealed or non-public locations only. Machine printed labels are to be used to identify boxes where such are permitted to appear in areas accessible by the public; embossed type plastic labels are not acceptable for use on this project. Where hand produced marking is permitted, the lettering shall be made with waterproof ink.

Equipment/System Identification:

General: Install an engraved plastic laminate sign on each major unit of electrical equipment on project. Such equipment includes central or master unit of each electrical system including communication, control, and signal systems, unless unit is specified with its own self-explanatory identification. Except as otherwise indicated, provide single line of text, 1/2" high lettering, on 1-1/2" high sign (2" high where 2 lines are required), white lettering in field color as indicated below. Provide text matching terminology and numbering of the Contract Documents and shop drawings.

Field Colors shall be the following:

Blue surface with white core for 120/208 Volt equipment.
Black surface with white core for 277/480 Volt equipment.
Bright red surface with white core for all equipment related to fire alarm system.
Dark red (burgundy) surface with white core for all equipment related to security.
Green surface with white core for all equipment related to emergency systems.
Yellow surface with black core for all equipment related to optional stand-by systems.

Yellow surface with red core for all equipment related to legally required stand-by systems.
Orange surface with white core for all equipment related to telephone systems.
Brown surface with white core for all equipment related to data systems.
White surface with black core for all equipment related to paging systems.
Purple surface with white core for all equipment related to TV systems.

Provide Signs for Each Unit of the Following Categories of Electrical Work:

Fire alarm master stations

Cable/Conductor Identification (Low Voltage):

General: Apply cable/conductor identification, including feeder number, on each cable/conductor in each box/enclosure/cabinet where wires of more than one circuit or communication/signal system are present, except where another form of identification (such as color-coded conductors) is provided. Match identification with marking system used in panelboards, shop drawings, contract documents, and similar previously established identification for project's electrical work.

Optional Identification and Warnings:

General: Install self adhesive plastic signs or similar equivalent identification wherever reasonably required to prevent misuse by unauthorized personnel or to ensure safe and efficient operation and maintenance of electrical systems, electrically connected mechanical systems, and general systems and equipment. Install self-adhesive plastic signs or similar equivalent identification giving instruction or warnings on switches, outlets, controls, or devices where instructions or explanations are needed. Provide plasticized tags with clearly written messages adequate for intended purposes.

END OF SECTION 260533

SECTION 260534 - RACEWAYS

PART 1 - GENERAL

RELATED DOCUMENTS

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

QUALITY ASSURANCE

Manufacturers: Firms regularly engaged in manufacture of raceway systems of types and sizes required, whose products are Listed and Labeled.

Codes and Standards:

NEMA Compliance: Comply with applicable requirements of NEMA Standards Publications pertaining to raceways.

Testing Laboratory Compliance and Labeling: Comply with applicable requirements of UL safety standards pertaining to electrical raceway systems. Provide raceway products and components that have been Listed and Labeled.

NEC Compliance: Comply with applicable requirements of the latest edition of the NEC pertaining to construction and installation of raceway systems.

SUBMITTALS

Submittals shall be made in strict accordance with the requirements of Section 019913. Specific submittal requirements are defined in each section of this Division.

Product Data: Submit manufacturer's technical product data, including specifications and installation instructions, for each type of raceway system required. Include data substantiating that materials comply with requirements.

PART 2 - PRODUCTS

METAL CONDUIT AND TUBING

General: Provide metal conduit, tubing and fittings of types, grades, sizes and weights (wall thicknesses) for each use indicated. Where types and grades are not indicated, provide proper selection determined by Installer to fulfill wiring requirements as stated herein while complying with applicable portions of NEC for raceways.

Rigid Metal Conduit (RMC): Provide rigid steel, zinc-coated, threaded type conforming to ANSI C80.1 and UL 6. Provide zinc coating fused to inside and outside walls.

Intermediate Metal Conduit (IMC): Provide rigid intermediate grade hot-dip galvanized type conforming to UL 1242.

Electrical Metallic Tubing (EMT): Provide electrical metallic conduit conforming to ANSI C80.3 and UL 797.

Flexible Metal Conduit (FMC): Provide steel flexible metal conduit conforming to UL 1. Conduit shall be formed from continuous length of spirally wound, interlocked zinc-coated strip steel.

Liquid-Tight Flexible Metal Conduit (LFMC): Provide flexible liquid-tight metal conduit constructed of single strip, flexible, continuous, interlocked, and double-wrapped steel. Inside and outside shall be galvanized; conduit shall be coated with liquid-tight jacket of flexible polyvinyl chloride (PVC).

Rigid Metal Conduit Fittings: Provide cast malleable iron, galvanized or cadmium plated.

Use Type 1 fittings for raintight connections.
Use Type 2 fittings for concrete tight connections.

Conduit Locknuts: Provide case-hardened steel locknuts for use on threaded raceway.

Conduit Bushings:

Insulated: Provide Listed and Labeled, threaded, thermosetting plastic bushings at each end of all threaded raceway. Provide grounding type if same is indicated elsewhere.

Grounding (bonding type): Provide Listed and Labeled, threaded, insulated throat, bonding type bushings. Provide steel frame bushings for use on ferrous raceway. Provide bushings with tin-plated copper grounding saddle sized to accept grounding conductor size as indicated on the Drawings. Where grounding conductors are oversized, provide separate copper grounding lugs that are appropriately sized.

Flexible Metal Conduit Fittings: Provide steel conduit fittings for use with flexible steel conduit of threadless hinged clamp type. All flexible metal conduit fittings shall be Listed as suitable for grounding.

Straight Terminal Connectors: Provide insulated throat type, one piece body, female end with clamp and deep slotted machine screw for securing conduit, and male threaded end provided with steel locknut.

45° or 90° Terminal Angle Connectors: Provide steel insulated throat type, two-piece body construction with removable upper section, female end with clamp and deep slotted machine screw for securing conduit, and male threaded end provided with steel locknut.

Liquid-Tight Flexible Metal Conduit Fittings: Type 1, Class 3, Style G. Provide cadmium plated, malleable iron fittings with compression type steel ferrule and neoprene gasket sealing rings, with insulated throat and steel locknut. All liquid tight flexible metal conduit fittings shall be Listed as suitable for grounding.

EMT Fittings:

EMT Conduit Couplings: Cadmium plated steel, dual compression type with two (2) hexagon compression fittings. Fittings that can not be tightened with an open-end wrench of the appropriate size are not acceptable.

EMT Conduit Connectors: Cadmium plated steel, insulated throat, compression type with hexagon compression fitting and steel locknut. Fittings that can not be tightened with an open-end wrench of the appropriate size are not acceptable.

Unacceptable fitting types: Pot metal, set screw, and indenter type fittings, or connectors that do not have insulated throats, are not acceptable for use on this project.

Conduit Bodies: Provide galvanized steel conduit bodies of types, shapes and sizes as required to fulfill job and NEC requirements. Conduit bodies shall be constructed with threaded conduit entrance ends, removable covers, either cast or of galvanized steel, and corrosion-resistant screws.

Metallic Conduit, and Tubing Accessories: Provide metallic conduit and tubing accessories of types, sizes, and materials, complying with manufacturer's published product information, which mate and match conduit and tubing.

PART 3 - EXECUTION

INSPECTION

Examine areas and conditions under which raceways are to be installed, and substrate that will support raceways. Notify A-E in writing of conditions detrimental to proper completion of the Work. Do not proceed with work until unsatisfactory conditions have been corrected.

SELECTION OF RACEWAY AND SIZE OF RACEWAY SYSTEM

General: Install concealed raceway system in new construction work, either in walls or above hung ceilings.

Do not route raceway below slabs unless such routing is specifically indicated on the Drawings.

Do not use surface metal raceway unless such use is specifically indicated on the Drawings.

Conduit Installation: Unless otherwise indicated on the Drawings, provide rigid steel zinc-coated conduit (RMC) where embedded in concrete, masonry, earth, or installed outdoors. Follow minimum requirements in other areas as follows:

Steel zinc-coated EMT may be installed in all areas except where specifically indicated otherwise in the Drawings or under the conditions of use listed below:

- Where it will be installed in exterior walls.
- Where it will be installed outdoors, in concrete or in direct contact with the earth.
- Where it will be subject to physical damage.
- Where it will be installed lower than four (4) feet from finished floor in areas where exposed to possible damage from area use activities.
- Where it will be subject to corrosive influence.
- Where it will be installed indoors in wet or damp locations.
- Where trade size is larger than 2".

Any of the above use conditions may be overridden by the Drawings.

Avoid use of dissimilar metals throughout system to reduce the possibility of galvanic action. Where dissimilar metals must be in contact, coat surfaces with corrosion inhibiting compound before assembling.

Use liquid-tight flexible metal conduit (LFMC) only where specifically indicated on the Drawings or where subjected to one or more of the following conditions:

- Flexible connection in an exterior location.
- Final 18" connection to motors.
- Equipment subject to movement or vibration.

Do not use PVC raceway unless such use is specifically indicated on the Drawings.

Use Flexible Metal Conduit (FMC) only for final connections to light fixtures and utilization equipment. Any other use shall be limited to applications where specifically indicated on the Drawings

Flexible Metal Conduit may not be used to interconnect device or junction boxes, utilization equipment, fixtures.

Flexible Metal Conduit length shall not exceed six feet.

Size raceway and raceway systems as follows:

Size raceway to meet NEC requirements, or as indicated on the Drawings, whichever size is larger, except no conduit smaller than 3/4 inch trade size shall be installed.

INSTALLATION OF RACEWAY SYSTEMS

General: Install raceways as indicated, in accordance with manufacturer's written installation instructions, and in compliance with the NEC and NECA's "Standards of Installation." Install raceway and related boxes and fittings plumb and level, ±2°. Maintain manufacturer's recommended clearances.

Fasten heavy wall conduit terminations in sheet metal enclosures by two locknuts, one inside and one outside of enclosure, and terminate with insulated bushing; terminate other conduit systems with connectors listed for the purpose and as described above.

Conduit couplers shall be steel threaded type in all locations where such use is possible. Otherwise use 3-piece union.

Conduits are not to cross pipe shafts or ventilating duct openings. Conduit is not to be routed in elevator shafts unless necessary to serve items within the shaft.

Keep conduits a minimum distance of 6" from parallel runs of hot water pipes or other sources of heat. Wherever possible, install horizontal raceway runs above water piping.

Support riser conduit at each floor level with clamp hangers.

Use of running threads at conduit joints and terminations is prohibited. Where required, use threaded nipples and 3-piece unions.

Support exposed conduit by use of hangers, clamps or clips Listed for the purpose. Support conduit on each side of bends and on spacing not to exceed following:

- Rigid Metal Conduits Up to 1": 8'-0".
- Rigid Metal Conduits 1-1/4" and Over: 10'-0".
- EMT Up to 1": 8'-0".
- EMT 1-1/4" and Over: 10'-0".

Arrange conduit supports to prevent distortion of alignment by wire pulling operations. Fasten conduit using galvanized straps, lay-in adjustable hangers, clevis hangers, or bolted split stamped galvanized hangers Listed for the purpose. Requirements for exposed conduits also apply to conduits installed in space above hung ceilings.

Concealed Conduits:

- Metallic raceways installed underground, in floors below grade (where permitted), or outside are to have conduit threads painted with corrosion inhibiting compound before couplings are assembled. Draw up coupling and conduit sufficiently tight to ensure a water tight joint.
- For floors-on-grade (where permitted), install conduits under crushed rock and concrete slabs.
- Install underground conduits 24" below finished grade (24" cover) as a minimum or as otherwise indicated on the Drawings if a greater depth is shown.

Exposed Conduits:

- Install conduits in a manner so as not to damage or run through structural members. Avoid horizontal or cross runs in building partitions or side walls.
- Install exposed conduits and extensions from concealed conduit systems neatly, parallel with, or at right angles to walls of building.
- Install exposed conduit work as not to interfere with ceiling inserts, lights or ventilation ducts or outlets. Coordinate conduit installation with other trades as required.

- Install exposed conduit directly on structure using two hole straps. Provide offsets at all boxes and as required to avoid exiting utilities.
- Conduits installed on interior of exterior walls shall be spaced off the wall surface a minimum of ¼ inch with appropriate straps.

Run conduits for outlets on waterproof walls exposed where indicated on the Drawings. Set anchors for supporting conduit on waterproof wall in waterproof cement. Requirements for exposed conduit also apply to conduits installed in space above hung ceilings.

Raceway Fittings: Install connectors, couplers, and related fittings as required for a complete raceway system.

Install insulated bushings for terminating all types of raceway where termination is not made with an insulated throat connector.

Where concentric, eccentric or over-sized knockouts are encountered, a grounding-type insulated bushing shall be provided. Bushing shall be connected to the equipment grounding conductor.

Miscellaneous fittings such as reducers, chase nipples, 3-piece unions, and plugs are to be constructed from steel and specifically designed and Listed for their particular application.

Coordinate with other work including wires/cables, boxes, and panel work, as necessary to interface installation of electrical raceways and components with other work.

Mechanically fasten together metal conduits, enclosures, and other components comprising raceway system to form a continuous electrical conductor. Connect to electrical boxes, fittings and cabinets to provide electrical continuity and firm mechanical assembly.

Raceway must be installed as a complete system prior to the installation of cables, conductors, or pull wires into any part of the systems.

Install miscellaneous fittings such as reducers, chase nipples, 3-piece unions, and plugs that have been specifically designed and manufactured for their particular application. Install expansion fittings in raceways every 200' linear run maximum and wherever structural expansion joints are crossed.

Use roughing-in dimensions of electrically supplied utilization equipment furnished by supplier or by other divisions as appropriate. Set conduit and boxes for connection to units only after receiving review of dimensions and after verification of location with other trades.

Do not set final connections for fixtures and/or utilization equipment until connection points and requirements are accurately known. The Contractor is responsible for the relocation of mis-located connection points as required to match equipment at no additional cost.

Cut conduits straight, properly ream. Threads shall be cut into heavy wall conduit using equipment designed for the purpose.

Make changes in direction of raceway run by means of proper field bends or with proper fittings, supplied by raceway manufacturer.

Field-bend conduit with benders designed for purpose so as not to distort nor vary internal diameter.

