

Osterlund

ARCHITECTS, LLC

5 W Hargett Street, Suite 310

Raleigh, North Carolina 27603

(919) 838-9337

osterlundarchitects.com

Project No. 2416

PROJECT MANUAL

**Board of Elections Storage Mezzanine
Raleigh, North Carolina**

RFB/Bid No. 24-103

OWNER

Wake County Facilities Design & Construction

Raleigh, North Carolina

Construction Documents

November 12, 2024

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TABLE OF CONTENTS

Division	Section Title	Pages
	COVER	1
	TABLE OF CONTENTS	3
<u>DIVISION 00 – PROCUREMENT AND CONTRACTING REQUIREMENTS</u>		
00 01 07	SEALS PAGE	2
00 11 13	NOTICE TO BIDDERS	1
00 20 00	INSTRUCTIONS TO BIDDERS	8
00 30 00	WAKE COUNTY MINORITY AND WOMEN BUSINESS ENTERPRISE RESOLUTIONS FOR CONSTRUCTION CONTRACTS WAKE COUNTY FORMS MBE-1 THROUGH MBE-6	12 6
00 40 00	BID PROPOSAL FORM	8
00 50 00	BID BOND FORM	1
00 60 00	CONSTRUCTION AGREEMENT	4
00 61 00	PAYMENT & PERFORMANCE BOND FORMS	4
00 70 00	GENERAL CONDITIONS OF THE CONTRACT FOR CONSTRUCTION SUPPLEMENTARY GENERAL CONDITIONS APPENDIX A TO GENERAL CONDITIONS OF THE CONTRACT FOR CONSTRUCTION – DISPUTE RESOLUTION MEDIATOR LIST APPENDIX B - PROJECT SALES TAX REPORTING FORM NOTICE OF WAKE COUNTY ELECTRONIC CONTRACTING PROCESS FOR CONSTRUCTION AGREEMENTS	48 7 8 1 1
<u>DIVISION 01 - GENERAL REQUIREMENTS</u>		
01 10 00	SUMMARY	5
01 23 00	ALTERNATES	2
01 25 00	SUBSTITUTION PROCEDURES	4
01 26 00	CONTRACT MODIFICATION PROCEDURES	2
01 29 00	PAYMENT PROCEDURES	4
01 31 00	PROJECT MANAGEMENT AND COORDINATION	7
01 32 00	CONSTRUCTION PROGRESS DOCUMENTATION	7
01 33 00	SUBMITTAL PROCEDURES	9
01 40 00	QUALITY REQUIREMENTS	8
01 50 00	TEMPORARY FACILITIES AND CONTROLS	8
01 60 00	PRODUCT REQUIREMENTS	5
01 73 00	EXECUTION	11
01 74 19	CONSTRUCTION WASTE MANAGEMENT AND DISPOSAL	2
01 77 00	CLOSEOUT PROCEDURES	6
01 78 00	PROJECT CLOSEOUT CHECKLIST	3
01 78 23	OPERATION AND MAINTENANCE DATA	8

DIVISION 02 - EXISTING CONDITIONS

02 41 19 SELECTIVE DEMOLITION 6

DIVISION 03 - CONCRETE

03 30 00 CONCRETE 22

DIVISION 04 - MASONRY

NOT APPLICABLE

DIVISION 05 - METALS

05 12 00 STRUCTURAL STEEL 12

05 31 00 STEEL DECKING 6

05 51 13 METAL PAN STAIRS 11

05 52 13 PIPE AND TUBE RAILINGS 8

DIVISION 06 - WOOD, PLASTICS, AND COMPOSITES

NOT APPLICABLE

DIVISION 07 - THERMAL AND MOISTURE PROTECTION

NOT APPLICABLE

DIVISION 08 - OPENINGS

NOT APPLICABLE

DIVISION 09 - FINISHES

09 91 23 INTERIOR PAINTING 7

DIVISION 10 - SPECIALTIES

10 44 16 FIRE EXTINGUISHERS 3

DIVISION 11 - EQUIPMENT

NOT APPLICABLE

DIVISION 12 - FURNISHINGS

NOT APPLICABLE

DIVISION 13 - SPECIAL CONSTRUCTION

NOT APPLICABLE

DIVISION 14 - CONVEYING EQUIPMENT

14 46 00 VERTICAL RECIPROCATING CONVEYOR 6

DIVISION 21 – FIRE SUPPRESSION

21 05 00	COMMON WORK RESULTS FOR FIRE PROTECTION	6
21 10 00	WET PIPE SPRINKLER SYSTEMS	10

DIVISION 22 - PLUMBING

NOT APPLICABLE

DIVISION 23 - HVAC

NOT APPLICABLE

DIVISION 26 - ELECTRICAL

26 05 00	COMMON WORK RESULTS FOR ELECTRICAL	6
26 05 19	LOW-VOLTAGE ELECTRICAL POWER CONDUCTORS AND CABLES	2
26 05 26	GROUNDING AND BONDING FOR ELECTRICAL SYSTEMS	
26 05 33	RACEWAY AND BOXES FOR ELECTRICAL SYSTEMS	4
26 05 53	IDENTIFICATION FOR ELECTRICAL SYSTEMS	4
26 27 26	WIRING DEVICES	5
26 28 16	ENCLOSED SWITCHES AND CIRCUIT BREAKERS	3
26 51 00	INTERIOR LIGHTING	7

DIVISION 28 – ELECTRONIC SAFETY AND SECURITY

28 31 11	DIGITAL, ADDRESSABLE FIRE-ALARM SYSTEM	7
----------	--	---

DIVISION 31 – EARTHWORK

NOT APPLICABLE

DIVISION 32 - EXTERIOR IMPROVEMENTS

NOT APPLICABLE

DIVISION 33 - UTILITIES

NOT APPLICABLE

END OF TABLE OF CONTENTS

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DOCUMENT 000107 - SEALS PAGE

PART 1 - GENERAL

1.1 DESIGN PROFESSIONALS OF RECORD

A. Structural Engineer:

1. Bowen Shen, PE.
2. 048747.
3. Seal:



4. Responsible for Divisions 03 & 05 Sections except where indicated as prepared by other design professionals of record.

B. Architect:

1. Kristen Marie Osterlund, AIA.
2. 10028.
3. Seal:



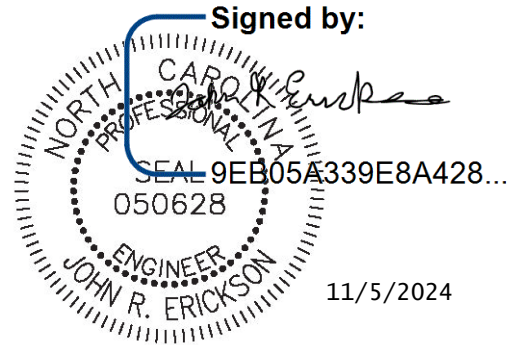
4. Responsible for Divisions 01-14 Sections except where indicated as prepared by other design professionals of record.

BOARD OF ELECTIONS STORAGE MEZZANINE
Osterlund Architects, PLLC #2416

CONSTRUCTION DOCUMENTS

C. Fire-Protection Engineer

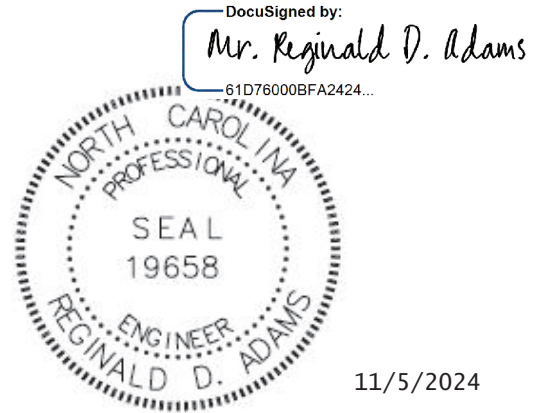
1. John R. Erickson, PE.
2. 050628
3. Seal:



4. Responsible for Divisions 21 Section except where indicated as prepared by other design professionals of record.

D. Electrical Engineer:

1. Reginald D. Adams, PE.
2. 19658
3. Seal:



4. Responsible for Divisions 26-28 Sections except where indicated as prepared by other design professionals of record.

PART 2 - PRODUCTS (Not Used)
PART 3 - EXECUTION (Not Used)

END OF DOCUMENT 000107

NOTICE TO BIDDERS

Sealed proposals will be received by the County of Wake in the Purchasing Department, Suite 2900, Wake County Justice Center, 301 McDowell Street, Raleigh, NC 27601, up to **2:00 p.m., Wednesday, December 18, 2024**, and immediately thereafter publicly opened and read for providing labor, material and equipment entering into the construction of Board of Elections Storage Mezzanine, located in Raleigh, NC (Wake County Bid RFB #24-103).

The Project includes a new storage mezzanine at the conditioned warehouse area of the Wake County Board of Elections Facility.

A **non-mandatory** Pre-bid Conference will be held at 1200 N. New Hope Rd. Raleigh, NC 27610 at 9:00am., local prevailing time, on Tuesday, December 3, 2024.

Complete plans and specifications for this project may be obtained from the Architect by sending an email request to Kristen Osterlund at kristen@osterlundarchitects.com and Joe Kasztelan at joe@osterlundarchitects.com.

Complete Plans are also available from the plan rooms below:

Construct Connect (<http://www.constructconnect.com>)

Dodge Data & Analytics (<http://www.thebluebook.com>)

The Blue Book (<http://www.thebluebook.com>)

Each Proposal shall be accompanied by a cash deposit, or a certified check drawn on some bank or trust company insured by the Federal Deposit Insurance Corporation, or a Bid Bond in an amount equal to not less than five percent (5%) of the Proposal. Said deposit to be retained by the Owner (referred to as Oblige on the Bond Form) as liquidated damages in event of failure of the successful Bidder to execute the Contract within ten (10) days after the award or to give satisfactory Surety as required by law.

The Bid Bond shall be conditioned that the surety will, upon demand, forthwith make payment to the Owner (referred to as Oblige on the Bond Form) upon the said bond if the Bidder fails to execute the contract.

Wake County provides minorities and women equal opportunity to participate in all aspects of its construction program consistent with NCGS §143-8. Bidders shall comply with the requirements of the Wake County Minority Business Enterprise Program, as outlined in Section 003000 of the Project Manual.

No bid may be withdrawn for sixty (60) days after the scheduled closing time for bids.

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

Signed: COUNTY OF WAKE

By: Sarah Kahr Richter, PE
Facilities Design & Construction

ARCHITECT: Kristen M. Osterlund, AIA
Principal Architect, Osterlund Architects, PLLC

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INSTRUCTIONS TO BIDDERS

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

1. PROPOSALS

Proposals must be made on the Bid Proposal Forms provided herein, and all blank spaces for Bids, Alternates and Unit Prices, applicable to bidder's work, shall be properly filled in. When requested Alternates are not Bid, the Proposal may be considered non responsive. The Bidders agree that Bids submitted on the specified Bid Proposal Forms, which are detached from specifications, will be considered and will have the same force and effect as if attached thereto. Numbers shall be stated both in writing and in figures for the Base Bids and Alternates.

Any modification to the Bid Proposal Forms (including Alternates and/or Unit Prices) may disqualify the Bid and may cause the Bid to be rejected.

The Contractor shall fill in the Bid Proposal Forms as follows:

- A. If the documents are executed by a sole Owner, that fact shall be evidenced by the word "Owner" appearing after the name of the person.
- B. If the documents are executed by a Partnership, that fact shall be evidenced by the word "Co-Partner" appearing after the name of the partner executing them.
- C. If the documents are executed on the part of a Corporation, they shall be executed by either the President or the Vice-President and attested by the Secretary or Assistant Secretary. In either case the title of the office of such person shall appear after their signatures. The seal of the Corporation shall be impressed on each signature page of the documents.
- D. If the Proposal is made by a Joint Venture, it shall be executed by each member of the Joint Venture in the above form for sole Owner, Partnership, or Corporation, whichever form is applicable.
- E. All signatures shall be properly witnessed or attested as applicable.
- F. Each proposal shall be addressed as indicated in the Advertisement for Bids and shall be delivered, enclosed in an opaque sealed envelope, marked "Proposal" and bearing the name of Project, name and address of the Bidder, the Bidder's license number and, if applicable, the designated portion of the Work for which Bid is submitted.
- G. It shall be the specific responsibility of the Bidder to deliver the Bid to the proper official at the appointed place and prior to the announced time for the opening of Bids. Later delivery of a Bid for any reason, including delivery by the United States Mail, shall disqualify the Bid.

- H. Modifications of previously deposited Bids or requests for withdrawal will be acceptable only if delivered in person or in writing to the place of the Bid opening prior to the time for opening Bids.
- I. Unit Prices quoted in the Proposal shall include overhead and profit and shall be the full compensation for the Contractor's cost involved in the work.
- J. All Bidders shall submit, attached to the bid, evidence of compliance with the Owners Minority Business Enterprise Program as outlined in Section 00300, Minority Business Enterprise Documents, of the Project Manual.

2. REQUIREMENTS FOR DOCUMENTING MINORITY BUSINESS PARTICIPATION

- A. Documentation to be submitted with each bid proposal
 - 1. All Bidders must provide, with the bid, Wake County Form MBE –1 (2002), Identity of Minority Business Participation, which identifies the minority businesses that will be used on the project, with the total dollar value of the work that will be performed by the listed minority businesses. Wake County Form MBE –1 (2002), Identity of Minority Business Participation, is a part of the bid form.
 - 2. All Bidders must provide, with the bid, one of the following:
 - a. Wake County Form MBE –2 (2002) – a listing of the good faith efforts made to solicit minority participation in the bid effort. A bidder must earn a minimum of 50 points from the good faith efforts listed for their bid to be considered responsive or;
 - b. Wake County Form MBE –3 (2002) – This form is to be submitted only by bidders certifying that all the work on the project will be performed 100% by their own workforce.

All bidders must submit with their bid the applicable forms; failure to submit the required forms may be grounds for rejection of the bid.

- B. Documentation to be submitted by the apparent low bidder after notification by the Owner

After the bid opening the Owner will consider all bid proposals and then determine and contact the apparent lowest responsible, responsive bidder. Within 72 hours of receipt of notification of being the apparent lowest responsible, responsive Bidder the Bidder shall submit the following:

 - 1. If the Bidder’s minority business participation meets or exceeds the established goal of 10%, the Bidder must submit Wake County Form MBE–4 (2002). This form is to include a description of the portion of work to be executed by minority business, expressed as a percentage of the total contract price.

2. If the Bidder's minority business participation is less than the established goal of 10%, the Bidder must submit Wake County Form MBE – 5 (2002). This form is to document the Bidder's good faith efforts to meet the established goal. Documentation to be provided on this form shall be evidence of all good faith efforts made, including any advertisements, solicitations and other specific actions demonstrating recruitment and selection of minority business for participation in the contract.

C. Other documentation to be provided after contract award

1. Within 30 days after a contract is awarded, or sooner if required by the Contract Documents, the successful Bidder must provide, to the Owner, a list of all subcontractors to be used on the project. The list must identify the minority category of each minority subcontractor.
2. With the final request for payment the successful Bidder shall provide a complete listing of all minority businesses used on the project, along with the total dollar value of work performed by each minority business. This information must be provided on Wake County Form MBE- 6 (2002).

3. EXAMINATION OF CONDITIONS

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

Reference is made to the Contract Documents for the identification of those surveys and investigative reports of subsurface or latent physical conditions at the site or otherwise affecting performance of the work which have been relied upon by the Licensed Professional who prepared the documents. Copies of all such surveys and reports are available to the Bidders, upon request. All Bidders are responsible for reviewing these documents prior to submission of their Bid Proposal.

Each Bidder may, at his own expense, make such additional surveys and investigations, as he may deem necessary to determine his Bid price for the performance of the work. Any on-site investigation shall be done at the convenience of the Owner. The Owner will honor any reasonable request for access to the site.

4. SUBSTITUTIONS

Material substitutions will be considered during the bidding phase until seven (7) days prior to the receipt of bids. No substitutions will be considered after seven (7) days prior to the receipt of Bids.

For proposed material substitutions submit the following information to the Licensed Professional who prepared the bidding documents:

- Name of manufacturer
- Address of manufacturer
- Phone number of manufacturer
- Trade name
- Model or catalogue designation
- Manufacturer's data including:
 - Performance and test data
 - Reference standards
- Detailed comparison with specified product including:
 - Performance
 - Test results
 - Warranties
 - Gauge, thickness or strength or material
 - Finish
 - Other pertinent data
- Other information requested by the Licensed Professional who prepared the bidding documents

Submittals relating to substitutions, which are not fully complete by seven (7) days prior to the receipt of bids, will not be reviewed.

If the Licensed Professional who prepared the bidding documents accepts a material substitution, Contractors will be notified by Addendum.

5. ADDENDA

Any Addenda to bidding documents issued during the time of bidding will be sent to each Bidder, and are to be considered covered in the Bid Proposal. It is the Contractor's responsibility to ascertain prior to Bid time, which Addenda have been issued and confirm that his Bid Proposal includes any changes covered by the Addenda.

Should the Bidder find discrepancies in, or omissions from, the drawings or documents or should he be in doubt as to their meaning, he shall at once notify the Licensed Professional who prepared said drawings or documents. Neither the Owner nor the Licensed Professional who prepared the bidding documents will be responsible for any oral instructions.

The Bidder on his Bid Proposal shall acknowledge all Addenda. Failure to do so may disqualify the Bid and may cause the Bid to be rejected.

6. BID SECURITY

Each Proposal shall be accompanied by a cash deposit, or a certified check drawn on some bank or trust company insured by the Federal Deposit Insurance Corporation, or a Bid Bond in an amount equal to not less than five percent (5%) of the Proposal. Said deposit to be retained by the Owner (referred to as Obligee on the Bond Form) as liquidated damages in event of failure of the successful Bidder to execute the Contract within ten (10) days after the award or to give satisfactory Surety as required by law.

The Bid Bond shall be conditioned that the surety will, upon demand, forthwith make payment to the Owner (referred to as Obligee on the Bond Form) upon the said bond if the Bidder fails to execute the contract.

A Wake County Bid Bond form is included in the project manual. The language in the Bid Bond form is required. Your Bid may be considered non-responsive if your Surety uses a different Bid Bond form. Notify your Surety that the language in the Wake County Bid Bond form must be used.

7. RECEIPT OF BIDS

Bids and Bid Security shall be received in strict accordance with requirements of the North Carolina General Statutes. Prior to opening of any Bids on the Project, the Bidder will be permitted to change or withdraw his Bid as allowed by Item 1-H of these Instructions.

All copies of the Bid, the Bid security, if any, and any other documents required to be submitted with the Bid shall be enclosed in a sealed opaque envelope. The envelope shall be addressed to the party receiving the Bids and should be identified with the Project name, time and date of Bid Opening, the Bidder's name and address, Bidder's license number and, if applicable, the designated portion of the Work for which the Bid is submitted. If the Bid is sent by mail, the sealed envelope shall be enclosed in a separate mailing envelope with the notation "SEALED BID ENCLOSED" on the face thereof.

8. OPENING OF BIDS

Upon opening, all Bids shall be read aloud. Once any Bid is opened, the Owner may return no Bids to any Bidder.

After Bids are opened, a Bidder may request that his Bid be withdrawn without forfeiting his Bid deposit in certain limited circumstances. Withdrawal after opening is permitted only if all of the following conditions specified in North Carolina General Statutes §143-129.1 are met:

- A. The Bid was submitted in good faith.
- B. The price Bid "was based upon a mistake, which constituted a substantial error".
- C. Credible evidence is submitted showing that the error (1) was clerical in nature, as opposed to a judgment error; and (2) was actually due to an unintentional and substantial arithmetic error or an unintentional omission of a substantial quantity of work, labor, material or services made directly in the compilation of the Bid.

- D. The error can be clearly shown by objective evidence drawn from inspection of the original work papers, documents, or materials used in the preparation of the Bid.
- E. The request to withdraw (1) is made in writing to the public agency that invited the Proposals, and (2) is made prior to the award of the Contract, but not later than seventy-two (72) hours after the opening of Bids.

9. REJECTION OF BIDS

The Owner reserves the unqualified right to reject any and all Bids. Reasons for rejection may include, but shall not be limited to, the following:

- A. If the Form of Proposal furnished to the Bidder is not used or is altered.
- B. If the Bidder fails to insert a price for all Bid items, Alternates and Unit Prices requested.
- C. If the Bidder adds any provisions reserving the right to accept or reject any award.
- D. If there are unauthorized additions or conditional Bids, or irregularities of any kind which tend to make the Proposal incomplete, indefinite, or ambiguous as to its meaning.
- E. If the Bidder fails to complete the Proposal forms where information is requested so the Bid may be properly evaluated by the Owner.
- F. If the Unit Prices contained in the Bid Schedule are unacceptable to the Owner.
- G. If the Bidder fails to comply with other instructions stated herein.
- H. If the Bidder fails to provide all documentation confirming compliance with the Wake County Minority Business Enterprise Program.

10. BID EVALUATION

The award of the Contract will be made to the lowest responsible Bidder as soon as practical. Should the successful Bidder default and fail to execute a Contract, the Contract may be awarded to the next lowest and responsible Bidder.

Before awarding a Contract, the Owner may require the apparent low Bidder to qualify himself to be a responsible Bidder by furnishing any or all of the following data:

- A. The latest financial statement showing assets and liabilities of the company or other information satisfactory to the Owner.
- B. A listing of similar completed projects of similar size, with contact persons and telephone numbers.
- C. Permanent name and address of place of business.

- D. The number of regular employees of the organization and length of time the organization has been in business under present name and percentage of work typically performed by the contractor's firm.
 - (1) Qualifications of key employees assigned to this Project.
 - (2) References for key employees assigned to this Project.
- E. The name and home office address of the Surety proposed and the name and address of the responsible local claim agent.
- F. The names of members of the firm who hold appropriate trade licenses, together with license numbers.
- G. Complete list of all subcontractors and suppliers proposed.
- H. Any pending arbitration or mediation cases or lawsuits. This may include all arbitration, mediation and lawsuits settled or resolved within last ten (10) years.

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

In determining the lowest responsible Bidder, the Owner may consider the past performance of the Bidder on construction contracts for the County of Wake, Wake County Public School System, the State of North Carolina or other governmental agencies. Particular concern will be given to completion times, quality of work, cooperation with other Contractors, and cooperation with the Designer and Owner.

Should the Owner adjudge that the apparent low Bidder is not the lowest "responsible" Bidder by virtue of the above information, said apparent low Bidder will be so notified and his Bid Security shall be returned to him.

The Owner shall have the right to accept Alternates in any order or combination and to determine the low Bidder on the basis of the sum of the Base Bid and the Alternates accepted.

The Owner reserves the right to reject any and all Bids, to waive all technicalities and irregularities, and to make the award as considered to be in the best interest of the Owner.

11. PERFORMANCE BOND

The successful Bidder, upon award of Contract, shall furnish a Performance Bond in an amount equal to one hundred percent (100%) of the Contract price.

12. PAYMENT BOND

The successful Bidder, upon award of Contract, shall furnish a Payment Bond in an amount equal to one hundred percent (100%) of the Contract price.

13. PRE-BID CONFERENCE

Bidders are requested to attend a Pre-Bid Conference at the time and place stipulated in the Bidding Documents.

14. PROPOSALS TO BE BID

General Construction Work

Fire Protection Work

Heating and Ventilation and Air Condition Work

Electrical Work

15. INFORMATION TO BIDDER

All questions concerning the plans and specifications should be directed to the Licensed Professional who prepared said documents.

**PART 1 WAKE COUNTY MINORITY AND WOMEN BUSINESS ENTERPRISE
RESOLUTIONS FOR CONSTRUCTION CONTRACTS**

**1.1 R-02-52 RESOLUTION UPDATING WAKE COUNTY PROCEDURES AND
POLICIES RELATING TO COUNTY CONSTRUCTION
PROJECTS AWARDED PURSUANT TO N.C.G.S. §143-128 ET
SEQ.**

WHEREAS, the North Carolina General Assembly has recently amended Article 8 of N.C.G.S. Chapter 143, Public Contracts, to increase the threshold for public contracts which must be bid, and to make other changes related to construction methods, construction management and minority business participation, and

WHEREAS, Wake County has adopted resolutions directing the County Manager to prepare and maintain minority and women business enterprise programs for all construction projects funded by Wake County (R-88-20) and establishing a verifiable percentage goal for minority business in awarding construction contracts the costs of which exceed one hundred thousand dollars (\$100,000) (R-90-13), and

WHEREAS, recent amendments to N.C.G.S. §143-129(a) have increased the threshold amount of public construction contract which must be bid from one hundred thousand dollars (\$100,000) to three hundred thousand dollars (\$300,000), and

WHEREAS, N.C.G.S. §143-128(a1) has increased the permissible methods that public bodies may use in awarding construction contracts, and

WHEREAS, N.C.G.S. §143-128.2 now requires more extensive efforts and detailed record keeping related to minority business participation in construction projects,

NOW, THEREFORE, BE IT RESOLVED by the Wake County Board of Commissioners

Section 1. That Resolutions R-90-13 and R-88-20 be amended to provide that the County Manager be directed to establish policies and procedures for bidding and awarding County building projects which comport with the requirements of Article 8 of N.C.G.S. Chapter 143, Public Contracts, as it is from time to time amended, and which are consistent with the policies contained in those Resolutions.

1.2 R-90-13 RESOLUTION TO ESTABLISH A VERIFIABLE PERCENTAGE GOAL FOR PARTICIPATION BY MINORITY BUSINESS IN THE AWARDING OF BUILDING CONSTRUCTION CONTRACTS AWARDED PURSUANT TO N.C.G.S. §143-128

WHEREAS, N.C.G.S. §43-128(c) requires each county to adopt, after notice and a public hearing, an appropriate verifiable percentage goal for participation by minority businesses (as defined in that statute) in the total value of work for building contracts the costs of which exceed one hundred thousand dollars (\$100,000) and which are awarded pursuant to N.C.G.S. §143-128; and

WHEREAS, N.C.G.S. §143-128(c)(3) requires a county awarding a building contract the cost of which exceeds one hundred thousand dollars (\$100,000) under a separate prime or separate specification contract system to adopt written guidelines specifying actions that will be taken by the county to ensure a good faith effort in the recruitment and selection of minority businesses for building contracts awarded under the separate prime or separate specification contract system; and

WHEREAS, N.C.G.S. §143-128(c)(4) requires a county awarding a building contract the costs of which exceeds one hundred thousand dollars (\$100,000) under a single-prime contract system to adopt written guidelines specifying the action that the prime contractor must take to ensure a good faith effort in the recruitment and selection of minority businesses for building contracts awarded under the single prime contract system; and requires that action taken by the prime contractor must be documented in writing by the contractor to the County; and

WHEREAS, N.C.G.S. §143-128(b) requires that a county choosing to use a single-prime contract system must also seek bids for a building contract the cost of which exceeds one hundred thousand dollars (\$100,000) under a separate prime or separate specification contract system and must award such building contract to the lowest responsible bidder or bidders for the total project; and

WHEREAS, N.C.G.S. §143-128(d) requires the county to award public building contracts the costs of which exceed one hundred thousand dollars (\$100,000) without regard to race, religion, color, creed, national origin, sex, age or handicapping condition; and

WHEREAS, notice of the public hearing was duly published and the public hearing required by N.C.G.S. §143-128(c) was held February 19, 1990;

NOW THEREFORE, BE IT RESOLVED BY the Wake County Board of Commissioners

Section 1. That Wake County shall have a verifiable goal of ten percent (10%) for participation by minority businesses in building construction contracts awarded pursuant to N.C.G.S. §143-128.

Section 2. That for each such building contract put out for bids under the separate specification or the single prime contract systems, notice of the contract shall be transmitted to the Minority Business Development Agency in Raleigh, North Carolina and the North Carolina Institute of Minority Economic Development in Durham, North Carolina (hereinafter "minority agencies").

Section 3. That for each such building contract put out for bids under the separate specification or single prime contract systems, documents related to the contract shall be available for inspection at a convenient and accessible location of which minority agencies shall receive notice.

Section 4. That for any such building contract put out for bids under the separate specification contract system, the County shall maintain records with respect to:

- a. those contractors or subcontractors that bid or otherwise respond to notice of the project,
- b. those contractors or subcontractors awarded contracts as part of the project, and
- c. the percentage of work on the project that is to be performed by minority businesses.

Section 5. That for any such building contract put out for bids under the single prime contract system, the single prime contractor shall:

- a. notify appropriate minority businesses of the portion of the project which will be subcontracted by the single contractor and solicit bids from those minority agencies.
- b. submit with his bids records with respect to:
 1. those minority subcontractors notified of the project and of those elements of the project for which subcontracts will be let, and
 2. those minority subcontractors that bid or otherwise respond to notice of the project, and
 3. those minority subcontractors awarded contracts as part of the project, and
 4. the percentage of work on the project that is to be performed by minority businesses.

Section 6. That these policies shall be a part of the request for proposals for any such contract, and noncompliance by any single prime bidder shall be grounds for declaring the bid non-responsive.

Section 7. The County Manager is hereby authorized to impose additional requirements, not inconsistent with the requirements of this resolution and pursuant to the resolution of this Board enacted February 28, 1988, the purposes of which are to promote the goal and intent of this resolution.

Commissioner Heater moved the adoption of the foregoing resolution. Commissioner Ward seconded the motion and, upon vote, the motion passed unanimously this the 19th day of February, 1990.

1.3 R-88-20 WAKE COUNTY, NORTH CAROLINA MINORITY AND WOMEN BUSINESS ENTERPRISE RESOLUTION FOR CONSTRUCTION CONTRACTS

WHEREAS, the Board of County Commissioners of Wake County, North Carolina desires that all segments of the population of Wake County have equal opportunity to compete for contracting and subcontracting work offered by the County; and

WHEREAS, it is in the best interest of Wake County to develop and maintain as large a pool of qualified, prospective contractors to draw upon as possible;

WHEREAS, it is the judgment of the Wake County Board of Commissioners that the County has a compelling interest to implement a minority/women business enterprise program to ensure the representative participation of all segments of the population in the County's economy; and

NOW, THEREFORE, BE IT RESOLVED that the Board of County Commissioners of Wake County declares that it is their policy to provide minorities and women equal opportunity to participate in all aspects of the County's construction program consistent with Chapter 143, Article 8 of the General Statutes of the State of North Carolina.

BE IT FURTHER RESOLVED that the Board of Commissioners of Wake County hereby directs the County Manager to prepare and maintain a minority and women business enterprise program for all construction projects funded by the County.

Upon motion of Commissioner Stout, seconded by Commissioner Zieverink, and upon roll call vote, the Board adopted the above resolution this 29th day of February 1988

**PART 2 MINORITY BUSINESS ENTERPRISE PARTICIPATION IN WAKE COUNTY
BUILDING CONSTRUCTION AND REPAIR CONTRACTS**

2.1 POLICY STATEMENT

It is the policy of the County to encourage minorities to participate in its building construction, renovation and repair projects.

It is further the policy of the County to prohibit illegal discrimination against any person or business enterprise and to conduct its building construction, renovation and repair programs so as to prevent such discrimination.

It is the policy of the County in concert with other local, state and federal agencies and with the assistance of minority groups and agencies, to seek and identify qualified minority business enterprises (MBEs) and to offer them the opportunity to participate, and to encourage them to participate, in the County's building construction and repair programs. Under this policy, the County adopts the definition of MBEs contained in N.C.G.S. § 143-128.2.

It is the policy of the County to provide information and opportunities to minority business enterprises that are available to other business enterprises, and to establish procedures providing MBEs access to information and opportunities available to other business enterprises.

It is the intent of this policy to secure contractors' participation and ensure competition. Nothing in this policy shall be construed to require contractors or the County to award contracts or subcontracts 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.

The County will award public building construction and repair contracts to the lowest responsible, responsive bidder as provided by Article 8 of Chapter 143 of the North Carolina General Statutes.

**2.2 SCOPE: This Policy Applies To Minority Business, Minority Persons, and
Socially and Economically Disadvantaged Individuals [Ref: N.C.G.S.
§143-128.2(g)]**

- A. A Minority Business (MBE) is a business:
 - 1. In which at least fifty-one percent (51%) is owned by one or more minority persons or socially and economically disadvantaged individuals, 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

2. 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.
- B. A Minority Person¹ is a person who is a citizen or lawful permanent resident of the United States, and who is:
1. Black, that is, a person having origins in any of the black racial groups in Africa;
 2. 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;
 3. 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;
 4. American Indian or Alaskan Native, that is, a person having origins in any of the original peoples of North America; or
 5. Female.
- C. A Socially and Economically Disadvantaged Individual is defined by 15 U.S.C. 637 as a socially disadvantaged individual 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. In determining the degree of diminished credit and capital opportunities, the federal government considers factors such as assets and net worth. This category includes members of economically disadvantaged Indian tribes.

2.3 VERIFIABLE GOALS FOR MINORITY BUSINESS ENTERPRISE PARTICIPATION²

- A. County Funded Building Construction or Repair Projects costing \$5000 or more.
1. The County has established a verifiable goal of ten percent (10%) for participation by minority businesses in building construction and repair projects covered by this section. [Ref: N.C.G.S. §143-128.2 (a)]
- B. For Building Construction or Repair Projects Using State Appropriations or Other State Grant Funds Where the Project Cost is Equal to or Greater than One

¹ For building projects funded in whole or in part with federal funds, Hasidic Jews are also considered minority persons.

² Projects funded in whole or in part with federal funds will comply with applicable federal thresholds regarding Minority and Woman Owned Business Enterprises participation.

Hundred Thousand Dollars (\$100,000), the County shall use the State's verifiable goal of ten percent (10%) for participation by minority business in building construction and repair projects covered by this section. [Ref: N.C.G.S. §143-128.2 (a)]

PART 3 REGULATIONS AND PROCEDURES FOR IMPLEMENTING MINORITY BUSINESS ENTERPRISE PARTICIPATION POLICY

3.1 INFORMAL BUILDING PROJECTS: Building construction and repair projects costing more than Five Thousand Dollars (\$5,000), but less than Three Hundred Thousand Dollars (\$300,000).

A. County Responsibilities:

1. Notify Minority Business Enterprises of bidding opportunities by one of the following methods:
 - a) Advertise the project at the Raleigh/Durham/Triad Minority Business Development Center or similar institution, or;
 - b) Advertise the project in an identified Minority Business Enterprise targeted newspaper(s) or;
 - c) Attempt to contact Minority Business Enterprises totaling at least 30% of the total number of vendors contacted [Ref.: N.C.G.S. §143-129. (b)]
2. Record all contractors contacted, along with the list of contractors provided with bidding documents.
3. Identify Minority Business firms contacted and record their minority category.
4. Record all contractors submitting bids, along with the amount of each bid.
5. Within five (5) days of project completion, submit a completed "Informal Construction Project Report Form" to the Wake County Finance Department.
6. The Wake County Finance Department will collect store, and report data and forms referenced in this Section 00600. See Section 3.3

B. Contractor Responsibilities:

1. The Contractor will provide the following documentation, Wake County Form MBE-6, at contract closeout and prior to final payment by the county.
 - a) A list of minority business's used on the project, identifying the businesses name, type of work performed, and minority category.
 - b) List the dollar amount paid to each minority business and the percentage it represents of the final project value.

3.2 FORMAL BUILDING PROJECTS: Building construction and repair projects costing Three Hundred Thousand Dollars (\$300,000) or more.

A. County Responsibilities:

1. Advertise Building Projects. When soliciting bids for formal building construction and repair projects, the county must
 - a) Advertise or post notice of bid opportunities to MBE and other potential bidders in trade publications (or whatever it is that we use now) and MBE targeted publications, plans review rooms or newspaper(s) with general circulation at least fourteen (14) days prior to the scheduled bid opening date. [Ref: N.C.G.S. §143-128.2(e)(3)]
 - b) Include the following in each advertisement or notice published: (i) a description of the work for which the bid is being solicited; (ii) the date, time, and location where bids are to be submitted; (iii) the name of the individual within the public entity who will be available to answer questions about the project; (iv) where bid documents may be reviewed; (v) notice of the date, time, and location of the prebid conference. [Ref: N.C.G.S. §143-128.2(e)(3)]
2. Hold a prebid conference prior to bid opening for each project and assure a County representative is in attendance. [Ref: N.C.G.S. §143-128.2(e)(2)]
3. Allow contractors to obtain, at least 10 days before the bid date, a complete set of Bidding Documents by providing a refundable deposit as outlined in the project Advertisement or published notice. Deposits will be refunded as stipulated in the Bidding Documents. [Ref: N.C.G.S. §43-128.2(e)(2)]

4. Include in the bidding documents for each project the following forms and a statement that all contractors submitting bids must include all applicable forms, fully completed, and that failure to file required forms with bids may be grounds for rejection of the bid. [Ref: N.C.G.S. §143-128.2.(c)(1)b.]
 - a) Wake County Form MBE-1, identifying minority business participation;
 - b) Wake County Form MBE-2, affidavit listing contractor's good faith efforts to meet the 10% goal for MBE participation, including any advertisements, solicitations, and evidence of other specific actions to recruit minority businesses for participation in the project;
 - c) Wake County Form MBE-3, affidavit evidencing contractor's intent to perform all contract work with its own workforce; and
 - d) A copy of the County's MBE policy and procedures.
5. Maintain all public records created for each project, including all records and documentation relating to MBE procedures, for a period of three years from the date of project completion. See Section 3.3. [Ref: N.C.G.S. §143-128.2(i)]
6. In any building or repair project financed in whole or in part with federal funds, the County must include a statement that all federal guidelines associated with the source of the federal funds must be complied with. For example, projects funded by HUD must comply with all requirements of 24 CFR §135.

B. Contractor Responsibilities:

1. All bidders on formal building construction or repair projects shall undertake a good faith effort to recruit minority businesses and provide documentation of meeting the minimum requirements of N.C. Gen. Stat. § 143-128.2.
 - a) Failure to comply with these procedural requirements and requirements for submittal of information in the Request for Proposals may render the bid non-responsive and may result in rejection of the bid. [Ref: N.C.G.S. §143-128.2.(c)(1)]
 - b) All contractors, including first-tier subcontractors on construction manager at risk projects, that do not propose to do all of the contract work with their own workforce must advertise for

minority subcontractor, vendors and suppliers at least ten days prior to submission of the contractor's bid. [Ref: N.C.G.S. §143-128.2.(f)(1)]

2. Each bidder, including first-tier subcontractors for construction manager at risk projects, must submit a completed Wake County Form MBE-1 and Wake County Form MBE-2. A contractor, including a first-tier subcontractor on a construction manager at risk project, that performs all of the work under a contract with its own workforce may submit a Wake County Form MBE-3 in lieu of Wake County Form MBE-2 otherwise required under this subsection. [Ref: N.C.G.S. §143-128.2.(c)]
3. The apparent lowest responsible, responsive bidder, must submit the following documents within 72 hours after notification of being the low bidder:
 - a) Form Wake County Form MBE-4, an affidavit 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 10% of the total cost of the contract; or
 - b) Form Wake County Form MBE-5, documentation of good faith effort to recruit MBE participation in the project, including any advertisements, solicitations, and evidence of other specific actions demonstrating recruitment of minority businesses for participation in the project. [Ref: N.C.G.S. §143-128.2.(c)(1)]
4. Within 30 days after the award of the contract, or sooner if stipulated in the Bidding Documents, the contractor shall provide to the County with a list of all subcontractors that the contractor will use on the project. [Ref: N.C.G.S. §143-128.2.(c)(2)]
5. During the construction of a project, if it becomes necessary to replace an MBE subcontractor, the prime contractor shall advise the Owner in writing. No MBE subcontractor may be replaced with a different subcontractor except for the following:
 - a) If the subcontractor's bid is later determined by the contractor or construction manager at risk to be nonresponsive or nonresponsive, or the listed subcontractor refuses to enter into a contract for the complete performance of the bid work; or
 - b) With the approval of the County for good cause. [Ref: N.C.G.S. §143-128.2.(d)]

Prior to substituting a subcontractor, the contractor shall identify the substitute subcontractor and inform the County, in writing, of its good faith efforts to replace with another MBE Subcontractor. Good faith efforts as set forth in N.C.G.S. § 143-131(b) apply to the selection of a substitute subcontractor. [Ref: N.C.G.S. §143-128.2(d)]

6. Prior to the final payment being due to the contractor Wake County Form MBE 6, which provides certification of actual work performed by Minority Businesses, must be submitted

3.3 COUNTY RECORD KEEPING PROCEDURES FOR MONITORING CONTRACTOR COMPLIANCE ON COUNTY BUILDING CONSTRUCTION AND REPAIR PROJECTS.

A. FORMAL CONTRACTS. The County shall maintain for three years from project completion date all records with respect to:

1. Those contractors notified or solicited for each building construction or repair projects, noting all that are minority businesses and their minority category.
2. Those contractors that bid or otherwise responded to advertisements or notices of building construction or repair projects, noting all that are minority businesses and their minority category.
3. Prime contracts awarded, the amount of the contracts, identity of those that are minority business.
4. The subcontractors utilized on projects, identity of minority subcontractors, type work performed by minority subcontractors amount paid minority businesses as reported by the prime contractor(s) awarded the bid.
5. The percentage of work on the project performed by minority businesses as reported by the prime contractor. [Ref: N.C.G.S. §143-128.2(i)]

B. INFORMAL CONTRACTS: Documents required to be kept by the County under this section will be maintained in the County Finance Department.

1. The requirements for record keeping for Informal Contracts are the same as for Formal Contracts listed above.

3.4 COMPLAINT PROCEDURES.

A. Formal and Informal Contracts:

1. Alleged violations of the provisions of this MBE plan by any party should be reported in writing to the County Manager or his/her designee.
2. The County Manager or his/her designee shall review all facts available and respond in writing. Unresolved complaints may be presented to the Board of County Commissioners. The decision rendered by the Board will be final.

Attach to Bid

Wake County – Form MBE-2 (2002)

Listing of the Good Faith Effort

Affidavit of _____
(Name of Bidder)

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 1.0101)

- 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 GS 143-128.2(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: _____



State of North Carolina, County of _____

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

Notary Public _____

My commission expires _____

{Note: Attach to Bid Only if Bidder Performs All Work With Own Workforces }

Wake County Form MBE-3 (2002)

Intent to Perform Contract with Own Workforce

Affidavit of _____
(Name of Bidder)

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

(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 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: _____



State of North Carolina, County of _____

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

Notary Public _____

My commission expires _____

Wake County Form MBE-4 (2002)

Portion of the Work to be Performed by Minority Firms

**** (NOTE: THIS FORM IS NOT TO BE SUBMITTED WITH THE BID PROPOSAL) ****

If the portion of the work to be executed by minority businesses as defined in GS143-128.2(g) 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, to the Owner, by the apparent lowest responsible, responsive bidder within 72 hours after notification of being the apparent low bidder.

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

(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	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**)

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: _____



State of North Carolina, County of _____

Subscribed and sworn to before me this _____ day of _____ 2003

Notary Public _____

My commission expires _____

Wake County Form MBE-5 (2002)

Good Faith Efforts

**** (NOTE: THIS FORM IS NOT TO BE SUBMITTED WITH THE BID PROPOSAL) ****

If the goal of 10% participation by minority business is not achieved, this affidavit shall be provided, to the Owner apparent lowest responsible, responsive bidder within 72 hours after notification of being the apparent low bidder.

Affidavit of: _____
(Bidder)

I do certify the attached documentation as true and accurate representation of my good faith efforts.

(Attach additional sheets if required)

Name and Phone Number	*Minority Category	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**)

Documentation of the Bidder's good faith efforts to meet the goals set forth in these provisions. Examples of documentation include, but are not limited to, the following evidence:

- 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 c 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.

Date: _____ Name of Authorized Officer: _____



Signature: _____

Title: _____

State of North Carolina, County of _____

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

Notary Public _____

My commission expires _____

Wake County Form MBE-6 (2002)

CERTIFICATION of Actual Work Performed by Minority Businesses

NOTE: THIS FORM IS TO BE SUBMITTED PRIOR TO FINAL PAYMENT BEING DUE THE CONTRACTOR

Affidavit of _____
(Contractor Name)

(Project Name)

Project ID# _____ Final Contract Amount \$ _____

I do hereby certify that _____% of the total dollar amount of the contract was performed with minority business. Such work was subcontracted to the firms listed below.

Attach additional sheets if required

Name and Phone Number	*Minority Category	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**)

*****Must list all businesses used, including Prime Contractor, and note which are minority and category*****

The undersigned hereby certifies that above information is correct to the best of his/her knowledge, information and belief.

Date: _____ Name of Authorized Officer: _____

Signature: _____

Title: _____



State of North Carolina, County of _____

Subscribed and sworn to before me this _____ day of _____ 2002

Notary Public _____

My commission expires _____

Board of Elections Storage Mezzanine

Project No. 24-103

BID PROPOSAL FORM

SINGLE PRIME GENERAL CONSTRUCTION WORK
FORMAL CONTRACT

BIDDERS NAME

_____ License Number: _____

BASE BID PROPOSAL

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 informed himself fully in regard to all conditions pertaining to the place where the work is to be done; that he has examined the specifications for the work and the Contract Documents relative thereto, including addenda, if any, and has read all special provisions furnished prior to the opening of bids; that he has satisfied himself relative to the work to be performed.

The Bidder proposes and agrees if this Proposal is accepted to contract with the County of Wake with a definite understanding that no money will be allowed for extra work except as set forth in the General Conditions and Contract Documents, for the sum of:

Base Bid _____ Dollars (\$_____).

SUBCONTRACTOR LISTING

FIRE PROTECTION CONTRACTOR

Name: _____ License Number: _____

\$ _____

HVAC CONTRACTOR

Name: _____ License Number: _____

\$ _____

ELECTRICAL CONTRACTOR

Name: _____ License Number: _____

\$ _____

(OTHER CONTRACTOR)

Name: _____ License Number: _____

\$ _____

Provide with the bid - Under GS 143-128.2(c) the bidder shall identify and include **with the bid, Wake County Form MBE-1 Identity of Minority Business Participation**, 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. **All bidders must submit, with the bid, Wake County Form MBE-1 Identity of Minority Business Participation Form even if there is zero MBE participation.**

Also include with the bid a list of the good faith efforts made to solicit minority participation in the bid effort, **Wake County Form MBE-2 Listing of the Good Faith Effort.**

NOTE: A contractor that performs all of the work with its own workforce may submit **Wake County Form MBE-3-Intent to Perform Contract with Own Workforce**, to that effect in lieu of **Wake County Form MBE-2-Listing of the Good Faith Effort.**

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 lowest responsible, responsive bidder, the bidder must then file within 72 hours of the notification **Wake County Form MBE-4.** It includes that portion of the Work to be Performed by Minority Business. Also included is 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 **Wake County Form MBE-5** is not necessary,

OR

If less than the 10% goal, **Wake County Form MBE-5** documenting all good faith efforts 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 project.

Note: Bidders must always submit **with their bid** the Identification of Minority Business Participation Form listing all MBE contractors, vendors, and suppliers that will be used. If there is no MBE participation, then enter none or zero on the form. **Wake County Form MBE-2** or **Wake County Form MBE-3** as applicable must also be submitted with the bid. Failure to submit a required affidavit or form with the bid or within the time required may be grounds for rejection of the bid.

Attach to Bid Form

Wake County – Form MBE-2 (2002)

Listing of the Good Faith Effort

Affidavit of _____
(Name of Bidder)

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 GS 143-128.2(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: _____



State of North Carolina, County of _____

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

Notary Public _____

My commission expires _____

Attach to Bid Only If Bidder Performs All Work With Own Workforces

Wake County Form MBE-3 (2002)
Intent to Perform Contract with Own Workforce

Affidavit of

(Name of Bidder)

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

(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 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: _____



State of North Carolina, County of _____

Subscribed and sworn to before me this ___ day of _____ 20__

Notary Public _____

My commission expires _____

CERTIFICATION OF PROPOSER:

The Bidder further proposes and agrees hereby to commence work under his Contract on a date to be specified in a written order of Wake County and shall fully complete all work thereunder within the number of consecutive calendar days stipulated in the Supplementary General Conditions. Applicable liquidated damages shall be as stated in Supplementary General Conditions.