Properly support and anchor raceways for their entire length by structural materials. Raceways are not to span any space unsupported for lengths in excess of the maximum support distance as previously specified. Raceways may not be used to support other raceways or other items of equipment.

Arrange conduit to maintain headroom and present a neat appearance.

Route exposed conduit and conduit above accessible ceilings parallel and perpendicular to walls and adjacent piping.

Group raceway in parallel runs where three (3) or more raceway are routed together. Use conduit rack constructed of steel channel with conduit straps or clamps. Provide space for 25% additional conduit.

Do not fasten and/or hang conduit with wire or perforated pipe straps. Before conductors are pulled, remove all wire used during construction for temporary conduit support.

Bring conduit to the shoulder of fittings and couplings and fasten securely. All raceway shall be cut to proper length so ends fit accurately in connectors or couplers.

Use conduit hubs for fastening conduit to cast boxes and for fastening conduit to sheet metal boxes in damp or wet locations.

Use conduit bodies to make sharp changes in direction, as around beams.

Use hydraulic one-shot conduit bender for all field bends in conduit. All field made conduit bends shall meet minimum bending radius requirements of the NEC. Bends in metallic conduit shall be made while "cold". Factory made conduit sections may be used in lieu of field made bends for conduit larger than 2".

Avoid moisture traps where possible; where unavoidable, provide junction box with drain fitting at conduit low point.

Use suitable conduit caps to protect installed conduit against entrance of dirt and moisture.

Where raceways penetrate walls or partitions separating spaces with differing environmental conditions, such as freezers, coolers and exterior walls, provide an internal seal to prevent condensation within the raceway as it enters the conditioned space.

Where conduit penetrates fire rated partitions, provide penetration protection in accordance with the UL through-penetration detail indicated on the Drawings for the type of partition and conduit involved. All instructions furnished with firestopping materials shall be followed explicitly.

Route conduit through roof openings for piping and ductwork where possible; otherwise, route through roof jack with pitch pocket. All pitch pockets shall be absolutely water tight; once conduit has been routed thought a pitch pocket the water integrity of the pitch pocket is the responsibility of the Division 26-28 Contractor.

Combining of circuits into raceway systems other than indicated on Drawings shall not be permitted.

Bolts, clamps, screws and expansion bolts shall be used in securing conduit, equipment, etc. Holes for lead shields or other anchors shall be the size recommended by the fastener manufacturer and shall be completely covered by the mounted item. Holes used for support of conduit on brick or block walls shall be located in mortar joints where such location is possible.

Provide nylon pull string in empty conduits where indicated, including conduit placed for telephone and data use. Conduit installed but left empty (with pull string) shall be tested with a ball mandrel. Clear any conduit that rejects ball mandrel. Any costs involved for restoration of conduit and surrounding surfaces to original condition are the responsibility of the Contractor.

END OF SECTION 260534

SECTION 260535 - ELECTRICAL BOXES AND FITTINGS

PART 1 - GENERAL

RELATED DOCUMENTS

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

QUALITY ASSURANCE

Manufacturers: Firms regularly engaged in manufacture of electrical boxes and fittings, of types, sizes, and capacities required, whose products are Listed and Labeled.

Codes and Standards:

NEC Compliance: Comply with NEC as applicable to construction and installation of electrical wiring boxes and fittings.

Testing Laboratory Compliance: Comply with applicable requirements of UL 50, UL 514-Series, and UL 886 pertaining to electrical boxes and fittings. Provide electrical boxes and fittings that are Listed and Labeled.

SUBMITTALS

Submittals shall be made in strict accordance with the requirements of Section 019913. Specific submittal requirements are defined in each section of this Division.

Product Data: Submit manufacturer's data on electrical boxes and fittings.

PART 2 - PRODUCTS

FABRICATED MATERIALS

Aluminum products are not acceptable for use on the project.

Outlet Boxes: Provide galvanized coated flat rolled sheet-steel outlet wiring boxes, of shapes, cubic inch capacities, and sizes, including box depths as indicated, suitable for installation at respective locations. Construct outlet boxes with mounting holes, and with cable or conduit-size knockout openings in bottom and sides. Provide boxes with threaded screw holes for attachment of grounding conductor and cover plate or device attachment fittings.

Provide waterproof outlet boxes where box is installed in an outdoor location or in a wet location as defined by the NEC.

Outlet Box Accessories: Provide outlet box accessories as required for each installation, including box supports, mounting ears and brackets, wallboard hangers, box extension rings, fixture studs, cable clamps and metal straps for supporting outlet boxes. Supplied items shall be compatible with outlet boxes being used to fulfill installation requirements for individual wiring situations. Choice of accessories is Contractor's code-compliance option.

Device Boxes: Provide galvanized coated flat rolled sheet-steel device boxes, of shapes, cubic inch capacities, and sizes, including box depths as indicated, suitable for installation at respective locations. Unless otherwise specified device boxes shall be 4" square by 2 1/8" deep, flush mounted, and furnished with suitable plaster ring for the type devices to be used and of a depth to match the type of construction involved. Device boxes shall have ¾" knockout openings in bottom and ends, and with threaded screw holes in the rear for attachment of a grounding conductor. All fasteners shall have a corrosion resistant finish.

Where more than two devices are ganged together at a single location provide gangable device boxes with suitable partitions, conduit knockouts and attachment hardware.

Device Box Accessories: Provide device box accessories as required for each installation, including mounting brackets, device box extensions, switch box supports, plaster ears, and plaster board expandable grip fasteners, which are compatible with device boxes being utilized to fulfill installation requirements for individual wiring situations. Choice of accessories is Contractor's code-compliance option.

Where device boxes are surface mounted (as may permitted elsewhere) use cast steel type 'FS' boxes. Raintight device boxes shall have threaded conduit holes for the attachment of electrical conduit, cast-metal face plates with spring-hinged watertight caps suitable configured for each application, including face plate gaskets and corrosion-resistant plugs and fasteners. Boxes provided under this section shall have a threaded internal grounding conductor attachment point.

Device boxes exposed to outdoor or wet locations shall be flush mounted and shall be equipped with cast steel covers that are designed to exclude water when closed.

Provide covers that are suitable for use in wet location with device attached if such use is indicated on the Drawings.

Where flush mounting is not possible or not practicable due to the location of the device, provide surface mounted cast steel type 'FS' boxes as described elsewhere.

Junction boxes with no more than 4 entries of ¾" conduit containing conductors no larger than #12 may be 4" square by 2 1/8" deep with ¾" knockouts, threaded hole for connection of grounding conductor and threaded holes for the attachment of a blank cover plate. Provide suitable blank cover plate. Box extensions shall not be used to obtain more volume in 4" square junction boxes.

If box volume is not sufficient, the contractor may, as a code compliance option, may use 4 11/16" square by 2 1/8" deep boxes with ¾" knockouts, threaded hole for connection of grounding conductor and threaded hoses for the attachment of a blank cover plate. Provide suitable blank cover plate. Box extensions shall not be used to obtain more volume in 4 11/16" square junction boxes.

Use fabricated junction boxes as described below if box volumes that can be obtained by the use of 4" square or 4 11/16" square boxes are not sufficient to meet NEC minimum volume requirements.

Junction and Pull Boxes: Provide as required galvanized code-gage sheet steel junction and pull boxes, no knockouts, Listed, with screw-on covers. Types, shapes, and sizes of junction and pull boxes shall be suitable for each respective location and installation. Boxes shall have welded seams and shall be equipped with stainless fastening hardware. Provide steel barriers in boxes with multiple feeder circuits.

Auxiliary Wireways: Construct as required in accordance with UL 870, with Listed and Labeled components.

Construction: 16-gage galvanized sheet metal parts for 4" x 4" to 6" x 6" sections, and 14-gage parts for 8" x 8" and larger sections. Provide wireways with no knockouts.

Finish: Provide 14-gage and 16-gage galvanized sheet metal parts. Plate hardware to prevent corrosion.

In outdoor or wet locations provide wireways that are NEMA 3R. Do not use gaskets that can rip or tear during installation, or would otherwise compromise raintight capability of the wireway.

Do not use cover screws that will protrude into the trough area and damage wire insulation.

Size of device, outlet, junction, pull boxes, gutters, and similar components shall be as required to match the number of devices and/or conductors contained within as based on the requirements of NEC Article 314.16.

Bushings, Knockout Closures and Locknuts: Provide corrosion-resistant box knockout closures, conduit locknuts and malleable iron conduit insulated bushings, offset connectors, of types and sizes, to suit respective installation requirements and applications.

PART 3 - EXECUTION

INSTALLATION OF ELECTRICAL BOXES AND FITTINGS

General: Install electrical boxes and fittings as indicated, in accordance with manufacturer's written instructions, applicable requirements of NEC and NECA's "Standard of Installation," and in accordance with recognized industry practices to fulfill project requirements.

Coordinate installation of electrical boxes and fittings with wire/cable, wiring devices, and raceway installation work.

Provide weatherproof boxes and fittings for interior and exterior locations that are exposed to weather or moisture. Weatherproof boxes must be Listed and Labeled and identified as “extra duty” for use in wet locations.

Provide knockout closures to cap unused knockout holes where blanks have been removed.

Install electrical boxes and similar items only in those locations that ensure accessibility to enclosed electrical wiring.

Avoid installing boxes back-to-back in walls. Provide not less than 6" separation in non-rated partitions. Provide 24" minimum horizontal separation in fire-rated partitions or in acoustic rated walls.

Position recessed outlet or device boxes in walls or ceilings accurately to allow for surface finish thickness. Where the surface material or covering is combustible the front edge of the plaster ring (or box) shall be flush (- 0”,+1/32”) with the finished surface. Where the wall or ceiling material is non-combustible, the front edge of the plaster ring (or box) may be recessed into the wall no further than 3/16". The maximum gap between the edge of an installed box/plaster ring combination shall not exceed 1/8”. **These requirements will be rigidly enforced.**

Fasten electrical boxes firmly and rigidly to substrates, or structural surfaces to which attached, or solidly embed electrical boxes in concrete or masonry. All boxes shall be supported independently of conduit.

Provide electrical connections for installed boxes.

Electrical box locations indicated on Drawings are approximate unless dimensioned. Verify location of outlets prior to rough-in. Coordinate exact locations with the work of other Divisions. Mis-located outlets and/or devices shall be relocated upon instruction from Owner's representative at no additional cost.

Locate and install to maintain headroom and to present a neat appearance.

Use multiple gang boxes where more than one device is mounted together; do not use sectional boxes. Provide barriers to separate wiring of different voltage systems. Provide barriers to separate adjacent devices where the voltage is greater than 150 Volts between the devices.

Install boxes in walls without damaging wall insulation or fire proofing.

Position outlets to locate lighting fixtures and/or luminaries as indicated on Drawings. Boxes are to be positioned plum and vertical, $\pm$ 2°.

Align wall mounted outlet boxes for switches, thermostats, and similar devices.

Subsequent to installation of boxes, protect boxes from construction debris and damage.

GROUNDING

Upon completion of installation work, properly ground electrical boxes and demonstrate compliance with requirements.

END OF SECTION 260535

SECTION 260593 - ELECTRICAL CONNECTIONS FOR EQUIPMENT

PART 1 - GENERAL

RELATED DOCUMENTS

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

QUALITY ASSURANCE

Manufacturers: Firms regularly engaged in manufacture of electrical connectors and terminals, of types and ratings required, and ancillary connection materials, including electrical insulating tape, solder/fluxes, and cable ties, whose products are Listed.

Codes and Standards:

NEC Compliance: Comply with applicable requirements of NEC as to type products used and installation of electrical power connections (terminals and splices), for junction boxes, motor starters, and disconnect switches.

Testing Laboratory Compliance: Comply with UL Std. 486A, "Wire Connectors and Soldering Lugs for Use with Copper Conductors" including, but not limited to, tightening of electrical connectors to torque values indicated. Provide electrical connection products and materials that are Listed and Labeled.

SUBMITTALS

Submittals shall be made in strict accordance with the requirements of Section 019913. Specific submittal requirements are defined in each section of this Division.

Product Data: Submit manufacturer's data on electrical connections for equipment products and materials.

PART 2 - PRODUCTS

MATERIALS AND COMPONENTS

General: For each electrical connection indicated, provide complete assembly of materials, including but not necessarily limited to, pressure connectors, terminals (lugs), electrical insulating tape, cable ties, solderless wire-nuts, and other items and accessories as needed to complete splices and terminations of types indicated.

Metal Conduit, Tubing and Fittings:

General: Provide metal conduit, tubing and fittings of types, grades, and sizes indicated for each type service. Where types and grades are not indicated, provide proper selection as determined by Installer to fulfill wiring requirements and comply with NEC requirements for raceways. Provide products complying with Section 260534, *RACEWAYS*, and in accordance with the following listing of metal conduit, tubing and fittings:

Rigid steel conduit

Rigid metal conduit fittings

Electrical metallic tubing

EMT fittings

Flexible metal conduit

Flexible metal conduit fittings

Liquid-tight flexible metal conduit

Liquid-tight flexible metal conduit fittings

Wires, Cables, and Connectors:

General: Provide wires, cables, and connectors complying with Section 260519, *SECONDARY VOLTAGE WIRES AND CABLES*.

Wires/Cables: Unless otherwise indicated, provide conductors for electrical connections that match, including sizes and ratings, of wires/cables that are supplying electrical power. Provide copper conductors with conductivity of not less than 98% at 68° F.

Connectors and Terminals: Provide copper electrical connectors and terminals that mate and match, including sizes and ratings, with equipment terminals and are recommended by equipment manufacturer for intended applications. **Aluminum conducting components are not acceptable for use on this project.**

Electrical Connection Accessories: Provide electrical insulating tape, wirenuts and cable ties as recommended for use by accessories manufacturers for type services indicated.

PART 3 - EXECUTION

INSPECTION

Inspect area and conditions under which electrical connections for equipment are to be installed and notify A-E in writing of conditions detrimental to proper completion of the Work. Do not proceed with the Work until unsatisfactory conditions have been corrected.

INSTALLATION OF ELECTRICAL CONNECTIONS

Install electrical connections as indicated in accordance with equipment manufacturer's written instructions and with recognized industry practices, and complying with applicable requirements of UL, NEC and NECA'S "Standard of Installation" to ensure that products fulfill requirements.

Coordinate with other work, including wires/cables, raceway and equipment installation, as necessary to properly interface installation of electrical connections for equipment with other work.

Connect electrical power supply conductors to equipment conductors in accordance with equipment manufacturer's written instructions and wiring diagrams. Mate and match conductors of electrical connections for proper interface between electrical power supplies and installed equipment.

Cover splices with electrical insulating material equivalent to, or of greater insulation resistivity rating than electrical insulation rating of those conductors being spliced.

Prepare cables and wires by cutting and stripping covering armor, jacket, and insulation properly to ensure uniform and neat appearance where cables and wires are terminated. Exercise care to avoid cutting through tapes that will remain on conductors. Also avoid "ringing" copper conductors while skinning wire.

Trim cables and wires as short as practicable and arrange routing to facilitate inspection, testing and maintenance. Leave a minimum of 6” of excess spare conductor at each termination.

Tighten connectors and terminals, including screws and bolts, in accordance with equipment manufacturers published torque tightening values for equipment connectors. Accomplish tightening by utilizing proper torquing tools, including torque screwdriver, beam-type torque wrench, and ratchet wrench with adjustable torque settings. Where manufacturer's torque requirements are not available, tighten connectors and terminals to comply with torque values contained in UL 486A.

Provide flexible connections to equipment as follows:

Provide Flexible Metal Conduit (FMC) for connection of electrical equipment where subject to movement and vibration or as otherwise required by the Specifications or on the Drawings.

Provide metal Liquidtight Flexible Metal Conduit (LFMC) for equipment in exterior locations, wet locations, or in other locations where so indicated on the Drawings.

Fasten identification markers to each electrical power supply wire/cable conductor that indicates their voltage, phase and feeder number in accordance with Section 260533, *ELECTRICAL IDENTIFICATION*. Affix markers on each terminal conductor, as close as possible to the point of connection.

FIELD QUALITY CONTROL

Upon completion of installation of electrical connections, and after circuitry has been energized with rated power source, test connections to demonstrate capability and compliance with requirements. Ensure that direction of rotation of each motor fulfills requirement. Correct malfunctioning units at site, then retest to demonstrate compliance.

END OF SECTION 260593

SECTION 260800 - TESTING AND PLACING IN SERVICE

PART 1 - GENERAL

RELATED DOCUMENTS

Drawings and general provisions of contract, including general and supplementary conditions and Division-1 Specification Sections, apply to work of this Section.

WORK INCLUDED

Provide all material, equipment, labor and technical supervision to perform and complete the electrical acceptance tests in accordance with the requirements of this section for equipment installed as the Work of this contract. Notify A-E at least four (4) working days in advance of tests.

Perform Tests on the Following Equipment and/or in the following areas:

Cable Tests
Low Voltage (≤ 600 Volt)
Grounding
Overcurrent devices

DEFINITIONS

Measure: To obtain the requested system information by use of suitable instruments and to record this information in the appropriate section of the test report.

Repaired: Material or equipment that has been brought to new condition, retested and made to pass all required tests.

QUALITY ASSURANCE

Perform tests to obtain required information in accordance with accepted industry procedures and/or in accordance with manufacturer's recommendations. Should manufacturer's recommendations conflict with these specifications, notify A-E. Do not proceed with tests until directed by A-E.

Material or equipment failing tests shall be repaired or replaced at the Contractor's expense.

The Contractor shall be responsible for all tests and for documentation of test data. Testing shall be performed by or under the immediate supervision of the Contractor.

DOCUMENTATION

Records of all tests and inspections, with complete data on all readings taken, shall be made and incorporated into a single report.

Five (5) bound copies of all test reports shall be submitted at the end of the test period. All required documentation of readings indicated above shall be submitted to the engineer prior to, and as one of the prerequisites for, final acceptance of the project.

PART 2 - PRODUCTS

The Contractor shall employ testing devices as required to accomplish specified testing herein and as described elsewhere in the Contract Documents.

Test Equipment Suitability: The test equipment used by the Contractor shall be suitable for the intended tests and shall comply with ANSI/NETA ATS-2009, Section 5.2.

Test Equipment Calibration: The test equipment used by the Contractor shall be suitable for the intended tests and shall comply with ANSI/NETA ATS-2009, Section 5.3.

PART 3 - EXECUTION

GENERAL

Check cable continuity and phase identification for each conductor used on the project. This includes service conductors, feeders, and branch circuit conductors. It is not required to document this test in the testing report required under this section.

Insulation testing: The insulation tests (megger tests) as specified in this Section are the minimum readings desired at an ambient temperature of 60° F and a low relative humidity.

Megger readings taken at other than ambient temperature of 60° F shall be corrected to 60° F.

When megger readings fall below the specified minimum values utilize recognized means to dry out the equipment. The method utilized by the Contractor must be in accordance with manufacturer's written instructions.

If drying is to be accomplished by applying an electric potential to a cable or piece of equipment, then, in no case (induced or direct) shall the voltage or current exceed the ampacity or the continuous rating of the equipment being dried.

CABLE TESTS

General: Disconnect each end of all cables from their associated equipment prior to the test.

Cables ≤ 600 Volt: Inspect all cable connections for workmanship and conformance with standard practice.

Perform the following tests:

Test cable insulation using a megger.

Perform megger tests between phases and between each conductor and ground with the other conductors and interlocked armor (if part of cable assembly) grounded.

Test other conductors in the same manner. The minimum acceptable megger reading for cables shall be 1 megohm (MΩ) for #6 AWG conductors and smaller and 250,000 ohms (Ω) for #4 AWG conductors and larger.

The Test Record Shall Include the Following:

Complete identification of the cable, including approximate length.

Megger reading data.

GROUNDING

Resistance: Measure the resistance (relative to earth) of each electrical equipment ground brought up from each grounding electrode, made electrode (rod), and the underground grid.

Do not measure outside ground rod and ground grid resistances to earth during unusually wet weather.

The Test Record Shall Include the Following:

Identification of the ground point where the test is performed.

Value of resistances relative to earth.

Test ground resistance with tester equivalent to Fluke 1625. Test arrangement shall be based on a three point, fall of potential test. Two field installed stakes used for the test shall be placed to form a line with the driven grounding electrode and separated at intervals of 60 feet. Where tests show resistance-to-ground is over 25 Ohms, take appropriate action to reduce resistance to 25 Ohms, or less, by driving additional ground rods; then retest to demonstrate compliance.

OVERCURRENT DEVICES

Performance Testing of Time-Current Functions: For services 1,000 amperes and larger, perform the tests listed below on the service circuit breakers and the distribution circuit breakers. Using circuit breaker test set, set and field test time-current trip functions for new circuit breakers to verify operation in accordance with the circuit breaker settings provided by a coordination study as part of the analysis and documentation required in 260500.

Testing shall be performed by a qualified technician employed by an independent, third-party electrical testing firm at the job site utilizing primary injection current. All readings shall be tabulated:

Phase tripping tolerance (within 20% of UL requirements).

Trip time (per phase) in seconds.

Instantaneous trip (amps) per phase.

Insulation resistance (in megohms) at 1,000 volts (phase to phase, and line to load).

For services smaller than 1,000 amperes and where additional testing of existing equipment is indicated on the drawings, use circuit breaker test set to set and field test time-current trip functions for circuit breakers to verify operation in accordance with the circuit breaker settings provided by the engineer.

Operational Test Procedures for Circuit Breakers: Visually inspect and manually operate breakers through a minimum of three (3) open/close cycles. Check for correct alignment, freedom from binding and good contact. Check phase matching and phase rotation immediately prior to energizing of equipment.

Specified Megger and High Potential Tests Shall Be As Follows:

EQUIPMENT	MEGGER VOLTAGE	MIN. MEGGER READING (megohms)
4160 Volt bus	2500	800
480 Volt bus	500	10
480 Volt breaker	500	100
208 Volt breaker	500	100
Current Transformer secondary wiring	500	5

In accordance with manufacturer's recommendations, maintain 2500-Volt and 500-Volt megger tests until the reading reaches a constant value and until three (3) consecutive equal readings one (1) minute apart are obtained. Maintain all 2500-Volt megger tests at least five (5) minutes and until three (3) consecutive readings one (1) minutes apart are obtained. Take readings every 30 seconds during the first two (2) minutes and every minute thereafter. Record all megger readings.

Acceptance: Make complete and accurate records of all tests. All megger readings shall pass manufacturer's specified and minimum values. Equipment shall pass operational tests and visual inspection requirements.

The Test Record Shall Include the Following:

Complete identification of all test points, including a description of which terminals are shorted and/or grounded.

Megger readings versus time data.

The approximate average equipment temperature.

TEST RESULTS

The Contractor shall send a letter to the engineer, with a copy to the State Construction Office (SCO) official project observer, certifying that the above testing has been performed. This shall be done at least four (4) days prior to final inspection.

Final testing reports are to be available at the SCO final inspection.

At final inspection, the Contractor shall furnish instruments as required to demonstrate to the A-E and to the SCO representative that all testing requirements have been satisfied. All measurement instruments, labor, and materials associated with the testing, verification, and demonstration of results shall be provided without additional cost. The contractor shall provide ladders, hand tools, digital multimeters, meggers, two-way radios and other specific items required by the Engineer for the final inspection.

END OF SECTION 260800

SECTION 283100 - FIRE ALARM SYSTEMS

PART 1 - GENERAL

RELATED DOCUMENTS

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

SCOPE

This section of the specifications includes the furnishing, installation, and connection of the microprocessor controlled, intelligent reporting fire alarm equipment required to form a complete coordinated system ready for operation. It shall include, but not be limited to, alarm initiating devices, alarm notification appliances, control panels, auxiliary control devices, annunciators, power supplies, and wiring as shown on the Drawings and specified herein.

The design provided is based on the State Construction Office 2020 Fire Alarm Guidelines and Policies and includes the relevant criteria from that document.

QUALITY ASSURANCE

Manufacturer's Qualifications: Provide equipment from manufacturers of fire alarm systems of types, sizes, and electrical characteristics required, and whose products are Listed and Labeled. Products of firms that do not maintain factory authorized service organization and spare parts stock are not acceptable for use on this project. Subject to compliance with the requirements of this section and the drawings, provide equipment equivalent to that manufactured by:

Notifier
Edwards EST
Simplex

Installer's Qualifications: Installer shall be a company specializing in performing the work of this section, with a minimum of 5 years documented experience installing fire detection and alarm systems similar in size and scope to this project. Installer shall be certified by the manufacturer to install, program and service the system. Installer shall directly provide the final connections between the equipment and the wiring system and the addressing of all system devices.

Installer shall directly provide the installation of all wiring and devices required in the system, or provide supervision over this work when provided by the electrical contractor. Installer shall not sub-contract any portion of the required work to a third party. All work shall be performed in accordance with the Installer's submitted and approve fire alarm shop drawings and calculations.

System programming shall be done only by a manufacturer, or by an authorized Installer. The Installer's technicians who perform this work shall be trained and individually certified by the manufacturer, for the model and series of equipment being installed. The technicians' training and certification must have occurred in the most recent 24 months. Qualifications of installer, including technician certifications, shall be provided with equipment submittal.

Installer shall be present on site for the 100% test, Designer's pre-final review and Owner inspections.

Codes and Standards:

NFPA Compliance: Comply with applicable requirements of NFPA-72, 2013 National Fire Alarm Code.

NEC Compliance: Comply with applicable requirements of NFPA-70, National Electrical Code (NEC) standards pertaining to fire alarm systems.

Testing Laboratory Compliance: Comply with provisions of UL safety standards pertaining to fire alarm systems. Provide products and components which are Listed and Labeled.

UL Compliance: Provide fire alarm notification appliances consistent with requirements in UL 1971, Signaling Devices for the Hearing Impaired, for determining device operating currents and device ratings.

NCBC Compliance: Fire Alarm notification appliances shall comply with NC Building Code and NC Accessibility Code criteria for intensity and placement.

FM Compliance: Provide fire alarm systems and accessories which are FM approved.

SUBMITTALS

Submittals shall be made in strict accordance with the requirements of Section 019913. Specific submittal requirements are defined in each section of this Division.

Product Data: Submit Manufacturer's technical product data, including specifications and installation instructions, for each type of fire alarm system equipment. Submit technical product data on the fire alarm service equipment. Submittals shall provide mA draw for each device submitted and UL listed minimum voltage required to operate. Panel submittal shall list voltage drop allowed for panel and for individual NAC circuits.

Shop Drawings: Submit shop drawings showing equipment, device identification numbers and locations, and connecting wiring of entire fire alarm system. Include wiring and riser diagrams. Wiring diagrams shall be based on the project floor plans, with devices and proposed conduit routing shown. Provide conductor composition for each conduit section. Provide distance and route for each NAC (Notification Appliance Circuit). Risers diagrams shall show consecutive connections for all devices with addresses and ratings. Copies of Project Construction Documents or details therefrom may not be a part of the shop drawing submittal. Shop drawings shall be prepared in an electronic format that is convertible to DXF files. The fire alarm contractor shall submit complete shop drawings to the engineer for review prior to installation.

Wiring and Cabling: Submit wire and cable for signal circuits and notification circuits.

Installation Instructions: Submit Manufacturer's detailed installation instruction for all duct mounted smoke detectors, flow switches, tamper switches, supervisory switches, and similar items which require mechanical installation.

Battery Calculations: Provide battery calculations used to size secondary power source. Calculations must be submitted prior to installation of equipment. Battery calculations shall utilize the UL 1971 RMS DC or full wave rectified (FWR) current values of notification appliances, as appropriate for the power supply used, provided by the product manufacturer. These values shall be highlighted in the submittal for each appliance used in the project. Identify notification appliance circuit (NAC) current draws and calculate voltage drops for each circuit in the submittal package. Identify EOL voltage for each proposed NAC, based on a source voltage of 20.4 volts. In no case shall the calculated EOL for any NAC be below the minimum listed operating voltage for the devices used.

Device List: Submit a listing for each addressable device that indicates the device address, function and location. This information shall be the basis for the device descriptions to be programmed into the system, contingent upon approval of Designer and Owner. Information shall be included in device identification that is observed at the FACP and FAAP. Device addresses shall exactly match the information provided on the shop drawings.