The undersigned acknowledges receipt of the following addenda issued during the time of bidding and includes the changes therein in this Proposal:

Addendum Number _____, Dated _____

Addendum Number _____, Dated _____

Addendum Number _____, Dated _____

The undersigned agrees that this Proposal will not be withdrawn for a period of sixty (60) days.

The undersigned agrees to comply with the E-Verify requirements of the General Statutes of North Carolina, all contractors, including any subcontractors employed by the contractor(s), by submitting a bid, proposal or any other response, or by providing any material, equipment, supplies, services, etc., attest and affirm that they are aware and in full compliance with Article 2 of Chapter 64, (NCGS64-26(a)) relating to the E-Verify requirements.

The undersigned agrees not to discriminate in any manner on the basis of race, natural hair or hairstyles, ethnicity, creed, color, sex, pregnancy, marital or familial status, sexual orientation, gender identity or expression, national origin or ancestry, marital or familial status, pregnancy, National Guard or veteran status, religious belief or non-belief, age, or disability with reference to the subject matter of this Contract. The Parties agree to comply with the provisions and intent of Wake County Ordinance SL 2017-4. This anti-discrimination provision shall be binding on the successors and assigns of the Parties with reference to the subject matter of this Contract.

The undersigned further agrees that in the case of failure on his part to execute the said Contract and the Bond within ten (10) consecutive calendar days after written notice being given of the award of the Contract, the check, cash or Bid Bond accompanying this Bid shall be paid into the funds of Owner's Account set aside for this Project, as liquidated damages for such failure; otherwise the check, cash or Bid Bond accompanying this Proposal shall be returned to the undersigned.

Respectfully submitted this ___ day of _____, 20__

PROPOSER SIGNATURE PAGE

(Name of Firm or Corporation making Bid)

By: _____

WITNESS:

(Proprietorship or Partnership)

Title: _____
(Owner, Partner, or Corporation President
or Vice President only)

Address: _____

License Number: _____



Affix Corporate Seal Above

ATTEST:

By: _____

Title: _____
(Corporation Secretary or Assistant Secretary only)

BID BOND

KNOW ALL MEN BY THESE PRESENTS, that we, _____,

(Bidder's Name)

_____, of _____

(Street Address)

(City, State, Zip)

hereinafter called the Principal, and _____ of

(Surety's Name)

_____, a Corporation duly organized, and existing under the laws of the State of

_____ and authorized to transact business in the State of North Carolina, as Surety,

hereinafter called the Surety, are held and firmly bound unto the County of Wake as Owner, hereinafter called the Obligee, in

the Penal sum of five percent (5%) of the amount bid, good and lawful money of the United States of America, for the payment

for which the Principal and the Surety, bind ourselves, their heirs, executors, administrators, successors and assigns, jointly and

severally, firmly by these presents. This bid bond is submitted in lieu of submitting cash, a cashier's check, or a certified check

pursuant to G.S. 143- 129.

WHEREAS, the Principal has submitted a Bid for the construction of _____.

(Project Name)

NOW THEREFORE, if the Obligee shall accept the Bid of the Principal and the Principal shall enter into a Contract with the Obligee in accordance with the terms of said Bid, and give such bond or bonds as may be specified in the Bidding and Contract Documents with good and sufficient surety for the faithful performance of such Contract and for the prompt payment of labor and materials furnished in the prosecution thereof, then this obligation shall be null and void; but if the Principal fails to so execute such Contract and give such bonds as required by G.S. 143-129, this obligation shall otherwise remain in full force and effect and the Surety shall, upon demand, forthwith pay to the Obligee the full amount set forth in the first paragraph hereof.

SIGNED AND SEALED this __ day of _____, 20__ in the presence of:

Witness _____

Witness _____

Principal (SEAL)

Surety (SEAL)

Title

Title

******USE OF BOND FORM OTHER THAN THIS MAY RESULT IN DISQUALIFICATION OF THE BIDDER******

(This page intentionally left blank)

CONSTRUCTION AGREEMENT

FOR

{Project Name and Location}

THIS AGREEMENT, made as of the {DayOfMonYear_Script}, by and between {Vendor_Name}, a corporation, hereinafter called the Contractor, and Wake County, a body corporate and politic and a political subdivision of the State of North Carolina, hereinafter called the Owner.

WITNESSETH:

That the Contractor and the Owner, for the consideration herein named, agree as follows:

1. SCOPE OF WORK - The Contractor shall furnish and deliver all of the materials, and perform all of the work required by this Agreement and the following enumerated documents, which are attached hereto and made a part hereof as if fully contained herein: General Conditions, Supplemental Conditions, Contract Construction Schedule, Specifications, Drawings entitled "{Project Name and Location}" which Drawings are listed in the Specifications, Performance Bond, Labor and Material Payment Bond, Insurance Certificates, Unit Prices, Bid Proposal dated {UP_BidProposalDate}, and the following addenda:

Addendum No. {1AddendumNo} Dated {1AddendumDated}

Addendum No. {2AddendumNo} Dated {2AddendumDated}

Addendum No. {3AddendumNo} Dated {3AddendumDated}

All of the documents listed, referenced or described in this paragraph, together with Modifications made or issued in accordance herewith are the Contract Documents, and the work, labor, materials and completed construction required by the Contract Documents and all parts thereof is the Work. The Contractor shall perform the Work in the time, manner and form required by the Contract Documents. The Contract Documents constitute the entire agreement between Owner and Contractor.

2. The Contractor agrees to commence work not later than three (3) days after the commencement date specified in the Notice to Proceed. The Contractor agrees to complete fully all Work hereunder on the dates specified in the Contract Documents, as may be adjusted in accordance with the terms thereof. Time is of the essence with respect to all dates specified in the Contract Documents as Completion Dates. Liquidated damages for failure(s) to complete in accordance with the provisions of this paragraph shall be computed and assessed against the Contractor in accordance with the Contract Documents.

3. The Owner hereby agrees to pay to the Contractor for the faithful performance of this Agreement, and the Contractor hereby agrees to perform all of the Work, for the sum of {MaxAmountPayable_Script} in the lawful money of the United States, subject to adjustments as provided for in the Contract Documents. Payment of the Contract Price shall be in accordance with Articles 20 and 21 of the General Conditions.

4. It is further mutually agreed between the parties hereto that if at any time after the execution of this Agreement and the Performance Bond and Labor and Material Payment Bond hereto attached for its faithful performance, the Owner shall deem the surety or sureties upon such Bonds to be unsatisfactory, or if, for any reason, such Bonds or either of them cease to be adequate to cover the performance of and payment for the Work, the Contractor shall, at its expense, within five (5) days after notice from the Owner 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 Owner. In such event no further payment to the Contractor shall be deemed to be due under this Agreement until such new or additional security for the faithful performance of or payment for the Work shall be furnished in a manner and form satisfactory to the Owner.

5. Terms used in this Agreement which are defined in the Contract Documents shall have the meanings designated in those Contract Documents.

6. The Contractor agrees to indemnify and hold harmless the Owner against liability for damages arising out of bodily injury including death, or property damage, to any person or persons only to the extent that the fault of the Contractor or its derivative parties is a proximate cause of the loss, damage, or expense to be indemnified. This obligation to indemnify includes the obligation to pay any attorney's fees, litigation expenses, or court costs actually incurred by Owner to the extent that the fault of the Contractor or its derivative parties is a proximate cause of the fees, expenses, or cost to be indemnified. It is the intent of this provision to require the Contractor to indemnify the Owner to the fullest extent permitted by North Carolina law. The language and definitions in this section shall be construed consistent with N.C.G.S. 22B-1 et seq. as it may be amended. The indemnification obligation under this paragraph shall not be limited in any way by any limitation of the amount or type of damages, compensation or benefits payable by or for the Contractor or any subcontractor under workers' compensation acts, disability benefits acts or other employee benefit acts.

7. The laws of the State of North Carolina shall apply to the interpretation and enforcement of this Agreement. Any and all suits or actions to enforce, interpret or seek damages with respect to any provision of, or the performance or nonperformance of, this Agreement shall be brought in the General Court of Justice of North Carolina sitting in Wake County, North Carolina, or the United States District Court sitting in Wake County, North Carolina, and it is agreed by the parties that no other court shall have jurisdiction or venue with respect to such suits or actions.

8. To ensure compliance with the E-Verify requirements of the General Statutes of North Carolina, all contractors, including any subcontractors employed by the contractor(s), by submitting a bid, proposal or any other response, or by providing any material, equipment, supplies, services, etc, attest and affirm that they are aware and in full compliance with N.C.G.S. Chapter 64, Article 2 (N.C.G.S. 64-26(a)) relating to the E-Verify requirements.

9. By signing this agreement; accepting this contract/purchase order; or submitting any bid, proposal, etc., vendors and contractors certify that as of the date of execution, receipt, or submission they are not listed on the Final Divestment List created by the NC Office of State Treasurer pursuant to [NCGS 147 Article 6E, Iran Divestment Act](#), Iran Divestment Act Certification. Vendors and contractors shall not utilize any subcontractor that is identified on the Final Divestment List. Any organization defined under NCGS 147-86.80(2), Divestment from Companies Boycotting Israel, shall not engage in business totaling more than \$1,000 with any company/business, etc. that boycotts Israel. A list of companies that boycott Israel is maintained by the NC Office of State Treasurer, pursuant to NCGS 147-86.81(a)(1). Any company listed as boycotting Israel is not eligible to do business with any State agency or political subdivision of the State.

10. If the source of funds for this contract is federal funds, the following federal provisions apply pursuant to 2 C.F.R. § 200.326 and 2 C.F.R. Part 200, Appendix II (as applicable):

Equal Employment Opportunity (41 C.F.R. Part 60); Davis-Bacon Act (40 U.S.C. 3141-3148); Copeland "Anti-Kickback" Act (40 U.S.C. 3145); Contract Work Hours and Safety Standards Act (40 U.S.C. 3701-3708); Clean Air Act (42 U.S.C. 7401-7671q.) and the Federal Water Pollution Control Act (33 U.S.C. 1251-1387); Debarment and Suspension (Executive Orders 12549 and 12689); Byrd Anti-Lobbying Amendment (31 U.S.C. 1352); Procurement of Recovered Materials (2 C.F.R. § 200.323); and Record Retention Requirements (2 CFR § 200.334).

11. In consideration of signing this Agreement, the Parties hereby agree not to discriminate in any manner on the basis of race, natural hair or hairstyles, ethnicity, creed, color, sex, pregnancy, marital or familial status, sexual orientation, gender identity or expression, national origin or ancestry, marital or familial status, pregnancy, National Guard or veteran status, religious belief or non-belief, age, or disability with reference to the subject matter of this Contract. The Parties agree to comply with the provisions and intent of Wake County Ordinance SL 2017-4. This anti-discrimination provision shall be binding on the successors and assigns of the Parties with reference to the subject matter of this Contract.

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

{Vendor_Name}
{Vendor_Addr1}
{Vendor_City}, {Vendor_St} {Vendor_Zip}

ATTEST: (CORPORATION)

By: _____

By: _____

Name: {Vendor_Contract_Signee}

Name:

Title: {Vendor_Signee_Title}

Title:

Date: _____

Date: _____

WAKE COUNTY
P. O. Box 550
Raleigh, N.C. 27602

By: _____

Name:
Title: Wake County Manager or Designee
Date: _____

By: _____

Name:
Title: Wake County Department Director
Date: _____

This instrument has been pre-audited in the manner required by the Local Government Budget and Fiscal Control Act.

Wake County Finance Officer

The person responsible for monitoring the contract performance requirements is {Contract_Perf_Monitor}.

Department Head Initials: _____

PAYMENT BOND

Date of Contract: _____

Date of Execution: _____

Name of Principal:
(Contractor) _____

Name of Surety: _____

Name of Contracting Body: County of Wake
P.O. Box 550
Raleigh, N.C. 27602

Amount of Bond: _____
Dollars (\$ _____)

Project: _____

KNOW ALL MEN BY THESE PRESENTS, that we, the PRINCIPAL and SURETY above named, are held and firmly bound unto the above named owner, hereinafter called "Owner", 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 Owner identified as shown above and hereto attached:

NOW THEREFORE, if the Principal shall promptly make payment to all persons supplying labor and 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 modification 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 representatives, pursuant to authority of its governing body.

PAYMENT BOND

Executed in Four (4) Counterparts.

CONTRACTOR:

By: _____

Title: _____

(Corporation President or
Vice President Only)

ATTEST: (Corporation)

(Corporation Secretary or Assistant
Secretary Only)

(CORPORATE SEAL)

SURETY COMPANY:

WITNESS: By: _____

(Attorney in Fact)

Title: _____

(SURETY CORPORATE SEAL)

COUNTERSIGNED:

(N.C. Licensed Resident Agent)

Name and Address-Surety Agency

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

PERFORMANCE BOND

Date of Contract: _____

Date of Execution: _____

Name of Principal:
(Contractor) _____

Name of Surety: _____

Name of Contracting Body: County of Wake
P.O. Box 550
Raleigh, N.C. 27602

Amount of Bond: _____
Dollars (\$ _____)

Project: _____

KNOW ALL MEN BY THESE PRESENTS, that we, the PRINCIPAL and SURETY above named, are held and firmly bound unto the 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 countersigned representative, pursuant to authority of its governing body.

PERFORMANCE BOND

Executed in Four (4) Counterparts.

CONTRACTOR:

By: _____

Title: _____
(Corporation President or
Vice President Only)

ATTEST: (Corporation)

(Corporation Secretary or Assistant
Secretary Only)

(CORPORATE SEAL)

SURETY COMPANY:

WITNESS: By: _____

(Attorney in Fact)

Title: _____

(SURETY CORPORATE SEAL)

COUNTERSIGNED:

(N.C. Licensed Resident Agent)

Name and Address-Surety Agency

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



GENERAL CONDITIONS OF THE CONTRACT FOR CONSTRUCTION

Table of Contents

	Page
Article 1. Definitions	3
Article 2. Correlation, Interpretation and Intent of Contract Documents.....	7
Article 3. Familiarity with Work, Conditions and Laws	8
Article 4. Bonds.....	9
Article 5. Insurance and Indemnity	9
Article 6. Other Record Documents and Submittals	18
Article 7. Contractor	19
Article 8. Owner	27
Article 9. Construction Manager	28
Article 10. Designer	28
Article 11. Testing and Surveying.....	28
Article 12. Separate Contracts.....	29
Article 13. Contract Time	29
Article 14. Changes in the Work	33
Article 15. Change of the Contract Price	35
Article 16. Unforeseen Conditions	37
Article 17. Correction of Work before Final Payment	37
Article 18. Correction of Work after Substantial Completion; Warranties and Guaranties	38
Article 19. Owner's Right to Do Work	39
Article 20. Partial Payments	39
Article 21. Final Payment.....	42
Article 22. Contractor, Subcontractor and Supplier Affidavit	43



GENERAL CONDITIONS OF THE CONTRACT FOR CONSTRUCTION

Article 23.	Assignments and Subcontracts	43
Article 24.	Measurements	44
Article 25.	Contractor and Subcontractor Relationships.....	44
Article 26.	Use of Premises	44
Article 27.	Cutting, Patching and Fitting	45
Article 28.	Dispute Resolution	45
Article 29.	Taxes	45
Article 30.	Operation of Owner's Facilities.....	46
Article 31.	Third Party Beneficiary Clause	46
Article 32.	Measurement of Quantities	46
Article 33.	Termination by the Owner for Cause	46
Article 34.	Termination or Suspension by the Owner for Convenience.....	47
Article 35.	Minority Business Enterprise Program	48
Article 36.	General	48



GENERAL CONDITIONS OF THE CONTRACT FOR CONSTRUCTION

ARTICLE 1.

DEFINITIONS

- 1.1 Agreement - The Construction Agreement, these General Conditions, and any Supplementary Conditions.
- 1.2 AIA - The American Institute of Architects.
- 1.3 ASTM - The American Society for Testing and Materials.
- 1.4 Beneficial Occupancy – The point at which the Project can be occupied by the Owner for its intended purpose, upon achievement of Substantial Completion, as defined in 1.40.
- 1.5 Change Order - A written order to the Contractor signed by the Owner and the Designer authorizing an addition, deletion, or revision in the Work and/or an adjustment in the Contract Price and/or the Contract Time issued after execution of the Construction Agreement. See paragraph 14.1.
- 1.6 Completion Date - Those dates identified as Completion Dates in the Contract Construction Schedule or elsewhere in the Contract Documents.
- 1.7 Construction Agreement – The document executed by the Contractor and the Owner to formally memorialize their consent to the terms of the Agreement.
- 1.8 Construction Change Directive – A written order to the Contractor signed by the Owner and the Designer directing an addition, deletion, or revision in the Work after execution of the Construction Agreement, in circumstances when the parties have been unable to agree on an adjustment to the Contract Price or the Contract Time, but the Owner requests that the Contractor proceed with said Work subject to adjustment of the Contract Price and/or Contract Time under the procedures described herein.
- 1.9 Construction Manager(s) - The person or firm designated as the Construction Manager in the Contract Documents, or their authorized representatives. The Construction Manager(s), as referred to herein, will be referred to hereinafter as if each were of the singular number, masculine gender.
- 1.10 Contract Construction Schedule - That schedule described in Article 13 hereof and identified as the Contract Construction Schedule.
- 1.11 Contract Documents - All of the documents that make up the Agreement, plus the Drawings and Specifications that describe the scope of the Work, plus allowable Modifications to the Contract Documents.
- 1.12 Contract Price - The total monies payable to the Contractor under the Contract Documents pursuant to paragraph 15.1 of the Agreement.
- 1.13 Contract Time - The number of calendar days stated in, or computed from, the Contract Documents for the completion of the Work, or any portion thereof. See, particularly, Article 13 hereof and the Contract Construction Schedule. Time of completion as specified therein is of the essence. The time used and referred to on the Project will be that time which is



GENERAL CONDITIONS OF THE CONTRACT FOR CONSTRUCTION

observed in Raleigh, North Carolina, being Eastern Daylight Savings Time (EDT), Eastern Standard Time (EST), or other as designated by the Designer.

- 1.14 Contractor - The Contractor shall be that party identified as such in the Agreement.
- 1.15 Days - Unless otherwise indicated, the term "days" shall mean consecutive calendar days.
- 1.16 Daylight Hours - The hours or portions of hours between sunrise and sunset local time.
- 1.17 Designer(s) – The person or firm designated as the Designer in the Contract Documents, or their authorized representatives. The Designer(s), as referred to herein, shall mean architect, landscape architect, and/or engineer. They will be referred to hereinafter as if each were of the singular number, masculine gender.
- 1.18 Drawings - The Drawings are the graphic and pictorial portions of the Contract Documents, wherever located and whenever issued, showing the design, location, and dimensions of the Work, and generally including plans, elevations, sections, details, schedules and diagrams. A list of the Drawings is contained in the Supplemental General Conditions.
- 1.19 Field Order - A written order issued by the Designer which clarifies or interprets the Contract Documents or orders minor changes in the Work in accordance with the Contract Documents. See paragraph 14.2.
- 1.20 Final Completion - The point at which the Contractor has, as determined by the Designer, completed the Work, with the exception of guaranty and warranty obligations, and becomes entitled, upon the recommendation of the Designer and determination by the Owner, to final payment.
- 1.21 The words "furnish," "furnish and install," "install," and "provide" or words with similar meanings shall be interpreted, unless otherwise stated, to mean furnish and install complete, in place and ready for service.
- 1.22 Liquidated Damages – See paragraph 13.18 of these General Conditions.
- 1.23 Modification - (A) a written amendment to the Contract Documents signed by the Owner and the Contractor and identified therein as such, (B) a Change Order, (C) Construction Change Directive, or (D) a Field Order. A Modification may only be issued after execution of the Agreement.
- 1.24 Notice of Award - The written notice by the Owner to the Contractor that the Contractor is the successful Bidder and that upon compliance with the conditions precedent to be fulfilled by the Contractor within the time specified, the Owner will execute and deliver the Agreement to him.
- 1.25 Notice to Proceed - See paragraph 13.3.
- 1.26 Owner - The Owner is the person designated as such in the Agreement.



GENERAL CONDITIONS OF THE CONTRACT FOR CONSTRUCTION

- 1.27 Owner's Authorized Representative - A person, or persons, employed by the Owner and designated from time to time by written notice to the Contractor to administer the Contract Documents, and to observe and monitor the Work on behalf of the Owner with authority and responsibility as herein specified.
- 1.28 Notice - The term "notice" or "written notice" as used herein shall mean and include all written notices, demands, instructions, and claims approvals and disapprovals furnished by the Owner or the Designer to obtain compliance with the requirements of the Contract Documents, as well as all written notices, demands, instructions and claims furnished by the Contractor as required by the Contract Documents. Where notice is required under the terms of the Contract Documents written notice shall always be required, and oral or "constructive" notice shall be insufficient and ineffective as notice. Email or other electronic delivery shall be insufficient and ineffective as notice unless specifically allowed by the Supplementary Conditions or a Modification to the Agreement. Written notice shall be deemed to have been duly served on the date that it is delivered in person to the individual or to a member of the firm, to an officer of the corporation for whom it is intended, to an authorized representative of such individual, firm, or corporation, or on the date that it is mailed by registered or certified mail, return receipt requested, addressed to the last business address of such individual, firm, or corporation known to the person giving the notice. Written notice may also be given by facsimile transmission, provided that proof of delivery is obtained. In the case of delivery in person, such delivery shall not be effective unless and until a written and signed receipt showing the date and time of delivery is obtained.
- 1.29 Project - The total construction of which the Work performed under the Contract Documents may be the whole or a part.
- 1.30 Project Expediter – As used herein, is an entity stated in the Contract Documents, designated to effectively facilitate scheduling and coordination of Work activities. For the purpose of a single prime contract, the single prime contractor is designated as the Project Expediter. For the purpose of a project involving separate prime contracts, the Contractor for general work shall be designated as the Project Expediter unless otherwise indicated in the Supplementary General Conditions. See paragraph 7.27.
- 1.31 Project Manager - That person designated by the Contractor in accordance with paragraph 7.2 who shall be in general charge of the Work and its performance and who shall have the authority set forth in the last sentence of paragraph 7.2.
- 1.32 Request for Information - A written communication from the Contractor to the Designer for any interpretation of, or information needed, required, or desired under the Contract Documents. The Owner reserves the right to determine the reasonable format and contents required for a Request for Information. In any Request for Information, the Contractor shall state a reasonable date by which a response is necessary in order to avoid delay in progress on the Work and shall make such request sufficiently in advance of such date as to avoid any such delay. The Designer shall respond in writing to the Request for Information by the date stated by the Contractor unless he cannot reasonably do so, in which case he shall prior to that date notify the Contractor of the date by which he can reasonably respond. The Contractor shall not be entitled to any additional time for the completion of the Work or any portion thereof by reason of the Designer's failure to respond



GENERAL CONDITIONS OF THE CONTRACT FOR CONSTRUCTION

if he has not submitted his Request for Information sufficiently in advance to allow the Designer a reasonable time within which to respond.

- 1.33 Request for Payment - The form, in the form of AIA Document G702 (latest ed.) or other published document approved by Owner, which is to be used by the Contractor in requesting progress payments and which is to include a Schedule of Values as required by the Contract Documents and an affidavit of the Contractor that progress payments theretofore received from the Owner on account of the Work have been applied by the Contractor to discharge in full all the Contractor's obligations incurred in connection with Work covered by all prior applications for payment. See paragraph 20.2.
- 1.34 Resident Superintendent - That person designated by the Contractor in accordance with paragraph 7.2 who has day-to-day responsibility for the prosecution of the Work and the obtaining of proper materials and equipment, and adequate labor and who shall have the authority set forth in the last sentence of paragraph 7.2.
- 1.35 Schedule of Values - Any breakdown of the Contract Price which may be required by the Contract Documents, and designated as such. See paragraph 20.1.
- 1.36 Specifications - That portion of the Contract Documents consisting generally of the written requirements for materials, equipment, construction systems, standards, and workmanship for the Work and performance of related services.
- 1.37 Subcontractor - A person, firm, or corporation who has entered into a direct contract with the Contractor to perform any of the Work at the Project.
- 1.38 Submittal - Shop drawings, product data, samples, and other documents required by the Contract Documents to be submitted by the Contractor to the Designer.
- 1.39 Submittal Register - See paragraph 13.2 of these General Conditions.
- 1.40 Substantial Completion - The point at which the Work, and Work by other Contractors on or in connection with the Project, as determined by the Designer, is sufficiently complete in accordance with the Contract Documents that it can be beneficially occupied by the Owner, and the Work can be utilized by the Owner for its intended use, and all necessary permits and permissions for Beneficial Occupancy and utilization having been obtained by the Contractor. All operations and maintenance manuals, Owner training, and as-built drawings must be submitted prior to Substantial Completion being achieved.
- 1.41 Sub-subcontractor - A person or entity that has a direct or indirect contract with a Subcontractor to perform any of the Work at the Project.
- 1.42 Work - The construction and services required by the Contract Documents, including all labor, materials, equipment, and services provided or to be provided by the Contractor to fulfill the Contractor's obligations.
- 1.43 All references in the Contract Documents to the masculine shall be interpreted as including the feminine or neuter and all references in the Contract Documents to the singular or the



GENERAL CONDITIONS OF THE CONTRACT FOR CONSTRUCTION

plural shall be interpreted as including the other, as may be appropriate in the reasonable interpretation of the Contract Documents.

ARTICLE 2. CORRELATION, INTERPRETATION AND INTENT OF CONTRACT DOCUMENTS

- 2.1 It is the intent of the Specifications and Drawings and other Contract Documents to describe a complete Project in accordance with the Contract Documents.
- 2.2 The Contract Documents are complementary; what is called for by one is as binding as if called for by all. If the Contractor finds a conflict, error or discrepancy in the Contract Documents, the Contractor shall notify the Designer in writing before proceeding with the Work affected thereby. In resolving such conflicts, errors and discrepancies, the Contract Documents shall be given preference in the following order: Construction Agreement, Modifications, Addenda, Supplemental Conditions, General Conditions, Specifications, and Drawings. Figure dimensions on Drawings shall govern over scale dimensions, and detailed Drawings shall govern over general Drawings. Any Work that may reasonably be inferred from the Contract Documents as being required to produce the intended result shall be supplied whether or not it is specifically called for. Work, materials or equipment described in words which, so applied, have a well known technical trade meaning shall be deemed to refer to such meaning and to incorporate any recognized standards which are a part of such meaning.
- 2.3 Miscellaneous items, accessories and work which are not specifically mentioned, but which are essential to produce a complete and properly operating installation, or useable 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 specified for the major component of which the miscellaneous item or accessory is an essential part, and shall be approved by the Designer before installation. This requirement is not intended to include major components not covered by or inferable from the Contract Documents.
- 2.4 The Work of all trades under the Contract Documents shall be coordinated by the Contractor in such a manner as to obtain the best workmanship possible for the entire Project and all components of the Work shall be installed or erected in accordance with the best practices of the particular trade.
- 2.5 The Contractor shall fully complete the Work and shall be responsible for all of the Work under the Contract Documents to which the Construction Agreement applies. If the Contractor is prevented from doing so by any limitation of the Contract Documents, the Contractor shall immediately give notice thereof to the Designer and the Owner in writing before proceeding with the construction in the area where the problem or limitation exists.
- 2.6 Standard specifications or manufacturers' literature, when referenced, shall be of the latest revision or printing unless otherwise stated and is intended to establish the minimum requirements acceptable.



GENERAL CONDITIONS OF THE CONTRACT FOR CONSTRUCTION

- 2.7 For those materials specified without the use of brand names, the Contractor shall submit within thirty (30) days after his receiving the Construction Agreement for signatures, any product that meets the express requirements of the Specifications.
- Such Submittal shall include manufacturer's data, test reports, performance data and certifications, samples, erection details, and other applicable information as required to permit determination by the Designer whether such proposed products are suitable. The Designer shall be the sole judge as to the suitability of any proposed product. The burden of proof of quality rests with the Contractor.
- 2.8 The Contractor is required to examine and read the complete set of Contract Documents for information concerning the Work, because some of the Work for which the Contractor will be responsible may be indicated on or in documentation applying primarily to the Work of one or more other separate prime contractors. No allowance will be made for the Contractor's failure to become familiar with the complete set of project documents.
- 2.9 Contractor's requests for clarification or information shall clearly define the cause(s) of Contractor's request and, as appropriate, shall include Contractor's interpretation and Contractor's proposed solution.

ARTICLE 3. FAMILIARITY WITH WORK, CONDITIONS AND LAWS

- 3.1 The Contractor has investigated prior to bidding and is satisfied with all conditions affecting the Work, including but not restricted to those bearing upon transportation, disposal, handling and storage of materials, availability of labor, water, electrical power, roads and uncertainties of weather, or similar physical conditions at the Project site, and the character of equipment and facilities needed prior to and during prosecution of the Work. The Contractor is satisfied as to the character, quality and quantity of surface and subsurface materials or obstacles to be encountered insofar as this information is reasonably ascertainable from inspection of the Project site, including all exploratory work done by the Owner, as well as from information presented by the Contract Documents, or any other information made available to the Contractor prior to receipt of bids. Any failure by the Contractor to become acquainted with the available information shall not relieve the Contractor from the responsibility for estimating properly the difficulty or cost of successfully performing the Work.
- 3.2 The Contractor shall be entitled to rely upon all information furnished to the Contractor in writing by the Owner with respect to the Project site and to make all inferences from it that would reasonably be made by a contractor having knowledge and experience with similar work; however, the Contractor shall not be entitled to infer from Owner-supplied information any fact or condition which would not be inferred by a contractor having knowledge and experience with similar work and, if the Owner-supplied information is inadequate or insufficient in any respect, the Contractor shall be required to obtain independently such other information as a knowledgeable and experienced contractor would prudently obtain in order to evaluate any such condition.
- 3.3 The Contractor specifically acknowledges familiarity with all Federal, State, and local laws, ordinances, rules, and regulations which may in any manner affect those engaged or



GENERAL CONDITIONS OF THE CONTRACT FOR CONSTRUCTION

employed in the Work, or the materials or equipment in or about the Work, or in any way affect the conduct of the Work and agrees that the Contractor and the Contractor's employees, subcontractors, and suppliers will, at all times, comply with same. If the Contractor shall discover any provisions in the Contract Documents which are contrary to or inconsistent with any such law, ordinance, rule, or regulation, the Contractor shall immediately give notice thereof to the Designer and the Owner in writing, identifying any items of Work affected, and the Contractor shall not proceed until the Contractor has received written direction from the Designer with respect to these items. If the Contractor performs contrary to or inconsistently with any such law, ordinance, rule, or regulation without giving such notice, the Contractor shall bear all costs which are a consequence of such performance.

- 3.4 At times selected by the Designer after execution by the Contractor of the Construction Agreement, a pre-construction conference shall be scheduled and conducted for the benefit of the Project.

ARTICLE 4. BONDS

- 4.1 A performance bond in the full amount of the Contract Price shall be required of the Contractor to guarantee the faithful performance of the Work in compliance with the Contract Documents, in such form as may be required by law and approved by the Owner. The bond shall be dated the same date as the Construction Agreement and must be accompanied by a current copy of the power of attorney for the attorney-in-fact executing such bond on behalf of a surety company licensed to do business in the state of North Carolina.
- 4.2 A payment bond in the full amount of the Contract Price shall be required of the Contractor to guarantee the payment of all labor and material costs or claims in connection with compliance with the Contract. The payment bond shall be in such form as may be required by law and approved by the Owner. Said bond shall be dated and executed in the same manner as the performance bond in paragraph 4.1.

ARTICLE 5. INSURANCE AND INDEMNITY

5.1 CONTRACTOR PROVIDED INSURANCE

The Contractor shall, without limiting its obligations or liabilities, procure, pay for and maintain such insurance as is required by law and as is required by this Agreement to protect the Contractor and the Owner from claims for damages for bodily injury, including death, and from claims for property damage which may arise from the Contractor's or its representatives', consultants', Subcontractors', agents', or employees' operations under this Agreement. Such insurance shall be of the kinds and have limits of liability and coverages not less than the minimum limits hereinafter specified or required by law, whichever is greater. The Owner makes no representation as to the adequacy or sufficiency of such coverages. The following requirements shall in no way be construed to limit or eliminate the liability of the Contractor, which arises from performance of Work under the Agreement. The Contractor is strictly responsible for any losses, claims, and costs of any kind which exceed the Contractor's limits of liability, or which may be outside the coverage scope of the policies.



GENERAL CONDITIONS OF THE CONTRACT FOR CONSTRUCTION

The insurance specified shall be provided by an insurer approved by the Owner, authorized to do such business in the State of North Carolina, and on terms approved by the Owner. Insurance companies utilized shall have a minimum rating of A- and Class VII as evaluated by the most current A.M. Best Rating Guide. If the insurer has a Best Rating less than A- and Class VII, the Contractor must receive specific written approval from the Owner prior to proceeding with any Work under the Agreement. All agents and brokers shall hold valid licenses from the State of North Carolina. Before commencing mobilization to the Project site and not later than 7 days after the receipt of the Construction Agreement by the Contractor for signatures, the Contractor shall furnish to the Owner a certificate or certificates of insurance in a form satisfactory to the Owner. Upon request of the Owner, the Contractor shall provide the Owner with certified copies of the insurance policies required by this Article, including without limitation declaration pages, conditions, exclusions and endorsements, and confirmation that each policy premium has been paid for the required term of this Agreement. A copy of the umbrella policy shall be provided to the Wake County Finance Department. Certificates shall be signed by a person authorized by that insurer to bind coverage on its behalf. In the event of any such cancellation, non-renewal, reduction, restriction, or change in any insurance, the Contractor is obligated to replace such insurance within 7 days without a gap in coverage and file accordingly such notice with the Owner, and other interested parties. Failing immediate receipt of evidence of such replacement of insurance the Owner reserves the right to procure such insurance as the Owner considers desirable and the Contractor shall pay or reimburse the cost of the premium in respect thereof. It is expressly provided, however, that any action or inaction on the part of the Owner in this respect shall in no way change or reduce the Contractor's responsibilities and liabilities under this Agreement. Self-funded, policy fronting, or other non-risk transfer insurance mechanisms are not acceptable without prior written approval of the Owner. Full disclosure of such a program must be made prior to commencing mobilization to the Project site. Failure to make a full disclosure constitutes a material breach of the Agreement, justifying termination for default.

The Contractor shall name the Owner, the Designer, the Designer's consultants, and the Construction Manager as additional insureds under all its insurance contracts (except workers' compensation) with respect to and including without limitation liability arising out of activities performed by or on behalf of the Contractor, products and completed operations of the Contractor, and automobiles owned, hired, leased, or borrowed by the Contractor. The coverage shall contain no special limitations on the scope of protection afforded to additional insureds.

For any claims related to this Project, the Contractor's insurance or self insurance shall be primary and noncontributory with respect to the Owner's insurance. Any insurance or self-insurance maintained by the Owner shall be excess and noncontributory with respect to the Contractor's insurance.

All policies of insurance shall contain a clause waiving rights of subrogation against the Owner, unless the Owner approves otherwise in writing.

Limits of coverage are not to be amended by deductible clauses of any nature without the express written consent of the Owner. The Contractor shall be solely responsible for any deductible assumptions that may exist in any insurance policies required under this



GENERAL CONDITIONS OF THE CONTRACT FOR CONSTRUCTION

Agreement. In addition, the Contractor shall be responsible and shall not be reimbursed for any losses arising from any risk or exposure not insured as required herein, or not covered as a result of a normal policy exclusion or that falls within the self insured retention, if Contractor self insured.

The Contractor's insurance shall apply separately to each insured against whom claim is made or suit is brought, except with respect to the limits of the insurer's liability.

The claim provisions in the Contractor's insurance policies must specifically state the insurance company or Contractor's Third Party Administrator, if self insured, has both the right and duty to adjust a claim and provide defense.

The policies shall not contain any provision or definition which would serve to exclude or eliminate from coverage third party claims, including exclusions of claims for bodily or other injury to shareholders, partners, officers, directors, or employees of the insured, the premises owner, real estate manager, or the insured's Subcontractor, or any family relative of such persons.

If the policies contain any warranty stating that coverage is null and void (or words to that effect) if the Contractor does not comply with the most stringent regulations governing the Work, it shall be modified so that coverage shall be afforded in all cases except for the Contractor's willful or intentional noncompliance with applicable government regulations.

Any failure by any person to comply with reporting or other provisions of the policy including breach of warranties, shall not affect coverage provided to the Owner and its representatives, officials, and employees.

The insolvency or bankruptcy of the Insured or of the Insured's estate shall not relieve the insurance companies of their obligations under these policies. Any clauses to the contrary are unacceptable and must be stricken.

Failure to comply with these requirements shall be a material breach of this Agreement justifying termination for default.

5.1.1 Worker's Compensation and Employers' Liability Insurance

The Contractor and its Subcontractors shall procure and maintain Workers' Compensation Insurance in the amount and type required by the State of North Carolina and federal law for all employees employed under the Agreement who may come within the protection of Workers' Compensation Laws and covering all operations under the Agreement whether performed by the Contractor or by his Subcontractors. In jurisdictions not providing complete Workers' Compensation protection, the Contractor and his Subcontractors shall maintain employers' liability insurance in an amount, form, company, and agency satisfactory to the State of North Carolina and the Owner for the benefit of all employees not protected by Workers' Compensation Laws and covering all operations under the Agreement whether performed by the Contractor or by his Subcontractors.

The Contractor shall pay such assessments as will protect the Contractor and the Owner from claims under the Workers' Compensation Laws, workers' or workmen's compensation



GENERAL CONDITIONS OF THE CONTRACT FOR CONSTRUCTION

disability benefits, and other similar employee benefit acts. The current Experience Modification Factor shall be indicated on the Certificate of Insurance.

Coverage under this section shall be as required by federal and state Workers' Compensation and Occupational Disease Statutes, and shall have minimum limits as follows:

Coverage A:		Statutory, State of North Carolina
Employers' Liability:	Each Accident	\$1,000,000
	Disease - Policy Limit	\$1,000,000
	Disease - Each Employee	\$1,000,000

Such insurance shall include Voluntary Compensation coverage, a Waiver of Subrogation in favor of the Owner as well as other endorsements that may be required by applicable jurisdictions, i.e. United States Longshoremen and Harbor Workers Act and maritime coverage (Jones Act).

5.1.2 Automobile Liability Insurance

The Contractor shall procure and maintain automobile insurance against liability for bodily injury and property damage as described below, that may arise with respect to the Work being performed under the Agreement, and as will provide protection from claims which may arise out of or result from the Contractor's performance of the Work and the Contractor's other obligations under the Agreement, whether such performance of the Work is by the Contractor, by any representative or Subcontractor, by anyone, both officially and personally, directly or indirectly employed by any of them, or by anyone for whose acts any of them may be liable.

This policy of insurance shall carry the following minimum Limit of Liability:

Combined Single Limit	\$1,000,000
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The policy of insurance shall contain or be endorsed to include the following:

- a) owned, hired, and non-owned automobile liability.
- b) If the policy contains a warranty stating that coverage is null and void (or words to that effect) if the transporter does not comply with the most stringent regulations governing the Work, it shall be modified so that coverage shall be afforded in all cases except for the transporter's willful or intentional noncompliance with applicable government regulations.

Any failure by any party to comply with reporting or other provisions of the policy including breach of warranties, shall not affect coverage provided to the Owner and its representatives, officials, and employees.

No subcontracting of waste hauling shall be permitted without prior, written approval of the Owner.



GENERAL CONDITIONS OF THE CONTRACT FOR CONSTRUCTION

5.1.3 General Liability

This policy must be written on an Occurrence basis, with the following minimum Limits of Liability:

General Aggregate per project	\$2,000,000.00
Products/Completed Operations Aggregate	\$2,000,000.00
Bodily Injury and Property Damage csl/each occurrence	\$1,000,000.00
Personal Injury and Advertising Injury	\$2,000,000.00

The policy of insurance shall contain or be endorsed to include the following:

- a) Blanket Contractual Liability covering Contractor's indemnification obligations under this Agreement, in accordance with ISO policy form CG 00 01. Modifications to the standard provision will not be acceptable if they serve to reduce coverage.
- b) Premises/Operations Liability.
- c) Explosion, collapse, and underground fault.
- d) Independent Contractors and Independent Subcontractors coverage.
- e) Broad Form Property Damage.
- f) Personal Injury
- g) Cross Liability/Severability of Interest clause.
- h) Employer's Stop-Gap Liability endorsement, if applicable.
- i) Amendment of the Pollution Exclusion Endorsement to allow coverage for bodily injury or property damage caused by heat, smoke, or fumes from a hostile fire.
- j) Designated General Aggregate Limit Endorsement if required by the Supplemental General Conditions.

Coverage shall remain continuously in effect and without interruption for at least 6 years from the date of the Notice of Award and shall include coverage for exposures arising from operations that have been completed. The Contractor shall furnish the Owner and each other additional insured listed in the Agreement to whom the Certificates have been issued, evidence satisfactory to the Owner of continuation of such insurance at the date of Preliminary Acceptance and each year thereafter.

5.1.4 Pollution Legal Liability (PLL)

Pollution Legal Liability coverage will be provided if required by the Supplementary General Conditions.

5.1.5 Umbrella Liability



GENERAL CONDITIONS OF THE CONTRACT FOR CONSTRUCTION

The Contractor shall maintain an occurrence basis (as distinguished from a "claims made" basis) Umbrella Liability policy (true follow form) over the underlying General Liability, Automobile Liability, and Employer's Liability, with the following limits of liability:

Each Occurrence	\$3,000,000
Aggregate	\$3,000,000

On a fully insured basis such coverage will be subject to a deductible no greater than \$10,000 per occurrence where coverage is not provided by the underlying insurance, but is provided by the Umbrella Liability policy.

The Contractor may use any combination of primary and umbrella insurance policies to comply with the insurance requirements, provided the resulting insurance is equivalent to the insurance stated herein.

All Occupational Disease exclusions must be deleted. Any Pollution Exclusion must be amended to allow coverage for bodily injury or property damage caused by spill, upset, overturn, heat, smoke, or fumes from a hostile fire.

5.1.6 Property Insurance

The Contractor shall purchase All Risk Property Insurance on a Completed Value Form in the names of the Owner, Contractor, Subcontractors, and sub-subcontractors as their interests may appear with limits as follows:

- a) Full insurance value of the Work, or
- b) Amount equal to the Contract Price for the Work, whichever is higher.

The Contractor is responsible for all physical damage to owned or rented machinery, tools, equipment, forms, and other items owned, rented or used by the Contractor and/or Subcontractor(s) in the performance of the Work. The insurance coverage evidencing such shall include a waiver of subrogation in favor of the Owner.

5.1.7 Valuable Papers And Records

The Contractor shall provide valuable papers and records insurance with coverage in an amount commensurate with project scope and set forth in the Supplementary General Conditions.

5.1.8 Claims

The Contractor shall notify the Owner within 24 hours of any claims or alleged claims received by the Contractor covered by any of the policies of insurance required in this Agreement. The Contractor shall provide a written copy of the claim or alleged claim to the Owner within 3 days of the Contractor's receipt of the claim or alleged claim. If a claim is



GENERAL CONDITIONS OF THE CONTRACT FOR CONSTRUCTION

settled to the satisfaction of the claimant, the Contractor shall submit a copy of the claimant's release to the Owner.

If a claim or alleged claim is rejected by the Contractor and/or its insurance company, the Contractor shall immediately report this fact to the Owner.

Should 30 days elapse after the claim or alleged claim has been received by the Contractor, and the Contractor is not able to report a settlement or rejection of the claim, it shall report to the Owner the steps being taken with respect to the claim.

Without limiting the foregoing, the Contractor shall notify in writing the county risk manager of any paid or incurred claims which may impair annual aggregate or general liability.

5.1.9 Deductibles and Self-insured Retentions

Any deductibles or self-insured retentions must be declared to and approved by the Owner. At the option of the Owner, either: the insurer shall reduce to a maximum of \$250,000 or eliminate such deductibles or self-insured retentions with respect to the Owner, or the Contractor shall provide evidence of collateral provided to insurers or procure a bond guaranteeing payment of losses and related investigations, claim administration, and defense expenses within the deductible or self-insured retention amount. Any self-insured retention or deductible amount on the policy shall not reduce the amount of collectible limits or liability.

5.1.10 Subcontractors

The Contractor shall include all Subcontractors as Insureds under its policies, or shall furnish separate certificates, policies, and endorsements for each Subcontractor the Contractor intends to use. If a Subcontractor does not take out insurance in his own name and the Contractor wishes to provide insurance protection for such Subcontractor and such Subcontractor's employees, the Contractor shall either (a) procure appropriate policies in the name of the Subcontractor, or (b) cause a rider or riders to be attached to the Contractor's policies which shall identify the Subcontractor thereby covered; provided, however, in the case of the latter option, such a rider need not be attached to the Contractor's workers' compensation policy if such policy by its terms is sufficiently broad to cover the employees of all Subcontractors performing Work under the Contract Documents. Except as otherwise approved by the Owner in writing, Limits of Liability and coverage scope must be at a minimum as stringent as required of the Contractor by the Contract Documents. All Work performed for the Contractor by any Subcontractor shall be pursuant to an appropriate agreement between the Contractor and the Subcontractor which shall contain provisions that waive all rights the contracting parties may have against one another for damages caused by fire or other perils covered by insurance as provided herein. Insurance monies received from any loss shall be divided as the respective interest of the parties affected shall appear.

5.2 OWNER CONTROLLED PROJECT SPECIFIC INSURANCE



GENERAL CONDITIONS OF THE CONTRACT FOR CONSTRUCTION

In the event the Owner elects to purchase project-specific insurance affording coverage to the Contractor and Subcontractors, the terms and conditions of such coverage shall be set forth in the Supplementary Conditions.

5.3 CONTRACTOR AS JOINT VENTURE

If the Contractor is completing this Project on a joint venture basis, both joint venture partners retain all liabilities assumed by this Agreement, individually and collectively. This may include, but is not limited to, all premiums due, deductibles/self-insured retentions, coinsurance provisions, claim provisions, insurance policy conditions, and indemnification provisions hereunder.

Evidence of a Blanket Joint Venture Endorsement must be obtained from the General Liability and Contractor's Pollution Legal Liability carriers of each joint venture partner for a period of 6 years after completion of the Project, substantially as follows:

With respect to "your work", and the "products-completed operations hazard", you are an insured for your liability arising out of the conduct of any partnership or joint venture of which you were a partner or member, even though this partnership or joint venture is not shown as a Named Insured in the Declarations. This coverage is excess over any available liability purchased specifically to insure the partnership or joint venture. This coverage will not inure to the benefit of any other party except you."

5.4 INDEMNIFICATION

The Contractor, to the fullest extent not expressly prohibited by law, shall defend, indemnify, and save harmless the Owner, the Designer, the Construction Manager and their respective officials, officers, employees, and agents from and against any and all liabilities (foreseeable or unforeseeable), penalties, fines, forfeitures, demands, claims, causes of actions, suits, judgments, and costs and expenses incidental thereto, (including, without limitation, amounts paid pursuant to investigations, defense or settlements, and reasonable attorneys' fees), which any or all of them may hereafter suffer, incur, be responsible for, or pay out as a result of but not limited to:

- a) bodily injury (including sickness, disease, or death) to any person including but not limited to, the Contractor's employees or its representatives while on the site of the Project; or
- b) actual or alleged damage (including loss of use) to any property (public or private, including the Project or other property on the Project site); or
- c) contamination of or adverse effects on the environment arising directly or indirectly out of or in connection with the performance of the Work, including but not limited to any hazardous or toxic waste, substance, or constituent of any substance subject to regulation under CERCLA, RCRA, TSCA, and other Federal and state authorities that is spilled, released, threatening to release, or disposed of or destroyed by the Contractor or its Subcontractors on or off the site of the Project or while in transport to or from the site; or



GENERAL CONDITIONS OF THE CONTRACT FOR CONSTRUCTION

- d) any violation or alleged violation of laws and regulations, arising out of or in any way connected with the Work,

caused in whole or in part by the Contractor, any Subcontractor or supplier or any representatives of the Contractor. The Contractor shall not be required to indemnify the Owner against losses resulting from a breach of this Agreement by the Owner or its other agents and contractors, or resulting from negligence, misconduct or violation of laws on the part of the Owner or its other agents and contractors.

The Contractor further agrees to obtain, maintain, and pay for such liability insurance coverages and endorsements as will insure the provisions of this paragraph. Furthermore, the Contractor agrees to be liable for and to indemnify and reimburse the Owner for all legal fees and disbursements paid or incurred to enforce the provisions of this paragraph. The indemnification obligations under this paragraph shall not be limited in any way by the amount or type of damages, compensation or benefits payable under worker's compensation acts, disability benefit acts, other employment benefit acts, or the amount of insurance carried or recovered.

The Owner acknowledges that hazardous or toxic waste, material, chemicals, compounds or substances, or other environmental hazards, contamination or pollution, (referred to hereinafter as "environmental hazards") may be present at the Project site that were not created, generated, or released at the Project site by the Contractor or its Subcontractors, agents or employees, acting alone or in concert with others. Unless the remediation, abatement or handling of such environmental hazards is part of the scope of the Work under this Agreement, then upon the discovery of such environmental hazards, the Contractor shall immediately, and in no event more than three days later, give notice to the Owner of the environmental hazards before they are disturbed. The Owner and the Designer shall thereupon promptly investigate the environmental hazards, and make such changes in the Drawings and/or Specifications as they may find necessary to abate, remediate, isolate or handle the environmental hazards. Any increase or decrease in the Contract Price or the Contract Time resulting from such changes shall be adjusted in the manner provided herein for adjustments as to extra and/or additional Work and changes. It is agreed that the Contractor shall have no liability under this Agreement for any environmental hazards existing prior to the date that Work commences under this Agreement unless the Contractor or its Subcontractors, agents or employees, acting alone or in concert with others, by their own negligence or misconduct, release or expose the Owner or third parties to the environmental hazards.

The provisions of this paragraph shall survive the termination or cancellation or completion of this Agreement.

ARTICLE 6. OTHER RECORD DOCUMENTS AND SUBMITTALS

- 6.1 The Designer shall furnish to the Contractor the number of copies of Drawings and Specifications stated in the Supplementary General Conditions. Additional copies of Drawings and Specifications may be obtained at the cost of reproduction and handling.



GENERAL CONDITIONS OF THE CONTRACT FOR CONSTRUCTION

- 6.2 The Contractor shall submit to the Designer all Submittals required by the Contract Documents. The Contractor shall submit three (3) reproducible prints of all shop drawings plus the number of copies sufficient for his requirements. The Contractor shall submit samples in quantities required by the Contract Documents. The Contractor shall submit product data in five (5) copies, plus the number of copies sufficient for the Contractor's requirements. All shop drawings shall be reviewed by the Contractor and shall bear the Contractor's stamp of approval before being forwarded to the Designer. Submittals shall be submitted in such time as to cause no delay to the Work or any part thereof and in accordance with the Contract Construction Schedule and Submittal Register. The Designer shall review the submittal with reasonable promptness, noting desired corrections, if any. The Designer shall retain two (2) copies of the submittal and shall return the balance of the reviewed submittal to the Contractor for action. The Contractor shall furnish any corrected submittal to the Designer. The Designer shall retain two (2) copies of the corrected submittal and will return the balance of the reviewed submittal to the Contractor.

No substitutions will be accepted after the bids have been received. All substitutions prior to the receipt of bids shall be in accordance with the Contract Documents. Refer to Instructions to Bidders, Paragraph 3, Substitutions.

The Contractor acknowledges that the processing of shop drawings and other submittals is directly impacted by the clarity, completeness, and accuracy of said documents and that it is the Contractor's responsibility to (i) review and coordinate each submittal with all other related or affected Work and (ii) approve each submittal before submitting same to the Designer for approval.

- 6.3 No substitutions and no deviations from any requirement of the Contract Documents shall be deemed allowed unless the Contractor has specifically informed the Designer and the Owner in writing of such deviations at the time of submittal and the Designer and the Owner have given written and specific approval to the substitutions or deviations. In proposing a deviation or substitution the Contractor warrants to the Owner, notwithstanding any review, allowance or approval by the Designer or the Owner that the deviation or substitution is at least equal to or better in quality and for the purpose intended, and that Contractor shall not by reason of any such review, allowance or approval be relieved from any obligation or responsibility contained in the Contract Documents.
- 6.4 Review of submittal by the Designer shall not be construed as relieving the Contractor from responsibility for compliance with terms or designs of the Contract Documents nor from responsibility for errors of any sort in the submittal.
- 6.5 The Contractor shall keep one record copy marked "As-Built" of all Specifications, Drawings, Addenda, Modifications, and Submittals at the Project in good order and annotated at least monthly to show all changes made during the construction process. Such monthly annotations and their approval by the Designer shall be a condition precedent to approval by the Designer of each monthly Request for Payment. Said record copy shall be stored at the Project and fully protected from damage by fire or other hazard. This record copy shall be available to the Designer and Owner for inspection at all times and shall be delivered to the Designer for the Owner's purposes prior to the Designer's certifying Substantial Completion of the Work.



GENERAL CONDITIONS OF THE CONTRACT FOR CONSTRUCTION

- 6.6 At completion of the Project and before Final Payment, the Contractor shall assemble and deliver to the Owner one complete set of all as-built drawings and one complete set of all approved submittals, product data, and samples which were reviewed by the Designer. These drawings and submittals shall be on paper, or in electronic or other media if required by the Supplementary Conditions. These drawings and submittals shall be categorized and packaged as directed by the Designer.

ARTICLE 7. CONTRACTOR

- 7.1 The Contractor shall supervise and direct the Work efficiently and with the Contractor's best skill and attention. Except as may be set forth specifically in the Contract Documents, the Contractor shall be solely responsible for the means, methods, techniques, sequences, and procedures of construction, and for safety precautions and programs in connection with the Work. The Contractor shall be responsible to see that the finished Work complies accurately with the Contract Documents.

- 7.2 The Contractor shall appoint a Project Manager and shall keep on the Project at all times during its progress a competent Resident Superintendent and necessary assistants who shall not be replaced without prior written approval by the Owner except under extraordinary circumstances, in which event immediate written notice shall be given to the Designer and the Owner. The Project Manager and the Resident Superintendent may be the same person or different persons. At any time, the Owner, in its sole and absolute discretion, may require the Contractor to replace the Project Manager or Resident Superintendent with an experienced and competent person or persons upon seven (7) days written notice from the Owner to the Contractor. Such replacement shall be at the Contractor's expense and at no cost to the Owner.

Both the Project Manager and the Resident Superintendent shall have authority to act on behalf of the Contractor, and instructions, directions or notices given to either of them shall be as binding as if given to the Contractor.

- 7.3 The Contractor shall provide sufficient competent and suitably qualified personnel, equipment, and supplies to lay out the Work and perform construction as required by the Contract Documents. The Contractor will at all times maintain good discipline and order at the site, and will comply with all applicable OSHA standards.

Any person employed by the Contractor, any Subcontractor, or any sub-subcontractor who, in the opinion of the Designer or the Owner, does not perform his Work in a proper and skillful manner or is intemperate or disorderly shall, at the written request of the Owner or Designer, be removed forthwith by the Contractor, Subcontractor, or sub-subcontractor employing such person without cost to the Owner, and shall not be employed again in any portion of the Work without the written approval of the Owner or Designer.

Should the Contractor fail to remove such person or persons or fail to furnish suitable and sufficient personnel for the proper prosecution of the Work within three (3) days after written order, the Owner may withhold further payment by written notice until compliance with such order.



GENERAL CONDITIONS OF THE CONTRACT FOR CONSTRUCTION

- 7.4 If, in the opinion of the Designer or the Owner, any Subcontractor on the Project is incompetent or otherwise unsatisfactory, he shall be replaced by the Contractor with no increase in the Contract Price if and when directed by the Designer or the Owner in writing.
- 7.5 The Contractor shall furnish all materials, equipment, labor, transportation, construction equipment and machinery, tools appliances, fuel, light, heat, and all other facilities and incidentals necessary for the execution, maintenance, initial operation, and completion of the Work, other than those specifically excluded by the Contract Documents and to be furnished by the Owner or others. When use or storage of hazardous materials or equipment or methods of more than ordinary risk are necessary in accomplishing the Work, the Contractor shall give the Owner and Designer reasonable advance notice.

If any materials are to be furnished or installed by the Owner or others under the terms of the Contract Documents, said materials shall be made available to the Contractor at the location(s) specified in the Contract Documents. All costs of handling, transportation from the specified location to the Project, storage, and installing of Owner-furnished materials shall be included in the Contract Price. The Contractor shall be responsible for any demurrage, damage, loss, or other deficiencies which may occur during the Contractor's handling, storage, or use of such Owner-furnished material. The Owner shall deduct from any monies due or to become due the Contractor any cost incurred by the Owner in making good any such damage, loss, or deficiency.

All equipment which is proposed to be used in the Work shall be of sufficient size and in such mechanical condition as to meet the requirements of the Work and produce a satisfactory quality of work. Equipment used on any portion of the Work shall be such that no injury to previously completed Work, adjacent property, or existing facilities shall result from its use.

When the methods and equipment to be used by the Contractor accomplishing the Work are not prescribed in the Contract Documents, the Contractor shall be free to use any methods or equipment that will accomplish the Work in conformity with the requirements of the Contract Documents.

When the Contract Documents specify the use of certain methods and equipment, such methods and equipment shall be used unless others are authorized by the Designer. If the Contractor desires to use a method or type of equipment other than specified in the Contract Documents, the Contractor may request authority from the Designer to do so. The request shall be in writing and shall include a full description of the methods and equipment proposed and of the reasons for desiring to make the change. If approval is given, it shall be on the condition that the Contractor shall be fully responsible for producing Work in conformity with the requirements of the Contract Documents. If, after trial use of the substituted methods or equipment, the Designer determines that the Work produced does not meet the requirements of the Contract Documents, the Contractor shall discontinue the use of the substitute method or equipment and shall complete the remaining Work with the specified methods and equipment at no additional cost to the Owner. The Contractor shall remove any deficient Work and replace it with Work of specified quality, or take such other corrective action as the Designer may direct. No change in the Contract Price or in Contract Time shall be made as a result of authorizing a change in methods or equipment under this paragraph.



GENERAL CONDITIONS OF THE CONTRACT FOR CONSTRUCTION

- 7.6 All materials and equipment shall be new, except as otherwise provided in the Contract Documents. When special makes or grades of material which are normally packaged by the supplier or manufacturer are specified or approved, such materials shall be delivered to the Project site in their original packages or containers with seals unbroken and labels intact.
- Materials shall be so stored as to assure the preservation of their quantity, quality and fitness for the Work. Stored materials, even though approved before storage, may again be inspected by the Designer or Owner prior to their use in the Work and shall meet the requirements of the Contract Documents at the time they are incorporated into the Work. Stored materials shall be located so as to facilitate their prompt inspection. The Contractor shall coordinate the storage of all materials with the Designer and the Owner. Materials to be stored at the Project or on the Owner's property shall not create an obstruction to the Owner's or other contractor's reasonable activities. Private property shall not be used for storage purposes without written permission of the owner or lessee of such property. The Contractor shall make all arrangements and bear all expenses for the storage of materials on private property. Upon request, the Contractor shall furnish the Owner a copy of the property owner's permission. All storage sites on private or the Owner's property shall be restored to their original condition by the Contractor at his entire expense, except as otherwise agreed to (in writing) by the owner or lessee of the property.
- 7.7 All materials and equipment shall be applied, installed, connected, erected, used, cleaned and conditioned in accordance with the instructions of the applicable manufacturer, fabricator, or processor, except as otherwise provided in the Contract Documents.
- 7.8 The Contractor will be fully responsible for all acts and omissions of his Subcontractors and of persons directly or indirectly employed by them and of persons for whose acts any of them may be liable to the same extent that the Contractor is responsible for the acts and omissions of the Contractor's own employees. Nothing in the Contract Documents shall create any contractual relationship between any Subcontractor or supplier and the Owner or the Designer, or any obligation on the part of the Owner or the Designer to pay or see to the payment of any money due any such Subcontractor or material furnisher except as may otherwise be required by law. The Owner or the Designer may furnish to any Subcontractor or supplier, to the extent practicable, evidence of amounts paid to the Contractor on account of specific Work done.
- 7.9 The divisions and sections of the Specifications and the identifications of any Drawings shall not control the Contractor in dividing the Work among Subcontractors.
- 7.10 The Contractor agrees to bind specifically every Subcontractor to the terms and conditions of the Contract Documents for the benefit of the Owner and to furnish written evidence thereof to the Designer and the Owner within seven (7) days after written request by the Owner.
- 7.11 The Contractor shall attend job progress conferences and all other meetings or conferences as directed by the Designer. The Contractor shall be represented at these job progress conferences by a representative having the authority of the Project Manager and by such other representatives as the Designer may direct. Job progress conferences shall



GENERAL CONDITIONS OF THE CONTRACT FOR CONSTRUCTION

be open to Subcontractors, suppliers and any others who may contribute beneficially toward maintaining required job progress, and such personnel shall be encouraged by the Contractor to attend. It shall be the principal purpose of job progress 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 Work and the Project by the specified Completion Dates. The Contractor shall be prepared to assess progress of the Work as required in the Contract Documents and to recommend remedial measures for correction of progress as may be appropriate. The Designer shall preside as chairman and arrange for minutes to be taken and circulated.

In the event that the prosecution of the Work is discontinued for any reason, the Contractor shall notify the Designer and the Owner at least forty-eight (48) hours in advance of resuming operations.

Should the terms of the Contract Documents require completion of one or more portions of the Work for the Beneficial Occupancy of the Owner prior to completion of the entire Work, the Contractor shall complete such portion(s) of the Work on or before the date specified. Such completion shall include the obtaining of all government or other permits, permission, and/or approvals necessary to occupancy. The Contractor shall independently estimate the difficulties involved in arranging the Work to permit such Beneficial Occupancy and shall not claim any additional compensation or time extension by reason of any delay or increased cost due to completing such portion(s) of the Work. The Owner's possession and use of such portion(s) of the Work shall not be deemed an acceptance of any Work not completed in accordance with the Contract Documents. The Owner shall be responsible for the security, maintenance, utilities, and insurance of all portions of the Work completed and beneficially occupied by the Owner.

- 7.12 The Contractor shall pay all license fees and royalties, and assume all costs incident to the use of any invention, design process, or device which is the subject of patent rights or copyrights held by others, except for inventions, design processes, or devices specified by the Designer in the Contract Documents. The Contractor shall indemnify and hold harmless the Owner, the Designer, and anyone directly employed by either of them, from and against all claims, damages, losses and expenses, including attorney's fees and costs of defense, arising out of any infringement or alleged infringement of such rights during or after completion of the Work, and shall defend all such claims in connection with any actual or alleged infringement of such rights.
- 7.13 The Contractor shall secure and pay for all permits, including without limitation construction permits and licenses, and will pay all governmental charges and inspection fees necessary for the prosecution of the Work.
- 7.14 The Contractor shall give all notices and comply with all laws, ordinances, rules, and regulations applicable to the Work and shall protect and indemnify the Owner and the Owner's officers, agents, or servants against any claim or liability arising from or based on the violation of any such law, ordinance, regulation, order, or decree, whether by the Contractor or by the Contractor's employees, Subcontractors, sub-subcontractors, or their employees.



GENERAL CONDITIONS OF THE CONTRACT FOR CONSTRUCTION

- 7.15 The Contractor shall be responsible for the entire site of the Project and for its reasonable and necessary protection and security, as required by laws or ordinances governing such conditions, or by custom or sound construction practices, and shall share such responsibilities as may be agreed upon among them, or in the absence of such agreement, as may be directed by the Contract Documents, Owner, or Designer. The Contractor shall be responsible for any damage to the Owner's property, or that of others, by the Contractor or the Contractor's employees, Subcontractors, sub-subcontractors, or their employees or agents, and shall make good such damages. The Contractor shall be responsible for and pay for any such claims against the Owner.
- 7.16 The Contractor shall protect all landscaping designated to remain in the vicinity of the operations and barricade all walks, roads, and areas as necessary to keep the public away from the construction.
- 7.17 The Contractor shall provide cover and/or protect all portions of the Work and provide all materials necessary to protect the Work whether performed by the Contractor or any of the Subcontractors or sub-subcontractors. Any Work damaged through the lack of proper protection, or from any other cause, shall be repaired or replaced without extra cost to the Owner or extension to the Contract Time.

The Contractor shall maintain the Work during construction and until the Work is accepted. This maintenance shall constitute continuous and effective effort prosecuted day by day, with adequate equipment and forces so that the Work is maintained in satisfactory condition at all times. All costs of maintenance shall be included in the Contract Price and the Contractor will not be paid an additional amount for such effort. Should the Owner or Designer observe that the Contractor at any time has failed to maintain the Work as provided herein, the Designer may immediately notify the Contractor of such non-compliance. Such notification shall specify a reasonable time within which the Contractor shall be required to remedy such unsatisfactory maintenance condition. Should the Contractor fail to properly respond to the Designer's notification, the Owner may, at the Contractor's expense, take such action as it may deem appropriate to remedy the defective maintenance, including suspension of the Contractor's Work or any part thereof. Any such expense incurred by the Owner shall be deducted from monies due or to become due the Contractor.

Parking lots, streets, and walks connecting to the Project area shall be protected by the Contractor from deposits of mud, sand, stone, litter, or debris in any form.

Pedestrian traffic areas around the construction limits must be maintained in a clean and safe condition at all times with required barricades and covered walkways. When excavation or other operations outside the Project limits is required, the Contractor shall, immediately following that work, return the area to its original condition.

All catch basins and storm drain lines in the vicinity of the Project site shall be protected at all times from entry of dirt, rubble and other debris. The residue from the cleaning of trucks, wheelbarrows, concrete buggies, etc. must be prevented from entering the drainage system, and if cleaning is done, the residue must be contained and removed from the Project site with other refuse.



GENERAL CONDITIONS OF THE CONTRACT FOR CONSTRUCTION

- 7.18 No burning of refuse or debris shall be allowed inside or around the Project during the course of construction without written authority from authorities having jurisdiction and the Owner.
- 7.19 The Contractor shall provide for and maintain necessary safety measures and safety programs for the protection of all persons involved with the Work. Such measures and programs shall include the requirements of the most current edition of the CAGC Safety and Health Manual [or the AGC Accident Prevention Manual in Construction], or equivalent requirements, and shall fully comply with all Federal, State, and local laws, rules, regulations, and building code requirements relating to the prevention of accidents or injuries to persons on or about the location of the Work.
- All trenches, excavations, or other hazards in the vicinity of the Work shall be well barricaded, and properly lighted at night. When Work requires closing of an area normally used by the Owner or the public, the Contractor shall furnish, erect, and maintain temporary barricades, and properly light the area. The Contractor shall comply with any directions and public authorities in this respect.
- 7.20 The Contractor shall designate a responsible officer or employee as safety inspector, whose duties shall include accident prevention on the Project as well as implementation of the Contractor's safety measures and safety programs on the Project. The name of the safety inspector shall be made known to the Designer and the Owner at the pre-construction conference.
- 7.21 In emergencies affecting the safety of persons, the Work, or property at the Project site or adjacent thereto, the Contractor is obligated to act in the Contractor's discretion to prevent threatened damage, injury, or loss. As soon as practicable, the Contractor shall notify the Designer and Owner of such emergency. The Contractor shall give the Designer and the Owner prompt written notice of any significant changes in the Work or deviations from the Contract Documents caused by such emergency. If the Contractor believes that additional work done in an emergency entitles the Contractor to an increase in the Contract Price or an extension of the Contract Time, the Contractor may make a claim therefore as provided in Articles 14 and/or 15.
- 7.22 The Contractor shall at all times keep the premises free from accumulation of waste materials or rubbish caused by the Work. At least weekly and at the completion of the Work, the Contractor shall remove all waste materials and rubbish from and about the Project. At the completion of the Work, the Contractor shall remove all tools, construction equipment, machinery, and surplus materials. The Contractor shall leave the Work in condition for occupancy by the Owner such that no cleaning or other operations are required. Material cleared from the Project and deposited on adjacent property shall not be considered as having been disposed of satisfactorily. If the Contractor fails to keep the Project clean of waste materials or rubbish, fails to satisfactorily clean-up weekly or at the completion of the Work, the Owner may do so and the costs thereof may be deducted from any amounts due the Contractor.
- 7.23 Utilities, temporary facilities, and signs shall be provided as described in the Contract Documents. Absent a contrary direction in the Supplementary Conditions, the Contractor shall pay all bills for water, electricity, or other public utility service to the Project site.



GENERAL CONDITIONS OF THE CONTRACT FOR CONSTRUCTION

7.24 The Contractor shall indemnify and hold the Owner, the Designer, the Designer's consultants, and their officers, agents, and employees harmless against all costs, damages, and expenses, including attorney's fees and costs of defense, arising out of claims by any separate contractor or by any Subcontractor, sub-subcontractor, or supplier engaged by or employed by the Contractor or employed by any of the Subcontractors claiming through him, including without limitation damages, losses, and expenses arising out of or relating to any inconvenience, delay, interference, or other action or non-action of the Contractor or the Contractor's Subcontractors on the Project.

The Contractor acknowledges that should the Contractor or any of the Contractor's Subcontractors be damaged by any breach of contract by any other separate prime contractor on the Project, the Contractor may invoke applicable dispute resolution procedures with said other separate prime contractor or bring a direct civil action against said other separate prime contractor. The Contractor hereby expressly agrees that neither the Owner nor its officers, agents, or employees shall have any liability of any kind or nature whatsoever to the Contractor, its Subcontractors, sub-subcontractors, or suppliers arising out of or relating to any breach, inconvenience, delay, interference, or other action or non-action by any other separate prime contractor. The Contractor covenants not to sue the Owner for any loss or damage caused by any breach, inconvenience, delay, interference, or other action or non-action by any other separate prime contractor, notwithstanding whatever rights at law the Contractor might have to bring a civil action against the Owner for any breach, inconvenience, delay, interference, or other action or non-action of any other separate prime contractor. The Contractor agrees to look exclusively to the other prime contractor for relief or remedy.

Nothing contained herein or appearing anywhere in the Contract Documents shall obligate or require the Owner to exercise any right or privilege, or to take any action or to refrain from taking any action under any contract it may have with any other prime contractor or party to the Project for the benefit of the Contractor or any Subcontractor, sub-Subcontractor, or supplier claiming through the Contractor.

7.25 Prior to completion of the Work and Final Payment of the Contract Price, excepting only those portions of the Work deemed accepted in accordance with the Contract Documents, the Contractor shall have charge and care of the Work, and shall take every precaution against injury or damage to any part due to the action of the elements or from any other cause, whether arising from the execution or from the non-execution of the Work. The Contractor shall as required by the Owner replace, rebuild, repair, restore, and make good all injury or damage to any portion of the Work occasioned by any of the above causes before Final Completion and shall bear the expenses thereof.

7.26 In the event that the Work, or any portion thereof, is suspended at any time pursuant to an order of the Owner, the Contractor shall obey all instructions of the Owner regarding storage of materials, drainage, protection of the Work, and erection of temporary structures during the suspension period.

7.27 The Project Expediter for the Project shall be responsible for the coordination of the Work of itself and any other separate contractors, both as to space and time. The Project Expediter shall coordinate the implementation of the Contract Construction Schedule, all



GENERAL CONDITIONS OF THE CONTRACT FOR CONSTRUCTION

construction activities and close-out of the Project, including but not limited to all testing, inspection, certifications, and approvals required by public agencies.

The Contractor and the Project Expediter shall each be required to notify the Designer and the Owner promptly of any event or condition which could affect the conduct or progress of the Work and shall cooperate fully with all other contractors on the Project site.

- 7.28 The Owner hereby delegates to the Project Expediter all of its duties to coordinate and to expedite the Work not expressly reserved to the Owner by other provisions of the Contract Documents.
- 7.29 All Work performed pursuant to the Contract Documents shall conform in all respects to the North Carolina State Building Code and all other state, local, and national codes in effect at the time of and applicable to this Work.
- 7.30 The Contractor shall provide for and maintain necessary safety measures and safety programs for the protection of all persons at the Project site, and shall comply at all times with the requirements of the most current edition of the CAGC Safety and Health Manual [or the AGC Accident Prevention Manual in Construction], or the equivalent requirements of the Contractor's safety program, and shall fully comply with all Federal, State, and local laws, rules, regulations, and building code requirements so as to prevent accidents or injuries to persons on or about the Project site. The Contractor shall clearly mark or post signs warning of existing hazards, and shall barricade excavations, elevator shafts, stairways, and similar hazards. The Contractor shall protect against damage or injury resulting from falling materials, and shall maintain all protective devices and signs throughout the progress of the Work.
- 7.31 The Contractor shall adhere to the rules, regulations, and interpretations of the North Carolina Department of Labor's Occupational Safety and Health Standards for the Construction Industry (29 CFR Part 1926 as adopted in 13 NCAC 07F.0201, including 29 CFR Part 1910 General Industry Safety and Health Standards applicable to construction) and N.C. Gen. Stat. §95-126 through 155 (Occupational Safety and Health) as well as all revisions and amendments to such standards or statutes as may occur throughout the performance of the Work.
- 7.32 Any land disturbing activity performed by the Contractor 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 NCAC 4A, 4B, and 4C), and as may be revised or amended in the future. Upon receipt of notice that a land-disturbing activity is in violation of said Act, the Contractor shall be responsible for ensuring that all steps or actions necessary to bring the Project in compliance with said Act are promptly taken. The Contractor shall be responsible for all penalties assessed pursuant to N.C. Gen. Stat. 113A-64 with respect to its Work, and shall indemnify and hold harmless the Owner from all costs and expenses, including attorney's fees and costs of defense arising out of or related to the enforcement of the Act against any party or person described in this Article.



GENERAL CONDITIONS OF THE CONTRACT FOR CONSTRUCTION

- 7.33 Any mechanical or electrical work such as sleeves, inserts, chases, etc. located in the Work of the Contractor for general work shall be built in by that Contractor. On multiple prime projects, the mechanical and electrical contractors shall set all sleeves, inserts, and other devices built into the structure in cooperation and under the supervision of the Contractor for general work. The responsibility for exact location of such items shall be that of the mechanical, plumbing, or electrical prime contractor.
- 7.34 The Contractor shall be responsible for permanently fixed service facilities and systems in use during progress of the Work and shall strictly adhere to the following procedures:
- a) Prior to acceptance of the Work by the Owner, the Contractor shall remove and replace any part of the permanent building systems damaged through use during construction.
 - b) Temporary filters shall be installed in each of the heating and air conditioning units, return air grilles, and other locations to prevent intrusion of dust, dirt, and debris during construction. Temporary filters shall be removed and replaced with new filters immediately prior to Substantial Completion.
 - c) Extra effort shall be maintained to keep the building clean and under no circumstances shall air systems be operated if finishing operations are creating dust in excess of what would be considered normal if the building were occupied.
 - d) When the permanent lighting system is used during construction, lamps shall be replaced and shall be new on the date of Substantial Completion.

ARTICLE 8. OWNER

- 8.1 The Owner shall issue communications and notices to the Contractor through the Designer to the extent contemplated by the Contract Documents.
- 8.2 In case of termination of the employment of the Designer, the Owner shall appoint as Designer a qualified person who shall have and assume all rights and duties held by the original Designer.
- 8.3 The Owner shall have the right to take possession of and use any portion of the Work notwithstanding the fact that the time for completion of such portion of the Work may not have expired, but such taking possession and use shall not be deemed an acceptance of any Work not completed in accordance with the Contract Documents.
- 8.4 A waiver on the part of the Owner of any breach of any part of the Contractor shall not be held to be a waiver of any other or subsequent breach.
- 8.5 The Owner shall pay all permanent acreage fees, governmental impact fees, and meter deposits for permanent utilities.

ARTICLE 9. CONSTRUCTION MANAGER



GENERAL CONDITIONS OF THE CONTRACT FOR CONSTRUCTION

- 9.1 The Owner may employ one or more Construction Managers for the purpose of assisting the Owner, Designer, and Contractor in developing and administering budgets and cost controls, in evaluating constructability and value engineering proposals, in establishing and maintaining a critical path method (CPM) schedule, in coordinating and/or expediting the Work with other projects being constructed by the Owner or others adjacent or near the Work, or for such other purposes as the Owner may deem appropriate. From time to time the Owner may identify such Construction Managers(s) to the Contractor in writing identifying any tasks assigned to such Construction Managers(s).

ARTICLE 10. DESIGNER

- 10.1 The Designer is charged with the responsibility of interpretation of the Contract Documents. The Designer's decisions relating to aesthetic matters shall be final.
- 10.2 All Work completed under the Contract Documents shall be subject to review by the Designer. No Work is to be covered without the Designer's review or prior authorization. Any Work so covered without the Designer's review or prior authorization shall be uncovered at the Contractor's expense. The Contractor shall notify the Designer in writing at least twenty-four (24) hours in advance of covering any Work.
- 10.3 The Designer shall not be responsible for the construction means, methods, techniques, sequences, procedures, or the safety precautions and programs incident thereto, and shall not be responsible for the Contractor's failure to perform the Work in accordance with the Contract Documents, but shall be entitled to enforce any requirements in the Contract Documents specifying particular means, methods, techniques, sequences, or procedures.
- 10.4 The Designer shall be an Owner's representative during the construction period. The duties, responsibilities and authority of the Designer as the Owner's representative during construction are as set forth in the Contract Documents.

ARTICLE 11. TESTING AND SURVEYING

- 11.1 Laboratory and field tests to determine compliance of construction with the Contract Documents shall be made by the Owner or testing consultants employed by the Owner except those required elsewhere in the Contract Documents to be paid for by the Contractor. The costs and expenses of providing samples for and assistance in any testing shall be borne by the Contractor and are included in the Contract Price. Any Work in which untested materials are used without approval or written permission of the Designer shall be removed and replaced at the Contractor's expense. Work found to be unacceptable or unauthorized will not be paid for and, if directed by the Designer shall be removed and replaced at the Contractor's expense. Unless otherwise designated, tests in accordance with the cited standard methods of ASTM or other generally recognized or specifically authorized methods which are current on the date of advertisement for bids shall be made at the expense of the Owner; provided, however, in the event that after such testing any Work is found to be defective or does not meet the requirements of the Contract Documents, the costs of retesting such Work and the costs of inspection services shall be paid by the Contractor. Samples shall be taken by a testing laboratory employed by the Owner. All materials being used are subject to inspection, tests, or rejection at any time prior to or during incorporation into the Work. Copies of all Owner test reports will be



GENERAL CONDITIONS OF THE CONTRACT FOR CONSTRUCTION

furnished to the Contractor at his written request. Copies of Contractor test reports shall be furnished to the Designer upon written request.

11.2 The Owner shall have the right to deduct the costs of additional testing as described in paragraph 11.1 from any money due the Contractor; or if no money is due the Contractor, the Owner shall have the right to recover these costs from the Contractor, from its sureties, or from both.

11.3 All layouts and surveying shall be accomplished by properly qualified personnel duly licensed in the State of North Carolina.

ARTICLE 12. SEPARATE CONTRACTS

12.1 It is expressly understood that the Owner may deploy the Owner's own employees or engage other separate prime contractors to perform Work as a part of the Project whose work will be performed simultaneously and sequentially with the performance of the Work by the Contractor. It shall be necessary for the Contractor to coordinate construction activities with such other contractors, particularly with respect to access to work areas, storage of materials, and use of elevators and other common facilities. The Contractor shall diligently and in good faith cooperate with the Owner, the Designer, and all other contractors with respect to such matters and shall regularly and faithfully attend any and all meetings called by the Owner or the Designer with respect to such matters. Any disputes between the Contractor and any other separate prime contractor with respect to such matters shall be resolved in accordance with the claim and dispute resolution procedures in the Agreement.

ARTICLE 13. CONTRACT TIME

13.1 Within fourteen (14) days after receipt of the Construction Agreement by the Contractor for signatures, the Project Expediter shall prepare and submit to the Designer and Owner for review and approval a preliminary progress schedule for the Work pursuant to the requirements stated in the Contract Documents.

13.2 Within fourteen (14) days after initial receipt of the Construction Agreement for signatures the Contractor shall submit to the Designer a Submittal Register listing all Submittals the Contractor is required to make or proposes to make under the Contract Documents, the dates on which the Contractor proposes to make such Submittals and the dates by which the Contractor reasonably requires a response from the Designer with respect to each Submittal. The dates submitted shall be incorporated into the Contract Construction Schedule as Completion Dates when they have been approved or modified by the Owner. The Designer shall not be required to review any Submittal from the Contractor until a Submittal Register acceptable to and approved by the Owner has been submitted by the Contractor.

13.3 Not later than thirty (30) days following execution and delivery of the Construction Agreement by Owner to Contractor, the Owner shall deliver to the Contractor a Notice to Proceed. The Notice to Proceed shall state a commencement date on which it is expected that the Contractor will begin the Work to be performed under the Agreement. The Contract Time shall be measured from said specified commencement date. The commencement



GENERAL CONDITIONS OF THE CONTRACT FOR CONSTRUCTION

date stated in the Notice to Proceed shall not be earlier than three (3) days after the Notice to Proceed is served on the Contractor.

If, other than by mutual agreement, said specified commencement date is more than thirty (30) days after the date of execution and delivery of the Agreement from Owner to Contractor and the Contractor believes said delay justifies an increase in Contract Price and/or an extension of Contract Time, the Contractor may make a claim therefore as provided in Article 14 and/or Article 15.

No Work shall be done prior to the date specified in the Notice to Proceed.

A final Contract Construction Schedule shall be submitted for approval by the Contractor, Designer, and Owner no later than fourteen (14) days after Notice to Proceed. No payments shall be due the Contractor until this schedule is approved by all parties.

- 13.4 The Contract Construction Schedule is a Contract Document. The Contractor represents that the Contract Construction Schedule has been reviewed in detail, that the Contractor participated in its preparation, that all of the activities which impact, limit, or otherwise affect the time of completion of the Work are shown in the Contract Construction Schedule and that all of the activities of others which impact, limit, or otherwise affect the start, duration, or completion of the Contractor's activities are also shown. The Contractor further represents that the Contractor can and will complete each activity within the time shown for that activity. Time is of the essence with respect to each such activity and Completion Date.
- 13.5 If the Contractor submits a construction schedule, progress report, or any other document that indicates or otherwise expresses an intention to achieve completion of the Work prior to any Completion Date required by the Contract Documents or prior to expiration of the Contract Time, no liability of the Owner to the Contractor for any failure of the Contractor to so complete the Work shall be created or implied.
- 13.6 If the Contractor, for reasons beyond the Contractor's control, is delayed in beginning any activity, the Contractor shall, nevertheless, have the same number of days as is shown in the Contract Construction Schedule for the activity, and the affected activity and any succeeding activity that is dependent upon that activity shall be adjusted accordingly; provided that at any time the Owner, by means of a Change Order, may require the Contractor to work overtime, to increase labor forces or to take any necessary or appropriate action to decrease the time required for any activity, and the Contractor shall be entitled to an adjustment in the Contract Price computed in accordance with Article 15 of these General Conditions.
- 13.7 At any time, the Owner may order the Contractor, on seven (7) days written notice, to begin any activity earlier than the starting date shown on the Contract Construction Schedule.
- 13.8 Should the Contractor fail to start any activity on the start date shown in the Contract Construction Schedule or as it may have been adjusted in accordance with paragraphs 13.5 or 13.6 above, or become delayed, the Contractor shall, without being entitled to any increase in the Contract Price or other compensation, work overtime, increase labor forces or take such other action as may be necessary or appropriate to complete the activity by



GENERAL CONDITIONS OF THE CONTRACT FOR CONSTRUCTION

the Completion Date shown on the Contract Construction Schedule, or as such Completion Date may have been adjusted.

- 13.9 The Designer and Owner or his Construction Consultant shall monitor progress of the Work at all times and the Contractor shall cooperate with such monitoring and provide any and all information with respect to the progress of the Work and scheduling as the Owner may reasonably require.
- 13.10 On a monthly basis, the Contractor shall revise the Contract Construction Schedule, showing any adjustments made in accordance with paragraphs 13.5 or 13.6, above, by any Change Order, the progress of the Work, and any days gained or days lost with respect to any activity, and shall furnish copies thereof to the Owner and Designer.
- 13.11 Should any monthly revision of any Contract Construction Schedule show that the Contractor is behind on any activity, the late completion of which could delay Substantial Completion of the Work, the Owner shall be entitled to withhold from the next Progress Payment due the Contractor an amount not exceeding the amount the Owner would be entitled to in Liquidated Damages, should Substantial Completion be delayed by the same number of days that the Contractor is currently behind schedule. If, subsequently, the Contractor's progress, as shown by any succeeding monthly revision to the Contract Construction Schedule, is such that the anticipated delay no longer exists, the Owner shall pay with the Progress Payment next due to the Contractor such amounts as have been withheld in accordance with this paragraph.
- 13.12 The Owner shall have the right to perform Work, hire and employ labor and craftsmen, rent equipment, subcontract with other parties, or do anything that the Owner deems necessary or appropriate to remedy or cure any delay by the Contractor in the progress of the Work. Such action by the Owner shall not, in any way, affect, void or limit any warranty, guaranty or other responsibility of the Contractor under the Contract Documents. Such action may be taken by the Owner only after three (3) days written notice to the Contractor. All costs incurred by the Owner in taking any such action shall be charged to the Contractor and deducted from any amounts remaining due under the Agreement.
- 13.13 The Contractor may be entitled to an extension of the Contract Time (but no increase in the Contract Sum) for delays arising from unforeseen causes beyond the control and without the fault or negligence of the Owner, the Contractor or the Contractor's Subcontractors as follows:
- a) Labor disputes and strikes that directly impact the critical path activities of the Contract Construction Schedule;
 - b) Acts of God, tornado, fire, hurricane, blizzard, earthquake, typhoon, or flood that damage completed Work or stored materials.
 - c) Acts of the public enemy; acts of the State, Federal, or local government in their sovereign capacities.
 - d) Abnormal inclement weather as defined in Article 13.14.



GENERAL CONDITIONS OF THE CONTRACT FOR CONSTRUCTION

13.14 On any day that the Contractor considers that the Project is delayed by adverse weather conditions, the Contractor shall identify in writing to the Designer and the Owner the adverse weather conditions affecting each activity, the specific nature of the activity affected, the number of hours lost, and the number of and identity (by responsibility or trade) of workers affected and shall obtain from the Designer written recognition of the delay. The time for performance of this Contract includes an allowance for a number of calendar days which may not be suitable for construction Work by reason of adverse weather. The Contract Time will be extended only if the number of calendar days of adverse weather recognized by the Designer exceeds the number of inclement weather days set forth below, and the Contractor demonstrates how this adverse weather impacts activities on the critical path of the Contract Construction Schedule.

Table with 2 columns: Month, Number of Inclement Weather Days. Rows include January (10), February (10), March (10), April (9), May (10), June (9), July (11), August (10), September (8), October (7), November (8), December (9).

13.15 If the Contractor believes that the progress of the Work has been adversely affected by adverse weather recognized by the Designer during a particular month, the Contractor shall submit a written request for extension of time to the Designer. Such a request for time extension of the Contract Time shall be submitted by the tenth (10th) day of the month following that month in which the adverse weather is encountered. The request shall include, but is not limited to, the following information:

- a) Detailed description of weather's effect on scheduled activities and its net effect on the critical path of the Project, and
b) Weather records from the official weather station nearest the Project site and records of actual observation as contained in daily reports, correspondence, or other documentation.

13.16 The Contractor specifically recognizes that a delay by the Contractor in achieving any Completion Date can have the effect of delaying the Substantial Completion of the Project, that such delay in Substantial Completion of the Project will necessarily cause damages, losses, and expenses to the Owner, including, but not limited to and by way of illustration only, increased capitalized costs and interests for the Project, increased and extended Project overhead, Designer's and Consultant's fees, increased costs of construction, increased and extended operation costs of other facilities, and inefficiency and loss of productivity, and that such damages, losses, and expenses may not be readily identifiable or ascertainable at the time they are incurred or at any time. Therefore, and in recognition



GENERAL CONDITIONS OF THE CONTRACT FOR CONSTRUCTION

of these factors and the likelihood that actual damages from his delay will not be readily ascertainable, the Contractor agrees to pay to the Owner, as Liquidated Damages and not as a penalty, the sum identified in the Supplemental Conditions hereto as the Liquidated Damages per Day, for each day by which the failure to meet any Completion Date shown in the Contract Construction Schedule, adjusted in accordance with this Article, delays the Substantial Completion of the Project.

- 13.17 The Contractor shall not be entitled to any adjustment in the Contract Price or other compensation from the Owner for any delay in the completion of or progress on the Work that is caused by a force majeure condition or is otherwise not caused by the sole and direct act or omission of the Owner and the Owner's employees or agents.
- 13.18 The sum for Liquidated Damages is the amount stipulated in the Supplementary General Conditions per day per Prime Contractor as Liquidated Damages reasonably estimated in advance to cover the losses to be incurred by the Owner by reason of failure of said Contractor(s) to complete the Work within the time specified, such time being in the essence of this contract and a material consideration thereof.

ARTICLE 14. CHANGES IN THE WORK

- 14.1 Without invalidating the Contract Documents, the Owner may, at any time, or from time to time order additions, deletions, or revisions in the Work. Said additions, deletions, or revisions shall be authorized only by written Change Orders, Construction Change Directives or Field Orders. Upon receipt of a Change Order, Construction Change Directive or Field Order, the Contractor shall proceed with the Work involved. All such Work shall be executed under the applicable conditions of the Contract Documents. If any change causes an increase or decrease in the Contract Price and/or an extension or shortening of the Contract Time, adjustments shall be made as provided in Article 14 and/or Article 15.

In order to expedite the Work and avoid or minimize delay in the Work that might affect the Contract Price or Contract Time, the Designer may issue a Change Order in the form of a Construction Change Directive which when signed by the Owner and Designer, directs the Contractor to proceed promptly with the Work involved. Any claim for an adjustment in Contract Price or Time, if not defined in the Construction Change Directive, shall be promptly made in writing in accordance with the procedures defined in Article 15.2.

- 14.2 The Designer may authorize minor changes or alterations in the Work not involving change in the Contract Price or in the Contract Time and not inconsistent with the overall intent of the Contract Documents. These may be accomplished by a Field Order. Such alterations shall not invalidate the Contract Documents nor release the surety. If the Contractor believes that any minor change or alteration authorized by the Designer entitles him to an increase in the Contract Price and/or an extension of Contract Time, he may make a claim therefore as provided in Article 14 and/or Article 15.
- 14.3 Except in an emergency endangering life or property, no change shall be made by the Contractor except upon prior written Change Order, Directive or Field Order authorizing such Change.



GENERAL CONDITIONS OF THE CONTRACT FOR CONSTRUCTION

- 14.4 Increases in the Contract Price and/or extensions of the Contract Time for additional Work performed by the Contractor shall only be in accordance with a written Change Order signed by the Owner and Designer. The Contractor shall not be entitled to additional time or to additional compensation for any Work performed or material supplied which is claimed to have been authorized or settled by an "oral" change, or by a "constructive" or "implied" change, or by a course of conduct, or by any action or non-action by the Owner, Designer, or any other persons, or by any means whatsoever other than by a written Change Order for such Work or material signed by the Owner and the Designer.
- 14.5 Changes in the Work resulting from emergency shall not invalidate the Contract Documents nor release the surety.
- 14.6 Neither the Owner nor the Designer shall be responsible for verbal instructions which have not been confirmed in writing, and in no case shall such instructions be interpreted as permitting a departure from the Contract Documents unless such instruction is confirmed in writing and supported by a proper Change Order, Construction Change Directive or Field Order, whether or not the cost is affected.
- 14.7 The Owner, in its sole discretion, may require that the Contractor notify the Contractor's sureties of any changes affecting the general scope of the Work or change in the Contract Price, and that the amount of applicable bonds shall be adjusted accordingly. If this requirement is exercised, the Contractor shall furnish proof of such adjustment to the Designer and the Owner.
- If this requirement is exercised, the Change Orders shall require written consent of the Contractor's surety. At the time of signing a Change Order, the Contractor shall be required to certify as follows:
- "I certify that all sureties have been notified that my contract has been altered by the amount of this Change Order, and that a copy of the approved Change Order will be mailed to all sureties upon its receipt by me."
- If this requirement is exercised, no payment to the Contractor on account of any Change Order shall become due or payable until written evidence of the surety's consent to the Change Order has been furnished to the Designer and to the Owner, and the furnishing of such written consent is a condition precedent to such payment.
- 14.8 The Contractor shall support all requests for Change Orders with a detailed cost breakdown showing cost of materials, labor, equipment, transportation, other items, Contractor's overhead and profit, and total cost, in accordance with methods defined in this Article, and, if the request seeks an extension of the Contract Time, with a time-related diagram which demonstrates specifically why an increase in construction time is needed.
- 14.9 When a request for a Change Order involves a Subcontractor, the Contractor shall provide quotation from same on Subcontractor's letterhead. The Subcontractor's quote shall list materials, equipment, and labor separately, and show overhead and profit in the manner provided in paragraph 14.8.

ARTICLE 15. CHANGE OF THE CONTRACT PRICE



GENERAL CONDITIONS OF THE CONTRACT FOR CONSTRUCTION

15.1 The Contract Price constitutes the total compensation payable to the Contractor for performing all Work under the Contract Documents. All duties, responsibilities, and obligations assigned to or undertaken by the Contractor shall be at his expense without change in the Contract Price. The Contract Price may only be changed by a Change Order.

15.2 Any claim for an adjustment in the Contract Price shall be in writing and written notice of any event, action, or non-action which may become the basis of a claim shall be delivered to the Owner and the Designer within three (3) days of the occurrence, or the beginning of the occurrence, of any such event, action or non-action giving rise to the claim. Such written notice is a condition precedent to the making of a claim, and such notice shall describe the basis of the potential claim with reasonable detail and clarity.

A claim shall be made in writing and shall be delivered to the Designer and the Owner no later than fourteen (14) days after such notice. The claim shall describe in detail the basis for the claim, with specific reference to any provisions of the Contract Documents, by paragraph, drawing number, or other specific identification, and shall state the amount claimed and how it is calculated. If the Contractor, at the time the claim is made, is unable to state the amount claimed with accuracy, the Contractor shall so state and provide the estimated amount and the basis on which the amount is to be calculated. At the earliest date practicable, but in no event more than thirty (30) days after Contractor's notice of claim, the Contractor shall supplement the claim with an accurate statement of the amount claimed and how it has been calculated. The Contractor shall provide, in writing, in support of the claim all such explanations, arguments, data, receipts, expert opinions, or other documents or information as the Contractor deems appropriate to be considered in support of the claim. A claim may properly be rejected by the Owner by reason of the Contractor's failure to submit adequate or accurate documentation or information, except that within seven (7) days after being given notice that the claim has been rejected on this basis, the Contractor may submit additional documentation or information. No claim for a change of the Contract Price shall be considered or granted (except solely at the discretion of the Owner) unless a claim is so made, nor shall the Contractor be entitled to any increase in the Contract Price unless the Contractor has given notice and made such a written claim within the times required. The Owner shall decide, after obtaining the advice of the Designer, whether an increase in Contract Price is warranted, and the amount of such increase shall be determined as provided in paragraph 15.4 through 15.5, below. Any change in the Contract Price resulting from any such claim shall be incorporated in a Change Order.

The Owner shall advise the Contractor of its decision with respect to the claim within fourteen (14) days of its receipt, or of the receipt of additional documentation or information if the absence of such has previously been the basis of rejection of the claim; provided, however, that if, in its sole discretion, the Owner deems that review or consideration of any part of the claim or any matter related thereto by its governing Board is necessary or appropriate, it shall so advise the Contractor and shall provide its decision to the Contractor within seven (7) days after such Board consideration, review or action. Any claim on which the Owner has not provided its decision to the Contractor within the applicable time period shall be deemed denied.