Maintenance Data: Submit maintenance data and parts lists for each type of fire alarm equipment installed, including furnished specialties and accessories. Include this data, product data, and shop drawings in maintenance manual.

Maintenance Contract: Submit a quote for a maintenance contract to provide all maintenance, test, and repair described below and/or in accordance with NFPA-72, "Guide for Testing Protection Signaling Systems". Include also a quote of unscheduled maintenance/repair, including hourly rates for technicians trained on this equipment, and response travel costs. Submittals that do not identify all post contract maintenance costs will not be accepted. Rates and costs shall be valid for the period of five (5) years after expiration of the guaranty. Maintenance and testing shall be on a semiannual basis or as required by the local AHJ. A preventive maintenance schedule shall be provided by the Contractor that shall describe the protocol for preventive maintenance. The schedule shall include:

1. Semiannual systematic examination, adjustment and cleaning of all detectors, manual fire alarm stations, control panels, power supplies, relays, water flow switches and all accessories of the fire alarm system.
2. Semiannual testing of each circuit in the fire alarm system.
3. Semiannual testing of each smoke detector in accordance with the requirements of NFPA 72, Chapter 7.

Training Quote: Provide a quote for one of the owner's Employees to receive one week of factory level training on the system being installed. Quote is not to include travel, room or food allowance.

Certifications: Submit a certification from the major equipment manufacturer indicating that the proposed supervisor of installation and the proposed performer of contract maintenance is an authorized representative of the major equipment manufacturer. Include names and addresses, and telephone numbers in the certification.

Pre-installation Meeting: Upon completion of the submittal process, Contractor shall schedule a pre-installation meeting before start of installation of fire alarm system. The attendance of all parties directly affecting work of this section, including Contractor, Designer, Installer, and manufacturer's representative is required. The meeting agenda shall include review of submittal and installation requirements of Specification Section 283100, coordination with other work, field quality control, adjusting, testing and demonstration/training.

PART 2 - PRODUCTS

FIRE ALARM CONTROL PANEL (FACP)

FACP - General: The FACP shall meet the following general requirements:

Signal Line Circuits: Alarm, trouble and supervisory signals from all intelligent reporting devices shall be encoded onto an NFPA Style 6 (Class A) Signaling Line Circuit (SLC) with no "T" taps.

Initiation Device Circuits: Initiation Device Circuits (IDC) shall be wired Class A (NFPA Style D).

Notification Appliance Circuits: Notification appliance circuits shall be wired Class B (NFPA 72 Style Y).

Digitized electronic signals shall employ check digits or multiple polling. In general a single ground or open on any system signaling line circuit, initiating device circuit, or notification appliance circuit shall not cause system malfunction, loss of operating power or the ability to report an alarm.

Loss of Power: Alarm signals arriving at the main FACP shall not be lost following a power failure (or outage) until the alarm signal is processed and recorded.

System Response to an Alarm Condition: When a fire alarm condition is detected and reported by one of the system initiating devices or appliances, the following functions shall immediately occur:

1. The system alarm LED shall flash.
2. A local piezo-electric signal in the control panel shall sound.
3. The 80-character LCD display shall indicate all information associated with the fire alarm condition, including the type of alarm point and its location within the protected premises.

4. On systems equipped with a printer, printing and history storage equipment shall log the information associated with each new fire alarm control panel condition, along with time and date of occurrence.
5. All system output programs assigned *via* control-by-event equations to be activated by the particular point in alarm shall be executed, and the associated system outputs (alarm notification appliances and/or relays) shall be activated. Exact programming shall be provided by the Contractor to meet the Owner's requirements.
6. Activate all fire alarm Notification Appliances in the building, sounding and flashing in synchronization continuously until manually silenced, or until the initiating device and control unit have been reset to normal condition.
7. Activate digital alarm communicator.
8. Deactivate door hold control relay such that all smoke doors are allowed to close.
9. Deactivate control relays allowing HVAC units to run.
10. Activate elevator recall sequence if smoke is detected in any elevator lobby or in the elevator equipment room.

System Response to a Trouble Condition:

- Systems AC power trouble signal shall not be sent unless maintained for 8. Provide additional relays as required for this purpose.
- Provide immediate transmission of all other supervising signals.
- Provide adjustable time delay for all other trouble signals prior to transmission.

FACP - Minimum Requirements: The FACP shall contain a microprocessor based Central Processing Unit (CPU). The CPU shall communicate with and control the following types of equipment used to make up the system: intelligent detectors, addressable modules, local and remote operator terminals, printers, annunciators, and other system controlled devices. The main FACP shall perform the following functions:

1. Supervise and monitor all intelligent addressable detectors and monitor modules connected to the system for normal, trouble and alarm conditions.
2. Supervise all initiating, signaling, and notification circuits throughout the facility by way of connection to monitor and control modules.
3. Detect the activation of any initiating device and the location of the alarm condition. Operate all notification appliances and auxiliary devices as programmed.
4. Visually and audibly annunciate any trouble, supervisory or alarm condition on operator's terminals, panel display, and annunciators.

System Capacity and General Operation: The system shall have the following capacities and general operation modes:

1. The FACP shall provide, or be capable of expansion to 198 intelligent/addressable devices per SLC and 2048 annunciation points per system. The number of SLCs provided shall be as indicated on the Drawings.

2. The FACP shall include a full featured operator interface control and annunciation panel that shall include a backlit, 80 character liquid crystal display, individual, color coded system status LEDs, and an alphanumeric keypad for the field programming and control of the fire alarm system.

3. All programming or editing of the existing program in the system shall be achieved without special equipment and without interrupting the alarm monitoring functions of the fire alarm control panel.

4. The FACP shall be able to provide the following features:

Upload/Download to PC Computer	Charger Rate Control
Alarm Verification with Tally	Drift Compensation
Automatic Day/Night Sensitivity Adjust	Device Blink Control
Pre-alarm Control Panel Indication	Trouble Reminder
NFPA 72 Smoke Detector Sensitivity Test	Walk Test
System Status Reports	Periodic Detector Test
Alarm Verification, by device, with tally	Multiple Printer Interface

Multiple CRT Display Interface	Security Monitor Points
Non-Alarm Module Reporting	Block Acknowledge
Smoke Detector Maintenance Alert	Control-By-Time

5. The control panel shall be capable of printing historical data and device parameters and shall include all equipment necessary to produce printouts, including an external printer and shall be U.L. listed as meeting the NFPA sensitivity testing and maintenance requirements without the need for manually removing and testing each smoke detector. The control panel shall provide a display and a printed list of these sensitivity measurements as a permanent record of the required sensitivity testing. The system shall also annunciate a trouble condition when any smoke detector approaches 80% of its alarm threshold due to gradual contamination, with an annunciation of the location of the smoke detector requiring service. If any specialized equipment must be used to program any function of the smoke detector devices, then one must be furnished as part of the system.

6. The system shall perform time based control functions including automatic changes of specified smoke detector sensitivity settings.

Central Processing Unit: The Central Processing Unit (CPU) shall communicate with, monitor, and control all other modules within the control panel. Removal, disconnection or failure of any control panel module shall be detected and reported to the system display by the CPU.

The CPU shall contain and execute all control-by-event (including ANDing, ORing, NOTing, CROSSZONEing) programs for specific action to be taken if an alarm condition is detected by the system. Such control-by-event programs shall be held in non-volatile programmable memory, and shall not be lost with system primary and secondary power failure. The CPU shall also provide a real-time clock for time annotation of all system displays. The Time-of-Day and date shall not be lost if system primary and secondary power supplies fail.

The CPU shall be capable of being programmed on site without requiring the use of any external programming equipment. Systems that require the use of external programmers or change of EPROMs are not acceptable.

The CPU and associated equipment are to be protected so that they will not be affected by voltage surges or line transients consistent with UL standard 864.

Display: The system display shall provide all the controls and indicators used by the system operator and may also be used to program all system operational parameters. The display assembly shall contain, and display as required, custom alphanumeric labels for all intelligent detectors, addressable modules, and software zones.

The system display shall provide an 80-character back-lit alphanumeric Liquid Crystal Display (LCD). It shall also provide five Light-Emitting-Diodes (LEDs), that will indicate the status of the following system parameters: AC POWER, SYSTEM ALARM, SYSTEM TROUBLE, DISPLAY TROUBLE, and SIGNAL SILENCE.

The system display shall provide a 25-key touch key-pad with control capability to command all system functions, entry of any alphabetic or numeric information, and field programming. Two different password levels shall be accessible through the display interface assembly to prevent unauthorized system control or programming.

The system display shall include the following operator control switches: SIGNAL SILENCE, LAMP TEST, RESET, SYSTEM TEST, and ACKNOWLEDGE.

Signaling Line Circuit (SLC) Interface Board: The FACP shall contain SLC interface boards as required to communicate with the SLC loops as shown on the Drawings. Each SLC board shall monitor and control a minimum of 198 intelligent addressable devices. This includes 99 analog detectors (Ionization, Photoelectric, or Thermal) and 99 monitor or control modules.

Each SLC interface board shall contain its own microprocessor, and shall be capable of operating in a local mode (any SLC input activates all or specific SLC outputs) in the event of a failure in the main CPU of the control panel. The SLC interface board shall not require any jumper cuts or address switch settings to initialize SLC Loop operations. SLC interface boards shall provide power and communicate with all intelligent addressable detectors and modules connected to it's SLC Loop on a single pair of wires. This SLC Loop shall be capable of operation as NFPA Style 4, Style 6, or Style 7.

Each SLC interface board shall receive analog information from all intelligent detectors and shall process this information to determine whether normal, alarm, or trouble conditions exist for that particular detector. The SLC interface board software shall include software to automatically maintain the detector's desired sensitivity level by adjusting for the effects of environmental factors, including the accumulation of dust in each detector. The analog information may also be used for automatic detector testing and for the automatic determination of detector maintenance requirements.

Serial Interface Board: The FACP shall contain a serial interface board to provide an EIA-232 interface between the fire alarm control panel and the UL Listed Electronic Data Processing (EDP) peripherals. The serial interface board shall allow the use of multiple printers, CRT monitors, and other peripherals connected to the EIA-232 ports. In addition, the serial interface board shall provide one EIA-485 port for the serial connection to annunciation and control subsystem components; LEDs shall be provided to show operational status. All serial interface input/outputs shall be optically isolated to provide protection from surges and/or earth grounds.

Operators Terminal: Provide an operators terminal which allows the following minimum functions. In addition, the operator’s terminal shall support any other functions required for system control and/or operation:

1. Acknowledge (ACK/STEP) Switch
2. Signal Silence Switch
3. System Reset Switch
4. System Test Switch
5. Lamp Test Switch

Video Display Terminal: Where indicated on the Drawings provide a video display terminal with detachable keyboard to provide a visual display and an audible alert of all changes in status of the system and shall annotate such displays with the current time-of-day and date.

Printer: Where indicated on the Drawings provide a printer to provide hard-copy printout of all changes in status of the system. The printer shall time-stamp such printouts with the current time-of-day and date. The printer shall be standard carriage with 80-characters per line and shall use standard pin-feed paper. Thermal printers are not acceptable. The printer shall operate from a 120 VAC, 60 Hz power source. Provide table and stand for printer.

Remote Transmissions: The FACP shall be interfaced to a separate Digital Alarm Communications Transmitter (DACT) as indicated on the Drawings. Systems which contain built-in DACTs shall be acceptable on the condition of total compatibility with the Owner's receiving station equipment.

Power Supply: The FACP power supply shall operate on 120 VAC, 60 Hz and shall have a continuous rating adequate to power all equipment and functions in full alarm continuously. All modules and drivers must be able to withstand prolonged short circuits in the field wiring, either line-to-line or line-to-ground, without damage. Further, the power supply shall be expandable for additional notification appliance power in 3.0 Ampere increments. The power supply shall provide a battery charger using dual-rate charging techniques for fast battery recharge.

Batteries: Shall be completely maintenance free, shall not require liquids, fluid level checks or refilling, and shall not be capable of producing spills and/or leaks. Batteries shall be sealed gel-cell type with expected life of 10 years. Battery voltage shall be as required by the FACP and related equipment. Battery shall have sufficient capacity to power the fire alarm system for not less than 24 hours plus 5 minutes of alarm upon a normal AC power failure. Battery cabinet shall be twice the size of the batteries it will contain. The connected load for NAC circuits shall not exceed 75% of rated current output of the power supply.

Enclosures: The FACP shall be housed in a UL listed cabinet suitable for surface or semi-flush mounting. Cabinet and front shall be corrosion protected, given a rust-resistant prime coat, and manufacturer's standard finish. The door shall provide a key lock and shall include a glass or other transparent opening for viewing of all indicators. For convenience, the door may be hinged on either the right or left side (field selectable).

ALARM APPLIANCES

Programmable Electronic Sounders shall be located as shown on the Drawings; sounders located outdoors shall be listed for use in wet locations. Electric sounders shall operate with synchronized audible output and have the following specifications:

Voltage: Programmable electronic sounders shall operate on 24 VDC nominal.

Programming: Electronic Sounders shall provide the ANSI S3.41 three-pulse temporal pattern audible evacuation signal, described in NFPA 72, with an output sound level of at least 90 dBA measured at 10 feet from the device. Output sound level shall be 120 dB maximum. Electronic Sounders shall be field programmable without the use of special tools.

Mounting: Provide flush mounting devices suitable for mounting in a standard single gang device box unless otherwise indicated on the Drawings. Unless otherwise indicated on the Drawings, electronic sounders shall be mounted at 6’-8" (2.05 M) Above Finished Floor (AFF) or 6" (15.3 Cm) Below Finished Ceiling (BFC), whichever is lower.

Strobe Lights shall be located as shown on the Drawings. Strobe lights indicated for use exterior to the building shall be mounted at the indicated elevation and listed for use in wet locations. Strobe lights shall operate with synchronized flash output and have the following specifications:

Voltage: Strobe lights shall operate on 24 VDC nominal.

Maximum pulse duration: 2/10ths of one second.