GENERAL CONDITIONS OF THE CONTRACT FOR CONSTRUCTION

If the Contractor is not satisfied with the decision of the Owner, the Contractor may within seven (7) days of receipt of the Owner's decision initiate the mediation process as described in Appendix A to the General Conditions of the Contract for Construction.

15.3 In determining the amount of a Contract Price adjustment, the parties shall apply the following methods, as appropriate:

(A) Change in Work: The Owner and Contractor shall negotiate in good faith and attempt to agree upon the value of any change (extra or decrease) in Work prior to the issuance of a Change Order covering said Work. Such Change Order shall set forth the corresponding adjustment to the Contract Price. In the event the Owner and the Contractor are unable to agree, the Owner shall grant an equitable adjustment in the Contract Price.

(B) Emergency Work: In the event of emergency endangering life or property, the Contractor may be directed by the Designer to proceed on a time and material basis, whereupon the Contractor shall so proceed and keep accurately, in such form as may be required by the Designer, a correct account of costs together with all proper invoices, payrolls, and supporting data therefore.

15.4 Where the Contract Price is to be adjusted, the following limitations shall apply in determining the amount of adjustment:

(A) In the case of extra or emergency work, the Contract Price shall not be increased by more than the reasonable, actual, and documented net cost of the extra or emergency work plus ten percent (10%) of such net cost on Work performed by the Contractor and five percent (5%) thereof on any subcontracted Work for overhead and profit combined.

(B) In the case of a decrease in Work, the Contract Price shall not be decreased by less than the net cost of the deleted Work plus five percent (5%) of such direct net cost for profit and overhead.

The term 'net cost' as used herein shall include, as applicable, and shall be limited to, all direct labor, direct material, direct equipment, labor burden, sales taxes, shipping and handling charges, permits and fees, and insurance and bond premium adjustments, if any, attributable to the change. All other items of cost shall be considered as overhead and covered by the percentages allowed in sections A and B of this paragraph.

The Contractor shall provide worksheets or tabulations describing the method by which the direct net cost was calculated, and shall provide all data needed to support the calculation of the direct net cost, all in a form acceptable to the Owner.

15.5 Where the Contract Price is to be adjusted by negotiation, the Owner may authorize and designate the Designer to negotiate with the Contractor on behalf of the Owner; provided, however, any agreement reached between the Contractor and Designer shall be subject to approval by the Owner.



GENERAL CONDITIONS OF THE CONTRACT FOR CONSTRUCTION

ARTICLE 16. UNFORESEEN CONDITIONS

- 16.1 Should the Contractor encounter unforeseen conditions at the Project site materially differing from those shown on the Drawings or indicated in the Specifications or differing materially from those ordinarily encountered and generally recognized as inherent in work of the character provided for in this Agreement, the Contractor shall immediately, and in no event more than three days later, give notice to the Owner of such conditions before they are disturbed. The Owner and the Designer shall thereupon promptly investigate the conditions and if they find that they materially differ from those shown on the Drawings or indicated in the Specifications, they shall at once make such changes in the Drawings and/or Specifications as they may find necessary. Any increase or decrease in the Contract Price resulting from such changes shall be adjusted in the manner provided herein for adjustments as to extra and/or additional Work and changes. However, neither the Owner nor the Designer shall be liable or responsible for additional work, costs, or changes to the Work that could have been reasonably determined from any reports, surveys, and analyses made available for the Contractor's review or that could have been discovered by the Contractor through the performance of its obligations pursuant to the Contract Documents.

ARTICLE 17. CORRECTION OF WORK BEFORE FINAL PAYMENT

- 17.1 The Owner has the authority to stop or suspend work, and the Designer has the authority to order Work removed or to order corrections of defective Work or Work not in compliance with the Contract Documents where such action may be necessary to ensure successful completion of the Work.

Any work, materials, fabricated items, or other parts of the Work which have been found by the Designer to be defective or not in accordance with the Contract Documents shall be condemned and shall be removed from the Project by the Contractor, and immediately replaced by new Work in accordance with the Contract Documents at no additional cost to the Owner. Work or property of the Owner or others damaged or destroyed by virtue of such condemned Work shall be made good at the expense of the Contractor.

Correction of condemned Work described above shall be commenced by the Contractor within twenty-four (24) hours after notice from the Designer or the Owner and shall be pursued to completion. Should the Contractor fail to proceed reasonably with the above-mentioned corrections, the Owner may, three (3) days after the notice specified in the preceding sentence, proceed with correction, paying the cost, including costs of uncovering such condemned Work, of such corrections from amounts due or to become due to the Contractor.

Condemned Work removed shall be the property of the Contractor and shall be removed from the Project by him within ten (10) days after notice to remove it, and if not then removed, thereafter may be disposed of by the Owner without compensation to the Contractor and the cost of such disposal shall be deducted from amounts due or to become due to the Contractor.



GENERAL CONDITIONS OF THE CONTRACT FOR CONSTRUCTION

Should the cost of correction of the Work and, if applicable, disposal of the condemned Work by the Owner exceed amounts due or to become due the Contractor, then the Contractor and the Contractor's sureties shall be liable for and shall pay to the Owner the amount of such excess.

ARTICLE 18. CORRECTION OF WORK AFTER SUBSTANTIAL COMPLETION; WARRANTIES AND GUARANTIES

18.1 Neither the final certificate, Final Payment, occupation of the premises by the Owner, nor any provision of the Contract Documents, nor any other act or instrument of the Owner or the Designer shall relieve the Contractor from responsibility for negligence, defective material or workmanship, or failure to comply with the Contract Documents.

18.2 The Contractor shall, at the Contractor's sole cost and expense, make all necessary repairs, replacements, and corrections of any nature or description, interior or exterior, structural or non-structural, that shall become necessary by reason of defective workmanship or materials which appear within a period of one (1) year from the date of Substantial Completion; provided, however that notwithstanding the preceding, if any longer guarantee period is specified for any particular materials or workmanship under the Contract Documents, or under any subcontract, or in connection with any manufactured unit which is installed in the Project, or under the laws of the State of North Carolina, the longer guarantee period shall govern.

18.3 If, within any guarantee period, repairs or changes are required in connection with the Work, which are rendered necessary as the result of the use of materials, equipment, or workmanship which are inferior, defective, or not in accordance with the terms of the Contract Documents, the Contractor shall, promptly upon receipt of notice from the Designer and without expense to the Owner:

- a) Completely repair or replace the Work so that it conforms to the Contract Documents;
- b) Correct all defects therein;
- c) Make good all damage which, in the opinion of the Designer, is the result of the use of materials, equipment, or workmanship which are inferior, defective, or not in accordance with the terms of the Contract Documents; and
- d) Make good any Work or material, or any equipment or contents disturbed in fulfilling any such guarantee.

If, in fulfilling the requirements of the Contract Documents or of any guarantee embraced therein or required thereby, the Contractor disturbs any work, facility, premises, or construction belonging to the Owner, the Contractor shall restore such disturbed work to a condition satisfactory to the Owner, and shall guarantee such restored work to the same extent as if it were Work under the Contract Documents.

If the Contractor, after notice, fails to proceed promptly to comply with the terms of the guarantee, the Owner may have the defects corrected, and the Contractor and the



GENERAL CONDITIONS OF THE CONTRACT FOR CONSTRUCTION

Contractor's sureties shall be liable for all expenses incurred. "Promptly" is defined as within twenty-four (24) hours for systems necessary to normal operation of the building and within seventy-two (72) hours for all other items. All special guarantees applicable to definite parts of the Work that may be shown in or required by Contract Documents shall be subject to the terms of this paragraph during the first year of the life of such special guarantee. Manufacturer's standard guarantees or warranties which do not comply with the time limit specified herein shall be extended by the Contractor automatically without further action on the part of the Owner or the Designer.

- 18.4 In the eleventh calendar month after the date of Substantial Completion, and at the request of the Owner, the Contractor, the Owner and the Designer shall make an inspection of the Work for the purpose of identifying defective workmanship and/or materials. If the Contractor, having been requested to do so by the Owner, fails to participate in such inspection, the Contractor shall be conclusively bound by any decision or ruling by the Designer as to any defective workmanship or material and as to the Contractor's responsibility for its repair or replacement.

ARTICLE 19. OWNER'S RIGHT TO DO WORK

- 19.1 If, during the progress of the Work or during any period of guarantee, the Contractor fails to prosecute the Work properly or to perform any provision of the Contract Documents, the Owner, after three (3) days written notice to the Contractor from the Designer, or from the Owner after Final Payment, may perform or have performed that portion of the Work and may deduct the cost thereof from any amounts due or to become due the Contractor. Notwithstanding any action by the Owner under this paragraph, all warranties and bonds given or to be given by the Contractor shall remain in effect or shall be given by the Contractor.
- 19.2 Should the cost of such action by the Owner exceed the amount due or to become due the Contractor, the Contractor and his sureties shall be liable for and shall pay to the Owner the amount of such excess.

ARTICLE 20. PARTIAL PAYMENTS

- 20.1 Within thirty (30) days after his initial receipt of the Construction Agreement for signatures, the Contractor shall submit to the Designer a Schedule of Values. The Schedule of Values shall indicate the value of the Work, including applicable overhead and profit, for each Division and section of the Project Specifications. The Designer and Owner shall be provided with the Contractor's estimate papers, Subcontractor agreements, supplier quotes, or other documents substantiating these values if so requested in writing by the Designer. The Contractor shall provide the requested documentation within seven (7) days after receipt of the Designer's written request. The Schedule of Values shall be subject to approval by the Owner, and if the Owner and the Contractor cannot agree upon the Schedule of Values, the Designer shall prepare it, and the Schedule of Values as prepared by the Designer shall be binding on the Owner and the Contractor. No Request for Payment shall be certified by the Designer until the Designer has issued approval of said Schedule of Values.



GENERAL CONDITIONS OF THE CONTRACT FOR CONSTRUCTION

20.2 Not later than the fifth (5th) day of each calendar month the Contractor shall submit to the Designer a Request for Payment for Work done during the previous calendar month. The Request for Payment shall be in form of AIA Document G702 (latest edition) and shall show substantially the value of Work done (including the value of material delivered to the Project or stored by the Contractor at another site, subject to the conditions hereinafter set forth) during the previous calendar month, and shall sum up the financial status of the Work with the following information:

- a) Total Contract Price, including any adjustment thereto made pursuant to the Contract Documents.
- b) Value of Work completed and materials properly stored to date.
- c) Less amount retained.
- d) Less previous payments.
- e) Current amount due.
- f) Balance remaining.

The Contractor, upon request of the Designer, shall substantiate the request with invoices, vouchers, payrolls, or other evidence.

20.3 When payment is requested or made on an account of stored materials, such materials must be stored on the Owner's property at such places and in such a manner as may be designated by the Designer. However, in the sole discretion of the Owner, with permission in writing from the Designer and Owner and under such circumstances as may be determined by the Owner, such materials may be stored in a bonded warehouse. The location and conditions for storage of such materials away from the Owner's property in a bonded warehouse shall be within the sole discretion of the Owner. Requests for Payment on account of stored materials shall be accompanied by paid invoices, bills of sale, warehouse receipts, or other documentary evidence establishing Owner's title to such materials, evidence that the stored materials are insured against loss and damage, and such other documentation as required by the Designer. Responsibility for the quantity, quality, and condition of such stored materials, whether stored on the Owner's property or away from the Owner's property, shall remain with the Contractor regardless of ownership or title. No payment shall be made on account of materials stored in a bonded warehouse unless the Contractor has acquired written permission from the Designer for such storage of materials and has complied with all conditions set forth in such permission regarding such storage of materials in a bonded warehouse.

20.4 Any Request for Payment received by the Designer on or before the fifth (5th) of the calendar month shall be certified for payment or returned for re-submission to the Contractor on or before the fifteenth (15th) of the calendar month. The Designer's certification shall be for the amount which was requested or that which the Designer has decided was justly due, and shall state in writing to the Contractor and Owner the reasons for withholding payment of any or all of the amount requested.



GENERAL CONDITIONS OF THE CONTRACT FOR CONSTRUCTION

- 20.5 The Designer may fail to certify all or part of any payment requested for any of the following reasons:
- a) Defective Work not corrected.
 - b) Suits, actions, or claims of any character filed against the Contractor, or due to the operations of the Contractor, or information or notice that a suit, action, or claim will be filed or has been made.
 - c) Information or notice that a Subcontractor or a supplier has not received payment.
 - d) The balance unpaid of the Contract Price is insufficient to complete the Work in the judgment of the Designer or Owner.
 - e) Damage to the Owner or another contractor.
 - f) Inability of the Contractor to meet a Completion Date, including an anticipated failure to meet a Completion Date entitling the Owner to withhold anticipated Liquidated Damages in accordance with paragraphs 13.16 and 13.18 hereof.
 - g) Failure to furnish Submittal as required by the Contract Documents on a timely basis in accordance with the Submittal Register.
 - h) Such other reason as to the Designer may appear prudent, proper, or equitable.

When grounds for withholding certification have been corrected, the Designer shall so certify to the Owner and the Owner shall make any payment due with respect to such certification as a part of his next payment after such certification.

- 20.6 No certificate issued or progress payment made shall constitute an acceptance of the Work or any part thereof.
- 20.7 The amount certified by the Designer for payment shall be ninety-five percent (95%) of the value of Work completed and materials stored since the Designer's last certification as shown on the Request for Payment, less any amounts not certified in accordance with paragraph 20.4, and this amount shall be paid by the Owner on or before the last business day of the month, but payment shall not be past due until not paid within fifteen (15) days thereafter.
- 20.8 After certification by the Designer that the Work is fifty percent (50%) complete, based on a determination that the Contractor's gross project invoices, excluding the value of materials stored off-site, equal or exceed fifty percent (50%) of the value of the Contract, (except the value of materials stored on-site shall not exceed twenty percent (20%) of the Contractor's gross project invoices for the purpose of determining whether the Project is fifty percent (50%) complete) and the Contractor has provided to the Owner the written consent of its sureties to the cessation of further percentage retention, the amount certified for payment with respect to subsequent Requests for Payment shall be one hundred percent (100%) of the value of Work completed and materials stored since the Designer's last certification as shown on the Request for Payment, less any amounts not certified in accordance with



GENERAL CONDITIONS OF THE CONTRACT FOR CONSTRUCTION

paragraphs 20.4 and 20.5; provided, however, that the aggregate of periodic payments shall not exceed ninety-seven and one half percent (97.5%) of the Contract Price. If the Owner determines that the Contractor's performance under the Contract is unsatisfactory, the Owner may resume withholding percentage retention from each subsequent periodic payment application up to the maximum amount of five percent (5%) of the Contract Price.

ARTICLE 21. FINAL PAYMENT

- 21.1 If the Work of the Contractor is limited to demolition, pilings, caissons and/or structural steel, the remaining unpaid balance of the Contractor's Contract Price, less a sum equal to five-tenths percent (0.5%) of the Contract Price, shall be paid within sixty days following receipt of the following documents, all of which must be received before payment shall become due: (i) request for payment from the Contractor; (ii) receipt of consent from the Contractor's surety to the payment; and (iii) approval or certification from the Designer that the work performed by the Contractor is acceptable and in accordance with the Contract Documents.
- 21.2 Except as set forth in paragraph 21.1, within forty five days after Substantial Completion of the Project, the remaining unpaid balance of the Contract Price shall be paid to the Contractor, less an amount equal to two and one-half times the value of punch list work or other work remaining to be completed or corrected, as reasonably estimated by the Owner.
- 21.3 Upon Substantial Completion, the Designer shall prepare and submit to the Contractor a deficiency list identifying all portions of the Work which are known by the Designer at that time to be incomplete or defective. Within thirty (30) days of receipt of this deficiency list, the Contractor shall complete and correct all items on that list along with all other Work required to achieve Final Completion of the Work. At any time prior to completion of the period of warranty, the Designer may submit to the Contractor a supplemental deficiency list, in which case the Contractor shall complete or correct any and all new items identified on the Supplemental deficiency list within the time period stipulated in paragraph 18.3.
- 21.4 Final Payment of any remaining balance of the Contract Price shall not be due to the Contractor until the Contractor achieves Final Completion of the Project.
- 21.5 The making and acceptance of Final Payment shall constitute a waiver of all claims by the Owner except:
- a) Claims arising from unsettled liens or claims against the Contractor.
 - b) Defective Work or materials appearing after Final Payment.
 - c) Failure of the Contractor to perform the Work in accordance with the Contract Documents.
 - d) As conditioned in the Performance Bond.
 - e) Claims made prior to Final Payment which remain unsettled.
 - f) Amounts due arising under Articles 18 and 28.



GENERAL CONDITIONS OF THE CONTRACT FOR CONSTRUCTION

- g) Claims for recovery of overpayment based upon incorrect measurement, estimate, or certificate.
- 21.6 The making and acceptance of Final Payment shall constitute a waiver of all claims by the Contractor except those claims previously made in writing pursuant to paragraph 15.2 and not finally resolved.
- 21.7 The Designer shall not authorize Final Payment until all of the Work under the Contract Documents has been certified by the Designer as completed, proper and suitable for occupancy and use, and has been approved by all federal, state and local agencies having jurisdiction.
- 21.8 The final Request for Payment shall be identified on its face as such and shall be presented by the Contractor to the Designer within thirty (30) days of completion of the Work. Final payment of the retained amount due the Contractor shall be made by the Owner within thirty (30) days after the later of (i) full and Final Completion of all Work required by the Contract Documents, and certification of such Work in accordance with paragraph 20.4; (ii) submission of the affidavits of other documentation required by Article 22; (iii) submission by the Contractor of a Request for Payment identified on its face as final and including the Designer's certification.

ARTICLE 22. CONTRACTOR, SUBCONTRACTOR AND SUPPLIER AFFIDAVIT

- 22.1 The Final Payment due the Contractor on account of the Contract Documents shall not become due until the Contractor has furnished to the Owner through the Designer: (A) an affidavit by the Contractor signed, sworn, and notarized to the effect that all payments for materials, services, or for any other reason in connection with the Work or performance of the Contract Documents have been satisfied and that no claims or liens exist against the Contractor in connection with the same; (B) affidavits from each Subcontractor and supplier signed, sworn, and notarized to the effect that (i) each such Subcontractor or supplier has been paid in full by the Contractor for all Work performed and/or materials supplied by him in connection with the Project, and (ii) that all payments for materials, services, and for any other reason in connection with the subcontract or supply contract have been satisfied and that no claims or liens exist against the Subcontractor or supplier in connection therewith; and (C) the written consent of the Contractor's sureties to Final Payment. In the event that the Contractor cannot obtain an affidavit, as required above, from any Subcontractor or supplier, the Contractor shall state in the Contractor's affidavit that no claims or liens exist against such Subcontractor or supplier to the best of the Contractor's knowledge, and that if any appear afterwards, the Contractor shall save the Owner harmless for all costs and expenses, including attorneys fees, on account thereof.

ARTICLE 23. ASSIGNMENTS AND SUBCONTRACTS

- 23.1 The Contractor shall not assign any portion of this Agreement nor subcontract the Work in its entirety without the prior written consent of the Owner. Except as may be required under terms of the bonds required by the Contract Documents, no funds or sums of money due or to become due to the Contractor under the Contract Documents may be assigned.



GENERAL CONDITIONS OF THE CONTRACT FOR CONSTRUCTION

ARTICLE 24. MEASUREMENTS

- 24.1 Before ordering material or doing Work which is dependent for proper size or installation upon coordination with building conditions, the Contractor shall verify all dimensions and shall be responsible for the correctness of same. No consideration will be given for any claim based on differences between the actual dimensions and those indicated in the Contract Documents. Any discrepancies between the Contract Documents and the existing conditions shall be referred to the Designer for adjustment before any Work affected thereby is begun.

ARTICLE 25. CONTRACTOR AND SUBCONTRACTOR RELATIONSHIPS

- 25.1 Within thirty (30) days after initial receipt of the Construction Agreement for signatures the Contractor shall submit to the Designer and Owner for acceptance a current list of the names of Subcontractors and such other persons and organizations (including those who are to furnish materials or equipment fabricated to a special design) proposed for any and all portions of the Work. The Contractor shall provide this list at this time even if the Contractor was required to submit a list of proposed Subcontractors with the Contractor's bid. The Designer shall promptly reply to the Contractor in writing stating whether or not the Owner or the Designer, after due investigation, has objection to any such proposed person or entity or if it needs additional information to evaluate the persons on the list. Failure of the Designer to reply within ten (10) days after the Contractor has furnished all required information shall constitute notice of no objection.

The Contractor shall not contract with any such proposed person or entity to whom the Owner or the Designer has made reasonable objection. If the Designer or Owner has reasonable objection to any such proposed person or entity, the Contractor shall submit a substitute to whom the Owner and the Designer have no reasonable objection. The Contractor shall make no substitution for any Subcontractor, person, or entity previously allowed without first notifying the Designer and Owner in writing and no substitution may be made if the Owner or Designer makes a reasonable objection to such substitution.

- 25.2 The Contractor agrees that the terms of the Contract Documents, including all portions thereof, shall apply to all Subcontractors of the Contractor as if they were the Contractor, and that the Subcontractors of the Contractor shall, by means of their subcontracts, be bound by all the terms of the Contract Documents including, but not limited to, Article 26 of these General Conditions.
- 25.3 Payments to Subcontractors shall be made in accordance with the provisions of N.C. Gen. Stat. §143-134.1.

ARTICLE 26. USE OF PREMISES

- 26.1 The Contractor shall confine apparatus, the storage of materials, the operations of workers, and the disposal of material to limits indicated by law, ordinances, permits, and directions of the Designer, if any.
- 26.2 The Contractor shall not load or permit any part of the Work to be loaded with a weight that will endanger its safety, intended performance, or configuration.



GENERAL CONDITIONS OF THE CONTRACT FOR CONSTRUCTION

- 26.3 The Contractor shall enforce all of the Designer's instructions, including, but not limited to, those regarding signs, advertisements, fires, and smoking.

ARTICLE 27. CUTTING, PATCHING AND FITTING

- 27.1 The Contractor shall do all cutting, fitting, and patching of the Work that may be required to make its several parts come together properly and fit it to receive or to be received by Work shown in or which can be reasonably implied from the Contract Documents.

ARTICLE 28. DISPUTE RESOLUTION

- 28.1 The laws of the State of North Carolina shall apply to the interpretation and enforcement of this Agreement. Any and all suits or actions to enforce, interpret, or seek damages with respect to any provision of, or the performance or nonperformance of, this Agreement shall be brought in the General Court of Justice of North Carolina sitting in Wake County, North Carolina, and it is agreed by the parties that no other court shall have jurisdiction or venue with respect to such suits or actions. Appendix A shall be a part of the Contract Documents. Prior to initiating an action under this Article, any party to this Agreement shall initiate the mediation process as provided in Appendix A to these General Conditions of the Contract for Construction.

- 28.2 Any person or firm that expressly or impliedly agrees to perform labor or services or to provide material, supplies, equipment, work, performance or payment bonds, insurance or indemnification for the construction of the Project or the Work shall be deemed a party to this Agreement solely for the purpose of this Article 28. The Contractor, by means of its subcontracts, shall specifically require its Subcontractors to be bound by this Article.

ARTICLE 29. TAXES

- 29.1 The Contractor has included in the Contract Price and shall pay all taxes assessed by any authority on the Work or the labor and materials used therein. The Contractor shall maintain all tax records during the life of the Project and furnish the Owner with a complete listing of all taxes paid by taxing authority, invoice number, date, amount, etc. in a form acceptable to the Owner. The Contractor is required to maintain a file showing taxes paid on the Project for three (3) years after Final Payment or turn said documents over to the Owner for his files.

- 29.2 The following is a list of requirements to be followed by the Contractor in maintaining proper records and reporting the North Carolina Sales and Use Tax and Local Sales and Use Tax. The Contractor shall comply fully with the requirements outlined below, in order that the Owner may recover the amount of the tax permitted under the law.
- a) It shall be the Contractor's responsibility to furnish the Owner documentary evidence showing the materials used and sales and use tax paid by the Contractor and each of his Subcontractors. Such evidence shall be transmitted to the Owner with each pay request irregardless of whether taxes were paid in that period.



GENERAL CONDITIONS OF THE CONTRACT FOR CONSTRUCTION

- b) The documentary evidence shall consist of a certified statement by the Contractor and each of the Contractor's Subcontractors individually, showing total purchases of materials from each separate vendor and total sales and use taxes paid to each vendor. Certified statements must show the invoice number, or numbers, covered, and inclusive dates of such invoices.
- c) Materials used from Contractor's or Subcontractor's warehouse stock shall be shown in a certified statement at warehouse stock prices.
- d) The Contractor shall not be required to certify the Subcontractor's statements.

ARTICLE 30. OPERATION OF OWNER'S FACILITIES

- 30.1 The Contractor agrees that all Work done under the Contract Documents shall be carried on in such a manner so as to ensure the regular and continuous operation of the adjoining or adjacent facilities. The Contractor further agrees that the sequence of operations under the Contract Documents shall be scheduled and carried out so as to ensure said regular and continuous operation. The Contractor shall not close any areas of construction until so authorized by the Designer. The Contractor shall control operations to assure the least inconvenience to the public. Under all circumstances, safety shall be the most important consideration.

ARTICLE 31. THIRD PARTY BENEFICIARY CLAUSE

- 31.1 It is specifically agreed between the parties executing the Agreement that, with the specific exception set forth paragraph 7.24 hereof, and that exception only, the Contract Documents and the provisions therein are not intended to make the public, or any member thereof, a third-party beneficiary of the Agreement, or to authorize anyone not a party to the Contract Documents to maintain a suit for personal injuries or property damage pursuant to the terms of provisions of the Contract Documents.

ARTICLE 32. MEASUREMENT OF QUANTITIES

- 32.1 All Work completed under the Contract Documents shall be measured by the Contractor using United States customary units of measurement. The method of measurement and computations to be used in determination of quantities of material furnished and of Work performed under the Contract Documents shall be those methods set forth in the Contract Documents or, if not specifically set forth therein, the method generally recognized as conforming to good engineering practice.

ARTICLE 33. TERMINATION BY THE OWNER FOR CAUSE

- 33.1 If the Contractor fails to begin or complete the Work under the Contract Documents within the time specified, or fails to perform the Work with sufficient labor and equipment or with sufficient materials to insure the prompt completion of said Work, or shall perform the Work unsuitably or shall discontinue the prosecution of the Work for three (3) days, or if the Contractor shall become insolvent, be declared bankrupt, commit any act of bankruptcy or insolvency, allow any final judgment to stand against the Contractor or its affiliated



GENERAL CONDITIONS OF THE CONTRACT FOR CONSTRUCTION

companies unsatisfied for a period of forty-eight (48) hours, make an assignment for the benefit of creditors, or for any other cause whatsoever shall not carry on the Work in an acceptable manner, the Owner may give notice in writing to the Contractor and the Contractor's sureties of such delay, neglect, or default, specifying the same, and if the Contractor within a period of three (3) days after such notice shall not proceed in good faith and with reasonable speed to correct such delay, neglect, or default in accordance with such notice, the Owner shall have full power and authority, to the extent permitted by law, without violating the Contract Documents, to take the prosecution of the Work out of the hands of the Contractor, to appropriate or use any or all materials and equipment at the Project as may be suitable and acceptable, and may enter into an agreement for the completion of the Work or pursue such other methods as in the Owner's opinion shall be necessary or appropriate for the completion of the Work in an acceptable manner. All costs and charges incurred by the Owner in proceeding in accordance with the preceding sentence, including attorney's fees, and all costs incurred by the Owner in completing the Work shall be deducted from any money due or which becomes due the Contractor. If such costs and expenses incurred by the Owner shall be less than the sum which would have been payable under Contract Documents if it had been completed by the Contractor, then the Contractor shall be entitled to receive the difference, but if such costs and expenses shall exceed the sum which would have been payable under the Contract Documents, the Contractor and the Contractor's surety shall be liable to the Owner for and shall pay to the Owner the amount of such excess.

ARTICLE 34. TERMINATION OR SUSPENSION BY THE OWNER FOR CONVENIENCE

- 34.1 The Owner may, without cause, order the Contractor to terminate, suspend, delay, or interrupt the Work in whole or in part for such period of time as the Owner may determine.
- 34.2 If the Contractor is subsequently ordered by the Owner to resume the Work, any cost or expenses to which the Contractor may be entitled by reason of the suspension, delay, or interruption shall be recovered by means of a Change Order in accordance with Articles 13 and 14 hereof and the Contract Construction Schedule shall be adjusted in accordance with Article 13 hereof.
- 34.3 The Owner shall terminate the Work or portion thereof by written notice when the Contractor is prevented from proceeding with the Work as a direct result of an executive order of the President with respect to the prosecution of war or in the interest of national defense.
- 34.4 In the event of termination by the Owner under this Article, the Contractor shall be entitled to receive the reasonable and documented direct costs incurred prior to termination, including the cost of materials purchased for the Work which purchases cannot be canceled or which material cannot reasonably be used by the Contractor on other work, and the cost of closing down the Project in a safe and efficient manner, plus ten percent (10%) thereof for overhead and profit, subject to the following conditions:
- a) When the Contract is terminated before completion of all items of Work, payment shall be made for the actual number of units or items of Work completed at the applicable contract prices, or as mutually agreed for items of Work partially complete. If a mutual agreement cannot be reached, the Owner shall have the



GENERAL CONDITIONS OF THE CONTRACT FOR CONSTRUCTION

authority to make such equitable adjustment as it deems warranted and the Final Payment shall be made accordingly.

- b) Reimbursement for organization of any Work and moving equipment to and from the job shall be considered when not otherwise provided for in the Contract Documents where the volume of completed Work is too small to compensate the Contractor for those expenses under unit prices. If a mutual agreement cannot be reached, the Owner will have the authority to make such equitable adjustments as it deems warranted and the Final Payment will be made accordingly.
- c) Materials obtained by the Contractor for the Work that have been inspected and accepted by the Designer and that are not incorporated in the Work shall, at the request of the Contractor, be purchased from the Contractor at the Contractor's actual cost as shown by receipted bills and actual costs records at such points of delivery as may be determined by the Owner.
- d) No payment shall be made by Owner to Contractor except as herein above provided. No claim for loss of anticipated profits shall be considered or allowed.
- e) Termination of the Contract shall not relieve the Contractor of his responsibilities for any completed portion of the Work nor shall it relieve his sureties of their obligation for and concerning any just claims arising out of the Work performed.

The Contractor shall not be entitled to any other compensation, including compensation for lost profit, lost opportunity, or any other direct or consequential cost, loss, or damage.

ARTICLE 35. MINORITY BUSINESS ENTERPRISE PROGRAM

- 35.1 The Contractor shall at all times comply with the latest edition of the Wake County Minority Business Enterprise Policy. All documentation substantiating compliance with the requirements of this program shall be delivered to the Owner as stipulated in the Contract Documents. A copy of the Wake County Minority Business Enterprise Policy is included in the Project Manual.

ARTICLE 36. GENERAL

- 36.1 If any provision of the Agreement shall be declared invalid or unenforceable, the remainder of the Agreement shall continue in full force and effect.
- 36.2 The titles to Articles herein are for convenience only, are not substantive parts of the General Conditions, and are not to be considered in interpreting the Contract Documents.

END OF GENERAL CONDITIONS OF THE
CONTRACT FOR CONSTRUCTION

**COUNTY OF WAKE
BOARD OF ELECTIONS STORAGE MEZZANINE**

TYPICAL SUPPLEMENTARY GENERAL CONDITIONS

GENERAL

These Supplementary Conditions contain changes and additions to the project "GENERAL CONDITIONS OF THE CONTRACT FOR CONSTRUCTION", as published herein. Where any Article of the General Conditions is modified or any Paragraph, Subparagraph or Clause thereof is modified or deleted by these Supplementary Conditions, the unaltered provisions of the Article, Paragraph, Subparagraph or Clause shall remain in effect.

ARTICLE 1 - DEFINITIONS

Paragraph 1.13: At the end of the existing paragraph, add the following:

The Contract Time is 180 consecutive calendar days, beginning on the Date of Commencement as specified in the written Notice-to-Proceed.

A maximum of the first 132 calendar days following the Notice-To-Proceed will be devoted to submittals, required paperwork, materials procurement, and Staff move-out of the building.

On-site construction activities will commence no later than June 2, 2025.

Contractor will purchase and store materials in secure bonded location until on-site construction activities commence.

The actual construction period is 48 calendar days following the initial 132 calendar days. All on-site construction work must be completed within 48 calendar days. Final Completion will be 30 calendar days from Substantial Completion.

Paragraph 1.18: Delete the last sentence in its entirety and substitute the following in lieu thereof:

“A list of the Drawings is contained in the “Supplementary General Conditions.”

The Drawings applicable to this Contract are as follows:

G001 - COVER
G002 - CODE SUMMARY
G101 - LIFE SAFETY PLANS
S001 - GENERAL NOTES
S002 - GENERAL NOTES
S111 - FOUNDATION AND SLAB-ON-GRADE PLAN

**COUNTY OF WAKE
BOARD OF ELECTIONS STORAGE MEZZANINE**

S121 - MEZZANINE FRAMING PLAN
S122 - MEZZANINE SLAB PLAN
S301 - SECTIONS
S501 - TYPICAL DETAILS
S502 - TYPICAL DETAILS
S503 - TYPICAL DETAILS
A101 - DEMOLITION PLANS
A102 - FLOOR PLANS
A103 - MEZZANINE PLANS
A104 - MEZZANINE CEILING PLAN
A201 - ELEVATION & 3D VIEWS
A411 - ENLARGED PLANS, SECTIONS, & DETAILS
FP001 - FIRE PROTECTION COVER
FP101 - FIRE PROTECTION PLANS
ME101 - MECHANICAL & ELECTRICAL DEMOLITION PLANS
E001 - ELECTRICAL COVER
E100 - ELECTRICAL PLANS
E200 - ELECTRICAL PLANS
E400 – ELECTRICAL SINGLE LINE
E401 – PANEL SCHEDULES
FA100 - FIRE ALARM PLANS
FA200 - FIRE ALARM PLANS
FA400 – FIRE ALARM RISER AND MATRIX

ARTICLE 3. FAMILIARITY WITH WORK, CONDITIONS AND LAWS

Paragraph 3.3: At the end of the existing paragraph, add the following paragraph:

“To ensure compliance with the E-Verify requirements of the General Statutes of North Carolina, all contractors, including any subcontractors employed by the contractor(s), by submitting a bid, proposal or any other response, or by providing any material, equipment, supplies, services, etc., attest and affirm that they are aware and in full compliance with Article 2 of Chapter 64, (NCGS64-26(a)) relating to the E-Verify requirements.”

“By signing this agreement; accepting this contract/purchase order; or submitting any bid, proposal, etc., vendors and contractors certify that as of the date of execution, receipt, or submission they are not listed on the Final Divestment List created by the NC Office of State Treasurer pursuant to NCGS 147 Article 6E, Iran Divestment Act, Iran Divestment Act Certification. Vendors and contractors shall not utilize any subcontractor that is identified on the Final Divestment List.”

“Any organization defined under NCGS 147-86.80(2), Divestment from Companies Boycotting Israel, shall not engage in business totaling more than \$1,000 with any company/business, etc. that boycotts Israel. A list of companies

COUNTY OF WAKE
BOARD OF ELECTIONS STORAGE MEZZANINE

that boycott Israel is maintained by the NC Office of State Treasurer, pursuant to NCGS 147-86.81(a)(1). Any company listed as boycotting Israel is not eligible to do business with any State agency or political subdivision of the State.”

“If the source of funds for this contract is federal funds, the following federal provisions apply pursuant to 2 C.F.R. § 200.326 and 2 C.F.R. Part 200, Appendix II (as applicable): Equal Employment Opportunity (41 C.F.R. Part 60); Davis-Bacon Act (40 U.S.C. 3141-3148); Copeland “Anti-Kickback” Act (40 U.S.C. 3145); Contract Work Hours and Safety Standards Act (40 U.S.C. 3701- 3708); Clean Air Act (42 U.S.C. 7401-7671q.) and the Federal Water Pollution Control Act (33 U.S.C. 1251-1387); Debarment and Suspension (Executive Orders 12549 and 12689); Byrd Anti-Lobbying Amendment (31 U.S.C. 1352); Procurement of Recovered Materials (2 C.F.R. § 200.322); and Record Retention Requirements (2 CFR § 200.324).”

“In consideration of signing this Agreement, the Parties hereby agree not to discriminate in any manner on the basis of race, natural hair or hairstyles, ethnicity, creed, color, sex, pregnancy, marital or familial status, sexual orientation, gender identity or expression, national origin or ancestry, marital or familial status, pregnancy, National Guard or veteran status, religious belief or non-belief, age, or disability with reference to the subject matter of this Contract. The Parties agree to comply with the provisions and intent of Wake County Ordinance SL 2017-4. This anti-discrimination provision shall be binding on the successors and assigns of the Parties with reference to the subject matter of this Contract.”

Add the following paragraph:

- “3.5 A **non-mandatory** Pre-Bid Conference will be held at 1200 N. New Hope Rd. Raleigh, NC 27610 at 9:00am, local prevailing time, on Tuesday, December 3, 2024. Purpose of conference is for prospective Bidders to familiarize themselves with the site and to ask questions pertaining to the Contract Documents. Bidders are reminded that no oral interpretations of meaning of Drawings and Specifications can be made. Conflicts in documents, if any, will be resolved by written addendum. (Reference “Instructions to Bidders, Paragraph 5 (for formal).”

**COUNTY OF WAKE
BOARD OF ELECTIONS STORAGE MEZZANINE**

ARTICLE 5. INSURANCE AND INDEMNITY

Paragraph 5.1.2: In addition to all other endorsements required by the General Conditions, if the Contractor is required to transport, dispose of or otherwise handle hazardous or toxic waste, material, chemicals, compounds or substances, the policy of insurance shall be further endorsed to include the following:

Insurance Service Office (ISO) Form #CA 00 01 06 92 or its equivalent, amending exclusion 11 in the following manner:

- i. Delete section a. (1) a.: (Pollution) "being transported or towed by, or handled for movement into, onto or from, the covered auto."
- ii. Delete section a. (1) b.: "Otherwise in the course of transit by the insured."

The Contractor and transporter must comply with all applicable DOT and EPA requirements.

Paragraph 5.1.4: Add the following Paragraph [as necessary if the Contractor or its Subcontractor is required to consolidate, transfer, transport, dispose of, store or otherwise handle hazardous or toxic waste, material, chemicals, compounds or substances at any location]:

"Pollution Legal Liability (PLL)

A PLL policy must be provided for the Project. Coverage must be sudden and non-sudden, and include:

- a) Bodily injury, sickness, disease, mental anguish, or shock sustained by any person, including death;
- b) property damage including physical injury to or destruction of tangible property including the resulting loss of use thereof, cleanup costs, and the loss of use of tangible property that has not been physically injured or destroyed; and
- c) Defense including costs, charges, and expenses incurred in the investigation, adjustment, or defense of claims for such compensatory damages.

The Owner must be named as Additional Insured, and a Non-Owned Disposal Site Endorsement must be provided, scheduling the appropriate landfill.

**COUNTY OF WAKE
BOARD OF ELECTIONS STORAGE MEZZANINE**

Minimum PLL limits of coverage shall be:

Per Loss	\$1,000,000
All Losses	\$2,000,000

ARTICLE 6. OTHER RECORD DOCUMENTS AND SUBMITTALS

Paragraph 6.1: At the end of the existing paragraph, add the following:

“Two (2) copies of the Contract Documents will be furnished to the General Contractor.”

Paragraph 6.6: Special requirements for submittal and record document media: Submittals and record documents shall be in electronic media.

ARTICLE 7. CONTRACTOR

Paragraph 7.13: Amend with the addition of the following paragraph:

“The General Contractor shall secure and pay for all building permits, including plumbing, electrical, HVAC and for the permit from the office of the Fire Marshall. The Cost for the Express Permit Review, if necessary, will be paid by others and is not the responsibility of the Contractor.”

ARTICLE 10. DESIGNER

Add the following paragraphs:

“10.5 As a part of its Basic Services under the Owner-Designer Agreement, the Designer will conduct a single site visit to determine Substantial Completion of the Work. If, after the performance of said site visit, the Designer determines that the Work is not substantially complete, successive site visits to determine Substantial Completion will be deemed Additional Services under the Owner-Designer Agreement. The Contractor shall be liable to the Owner for any Designer’s fees incurred as a result of any such Additional Services of the Designer. Any funds due under this paragraph may be deducted by the Owner from the amounts due the Contractor for such additional Designer’s fees and paid directly to the Designer. Should the cost for such Additional Services of the Designer exceed the amount due or to become due to the Contractor, then the Contractor and his sureties shall be liable for and shall pay to the Owner the amount of any such excess.

“10.6 As a part of its Basic Services under the Owner-Designer Agreement, the Designer will conduct a single site visit to determine Final Completion of the Work. If, after the performance of said site visit, the Designer determines that the Work is not complete,

**COUNTY OF WAKE
BOARD OF ELECTIONS STORAGE MEZZANINE**

successive site visits to determine Final Completion of the Work will be deemed Additional Services under the Owner-Designer Agreement. The Contractor shall be liable to the Owner for any Designer's fees incurred as a result of any such Additional Services of the Designer. Any funds due under this paragraph may be deducted by the Owner from the amounts due the Contractor for such additional Designer's fees and paid directly to the Designer. Should the cost for such Additional Services of the Designer exceed the amount due or to become due to the Contractor, then the Contractor and his sureties shall be liable for and shall pay to the Owner the amount of any such excess."

ARTICLE 13 - CONTRACT TIME

Paragraph 13.18: Add the following:

"If the Contractor fails to achieve Substantial Completion of the Work within the Contract Time and as otherwise required by the Contract Documents, the Owner shall be entitled to retain or recover from the Contractor, as Step One Liquidated Damages and not as a penalty, the following per diem amount commencing upon the first day following expiration of the Contract Time and continuing until the actual date of Substantial Completion. Such liquidated damages are hereby agreed to be a reasonable pre-estimate of damages the Owner will incur as a result of delayed Substantial Completion of the Work:

Five Hundred Dollars (\$500) per consecutive calendar day

If the Contractor fails to achieve Final Completion of the Work within thirty (30) consecutive calendar days of the actual date of Substantial Completion of the Work, the Owner shall be entitled to retain or recover from the Contractor, as Step Two Liquidated Damages and not as a penalty, the following per diem amount commencing upon the first day following the actual date of Substantial Completion and continuing until the actual date of Final Completion. Such liquidated damages are hereby agreed to be a reasonable pre-estimate of damages the Owner will incur as a result of delayed Final Completion of the Work:

Two Hundred Fifty Dollars (\$250) per consecutive calendar day

The Owner may deduct liquidated damages described above from any unpaid amounts then or thereafter due the Contractor under this Agreement. Should the amount of any liquidated damages exceed the amount due or to become due to the Contractor, then the Contractor and his sureties shall be liable for and shall pay to the Owner the amount of any such excess."

**COUNTY OF WAKE
BOARD OF ELECTIONS STORAGE MEZZANINE**

ARTICLE 29 – TAXES

Paragraph 29.1: Add the following to the existing paragraph:

“The Contractor is to use the Sales Tax Reporting Form attached to the contract documents for reporting taxes paid.

Add the following paragraph under Article 29

29.3 This project is considered a “Capital Improvement” with respect to Real Property Contracts, and the collection of State sales and use tax, as referenced in North Carolina General Statutes and further clarified in sales and use tax bulletins issued by the North Carolina Department of Revenue. It shall be the responsibility of the Contractor to issue any affidavits of capital improvement to their subcontractors as necessary.

ARTICLE 36. GENERAL

Add the following paragraph:

“36.3 Any specific requirement in this Contract that the responsibilities or obligations of the Contractor also apply to a Subcontractor is added for emphasis and is also hereby deemed to include a Subcontractor of any tier. The omission of a reference to a Subcontractor in connection with any of the Contractor’s responsibilities or obligations shall not be construed to diminish, abrogate, or limit any responsibilities or obligations of a Subcontractor of any tier under the Contract Documents or the applicable subcontract.”

END OF SUPPLEMENTARY GENERAL CONDITIONS

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**APPENDIX A
TO GENERAL CONDITIONS OF THE CONTRACT FOR CONSTRUCTION**

**DISPUTE RESOLUTION PROCEDURES FOR WAKE COUNTY BUILDING CONSTRUCTION
RENOVATION AND REPAIR PROJECTS**

Table of Rules

Rule

- 1. Initiating Mediated Settlement Conferences**
 - A. Purpose of Mandatory Settlement Conferences
 - B. Initiating the Dispute Resolution Process

- 2. Selection of Mediator**
 - A. Mediator Listing
 - B. Selection of Mediator
 - C. Disqualification of Mediator

- 3. The Mediated Settlement Conference**
 - A. Where Conference is to be Held
 - B. When Conference is to be Held
 - C. Request to Modify Deadline for Completion
 - D. Recesses
 - E. Project Delay

- 4. Duties of Parties and Other Participants in Formal Dispute Resolution Process**
 - A. Attendance
 - B. Finalizing Agreement
 - C. Payment of Mediation Fee
 - D. Failure to Compensate Mediator

- 5. Authority and Duties of Mediators**
 - A. Authority of Mediator
 - B. Duties of Mediator

- 6. Compensation of the Mediator**

- 7. Rule Making**

- 8. Definitions**

- 9. Time Limits**

RULE 1 INITIATING MEDIATED SETTLEMENT CONFERENCES

A Purpose of Mandatory Settlement Conferences. Pursuant to G.S. §143-128(f1) and 143-135.26(11), these Rules are promulgated to implement a mediated settlement program designed to focus the parties’ attention on settlement rather than on claim preparation and to provide an opportunity for orderly settlement negotiations to take place. Nothing herein is intended to limit or prevent the parties from engaging in settlement procedures voluntarily at any time prior to or during commencement of the dispute resolution process.

B Initiating the Dispute Resolution Process

Any party to a County public construction contract (referred to herein generally as the “Contract”) governed by Article 8. Ch. 143 of the General Statutes and identified in G.S. § 143-128(f1) and who is a party to a dispute arising out of the Contract and the construction process in which the amount in controversy is at least \$15,000 may submit a written request to the County for mediation of the dispute.

Prior to submission of a written request for mediation to the County, the parties should give notice of any and all claims in accordance with their respective contracts, obtain decisions on the claims as required or allowed by their respective contracts, and attempt to resolve the dispute according to the terms and conditions in their respective contracts. The Mediator may adjourn any mediated settlement conference if the Mediator believes, in his or her sole discretion, that the parties have not satisfied all of the terms and conditions of their respective contracts and that doing so will enhance the prospects for a negotiated settlement.

C Condition Precedent to Litigation. Before any party to a Contract may commence a civil action against the County seeking remedies for breach or non-performance of the Contract by the County, said party must first initiate the dispute resolution process under these rules and attend the mediated settlement conference.

RULE 2 SELECTION OF MEDIATOR

A Mediator Listing. A list of Mediators acceptable to the County is attached to and incorporated by reference into these Rules. The party requesting mediation shall select a Mediator from the designated list. If the County fails to provide a list of acceptable mediators, the list of Mediators shall be deemed to be the list of mediators certified by the North Carolina Dispute Resolution Commission to conduct mediated settlement conferences in the North Carolina Superior Courts.

B Selection of a Mediator. The party requesting mediation shall select a Mediator from the County’s list of Mediators and shall file, with the County, a Notice of Selection of Mediator within 21 days of the request for mediation. Such notice shall state the name, address, and phone number of the Mediator selected. If the Mediator selected is not available or declines to participate for any reason, the requesting party shall select

another person from the County's list of Mediators. If the party requesting mediation does not select and designate a mediator within 21 days of the request for mediation, the County shall have the right in its absolute discretion to appoint a mediator from its list of Mediators.

- C Disqualification of Mediator.** Any party may request replacement of the Mediator for good cause. Nothing in this provision shall preclude Mediators from disqualifying themselves.

RULE 3 THE MEDIATED SETTLEMENT CONFERENCE

- A Where Conference is to be Held.** Unless all parties and the Mediator otherwise agree, the mediated settlement conference shall be held in Wake County. The Mediator shall be responsible for reserving a place, making arrangements for the conference, and giving timely notice of the time and location of the conference to all attorneys, unrepresented parties and other persons or entities required to attend.

- B When Conference is to be Held.** The mediation shall be completed within 90 days after selection of the Mediator.

- C Request to Accelerate or Extend Deadline for Completion.** Any party or the Mediator may request the County to accelerate or extend the deadline for completion of the conference. Such request shall state the reasons the extension is sought and shall be served by the moving party upon the other parties and the Mediator. Objections to the request must be promptly communicated to the County and to the Mediator.

The County, with the concurrence of the designated Mediator, may grant the request by adjusting the time for completion of the conference.

- D Recesses.** The Mediator may recess the mediation conference at any time and may set times for reconvening. If the Mediator determines the time and place where the conference is to reconvene before the conference is recessed, no further notice is required to persons present at the conference.

- E Project Delay.** The mediated settlement conference that results from a construction contract dispute shall not be cause for the delay of the construction project.

RULE 4 DUTIES OF PARTIES AND OTHER PARTICIPANTS IN FORMAL DISPUTE RESOLUTION PROCESS

- A Attendance**

1. All parties to the dispute must designate an official representative to attend the mediation.

2. "Attendance" means physical attendance, not by telephone or other electronic means. Any attendee representing a party must have authority from that party to bind it to any agreement reached as a result of the mediation.
3. Attorneys representing parties may attend the mediation, but are not required to do so.
4. Sureties and insurance company representatives are required to physically attend the mediation unless the Mediator and all of the other parties to the mediation excuse their attendance or consent to their attendance by telephone or other electronic means.
5. The parties who attend a duly scheduled mediation conference shall have the right to recover their share of the Mediator's compensation from any party or parties who fail to attend the conference without good cause.

B Finalizing Agreement. If an agreement is reached in the conference, the terms of the agreement shall be confirmed in writing and signed by all parties.

C Mediation Fees charged by the Mediator shall be paid in accordance with G.S. § 143-128(f1).

D Failure to compensate Mediator. Any party's failure to compensate the Mediators in accordance with G.S. § 143-128(f1) shall subject that party to a withholding of said amount of money from the party's monthly payment by the County.

Should the County fail to compensate the Mediator, it shall hereby be subject to a civil cause of action from the Mediator for the 1/3 portion of the Mediator's total fee as required by G.S. § 143-128(f1).

RULE 5 AUTHORITY AND DUTIES OF MEDIATORS

A Authority of Mediator

1. **Control of Conference.** The Mediator shall at all times be in control of the conference and the procedures to be followed.
2. **Private Consultation.** The Mediator may communicate privately with any participant or counsel prior to and during the conference. The fact that private communications have occurred with a participant shall be disclosed to all other participants at the beginning of the conference.
3. **Scheduling the Conference.** The Mediator shall make a good faith effort to schedule the conference at a time that is convenient with the participants, attorneys and Mediator. In the absence of agreement, the Mediator shall select the date for the conference.

4. Determining good cause for a party's failure to appear at a scheduled mediation conference.

B Duties of Mediator

1. The Mediator shall define and describe the following at the beginning of the conference:
 - a. The process of mediation.
 - b. The difference between mediation and other forms of conflict resolution.
 - c. The costs of the mediated settlement conference.
 - d. That the mediated settlement conference is not a trial, the Mediator is not a judge, and the parties retain their legal rights if they do not reach settlement; however, the Mediator will advise all parties that failure to appear at mediation without good cause may result in imposition of sanctions and may be asserted as a bar to lawsuits by claimants who have failed to exhaust this administrative remedy.
 - e. The circumstances under which the Mediator may meet and communicate privately with any of the parties or with any other person.
 - f. Whether and under what conditions communications with the Mediator will be held in confidence during the conference.
 - g. The inadmissibility of conduct and statements as provided by GS §7A-38.1(1).
 - h. The duties and responsibilities of the Mediator and the participants.
 - i. That any agreement reached will be reached by mutual consent.
2. Disclosure: The Mediator has a duty to be impartial and to advise all participants of any possible bias, prejudice or partiality.
3. Declaring Impasse: The Mediator may determine at any time during the mediation conference that an impasse exists and that the conference should end.
4. Reporting Results of Conference. The Mediator shall submit a written report to the County and the other parties within 10 days of the conference stating whether or not the parties reached an agreement. The Mediator's report shall indicate the absence of any party from the mediated settlement conference without permission or good cause.
5. Scheduling and Holding the Conference. It is the duty of the Mediator to schedule the conference and conduct it prior to the deadline of completion set by the rules. The Mediator shall strictly observe deadlines for completion of the conference unless said time limit is changed by agreement of the parties.

RULE 6 COMPENSATION OF THE MEDIATOR

- A The parties shall compensate the Mediator for mediation services at the rate proposed by the Mediator and agreed to by the parties at the time the Mediator is selected.

RULE 7 RULE MAKING

- A These Rules may be amended by the County at any time. Amendments will not affect mediations where claims and/or requests for mediation have been filed at the time the amendment takes effect

RULE 8 DEFINITIONS

- A “County” shall mean the County of Wake, North Carolina
- B “Project Designer” is that person or firm stipulated as project designer in the Contract Documents for the project.
- C “Claim” is a demand or assertion by a party seeking adjustment or interpretation of Contract terms, payment of money, extension of time or other relief with respect to the terms of the Contract. The term “Claim” also includes other disputes and matters in question between the parties to a Contract involved in the County’s building construction renovation and repair projects arising out of or relating to the Contract or the construction process. Claims must be initiated by a written notice. The responsibility to substantiate Claims shall rest with the party making the Claim.
- D “Good Cause” generally includes any circumstance beyond the control of a party, which prevents that party from meeting obligations. When good cause is asserted as an excuse for a party’s failure to appear at a mediation conference or to otherwise comply with the requirements of these Rules, the Mediator, in his or her sole discretion, will determine whether good cause exists to excuse the party’s failure to appear or otherwise comply with these rules.

RULE 9 TIME LIMITS

- A Any time limit provided for by these Rules may be waived or extended at the sole discretion of the County if no Mediator has been selected and at the discretion of the County with concurrence of the Mediator if a Mediator has been selected.

MEDIATOR LIST

Name	Bar #	Address	Phone	Fax	Email
David M. Barnes	12854	PO Box 10096 Raleigh, NC 27605	919-783-2812	919-783-1075	dmbarnes@poynerspruill.com
Robert Beason	5502	PO Box 52270 Durham, NC 27717	919-419-8979	919-403-8533	rbeason@beasonellis.com
William A. Blancato	12729	633 W. 4 TH Street, Suite 150 Winston-Salem, NC 27101	336-725-9416	336-725-5129	blancato@bdl-law.com
Richard T. Boyette	7623	PO Box 27808 Raleigh, NC 27611	919-828-5100	919-828-2277	rtb@cshlaw.com
Jacqueline R. Clare	10277	1011 Vance Street Raleigh, NC 27608	919-755-9979	919-755-9512	jclare@mindspring.com
Thomas C. Duncan	1255	PO Box 989 Greensboro, NC 27402	910-379-1390	910-379-1198	duncan@hillefans.com
Sidney Smith Eagles	1271	PO Box 27525 Raleigh, NC 27611	919-755-8771	919-755-8800	sid.eagles@smithmoorelaw.com
Rene Stemple Ellis	DC/P A	PO Box 52270 Durham, NC 27712	919-417-9979	919-403-8533	rellis@beasonellis.com
Marshall Gallop	6626	PO Box 7100 Rocky Mount, NC 27804	252-937-2200	252-937-8100	mgallop@bws.com
Allen Holt Gwyn		PO Box 20744 Greensboro, NC 27420	336-691-9222	336-691-9259	ahgwyn@cgspllc.com
Jonathan R. Harkavy	5238	PO Box 29269 Greensboro, NC 27429	336-370-4200	336-274-8490	jharkavy@aol.com
Joseph R. John	2361	11800 Black Horse Run Raleigh, NC 27613	919-676-8796	919-676-8796	jo638sr@aol.com
J. Anderson Little	6730	PO Box 16205 Chapel Hill, NC 27514	919-967-6611	919-967-3212	jandersonlittle@nc.rr.com
James D. Llewellyn	2732	PO Box 567 Atlantic Beach, NC 28512	252-559-2714	252-726-1973	judgelew@embarqmail.com

Name	Bar #	Address	Phone	Fax	Email
Charles K. McCotter		PO Box 12800 Newbern, NC 28561-2800	252-635-1005	252-635-5050	ckm@justice.com
Peter M. McHugh	6269	915 Country Club Drive Reidsville, NC 27320	336-361-9557	336-361-9569	pmchugh@triad.rr.com
Charles E. Nichols	10448	PO Box 20389 Raleigh, NC 27619-0389	919-787-8800	919-781-0811	nichols@manningfulton.com
Jeffrey B. Parsons	16006	PO Box 30933 Raleigh, NC 27622	919-789-9242	919-789-9242	jparsons@cgspllc.com
J. Dickson Phillips	8941	PO Drawer 4825 Chapel Hill, NC 27515	919-967-8989	919-419-1429	dphillips@lapgh.com
Lacy M. Presnell	7272	PO Box 10867 Raleigh, NC 27605	919-782-1441	919-782-2311	lpresnell@bdppa.com
John L. Shaw	3950	PO Box 10096 Raleigh, NC 27605	919-783-6400	919-783-1075	jshaw@poynerspruill.com
Edwin M. Speas	4112	PO Box 10096 Raleigh, NC 27607	919-783-6400	919-783-1075	espeas@poynerspruill.com
Odes L. Stroupe	4983	3105 Glenwood Ave., Suite 300 Raleigh, NC 27612	919-881-0338	919-881-9548	stroupe@bcs-law.com
Arthur A. Vreeland	6899	4 Parkmont Court Greensboro, NC 27408	336-288-7500	336-288-7500	aavreeland@aol.com
Charles P. Younce	4891	PO Box 3486 Greensboro, NC 27402	336-379-0123	336-379-9894	cyounce@jymmlaw.com
Julia F. Youngman	21320	PO Box 33550 Raleigh, NC 27636	919-865-7000	919-865-7010	julie_youngman@elliswinters.com

APPENDIX B
CONTRACTOR'S SALES TAX REPORT
N.C. STATE & LOCAL SALES TAXES PAID

OWNER: _____
CONTRACTOR: _____
ADDRESS: _____

PROJECT: _____
FOR PERIOD: _____
TO: _____

VENDOR	MATERIAL PURCHASED	ADDRESS	INVOICE NUMBER	DATE	INVOICE SUBTOTAL	N.C. TAX	COUNTY TAX	TRANSIT TAX	NAME OF COUNTY WHERE GOODS WERE RECEIVED

TOTALS _____

I hereby certify that, during the period stated above, North Carolina sales and use taxes were paid as listed above, with respect to building materials, supplies, fixtures, and equipment which have become a part of, or annexed to, a building or structure erected, altered or repaired for the County of Wake, and that the vendors from whom the property was purchased, the dates and numbers of the invoices covering the purchases, the total amount of the invoices of each vendor, the North Carolina sales and use taxes paid thereon, and the cost of property withdrawn from warehouse stock and North Carolina sales or use taxes paid thereon are as set forth above.

Sworn to and Subscribed before me, this _____ day of _____, 20__.

By: _____

_____ Notary

My Commission expires _____.

Title: _____

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Facilities Design & Construction

☎ 919 856 6350
☎ 919 856 6355

Waverly F. Akins Wake County Office Building
P.O. Box 550 • Raleigh, NC 27602
336 Fayetteville St., Room 1100 • Raleigh, NC 27601
wake.gov

Notice of Wake County Electronic Contracting Processes for Construction Agreements

All Wake County contracts are now executed and processed electronically. The successful lowest responsive responsible bidder upon award of the construction contract must be a registered Wake County vendor to start the electronic contract process. Any company not registered as a Wake County vendor must register. The County will contact the low bidder and offer instructions on how to register as a vendor or update their existing vendor registration info if needed.

Upon notification of contract award, contractor will be issued instructions for processing Performance and Payment Bonds, Certificates of Insurance, and issuance of the Construction Agreement

Contracts will then be transmitted via DocuSign for signing, attesting, and execution.

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SECTION 011000 - SUMMARY

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Project information.
2. Work covered by Contract Documents.
3. Work under Owner's separate contracts.
4. Contractor's use of site and premises.
5. Coordination with occupants.
6. Work restrictions.
7. Specification and Drawing conventions.

B. Related Requirements:

1. Section 015000 "Temporary Facilities and Controls" for limitations and procedures governing temporary use of Owner's facilities.

1.2 PROJECT INFORMATION

A. Project Identification: Board of Elections Storage Mezzanine.

1. Project Location: 1200 N. New Hope Rd., Raleigh, NC 27610.

B. Owner: Wake County Facilities Design & Construction.

1. Owner's Representative: Sarah Kahr Richter, PE; sarahkahrrichter@wake.gov; (919) 856-6363.
2. Owner's Address: 336 Fayetteville Street, WCOB 11th Floor, Raleigh, NC 27601.

C. Architect: Osterlund Architects, PLLC.

1. Architect's Representative: Kristen Osterlund, AIA; kristen@osterlundarchitects.com; (919) 838-9337.
2. Architect's Project Manager: Joe Kasztelan; joe@osterlundarchitects.com; (919) 838-9337.
3. Architect's Address: 5 West Hargett Street, Suite 310, Raleigh, North Carolina, 27601

D. Architect's Consultants: Architect has retained the following design professionals, who have prepared designated portions of the Contract Documents:

1. Structural Engineer: Lynch Mykins Structural Engineers, P.C.
 - a. Engineer Representative: Bowen Shen, PE; bshen@lynchmykins.com;

(919) 782-1833.

2. Fire Protection, Mechanical, Electrical Engineer: Sigma Engineered Solutions, PC.
 - a. Fire Protection and Mechanical Engineer Representative: John Erickson, PE; jerickson@sigmaes.com; (919) 840-9300.
 - b. Electrical Engineer Representative: Reggie Adams, PE; radams@sigmaes.com; (919) 840-9300
- E. Project Coordinator for Multiple Contracts: Owner shall serve as Project coordinator.

1.3 WORK COVERED BY CONTRACT DOCUMENTS

- A. The Work of Project is defined by the Contract Documents and includes, but is not limited to, the following:
 1. The installation of a structural steel mezzanine with a concrete slab on metal deck and other Work indicated in the Contract Documents.
- B. Type of Contract:
 1. Project will be constructed under a single prime contract.

1.4 WORK UNDER OWNER'S SEPARATE CONTRACTS

- A. Work with Separate Contractors: Cooperate fully with Owner's separate contractors, so work on those contracts may be carried out smoothly, without interfering with or delaying Work under this Contract or other contracts. Coordinate the Work of this Contract with work performed under Owner's separate contracts.
- B. Concurrent Work: Owner has awarded separate contract(s) for the following construction operations at Project site. Those operations will be conducted simultaneously with Work under this Contract.
 1. Construction Agreement: Replacement of storefront windows at the 2-story office side (West portion) of the building. This project is in a different area of work within the building but will share similar site access. However, it will have different building access, parking, lay down area, etc. Project will mobilize in January 2025.
 2. Construction Agreement: HVAC upgrades at the 2-story office side (West portion) of the building. This project is in a different area of work within the building but will share similar site access. However, it will have different building access, parking, lay down area, etc. Project will mobilize in January 2025.

1.5 CONTRACTOR'S USE OF SITE AND PREMISES

- A. Limits on Use of Site: Limit use of Project site to Work in areas indicated. Do not disturb portions of Project site beyond areas in which the Work is indicated.

1. Driveways, Walkways and Entrances: Keep driveways loading areas, and entrances serving premises clear and available to Owner, Owner's employees, and emergency vehicles at all times. Do not use these areas for parking or for storage of materials.
 - a. Schedule deliveries to minimize use of driveways and entrances by construction operations.
 - b. Schedule deliveries to minimize space and time requirements for storage of materials and equipment on-site.
- B. Condition of Existing Building: Maintain portions of existing building affected by construction operations in a weathertight condition throughout construction period. Repair damage caused by construction operations.
- C. Condition of Existing Grounds: Maintain portions of existing grounds, landscaping, and hardscaping affected by construction operations throughout construction period. Repair damage caused by construction operations.

1.6 COORDINATION WITH OCCUPANTS

- A. Full Owner Occupancy: Owner will occupy Project site and existing building(s) during entire construction period. Cooperate with Owner during construction operations to minimize conflicts and facilitate Owner usage. Perform the Work so as not to interfere with Owner's day-to-day operations. Maintain existing exits unless otherwise indicated.
 1. Maintain access to existing walkways, corridors, and other adjacent occupied or used facilities. Do not close or obstruct walkways, corridors, or other occupied or used facilities without written permission from Owner and approval of authorities having jurisdiction.
 2. Notify Owner not less than 72 hours in advance of activities that will affect Owner's operations.
- B. Owner Limited Occupancy of Completed Areas of Construction: Owner reserves the right to occupy and to place and install equipment in completed portions of the Work, prior to Substantial Completion of the Work, provided such occupancy does not interfere with completion of the Work. Such placement of equipment and limited occupancy shall not constitute acceptance of the total Work.
 1. Architect will prepare a Certificate of Substantial Completion for each specific portion of the Work to be occupied prior to Owner acceptance of the completed Work.
 2. Obtain a Certificate of Occupancy from authorities having jurisdiction before limited Owner occupancy.
 3. Before limited Owner occupancy, mechanical and electrical systems shall be fully operational, and required tests and inspections shall be successfully completed. On occupancy, Owner will operate and maintain mechanical and electrical systems serving occupied portions of Work.
 4. On occupancy, Owner will assume responsibility for maintenance and custodial service for occupied portions of Work.

1.7 WORK RESTRICTIONS

- A. Comply with restrictions on construction operations.
 - 1. Comply with limitations on use of public streets, work on public streets, rights of way, and other requirements of authorities having jurisdiction.
- B. On-Site Work Hours: Limit work to between 8:30 a.m. to 4:30 p.m., Monday through Friday, unless otherwise indicated. Work hours may be modified to meet Project requirements if approved by Owner and authorities having jurisdiction.
 - 1. Weekend Hours: Weekend hours may be permitted for work that is disruptive to Owner operations.
 - 2. Early Morning Hours: Early morning hours may be permitted for work that is disruptive to Owner operations.
 - 3. Work in Existing Building: Perform work in occupied portions of building during On-Site Work Hours unless otherwise indicated.
 - 4. Hours for Utility Shutdowns: Perform utility shutdowns during On-Site Work Hours when possible. Request weekend, early morning or evening hours for utility shutdowns that will be disruptive to Owner operations.
 - 5. Hours for Noisy Activity: Perform noisy activity during On-Site Work Hours unless otherwise indicated.
- C. On-Site Work Day Restrictions: Do not perform work resulting in utility shutdowns or resulting in noisy activity on-site during work black-out days indicated in Document 003113 "Preliminary Schedules."
- D. Existing Utility Interruptions: Do not interrupt utilities serving facilities occupied by Owner or others unless permitted under the following conditions and then only after arranging for temporary utility services according to requirements indicated:
 - 1. Notify Architect not less than seven days in advance of proposed utility interruptions.
 - 2. Obtain Owner's written permission before proceeding with utility interruptions.
- E. Noise, Vibration, Dust, and Odors: Coordinate operations that may result in high levels of noise and vibration, dust, odors, or other disruption to Owner occupancy with Owner.
 - 1. Notify Architect not less than seven days in advance of proposed disruptive operations.
 - 2. Obtain Owner's written permission before proceeding with disruptive operations.
- F. Smoking and Controlled Substance Restrictions: Use of tobacco products , alcoholic beverages, and other controlled substances on Owner's property is not permitted.
- G. Employee Identification: Owner will provide identification tags for Contractor personnel working on Project site. Require personnel to use identification tags at all times.
- H. Employee Screening: Comply with Owner's requirements for drug and background screening of Contractor personnel working on Project site.

1. Maintain list of approved screened personnel with Owner's representative.

1.8 SPECIFICATION AND DRAWING CONVENTIONS

- A. Specification Content: The Specifications use certain conventions for the style of language and the intended meaning of certain terms, words, and phrases when used in particular situations. These conventions are as follows:
 1. Imperative mood and streamlined language are generally used in the Specifications. The words "shall," "shall be," or "shall comply with," depending on the context, are implied where a colon (:) is used within a sentence or phrase.
 2. Specification requirements are to be performed by Contractor unless specifically stated otherwise.
- B. Division 00 Contracting Requirements: General provisions of the Contract, including General and Supplementary Conditions, apply to all Sections of the Specifications.
- C. Division 01 General Requirements: Requirements of Sections in Division 01 apply to the Work of all Sections in the Specifications.
- D. Drawing Coordination: Requirements for materials and products identified on Drawings are described in detail in the Specifications. One or more of the following are used on Drawings to identify materials and products:
 1. Terminology: Materials and products are identified by the typical generic terms used in the individual Specifications Sections.
 2. Abbreviations: Materials and products are identified by abbreviations published as part of the U.S. National CAD Standard.
 3. Keynoting: Materials and products are identified by reference keynotes referencing Specification Section numbers found in this Project Manual.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 011000

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SECTION 012300 - ALTERNATES

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes administrative and procedural requirements for alternates.

1.2 DEFINITIONS

- A. Alternate: An amount proposed by bidders and stated on the Bid Form for certain work defined in the bidding requirements that may be added to or deducted from the base bid amount if the 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.
 - 1. Alternates described in this Section are part of the Work only if enumerated in the Agreement.
 - 2. The cost or credit for each alternate is the net addition to or deduction from the Contract Sum to incorporate alternates into the Work. No other adjustments are made to the Contract Sum.

1.3 PROCEDURES

- A. Coordination: Revise or adjust affected adjacent work as necessary to completely integrate work of the alternate into Project.
 - 1. 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.
- B. Execute accepted alternates under the same conditions as other Work of the Contract.
- C. Schedule: A Part 3 "Schedule of Alternates" Article 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

3.1 SCHEDULE OF ALTERNATES

- A. Alternate No. 1: Electrical Receptacles on Mezzanine Level.
 - 1. Base Bid: No receptacles on mezzanine level.

2. Alternate: Install (3) receptacles on the mezzanine level as indicated on Drawing 8A/E200 and as specified in Section 262726 "Wiring Devices".

END OF SECTION 012300

SECTION 012500 - SUBSTITUTION PROCEDURES

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes administrative and procedural requirements for substitutions.
- B. Related Requirements:
 - 1. Section 016000 "Product Requirements" for requirements for submitting comparable product submittals for products by listed manufacturers.

1.2 DEFINITIONS

- A. Substitutions: Changes in products, materials, equipment, and methods of construction from those required by the Contract Documents.
 - 1. Substitutions for Cause: Changes proposed by Contractor that are required due to changed Project conditions, such as unavailability of product, regulatory changes, or unavailability of required warranty terms.
 - 2. Substitutions for Convenience: Changes proposed by Contractor or Owner that are not required to meet other Project requirements but may offer advantage to Contractor or Owner.

1.3 ACTION SUBMITTALS

- A. Substitution Requests: Submit documentation identifying product or fabrication or installation method to be replaced. Include Specification Section number and title and Drawing numbers and titles.
 - 1. Substitution Request Form: Use form acceptable to Architect.
 - 2. Documentation: Show compliance with requirements for substitutions and the following, as applicable:
 - a. Statement indicating why specified product or fabrication or installation method cannot be provided, if applicable.
 - b. Coordination of information, including a list of changes or revisions needed to other parts of the Work and to construction performed by Owner and separate contractors that will be necessary to accommodate proposed substitution.
 - c. Detailed comparison of significant qualities of proposed substitutions with those of the Work specified. Include annotated copy of applicable Specification Section. Significant qualities may include attributes, such as performance, weight, size, durability, visual effect, sustainable design characteristics, warranties, and specific features and requirements indicated. Indicate deviations, if any, from the Work specified.

- d. Product Data, including drawings and descriptions of products and fabrication and installation procedures.
 - e. Samples, where applicable or requested.
 - f. Certificates and qualification data, where applicable or requested.
 - g. List of similar installations for completed projects, with project names and addresses as well as names and addresses of architects and owners.
 - h. Material test reports from a qualified testing agency, indicating and interpreting test results for compliance with requirements indicated.
 - i. Research reports evidencing compliance with building code in effect for Project, from ICC-ES.
 - j. Detailed comparison of Contractor's construction schedule using proposed substitutions with products specified for the Work, including effect on the overall Contract Time. If specified product or method of construction cannot be provided within the Contract Time, include letter from manufacturer, on manufacturer's letterhead, stating date of receipt of purchase order, lack of availability, or delays in delivery.
 - k. Cost information, including a proposal of change, if any, in the Contract Sum.
 - l. Contractor's certification that proposed substitution complies with requirements in the Contract Documents, except as indicated in substitution request, is compatible with related materials and is appropriate for applications indicated.
 - m. Contractor's waiver of rights to additional payment or time that may subsequently become necessary because of failure of proposed substitution to produce indicated results.
3. Architect's Action: If necessary, Architect will request additional information or documentation for evaluation within seven days of receipt of a request for substitution. Architect will notify Contractor of acceptance or rejection of proposed substitution within 15 days of receipt of request, or seven days of receipt of additional information or documentation, whichever is later.
- a. Forms of Acceptance: Change Order, Construction Change Directive, or Architect's Supplemental Instructions for minor changes in the Work.
 - b. Use product specified if Architect does not issue a decision on use of a proposed substitution within time allocated.

1.4 QUALITY ASSURANCE

- A. Compatibility of Substitutions: Investigate and document compatibility of proposed substitution with related products and materials. Engage a qualified testing agency to perform compatibility tests recommended by manufacturers.

1.5 PROCEDURES

- A. Coordination: Revise or adjust affected work as necessary to integrate work of the approved substitutions.

1.6 SUBSTITUTIONS

- A. Substitutions for Cause: Submit requests for substitution immediately on discovery of need for change, but not later than 15 days prior to time required for preparation and review of related submittals.
1. Conditions: Architect will consider Contractor's request for substitution when the following conditions are satisfied. If the following conditions are not satisfied, Architect will return requests without action, except to record noncompliance with these requirements:
 - a. Requested substitution is consistent with the Contract Documents and will produce indicated results.
 - b. Substitution request is fully documented and properly submitted.
 - c. Requested substitution will not adversely affect Contractor's construction schedule.
 - d. Requested substitution has received necessary approvals of authorities having jurisdiction.
 - e. Requested substitution is compatible with other portions of the Work.
 - f. Requested substitution has been coordinated with other portions of the Work.
 - g. Requested substitution provides specified warranty.
 - h. If requested substitution involves more than one contractor, requested substitution has been coordinated with other portions of the Work, is uniform and consistent, is compatible with other products, and is acceptable to all contractors involved.
- B. Substitutions for Convenience:
1. Architect will consider requests for substitution if received within 15 days after the Notice to Proceed. Requests received after that time may be considered or rejected at discretion of Architect.
 - a. Conditions: Architect will consider Contractor's request for substitution when the following conditions are satisfied. If the following conditions are not satisfied, Architect will return requests without action, except to record noncompliance with these requirements:
 - 1) Requested substitution offers Owner a substantial advantage in cost, time, energy conservation, or other considerations, after deducting additional responsibilities Owner must assume. Owner's additional responsibilities may include compensation to Architect for redesign and evaluation services, increased cost of other construction by Owner, and similar considerations.
 - 2) Requested substitution does not require extensive revisions to the Contract Documents.
 - 3) Requested substitution is consistent with the Contract Documents and will produce indicated results.
 - 4) Substitution request is fully documented and properly submitted.
 - 5) Requested substitution will not adversely affect Contractor's construction schedule.
 - 6) Requested substitution has received necessary approvals of

- authorities having jurisdiction.
- 7) Requested substitution is compatible with other portions of the Work.
 - 8) Requested substitution has been coordinated with other portions of the Work.
 - 9) Requested substitution provides specified warranty.
 - 10) If requested substitution involves more than one contractor, requested substitution has been coordinated with other portions of the Work, is uniform and consistent, is compatible with other products, and is acceptable to all contractors involved.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 012500

SECTION 012600 - CONTRACT MODIFICATION PROCEDURES

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes administrative and procedural requirements for handling and processing Contract modifications.
- B. Related Requirements:
 - 1. Section 012500 "Substitution Procedures" for administrative procedures for handling requests for substitutions made after the Contract award.

1.2 MINOR CHANGES IN THE WORK

- A. Architect will issue supplemental instructions authorizing minor changes in the Work, not involving adjustment to the Contract Sum or the Contract Time, on AIA Document G710.

1.3 PROPOSAL REQUESTS

- A. Owner-Initiated Proposal Requests: Architect will issue a detailed description of proposed changes in the Work that may require adjustment to the Contract Sum or the Contract Time. If necessary, the description will include supplemental or revised Drawings and Specifications.
 - 1. Work Change Proposal Requests issued by Architect are not instructions either to stop work in progress or to execute the proposed change.
 - 2. Within 7 after receipt of Proposal Request, submit a quotation estimating cost adjustments to the Contract Sum and the Contract Time necessary to execute the change.
 - a. Include a list of quantities of products required or eliminated and unit costs, with total amount of purchases and credits to be made. If requested, furnish survey data to substantiate quantities.
 - b. Indicate applicable taxes, delivery charges, equipment rental, and amounts of trade discounts.
 - c. Include costs of labor and supervision directly attributable to the change.
 - d. Include an updated Contractor's construction schedule that indicates the effect of the change, including, but not limited to, changes in activity duration, start and finish times, and activity relationship. Use available total float before requesting an extension of the Contract Time.
- B. Contractor-Initiated Proposals: If latent or changed conditions require modifications to the Contract, Contractor may initiate a claim by submitting a request for a change to Architect.

1. Include a statement outlining reasons for the change and the effect of the change on the Work. Provide a complete description of the proposed change. Indicate the effect of the proposed change on the Contract Sum and the Contract Time.
2. Include a list of quantities of products required or eliminated and unit costs, with total amount of purchases and credits to be made. If requested, furnish survey data to substantiate quantities.
3. Indicate applicable taxes, delivery charges, equipment rental, and amounts of trade discounts.
4. Include costs of labor and supervision directly attributable to the change.
5. Include an updated Contractor's construction schedule that indicates the effect of the change, including, but not limited to, changes in activity duration, start and finish times, and activity relationship. Use available total float before requesting an extension of the Contract Time.
6. Comply with requirements in Section 012500 "Substitution Procedures" if the proposed change requires substitution of one product or system for product or system specified.
7. Proposal Request Form: Use form acceptable to Architect.

1.4 CHANGE ORDER PROCEDURES

- A. On Owner's approval of a Work Change Proposal Request, Architect will issue a Change Order for signatures of Owner and Contractor on AIA Document G701.

1.5 CONSTRUCTION CHANGE DIRECTIVE

- A. Construction Change Directive: Architect may issue a Construction Change Directive on AIA Document G714. Construction Change Directive instructs Contractor to proceed with a change in the Work, for subsequent inclusion in a Change Order.
 1. Construction Change Directive contains a complete description of change in the Work. It also designates method to be followed to determine change in the Contract Sum or the Contract Time.
- B. Documentation: Maintain detailed records on a time and material basis of work required by the Construction Change Directive.
 1. After completion of change, submit an itemized account and supporting data necessary to substantiate cost and time adjustments to the Contract.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 012600

SECTION 012900 - PAYMENT PROCEDURES

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes administrative and procedural requirements necessary to prepare and process Applications for Payment.
- B. Related Requirements:
 - 1. Section 012600 "Contract Modification Procedures" for administrative procedures for handling changes to the Contract.
 - 2. Section 013200 "Construction Progress Documentation" for administrative requirements governing the preparation and submittal of the Contractor's construction schedule.

1.2 DEFINITIONS

- A. Schedule of Values: A statement furnished by Contractor allocating portions of the Contract Sum to various portions of the Work and used as the basis for reviewing Contractor's Applications for Payment.

1.3 SCHEDULE OF VALUES

- A. Coordination: Coordinate preparation of the schedule of values with preparation of Contractor's construction schedule.
 - 1. Coordinate line items in the schedule of values with items required to be indicated as separate activities in Contractor's construction schedule.
 - 2. Submit the schedule of values to Architect through Construction Manager at earliest possible date, but no later than seven days before the date scheduled for submittal of initial Applications for Payment.
 - 3. Subschedules for Separate Design Contracts: Where the Owner has retained design professionals under separate contracts who will each provide certification of payment requests, provide subschedules showing values coordinated with the scope of each design services contract, as described in Section 011000 "Summary."
- B. Format and Content: Use Project Manual table of contents as a guide to establish line items for the schedule of values. Provide at least one line item for each Specification Section.
 - 1. Arrange schedule of values consistent with format of AIA Document G703.
 - 2. Provide a breakdown of the Contract Sum in enough detail to facilitate continued evaluation of Applications for Payment and progress reports. Provide multiple line items for principal subcontract amounts in excess of five percent of the Contract Sum.

3. Provide a separate line item in the schedule of values for each part of the Work where Applications for Payment may include materials or equipment purchased or fabricated and stored, but not yet installed.
 - a. Differentiate between items stored on-site and items stored off-site.
4. Overhead Costs, Proportional Distribution: Include total cost and proportionate share of general overhead and profit for each line item.
5. Overhead Costs, Separate Line Items: Show cost of temporary facilities and other major cost items that are not direct cost of actual work-in-place as separate line items.
6. Temporary Facilities: Show cost of temporary facilities and other major cost items that are not direct cost of actual work-in-place as separate line items.
7. Closeout Costs. Include separate line items under Contractor and principal subcontracts for Project closeout requirements in an amount totaling five percent of the Contract Sum and subcontract amount.
8. Schedule of Values Revisions: Revise the schedule of values when Change Orders or Construction Change Directives result in a change in the Contract Sum. Include at least one separate line item for each Change Order and Construction Change Directive.

1.4 APPLICATIONS FOR PAYMENT

- A. Each Application for Payment following the initial Application for Payment shall be consistent with previous applications and payments, as certified by Architect and paid for by Owner.
- B. Payment Application Times: The date for each progress payment is indicated in the Owner/Contractor Agreement. The period of construction work covered by each Application for Payment is the period indicated in the Agreement.
- C. Payment Application Times: Submit Application for Payment to Architect by the x day of the month. The period covered by each Application for Payment is one month, ending on the last day of the month.
 1. Submit draft copy of Application for Payment seven days prior to due date for review by Architect.
- D. Application for Payment Forms: Use AIA Document G702 and AIA Document G703 as form for Applications for Payment.
- E. Application Preparation: Complete every entry on form. Notarize and execute by a person authorized to sign legal documents on behalf of Contractor. Architect will return incomplete applications without action.
 1. Entries shall match data on the schedule of values and Contractor's construction schedule. Use updated schedules if revisions were made.
 2. Include amounts for work completed following previous Application for Payment, whether or not payment has been received. Include only amounts for work completed at time of Application for Payment.
 3. Include amounts of Change Orders and Construction Change Directives issued

before last day of construction period covered by application.

- F. Stored Materials: Include in Application for Payment amounts applied for materials or equipment purchased or fabricated and stored, but not yet installed. Differentiate between items stored on-site and items stored off-site.
1. Provide certificate of insurance, evidence of transfer of title to Owner, and consent of surety to payment for stored materials.
 2. Provide supporting documentation that verifies amount requested, such as paid invoices. Match amount requested with amounts indicated on documentation; do not include overhead and profit on stored materials.
 3. Provide summary documentation for stored materials indicating the following:
 - a. Value of materials previously stored and remaining stored as of date of previous Applications for Payment.
 - b. Value of previously stored materials put in place after date of previous Application for Payment and on or before date of current Application for Payment.
 - c. Value of materials stored since date of previous Application for Payment and remaining stored as of date of current Application for Payment.
- G. Transmittal: Submit three signed and notarized original copies of each Application for Payment to Architect by a method ensuring receipt within 24 hours. One copy shall include waivers of lien and similar attachments if required.
1. Transmit each copy with a transmittal form listing attachments and recording appropriate information about application.
- H. Initial Application for Payment: Administrative actions and submittals that must precede or coincide with submittal of first Application for Payment include the following:
1. List of subcontractors.
 2. Schedule of values.
 3. Contractor's construction schedule (preliminary if not final).
 4. Products list (preliminary if not final).
 5. Sustainable design action plans, including preliminary project materials cost data.
 6. Schedule of unit prices.
 7. Submittal schedule (preliminary if not final).
 8. List of Contractor's staff assignments.
 9. List of Contractor's principal consultants.
 10. Copies of building permits.
 11. Copies of authorizations and licenses from authorities having jurisdiction for performance of the Work.
 12. Initial progress report.
 13. Report of preconstruction conference.
- I. Application for Payment at Substantial Completion: After Architect issues the Certificate of Substantial Completion, submit an Application for Payment showing 100 percent completion for portion of the Work claimed as substantially complete.
1. Include documentation supporting claim that the Work is substantially complete

- and a statement showing an accounting of changes to the Contract Sum.
2. This application shall reflect Certificate(s) of Substantial Completion issued previously for Owner occupancy of designated portions of the Work.
- J. Final Payment Application: After completing Project closeout requirements, submit final Application for Payment with releases and supporting documentation not previously submitted and accepted, including, but not limited, to the following:
1. Evidence of completion of Project closeout requirements.
 2. Insurance certificates for products and completed operations where required and proof that taxes, fees, and similar obligations were paid.
 3. Updated final statement, accounting for final changes to the Contract Sum.
 4. AIA Document G706.
 5. AIA Document G706A.
 6. AIA Document G707.
 7. Evidence that claims have been settled.
 8. Final meter readings for utilities, a measured record of stored fuel, and similar data as of date of Substantial Completion or when Owner took possession of and assumed responsibility for corresponding elements of the Work.
 9. Final liquidated damages settlement statement.

PART 2 - PRODUCTS (Not Used)
PART 3 - EXECUTION (Not Used)

END OF SECTION 012900

SECTION 013100 - PROJECT MANAGEMENT AND COORDINATION

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes administrative provisions for coordinating construction operations on Project, including, but not limited to, the following:
 - 1. General coordination procedures.
 - 2. RFIs.
 - 3. Digital project management procedures.
 - 4. Project meetings.
- B. Related Requirements:
 - 1. Section 013200 "Construction Progress Documentation" for preparing and submitting Contractor's construction schedule.
 - 2. Section 017300 "Execution" for procedures for coordinating general installation and field-engineering services, including establishment of benchmarks and control points.
 - 3. Section 017700 "Closeout Procedures" for coordinating closeout of the Contract.

1.2 DEFINITIONS

- A. RFI: Request for Information. Request from Owner, Architect, or Contractor seeking information required by or clarifications of the Contract Documents.

1.3 INFORMATIONAL SUBMITTALS

- A. Subcontract List: Prepare a written summary identifying individuals or firms proposed for each portion of the Work, including those who are to furnish products or equipment fabricated to a special design. Include the following information in tabular form:
 - 1. Name, address, telephone number, and email address of entity performing subcontract or supplying products.
 - 2. Number and title of related Specification Section(s) covered by subcontract.
 - 3. Drawing number and detail references, as appropriate, covered by subcontract.

1.4 GENERAL COORDINATION PROCEDURES

- A. Coordination: Coordinate construction operations included in different Sections of the Specifications to ensure efficient and orderly installation of each part of the Work. Coordinate construction operations included in different Sections that depend on each other for proper installation, connection, and operation.
 - 1. Schedule construction operations in sequence required to obtain the best results,

where installation of one part of the Work depends on installation of other components, before or after its own installation.

2. Coordinate installation of different components to ensure maximum performance and accessibility for required maintenance, service, and repair.
3. Make adequate provisions to accommodate items scheduled for later installation.

B. Administrative Procedures: Coordinate scheduling and timing of required administrative procedures with other construction activities to avoid conflicts and to ensure orderly progress of the Work. Such administrative activities include, but are not limited to, the following:

1. Preparation of Contractor's construction schedule.
2. Preparation of the schedule of values.
3. Installation and removal of temporary facilities and controls.
4. Delivery and processing of submittals.
5. Progress meetings.
6. Preinstallation conferences.
7. Project closeout activities.
8. Startup and adjustment of systems.

1.5 REQUEST FOR INFORMATION (RFI)

A. General: Immediately on discovery of the need for additional information, clarification, or interpretation of the Contract Documents, Contractor shall prepare and submit an RFI in the form specified.

1. Architect will return without response those RFIs submitted to Architect by other entities controlled by Contractor.
2. Coordinate and submit RFIs in a prompt manner to avoid delays in Contractor's work or work of subcontractors.

B. Content of the RFI: Include a detailed, legible description of item needing information or interpretation and the following:

1. Project name.
2. Name of Architect.
3. Architect's Project number.
4. Date.
5. Name of Contractor.
6. RFI number, numbered sequentially.
7. RFI subject.
8. Specification Section number and title and related paragraphs, as appropriate.
9. Drawing number and detail references, as appropriate.
10. Field dimensions and conditions, as appropriate.
11. Contractor's suggested resolution. If Contractor's suggested resolution impacts the Contract Time or the Contract Sum, Contractor shall state impact in the RFI.
12. Contractor's signature.
13. Attachments: Include sketches, descriptions, measurements, photos, Product Data, Shop Drawings, coordination drawings, and other information necessary to fully describe items needing interpretation.

- C. Architect's Action: Architect will review each RFI, determine action required, and respond. Allow seven days for Architect's response for each RFI. RFIs received by Architect after 1:00 p.m. will be considered as received the following working day.
1. The following Contractor-generated RFIs will be returned without action:
 - a. Requests for approval of submittals.
 - b. Requests for approval of substitutions.
 - c. Requests for approval of Contractor's means and methods.
 - d. Requests for coordination information already indicated in the Contract Documents.
 - e. Requests for adjustments in the Contract Time or the Contract Sum.
 - f. Requests for interpretation of Architect's actions on submittals.
 - g. Incomplete RFIs or inaccurately prepared RFIs.
 2. Architect's action may include a request for additional information, in which case Architect's time for response will date from time of receipt by Architect of additional information.
 3. Architect's action on RFIs that may result in a change to the Contract Time or the Contract Sum may be eligible for Contractor to submit Change Proposal according to Section 012600 "Contract Modification Procedures."
 - a. If Contractor believes the RFI response warrants change in the Contract Time or the Contract Sum, notify Architect in writing within 10 days of receipt of the RFI response.
- D. RFI Log: Prepare, maintain, and submit a tabular log of RFIs organized by the RFI number. Submit log weekly. Include the following:
1. Project name.
 2. Name and address of Contractor.
 3. Name and address of Architect.
 4. RFI number, including RFIs that were returned without action or withdrawn.
 5. RFI description.
 6. Date the RFI was submitted.
 7. Date Architect's response was received.
- E. On receipt of Architect's action, update the RFI log and immediately distribute the RFI response to affected parties. Review response and notify Architect within seven days if Contractor disagrees with response.

1.6 DIGITAL PROJECT MANAGEMENT PROCEDURES

- A. PDF Document Preparation: Where PDFs are required to be submitted to Architect, prepare as follows:
1. Assemble complete submittal package into a single indexed file, incorporating submittal requirements of a single Specification Section and transmittal form with links enabling navigation to each item.
 2. Name file with submittal number or other unique identifier, including revision

identifier.

3. Certifications: Where digitally submitted certificates and certifications are required, provide a digital signature with digital certificate on where indicated.

1.7 PROJECT MEETINGS

- A. General: Schedule and conduct meetings and conferences at Project site unless otherwise indicated.
- B. Preconstruction Conference: Architect will schedule and conduct a preconstruction conference before starting construction, at a time convenient to Owner and Architect, but no later than 15 days after execution of the Agreement.
 1. Attendees: Authorized representatives of Owner, Architect, and their consultants; Contractor and its superintendent; major subcontractors; suppliers; and other concerned parties shall attend the conference. Participants at the conference shall be familiar with Project and authorized to conclude matters relating to the Work.
 2. Agenda: Discuss items of significance that could affect progress, including the following:
 - a. Responsibilities and personnel assignments.
 - b. Tentative construction schedule.
 - c. Phasing.
 - d. Critical work sequencing and long lead items.
 - e. Designation of key personnel and their duties.
 - f. Lines of communications.
 - g. Use of web-based Project software.
 - h. Procedures for processing field decisions and Change Orders.
 - i. Procedures for RFIs.
 - j. Procedures for testing and inspecting.
 - k. Procedures for processing Applications for Payment.
 - l. Distribution of the Contract Documents.
 - m. Submittal procedures.
 - n. Preparation of Record Documents.
 - o. Use of the premises and existing building.
 - p. Work restrictions.
 - q. Working hours.
 - r. Owner's occupancy requirements.
 - s. Responsibility for temporary facilities and controls.
 - t. Procedures for moisture and mold control.
 - u. Procedures for disruptions and shutdowns.
 - v. Construction waste management and recycling.
 - w. Parking availability.
 - x. Office, work, and storage areas.
 - y. Equipment deliveries and priorities.
 - z. First aid.
 - aa. Security.
 - bb. Progress cleaning.

3. Minutes: Entity responsible for conducting meeting will record and distribute meeting minutes.
- C. Preinstallation Conferences: Conduct a preinstallation conference at Project site before each construction activity when required by other Sections and when required for coordination with other construction.
1. Attendees: Installer and representatives of manufacturers and fabricators involved in or affected by the installation and its coordination or integration with other materials and installations that have preceded or will follow, shall attend the meeting. Advise Architect of scheduled meeting dates.
 2. Agenda: Review progress of other construction activities and preparations for the particular activity under consideration, including requirements for the following:
 - a. Contract Documents.
 - b. Options.
 - c. Related RFIs.
 - d. Related Change Orders.
 - e. Purchases.
 - f. Deliveries.
 - g. Submittals.
 - h. Sustainable design requirements.
 - i. Review of mockups.
 - j. Possible conflicts.
 - k. Compatibility requirements.
 - l. Time schedules.
 - m. Weather limitations.
 - n. Manufacturer's written instructions.
 - o. Warranty requirements.
 - p. Compatibility of materials.
 - q. Acceptability of substrates.
 - r. Temporary facilities and controls.
 - s. Space and access limitations.
 - t. Regulations of authorities having jurisdiction.
 - u. Testing and inspecting requirements.
 - v. Installation procedures.
 - w. Coordination with other work.
 - x. Required performance results.
 - y. Protection of adjacent work.
 - z. Protection of construction and personnel.
 3. Record significant conference discussions, agreements, and disagreements, including required corrective measures and actions.
 4. Reporting: Distribute minutes of the meeting to each party present and to other parties requiring information.
 5. Do not proceed with installation if the conference cannot be successfully concluded. Initiate whatever actions are necessary to resolve impediments to performance of the Work and reconvene the conference at earliest feasible date.
- D. Progress Meetings: Conduct progress meetings at biweekly intervals.

1. Coordinate dates of meetings with preparation of payment requests.
2. Attendees: In addition to representatives of Owner and Architect, each contractor, subcontractor, supplier, and other entity concerned with current progress or involved in planning, coordination, or performance of future activities shall be represented at these meetings. All participants at the meeting shall be familiar with Project and authorized to conclude matters relating to the Work.
3. Agenda: Review and correct or approve minutes of previous progress meeting. Review other items of significance that could affect progress. Include topics for discussion as appropriate to status of Project.
 - a. Contractor's Construction Schedule: Review progress since the last meeting. Determine whether each activity is on time, ahead of schedule, or behind schedule, in relation to Contractor's construction schedule. Determine how construction behind schedule will be expedited; secure commitments from parties involved to do so. Discuss whether schedule revisions are required to ensure that current and subsequent activities will be completed within the Contract Time.
 - 1) Review schedule for next period.
 - b. Review present and future needs of each entity present, including the following:
 - 1) Interface requirements.
 - 2) Sequence of operations.
 - 3) Resolution of BIM component conflicts.
 - 4) Status of submittals.
 - 5) Status of sustainable design documentation.
 - 6) Deliveries.
 - 7) Off-site fabrication.
 - 8) Access.
 - 9) Site use.
 - 10) Temporary facilities and controls.
 - 11) Progress cleaning.
 - 12) Quality and work standards.
 - 13) Status of correction of deficient items.
 - 14) Field observations.
 - 15) Status of RFIs.
 - 16) Status of Proposal Requests.
 - 17) Pending changes.
 - 18) Status of Change Orders.
 - 19) Pending claims and disputes.
 - 20) Documentation of information for payment requests.
4. Minutes: Entity responsible for conducting the meeting will record and distribute the meeting minutes to each party present and to parties requiring information.
 - a. Schedule Updating: Revise Contractor's construction schedule after each progress meeting, where revisions to the schedule have been made or recognized. Issue revised schedule concurrently with the report of each meeting.