Mounting: Provide flush mounting devices suitable for mounting in a standard single gang device box unless otherwise indicated on the Drawings. Unless otherwise indicated on the Drawings, strobe lights shall be mounted with the lower edge of the visual element at 6'-8" (2.05 M) Above Finished Floor (AFF) or 6" (15.3 Cm) Below Finished Ceiling (BFC), whichever is lower.

Strobe intensity and flash rate: Must meet minimum requirements of UL 1971. Provide strobe lights with minimum intensity Candela (Cd) rating of 15 Cd, or greater if such is indicated adjacent to the device symbol on the Drawings.

Audible/Visual Combination Devices shall be located as shown on the Drawings and shall comply with all applicable requirements for both Audible Device and Strobe Lights. Unless otherwise indicated on the Drawings, combination A/V devices shall be mounted with the lower edge of the visual element at 6’-8" (2.05 M) Above Finished Floor (AFF) or 6" (15.3 Cm) Below Finished Ceiling (BFC), whichever is lower.

Bells shall be 10" diameter vibrating type located as shown on the Drawings; bells located outdoors shall be listed for use in wet locations. Bells shall have the following specifications:

Voltage: Bells shall operate on 24 VDC nominal.
Mounting: Provide flush mounting devices suitable for mounting in a standard single gang device box unless otherwise indicated on the Drawings. Bell mounting elevation shall be as described on the Drawings.

INITIATING DEVICES

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

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. Devices which use a binary address setting method, such as a dip switch, are not acceptable.

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.

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 FACP 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.

Intelligent Initiation Devices: All smoke detectors shall be the "intelligent" in that smoke detector sensitivity shall be set through the FACP and shall be adjustable in the field through the field programming of the system. Sensitivity shall be capable of being automatically adjusted by the FACP on a time-of-day basis. Using software in the FACP, 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 7.

Device mounting Base: Unless otherwise specified all detectors shall be ceiling-mount and shall include a separate twist-lock base with tamper proof feature.

Sounder Base: Where indicated on the Drawings, provide bases with a built-in (local) sounder rated at 85 dBA minimum. Configure sounder bases such that sounders are activated under conditions as described or otherwise indicated on the Drawings.

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.

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 either ION, PHOTO, or THERMAL.

Addressable Pull Stations - General: Addressable 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.

All pull stations shall be dual-action, have a positive, visual indication of operation and utilize a key type reset.

Construction: Pull stations shall be constructed of Lexan or other material suitable to the installation environment with clearly visible operating instructions provided on the cover. The word FIRE shall appear on the front of the stations in raised letters, 1.75 inches or larger. Stations shall be suitable for surface mounting or semiflush mounting as shown on the plans. Unless otherwise indicated on the Drawings pull stations shall be mounted at 42" Above Finished Floor.

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.

Ionization Smoke Detector: Ionization smoke detectors shall use the dual-chamber ionization principal to measure products of combustion and shall, on command from the control panel, send data to the panel representing the analog level of products of combustion. Ionization type smoke detectors are indicated on the Drawings by the designation ION adjacent to the smoke detector symbol.

Thermal Detectors: Thermal Detectors shall be intelligent addressable devices rated at 135°F. (58° C.) and unless otherwise indicated on the Drawings shall have a rate-of-rise element rated at 15° F. (9.4° C.) per minute. It shall connect via two wires to the Fire Alarm Control Panel Signaling Line Circuit. Up to 99 intelligent heat detectors may connect to one SLC loop. Thermal detectors shall use an electronic sensor to measure thermal conditions caused by a fire and shall, on command from the control panel, send data to the panel representing the analog level of such thermal measurements.

Non-Rate of Rise Detectors: Where indicated on the Drawings provide thermal detectors with non-rate of rise thermal elements. Non-rate of rise detectors are indicated by NRR adjacent to the thermal detector symbol.

Specialized Element Temperature Ratings: Where indicated on the Drawings provide thermal detectors with specialized element temperature ratings. Specialized element temperatures are indicated by a temperature rating adjacent to the thermal detector symbol, *e.g.* 195°F.

Duct Smoke Detector: In-Duct Smoke Detector Housings shall accommodate either an intelligent ionization sensor or an intelligent photoelectric sensor as described elsewhere. The device, independent of the type used, shall be velocity rated and provide continuous analog monitoring and alarm verification from the panel. When sufficient smoke is sensed, an alarm signal shall be initiated at the FACP.

Installation: Duct detectors and related items shall be furnished and connected by the Division 28 (Electrical) Contractor but installed by the Division 20-25 (Mechanical) Contractor.

MISCELLANEOUS SYSTEM ITEMS

Addressable Dry Contact Monitor Module: Addressable Monitor Modules shall be provided to connect one supervised IDC zone (either Style D or Style B) of non-addressable 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. Modules must be located in conditioned spaces unless they are tested, listed and marked for continuous duty across the range of temperature and humidity levels expected at their installed location.

Indication of Operation: Module shall include an LED that shall flash under normal conditions, indicating that the Monitor Module is operational and in regular communication with the control panel.
Mounting Requirements: Monitor Modules shall mount in a standard 4-inch square, 2-1/8" deep electrical box. LED shall be clearly visible through light pipe in box cover.

Supervision: Unless specifically noted otherwise on the drawings provide one monitor module for each sprinkler switch (tamper and flow) and one for each non-addressable detector.

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 non-addressable 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 and be UL Listed to operate with the specific smoke detectors in the IDC zone. All required monitor modules may not be shown on the Drawings. Modules must be located in conditioned spaces unless they are tested, listed and marked for continuous duty across the range of temperature and humidity levels expected at their installed location.

Indication of Operation: Module shall include an LED that shall flash under normal conditions, indicating that the Monitor Module is operational and in regular communication with the control panel.

Mounting Requirements: Monitor Modules shall mount in a standard 4-inch square, 2-1/8" deep electrical box.

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. Modules must be located in conditioned spaces unless they are tested, listed and marked for continuous duty across the range of temperature and humidity levels expected at their installed location.

Indication of Operation: Module shall include an LED that shall flash under normal conditions, indicating that the Control Module is operational and in regular communication with the control panel.

Mounting Requirements: Control Modules shall mount in a standard 4-inch square, 2-1/8" deep electrical box. LED shall be clearly visible through light pipe in box cover.

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.

Power Source: Audio/visual power shall be provided by a separate supervised power loop from the main fire alarm control panel or from a supervised, UL listed remote power supply. A/V power sources and connections are not shown on the Drawings.

Test Switch: A magnetic test switch shall be provided to test the module without opening or shorting its NAC wiring.

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. Modules must be readily accessible (not above ceiling) and clearly labeled. Modules must be located in conditioned spaces unless they are tested, listed and marked for continuous duty across the range of temperature and humidity levels expected at their installed location. Modules shall be shown on shop drawings and as-built drawings.

Indication of Operation: Module shall include an LED that shall flash under normal conditions, indicating that the Isolator Module is operational and in regular communication with the control panel. The LED shall illuminate steadily to indicate that a short circuit condition has been detected and isolated.

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.

Mounting: The Isolator Module shall mount in a standard 4-inch square, 2-1/8" deep electrical box. LED shall be clearly visible through light pipe in box cover.

Installation: Supervisory switches shall be connected by the Division 28 (Electrical) Contractor but furnished and installed by the Division 20-25 (Mechanical) Contractor.

LCD Alphanumeric Display Annunciator: The Alphanumeric display annunciator shall be a supervised, remotely located back-lit LCD display containing a minimum of eighty (80) characters for alarm annunciation in clear English text. The LCD annunciator shall display all alarm and trouble conditions in the system.

System Capacity: The system shall allow a minimum of four LCD annunciators. In addition to annunciation functions, each LCD annunciator shall be capable of the following software programmed system functions: Acknowledge, Signal Silence and Reset.

Connections: The annunciator shall connect to a two-wire EIA-485 interface. The two-wire connection shall be capable operation at distances of 6,000 feet. Provide interface to fiber optic cable systems and/or repeater units where such are indicated on the Drawings.

Remote Annunciator Indicator Lights (RAIL): Remote annunciator indicator lights shall be provided in locations where indicated on the Drawings. RAILs shall be provided with a key type switch for testing of the annunciated device. In addition, RAILs shall have the following features:

Voltage: RAILs shall operate on 24 VDC nominal.

Mounting: Provide flush mounting devices suitable for mounting in a standard single gang device box unless otherwise indicated on the Drawings. Unless otherwise indicated on the Drawings, RAILs shall be mounted as described for electronic sounders above.

Door Hold-Open Magnets: Door hold open magnets shall be suitable for mounting in a single gang electrical device box. Door hold open magnets shall be furnished with keepers, door chains, and other accessories as required to properly hold open doors as indicated on the Drawings. Holding force of the magnet shall be appropriate for the door to be held open. Proper attachment of door magnet hardware to doors is the responsibility of the Division 28 contractor. Door hold open magnets shall operate in a fail safe manner, *i.e.*, the door shall release in event of a failure of voltage to the device.

Power Source: Door hold open magnets shall be configured to operate from a nominal 24 VDC system as supplied by the FACP or other power supply listed for the purpose. All hold open magnet supply sources, whether a part of the FACP or whether derived from a separate power supply, shall be supervised. Door hold open magnet circuits which use step-down transformers, 120 VAC, or local relays are not permitted.

Device box support: Door hold open magnet device boxes shall be securely attached to the building structure by means of wood blocking or other equally effective means. Boxes attached directly to only one metal stud or boxes supported by means of expansion type fasteners are not acceptable.

Remote Power Supply: Ancillary power supply used to power NAC circuits, sounder bases, door holds and similar items shall operate on 120 VAC, 60 Hz and shall have a continuous rating adequate to power all equipment and functions in full alarm continuously. All modules and drivers must be able to withstand prolonged short circuits in the field wiring, either line-to-line or line-to-ground, without damage. The power supply shall provide a battery charger using dual-rate charging techniques for fast battery recharge. The remote power supply shall be monitored by the FACP. It shall not be installed above a ceiling or in a non-conditioned space.

Batteries: Shall be completely maintenance free, shall not require liquids, fluid level checks or refilling, and shall not be capable of producing spills and/or leaks. Batteries shall be sealed gel-cell type with expected life of 10 years. Battery voltage shall be as required by the power supply ad related equipment. Battery shall have sufficient capacity to power the fire alarm system for not less than 24 hours plus 5 minutes of alarm upon a normal AC power failure. The connected load for NAC circuits shall not exceed 75% of rated current output of the power supply.

PART 3 - EXECUTION

Fire and smoke detection and alarm systems shall comply with the following system requirements with regard to operation and installation.

All equipment and components shall be installed in strict compliance with manufacturers' recommendations. All equipment supplied must be specifically listed for its intended use and shall be installed in accordance with any instructions including in its listing. Consult the manufacturer's installation manuals for all wiring diagrams, schematics, physical equipment sizes, etc., before beginning system installation. Refer to the Riser/Connection diagram for all specific system installation/termination/wiring data.

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 fire alarm system components to building surfaces or structure.

The system shall be new and furnished with a warranty (parts & labor) of at least one year from the date of final inspection and acceptance by the Owner. Equipment, initiating devices, and alarm appliances shall be arranged as described in the Drawings; annunciator zones shall be configured as described in the Drawings.

The system shall be equipped with the following protective devices to prevent damage or nuisance alarms by nearby lightning strikes, stray currents, or voltage transients. The devices are to be provided by the fire alarm equipment supplier:

On AC Input: Provide a 120 volt, 20 amp feed through branch circuit series connected surge protective device (SPD) in dedicated enclosure. Install at panelboard and trim excess lead lengths. Wind small coil in branch circuit phase conductor, within SPD enclosure, downstream of the SPD connection. Coil is to be about 1" diameter, 5 to 10 turns, and tie-wrapped. Ditek DTK-DF120S1 series, 20 Amp is a product meeting this performance specification. Equivalent units with UL 1449 listing by other suppliers are acceptable.

On DC Circuits Extending Outside Building: Near the point of entry to or exit from each building, provide a hybrid technology surge protection device on each leg. The filter shall consist of gas discharge tube (GDT) technology paired with silicon avalanche diode (SAD) technology, clamping voltage between 30 and 40 Volts. Ditek DTK – 2MHLP24BWB series is a product meeting this performance specification. Equivalent units with UL 497B listing by other suppliers are acceptable. Devices shall not use only MOV active elements for protection.

Both audible and visible alarm signals shall be provided. Visible signals must be the strobe (flash discharge) type, with white or clear lens, and shall comply with current ADA requirements for intensity and placement.

The FACP must have an Alarm Silence switch, and be equipped with the Subsequent Alarm (alarm resound) feature. Any remote annunciators or graphic displays located away from the alarm area must also include an audible signal with alarm resound feature.

If the system includes AHU shutdown or smoke removal startup, silencing the alarm (without resetting) must not reverse the shutdown. A supervised "AHU Shutdown Defeat" switch must be provided in the FACP. The switch must be labeled and its "Normal" position indicated. Provide supervised Hand-Off-Auto switch(es) at the FACP for any building smoke control equipment (pressurization or exhaust fans). The switch must cause a system “trouble” indication when it is placed in the off-normal (“shutdown defeated”) position.

The coverage of each fire alarm zone as described in the Drawings shall be indicated on the FACP and any remote annunciator. This may be accomplished by engraved labels, framed directories, and/or graphic displays. Label tape or handwritten labels are not acceptable.

Detectors used for elevator capture are identified on the Drawings by the designation EL adjacent to the detector. Primary and/or alternate recall points are indicated by the designation PRI or ALT respectively. Elevator capture or control signals must come from the FACP as relayed by control modules. Use of detector auxiliary contacts for elevator capture is not acceptable.

Systems are to be provided with a separate and independent source of emergency power. Switching to emergency power during alarm shall not cause signal drop-out. Batteries must meet the appropriate NFPA capacity requirements, with a 25% safety factor. This requirement is in effect even if generator power is supplied to the Fire Alarm Control Panel.

Style 6 Circuits Required: Systems with one or more addressable sub-panels that (1) have an integral addressable loop controller, or (2) monitor multiple non-addressable initiation zones, shall comply with the NFPA 72 requirements for Style 6 circuits.

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:

Signal Line Circuit cable	Red jacket with Red(+)/Black(-)
Alarm Indicating Appliance Circuits	Blue (+)/Black (-)
AHU Shutdown Circuits	Yellow (+)/Brown (-)
Initiation Circuits from Monitor Modules	Violet (+)/Gray (-)
Door Control Circuits	Orange
Elevator Capture Circuits	Brown

There shall be NO splices in the system other than at terminals in panels, fire alarm terminal cabinets (FATC) and devices. "Wire nuts," crimp splices, or insulation piercing type connectors are not acceptable. All terminal blocks shall be mounted in enclosures. All terminal 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 within FATC's, use markers or other means to indicate which conductors leads to the FACP.

In multistory buildings, all circuits leaving the riser on each floor shall feed through a labeled terminal block in an FATC with hinged cover, located for convenient access as indicated on the drawings. All required splices shall be made on termination blocks that are securely mounted in the cabinet. Wire markers and corresponding wiring legend shall be arranged as indicated on FATC detail on Drawings.

All fire alarm system cables and conductors shall be installed in raceway, couplers, and connectors meeting the performance of installation requirements of Section 260534, RACEWAYS. The minimum size for fire alarm system raceway shall be 3/4" trade size.

The exterior of all junction boxes containing fire alarm conductors shall be painted red; box interiors shall not be painted. Box covers for junction boxes containing fire alarm 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. Those boxes in finished areas are permitted to be painted to match the finish color.

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.

Raceways that penetrate outside walls from conditioned space shall have an internal seal to prevent condensation within the raceway as it enters the conditioned space.

Provide metal backboxes or plastic skirts as manufactured by the fire alarm manufacturer for devices installed in a surface mounted application. Such boxes shall match device in size and color.

Wire shall be new AWG #14 minimum stranded copper, type THHN/THWN for Notification Appliance Circuits. Addressable loop (signaling line) circuits shall be wired with type FPL/FPLR/FPLP fire alarm cable, AWG 18 minimum, low capacitance, twisted shielded copper pair. Cable shield drain wires are to be connected at each device on the loop to maintain continuity, taped to insulate from ground, and terminated at the FACP. Acceptable cables include Atlas 22-18-1-1STP, BSCC S1802s19 (same as EEC 7806LC), West Penn D975, D991 (AWG 16), D995 (AWG 14), or equal wire having capacitance of 30pf/ft maximum between conductors. The cable jacket color shall be red, with red (+) and black (-) conductor insulation.

EXCEPTION #1: Unshielded cable, otherwise equal to the above, is permitted to be used where the manufacturer's installation instructions unequivocally require, or state a preference for, the use of unshielded cable for all systems, AWG #16 minimum.

EXCEPTION #2: In underground conduit, use Type TC or PLTC cable (PE insulated) to avoid problems from moisture.

Detection or alarm circuits must not be included in raceways containing AC power or AC control wiring. Within the FACP, 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.

Provide an engraved label in FACP identifying its 120 VAC power source. This label shall include panelboard location, identification, and circuit number.

Branch circuit breakers serving fire alarm systems shall be physically protected from inadvertent contact using a breaker handle lock. Load designation shall be clearly identified (typed) in the panel directory. Breakers shall be further identified with a permanent red dot applied to the handle or other visible portion of the breaker. Do not cover operable portions of the breaker or written information on the case in meeting this requirement.

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 MW), as verified with a megger. Provide advance notice to the A-E of these tests.

All connections at the FACP must be made by the Manufacturer's authorized, factory trained representative (rather than by the electrical contractor).

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.

Spare Parts: Provide the following spare parts with the system, each individually packaged and labeled. For multi-building projects, calculate separately for each building:

Fuses	2 of each size used in the system
Manual Stations	2% of installed quantity
Addressble Control Modules	4% of installed quantity
Indoor Horns/Strobes	4% of installed quantity
Indoor Strobe-only Notification Appliances	4% of installed quantity
Monitor Modules (Addressable interface)	4% of installed quantity
Isolation Modules /Isolation Bases	4% of installed quantity
Addressable Heat Detectors, Bases	4% of installed quantity
Spot Smoke Detectors, Bases	6% of installed quantity

Increase decimal quantities of spare parts to the next higher whole number. For example, if a system has 20 spot-type smoke detectors provide 2 spare detectors with bases.

ALARM VERIFICATION FOR SMOKE DETECTORS

Fire alarm systems are specified with automatic drift compensation functions and shall be programmed with this feature activated for all spot-type detectors. The fire alarm system shall be equipped with alarm verification, but shall not be programmed with the feature activated unless it is determined necessary through system testing.

Alarm verification shall be by device, with timer and tally. The system shall provide a timer function that can be set for a specific detector or input module.

The timer function shall delay alarm signal for a field-programmable time period. The control panel shall override the alarm verification functions if a subsequent alarm is reported during the verification period.

The talley function shall be capable of monitoring the total quantity of verification cycles initiated at the panel. A maximum verification count may be set in the field, ranging from 0-20. When the counter threshold is exceeded, a trouble signal shall be generated to the FACP.

Alarms from other than spot type smoke detectors must not be delayed by Alarm Verification. Alarm Verification is NOT to be applied to duct smoke detectors, nor to any software configured "cross-zoned" detection devices.

REMOTE ALARM TRANSMISSION REQUIREMENTS

Each system with automatic fire detection, or which monitors a sprinkler system shall be equipped with a NFPA 72 type, dual line, four channel minimum, Digital Alarm Communicator Transmitter (DACT) for transmission of its fire alarm, supervisory, and trouble signals to a Listed central station. As a minimum, where applicable, the following signals shall be transmitted.

Fire alarm
Sprinkler waterflow alarm
Fire pump running alarm (if pump provided)
Fire pump abnormal status supervisory signal
Sprinkler valve tamper (closed) supervisory signal
Sprinkler low temperature / Air pressure supervisory signal
Burglary / Intrusion / Duress / Other security or emergency alarms
Fire alarm system AC power trouble (only if 120 VAC is interrupted for 8 hours)

The precedence of DACT / Proprietary alarm system transmission shall be as follows:

1. Fire
2. Security
3. Supervisory
4. Trouble

The "trouble" signal must not be sent unless maintained for 60 seconds or more to avoid nuisance transmissions due to alarm verification cycles. Do not report ac power fail unless outage exceeds 8 hours.

Provide a DACT which is compatible with the Owner's alarm receiving equipment or the Listed central station as indicated on the Drawings. Provide programming of any electronic memories (PROM "burn-in") and connect each DACT to the appropriate telephone or communications lines. Verify proper signal receipt of each channel by the supervising station.

Where leased or dedicated lines are available back to the Owner's security station and where indicated on the Drawings, provide a polarity reversal type alarm module. Note that polarity reversal type alarm modules report only Alarm, Line Trouble, and OK conditions.

SMOKE DETECTORS

Detectors must be the plug-in type, each having a separate base, not a mounting ring, to facilitate replacement and maintenance. The base shall have integral terminal strips for circuit connections, rather than wire pigtails. Each detector or detector base shall incorporate an LED to indicate alarm. 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.

A smoke detector shall be mounted with in 15 feet horizontally of each piece of fire alarm control system equipment, including transponders, sub-panels, and booster power supplies.

Spot type smoke detectors mounted within 12 feet of a walking surface shall have their built-in locking device activated. Activate the locks after the system has passed the final inspection by the owner.

Spot type smoke detectors shall not be used where ceiling height exceeds 25 feet, due to the increased difficulty with access for maintenance and the impact on device performance.

Activate automatic drift compensation feature for all spot type smoke detectors. Systems shall not have alarm verification feature activated with drift compensation functions activated.

Set spot-type smoke detector sensitivity to normal/ medium, unless directed otherwise by the design engineer or owner’s representative. Make additional changes as directed during testing and certification of the system.

Unless suitably protected against dust, paint, etc., detectors shall not be installed until the final construction clean-up has been completed. Covers supplied with smoke detectors do not provide adequate protection from heavy construction activities and shall not be used in this manner. Contaminated detectors must be REPLACED by the Contractor at no additional cost to the Owner.

Identification of individual detectors is required. These device numbers, 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. Identification labels must be printed labels with black lettering on a clear background. Handwritten labels or labels made from embossed tape are not acceptable.

Where shown on the Drawings air duct/plenum detectors must have a RAIL with a keyed Alarm Test switch, located in the nearest corridor or public area and identified by an engraved label affixed to the wall or ceiling.

Duct detectors installed under this division shall be installed by a Licensed Mechanical Contractor. Detectors shall be located and installed in strict accordance with manufacturer's recommendations. Detectors shall be installed in a manner that provides suitable access for required periodic cleaning and calibration.

> Access doors: Provide access doors for duct detectors that have monitoring tubes or other components located within the ductwork. Access doors shall be installed adjacent to the location of the detector and positioned so that interior components are easily accessible through the door. Ductwork insulation, if present, shall be restored to existing condition in the area of the access door. Provide additional access doors where necessary to assure ease of cleaning or maintenance functions. Provide a label to mark the direction of air flow in the duct on the access door. Access doors shall be installed by a Licensed Mechanical Contractor.

Duct detector sampling tubes: Sampling tubes shall extend the full width of the duct. Those over 36 inches long must be provided with rear support. The preferred method for doing this is to have the tube go through the far side of the duct, with the point of penetration tightly sealed to prevent air leakage around the tube. This facilitates smoke testing and tube cleaning. Duct smoke detector mounting position and air sampling tube orientation, are critical for proper operation. The Manufacturer's detailed installation instructions must be followed.

Smoke detector guards, where indicated on the Drawings shall be Listed for use with the specific model of smoke detector being protected. All smoke detector guards are to have a separate base which must be very securely anchored to wall or ceiling. The cover must be readily removable by the Owner for periodic detector cleaning and servicing but, to prevent unauthorized entry, must be secured to the base by a lock or tamper resistant screws approved by the A-E. Metal guards must be 16 gauge or heavier steel.

LINEAR BEAM SMOKE DETECTORS

Linear beam type smoke detectors shall be installed in locations as shown on the Drawings.

AUTOMATIC SMOKE DOOR AND AUTOMATIC LOCK REQUIREMENTS

Wall-mounted magnetic door holders and separate heavy-duty closers shall be used, instead of combination door control units. The electromagnets shall be controlled by the building's smoke detection system FACP. Individual smoke detector auxiliary contacts shall not be used to release door holders.

Automatic door locks controlled by the system must be either fail safe magnetic locks or fail-safe electro-mechanical with reverse bevel dead bolts.

> All lock protected doors must immediately unlock upon fire alarm, loss of AC power, disablement of the fire alarm system (defined as loss of 24 VDC power) or upon manual operation of an unlock switch at a constantly attended location.
>
> Where door locks are installed on smoke or fire rated doors, power failure shall cause these mechanisms to default to egress mode (automatically close) with normal mechanical latching.

Smoke doors are permitted to be held open by magnets powered by the FACP or remote power supplies and released upon alarm. The resulting current drain must be accounted for in the stand-by current for the appropriate battery calculation or the system shall be programmed to drop the door magnets within 60 seconds after a loss of primary (120 VAC) power.

SPRINKLER SYSTEM MONITORING

The following sprinkler system alarm and supervisory functions shall be provided as a part of the fire alarm system:

1. Waterflow alarm, by sprinkler zone (not to exceed one floor).
2. Supervision of each control valve.
3. Supervision of air pressure, if used (both high and low).
4. Supervision of fire pump.

Sprinkler supervisory monitoring of flow switches, tamper switches, and similar functions shall be accomplished with a separate system address for each activity monitored.

KITCHEN EXHAUST HOOD EXTINGUISHING SYSTEMS

Installation shall comply with the current edition of NFPA Standard for the type of system installed.

System(s) shall be interconnected with the fire alarm system as a separate system address.

The following operational requirements are generally provided directly by the extinguishing system. The Contractor shall verify that the means for providing the following operation sequence is in place:

> The exhaust fan must continue running after the system has been discharged, (except on carbon dioxide systems) to remove smoke; the supply fan should stop. All sources of heat for appliances served by the extinguishing system (both electric and/or gas) must be turned off.

The fire alarm system shall monitor the control power to shunt trip breakers used to interrupt power to kitchen equipment.

ELEVATOR SHUTDOWN SYSTEMS

Installation shall comply with the current editions of NFPA 72 and ANSI/ASME A17.1.

System(s) shall be interconnected with the fire alarm system such that the following components occur at each installed sprinkler head in the elevator machine room and elevator hoistway, including the pit.

> A smoke detector placed adjacent the sprinkler head shall monitor for early indication of smoke. Upon alarm, the appropriate sequence of elevator recall is initiated, based on the location of the smoke detector.
>
> A heat detector placed adjacent the sprinkler head shall monitor for early indication of heat. Upon alarm, the branch breaker(s) serving the elevator car(s) shall be shunt trip to de-energize power to each elevator controller.

The fire alarm system shall monitor the control power circuit to shunt trip breakers used to interrupt power to elevator controllers.

FIRE ALARM SYSTEM INSTALLATION AND CONFIGURATION

In addition to other requirements of these Specifications the fire alarm system must comply with the following:

The addressable fire alarm system shall be connected, programmed, and tested only by the Manufacturer or by an authorized distributor who stocks a full compliment of spare parts for the system. Technicians performing this service shall be trained and individually certified by the Manufacturer for the model of system being installed. Copies of installer certification must be included with the Contractor's submittal.

The complete configuration data (site-specific programming) for the system must be permanently stored on a USB drive or compact disc (CD) and archived by the manufacturer or authorized distributor. A USB drive or compact disc (CD) copy of this data must be submitted to the A-E for transmission to the Owner when the system is commissioned.

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.

All addressable loop controller circuits (SLCs) must be NFPA 72 Style 6 ("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. At the FACP, at each end of the loop.
2. At the mid-point of a loop with less than 20 devices or control points.
3. After each 20 devices/control points on any addressable circuit.
4. For each circuit extending outside the building.
5. At each terminal cabinet on loops serving multiple floors (each floor).

Notification Appliance Circuits (NACs) shall be NFPA 72 Style Y (Class B). The load connected to each circuit must not exceed 80% of rated supply output. The coverage of each circuit shall not exceed 3 floors. The NAC voltage drop during alarm shall not exceed 14% of the voltage measured across the batteries. The contractor shall use power outage testing to verify proper installation.