PART 2 - PRODUCTS (Not Used)
PART 3 - EXECUTION (Not Used)

END OF SECTION 013100

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SECTION 013200 - CONSTRUCTION PROGRESS DOCUMENTATION

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes administrative and procedural requirements for documenting the progress of construction during performance of the Work, including the following:
 - 1. Contractor's Construction Schedule.
 - 2. Construction schedule updating reports.
 - 3. Daily construction reports.
 - 4. Site condition reports.

- B. Related Requirements:
 - 1. Section 012900 "Payment Procedures" for schedule of values and requirements for use of cost-loaded schedule for Applications for Payment.
 - 2. Section 014000 "Quality Requirements" for schedule of tests and inspections.

1.2 DEFINITIONS

- A. Activity: A discrete part of a project that can be identified for planning, scheduling, monitoring, and controlling the construction Project. Activities included in a construction schedule consume time and resources.
 - 1. Critical Activity: An activity on the critical path that must start and finish on the planned early start and finish times.
 - 2. Predecessor Activity: An activity that precedes another activity in the network.
 - 3. Successor Activity: An activity that follows another activity in the network.

- B. CPM: Critical path method, which is a method of planning and scheduling a construction project where activities are arranged based on activity relationships. Network calculations determine the critical path of Project and when activities can be performed.

- C. Critical Path: The longest connected chain of interdependent activities through the network schedule that establishes the minimum overall Project duration and contains no float.

- D. Event: The starting or ending point of an activity.

- E. Float: The measure of leeway in starting and completing an activity.
 - 1. Float time is not for the exclusive use or benefit of either Owner or Contractor, but is a jointly owned, expiring Project resource available to both parties as needed to meet schedule milestones and Contract completion date.
 - 2. Free float is the amount of time an activity can be delayed without adversely affecting the early start of the successor activity.

3. Total float is the measure of leeway in starting or completing an activity without adversely affecting the planned Project completion date.

1.3 INFORMATIONAL SUBMITTALS

- A. Format for Submittals: Submit required submittals in the following format:
 1. Working electronic copy of schedule file.
 2. PDF file.
 3. Two paper copies, of sufficient size to display entire period or schedule, as required.
- B. Startup construction schedule.
 1. Submittal of cost-loaded startup construction schedule will not constitute approval of schedule of values for cost-loaded activities.
- C. Startup Network Diagram: Of size required to display entire network for entire construction period. Show logic ties for activities.
- D. Contractor's Construction Schedule: Initial schedule, of size required to display entire schedule for entire construction period.
 1. Submit a working digital copy of schedule, using software indicated, and labeled to comply with requirements for submittals.
- E. CPM Reports: Concurrent with CPM schedule, submit each of the following reports. Format for each activity in reports to contain activity number, activity description, cost and resource loading, original duration, remaining duration, early start date, early finish date, late start date, late finish date, and total float in calendar days.
 1. Activity Report: List of activities sorted by activity number and then early start date, or actual start date if known.
 2. Logic Report: List of preceding and succeeding activities for each activity, sorted in ascending order by activity number and then by early start date, or actual start date if known.
 3. Total Float Report: List of activities sorted in ascending order of total float.
- F. Construction Schedule Updating Reports: Submit with Applications for Payment.
- G. Daily Construction Reports: Submit at monthly intervals.
- H. Material Location Reports: Submit at monthly intervals.
- I. Site Condition Reports: Submit at time of discovery of differing conditions.

1.4 COORDINATION

- A. Coordinate Contractor's Construction Schedule with the schedule of values, submittal schedule, progress reports, payment requests, and other required schedules and

reports.

1. Secure time commitments for performing critical elements of the Work from entities involved.
2. Coordinate each construction activity in the network with other activities, and schedule them in proper sequence.

1.5 CONTRACTOR'S CONSTRUCTION SCHEDULE

- A. Computer Scheduling Software: Prepare schedules using current version of a program that is capable of managing construction schedules.
- B. Scheduling Consultant: Engage a consultant to provide planning, evaluation, and reporting, using CPM scheduling.
 1. In-House Option: Owner may waive requirement to retain a consultant if Contractor employs skilled personnel with experience in CPM scheduling and reporting techniques. Submit qualifications.
 2. Meetings: Scheduling consultant to attend all meetings related to Project progress, alleged delays, and time impact.
- C. Time Frame: Extend schedule from date established for the Notice of Award to date of .
 1. Contract completion date to not be changed by submission of a schedule that shows an early completion date, unless specifically authorized by Change Order.
- D. Activities: Treat each floor or separate area as a separate numbered activity for each main element of the Work. Comply with the following:
 1. Activity Duration: Define activities so no activity is longer than 20 days, unless specifically allowed by Architect.
 2. Procurement Activities: Include procurement process activities for the following long lead-time items and major items, requiring a cycle of more than 60 days, as separate activities in schedule. Procurement cycle activities include, but are not limited to, submittals, approvals, purchasing, fabrication, and delivery.
 3. Submittal Review Time: Include review and resubmittal times indicated in Section 013300 "Submittal Procedures" in schedule. Coordinate submittal review times in Contractor's Construction Schedule with submittal schedule.
 4. Startup and Testing Time: Include no fewer than 15 days for startup and testing.
 5. Substantial Completion: Indicate completion in advance of date established for Substantial Completion, and allow time for Architect's administrative procedures necessary for certification of Substantial Completion.
 6. Punch List and Final Completion: Include not more than 30 days for completion of punch list items and Final Completion.
- E. Constraints: Include constraints and work restrictions indicated in the Contract Documents and as follows in schedule, and show how the sequence of the Work is affected.

1. Phasing: Arrange list of activities on schedule by phase.
 2. Work under More Than One Contract: Include a separate activity for each contract.
 3. Work Restrictions: Show the effect of the following items on the schedule:
 - a. Coordination with existing construction.
 - b. Uninterruptible services.
- F. Milestones: Include milestones indicated in the Contract Documents in schedule, including, but not limited to, the Notice to Proceed, Substantial Completion, and Final Completion.
- G. Upcoming Work Summary: Prepare summary report indicating activities scheduled to occur or commence prior to submittal of next schedule update. Summarize the following issues:
1. Unresolved issues.
 2. Unanswered Requests for Information.
 3. Rejected or unreturned submittals.
 4. Notations on returned submittals.
 5. Pending modifications affecting the Work and the Contract Time.
- H. Contractor's Construction Schedule Updating: At weekly intervals, update schedule to reflect actual construction progress and activities. Issue schedule one week before each regularly scheduled progress meeting.
1. Revise schedule immediately after each meeting or other activity where revisions have been recognized or made. Issue updated schedule concurrently with the report of each such meeting.
 2. Include a report with updated schedule that indicates every change, including, but not limited to, changes in logic, durations, actual starts and finishes, and activity durations.
 3. As the Work progresses, indicate Final Completion percentage for each activity.
- I. Recovery Schedule: When periodic update indicates the Work is 14 or more calendar days behind the current approved schedule, submit a separate recovery schedule indicating means by which Contractor intends to regain compliance with the schedule. Indicate changes to working hours, working days, crew sizes, equipment required to achieve compliance, and date by which recovery will be accomplished.
- J. Distribution: Distribute copies of approved schedule to Architect, Owner, separate contractors, testing and inspecting agencies, and other parties identified by Contractor with a need-to-know schedule responsibility.
1. Post copies in Project meeting rooms and temporary field offices.
 2. When revisions are made, distribute updated schedules to the same parties and post in the same locations. Delete parties from distribution when they have completed their assigned portion of the Work and are no longer involved in performance of construction activities.

1.6 CPM SCHEDULE REQUIREMENTS

- A. Prepare network diagrams using AON (activity-on-node) format.
- B. Startup Network Diagram: Submit diagram within 7 days of date established for the Notice to Proceed. Outline significant construction activities for the first 90 days of construction. Include skeleton diagram for the remainder of the Work and a cash requirement prediction based on indicated activities.
- C. CPM Schedule: Prepare Contractor's Construction Schedule using a cost- and resource-loaded, time-scaled CPM network analysis diagram for the Work.
 - 1. Develop network diagram in sufficient time to submit CPM schedule, so it can be accepted for use no later than 14 days after date established for the Notice of Award.
 - a. Failure to include any work item required for performance of this Contract must not excuse Contractor from completing all work within applicable completion dates.
 - 2. Conduct educational workshops to train and inform key Project personnel, including subcontractors' personnel, in proper methods of providing data and using CPM schedule information.
 - 3. Establish procedures for monitoring and updating CPM schedule and for reporting progress. Coordinate procedures with progress meeting and payment request dates.
 - 4. Use "one workday" as the unit of time for individual activities. Indicate nonworking days and holidays incorporated into the schedule to coordinate with the Contract Time.
- D. CPM Schedule Preparation: Prepare a list of all activities required to complete the Work. Using the startup network diagram, prepare a skeleton network to identify probable critical paths.
 - 1. Activities: Indicate the estimated time duration, sequence requirements, and relationship of each activity in relation to other activities. Include estimated time frames for the following activities:
 - a. Preparation and processing of submittals.
 - b. Mobilization and demobilization.
 - c. Purchase of materials.
 - d. Delivery.
 - e. Fabrication.
 - f. Utility interruptions.
 - g. Installation.
 - h. Work by Owner that may affect or be affected by Contractor's activities.
 - i. Testing and inspection.
 - j. Commissioning.
 - k. Punch list and Final Completion.
 - l. Activities occurring following Final Completion.

2. Critical Path Activities: Identify critical path activities, including those for interim completion dates. Scheduled start and completion dates to be consistent with Contract milestone dates.
 3. Processing: Process data to produce output data on a computer-drawn, time-scaled network. Revise data, reorganize activity sequences, and reproduce as often as necessary to produce the CPM schedule within the limitations of the Contract Time.
 4. Format: Mark the critical path. Locate the critical path near center of network; locate paths with most float near the edges.
 - a. Subnetworks on separate sheets are permissible for activities clearly off the critical path.
- E. Contract Modifications: For each proposed contract modification and concurrent with its submission, prepare a time-impact analysis using a network fragment to demonstrate the effect of the proposed change on the overall Project schedule.
- F. Initial Issue of Schedule: Prepare initial network diagram from a sorted activity list indicating straight "early start-total float." Identify critical activities. Prepare tabulated reports showing the following:
1. Contractor or subcontractor and the Work or activity.
 2. Description of activity.
 3. Main events of activity.
 4. Immediate preceding and succeeding activities.
 5. Early and late start dates.
 6. Early and late finish dates.
 7. Activity duration in workdays.
 8. Total float or slack time.
 9. Average size of workforce.
 10. Dollar value of activity (coordinated with the schedule of values).
- G. Schedule Updating: Concurrent with making revisions to schedule, prepare tabulated reports showing the following:
1. Identification of activities that have changed.
 2. Changes in early and late start dates.
 3. Changes in early and late finish dates.
 4. Changes in activity durations in workdays.
 5. Changes in the critical path.
 6. Changes in total float or slack time.
 7. Changes in the Contract Time.
- H. Value Summaries: Prepare two cumulative value lists, sorted by finish dates.
1. In first list, tabulate activity number, early finish date, dollar value, and cumulative dollar value.
 2. In second list, tabulate activity number, late finish date, dollar value, and cumulative dollar value.
 3. In subsequent issues of both lists, substitute actual finish dates for activities completed as of list date.

4. Prepare list for ease of comparison with payment requests; coordinate timing with progress meetings.
 - a. In both value summary lists, tabulate "actual percent complete" and "cumulative value completed" with total at bottom.
 - b. Submit value summary printouts one week before each regularly scheduled progress meeting.

1.7 REPORTS

- A. Daily Construction Reports: Prepare a daily construction report recording the following information concerning events at Project site:
 1. List of subcontractors at Project site.
 2. List of separate contractors at Project site.
 3. Approximate count of personnel at Project site.
 4. Equipment at Project site.
 5. Material deliveries.
 6. High and low temperatures and general weather conditions, including presence of rain or snow.
 7. Testing and inspection.
 8. Accidents.
 9. Meetings and significant decisions.
 10. Stoppages, delays, shortages, and losses.
 11. Meter readings and similar recordings.
 12. Emergency procedures.
 13. Orders and requests of authorities having jurisdiction.
 14. Change Orders received and implemented.
 15. Construction Change Directives received and implemented.
 16. Services connected and disconnected.
 17. Equipment or system tests and startups.
 18. Partial completions and occupancies.
 19. Substantial Completions authorized.
- B. Site Condition Reports: Immediately on discovery of a difference between site conditions and the Contract Documents, prepare and submit a detailed report. Submit with a Request for Information. Include a detailed description of the differing conditions, together with recommendations for changing the Contract Documents.

PART 2 - PRODUCTS (Not Used)
PART 3 - EXECUTION (Not Used)

END OF SECTION 013200

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SECTION 013300 - SUBMITTAL PROCEDURES

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Submittal schedule requirements.
2. Administrative and procedural requirements for submittals.

B. Related Requirements:

1. Section 012900 "Payment Procedures" for submitting Applications for Payment and the schedule of values.
2. Section 013100 "Project Management and Coordination" for submitting coordination drawings and subcontract list and for requirements for web-based Project software.
3. Section 013200 "Construction Progress Documentation" for submitting schedules and reports, including Contractor's construction schedule.
4. Section 014000 "Quality Requirements" for submitting test and inspection reports, and schedule of tests and inspections.
5. Section 017700 "Closeout Procedures" for submitting closeout submittals and maintenance material submittals.
6. Section 017823 "Operation and Maintenance Data" for submitting operation and maintenance manuals.

1.2 DEFINITIONS

- A. Action Submittals: Written and graphic information and physical samples that require Architect's responsive action. Action submittals are those submittals indicated in individual Specification Sections as "action submittals."
- B. Informational Submittals: Written and graphic information and physical samples that do not require Architect's responsive action. Submittals may be rejected for not complying with requirements. Informational submittals are those submittals indicated in individual Specification Sections as "informational submittals."

1.3 SUBMITTAL SCHEDULE

- A. Submittal Schedule: Submit, as an action submittal, a list of submittals, arranged in chronological order by dates required by construction schedule. Include time required for review, ordering, manufacturing, fabrication, and delivery when establishing dates. Include additional time required for making corrections or revisions to submittals noted by Architect and additional time for handling and reviewing submittals required by those corrections.

1.4 SUBMITTAL FORMATS

- A. Submittal Information: Include the following information in each submittal:
1. Project name.
 2. Date.
 3. Name of Architect.
 4. Name of Construction Manager.
 5. Name of Contractor.
 6. Name of firm or entity that prepared submittal.
 7. Names of subcontractor, manufacturer, and supplier.
 8. Unique submittal number, including revision identifier. Include Specification Section number with sequential alphanumeric identifier and alphanumeric suffix for resubmittals.
 9. Category and type of submittal.
 10. Submittal purpose and description.
 11. Number and title of Specification Section, with paragraph number and generic name for each of multiple items.
 12. Drawing number and detail references, as appropriate.
 13. Indication of full or partial submittal.
 14. Location(s) where product is to be installed, as appropriate.
 15. Other necessary identification.
 16. Remarks.
 17. Signature of transmitter.
- B. Options: Identify options requiring selection by Architect.
- C. Deviations and Additional Information: On each submittal, clearly indicate deviations from requirements in the Contract Documents, including minor variations and limitations; include relevant additional information and revisions, other than those requested by Architect on previous submittals. Indicate by highlighting on each submittal or noting on attached separate sheet.
- D. Paper Submittals:
1. Place a permanent label or title block on each submittal item for identification; include name of firm or entity that prepared submittal.
 2. Provide a space approximately **6 by 8 inches** on label or beside title block to record Contractor's review and approval markings and action taken by Architect.
 3. Action Submittals: Submit three paper copies of each submittal unless otherwise indicated. Architect will return two copies.
 4. Informational Submittals: Submit two paper copies of each submittal unless otherwise indicated. Architect will not return copies.
 5. Transmittal for Submittals: Assemble each submittal individually and appropriately for transmittal and handling. Transmit each submittal using transmittal form.
- E. Electronic Submittals: Prepare submittals as PDF package, incorporating complete information into each PDF file. Name PDF file with submittal number.

1.5 SUBMITTAL PROCEDURES

- A. Prepare and submit submittals required by individual Specification Sections. Types of submittals are indicated in individual Specification Sections.
 - 1. Email: Prepare submittals as PDF package and transmit to Architect by sending via email. Include PDF transmittal form. Include information in email subject line as requested by Architect.
 - a. Architect will return annotated file. Annotate and retain one copy of file as a digital Project Record Document file.
 - 2. Paper: Prepare submittals in paper form and deliver to Architect.
- B. Coordination: Coordinate preparation and processing of submittals with performance of construction activities.
 - 1. Coordinate each submittal with fabrication, purchasing, testing, delivery, other submittals, and related activities that require sequential activity.
 - 2. Submit all submittal items required for each Specification Section concurrently unless partial submittals for portions of the Work are indicated on approved submittal schedule.
 - 3. Submit action submittals and informational submittals required by the same Specification Section as separate packages under separate transmittals.
- C. Processing Time: Allow time for submittal review, including time for resubmittals, as follows. Time for review shall commence on Architect's receipt of submittal. No extension of the Contract Time will be authorized because of failure to transmit submittals enough in advance of the Work to permit processing, including resubmittals.
 - 1. Initial Review: Allow 15 days for initial review of each submittal. Allow additional time if coordination with subsequent submittals is required. Architect will advise Contractor when a submittal being processed must be delayed for coordination.
 - 2. Intermediate Review: If intermediate submittal is necessary, process it in same manner as initial submittal.
 - 3. Resubmittal Review: Allow 15 days for review of each resubmittal.
- D. Resubmittals: Make resubmittals in same form and number of copies as initial submittal.
- E. Distribution: Furnish copies of final submittals to manufacturers, subcontractors, suppliers, fabricators, installers, authorities having jurisdiction, and others as necessary for performance of construction activities. Show distribution on transmittal forms.
- F. Use for Construction: Retain complete copies of submittals on Project site. Use only final action submittals that are marked with approval notation from Architect's action stamp.

1.6 SUBMITTAL REQUIREMENTS

- A. Product Data: Collect information into a single submittal for each element of

construction and type of product or equipment.

1. If information must be specially prepared for submittal because standard published data are unsuitable for use, submit as Shop Drawings, not as Product Data.
 2. Mark each copy of each submittal to show which products and options are applicable.
 3. Include the following information, as applicable:
 - a. Manufacturer's catalog cuts.
 - b. Manufacturer's product specifications.
 - c. Standard color charts.
 - d. Statement of compliance with specified referenced standards.
 - e. Testing by recognized testing agency.
 - f. Application of testing agency labels and seals.
 - g. Notation of coordination requirements.
 - h. Availability and delivery time information.
 4. For equipment, include the following in addition to the above, as applicable:
 - a. Wiring diagrams that show factory-installed wiring.
 - b. Printed performance curves.
 - c. Operational range diagrams.
 - d. Clearances required to other construction, if not indicated on accompanying Shop Drawings.
 5. Submit Product Data before Shop Drawings, and before or concurrently with Samples.
- B. Shop Drawings: Prepare Project-specific information, drawn accurately to scale. Do not base Shop Drawings on reproductions of the Contract Documents or standard printed data unless submittal based on Architect's digital data drawing files is otherwise permitted.
1. Preparation: Fully illustrate requirements in the Contract Documents. Include the following information, as applicable:
 - a. Identification of products.
 - b. Schedules.
 - c. Compliance with specified standards.
 - d. Notation of coordination requirements.
 - e. Notation of dimensions established by field measurement.
 - f. Relationship and attachment to adjoining construction clearly indicated.
 - g. Seal and signature of professional engineer if specified.
 2. Paper Sheet Size: Except for templates, patterns, and similar full-size Drawings, submit Shop Drawings on sheets at least **8-1/2 by 11 inches**, but no larger than **30 by 42 inches**.
 - a. Six opaque copies of each submittal. Architect will retain two copies; remainder will be returned.

- C. Samples: Submit Samples for review of type, color, pattern, and texture for a check of these characteristics with other materials.
1. Transmit Samples that contain multiple, related components, such as accessories together in one submittal package.
 2. Identification: Permanently attach label on unexposed side of Samples that includes the following:
 - a. Project name and submittal number.
 - b. Generic description of Sample.
 - c. Product name and name of manufacturer.
 - d. Sample source.
 - e. Number and title of applicable Specification Section.
 - f. Specification paragraph number and generic name of each item.
 3. Email Transmittal: Provide PDF transmittal. Include digital image file illustrating Sample characteristics and identification information for record.
 4. Paper Transmittal: Include paper transmittal, including complete submittal information indicated.
 5. Disposition: Maintain sets of approved Samples at Project site, available for quality-control comparisons throughout the course of construction activity. Sample sets may be used to determine final acceptance of construction associated with each set.
 - a. Samples that may be incorporated into the Work are indicated in individual Specification Sections. Such Samples must be in an undamaged condition at time of use.
 - b. Samples not incorporated into the Work, or otherwise designated as Owner's property, are the property of Contractor.
 6. Samples for Initial Selection: Submit manufacturer's color charts consisting of units or sections of units, showing the full range of colors, textures, and patterns available.
 - a. Number of Samples: Submit one full set(s) of available choices where color, pattern, texture, or similar characteristics are required to be selected from manufacturer's product line. Architect will return submittal with options selected.
 7. Samples for Verification: Submit full-size units or Samples of size indicated, prepared from same material to be used for the Work, cured and finished in manner specified, and physically identical with material or product proposed for use, and that show full range of color and texture variations expected. Samples include, but are not limited to, the following: partial sections of manufactured or fabricated components; small cuts or containers of materials; complete units of repetitively used materials; swatches showing color, texture, and pattern; color range sets; and components used for independent testing and inspection.
 - a. Number of Samples: Submit three sets of Samples. Architect will retain two Sample sets; remainder will be returned. Mark up and retain one returned Sample set as a project record Sample.

- 1) Submit a single Sample where assembly details, workmanship, fabrication techniques, connections, operation, and other similar characteristics are to be demonstrated.
 - 2) If variation in color, pattern, texture, or other characteristic is inherent in material or product represented by a Sample, submit at least three sets of paired units that show approximate limits of variations.
- D. Product Schedule: As required in individual Specification Sections, prepare a written summary indicating types of products required for the Work and their intended location. Include the following information in tabular form:
1. Type of product. Include unique identifier for each product indicated in the Contract Documents or assigned by Contractor if none is indicated.
 2. Manufacturer and product name, and model number if applicable.
 3. Number and name of room or space.
 4. Location within room or space.
- E. Qualification Data: Prepare written information that demonstrates capabilities and experience of firm or person. Include lists of completed projects with project names and addresses, contact information of architects and owners, and other information specified.
- F. Design Data: Prepare and submit written and graphic information indicating compliance with indicated performance and design criteria in individual Specification Sections. Include list of assumptions and summary of loads. Include load diagrams if applicable. Provide name and version of software, if any, used for calculations. Number each page of submittal.
- G. Certificates:
1. Certificates and Certifications Submittals: Submit a statement that includes signature of entity responsible for preparing certification. Certificates and certifications shall be signed by an officer or other individual authorized to sign documents on behalf of that entity. Provide a notarized signature where indicated.
 2. Installer Certificates: Submit written statements on manufacturer's letterhead, certifying that Installer complies with requirements in the Contract Documents and, where required, is authorized by manufacturer for this specific Project.
 3. Manufacturer Certificates: Submit written statements on manufacturer's letterhead, certifying that manufacturer complies with requirements in the Contract Documents. Include evidence of manufacturing experience where required.
 4. Material Certificates: Submit written statements on manufacturer's letterhead, certifying that material complies with requirements in the Contract Documents.
 5. Product Certificates: Submit written statements on manufacturer's letterhead, certifying that product complies with requirements in the Contract Documents.
 6. Welding Certificates: Prepare written certification that welding procedures and personnel comply with requirements in the Contract Documents. Submit record of AWS B2.1/B2.1M on AWS forms. Include names of firms and personnel certified.

H. Test and Research Reports:

1. Compatibility Test Reports: Submit reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting results of compatibility tests performed before installation of product. Include written recommendations for substrate preparation and primers required.
2. Field Test Reports: Submit written reports indicating and interpreting results of field tests performed either during installation of product or after product is installed in its final location, for compliance with requirements in the Contract Documents.
3. Material Test Reports: Submit reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting test results of material for compliance with requirements in the Contract Documents.
4. Preconstruction Test Reports: Submit reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting results of tests performed before installation of product, for compliance with performance requirements in the Contract Documents.
5. Product Test Reports: Submit written reports indicating that current product produced by manufacturer complies with requirements in the Contract Documents. Base reports on evaluation of tests performed by manufacturer and witnessed by a qualified testing agency, or on comprehensive tests performed by a qualified testing agency.
6. Research Reports: Submit written evidence, from a model code organization acceptable to authorities having jurisdiction, that product complies with building code in effect for Project. Include the following information:
 - a. Name of evaluation organization.
 - b. Date of evaluation.
 - c. Time period when report is in effect.
 - d. Product and manufacturers' names.
 - e. Description of product.
 - f. Test procedures and results.
 - g. Limitations of use.

1.7 DELEGATED DESIGN SERVICES

- A. Performance and Design Criteria: Where professional design services or certifications by a design professional are specifically required of Contractor by the Contract Documents, provide products and systems complying with specific performance and design criteria indicated.
 1. If criteria indicated are insufficient to perform services or certification required, submit a written request for additional information to Architect.
- B. Delegated Design Services Certification: In addition to Shop Drawings, Product Data, and other required submittals, submit digitally signed PDF file and three paper copies of certificate, signed and sealed by the responsible design professional, for each product and system specifically assigned to Contractor to be designed or certified by a design professional.

1. Indicate that products and systems comply with performance and design criteria in the Contract Documents. Include list of codes, loads, and other factors used in performing these services.

1.8 CONTRACTOR'S REVIEW

- A. Action Submittals and Informational Submittals: Review each submittal and check for coordination with other Work of the Contract and for compliance with the Contract Documents. Note corrections and field dimensions. Mark with approval stamp before submitting to Architect.
- B. Contractor's Approval: Indicate Contractor's approval for each submittal with a uniform approval stamp. Include name of reviewer, date of Contractor's approval, and statement certifying that submittal has been reviewed, checked, and approved for compliance with the Contract Documents.
 1. Architect will not review submittals received from Contractor that do not have Contractor's review and approval.

1.9 ARCHITECT'S AND CONSTRUCTION MANAGER'S REVIEW

- A. Action Submittals: Architect and Construction Manager will review each submittal, indicate corrections or revisions required, and return.
 1. PDF Submittals: Architect and Construction Manager will indicate, via markup on each submittal, the appropriate action.
 2. Paper Submittals: Architect and Construction Manager will stamp each submittal with an action stamp and will mark stamp appropriately to indicate action.
- B. Informational Submittals: Architect and Construction Manager will review each submittal and will not return it, or will return it if it does not comply with requirements. Architect and Construction Manager will forward each submittal to appropriate party.
- C. Partial submittals prepared for a portion of the Work will be reviewed when use of partial submittals has received prior approval from Architect and Construction Manager.
- D. Incomplete submittals are unacceptable, will be considered nonresponsive, and will be returned for resubmittal without review.
- E. Architect and Construction Manager will discard submittals received from sources other than Contractor.
- F. Submittals not required by the Contract Documents will be returned by Architect without action.

PART 2 - PRODUCTS (Not Used)
PART 3 - EXECUTION (Not Used)

END OF SECTION 013300

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SECTION 014000 - QUALITY REQUIREMENTS

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes administrative and procedural requirements for quality assurance and quality control.
- B. Testing and inspection services are required to verify compliance with requirements specified or indicated. These services do not relieve Contractor of responsibility for compliance with the Contract Document requirements.
 - 1. Specified tests, inspections, and related actions do not limit Contractor's other quality-assurance and quality-control procedures that facilitate compliance with the Contract Document requirements.
 - 2. Requirements for Contractor to provide quality-assurance and quality-control services required by Architect, Owner, or authorities having jurisdiction are not limited by provisions of this Section.

1.2 DEFINITIONS

- A. Experienced: When used with an entity or individual, "experienced," unless otherwise further described, means having successfully completed a minimum of five previous projects similar in nature, size, and extent to this Project; being familiar with special requirements indicated; and having complied with requirements of authorities having jurisdiction.
- B. Field Quality-Control Tests and Inspections: Tests and inspections that are performed on-site for installation of the Work and for completed Work.
- C. Installer/Applicator/Erector: Contractor or another entity engaged by Contractor as an employee, subcontractor, or sub-subcontractor, to perform a particular construction operation, including installation, erection, application, assembly, and similar operations.
 - 1. Use of trade-specific terminology in referring to a Work result does not require that certain construction activities specified apply exclusively to specific trade(s).
- D. Mockups: Physical assemblies of portions of the Work constructed to establish the standard by which the Work will be judged. Mockups are not Samples.
 - 1. Mockups are used for one or more of the following:
 - a. Verify selections made under Sample submittals.
 - b. Demonstrate the qualities of products and workmanship.
 - c. Demonstrate successful installation of interfaces between components and systems.
 - 2. In-Place Mockups: Mockups constructed on-site in their actual final location as

part of permanent construction.

- E. Preconstruction Testing: Tests and inspections performed specifically for Project before products and materials are incorporated into the Work, to verify performance or compliance with specified criteria. Unless otherwise indicated, copies of reports of tests or inspections performed for other than the Project do not meet this definition.
- F. Product Tests: Tests and inspections that are performed by a nationally recognized testing laboratory (NRTL) in accordance with 29 CFR 1910.7, by a testing agency accredited in accordance with NIST's National Voluntary Laboratory Accreditation Program (NVLAP), or by a testing agency qualified to conduct product testing and acceptable to authorities having jurisdiction, to establish product performance and compliance with specified requirements.
- G. Source Quality-Control Tests and Inspections: Tests and inspections that are performed at the source (e.g., plant, mill, factory, or shop).
- H. Testing Agency: An entity engaged to perform specific tests, inspections, or both. The term "testing laboratory" has the same meaning as the term "testing agency."
- I. Quality-Assurance Services: Activities, actions, and procedures performed before and during execution of the Work, to guard against defects and deficiencies and substantiate that proposed construction will comply with requirements.
- J. Quality-Control Services: Tests, inspections, procedures, and related actions during and after execution of the Work, to evaluate that actual products incorporated into the Work and completed construction comply with requirements. Contractor's quality-control services do not include contract administration activities performed by Architect.

1.3 DELEGATED DESIGN SERVICES

- A. Performance and Design Criteria: Where professional design services or certifications by a design professional are specifically required of Contractor by the Contract Documents, provide products and systems complying with specific performance and design criteria indicated.
 - 1. If criteria indicated are not sufficient to perform services or certification required, submit a written request for additional information to Architect.

1.4 CONFLICTING REQUIREMENTS

- A. Conflicting Standards and Other Requirements: If compliance with two or more standards or requirements is specified and the standards or requirements establish different or conflicting requirements for minimum quantities or quality levels, inform the Architect regarding the conflict and obtain clarification prior to proceeding with the Work. Refer conflicting requirements that are different, but apparently equal, to Architect for clarification before proceeding.
- B. Minimum Quantity or Quality Levels: The quantity or quality level shown or specified is the minimum provided or performed. The actual installation may comply exactly with

the minimum quantity or quality specified, or it may exceed the minimum within reasonable limits. To comply with these requirements, indicated numeric values are minimum or maximum, as appropriate, for the context of requirements. Refer uncertainties to Architect for a decision before proceeding.

1.5 ACTION SUBMITTALS

A. Mockup Shop Drawings:

1. Include plans, sections, elevations, and details, indicating materials and size of mockup construction.
2. Indicate manufacturer and model number of individual components.
3. Provide axonometric drawings for conditions difficult to illustrate in two dimensions.

1.6 INFORMATIONAL SUBMITTALS

- A. Testing Agency Qualifications: For testing agencies specified in "Quality Assurance" Article to demonstrate their capabilities and experience. Include proof of qualifications in the form of a recent report on the inspection of the testing agency by a recognized authority.
- B. Permits, Licenses, and Certificates: For Owner's record, submit copies of permits, licenses, certifications, inspection reports, releases, jurisdictional settlements, notices, receipts for fee payments, judgments, correspondence, records, and similar documents established for compliance with standards and regulations bearing on performance of the Work.

1.7 REPORTS AND DOCUMENTS

- A. Test and Inspection Reports: Prepare and submit certified written reports specified in other Sections. Include the following:
1. Date of issue.
 2. Project title and number.
 3. Name, address, telephone number, and email address of testing agency.
 4. Dates and locations of samples and tests or inspections.
 5. Names of individuals making tests and inspections.
 6. Description of the Work and test and inspection method.
 7. Identification of product and Specification Section.
 8. Complete test or inspection data.
 9. Test and inspection results and an interpretation of test results.
 10. Record of temperature and weather conditions at time of sample-taking and testing and inspection.
 11. Comments or professional opinion on whether tested or inspected Work complies with the Contract Document requirements.
 12. Name and signature of laboratory inspector.
 13. Recommendations on retesting and reinspecting.

- B. Manufacturer's Technical Representative's Field Reports: Prepare written information documenting manufacturer's technical representative's tests and inspections specified in other Sections. Include the following:
 - 1. Statement on condition of substrates and their acceptability for installation of product.
 - 2. Statement that products at Project site comply with requirements.
 - 3. Summary of installation procedures being followed, whether they comply with requirements and, if not, what corrective action was taken.
 - 4. Results of operational and other tests and a statement of whether observed performance complies with requirements.
 - 5. Other required items indicated in individual Specification Sections.

- C. Factory-Authorized Service Representative's Reports: Prepare written information documenting manufacturer's factory-authorized service representative's tests and inspections specified in other Sections. Include the following:
 - 1. Statement that equipment complies with requirements.
 - 2. Results of operational and other tests and a statement of whether observed performance complies with requirements.
 - 3. Other required items indicated in individual Specification Sections.

1.8 QUALITY ASSURANCE

- A. Qualifications paragraphs in this article establish the minimum qualification levels required; individual Specification Sections specify additional requirements.

- B. Manufacturer Qualifications: A firm experienced in manufacturing products or systems similar to those indicated for this Project and with a record of successful in-service performance, as well as sufficient production capacity to produce required units. As applicable, procure products from manufacturers able to meet qualification requirements, warranty requirements, and technical or factory-authorized service representative requirements.

- C. Fabricator Qualifications: A firm experienced in producing products similar to those indicated for this Project and with a record of successful in-service performance, as well as sufficient production capacity to produce required units.

- D. Installer Qualifications: A firm or individual experienced in installing, erecting, applying, or assembling work similar in material, design, and extent to that indicated for this Project, whose work has resulted in construction with a record of successful in-service performance.

- E. Professional Engineer Qualifications: A professional engineer who is legally qualified to practice in jurisdiction where Project is located and who is experienced in providing engineering services of the kind indicated. Engineering services are defined as those performed for installations of the system, assembly, or product that is similar in material, design, and extent to those indicated for this Project.

- F. Specialists: Certain Specification Sections require that specific construction activities be performed by entities who are recognized experts in those operations. Specialists

will satisfy qualification requirements indicated and engage in the activities indicated.

1. Requirements of authorities having jurisdiction supersede requirements for specialists.
- G. Testing and Inspecting Agency Qualifications: An NRTL, an NVLAP, or an independent agency with the experience and capability to conduct testing and inspection indicated, as documented in accordance with ASTM E329, and with additional qualifications specified in individual Sections; and, where required by authorities having jurisdiction, that is acceptable to authorities.
- H. Manufacturer's Technical Representative Qualifications: An authorized representative of manufacturer who is trained and approved by manufacturer to observe and inspect installation of manufacturer's products that are similar in material, design, and extent to those indicated for this Project.
- I. Factory-Authorized Service Representative Qualifications: An authorized representative of manufacturer who is trained and approved by manufacturer to inspect, demonstrate, repair, and perform service on installations of manufacturer's products that are similar in material, design, and extent to those indicated for this Project.
- J. Preconstruction Testing: Where testing agency is indicated to perform preconstruction testing for compliance with specified requirements for performance and test methods, comply with the following:
1. Contractor's Responsibilities:
 - a. Provide test specimens representative of proposed products and construction.
 - b. Submit specimens in a timely manner with sufficient time for testing and analyzing results to prevent delaying the Work.
 - c. When testing is complete, remove test specimens and test assemblies, and mockups; do not reuse products on Project.
 2. Testing Agency Responsibilities: Submit a certified written report of each test, inspection, and similar quality-assurance service to Architect, with copy to Contractor. Interpret tests and inspections, and state in each report whether tested and inspected Work complies with or deviates from the Contract Documents.
- K. Mockups: Before installing portions of the Work requiring mockups, build mockups for each form of construction and finish required to comply with the following requirements, using materials indicated for the completed Work:
1. Build mockups of size indicated.
 2. Build mockups in location indicated or, if not indicated, as directed by Architect.
 3. Notify Architect seven days in advance of dates and times when mockups will be constructed.
 4. Employ supervisory personnel who will oversee mockup construction. Employ workers who will be employed to perform same tasks during the construction at

Project.

5. Demonstrate the proposed range of aesthetic effects and workmanship.
6. Obtain Architect's approval of mockups before starting corresponding Work, fabrication, or construction.
 - a. Allow seven days for initial review and each re-review of each mockup.
7. Promptly correct unsatisfactory conditions noted by Architect's preliminary review, to the satisfaction of the Architect, before completion of final mockup.
8. Approval of mockups by the Architect does not constitute approval of deviations from the Contract Documents contained in mockups unless Architect specifically approves such deviations in writing.
9. Maintain mockups during construction in an undisturbed condition as a standard for judging the completed Work.
10. Demolish and remove mockups when directed unless otherwise indicated.

1.9 QUALITY CONTROL

- A. Owner Responsibilities: Where quality-control services are indicated as Owner's responsibility, Owner will engage a qualified testing agency to perform these services.
 1. Owner will furnish Contractor with names, addresses, and telephone numbers of testing agencies engaged and a description of types of testing and inspection they are engaged to perform.
 2. Costs for retesting and reinspecting construction that replaces or is necessitated by Work that failed to comply with the Contract Documents will be charged to Contractor, and the Contract Sum will be adjusted by Change Order.
- B. Contractor Responsibilities: Tests and inspections not explicitly assigned to Owner are Contractor's responsibility. Perform additional quality-control activities, whether specified or not, to verify and document that the Work complies with requirements.
 1. Unless otherwise indicated, provide quality-control services specified and those required by authorities having jurisdiction. Perform quality-control services required of Contractor by authorities having jurisdiction, whether specified or not.
 2. Notify testing agencies at least 24 hours in advance of time when Work that requires testing or inspection will be performed.
 3. Where quality-control services are indicated as Contractor's responsibility, submit a certified written report, in duplicate, of each quality-control service.
 4. Testing and inspection requested by Contractor and not required by the Contract Documents are Contractor's responsibility.
 5. Submit additional copies of each written report directly to authorities having jurisdiction, when they so direct.
- C. Retesting/Reinspecting: Regardless of whether original tests or inspections were Contractor's responsibility, provide quality-control services, including retesting and reinspecting, for construction that replaced Work that failed to comply with the Contract Documents.
- D. Manufacturer's Field Services: Where indicated, engage a factory-authorized service representative to inspect field-assembled components and equipment installation,

including service connections. Report results in writing as specified in Section 013300 "Submittal Procedures."

- E. **Manufacturer's Technical Services:** Where indicated, engage a manufacturer's technical representative to observe and inspect the Work. Manufacturer's technical representative's services include participation in preinstallation conferences, examination of substrates and conditions, verification of materials, observation of Installer activities, inspection of completed portions of the Work, and submittal of written reports.
- F. **Contractor's Associated Requirements and Services:** Cooperate with agencies and representatives performing required tests, inspections, and similar quality-control services, and provide reasonable auxiliary services as requested. Notify agency sufficiently in advance of operations to permit assignment of personnel. Provide the following:
 - 1. Access to the Work.
 - 2. Incidental labor and facilities necessary to facilitate tests and inspections.
 - 3. Adequate quantities of representative samples of materials that require testing and inspection. Assist agency in obtaining samples.
 - 4. Facilities for storage and field curing of test samples.
 - 5. Preliminary design mix proposed for use for material mixes that require control by testing agency.
 - 6. Security and protection for samples and for testing and inspection equipment at Project site.
- G. **Coordination:** Coordinate sequence of activities to accommodate required quality-assurance and quality-control services with a minimum of delay and to avoid necessity of removing and replacing construction to accommodate testing and inspection.
 - 1. Schedule times for tests, inspections, obtaining samples, and similar activities.

1.10 SPECIAL TESTS AND INSPECTIONS

- A. **Special Tests and Inspections:** Owner will engage a qualified testing agency to conduct special tests and inspections required by authorities having jurisdiction as the responsibility of Owner, and as follows:
 - 1. Notifying Architect and Contractor promptly of irregularities and deficiencies observed in the Work during performance of its services.
 - 2. Submitting a certified written report of each test, inspection, and similar quality-control service to Architect with copy to Contractor and to authorities having jurisdiction.
 - 3. Submitting a final report of special tests and inspections at Substantial Completion, which includes a list of unresolved deficiencies.
 - 4. Interpreting tests and inspections, and stating in each report whether tested and inspected Work complies with or deviates from the Contract Documents.
 - 5. Retesting and reinspecting corrected Work.

PART 2 - PRODUCTS (Not Used)
PART 3 - EXECUTION

3.1 TEST AND INSPECTION LOG

- A. Test and Inspection Log: Prepare a record of tests and inspections. Include the following:
 - 1. Date test or inspection was conducted.
 - 2. Description of the Work tested or inspected.
 - 3. Date test or inspection results were transmitted to Architect.
 - 4. Identification of testing agency or special inspector conducting test or inspection.
- B. Maintain log at Project site. Post changes and revisions as they occur. Provide access to test and inspection log for Architect's reference during normal working hours.
 - 1. Submit log at Project closeout as part of Project Record Documents.

3.2 REPAIR AND PROTECTION

- A. General: On completion of testing, inspection, sample-taking, and similar services, repair damaged construction and restore substrates and finishes.
 - 1. Provide materials and comply with installation requirements specified in other Specification Sections or matching existing substrates and finishes. Restore patched areas and extend restoration into adjoining areas with durable seams that are as invisible as possible. Comply with the Contract Document requirements for cutting and patching in Section 017300 "Execution."
- B. Protect construction exposed by or for quality-control service activities.
- C. Repair and protection are Contractor's responsibility, regardless of the assignment of responsibility for quality-control services.

END OF SECTION 014000

SECTION 015000 - TEMPORARY FACILITIES AND CONTROLS

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes requirements for temporary utilities, support facilities, and security and protection facilities.
- B. Related Requirements:
 - 1. Section 011000 "Summary" for work restrictions and limitations on utility interruptions.

1.2 USE CHARGES

- A. Installation, removal, and use charges for temporary facilities to be included in the Contract Sum unless otherwise indicated. Allow other entities engaged in the Project to use temporary services and facilities without cost, including, but not limited to, Architect, testing agencies, and authorities having jurisdiction.
- B. Water and Sewer Service from Existing System: Water from Owner's existing water system is available for use without metering and without payment of use charges. Provide connections and extensions of services as required for construction operations.
- C. Electric Power Service from Existing System: Electric power from Owner's existing system is available for use without metering and without payment of use charges. Provide connections and extensions of services and metering as required for construction operations.

1.3 INFORMATIONAL SUBMITTALS

- A. Site Utilization Plan: Show temporary facilities, temporary utility lines and connections, staging areas, construction site entrances, vehicle circulation, and parking areas for construction personnel.
- B. Project Identification and Temporary Signs: Show fabrication and installation details, including plans, elevations, details, layouts, typestyles, graphic elements, and message content.
- C. Fire-Safety Program: Show compliance with requirements of NFPA 241 and authorities having jurisdiction. Indicate Contractor personnel responsible for management of fire-prevention program.
- D. Dust- and HVAC-Control Plan: Submit coordination drawing and narrative that indicates the dust- and HVAC-control measures proposed for use, proposed locations,

and proposed time frame for their operation. Include the following:

1. Locations of dust-control partitions at each phase of work.
2. HVAC system isolation schematic drawing.
3. Location of proposed air-filtration system discharge.
4. Waste-handling procedures.
5. Other dust-control measures.

E. Noise and Vibration Control Plan: Identify construction activities that may impact the occupancy and use of existing spaces within the building or adjacent existing buildings, whether occupied by others, or occupied by Owner. Include the following:

1. Methods used to meet the goals and requirements of Owner.
2. Concrete cutting method(s) to be used.
3. Location of construction devices on the site.
4. Show compliance with the use and maintenance of quieted construction devices for the duration of the Project.
5. Indicate activities that may disturb building occupants and that are planned to be performed during non-standard working hours as coordinated with Owner.
6. Indicate locations of sensitive equipment areas or other areas requiring special attention as identified by Owner. Indicate means for complying with Owner's requirements.

1.4 QUALITY ASSURANCE

- A. Electric Service: Comply with NECA, NEMA, and UL standards and regulations for temporary electric service. Install service to comply with NFPA 70.
- B. Tests and Inspections: Arrange for authorities having jurisdiction to test and inspect each temporary utility before use. Obtain required certifications and permits.
- C. Accessible Temporary Egress: Comply with applicable provisions in the DOJ's "2010 ADA Standards for Accessible Design".

1.5 PROJECT CONDITIONS

- A. Temporary Use of Permanent Facilities: Engage Installer of each permanent service to assume responsibility for operation, maintenance, and protection of each permanent service during its use as a construction facility before Owner's acceptance, regardless of previously assigned responsibilities.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Polyethylene Sheet: Reinforced, fire-resistive sheet, **10-mil** minimum thickness, with flame-spread rating of 15 or less in accordance with ASTM E84 and passing NFPA 701 Test Method 2.

1. Zippered access doors.
2. All other accessories required to install dustproof partitions specified in this Specification Section.

- B. Dust-Control Adhesive-Surface Walk-Off Mats: Provide mats, minimum **36 by 60 inches**.

2.2 TEMPORARY FACILITIES

- A. Field Offices:
1. A field office is not required for this project.
 2. The Owner will provide space with tables and chairs inside the existing building to be used for bi-weekly meetings.

2.3 EQUIPMENT

- A. Fire Extinguishers: Portable, UL rated; with class and extinguishing agent as required by locations and classes of fire exposures.
- B. HVAC Equipment: Unless Owner authorizes use of permanent HVAC system, provide vented, self-contained, liquid-propane-gas or fuel-oil heaters with individual space thermostatic control.
1. Use of gasoline-burning space heaters, open-flame heaters, or salamander-type heating units is prohibited.
 2. Heating, Cooling, and Dehumidifying Units: Listed and labeled for type of fuel being consumed, by a qualified testing agency acceptable to authorities having jurisdiction, and marked for intended location and application.
- C. Air-Filtration Units: Primary and secondary HEPA-filter-equipped portable units with four-stage filtration. Provide single switch for emergency shutoff. Configure to run continuously.

PART 3 - EXECUTION

3.1 TEMPORARY FACILITIES, GENERAL

- A. Conservation: Coordinate construction and use of temporary facilities with consideration given to conservation of energy, water, and materials. Coordinate use of temporary utilities to minimize waste.
1. Salvage materials and equipment involved in performance of, but not actually incorporated into, the Work. See other Sections for disposition of salvaged materials that are designated as Owner's property.

3.2 INSTALLATION, GENERAL

- A. Locate facilities where they will serve Project adequately and result in minimum interference with performance of the Work. Relocate and modify facilities as required by progress of the Work.
 - 1. Locate facilities to limit site disturbance as specified in Section 011000 "Summary."
- B. Provide each facility ready for use when needed to avoid delay. Do not remove until facilities are no longer needed or are replaced by authorized use of completed permanent facilities.
- C. Isolation of Work Areas in Occupied Facilities: Prevent dust, fumes, and odors from entering occupied areas.
 - 1. Prior to commencing work, isolate the HVAC system in area where work is to be performed.
 - a. Mark damper locations prior to isolation and isolate all air distribution in area of work.
 - b. Maintain negative air pressure within work area, using HEPA-equipped air-filtration units, starting with commencement of temporary partition construction, and continuing until removal of temporary partitions is complete.
 - 2. Maintain dust partitions during the Work. Use vacuum collection attachments on dust-producing equipment. Isolate limited work within occupied areas using portable dust-containment devices.
 - 3. Perform daily construction cleanup and final cleanup using approved, HEPA-filter-equipped vacuum equipment.

3.3 TEMPORARY UTILITY INSTALLATION

- A. General: Install temporary service or connect to existing service.
 - 1. Arrange with utility company, Owner, and existing users for time when service can be interrupted, if necessary, to make connections for temporary services.
- B. Water Service:
 - 1. Connect to Owner's existing water service facilities. Clean and maintain water service facilities in a condition acceptable to Owner. At Substantial Completion, restore these facilities to condition existing before initial use.
- C. Sanitary Facilities: Provide temporary toilets, wash facilities, safety shower and eyewash facilities, and drinking water for use of construction personnel. Comply with requirements of authorities having jurisdiction for type, number, location, operation, and maintenance of fixtures and facilities.
- D. Temporary Heating and Cooling: Provide temporary heating and cooling required by

construction activities for curing or drying of completed installations or for protecting installed construction from adverse effects of low temperatures or high humidity. Select equipment that will not have a harmful effect on completed installations or elements being installed.

1. Provide temporary dehumidification systems when required to reduce ambient and substrate moisture levels to level required to allow installation or application of finishes and their proper curing or drying.

E. Electric Power Service:

1. Connect to Owner's existing electric power service. Maintain equipment in a condition acceptable to Owner.

F. Lighting: Provide temporary lighting with local switching that provides adequate illumination for construction operations, observations, inspections, and traffic conditions.

1. Install and operate temporary lighting that fulfills security and protection requirements without operating entire system.

3.4 SUPPORT FACILITIES INSTALLATION

A. Comply with the following:

1. Provide construction for temporary field offices, shops, and sheds located within construction area or within **30 feet** of building lines that is noncombustible in accordance with ASTM E136. Comply with NFPA 241.
2. Maintain support facilities until Architect schedules Substantial Completion inspection. Remove before Substantial Completion. Personnel remaining after Substantial Completion will be permitted to use permanent facilities, under conditions acceptable to Owner.

B. Traffic Controls: Comply with requirements of authorities having jurisdiction.

1. Protect existing site improvements to remain, including curbs, pavement, and utilities.
2. Maintain access for fire-fighting equipment and access to fire hydrants.

C. Parking: Use designated areas of Owner's existing parking areas for construction personnel.

D. Storage and Staging: Use designated areas of Project site for storage and staging needs.

E. Dewatering Facilities and Drains: Comply with requirements of authorities having jurisdiction. Maintain Project site, excavations, and construction free of water.

1. Dispose of rainwater in a lawful manner that will not result in flooding Project or adjoining properties or endanger permanent Work or temporary facilities.
2. Remove snow and ice as required to minimize accumulations.

- F. Project Signs: Provide Project signs as indicated. Unauthorized signs are not permitted.
 - 1. Temporary Signs: Provide other signs as indicated and as required to inform public and individuals seeking entrance to Project.
 - a. Provide temporary, directional signs for construction personnel and visitors.
 - 2. Maintain and touch up signs, so they are legible at all times.
- G. Waste Disposal Facilities:
 - 1. Comply with requirements specified in Section 017419 "Construction Waste Management and Disposal."
 - 2. Provide waste-collection containers in sizes adequate to handle waste from construction operations. Comply with requirements of authorities having jurisdiction. Comply with progress cleaning requirements in Section 017300 "Execution."
- H. Lifts and Hoists: Provide facilities necessary for hoisting materials and personnel.
 - 1. Truck cranes and similar devices used for hoisting materials are considered "tools and equipment" and not temporary facilities.
- I. 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.
 - 1. Do not load elevators beyond their rated weight capacity.
 - 2. 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.
- J. Existing Stair Usage: 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.
 - 1. 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.

3.5 SECURITY AND PROTECTION FACILITIES INSTALLATION

- A. Protection of Existing Facilities: Protect existing vegetation, equipment, structures, utilities, and other improvements at Project site and on adjacent properties, except those indicated to be removed or altered. Repair damage to existing facilities.
 - 1. Where access to adjacent properties is required in order to affect protection of

existing facilities, obtain written permission from adjacent property owner to access property for that purpose.

- B. Environmental Protection: Provide protection, operate temporary facilities, and conduct construction as required to comply with environmental regulations and that minimize possible air, waterway, and subsoil contamination or pollution or other undesirable effects.
 - 1. Comply with work restrictions specified in Section 011000 "Summary."
- C. Barricades, Warning Signs, and Lights: Comply with requirements of authorities having jurisdiction for erecting structurally adequate barricades, including warning signs and lighting.
- D. Temporary Egress: Provide temporary egress from existing occupied facilities as indicated and as required by authorities having jurisdiction. Provide signage directing occupants to temporary egress.
- E. 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.
 - 1. Where heating or cooling is needed and permanent enclosure is incomplete, insulate temporary enclosures.
- F. Temporary Partitions: Provide **floor-to-ceiling** dustproof partitions to limit dust and dirt migration and to separate areas occupied by Owner from fumes and noise.
 - 1. Construct dustproof partitions with **6-mil** polyethylene sheet. Overlap and tape full length of joints.
 - 2. Where fire-resistance-rated temporary partitions are indicated or are required by authorities having jurisdiction, construct partitions according to the rated assemblies.
 - 3. Seal joints and perimeter. Equip partitions with magnetic doors.
 - a. ZipWall, ZipDoor Magnetic Door Kit or approved equal.
 - 4. Protect air-handling equipment.
 - 5. Provide walk-off mats at each entrance through temporary partition.
- G. Temporary Fire Protection: Install and maintain temporary fire-protection facilities of types needed to protect against reasonably predictable and controllable fire losses. Comply with NFPA 241; manage fire-prevention program.
 - 1. Prohibit smoking in construction areas. Comply with additional limits on smoking specified in other Sections.
 - 2. Supervise welding operations, combustion-type temporary heating units, and similar sources of fire ignition in accordance with requirements of authorities having jurisdiction.
 - 3. 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. Post warnings and information.

4. Provide temporary standpipes and hoses for fire protection. Hang hoses with a warning sign, stating that hoses are for fire-protection purposes only and are not to be removed. Match hose size with outlet size and equip with suitable nozzles.

3.6 OPERATION, TERMINATION, AND REMOVAL

- A. Supervision: Enforce strict discipline in use of temporary facilities. To minimize waste and abuse, limit availability of temporary facilities to essential and intended uses.
- B. Maintenance: Maintain facilities in good operating condition until removal.
 1. Maintain operation of temporary enclosures, heating, cooling, humidity control, ventilation, and similar facilities on a 24-hour basis where required to achieve indicated results and to avoid possibility of damage.
- C. Temporary Facility Changeover: Do not change over from using temporary security and protection facilities to permanent facilities until Substantial Completion.
- D. Termination and Removal: Remove each temporary facility when need for its service has ended, when it has been replaced by authorized use of a permanent facility, or no later than Substantial Completion. Complete or, if necessary, restore permanent construction that may have been delayed because of interference with temporary facility. Repair damaged Work, clean exposed surfaces, and replace construction that cannot be satisfactorily repaired.
 1. Materials and facilities that constitute temporary facilities are property of Contractor. Owner reserves right to take possession of Project identification signs.
 2. At Substantial Completion, repair, renovate, and clean permanent facilities used during construction period. Comply with final cleaning requirements specified in Section 017700 "Closeout Procedures."

END OF SECTION 015000

SECTION 016000 - PRODUCT REQUIREMENTS

PART 1 - GENERAL

1.1 SUMMARY

- A. The Work of This Section Includes: Administrative and procedural requirements for selection of products for use in Project; product delivery, storage, and handling; manufacturers' standard warranties on products; special warranties; and comparable products.
- B. Related Requirements:
 - 1. Section 011000 "Summary" for Contractor requirements related to Owner-furnished products.
 - 2. Section 012500 "Substitution Procedures" for requests for substitutions.
 - 3. Section 017700 "Closeout Procedures" for submitting warranties.

1.2 DEFINITIONS

- A. Products: Items obtained for incorporating into the Work, whether purchased for Project or taken from previously purchased stock. The term "product" includes the terms "material," "equipment," "system," and terms of similar intent.
 - 1. Named Products: Items identified by manufacturer's product name, including make or model number or other designation shown or listed in manufacturer's published product literature that is current as of date of the Contract Documents.
 - 2. New Products: Items that have not previously been incorporated into another project or facility. Salvaged items or items reused from other projects are not considered new products. Items that are manufactured or fabricated to include recycled content materials are considered new products unless otherwise indicated.
 - 3. Comparable Product: Product by named manufacturer that is demonstrated and approved through the comparable product submittal process described in "Comparable Products" Article, to have the indicated qualities related to type, function, dimension, in-service performance, physical properties, appearance, and other characteristics that equal or exceed those of specified product.
- B. Basis-of-Design Product Specification: A specification in which a single manufacturer's product is named and accompanied by the words "basis-of-design product," including make or model number or other designation. Published attributes and characteristics of basis-of-design product establish salient characteristics of products.

1.3 QUALITY ASSURANCE

- A. Compatibility of Options: If Contractor is given option of selecting between two or more products for use on Project, select product compatible with products previously

selected, even if previously selected products were also options.

1.4 COORDINATION

- A. Modify or adjust affected work as necessary to integrate work of approved comparable products and approved substitutions.

1.5 PRODUCT DELIVERY, STORAGE, AND HANDLING

- A. Deliver, store, and handle products, using means and methods that will prevent damage, deterioration, and loss, including theft and vandalism. Comply with manufacturer's written instructions.
- B. Delivery and Handling:
 - 1. Schedule delivery to minimize long-term storage at Project site and to prevent overcrowding of construction spaces.
 - 2. Coordinate delivery with installation time to ensure minimum holding time for items that are flammable, hazardous, easily damaged, or sensitive to deterioration, theft, and other losses.
 - 3. Deliver products to Project site in an undamaged condition in manufacturer's original sealed container or other packaging system, complete with labels and instructions for handling, storing, unpacking, protecting, and installing.
 - 4. Inspect products on delivery to determine compliance with the Contract Documents and that products are undamaged and properly protected.
- C. Storage:
 - 1. Store products to allow for inspection and measurement of quantity or counting of units.
 - 2. Store materials in a manner that will not endanger Project structure.
 - 3. Store products that are subject to damage by the elements under cover in a weathertight enclosure above ground, with ventilation adequate to prevent condensation and with adequate protection from wind.
 - 4. Protect foam plastic from exposure to sunlight, except to extent necessary for period of installation and concealment.
 - 5. Comply with product manufacturer's written instructions for temperature, humidity, ventilation, and weather-protection requirements for storage.
 - 6. Protect stored products from damage and liquids from freezing.

1.6 PRODUCT WARRANTIES

- A. Warranties specified in other Sections are to be in addition to, and run concurrent with, other warranties required by the Contract Documents. Manufacturer's disclaimers and limitations on product warranties do not relieve Contractor of obligations under requirements of the Contract Documents.
 - 1. Manufacturer's Warranty: Written standard warranty form furnished by individual manufacturer for a particular product and issued in the name of Owner or

2. endorsed by manufacturer to Owner.
 2. Special Warranty: Written warranty required by the Contract Documents to provide specific rights for Owner and issued in the name of Owner or endorsed by manufacturer to Owner.
- B. Special Warranties: Prepare a written document that contains appropriate terms and identification, ready for execution.
1. Manufacturer's Standard Form: Modified to include Project-specific information and properly executed.
 2. Specified Form: When specified forms are included in the Project Manual, prepare a written document, using indicated form properly executed.
 3. See other Sections for specific content requirements and particular requirements for submitting special warranties.
- C. Submittal Time: Comply with requirements in Section 017700 "Closeout Procedures."

PART 2 - PRODUCTS

2.1 PRODUCT SELECTION PROCEDURES

- A. General Product Requirements: Provide products that comply with the Contract Documents, are undamaged and, unless otherwise indicated, are new at time of installation.
1. Provide products complete with accessories, trim, finish, fasteners, and other items needed for a complete installation and indicated use and effect.
 2. Standard Products: If available, and unless custom products or nonstandard options are specified, provide standard products of types that have been produced and used successfully in similar situations on other projects.
 3. Owner reserves the right to limit selection to products with warranties meeting requirements of the Contract Documents.
 4. Where products are accompanied by the term "as selected," Architect will make selection.
 5. Descriptive, performance, and reference standard requirements in Specifications establish salient characteristics of products.
- B. Product Selection Procedures:
1. Limited List of Products: Where Specifications include a list of names of both manufacturers and products, provide one of the products listed that complies with requirements. Comparable products or substitutions for Contractor's convenience will be considered unless otherwise indicated.
 - a. Limited list of products may be indicated by the phrase "Subject to compliance with requirements, provide one of the following."
 2. Non-Limited List of Products: Where Specifications include a list of names of both available manufacturers and products, provide one of the products listed or

- an unnamed product that complies with requirements.
- a. Non-limited list of products is indicated by the phrase "Subject to compliance with requirements, available products that may be incorporated in the Work include, but are not limited to, the following."
 - b. Provision of an unnamed product is not considered a substitution, if the product complies with requirements.
3. Limited List of Manufacturers: Where Specifications include a list of manufacturers' names, provide a product by one of the manufacturers listed that complies with requirements. Comparable products or substitutions for Contractor's convenience will be considered unless otherwise indicated.
 - a. Limited list of manufacturers is indicated by the phrase "Subject to compliance with requirements, provide products by one of the following."
 4. Non-Limited List of Manufacturers: Where Specifications include a list of available manufacturers, provide a product by one of the manufacturers listed or a product by an unnamed manufacturer that complies with requirements.
 - a. Non-limited list of manufacturers is indicated by the phrase "Subject to compliance with requirements, available manufacturers whose products may be incorporated in the Work include, but are not limited to, the following."
 - b. Provision of products of an unnamed manufacturer is not considered a substitution, if the product complies with requirements.
 5. Basis-of-Design Product: Where Specifications name a product, or refer to a product indicated on Drawings, and include a list of manufacturers, provide the specified or indicated product or a comparable product by one of the other named manufacturers. Drawings and Specifications may additionally indicate sizes, profiles, dimensions, and other characteristics that are based on the product named. Comply with requirements in "Comparable Products" Article for consideration of an unnamed product by one of the other named manufacturers.
 - a. For approval of products by unnamed manufacturers, comply with requirements in Section 012500 "Substitution Procedures" for substitutions for convenience.
- C. Visual Matching Specification: Where Specifications require the phrase "match Architect's sample," provide a product that complies with requirements and matches Architect's sample. Architect's decision will be final on whether a proposed product matches.
1. If no product available within specified category matches and complies with other specified requirements, comply with requirements in Section 012500 "Substitution Procedures" for proposal of product.
- D. Visual Selection Specification: Where Specifications include the phrase "as selected by Architect from manufacturer's full range" or a similar phrase, select a product that complies with requirements. Architect will select color, gloss, pattern, density, or

texture from manufacturer's product line that includes both standard and premium items.

2.2 COMPARABLE PRODUCTS

A. Conditions for Consideration of Comparable Products: Architect will consider Contractor's request for comparable product when the following conditions are satisfied. If the following conditions are not satisfied, Architect may return requests without action, except to record noncompliance with the following requirements:

1. Evidence that proposed product does not require revisions to the Contract Documents, is consistent with the Contract Documents, will produce the indicated results, and is compatible with other portions of the Work.
2. Detailed comparison of significant qualities of proposed product with those of the named basis-of-design product. Significant product qualities include attributes such as type, function, in-service performance and physical properties, weight, dimension, durability, visual characteristics, and other specific features and requirements.
3. Evidence that proposed product provides specified warranty.
4. List of similar installations for completed projects, with project names and addresses and names and addresses of architects and owners, if requested.
5. Samples, if requested.

PART 3 - EXECUTION (Not Used)

END OF SECTION 016000

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SECTION 017300 - EXECUTION

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes general administrative and procedural requirements governing execution of the Work, including, but not limited to, the following:
 - 1. Construction layout.
 - 2. Field engineering.
 - 3. Installation.
 - 4. Cutting and patching.
 - 5. Progress cleaning.
 - 6. Starting and adjusting.
 - 7. Protection of installed construction.
 - 8. Correction of the Work.

- B. Related Requirements:
 - 1. Section 011000 "Summary" for coordination of , Owner's separate contracts, and limits on use of Project site.
 - 2. Section 013300 "Submittal Procedures" for submitting surveys.
 - 3. Section 017700 "Closeout Procedures" for submitting final property survey with Project Record Documents, recording of Owner-accepted deviations from indicated lines and levels, replacing defective work, and final cleaning.
 - 4. Section 024119 "Selective Demolition" for demolition and removal of selected portions of the building.

1.2 DEFINITIONS

- A. Cutting: Removal of in-place construction necessary to permit installation or performance of subsequent work.

- B. Patching: Fitting and repair work required to restore construction to original conditions after installation of subsequent work.

1.3 PREINSTALLATION MEETINGS

- A. Cutting and Patching Conference: Conduct conference at Project site.
 - 1. Prior to commencing work requiring cutting and patching, review extent of cutting and patching anticipated and examine procedures for ensuring satisfactory result from cutting and patching work. Inform Architect of scheduled meeting. Require representatives of each entity directly concerned with cutting and patching to attend, including the following:

- a. Contractor's superintendent.
 - b. Trade supervisor responsible for cutting operations.
 - c. Trade supervisor(s) responsible for patching of each type of substrate.
 - d. Mechanical, electrical, and utilities subcontractors' supervisors, to the extent each trade is affected by cutting and patching operations.
2. Review areas of potential interference and conflict. Coordinate procedures and resolve potential conflicts before proceeding.
- B. Layout Conference: Conduct conference at Project site.
1. Prior to establishing layout of new and existing perimeter and structural column grid(s), review building location requirements. Review benchmark, control point, and layout and dimension requirements. Inform Architect of scheduled meeting. Require representatives of each entity directly concerned with Project layout to attend, including the following:
 - a. Contractor's superintendent.
 - b. Professional engineer responsible for performing Project surveying and layout.
 - c. Professional engineer responsible for performing site survey serving as basis for Project design.
 2. Review meanings and intent of dimensions, notes, terms, graphic symbols, and other layout information indicated on the Drawings.
 3. Review requirements for including layouts on Shop Drawings and other submittals.
 4. Review areas of potential interference and conflict. Coordinate procedures and resolve potential conflicts before proceeding.

1.4 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For professional engineer.
- B. Certified Surveys: Submit two copies signed by professional engineer.
- C. Certificates: Submit certificate signed by professional engineer, certifying that location and elevation of improvements comply with requirements.
- D. Cutting and Patching Plan: Submit plan describing procedures at least 10 days prior to the time cutting and patching will be performed. Include the following information:
 1. Extent: Describe reason for and extent of each occurrence of cutting and patching.
 2. Changes to In-Place Construction: Describe anticipated results. Include changes to structural elements and operating components as well as changes in building appearance and other significant visual elements.
 3. Products: List products to be used for patching and firms or entities that will perform patching work.
 4. Dates: Indicate when cutting and patching will be performed.

5. Utilities and Mechanical and Electrical Systems: List services and systems that cutting and patching procedures will disturb or affect. List services and systems that will be relocated and those that will be temporarily out of service. Indicate length of time permanent services and systems will be disrupted.
 - a. Include description of provisions for temporary services and systems during interruption of permanent services and systems.

1.5 CLOSEOUT SUBMITTALS

- A. Final Property Survey: Submit 10 copies showing the Work performed and record survey data.

1.6 QUALITY ASSURANCE

- A. Professional Engineer Qualifications: Refer to Section 014000 "Quality Requirements."
- B. Cutting and Patching: Comply with requirements for and limitations on cutting and patching of construction elements.

1. Structural Elements: When cutting and patching structural elements, or when encountering the need for cutting and patching of elements whose structural function is not known, notify Architect of locations and details of cutting and await directions from Architect before proceeding. Shore, brace, and support structural elements during cutting and patching. Do not cut and patch structural elements in a manner that could change their load-carrying capacity or increase deflection.
2. Operational Elements: Do not cut and patch operating elements and related components in a manner that results in reducing their capacity to perform as intended or that results in increased maintenance or decreased operational life or safety. Operational elements include the following:
 - a. Primary operational systems and equipment.
 - b. Fire separation assemblies.
 - c. Air or smoke barriers.
 - d. Fire-suppression systems.
 - e. Plumbing piping systems.
 - f. Mechanical systems piping and ducts.
 - g. Control systems.
 - h. Communication systems.
 - i. Fire-detection and -alarm systems.
 - j. Conveying systems.
 - k. Electrical wiring systems.
 - l. Operating systems of special construction.
3. Other Construction Elements: Do not cut and patch other construction elements or components in a manner that could change their load-carrying capacity, that results in reducing their capacity to perform as intended, or that results in increased maintenance or decreased operational life or safety. Other construction elements include but are not limited to the following:

- a. Water, moisture, or vapor barriers.
 - b. Membranes and flashings.
 - c. Exterior curtain-wall construction.
 - d. Sprayed fire-resistive material.
 - e. Equipment supports.
 - f. Piping, ductwork, vessels, and equipment.
 - g. Noise- and vibration-control elements and systems.
4. Visual Elements: Do not cut and patch construction in a manner that results in visual evidence of cutting and patching. Do not cut and patch exposed construction in a manner that would, in Architect's opinion, reduce the building's aesthetic qualities. Remove and replace construction that has been cut and patched in a visually unsatisfactory manner.
- C. Manufacturer's Installation Instructions: Obtain and maintain on-site manufacturer's written recommendations and instructions for installation of specified products and equipment.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Comply with requirements specified in other Sections.
1. For projects requiring compliance with sustainable design and construction practices and procedures, use products for patching that comply with sustainable design requirements.
- B. In-Place Materials: Use materials for patching identical to in-place materials. For exposed surfaces, use materials that visually match in-place adjacent surfaces to the fullest extent possible.
1. If identical materials are unavailable or cannot be used, use materials that, when installed, will provide a match acceptable to Architect for the visual and functional performance of in-place materials. Use materials that are not considered hazardous.
- C. Cleaning Agents: Use cleaning materials and agents recommended by manufacturer or fabricator of the surface to be cleaned. Do not use cleaning agents that are potentially hazardous to health or property or that might damage finished surfaces.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Existing Conditions: The existence and location of underground and other utilities and construction indicated as existing are not guaranteed. Before beginning sitework,

investigate and verify the existence and location of underground utilities, mechanical and electrical systems, and other construction affecting the Work.

1. Before construction, verify the location and invert elevation at points of connection of sanitary sewer, storm sewer, gas service piping, and water-service piping; underground electrical services; and other utilities.
 2. Furnish location data for work related to Project that must be performed by public utilities serving Project site.
- B. Examination and Acceptance of Conditions: Before proceeding with each component of the Work, examine substrates, areas, and conditions, with Installer or Applicator present where indicated, for compliance with requirements for installation tolerances and other conditions affecting performance. Record observations.
1. Examine roughing-in for mechanical and electrical systems to verify actual locations of connections before equipment and fixture installation.
 2. Examine walls, floors, and roofs for suitable conditions where products and systems are to be installed.
 3. Verify compatibility with and suitability of substrates, including compatibility with existing finishes or primers.
- C. Proceed with installation only after unsatisfactory conditions have been corrected. Proceeding with the Work indicates acceptance of surfaces and conditions.

3.2 PREPARATION

- A. Existing Utility Information: Furnish information to Owner that is necessary to adjust, move, or relocate existing utility structures, utility poles, lines, services, or other utility appurtenances located in or affected by construction. Coordinate with authorities having jurisdiction.
- B. Field Measurements: Take field measurements as required to fit the Work properly. Recheck measurements before installing each product. Where portions of the Work are indicated to fit to other construction, verify dimensions of other construction by field measurements before fabrication. Coordinate fabrication schedule with construction progress to avoid delaying the Work.
- C. Space Requirements: Verify space requirements and dimensions of items shown diagrammatically on Drawings.
- D. Review of Contract Documents and Field Conditions: Immediately on discovery of the need for clarification of the Contract Documents, submit a request for information to Architect in accordance with requirements in Section 013100 "Project Management and Coordination."

3.3 CONSTRUCTION LAYOUT

- A. Verification: Before proceeding to lay out the Work, verify layout information shown on Drawings, in relation to the property survey and existing benchmarks and existing

conditions. If discrepancies are discovered, notify Architect promptly.

- B. Engage a professional engineer experienced in laying out the Work, using the following accepted surveying practices:
 - 1. Establish benchmarks and control points to set lines and levels at each story of construction and elsewhere as needed to locate each element of Project.
 - 2. Establish limits on use of Project site.
 - 3. Establish dimensions within tolerances indicated. Do not scale Drawings to obtain required dimensions.
 - 4. Inform installers of lines and levels to which they must comply.
 - 5. Check the location, level and plumb, of every major element as the Work progresses.
 - 6. Notify Architect when deviations from required lines and levels exceed allowable tolerances.
 - 7. Close site surveys with an error of closure equal to or less than the standard established by authorities having jurisdiction.
- C. Site Improvements: Locate and lay out site improvements, including pavements, grading, fill and topsoil placement, utility slopes, and rim and invert elevations.
- D. Building Lines and Levels: Locate and lay out control lines and levels for structures, building foundations, column grids, and floor levels, including those required for mechanical and electrical work. Transfer survey markings and elevations for use with control lines and levels. Level foundations and piers from two or more locations.
- E. Record Log: Maintain a log of layout control work. Record deviations from required lines and levels. Include beginning and ending dates and times of surveys, weather conditions, name and duty of each survey party member, and types of instruments and tapes used. Make the log available for reference by Architect.

3.4 INSTALLATION

- A. Locate the Work and components of the Work accurately, in correct alignment and elevation, as indicated.
 - 1. Make vertical work plumb, and make horizontal work level.
 - 2. Where space is limited, install components to maximize space available for maintenance and ease of removal for replacement.
 - 3. Conceal pipes, ducts, and wiring in finished areas unless otherwise indicated.
 - 4. Maintain minimum headroom clearance of **96 inches** in occupied spaces and **90 inches** in unoccupied spaces, unless otherwise indicated on Drawings.
- B. Comply with manufacturer's written instructions and recommendations for installing products in applications indicated.
- C. Install products at the time and under conditions that will ensure satisfactory results as judged by Architect. Maintain conditions required for product performance until Substantial Completion.

- D. Conduct construction operations, so no part of the Work is subjected to damaging operations or loading in excess of that expected during normal conditions of occupancy of type expected for Project.
- E. Sequence the Work and allow adequate clearances to accommodate movement of construction items on-site and placement in permanent locations.
- F. Tools and Equipment: Select tools or equipment that minimize production of excessive noise levels.
- G. Templates: Obtain and distribute to the parties involved templates for Work specified to be factory prepared and field installed. Check Shop Drawings of other portions of the Work to confirm that adequate provisions are made for locating and installing products to comply with indicated requirements.
- H. Attachment: Provide blocking and attachment plates and anchors and fasteners of adequate size and number to securely anchor each component in place, accurately located and aligned with other portions of the Work. Where size and type of attachments are not indicated, verify size and type required for load conditions with manufacturer.
 - 1. Mounting Heights: Where mounting heights are not indicated, mount components at heights directed by Architect.
 - 2. Allow for building movement, including thermal expansion and contraction.
 - 3. Coordinate installation of anchorages. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors, that are to be embedded in concrete or masonry. Deliver such items to Project site in time for installation.
- I. Joints: Make joints of uniform width. Where joint locations in exposed Work are not indicated, arrange joints for the best visual effect, as judged by Architect. Fit exposed connections together to form hairline joints.

3.5 CUTTING AND PATCHING

- A. General: Employ skilled workers to perform cutting and patching. Proceed with cutting and patching at the earliest feasible time, and complete without delay.
 - 1. Cut in-place construction to provide for installation of other components or performance of other construction, and subsequently patch as required to restore surfaces to their original condition.
- B. Existing Warranties: Remove, replace, patch, and repair materials and surfaces cut or damaged during installation or cutting and patching operations, by methods and with materials so as not to void existing warranties.
- C. Temporary Support: Provide temporary support of Work to be cut.
- D. Protection: Protect in-place construction during cutting and patching to prevent damage. Provide protection from adverse weather conditions for portions of Project

that might be exposed during cutting and patching operations.

- E. Adjacent Occupied Areas: Where interference with use of adjoining areas or interruption of free passage to adjoining areas is unavoidable, coordinate cutting and patching in accordance with requirements in Section 011000 "Summary."
- F. Existing Utility Services and Mechanical/Electrical Systems: Where existing services/systems are required to be removed, relocated, or abandoned, bypass such services/systems before cutting to prevent interruption to occupied areas.
- G. Cutting: Cut in-place construction by sawing, drilling, breaking, chipping, grinding, and similar operations, including excavation, using methods least likely to damage elements retained or adjoining construction. If possible, review proposed procedures with original Installer; comply with original Installer's written recommendations.
 - 1. In general, use hand or small power tools designed for sawing and grinding, not hammering and chopping. Cut holes and slots neatly to minimum size required, and with minimum disturbance of adjacent surfaces. Temporarily cover openings when not in use.
 - 2. Finished Surfaces: Cut or drill from the exposed or finished side into concealed surfaces.
 - 3. Concrete: Cut using a cutting machine, such as an abrasive saw or a diamond-core drill.
 - 4. Excavating and Backfilling: Comply with requirements in applicable Sections where required by cutting and patching operations.
 - 5. Mechanical and Electrical Services: Cut off pipe or conduit in walls or partitions to be removed. Cap, valve, or plug and seal remaining portion of pipe or conduit to prevent entrance of moisture or other foreign matter after cutting.
 - 6. Proceed with patching after construction operations requiring cutting are complete.
- H. Patching: Patch construction by filling, repairing, refinishing, closing up, and similar operations following performance of other Work. Patch with durable seams that are as invisible as practicable, as judged by Architect. Provide materials and comply with installation requirements specified in other Sections, where applicable.
 - 1. Inspection: Where feasible, test and inspect patched areas after completion to demonstrate physical integrity of installation.
 - 2. Exposed Finishes: Restore exposed finishes of patched areas and extend finish restoration into retained adjoining construction in a manner that will eliminate evidence of patching and refinishing.
 - a. Clean piping, conduit, and similar features before applying paint or other finishing materials.
 - b. Restore damaged pipe covering to its original condition.
 - 3. Floors and Walls: Where walls or partitions that are removed extend one finished area into another, patch and repair floor and wall surfaces in the new space. Provide an even surface of uniform finish, color, texture, and appearance. Remove in-place floor and wall coverings and replace with new materials, if necessary, to achieve uniform color and appearance.

- a. Where patching occurs in a painted surface, prepare substrate and apply primer and intermediate paint coats appropriate for substrate over the patch, and apply final paint coat over entire unbroken surface containing the patch, corner to corner of wall and edge to edge of ceiling. Provide additional coats until patch blends with adjacent surfaces.
4. Ceilings: Patch, repair, or rehang in-place ceilings as necessary to provide an even-plane surface of uniform appearance.
5. Exterior Building Enclosure: Patch components in a manner that restores enclosure to a weathertight condition and ensures thermal and moisture integrity of building enclosure.
- I. Cleaning: Clean areas and spaces where cutting and patching are performed. Remove paint, mortar, oils, putty, and similar materials from adjacent finished surfaces.

3.6 PROGRESS CLEANING

- A. Clean Project site and work areas daily, including common areas. Enforce requirements strictly. Dispose of materials lawfully.
 1. Comply with requirements in NFPA 241 for removal of combustible waste materials and debris.
 2. Do not hold waste materials more than seven days during normal weather or three days if the temperature is expected to rise above **80 deg F**.
 3. Containerize hazardous and unsanitary waste materials separately from other waste. Mark containers appropriately and dispose of legally, in accordance with regulations.
 - a. Use containers intended for holding waste materials of type to be stored.
 4. Coordinate progress cleaning for joint-use areas where Contractor and other contractors are working concurrently.
- B. Site: Maintain Project site free of waste materials and debris.
- C. Work Areas: Clean areas where Work is in progress to the level of cleanliness necessary for proper execution of the Work.
 1. Remove liquid spills promptly.
 2. Where dust would impair proper execution of the Work, broom-clean or vacuum the entire work area, as appropriate.
- D. Installed Work: Keep installed work clean. Clean installed surfaces in accordance with written instructions of manufacturer or fabricator of product installed, using only cleaning materials specifically recommended. If specific cleaning materials are not recommended, use cleaning materials that are not hazardous to health or property and that will not damage exposed surfaces.
- E. Concealed Spaces: Remove debris from concealed spaces before enclosing the space.

- F. Exposed Surfaces: Clean exposed surfaces and protect as necessary to ensure freedom from damage and deterioration at time of Substantial Completion.
- G. Waste Disposal: Do not bury or burn waste materials on-site. Do not wash waste materials down sewers or into waterways. Comply with waste disposal requirements in Section 017419 "Construction Waste Management and Disposal."
- H. During handling and installation, clean and protect construction in progress and adjoining materials already in place. Apply protective covering where required to ensure protection from damage or deterioration at Substantial Completion.
- I. Clean and provide maintenance on completed construction as frequently as necessary through the remainder of the construction period. Adjust and lubricate operable components to ensure operability without damaging effects.
- J. Limiting Exposures: Supervise construction operations to ensure that no part of the construction, completed or in progress, is subject to harmful, dangerous, damaging, or otherwise deleterious exposure during the construction period.

3.7 PROTECTION OF INSTALLED CONSTRUCTION

- A. Provide final protection and maintain conditions that ensure installed Work is without damage or deterioration at time of Substantial Completion.
- B. Protection of Existing Items: Provide protection and ensure that existing items to remain undisturbed by construction are maintained in condition that existed at commencement of the Work.
- C. Comply with manufacturer's written instructions for temperature and relative humidity.

3.8 CORRECTION OF THE WORK

- A. Repair or remove and replace damaged, defective, or nonconforming Work. Restore damaged substrates and finishes.
 - 1. Repairing includes replacing defective parts, refinishing damaged surfaces, touching up with matching materials, and properly adjusting operating equipment.
- B. Repair Work previously completed and subsequently damaged during construction period. Repair to like-new condition.
- C. Restore permanent facilities used during construction to their specified condition.
- D. Remove and replace damaged surfaces that are exposed to view if surfaces cannot be repaired without visible evidence of repair.
- E. Repair components that do not operate properly. Remove and replace operating components that cannot be repaired.

- F. Remove and replace chipped, scratched, and broken glass or reflective surfaces.

END OF SECTION 017300

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SECTION 017419 - CONSTRUCTION WASTE MANAGEMENT AND DISPOSAL

PART 1 - GENERAL

1.1 SUMMARY

- A. The Work of this Section includes administrative and procedural requirements for the following:
 - 1. Salvaging nonhazardous demolition and construction waste.
 - 2. Disposing of nonhazardous demolition and construction waste.

1.2 DEFINITIONS

- A. Construction Waste: Building, structure, and site improvement materials and other solid waste resulting from construction, remodeling, renovation, or repair operations. Construction waste includes packaging.
- B. Demolition Waste: Building, structure, and site improvement materials resulting from demolition operations.
- C. Disposal: Removal of demolition or construction waste and subsequent salvage, sale, recycling, or deposit in landfill, incinerator acceptable to authorities having jurisdiction, or designated spoil areas on Owner's property.
- D. Salvage: Recovery of demolition or construction waste and subsequent sale or reuse in another facility.

1.3 ACTION SUBMITTALS

- A. Waste Management Plan: Submit plan within 7 days of date established for the Notice to Proceed. Plan must include the following:

1.4 WASTE MANAGEMENT PLAN

- A. General: Develop a waste management plan in accordance with requirements in this Section. Plan must include provisions for waste identification, waste reduction work plan, and cost/revenue analysis. Indicate quantities by weight or volume, but use same units of measure throughout waste management plan.

PART 2 - PRODUCTS
PART 3 - EXECUTION

3.1 PLAN IMPLEMENTATION

- A. General: Implement approved waste management plan. Provide handling, containers, storage, signage, transportation, and other items as required to implement waste management plan during entire duration of the Contract.
 - 1. Comply with operation, termination, and removal requirements in Section 015000 "Temporary Facilities and Controls."
- B. Training: Train workers, subcontractors, and suppliers on proper waste management procedures, as appropriate for the Work.
- C. Site Access and Temporary Controls: Conduct waste management operations to ensure minimum interference with roads, streets, walks, walkways, and other adjacent occupied and used facilities.

3.2 SALVAGING DEMOLITION WASTE

- A. Comply with requirements in Section 024119 "Selective Demolition" for salvaging demolition waste.

3.3 DISPOSAL OF WASTE

- A. Except for items or materials to be salvaged or recycled, remove waste materials from Project site and legally dispose of them in a landfill or incinerator acceptable to authorities having jurisdiction.
 - 1. Unless otherwise specified, do not allow waste materials that are to be disposed of accumulate on-site.
 - 2. Remove and transport debris in a manner that will prevent spillage on adjacent surfaces and areas.
- B. Burning:
 - 1. Do not burn waste materials.

END OF SECTION 017419

SECTION 017700 - CLOSEOUT PROCEDURES

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes administrative and procedural requirements for Contract closeout, including, but not limited to, the following:
 - 1. Substantial Completion procedures.
 - 2. Final Completion procedures.
 - 3. List of incomplete items.
 - 4. Submittal of Project warranties.
 - 5. Final cleaning.
- B. Related Requirements:
 - 1. Section 012900 "Payment Procedures" for requirements for Applications for Payment for Substantial Completion and Final Completion.
 - 2. Section 017823 "Operation and Maintenance Data" for additional operation and maintenance manual requirements.

1.2 DEFINITIONS

- A. List of Incomplete Items: Contractor-prepared list of items to be completed or corrected, prepared for the Architect's use prior to Architect's inspection, to determine if the Work is substantially complete.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of cleaning agent.
- B. Contractor's List of Incomplete Items: Initial submittal at Substantial Completion.
- C. Certified List of Incomplete Items: Final submittal at Final Completion.

1.4 CLOSEOUT SUBMITTALS

- A. Certificates of Release: From authorities having jurisdiction.
- B. Certificate of Insurance: For continuing coverage.

1.5 SUBSTANTIAL COMPLETION PROCEDURES

- A. Contractor's List of Incomplete Items: Prepare and submit a list of items to be

completed and corrected (Contractor's "punch list"), indicating the value of each item on the list and reasons why the Work is incomplete.

- B. Submittals Prior to Substantial Completion: Complete the following a minimum of 10 days prior to requesting inspection for determining date of Substantial Completion. List items below that are incomplete at time of request.
1. Certificates of Release: Obtain and submit releases from authorities having jurisdiction, permitting Owner unrestricted use of the Work and access to services and utilities. Include occupancy permits, operating certificates, and similar releases.
 2. Submit closeout submittals specified in other Division 01 Sections, including Project Record Documents, operation and maintenance manuals, damage or settlement surveys, property surveys, and similar final record information.
 3. Submit closeout submittals specified in individual Sections, including specific warranties, workmanship bonds, maintenance service agreements, final certifications, and similar documents.
 4. Submit maintenance material submittals specified in individual Sections, including tools, spare parts, extra materials, and similar items, and deliver to location designated by Architect. Label with manufacturer's name and model number.
 5. Submit testing, adjusting, and balancing records.
 6. Submit changeover information related to Owner's occupancy, use, operation, and maintenance.
- C. Procedures Prior to Substantial Completion: Complete the following a minimum of 10 days prior to requesting inspection for determining date of Substantial Completion. List items below that are incomplete at time of request.
1. Advise Owner of pending insurance changeover requirements.
 2. Make final changeover of permanent locks and deliver keys to Owner. Advise Owner's personnel of changeover in security provisions.
 3. Complete startup and testing of systems and equipment.
 4. Perform preventive maintenance on equipment used prior to Substantial Completion.
 5. Instruct Owner's personnel in operation, adjustment, and maintenance of products, equipment, and systems. Submit demonstration and training video recordings specified in Section 017900 "Demonstration and Training."
 6. Advise Owner of changeover in utility services.
 7. Participate with Owner in conducting inspection and walkthrough with local emergency responders.
 8. Terminate and remove temporary facilities from Project site, along with mockups, construction tools, and similar elements.
 9. Complete final cleaning requirements.
 10. Touch up paint and otherwise repair and restore marred exposed finishes to eliminate visual defects.
- D. Inspection: Submit a written request for inspection to determine Substantial Completion a minimum of 10 days prior to date the Work will be completed and ready for final inspection and tests. On receipt of request, Architect will either proceed with inspection or notify Contractor of unfulfilled requirements. Architect will prepare the Certificate of

Substantial Completion after inspection or will notify Contractor of items, either on Contractor's list or additional items identified by Architect, that must be completed or corrected before certificate will be issued.

1.6 FINAL COMPLETION PROCEDURES

- A. Submittals Prior to Final Completion: Before requesting final inspection for determining Final Completion, complete the following:
1. Submit a final Application for Payment in accordance with Section 012900 "Payment Procedures."
 2. Certified List of Incomplete Items: Submit certified copy of Architect's Substantial Completion inspection list of items to be completed or corrected (punch list), endorsed and dated by Architect. Certified copy of the list will state that each item has been completed or otherwise resolved for acceptance.
 3. Certificate of Insurance: Submit evidence of final, continuing insurance coverage complying with insurance requirements.
 4. Submit pest-control final inspection report.
 5. Submit Final Completion photographic documentation.
- B. Inspection: Submit a written request for final inspection to determine acceptance a minimum of 10 days prior to date the Work will be completed and ready for final inspection and tests. On receipt of request, Architect will either proceed with inspection or notify Contractor of unfulfilled requirements. Architect will prepare a final Certificate for Payment after inspection or will notify Contractor of construction that must be completed or corrected before certificate will be issued.
1. Request reinspection when the Work identified in previous inspections as incomplete is completed or corrected.

1.7 LIST OF INCOMPLETE ITEMS

- A. Organization of List: Include name and identification of each space and area affected by construction operations for incomplete items and items needing correction including, if necessary, areas disturbed by Contractor that are outside the limits of construction.
1. Organize list of spaces in sequential order, proceeding from lowest floor to highest floor, listed by room or space number.
 2. Organize items applying to each space by major element, including categories for ceilings, individual walls, floors, equipment, and building systems.
 3. Submit list of incomplete items in the following format:
 - a. PDF Electronic File: Architect will return annotated file.

1.8 SUBMITTAL OF PROJECT WARRANTIES

- A. Time of Submittal: Submit written warranties on request of Architect for designated portions of the Work where warranties are indicated to commence on dates other than date of Substantial Completion, or when delay in submittal of warranties might limit

Owner's rights under warranty.

- B. Organize warranty documents into an orderly sequence based on the table of contents of Project Manual.
- C. Warranty Electronic File: Provide warranties and bonds in PDF format. Assemble complete warranty and bond submittal package into a single electronic PDF file with bookmarks enabling navigation to each item. Provide bookmarked table of contents at beginning of document.
 - 1. Submit on digital media acceptable to Architect.
- D. Warranties in Paper Form:
 - 1. Bind warranties and bonds in heavy-duty, three-ring, vinyl-covered, loose-leaf binders, thickness as necessary to accommodate contents, and sized to receive **8-1/2-by-11-inch** paper.
- E. Provide additional copies of each warranty to include in operation and maintenance manuals.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Cleaning Agents: Use cleaning materials and agents recommended by manufacturer or fabricator of the surface to be cleaned. Do not use cleaning agents that are potentially hazardous to health or property or that might damage finished surfaces.

PART 3 - EXECUTION

3.1 FINAL CLEANING

- A. General: Perform final cleaning. Conduct cleaning and waste-removal operations to comply with local laws and ordinances and Federal and local environmental and antipollution regulations.
- B. Cleaning: Employ experienced workers or professional cleaners for final cleaning. Clean each surface or unit to condition expected in an average commercial building cleaning and maintenance program. Comply with manufacturer's written instructions.
 - 1. Complete the following cleaning operations before requesting inspection for certification of Substantial Completion for entire Project or for a designated portion of Project:
 - a. Clean Project site of rubbish, waste material, litter, and other foreign substances.

- b. Remove tools, construction equipment, machinery, and surplus material from Project site.
- c. Clean exposed exterior and interior hard-surfaced finishes to a dirt-free condition, free of stains, films, and similar foreign substances. Avoid disturbing natural weathering of exterior surfaces. Restore reflective surfaces to their original condition.
- d. Remove debris and surface dust from limited-access spaces, including roofs, plenums, shafts, trenches, equipment vaults, manholes, attics, and similar spaces.
- e. Clean flooring, removing debris, dirt, and staining; clean in accordance with manufacturer's instructions.
- f. Vacuum and mop concrete.
- g. Vacuum carpet and similar soft surfaces, removing debris and excess nap; clean in accordance with manufacturer's instructions if visible soil or stains remain.
- h. Clean transparent materials, including mirrors and glass in doors and windows. Remove glazing compounds and other noticeable, vision-obscuring materials. Polish mirrors and glass, taking care not to scratch surfaces.
- i. Remove labels that are not permanent.
- j. Wipe surfaces of mechanical and electrical equipment, elevator equipment, and similar equipment. Remove excess lubrication, paint and mortar droppings, and other foreign substances.
- k. Replace disposable air filters and clean permanent air filters. Clean exposed surfaces of diffusers, registers, and grills.
- l. Clean ducts, blowers, and coils if units were operated without filters during construction or that display contamination with particulate matter on inspection.
- m. Clean luminaires, lamps, globes, and reflectors to function with full efficiency.
- n. Clean strainers.
- o. Leave Project clean and ready for occupancy.

- C. Construction Waste Disposal: Comply with waste-disposal requirements in Section 017419 "Construction Waste Management and Disposal."

3.2 CORRECTION OF THE WORK

- A. Complete repair and restoration operations required by "Correction of the Work" Article in Section 017300 "Execution" before requesting inspection for determination of Substantial Completion.

3.3 OWNER PROJECT CLOSE-OUT CHECKLIST

- A. Contractor shall document completion of Contractor closeout items on the Owner Project Close-Out Checklist. Contractor shall submit checklist to Designer when all Contractor closeout items are completed. Owner Project Close-out Checklist is in the Project Manual, following this Section.