Supervision required: The connection between individual addressable modules and their contact type initiating device(s) must be supervised.

The Fire Alarm System shall have multiple access levels which permit the Owner's authorized personnel to disable individual alarm inputs or normal system responses (outputs) for alarms without changing the system’s executive programming or affecting operation of the rest of the system. This must include the ability to override selected alarm inputs or system responses to alarms without affecting the remaining portions of the system. The owner shall be taught how to make these changes in the training program provided.

Where indicated on the Drawings, a Graphic Annunciator (GA) with separate Light Emitting Diodes (LED) indication for each alarm and supervisory signal initiating device shall be included. Multiple initiating devices of the same type within a single room may be permitted to share a common LED. The GA must show all major building features such as corridors, elevators, stairs, exits, and "YOU ARE HERE". GA layout must be submitted for approval.

Graphic Chart must be mounted behind Plexiglass and secured to surface. Mounting shall be such that charts cannot be removed without a flat head screw driver.

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 floor. Plans shall be reduced in size from engineering plans in order to fit on 11 x 14 sheets. All device addresses shall be clearly labeled on plans. Indicate locations of all cabinets, modules and end of line resistors. Plans shall be bound in book form. Sheets shall be laminated. 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.

Loop 1 shall be assigned to the first floor devices and loop number shall increase with floor number. Device numbering starts in the same location on each floor and increase accordingly as circuit location increases.

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.

SYSTEM DOCUMENTATION, TRAINING, AND MAINTENANCE

The contractor shall provide the A-E with three copies of the following:

1. As-built wiring and conduit layout diagrams, including wire color code and/or label numbers, and showing all interconnections in the system.
2. Electronic circuit diagrams of all control panels, modules, annunciators, communications panels, etc.
3. Technical literature on all major parts of the system, including control panels, batteries, detectors, manual stations, alarm indicating appliances, power supplies, and remote alarm transmission means.
4. Detailed maintenance requirements as recommended by the fire alarm manufacturer.

The contractor shall provide the A-E with one copy of the following:

1. All software required, both for the installed fire alarm system and for any personal computer (PC) necessary to access the fire alarm system for trouble shooting, programming, modifications, monitoring, de-bugging, or similar functions.
2. Complete documentation for all software for both the installed fire alarm system and for any interface PC software necessary for system functions as described in (1) above.
3. Framed floor plans for installation at the FACP. Plans shall show all system devices with the unique device identification numbers indicated adjacent to each device. The identification numbers shall match those represented in the as-built drawings and those reported at the FACP and the LCD annunciator.

At the Owner's Request, and at the conclusion of the project, the Contractor shall negotiate with the Owner for the purchase of one laptop computer, equivalent to that used to program the system.

The Manufacturer's authorized representative shall provide training for Owner's designated employees in proper operation of the system and in all required periodic maintenance. Scheduling of training must be arrange to meet the Owner's schedule. A minimum of 8 hours of training shall be provided at no additional cost to the Owner with additional training available at a cost to be mutually agreed upon by the Owner and the Contractor. The instruction shall include a minimum of two copies of a written, bound training summary, for future reference. Basic operating instructions shall be framed and mounted at the FACP.

Training shall be in the Owner's provided classroom.

The training may not be waived, deleted or reduced in the number of hours required.

Training shall cover the following topics at a minimum:

1. Preventive maintenance service techniques and schedules, including historical data trending of alarm and trouble records.

2. Overall system concepts, capabilities, and functions. Training shall be in depth, so that the owner shall be able to take any device out of service and return any device to service without need of Manufacture's approval or assistance.

3. Explanation of all access levels and control functions, including training to program and operate the system software.

4. Methods and means of troubleshooting and replacement of all field wiring devices.

5. Methods and procedures for troubleshooting the main fire alarm control panel, including field peripheral devices as to programming, bussing systems, internal panel and unit wiring, circuitry and interconnections.

6. Manuals, drawings, and technical documentation. Actual system software used for training shall be provided on USB drive or compact disc (CD) and shall be left with the Owner at the completion of training for the Owner's use in the future.

SYSTEM TESTING & CERTIFICATION

Upon completion of the installation the Division 28 Contractor and the Manufacturer's authorized installer together shall conduct a 100% performance test of each and every alarm initiating device for proper response. The system shall operate for 48 hours prior to start of test. The Division 28 Contractor shall be present for the full 100% test.

The Contractor's 100% Performance test shall consist of the following. Upon activation of each alarm initiating device, verify effective operation of every alarm notification appliance and all other functions such as elevator capture, control smoke doors/dampers, proper operations of HVAC systems, and pressurization fans. In addition, verify proper annunciation of each activated device, including device identification number, type and location, at the FACP and each remote annunciator. The FACP shall reset after testing of each alarm initiating device. The digital communicator shall be on-line and tested for proper communication to the receiving station. Equivalent methods of demonstrating proper operation of HVAC shutdown are acceptable for this test. All supervised circuits must also be tested to verify proper supervision. (Control circuits and remote annunciation lines are among those required to be supervised.)

All testing described above shall be repeated in the event that subsequent software or wiring modifications are determined necessary to meet the requirements of the contract documents. Such re-testing shall be included as part of the base bid and provided at no additional cost to the Owner.

The A-E must be given 7 days advance notice of the tests.

The contractor must submit the following test documentation:

1. Written verification that this 100% system test was done with copy of print out generated during test.
2. System status and programming report, including a system operation matrix showing the actual FACP response for each initiating device. In addition, provide the measured sensitivity of each smoke detector. (Generate on date of Designer Pre-Final).
3. NFPA 72-2013 "Record of Completion" form: Use this form to detail the system installation and to certify that it was installed per code requirements.
4. Voltage table indicating voltage at battery and at the last device on each NAC circuit. Take readings at the start of test and every 15 minutes during NAC test. Test shall be 30 minutes minimum.

After completion of the Contractor's 100% performance test and submission of the above documentation, the contractor will request in writing that the A-E set up a pre-final review.

If the initial inspection determines that the required 100% system test was not reasonably done, or if a reinspection of the project is requested without the punch list being nearly completed, the Contractor *may* be required to reimburse the Designer for inspection costs.

System Report: In addition to the shop drawing submittal the fire alarm system contractor shall provide the engineer two bound copies of the following technical information, for transmittal to the owner:

1) As-Built wiring diagram showing all loop numbers and device addresses, plus terminal numbers where they connect to control equipment.
2) Manufacturer's detailed maintenance requirements
3) Technical literature on all control equipment, isolation modules, power supplies, alarm/ supervisory signal initiating devices, alarm notification appliances, relays, etc…
4) The as-built "calculations" sheet referenced elsewhere in this specification.

Electronic archive: Complete configuration data (site-specific programming) for the system must be stored on electronic media and archived by the fire alarm system manufacturer or authorized distributor. A USB drive or compact disc (CD) copy of this data shall be submitted to the engineer for transmission to the owner.

INSPECTIONS

Fire Alarm System Designer Pre-final review: Upon completing the fire alarm system installation, and prior to scheduling the Designer Pre-final review, the installation contractor must successfully conduct and complete a 100% performance test of the entire fully functional system. All audio visual device tests shall be scheduled with the owner.

As part of the Designer Pre-final review the system will be inspected and functionally tested on a comprehensive basis. Equipment intended for open area protection or releasing device service may be subjected to simulated or actual test fires in accordance with ANSI/UL guideline and sound engineering practice, to verify proper response.

The Contractor shall provide two-way radios, equipment keys, as-built drawings, ladders, smoke products, meter and other materials required to test the system. The test will be conducted entirely by the Contractor. Any deficiencies shall be recorded and corrected. After the items have been corrected, the system shall be tested again in the presence of the Engineer.

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.

Test Report: Upon successful completion of the Performance Inspection and correction of all deficiencies, the manufacturer’s authorized representative shall issue a test report to the Engineer, detailing and certifying the test.

Final Inspection: At the Owner’s request and after passing the pre-final review, the Division 28 Contractor and Manufacturer’s authorized installer will conduct a full system test in the presence of the Owner and the Designer. Upon request, a copy of the final database software must be presented to the Owner on USB drive before this test. The software shall be loaded from the drive into the system in the presence of the Owner and Engineer. See requirements for pre-final test and conduct similarly.

System Acceptance: After successful completion of the Final Inspection and recommendation of the Engineer, the system will be accepted by the Owner. At this time 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 the system.

END OF SECTION 283100

SYSTEM RECORD OF COMPLETION

This form is to be completed by the system installation contractor at the time of system acceptance and approval.
It shall be permitted to modify this form as needed to provide a more complete and/or clear record.
Insert N/A in all unused lines.
Attach additional sheets, data, or calculations as necessary to provide a complete record.

Form Completion Date:_____ Supplemental Pages Attached:_____

1. PROPERTY INFORMATION

Name of property:_____
Address:_____
Description of property:_____
Name of property representative:_____
Address:_____
Phone:_____ Fax:_____ E-mail:_____

2. INSTALLATION, SERVICE, TESTING, AND MONITORING INFORMATION

Installation contractor:_____
Address:_____
Phone:_____ Fax:_____ E-mail:_____
Service organization:_____
Address:_____
Phone:_____ Fax:_____ E-mail:_____
Testing organization:_____
Address:_____
Phone:_____ Fax:_____ E-mail:_____
Effective date for test and inspection contract:_____
Monitoring organization:_____
Address:_____
Phone:_____ Fax:_____ E-mail:_____
Account number:_____ Phone line 1:_____ Phone line 2:_____
Means of transmission:_____
Entity to which alarms are retransmitted:_____ Phone:_____

3. DOCUMENTATION

On-site location of the required record documents and site-specific software:_____

4. DESCRIPTION OF SYSTEM OR SERVICE

This is a: ❑ New system ❑ Modification to existing system Permit number:_____
NFPA 72 edition:_____

4.1 Control Unit

Manufacturer:_____ Model number:_____

4.2 Software and Firmware

Firmware revision number:_____

4.3 Alarm Verification

❑ This system does not incorporate alarm verification.
Number of devices subject to alarm verification:_____ Alarm verification set for _____ seconds

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FIGURE 7.8.2(a) System Record of Completion. (SIG-FUN)

SYSTEM RECORD OF COMPLETION *(continued)*

5. SYSTEM POWER

5.1 Control Unit

5.1.1 Primary Power

Input voltage of control panel: _____ Control panel amps: _____

Overcurrent protection: Type: _____ Amps: _____

Branch circuit disconnecting means location: _____ Number: _____

5.1.2 Secondary Power

Type of secondary power: _____

Location, if remote from the plant: _____

Calculated capacity of secondary power to drive the system:

In standby mode (hours): _____ In alarm mode (minutes): _____

5.2 Control Unit

❑ This system does not have power extender panels

❑ Power extender panels are listed on supplementary sheet A

6. CIRCUITS AND PATHWAYS

Pathway Type	Dual Media Pathway	Separate Pathway	Class	Survivability Level
Signaling Line				
Device Power				
Initiating Device				
Notification Appliance				
Other (specify):				

7. REMOTE ANNUNCIATORS

Type	Location

8. INITIATING DEVICES

Type	Quantity	Addressable or Conventional	Alarm or Supervisory	Sensing Technology
Manual Pull Stations				
Smoke Detectors				
Duct Smoke Detectors				
Heat Detectors				
Gas Detectors				
Waterflow Switches				
Tamper Switches				

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FIGURE 7.8.2(a) *Continued*

SYSTEM RECORD OF COMPLETION *(continued)*

9. NOTIFICATION APPLIANCES

Type	Quantity	Description
Audible		
Visible		
Combination Audible and Visible		

10. SYSTEM CONTROL FUNCTIONS

Type	Quantity
Hold-Open Door Releasing Devices	
HVAC Shutdown	
Fire/Smoke Dampers	
Door Unlocking	
Elevator Recall	
Elevator Shunt Trip	

11. INTERCONNECTED SYSTEMS

❑ This system does not have interconnected systems.

❑ Interconnected systems are listed on supplementary sheet _____.

12. CERTIFICATION AND APPROVALS

12.1 System Installation Contractor

This system as specified herein has been installed according to all NFPA standards cited herein.

Signed: _____ Printed name: _____ Date: _____

Organization: _____ Title: _____ Phone: _____

12.2 System Operational Test

This system as specified herein has tested according to all NFPA standards cited herein.

Signed: _____ Printed name: _____ Date: _____

Organization: _____ Title: _____ Phone: _____

12.3 Acceptance Test

Date and time of acceptance test: _____

Installing contractor representative: _____

Testing contractor representative: _____

Property representative: _____

AHJ representative: _____

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FIGURE 7.8.2(a) *Continued*

EMERGENCY COMMUNICATIONS SYSTEMS SUPPLEMENTARY RECORD OF COMPLETION

This form is a supplement to the System Record of Completion. It includes systems and components specific to emergency communications systems.
This form is to be completed by the system installation contractor at the time of system acceptance and approval.
It shall be permitted to modify this form as needed to provide a more complete and/or clear record.
Insert N/A in all unused lines.

Form Completion Date:_____ Number of Supplemental Pages Attached:_____

1. PROPERTY INFORMATION

Name of property: _____

Address: _____

2. DESCRIPTION OF SYSTEM OR SERVICE

❑ Fire alarm with in-building fire emergency voice alarm communication system (EVAC)

❑ Mass notification system

❑ Combination system, with the following components:

❑ Fire alarm ❑ EVACS ❑ MNS ❑ Two-way, in-building, emergency communications system

❑ Other (specify): _____

NFPA 72 edition: _____ Additional description of system(s): _____

_____

2.1 In-Building Fire Emergency Voice Alarm Communications System

Manufacturer:_____ Model number: _____

Number of single voice alarm channels:_____ Number of multiple voice alarm channels: _____

Number of speakers: _____ Number of speaker circuits:_____

Location of amplification and sound processing equipment: _____

_____

_____

Location of paging microphone stations:

Location 1: _____

Location 2: _____

Location 3: _____

2.2 Mass Notification System

2.2.1 System Type:

❑ In-building MNS–combination

❑ In-building MNS ❑ Wide-area MNS ❑ Distributed recipient MNS

❑ Other (specify): _____

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FIGURE 7.8.2(b) Emergency Communications System Supplementary Record of Completion. (SIG-FUN)

EMERGENCY COMMUNICATIONS SYSTEMS SUPPLEMENTARY RECORD OF COMPLETION *(continued)*

2. DESCRIPTION OF SYSTEM OR SERVICE *(continued)*

2.2.2 System Features:

❑ Combination fire alarm/MNS ❑ MNS autonomous control unit ❑ Wide-area MNS to regional national alerting interface
❑ Local operating console (LOC) ❑ Distributed-recipient MNS (DRMNS) ❑ Wide-area MNS to DRMNS interface
❑ Wide-area MNS to high power speaker array (HPSA) interface ❑ In-building MNS to wide-area MNS interface
❑ Other (specify): _____

2.2.3 MNS Local Operating Consoles

Location 1: _____
Location 2: _____
Location 3: _____

2.2.4 High Power Speaker Arrays

Number of HPSA speaker initiation zones: _____
Location 1: _____
Location 2: _____
Location 3: _____

2.2.5 Mass Notification Devices

Combination fire alarm/MNS visual devices: _____ MNS-only visual devices: _____
Textual signs: _____ Other (describe): _____
Supervision class: _____

2.2.6 Special Hazard Notification

❑ This system does not have special suppression predischarge notification.
❑ MNS systems DO NOT override notification appliances required to provide special suppression predischarge notification.

3. TWO-WAY EMERGENCY COMMUNICATIONS SYSTEMS

3.1 Telephone System

Number of telephone jacks installed: _____ Number of warden stations installed: _____
Number of telephone handsets stored on site: _____
Type of telephone system installed: ❑ Electrically powered ❑ Sound powered

3.2 Two-Way Radio Communications Enhancement System

Percentage of area covered by two-way radio service: Critical areas _____ % General building areas _____ %
Amplification component locations: _____

_____

Inbound signal strength _____ dBm Outbound signal strength _____ dBm
Donor antenna isolation is _____ dB above the signal booster gain.
Radio frequencies covered: _____
Radio system monitor panel location: _____

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FIGURE 7.8.2(b) *Continued*

EMERGENCY COMMUNICATIONS SYSTEMS SUPPLEMENTARY RECORD OF COMPLETION *(continued)*

3. TWO-WAY EMERGENCY COMMUNICATIONS SYSTEMS *(continued)*

3.3 Area of Refuge (Area of Rescue Assistance) Emergency Communications Systems

Number of stations:_____ Location of central control point:_____

Days and hours when central control point is attended:_____

Location of alternate control point:_____

Days and hours when alternate control point is attended:_____

3.4 Elevator Emergency Communications Systems

Number of elevators with stations:_____ Location of central control point:_____

Days and hours when central control point is attended:_____

Location of alternate control point:_____

Days and hours when alternate control point is attended:_____

3.5 Other Two-Way Communications System

Describe:_____

4. CONTROL FUNCTIONS

This system activates the following control functions specific to emergency communications systems:

Type	Quantity
Mass Notification Override of Alarm Signaling Systems or Appliances	

See Main System Record of Completion for additional information, certifications, and approvals.

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FIGURE 7.8.2(b) *Continued*

POWER SYSTEMS
SUPPLEMENTARY RECORD OF COMPLETION

This form is a supplement to the System Record of Completion. It includes systems and components specific to power systems that incorporate generators, UPS systems, remote battery systems, or other complex power systems. This form is to be completed by the system installation contractor at the time of system acceptance and approval. It shall be permitted to modify this form as needed to provide a more complete and/or clear record. Insert N/A in all unused lines.

Form Completion Date:_____ Number of Supplemental Pages Attached:_____

1. PROPERTY INFORMATION

Name of property: _____

Address: _____

2. SYSTEM POWER

2.1 Control Unit

2.1.1 Primary Power

Input voltage of control panel: _____ Control panel amps: _____

Overcurrent protection: Type: _____ Amps: _____

Location (of primary supply panelboard): _____

Disconnecting means location: _____

2.1.2 Engine-Driven Generator

Location of generator: _____

Location of fuel storage: _____ Type of fuel: _____

2.1.3 Uninterruptible Power System

Equipment powered by UPS system: _____

Location of UPS system: _____

Calculated capacity of UPS batteries to drive the system components connected to it:

In standby mode (hours): _____ In alarm mode (minutes): _____

2.1.4 Batteries

Location: _____ Type: _____ Nominal voltage: _____ Amp/hour rating: _____

Calculated capacity of batteries to drive the system:

In standby mode (hours): _____ In alarm mode (minutes): _____

2.2 In-Building Fire Emergency Voice Alarm Communications System or Mass Notification System

2.2.1 Primary Power

Input voltage of EVACS or MNS panel: _____ EVACS or MNS panel amps: _____

Overcurrent protection: Type: _____ Amps: _____

Location (of primary supply panelboard): _____

Disconnecting means location: _____

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FIGURE 7.8.2(c) Power Systems Supplementary Record of Completion. (SIG-FUN)

POWER SYSTEMS
SUPPLEMENTARY RECORD OF COMPLETION *(continued)*

2. SYSTEM POWER *(continued)*

2.2.2 Engine-Driven Generator

Location of generator: _____

Location of fuel storage: _____ Type of fuel: _____

2.2.3 Uninterruptible Power System

Equipment powered by UPS system: _____

Location of UPS system: _____

Calculated capacity of UPS batteries to drive the system components connected to it:

In standby mode (hours): _____ In alarm mode (minutes): _____

2.2.4 Batteries

Location: _____ Type: _____ Nominal voltage: _____ Amp/hour rating: _____

Calculated capacity of batteries to drive the system:

In standby mode (hours): _____ In alarm mode (minutes): _____

2.3 Notification Appliance Power Extender Panels

❑ This system does not have power extender panels.

2.3.1 Primary Power

Input voltage of power extender panel(s): _____ Power extender panel amps: _____

Overcurrent protection: Type: _____ Amps: _____

Location (of primary supply panelboard): _____

Disconnecting means location: _____

2.3.2 Engine Driven Generator

Location of generator: _____

Location of fuel storage: _____ Type of fuel: _____

2.3.3 Uninterruptible Power System

Equipment powered by UPS system: _____

Location of UPS system: _____

Calculated capacity of UPS batteries to drive the system components connected to it:

In standby mode (hours): _____ In alarm mode (minutes): _____

2.3.4 Batteries

Location: _____ Type: _____ Nominal voltage: _____ Amp/hour rating: _____

Calculated capacity of batteries to drive the system:

In standby mode (hours): _____ In alarm mode (minutes): _____

See Main System Record of Completion for additional information, certifications, and approvals.

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FIGURE 7.8.2(c) *Continued*

NOTIFICATION APPLIANCE POWER PANEL SUPPLEMENTARY RECORD OF COMPLETION

This form is a supplement to the System Record of Completion. It includes a list of types and locations of notification appliance power extender panels.
This form is to be completed by the system installation contractor at the time of system acceptance and approval.
It shall be permitted to modify this form as needed to provide a more complete and/or clear record.
Insert N/A in all unused lines.

Form Completion Date:_____ Number of Supplemental Pages Attached:_____

1. PROPERTY INFORMATION

Name of property: _____

Address: _____

2. NOTIFICATION APPLIANCE POWER EXTENDER PANELS

Make and Model	Location	Area Served	Power Source

See Main System Record of Completion for additional information, certifications, and approvals.

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FIGURE 7.8.2(d) Notification Appliance Power Panel Supplementary Record of Completion. (SIG-FUN)

INTERCONNECTED SYSTEMS SUPPLEMENTARY RECORD OF COMPLETION

This form is a supplement to the System Record of Completion. It includes a list of types and locations of systems that are interconnected to the main system.
This form is to be completed by the system installation contractor at the time of system acceptance and approval.
It shall be permitted to modify this form as needed to provide a more complete and/or clear record.
Insert N/A in all unused lines.

Form Completion Date:_____ Number of Supplemental Pages Attached:_____

1. PROPERTY INFORMATION

Name of property: _____

Address: _____

2. INTERCONNECTED SYSTEMS

Description	Location	Purpose

See Main System Record of Completion for additional information, certifications, and approvals.

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FIGURE 7.8.2(e) Interconnected Systems Supplementary Record of Completion. (SIG-FUN)

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

Campus Fire Alarm Replacements Contract: _____

Pitt Community College Bidder: _____

25-30379-01A Date: _____

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

.

The Bidder proposes and agrees if this proposal is accepted to contract with the

Trustees of Pitt Community College

in the form of contract specified below, to furnish all necessary materials, equipment, machinery, tools, apparatus, means of transportation and labor necessary to complete the construction of

Replace or provide new fire alarm systems in buildings: AB Whitley, Leslie, Vernon White, Greenville Center Annex, and Law Enforcement Training (LET).

in full in complete accordance with the plans, specifications and contract documents, to the full and entire satisfaction of the State of North Carolina, and

Pitt Community College

with a definite understanding that no money will be allowed for extra work except as set forth in the General Conditions and the contract documents, for the sum of:

SINGLE PRIME CONTRACT: _____

Base Bid:

_____ Dollars($) _____

General Subcontractor: Plumbing Subcontractor:

_____ Lic _____ _____ Lic _____

Mechanical Subcontractor: Electrical Subcontractor:

_____ Lic _____ _____ Lic _____

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

MINORITY BUSINESS PARTICIPATION REQUIREMENTS

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

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

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

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

*** OR ***

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

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

Proposal Signature Page

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

Respectfully submitted this day of _____

_____

(Name of firm or corporation making bid)

By:_____
Signature

Name: _____
Print or type

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

Address_____

_____

License No._____

Federal I.D. No. _____

Email Address: _____

Addendum received and used in computing bid:

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

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

Identification of HUB Certified/ Minority Business Participation

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

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

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

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

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

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

County of _____

(Name of Bidder)

Affidavit of_____

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

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

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

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

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

Date:_____ Name of Authorized Officer:_____

Signature:_____

Title:_____

SEAL

State of_____, County of_____

Subscribed and sworn to before me this _____day of _____20____

Notary Public_____

My commission expires _____

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

County of _____

Affidavit of _____
(Name of Bidder)

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

_____ contract.
(Name of Project)

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

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

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

Date: _____ Name of Authorized Officer: _____

Signature: _____

Title: _____

SEAL

State of _____, County of _____

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

Notary Public _____

My commission expires _____

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

County of _____

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

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

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

_____
(Project Name)

Project ID#_____ Amount of Bid $_____

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

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

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

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

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

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

Date:_____ Name of Authorized Officer:_____

SEAL

Signature:_____

Title:_____

State of _____, County of _____
Subscribed and sworn to before me this _____ day of _____ 20____
Notary Public_____
My commission expires_____

State of North Carolina AFFIDAVIT D – Good Faith Efforts

County of _____

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

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

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

_____
(Project Name)

Project ID#_____ Amount of Bid $_____

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

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

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

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

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

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

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

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

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

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

F. Copy of pre-bid roster

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

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

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

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

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

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

Date:_____ Name of Authorized Officer:_____

Signature:_____

Title:_____

SEAL

State of _____, County of _____

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

Notary Public_____

My commission expires _____

FORM OF BID BOND

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

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

WHEREAS, the said principal is herewith submitting proposal for

and the principal desires to file this bid bond in lieu of making

the cash deposit as required by G.S. 143-129.

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

_____(SEAL)

_____(SEAL)

_____(SEAL)

_____(SEAL)

_____(SEAL)

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 Trustees of Pitt Community College 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:

G001, G111, G121, G131, G151, G161
FA111 LEVEL 1 - AB WHITLEY
FA112 LEVEL 2 - AB WHITLEY
FA113 LEVEL 3 - AB WHITLEY
FA121 LEVEL 1 - LESLIE
FA122 LEVEL 2 - LESLIE
FA123 LEVEL 3 - LESLIE
FA131 LEVEL 1 - WHICHARD
FA132 LEVEL 2 - WHICHARD
FA141 LEVEL 1 - GREENVILLE CENTER ANNEX
FA151 LEVEL 1 - VERNON WHITE DEMOLITION
FA152 LEVEL 1 - VERNON WHITE NEW WORK
FA161 LEVEL 1 - LET
FA211 FIRE ALARM SYSTEM
FA212 FIRE ALARM SYSTEM DETAILS

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:

Base Bid	$
Total Contract	$

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)

_____ By: _____
(Proprietorship or Partnership)

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: Pitt Community College
Campus Fire Alarm Replacement

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 4 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: Pitt Community College
Campus Fire Alarm Replacement

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 4 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

STATE OF NORTH CAROLINA
COUNTY SALES AND USE TAX REPORT
SUMMARY TOTALS AND CERTIFICATION

CONTRACTOR: _____ Page __1____ of _____

PROJECT: _____ FOR PERIOD: _____

	TOTAL FOR COUNTY OF:	TOTAL FOR COUNTY OF:	TOTAL FOR COUNTY OF:	TOTAL FOR COUNTY OF:	TOTAL FOR COUNTY OF:	TOTAL FOR COUNTY OF:	TOTAL ALL COUNTIES
CONTRACTOR							
SUBCONTRACTOR(S)*							
COUNTY TOTAL							

* Attach subcontractor(s) report(s)
** Must balance with Detail Sheet(s)

I certify that the above figures do not include any tax paid on supplies, tools and equipment which were used to perform this contract and only includes those building materials, supplies, fixtures and equipment which actually became a part of or annexed to the building or structure. I certify that, to the best of my knowledge, the information provided here is true, correct, and complete.

Sworn to and subscribed before me,

This the _____ day of _____, 20____

_____
Signed

_____
Notary Public

_____
Print or Type Name of Above

My Commission Expires: _____

Seal

NOTE:
This certified statement may be subject to audit.

STATE OF NORTH CAROLINA
SALES AND USE TAX REPORT DETAIL

CONTRACTOR: _____ Page ___2___ of _____

SUBCONTRACTOR _____ FOR PERIOD: _____

PROJECT: _____

PURCHASE DATE	VENDOR NAME	INVOICE NUMBER	TYPE OF PROPERTY	INVOICE TOTAL	COUNTY TAX PAID	COUNTY OF SALE *
				$	$	
				TOTAL:	$	

* If this is an out-of-state vendor, the County of Sale should be the county to which the merchandise was shipped.