END OF SECTION 017700

PROJECT CLOSE-OUT CHECK LIST

Project: _____

Page 1

<u>TASK DESCRIPTION</u>	<u>COMPLETED</u>	<u>DATE</u>
A. General Requirements		
1. Certificate of Substantial Completion (AIA G704) (Executed by Designer, Contractor and Owner)	_____	_____
2. Inspections Certifications		
a. Certificate of Occupancy (By Building Inspections Officials)	_____	_____
b. Copy of Building Official Inspection Card (Showing required inspection approvals)	_____	_____
c. Regulatory Inspection Sign-Offs (as applicable)		
(1) General Contract	_____	_____
(2) Plumbing Subcontract	_____	_____
(3) Fire Protection Contract	_____	_____
(4) Mechanical Contract	_____	_____
(5) Electrical Contract	_____	_____
(6) Certification Reports for All Backflow Assemblies (Includes Plumbing, HVAC, Fire Protection as applicable)	_____	_____
(7) Well Water Quality Test Report (if applicable)	_____	_____
(8) Other Certifications as Required (NCDFS, NC DOT, NC Land Quality, Local Government, Utilities, Health Dept., Fireproofing Certification, Structural Steel Inspection Certification, etc.)	_____	_____
3. Closeout Reports & Documentation		
a. Owner Instruction and Training with Equipment and Systems (Memo/List of Attendees required for each session)	_____	_____
b. HVAC Test and Balance Report (Approval cover letter from Designer required)	_____	_____
c. Attic Stock Turnover (Transfer to Owner with Typed Inventory Required)	_____	_____
d. Keys & Permanent Hardware Changeover (Delivery of Final Keys and Cabinet to Owner; Memo of Hardware Changeover Date)	_____	_____

PROJECT CLOSE-OUT CHECK LIST

Project: _____

Page 2

<u>TASK DESCRIPTION</u>	<u>COMPLETED</u>	<u>DATE</u>
e. Insurance Coverage Change Over	_____	_____
f. Utility Account Change Over		
(1) Electric Service	_____	_____
(2) Gas Service	_____	_____
(3) Water Service	_____	_____
(4) Other Utility Service	_____	_____
B. Record Document Requirements		
1. As-built drawings		
a. Site/Civil	_____	_____
b. Architectural & Structural	_____	_____
c. Plumbing	_____	_____
d. Fire Protection	_____	_____
e. Mechanical	_____	_____
f. Electrical	_____	_____
g. Security	_____	_____
h. Other (Kitchen Equipment, etc.)	_____	_____
2. Final Finish Schedule (updated with actual finishes and bound in with O+M Manual)	_____	_____
3. Operation & Maintenance (O+M) Manuals (Approval cover letter from Designer required)	_____	_____
a. Product & Operations Data	_____	_____
b. Maintenance Information	_____	_____
c. Product Warranty Certificates/Maintenance Agreements	_____	_____
3. Shop Drawings – Complete Set (With Architect's Review Stamp)	_____	_____
4. Construction Site Documentation (Contractor's Job Log and Photographs)	_____	_____

PROJECT CLOSE-OUT CHECK LIST

Project: _____

Page 3

<u>TASK DESCRIPTION</u>	<u>COMPLETED</u>	<u>DATE</u>
C. Final Accounting Requirements – by Contractor		
1. Contractor's Certification Of Completion Of Work	_____	_____
2. Affidavit of Release of Liens (AIA G706A)	_____	_____
3. Affidavit of Payment of Debts and Claims (AIA G706)	_____	_____
4. Consent of Surety to Final Payment (AIA G707)	_____	_____
5. Final Certified NC Sales Tax Report	_____	_____
6. Final MBE Documentation (MBE Form-6)	_____	_____
7. Final Request for Payment Certified by Designer	_____	_____
D. Final Accounting Requirements – by Designer		
1. Cover Letter of Approval of Roof Warranty	_____	_____
2. Cover Letter of Approval for O&M Manuals	_____	_____
3. Certification by Architect of Completed Final Punch List	_____	_____
4. Final Completion Certificate executed by Designer	_____	_____
5. Final Liquidated Damages analysis by Designer		
6. Record Drawings (electronic files + 3 reproducible sets of all drawings based on Contractor As-Builts)	_____	_____
E. Warranty Period		
1. Pre-Expiration Warranty Inspection (Inspection 30 days prior to warranty expiration date)	_____	_____

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SECTION 017823 - OPERATION AND MAINTENANCE DATA

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes: Administrative and procedural requirements for preparing operation and maintenance manuals, including the following:
 - 1. Operation and maintenance documentation directory manuals.
 - 2. Emergency manuals.
 - 3. Systems and equipment operation manuals.
 - 4. Systems and equipment maintenance manuals.
 - 5. Product maintenance manuals.
- B. Related Requirements:
 - 1. Section 013300 "Submittal Procedures" for submitting copies of submittals for operation and maintenance manuals.

1.2 DEFINITIONS

- A. System: An organized collection of parts, equipment, or subsystems united by regular interaction.
- B. Subsystem: A portion of a system with characteristics similar to a system.

1.3 CLOSEOUT SUBMITTALS

- A. Submit operation and maintenance manuals indicated. Provide content for each manual as specified in individual Specification Sections, and as reviewed and approved at the time of Section submittals. Submit reviewed manual content formatted and organized as required by this Section.
 - 1. Architect will comment on whether content of operation and maintenance submittals is acceptable.
 - 2. Where applicable, clarify and update reviewed manual content to correspond to revisions and field conditions.
- B. Format: Submit operation and maintenance manuals in the following format:
 - 1. Submit on digital media acceptable to Architect. Enable reviewer comments on draft submittals.
 - 2. Submit three paper copies. Architect will return two copies.
- C. Final Manual Submittal: Submit each manual in final form prior to requesting inspection for Substantial Completion and at least 15 days before commencing demonstration and training. Architect will return copy with comments.

1. Correct or revise each manual to comply with Architect's comments. Submit copies of each corrected manual within 15 days of receipt of Architect's comments and prior to commencing demonstration and training.
- D. Comply with Section 017700 "Closeout Procedures" for schedule for submitting operation and maintenance documentation.

1.4 FORMAT OF OPERATION AND MAINTENANCE MANUALS

- A. Manuals, Electronic Files: Submit manuals in the form of a multiple file composite electronic PDF file for each manual type required.
 1. Electronic Files: Use electronic files prepared by manufacturer where available. Where scanning of paper documents is required, configure scanned file for minimum readable file size.
 2. File Names and Bookmarks: Bookmark individual documents based on file names. Name document files to correspond to system, subsystem, and equipment names used in manual directory and table of contents. Group documents for each system and subsystem into individual composite bookmarked files, then create composite manual, so that resulting bookmarks reflect the system, subsystem, and equipment names in a readily navigated file tree. Configure electronic manual to display bookmark panel on opening file.
- B. Manuals, Paper Copy: Submit manuals in the form of hard-copy, bound and labeled volumes.
 1. Binders: Heavy-duty, three-ring, vinyl-covered, loose-leaf binders, in thickness necessary to accommodate contents, sized to hold **8-1/2-by-11-inch** paper; with clear plastic sleeve on spine to hold label describing contents and with pockets inside covers to hold folded oversize sheets.
 - a. If two or more binders are necessary to accommodate data of a system, organize data in each binder into groupings by subsystem and related components. Cross-reference other binders if necessary to provide essential information for proper operation or maintenance of equipment or system.
 - b. Identify each binder on front and spine, with printed title "OPERATION AND MAINTENANCE MANUAL," Project title or name, and subject matter of contents, and indicate Specification Section number on bottom of spine. Indicate volume number for multiple-volume sets.
 2. Dividers: Heavy-paper dividers with plastic-covered tabs for each section of the manual. Mark each tab to indicate contents. Include typed list of products and major components of equipment included in the section on each divider, cross-referenced to Specification Section number and title of Project Manual.
 3. Protective Plastic Sleeves: Transparent plastic sleeves designed to enclose diagnostic software storage media for computerized electronic equipment. Enclose title pages and directories in clear plastic sleeves.
 4. Supplementary Text: Prepared on **8-1/2-by-11-inch** white bond paper.
 5. Drawings: Attach reinforced, punched binder tabs on drawings and bind with text.

- a. If oversize drawings are necessary, fold drawings to same size as text pages and use as foldouts.
- b. If drawings are too large to be used as foldouts, fold and place drawings in labeled envelopes and bind envelopes in rear of manual. At appropriate locations in manual, insert typewritten pages indicating drawing titles, descriptions of contents, and drawing locations.

1.5 REQUIREMENTS FOR EMERGENCY, OPERATION, AND MAINTENANCE MANUALS

- A. Organization of Manuals: Unless otherwise indicated, organize each manual into a separate section for each system and subsystem, and a separate section for each piece of equipment not part of a system. Each manual to contain the following materials, in the order listed:
 1. Title page.
 2. Table of contents.
 3. Manual contents.
- B. Title Page: Include the following information:
 1. Subject matter included in manual.
 2. Name and address of Project.
 3. Name and address of Owner.
 4. Date of submittal.
 5. Name and contact information for Contractor.
 6. Name and contact information for Construction Manager.
 7. Name and contact information for Architect.
 8. Name and contact information for Commissioning Authority.
 9. Names and contact information for major consultants to the Architect that designed the systems contained in the manuals.
 10. Cross-reference to related systems in other operation and maintenance manuals.
- C. Table of Contents: List each product included in manual, identified by product name, indexed to the content of the volume, and cross-referenced to Specification Section number in Project Manual.
 1. If operation or maintenance documentation requires more than one volume to accommodate data, include comprehensive table of contents for all volumes in each volume of the set.
- D. Manual Contents: Organize into sets of manageable size. Arrange contents alphabetically by system, subsystem, and equipment. If possible, assemble instructions for subsystems, equipment, and components of one system into a single binder.
- E. Identification: In the documentation directory and in each operation and maintenance manual, identify each system, subsystem, and piece of equipment with same designation used in the Contract Documents. If no designation exists, assign a designation in accordance with ASHRAE Guideline 4, "Preparation of Operating and Maintenance Documentation for Building Systems."

1.6 EMERGENCY MANUALS

- A. Emergency Manual: Assemble a complete set of emergency information indicating procedures for use by emergency personnel and by Owner's operating personnel for types of emergencies indicated.
- B. Content: Organize manual into a separate section for each of the following:
 - 1. Type of emergency.
 - 2. Emergency instructions.
 - 3. Emergency procedures.
- C. Type of Emergency: Where applicable for each type of emergency indicated below, include instructions and procedures for each system, subsystem, piece of equipment, and component:
 - 1. Fire.
 - 2. Flood.
 - 3. Gas leak.
 - 4. Water leak.
 - 5. Power failure.
 - 6. Water outage.
 - 7. System, subsystem, or equipment failure.
 - 8. Chemical release or spill.
- D. Emergency Instructions: Describe and explain warnings, trouble indications, error messages, and similar codes and signals. Include responsibilities of Owner's operating personnel for notification of Installer, supplier, and manufacturer to maintain warranties.
- E. Emergency Procedures: Include the following, as applicable:
 - 1. Instructions on stopping.
 - 2. Shutdown instructions for each type of emergency.
 - 3. Operating instructions for conditions outside normal operating limits.
 - 4. Required sequences for electric or electronic systems.
 - 5. Special operating instructions and procedures.

1.7 SYSTEMS AND EQUIPMENT OPERATION MANUALS

- A. Systems and Equipment Operation Manual: Assemble a complete set of data indicating operation of each system, subsystem, and piece of equipment not part of a system. Include information required for daily operation and management, operating standards, and routine and special operating procedures.
 - 1. Engage a factory-authorized service representative to assemble and prepare information for each system, subsystem, and piece of equipment not part of a system.
 - 2. Prepare a separate manual for each system and subsystem, in the form of an instructional manual for use by Owner's operating personnel.

- B. Content: In addition to requirements in this Section, include operation data required in individual Specification Sections and the following information:
 - 1. System, subsystem, and equipment descriptions. Use designations for systems and equipment indicated on Contract Documents.
 - 2. Performance and design criteria if Contractor has delegated design responsibility.
 - 3. Operating standards.
 - 4. Operating procedures.
 - 5. Operating logs.
 - 6. Wiring diagrams.
 - 7. Control diagrams.
 - 8. Piped system diagrams.
 - 9. Precautions against improper use.
 - 10. License requirements including inspection and renewal dates.

- C. Descriptions: Include the following:
 - 1. Product name and model number. Use designations for products indicated on Contract Documents.
 - 2. Manufacturer's name.
 - 3. Equipment identification with serial number of each component.
 - 4. Equipment function.
 - 5. Operating characteristics.
 - 6. Limiting conditions.
 - 7. Performance curves.
 - 8. Engineering data and tests.
 - 9. Complete nomenclature and number of replacement parts.

- D. Operating Procedures: Include the following, as applicable:
 - 1. Startup procedures.
 - 2. Equipment or system break-in procedures.
 - 3. Routine and normal operating instructions.
 - 4. Regulation and control procedures.
 - 5. Instructions on stopping.
 - 6. Normal shutdown instructions.
 - 7. Seasonal and weekend operating instructions.
 - 8. Required sequences for electric or electronic systems.
 - 9. Special operating instructions and procedures.

- E. Systems and Equipment Controls: Describe the sequence of operation, and diagram controls as installed.

- F. Piped Systems: Diagram piping as installed, and identify color coding where required for identification.

1.8 SYSTEMS AND EQUIPMENT MAINTENANCE MANUALS

- A. Systems and Equipment Maintenance Manuals: Assemble a complete set of data

indicating maintenance of each system, subsystem, and piece of equipment not part of a system. Include manufacturers' maintenance documentation, preventive maintenance procedures and frequency, repair procedures, wiring and systems diagrams, lists of spare parts, and warranty information.

1. Engage a factory-authorized service representative to assemble and prepare information for each system, subsystem, and piece of equipment not part of a system.
 2. Prepare a separate manual for each system and subsystem, in the form of an instructional manual for use by Owner's operating personnel.
- B. Content: For each system, subsystem, and piece of equipment not part of a system, include source information, manufacturers' maintenance documentation, maintenance procedures, maintenance and service schedules, spare parts list and source information, maintenance service contracts, and warranties and bonds as described below.
- C. Source Information: List each system, subsystem, and piece of equipment included in manual, identified by product name and arranged to match manual's table of contents. For each product, list name, address, and telephone number of Installer or supplier and maintenance service agent, and cross-reference Specification Section number and title in Project Manual and drawing or schedule designation or identifier where applicable.
- D. Manufacturers' Maintenance Documentation: Include the following information for each component part or piece of equipment:
1. Standard maintenance instructions and bulletins; include only sheets pertinent to product or component installed. Mark each sheet to identify each product or component incorporated into the Work. If data include more than one item in a tabular format, identify each item using appropriate references from the Contract Documents. Identify data applicable to the Work and delete references to information not applicable.
 - a. Prepare supplementary text if manufacturers' standard printed data are not available and where the information is necessary for proper operation and maintenance of equipment or systems.
 2. Drawings, diagrams, and instructions required for maintenance, including disassembly and component removal, replacement, and assembly.
 3. Identification and nomenclature of parts and components.
 4. List of items recommended to be stocked as spare parts.
- E. Maintenance Procedures: Include the following information and items that detail essential maintenance procedures:
1. Test and inspection instructions.
 2. Troubleshooting guide.
 3. Precautions against improper maintenance.
 4. Disassembly; component removal, repair, and replacement; and reassembly instructions.
 5. Aligning, adjusting, and checking instructions.

6. Demonstration and training video recording, if available.
- F. Maintenance and Service Schedules: Include service and lubrication requirements, list of required lubricants for equipment, and separate schedules for preventive and routine maintenance and service with standard time allotment.
 1. Scheduled Maintenance and Service: Tabulate actions for daily, weekly, monthly, quarterly, semiannual, and annual frequencies.
 2. Maintenance and Service Record: Include manufacturers' forms for recording maintenance.
 - G. Spare Parts List and Source Information: Include lists of replacement and repair parts, with parts identified and cross-referenced to manufacturers' maintenance documentation and local sources of maintenance materials and related services.
 - H. Maintenance Service Contracts: Include copies of maintenance agreements with name and telephone number of service agent.
 - I. Warranties and Bonds: Include copies of warranties and bonds and lists of circumstances and conditions that would affect validity of warranties or bonds.
 1. Include procedures to follow and required notifications for warranty claims.
 - J. Drawings: Prepare drawings supplementing manufacturers' printed data to illustrate the relationship of component parts of equipment and systems and to illustrate control sequence and flow diagrams. Coordinate these drawings with information contained in record Drawings to ensure correct illustration of completed installation.
 1. Do not use original project record documents as part of maintenance manuals.
- 1.9 PRODUCT MAINTENANCE MANUALS
- A. Product Maintenance Manual: Assemble a complete set of maintenance data indicating care and maintenance of each product, material, and finish incorporated into the Work.
 - B. Content: Organize manual into a separate section for each product, material, and finish. Include source information, product information, maintenance procedures, repair materials and sources, and warranties and bonds, as described below.
 - C. Source Information: List each product included in manual, identified by product name and arranged to match manual's table of contents. For each product, list name, address, and telephone number of Installer or supplier and maintenance service agent, and cross-reference Specification Section number and title in Project Manual and drawing or schedule designation or identifier where applicable.
 - D. Product Information: Include the following, as applicable:
 1. Product name and model number.
 2. Manufacturer's name.
 3. Color, pattern, and texture.

4. Material and chemical composition.
 5. Reordering information for specially manufactured products.
- E. Maintenance Procedures: Include manufacturer's written recommendations and the following:
1. Inspection procedures.
 2. Types of cleaning agents to be used and methods of cleaning.
 3. List of cleaning agents and methods of cleaning detrimental to product.
 4. Schedule for routine cleaning and maintenance.
 5. Repair instructions.
- F. Repair Materials and Sources: Include lists of materials and local sources of materials and related services.
- G. Warranties and Bonds: Include copies of warranties and bonds and lists of circumstances and conditions that would affect validity of warranties or bonds.
1. Include procedures to follow and required notifications for warranty claims.

PART 2 - PRODUCTS (Not Used)
PART 3 - EXECUTION (Not Used)

END OF SECTION 017823

SECTION 024119 - SELECTIVE DEMOLITION

PART 1 - GENERAL

1.1 SUMMARY

A. The Work of this Section Includes:

1. Demolition and removal of selected portions of exterior or interior of building or structure and site elements.

B. Related Requirements:

1. Section 011000 "Summary" for restrictions on use of the premises, Owner-occupancy requirements, and phasing requirements.
2. Section 017300 "Execution" for cutting and patching procedures.

1.2 DEFINITIONS

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

- B. Existing to Remain: Existing items of construction that are not to be removed.

1.3 COORDINATION

- A. Arrange selective demolition schedule so as not to interfere with Owner's operations.

1.4 PREINSTALLATION MEETINGS

- A. Predemolition Conference: Conduct conference at Project site.

1. Inspect and discuss condition of construction to be selectively demolished.
2. Review structural load limitations of existing structure.
3. Review and finalize selective demolition schedule and verify availability of demolition personnel, equipment, and facilities needed to make progress and avoid delays.
4. Review requirements of work performed by other trades that rely on substrates exposed by selective demolition operations.
5. Review areas where existing construction is to remain and requires protection.
6. Review and finalize protection requirements.
7. Review procedures for noise control and dust control.
8. Review storage, protection, and accounting for items to be removed for salvage or reinstallation.

1.5 INFORMATIONAL SUBMITTALS

- A. Qualification Statements: For refrigerant recovery technician.
- B. Engineering Survey: Submit engineering survey of condition of building.
- C. Survey of Existing Conditions: Submit survey.
- D. Proposed Protection Measures: Submit report, including Drawings, that indicates the measures proposed for protecting individuals and property, for environmental protection, for dust control and, for noise control. Indicate proposed locations and construction of barriers.
- E. Schedule of Selective Demolition Activities: Indicate the following:
 - 1. Detailed sequence of selective demolition and removal work, with starting and ending dates for each activity. Ensure Owner's on-site operations are uninterrupted.
 - 2. Temporary interruption of utility services. Indicate how long utility services will be interrupted.
 - 3. Coordination for shutoff, capping, and continuation of utility services.
 - 4. Use of elevator and stairs.
 - 5. Coordination of Owner's continuing occupancy of portions of existing building and of Owner's partial occupancy of completed Work.
- F. Warranties: Documentation indicating that existing warranties are still in effect after completion of selective demolition.

1.6 FIELD CONDITIONS

- A. Owner will occupy portions of building immediately adjacent to selective demolition area. Conduct selective demolition so Owner's operations will not be disrupted.
- B. Conditions existing at time of inspection for bidding purpose will be maintained by Owner as far as practical.
 - 1. Before selective demolition, Owner will remove the following items:
 - a. Owner will relocate existing tabulator shelving along East wall prior to demolition.
- C. Notify Architect of discrepancies between existing conditions and Drawings before proceeding with selective demolition.
- D. Hazardous Materials:
 - 1. It is not expected that hazardous materials will be encountered in the Work.
 - a. If materials suspected of containing hazardous materials are encountered, do not disturb; immediately notify Architect and Owner. Hazardous materials will be removed by Owner under a separate contract.

- E. On-site sale of removed items or materials is not permitted.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Regulatory Requirements: Comply with governing EPA notification regulations before beginning selective demolition. Comply with hauling and disposal regulations of authorities having jurisdiction.
- B. Standards: Comply with ANSI/ASSP A10.6 and NFPA 241.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verify that utilities have been disconnected and capped before starting selective demolition operations.
- B. Review Project Record Documents of existing construction or other existing condition and hazardous material information provided by Owner. Owner does not guarantee that existing conditions are same as those indicated in Project Record Documents.
- C. Steel Tendons: Locate tensioned steel tendons and include recommendations for de-tensioning.

3.2 PREPARATION

- A. Temporary Shoring: Design, 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.
 - 1. Strengthen or add new supports when required during progress of selective demolition.
- B. Temporary Protection: Provide temporary barricades and other protection required to prevent injury to people and damage to adjacent buildings and facilities to remain.
 - 1. Provide protection to ensure safe passage of people around selective demolition area and to and from occupied portions of building.
 - 2. Protect walls, ceilings, floors, and other existing finish work that are to remain or that are exposed during selective demolition operations.
 - 3. Cover and protect furniture, furnishings, and equipment that have not been removed.

4. Comply with requirements for temporary enclosures, dust control, heating, and cooling specified in Section 015000 "Temporary Facilities and Controls."
- C. Existing Items to Remain: Protect construction indicated to remain against damage and soiling during selective demolition. When permitted by Architect, items may be removed to a suitable, protected storage location and reinstalled in their original locations after selective demolition operations are complete.

3.3 UTILITY SERVICES AND BUILDING SYSTEMS

- A. Existing Services/Systems to Remain: Maintain utilities and building systems and equipment to remain and protect against damage during selective demolition operations.
1. Maintain fire-protection facilities in service during selective demolition operations.
- B. Existing Services/Systems to Be Removed, Relocated, or Abandoned: Locate, identify, disconnect, and seal or cap off utilities and building systems serving areas to be selectively demolished.
1. Owner will arrange to shut off indicated utilities when requested by Contractor.
 2. Arrange to shut off utilities with utility companies.
 3. If disconnection of utilities and building systems will affect adjacent occupied parts of the building, provide temporary services/systems that bypass area of selective demolition and that maintain continuity of services/systems to those parts of the building.
 4. Demolish and remove existing building systems, equipment, and components indicated on Drawings to be removed.
 - a. Piping to Be Removed: Remove portion of piping indicated to be removed and cap or plug remaining piping with same or compatible piping material.
 - b. Ducts to Be Removed: Remove portion of ducts indicated to be removed and plug remaining ducts with same or compatible ductwork material.
 - c. Equipment to Be Removed: Disconnect and cap services and remove equipment and components.
 5. Abandon existing building systems, equipment, and components indicated on Drawings to be abandoned in place.
 - a. Piping to Be Abandoned in Place: Drain piping and cap or plug piping with same or compatible piping material and leave in place.
 - b. Ducts to Be Abandoned in Place: Cap or plug ducts with same or compatible ductwork material and leave in place.
 6. Remove and reinstall/salvage existing building systems, equipment, and components indicated on drawings to be removed and reinstalled or removed and salvaged:
 - a. Equipment to Be Removed and Reinstalled: Disconnect and cap services

and remove, clean, and store equipment and components; when appropriate, reinstall, reconnect, and make equipment operational.

- b. Equipment to Be Removed and Salvaged: Disconnect and cap services and remove equipment and components and deliver to Owner.

3.4 SELECTIVE DEMOLITION, GENERAL

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

1. Proceed with selective demolition systematically, from higher to lower level. Complete selective demolition operations above each floor or tier before disturbing supporting members on the next lower level.
2. 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. Temporarily cover openings to remain.
3. Cut or drill from the exposed or finished side into concealed surfaces to avoid marring existing finished surfaces.
4. 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 portable fire-suppression devices during flame-cutting operations.
5. Maintain fire watch during and for at least 4 hours after flame-cutting operations.
6. Maintain adequate ventilation when using cutting torches.
7. Remove decayed, vermin-infested, or otherwise dangerous or unsuitable materials and promptly dispose of off-site.
8. Remove structural framing members and lower to ground by method suitable to avoid free fall and to prevent ground impact or dust generation.
9. Locate selective demolition equipment and remove debris and materials so as not to impose excessive loads on supporting walls, floors, or framing.

- B. Site Access and Temporary Controls: Conduct selective demolition and debris-removal operations to ensure minimum interference with roads, streets, walks, walkways, and other adjacent occupied and used facilities.

1. Do not close or obstruct streets, walks, walkways, or other adjacent occupied or used facilities without permission from Owner and authorities having jurisdiction. Provide alternate routes around closed or obstructed trafficways if required by authorities having jurisdiction.
2. Use water mist and other suitable methods to limit spread of dust and dirt. Comply with governing environmental-protection regulations. Do not use water when it may damage adjacent construction or create hazardous or objectionable conditions, such as ice, flooding, and pollution.

3.5 SELECTIVE DEMOLITION PROCEDURES FOR SPECIFIC MATERIALS

- A. Concrete:

1. Demolish in small sections. Using power-driven saw, cut concrete to a depth of at

least **3/4 inch** at junctures with construction to remain. Dislodge concrete from reinforcement at perimeter of areas being demolished, cut reinforcement, and then remove remainder of concrete. Neatly trim openings to dimensions indicated.

2. Demolish in sections. Cut concrete full depth at junctures with construction to remain and at regular intervals using power-driven saw, and then remove concrete between saw cuts.

- B. Concrete Slabs-on-Grade: Saw-cut perimeter of area to be demolished, and then break up and remove.

3.6 DISPOSAL OF DEMOLISHED MATERIALS

- A. Remove demolition waste materials from Project site and recycle or dispose of them in accordance with Section 017419 "Construction Waste Management and Disposal."

1. Do not allow demolished materials to accumulate on-site.
2. Remove and transport debris in a manner that will prevent spillage on adjacent surfaces and areas.
3. Remove debris from elevated portions of building by chute, hoist, or other device that will convey debris to grade level in a controlled descent.
4. Comply with requirements specified in Section 017419 "Construction Waste Management and Disposal."

- B. Burning: Do not burn demolished materials.

3.7 CLEANING

- A. Clean adjacent structures and improvements of dust, dirt, and debris caused by selective demolition operations. Return adjacent areas to condition existing before selective demolition operations began.

END OF SECTION 024119

SECTION 03 30 00 – CAST-IN-PLACE CONCRETE

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section includes:

- 1. Cast-in-place concrete, including concrete materials, mixture design, placement procedures, and finishes.

- B. Related Requirements:

- 1. Section 031000 "Concrete Forming and Accessories" for form-facing materials, form liners, insulating concrete forms, and waterstops.
- 2. Section 032000 "Concrete Reinforcing" for steel reinforcing bars and welded-wire reinforcement.
- 3. Section 033300 "Architectural Concrete" for general building applications of specially finished formed concrete.
- 4. Section 312000 "Earth Moving" for drainage fill under slabs-on-ground.

1.3 DEFINITIONS

- A. Cementitious Materials: Portland cement alone or in combination with one or more of the following: blended hydraulic cement, fly ash, slag cement, other pozzolans, and silica fume; materials subject to compliance with requirements.

- B. Water/Cement Ratio (w/cm): The ratio by weight of water to cementitious materials.

1.4 PREINSTALLATION MEETINGS

- A. Preinstallation Conference: Conduct conference at Project site.

- 1. Require representatives of each entity directly concerned with cast-in-place concrete to attend, including the following:
 - a. Contractor's superintendent.
 - b. Independent testing agency responsible for concrete design mixtures.
 - c. Ready-mix concrete manufacturer.
 - d. Concrete Subcontractor
 - e. Special concrete finish Subcontractor

2. Review the following:
 - a. Special inspection and testing and inspecting agency procedures for field quality control.
 - b. Construction joints, control joints, isolation joints, and joint-filler strips.
 - c. Vapor-retarder installation.
 - d. Anchor rod and anchorage device installation tolerances.
 - e. Cold and hot weather concreting procedures.
 - f. Concrete finishes and finishing.
 - g. Curing procedures.
 - h. Forms and form-removal limitations.
 - i. Methods for achieving specified floor and slab flatness and levelness.
 - j. Floor and slab flatness and levelness measurements.
 - k. Concrete repair procedures.
 - l. Concrete protection.
 - m. Initial curing of test cylinders (ASTM C31/C31M.)
 - n. Protection of test cylinders.

1.5 ACTION SUBMITTALS

- A. Product Data: For each of the following.
 1. Portland cement.
 2. Fly ash.
 3. Aggregates.
 4. Admixtures:
 - a. Include limitations of use, including restrictions on cementitious materials, supplementary cementitious materials, air entrainment, aggregates, temperature at time of concrete placement, relative humidity at time of concrete placement, curing conditions, and use of other admixtures.
 5. Vapor retarders.
 6. Curing materials.
 7. Joint fillers.
 8. Repair materials.
- B. Design Mixtures: For each concrete mixture. Submit alternate design mixtures when characteristics of materials, Project conditions, weather, test results, or other circumstances warrant adjustments.
 1. Indicate amounts of mixing water to be withheld for later addition at Project site.
- C. Steel Reinforcement Shop Drawings: Prepare shop drawings in accordance with ACI 315. Placing drawings that detail fabrication, bending, and placement. Include bar sizes, lengths, material, grade, bar schedules, stirrup spacing, bent bar diagrams, bar arrangement, splices and laps, mechanical connections, tie spacing, hoop spacing, and supports for concrete reinforcement.

1. Include special reinforcement required for openings through concrete structures and dimensioned opening locations. Include applicable dimensions, sections, elevations, and details required to complete installation and coordination of the details, and typical details. Plan shall be drawn at a scale of no less than 1/8" per foot.
- D. Construction and Control Joint Layout: Indicate proposed construction joints required to construct the structure as well as wall and slab control joint locations.
1. Location of construction and control joints is subject to approval of the Architect.

1.6 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For Installer and Ready Mix Manufacturer.
- B. Welding Certificates.
- C. Material Certificates: For each of the following, signed by manufacturers:
1. Cementitious materials.
 2. Coarse and Fine Aggregates.
 3. Admixtures.
 4. Form materials and form-release agents.
 5. Steel reinforcement and accessories.
 6. Waterstops.
 7. Curing compounds.
 8. Floor and slab treatments.
 9. Bonding agents.
 10. Adhesives.
 11. Vapor retarders.
 12. Semirigid joint filler.
 13. Joint-filler strips.
 14. Repair materials.
- D. Material Test Reports: For the following, from a qualified testing agency indicating conformance with the material specification:
1. Aggregates: Include service record data indicating absence of deleterious expansion of concrete due to alkali aggregate reactivity.
 2. Cementitious materials.
 3. Steel Reinforcement
- E. Floor surface flatness and levelness measurements indicating compliance with specified tolerances.
- F. Minutes of preinstallation conference.

1.7 QUALITY ASSURANCE

- A. Installer Qualifications: A qualified installer who employs on Project personnel qualified as ACI-certified Flatwork Technician and Finisher and a supervisor who is an ACI-certified Concrete Flatwork Technician.
- B. Manufacturer Qualifications: A firm experienced in manufacturing ready-mixed concrete products and that complies with ASTM C 94/C 94M requirements for production facilities and equipment.
 - 1. Manufacturer certified according to NRMCA's "Certification of Ready Mixed Concrete Production Facilities."
- C. Testing Agency Qualifications: An independent agency, acceptable to authorities having jurisdiction, qualified according to ASTM C 1077 and ASTM E 329 for testing indicated.
 - 1. Personnel conducting field tests shall be qualified as ACI Concrete Field Testing Technician, Grade 1, according to ACI CP-1 or an equivalent certification program.
 - 2. Personnel performing laboratory tests shall be ACI-certified Concrete Strength Testing Technician and Concrete Laboratory Testing Technician, Grade I. Testing agency laboratory supervisor shall be an ACI-certified Concrete Laboratory Testing Technician, Grade II.
- D. Welding Qualifications: Qualify procedures and personnel according to AWS D1.4.

1.8 DELIVERY, STORAGE, AND HANDLING

- A. Steel Reinforcement: Deliver, store, and handle steel reinforcement to prevent bending and damage.
- B. Waterstops: Store waterstops under cover to protect from moisture, sunlight, dirt, oil, and other contaminants.

1.9 FIELD CONDITIONS

- A. Cold-Weather Placement: Comply with ACI 306.1 and as follows. Protect concrete work from physical damage or reduced strength that could be caused by frost, freezing actions, or low temperatures.
 - 1. When average high and low temperature is expected to fall below 40 deg F for three successive days, maintain delivered concrete mixture temperature within the temperature range required by ACI 306.1.
 - 2. Do not use frozen materials or materials containing ice or snow. Do not place concrete on frozen subgrade or on subgrade containing frozen materials.
 - 3. Do not use calcium chloride, salt, or other materials containing antifreeze agents or chemical accelerators unless otherwise specified and approved in mixture designs.
- B. Hot-Weather Placement: Comply with ACI 305.1 and as follows:

1. Maintain concrete temperature below 95 deg F at time of placement. Chilled mixing water or chopped ice may be used to control temperature, provided water equivalent of ice is calculated to total amount of mixing water. Using liquid nitrogen to cool concrete is Contractor's option.
2. Fog-spray forms, steel reinforcement, and subgrade just before placing concrete. Keep subgrade uniformly moist without standing water, soft spots, or dry areas.
 - a. Maximum temperature of forms, reinforcement, anchor bolts, and other embedded items shall not exceed 120 deg F.

PART 2 - PRODUCTS

2.1 CONCRETE, GENERAL

- A. ACI Publications: Comply with the following unless modified by requirements in the Contract Documents:
 1. ACI 301.
 2. ACI 117.
 3. ACI 315.
 4. CRSI "Manual of Standard Practice."
 5. ACI 318.

2.2 FORM-FACING MATERIALS

- A. Smooth-Formed Finished Concrete: Form-facing panels that will provide continuous, true, and smooth concrete surfaces. Furnish in largest practicable sizes to minimize number of joints.
 1. Plywood, metal, or other approved panel materials.
- B. Rough-Formed Finished Concrete: Plywood, lumber, metal, or another approved material. Provide lumber dressed on at least two edges and one side for tight fit.
- C. Chamfer Strips: Wood, metal, PVC, or rubber strips, 3/4 by 3/4 inch, minimum.
- D. Form-Release Agent: Commercially formulated form-release agent that will not bond with, stain, or adversely affect concrete surfaces and does not impair subsequent treatments of concrete surfaces.
 1. Formulate form-release agent with rust inhibitor for steel form-facing materials.
- E. Form Ties: Factory-fabricated, removable, or snap-off metal or glass-fiber-reinforced plastic form ties designed to resist lateral pressure of fresh concrete on forms and to prevent spalling of concrete on removal.

1. Furnish units that will leave no corrodible metal closer than 1 inch to the plane of exposed concrete surface.
2. Furnish ties that, when removed, will leave holes no larger than 1 inch in diameter in concrete surface.
3. Furnish ties with integral water-barrier plates to walls indicated to receive dampproofing or waterproofing.

2.3 STEEL REINFORCEMENT

- A. Reinforcing Bars: ASTM A 615/A 615M, Grade 60, deformed.
- B. Low-Alloy-Steel Reinforcing Bars: ASTM A 706, deformed.
- C. Deformed-Steel Welded-Wire Reinforcement: ASTM A 1064/A 1064M, flat sheet.
- D. Deformed-Steel Wire: ASTM A 1064 / A 1064M.
- E. Deformed Bar Anchors (DBAs): ASTM A1064, plain, Type C, 70,000 psi yield strength.

2.4 REINFORCEMENT ACCESSORIES

- A. Bar Supports: Bolsters, chairs, spacers, and other devices for spacing, supporting, and fastening reinforcing bars and welded wire reinforcement in place. Manufacture bar supports from steel wire, plastic, or precast concrete according to CRSI's "Manual of Standard Practice," of greater compressive strength than concrete and as follows:
 1. For concrete surfaces exposed to view where legs of wire bar supports contact forms, use CRSI Class 1 plastic-protected steel wire or CRSI Class 2 stainless-steel bar supports.

2.5 CONCRETE MATERIALS

- A. Source Limitations: Obtain each type or class of cementitious material of the same brand from the same manufacturer's plant, obtain aggregate from single source, and obtain admixtures from single source from single manufacturer.
- B. Cementitious Material: Use the following cementitious materials, of the same type, brand, and source, throughout Project:
 1. Portland Cement: ASTM C 150, Type I/II, gray.
 2. Fly Ash: ASTM C 618, Class F.
- C. Normal-Weight Aggregates: ASTM C 33, Class 3M coarse aggregate or better, graded. Provide aggregates from a single source with documented service record data of at least 10 years' satisfactory service in similar applications and service conditions using similar aggregates and cementitious materials.

1. Maximum Coarse-Aggregate Size: 1-1/2 inches nominal.
 2. Fine Aggregate: Free of materials with deleterious reactivity to alkali in cement.
- D. Water: ASTM C 94/C 94M and potable.
- E. Air-Entraining Admixture: ASTM C 260.
- F. Chemical Admixtures: Certified by manufacturer to be compatible with other admixtures and that will not contribute water-soluble chloride ions exceeding those permitted in hardened concrete. Do not use calcium chloride or admixtures containing calcium chloride.
1. Water-Reducing Admixture: ASTM C 494/C 494M, Type A.
 2. Retarding Admixture: ASTM C 494/C 494M, Type B.
 3. Water-Reducing and Retarding Admixture: ASTM C 494/C 494M, Type D.
 4. High-Range, Water-Reducing Admixture: ASTM C 494/C 494M, Type F.
 5. High-Range, Water-Reducing and Retarding Admixture: ASTM C 494/C 494M, Type G.
 6. Plasticizing and Retarding Admixture: ASTM C 1017/C 1017M, Type II.

2.6 WATERSTOPS

- A. Self-Expanding Butyl Strip Waterstops: Manufactured rectangular or trapezoidal strip, butyl rubber with sodium bentonite or other hydrophilic polymers, for adhesive bonding to concrete, 3/4 by 1 inch.
1. Waterstops applied where only 1 curtain of vertical reinforcing exists shall be certified by the manufacturer as acceptable for such applications.

2.7 VAPOR RETARDERS

- A. Sheet Vapor Retarder: ASTM E 1745, Class A, except with maximum water-vapor permeance of 0.01 and minimum 15 mils thickness. Include manufacturer's recommended adhesive or pressure-sensitive tape.

2.8 LIQUID FLOOR TREATMENTS

- A. Penetrating Liquid Floor Treatment: Clear, chemically reactive, waterborne solution of inorganic silicate or silicate materials and proprietary components; odorless; that penetrates, hardens, and densifies concrete surfaces.
1. Apply to concrete surfaces to receive polished concrete finish.

2.9 CURING MATERIALS

- A. Absorptive Cover: AASHTO M 182, Class 2, burlap cloth made from jute or kenaf, weighing approximately 9 oz./sq. yd. when dry.

- B. Moisture-Retaining Cover: ASTM C 171, polyethylene film or white burlap-polyethylene sheet.
- C. Water: Potable.
- D. Clear, Waterborne, Membrane-Forming Curing Compound: ASTM C 309, Type 1, Class B, dissipating.
- E. Clear, Waterborne, Membrane-Forming Curing and Sealing Compound: ASTM C 1315, Type 1, Class A.

2.10 RELATED MATERIALS

- A. Expansion- and Isolation-Joint-Filler Strips: ASTM D 1751, asphalt-saturated cellulosic fiber.
- B. Bonding Agent: ASTM C 1059/C 1059M, Type II, nonredispersible, acrylic emulsion or styrene butadiene.
- C. Epoxy Bonding Adhesive: ASTM C 881, two-component epoxy resin, capable of humid curing and bonding to damp surfaces, of class suitable for application temperature and of grade to suit requirements, and as follows:
 - 1. Types IV and V, load bearing, for bonding hardened or freshly mixed concrete to hardened concrete.

2.11 REPAIR MATERIALS

- A. Repair Underlayment: Cement-based, polymer-modified, self-leveling product that can be applied in thicknesses from 1/8 inch and that can be feathered at edges to match adjacent floor elevations.
 - 1. Cement Binder: ASTM C 150, portland cement or hydraulic or blended hydraulic cement as defined in ASTM C 219.
 - 2. Primer: Product of underlayment manufacturer recommended for substrate, conditions, and application.
 - 3. Aggregate: Well-graded, washed gravel, 1/8 to 1/4 inch or coarse sand as recommended by underlayment manufacturer.
 - 4. Compressive Strength: Not less than 5000 psi at 28 days when tested according to ASTM C 109/C 109M.
- B. Repair Overlayment: Cement-based, polymer-modified, self-leveling product that can be applied in thicknesses from 1/4 inch and that can be filled in over a scarified surface to match adjacent floor elevations.
 - 1. Cement Binder: ASTM C 150, portland cement or hydraulic or blended hydraulic cement as defined in ASTM C 219.
 - 2. Primer: Product of topping manufacturer recommended for substrate, conditions, and application.

3. Aggregate: Well-graded, washed gravel, 1/8 to 1/4 inch or coarse sand as recommended by topping manufacturer.
4. Compressive Strength: Not less than 5000 psi at 28 days when tested according to ASTM C 109/C 109M.

2.12 CONCRETE MIXTURES, GENERAL

- A. Prepare design mixtures for each type and strength of concrete, proportioned on the basis of laboratory trial mixture or field test data, or both, according to ACI 301.
 1. Use a qualified independent testing agency for preparing and reporting proposed mixture designs based on laboratory trial mixtures.
- B. Cementitious Materials: Limit percentage, by weight, of cementitious materials other than portland cement in concrete as follows:
 1. Fly Ash: 25 percent.
- C. Limit water-soluble, chloride-ion content in hardened concrete as follows:
 1. 0.30 percentage by weight of cement.
- D. Admixtures: Use admixtures according to manufacturer's written instructions.
 1. Use water-reducing, high-range water-reducing or plasticizing admixture in concrete, as required, for placement and workability.
 2. Use water-reducing and -retarding admixture when required by high temperatures, low humidity, or other adverse placement conditions.
 3. Use water-reducing admixture in pumped concrete and concrete with a w/c ratio below 0.50.

2.13 CONCRETE MIXTURES FOR BUILDING ELEMENTS

- A. Footings: Normal-weight concrete.
 1. Minimum Compressive Strength: 3,000 psi at 28 days.
 2. Maximum W/C Ratio: 0.45.
 3. Slump Limit: 4 inches, plus or minus 1 inch or 8 inches (maximum) for concrete with verified slump of 2 to 4 inches before adding high-range water-reducing admixture or plasticizing admixture at Project site.
 4. Air Content: 1.5 percent, plus or minus 1.5 percent.
 5. Maximum Aggregate Size : 1 inch.
- B. Interior Slabs-on-Grade: Normal-weight concrete.
 1. Minimum Compressive Strength: 3,500 psi at 28 days.
 2. Maximum W/C Ratio: 0.45.

3. Slump Limit: 4 inches, plus or minus 1 inch or 8 inches (maximum) for concrete with verified slump of 2 to 4 inches before adding high-range water-reducing admixture or plasticizing admixture at Project site.
4. Air Content: 1.5 percent, plus or minus 1.5 percent at point of final placement. Do not allow air content of trowel-finished floors to exceed 3 percent.
5. Maximum Aggregate Size : 3/4 inch.

C. Suspended Slabs: Normal-weight concrete.

1. Minimum Compressive Strength: 4,000 psi at 28 days.
2. Maximum W/C Ratio: 0.40.
3. Calculated Equilibrium Unit Weight: 145 lb/cu. ft., plus or minus 3 lb/cu. ft. as determined by ASTM C 567.
4. Slump Limit: 4 inches, plus or minus 1 inch or 8 inches (maximum) for concrete with verified slump of 2 to 4 inches before adding high-range water-reducing admixture or plasticizing admixture.
5. Air Content: 5.5 percent, plus or minus 1.5 percent at point of final placement.
6. Maximum Aggregate Size: 3/4 inch.

2.14 FABRICATING REINFORCEMENT

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

2.15 CONCRETE MIXING

- A. Ready-Mixed Concrete: Measure, batch, mix, and deliver concrete according to ASTM C 94/C 94M, and furnish batch ticket information.
1. Limit concrete mixing and delivery time to 90 minutes.
 2. Concrete Temperature: 50 deg F minimum, 95 deg F maximum, at point of placement.

PART 3 - EXECUTION

3.1 FORMWORK INSTALLATION

- A. Design, erect, shore, brace, and maintain formwork, according to ACI 301, to support vertical, lateral, static, and dynamic loads, and construction loads that might be applied, until structure can support such loads.
- B. Construct formwork so concrete members and structures are of size, shape, alignment, elevation, and position indicated, within tolerance limits of ACI 117.
- C. Limit concrete surface irregularities, designated by ACI 347 as abrupt or gradual, as follows:

1. Class A, 1/8 inch for smooth-formed finished exposed surfaces.
 2. Class B, 1/4 inch for rough-formed finished non-exposed surfaces.
- D. Construct forms tight enough to prevent loss of concrete mortar.
- E. Construct forms for easy removal without hammering or prying against concrete surfaces. Provide crush or wrecking plates where stripping may damage cast concrete surfaces. Provide top forms for inclined surfaces steeper than 1.5 horizontal to 1 vertical.
1. Install keyways and the like for easy removal.
 2. Do not use rust-stained steel form-facing material.
- F. Set edge forms, bulkheads, and intermediate screed strips for slabs to achieve required elevations and slopes in finished concrete surfaces. Provide and secure units to support screed strips; use strike-off templates or compacting-type screeds.
- G. Provide temporary openings for cleanouts and inspection ports where interior area of formwork is inaccessible. Close openings with panels tightly fitted to forms and securely braced to prevent loss of concrete mortar. Locate temporary openings in forms at inconspicuous locations.
- H. Chamfer exterior corners and edges of permanently exposed concrete.
- I. Form openings, chases, offsets, keyways, blocking, screeds, and bulkheads required in the Work. Determine sizes and locations from trades providing such items.
- J. Clean forms and adjacent surfaces to receive concrete. Remove chips, wood, sawdust, dirt, and other debris just before placing concrete.
- K. Retighten forms and bracing before placing concrete, as required, to prevent mortar leaks and maintain proper alignment.
- L. Coat contact surfaces of forms with form-release agent, according to manufacturer's written instructions, before placing reinforcement.

3.2 EMBEDDED ITEMS INSTALLATION

- A. Place and secure anchorage devices and other embedded items required for adjoining work that is attached to or supported by cast-in-place concrete. Use setting drawings, templates, diagrams, instructions, and directions furnished with items to be embedded.
1. Install anchor rods, accurately located, to elevations required and complying with tolerances in Section 7.5 of AISC 303.

3.3 REMOVING AND REUSING FORMS

- A. General: Formwork for sides of grade beams, walls, columns, and similar parts of the Work that does not support weight of concrete may be removed after cumulatively curing

at not less than 50 deg F for 48 hours after placing concrete. Concrete must be hard enough to not be damaged by form-removal operations, and curing and protection operations need to be maintained.

- B. Clean and repair surfaces of forms to be reused in the Work. Split, frayed, delaminated, or otherwise damaged form-facing material are not acceptable for exposed surfaces. Apply new form-release agent.
- C. When forms are reused, clean surfaces, remove fins and laitance, and tighten to close joints. Align and secure joints to avoid offsets. Do not use patched forms for exposed concrete surfaces unless approved by Architect.

3.4 VAPOR-RETARDER INSTALLATION

- A. Sheet Vapor Retarders: Place, protect, and repair sheet vapor retarder according to ASTM E 1643 and manufacturer's written instructions.
 - 1. Lap joints 6 inches and seal with manufacturer's recommended tape.
 - 2. Extend vapor retarder 2 feet beyond core and shell slab-on-grade extents for future connection with vapor barrier from tenant upfit.
 - 3. Protect exposed portions of vapor retarder until adjacent vapor retarder and slab from tenant upfit have been installed.

3.5 STEEL REINFORCEMENT INSTALLATION

- A. General: Comply with CRSI's "Manual of Standard Practice" for fabricating, placing, and supporting reinforcement.
 - 1. Do not cut or puncture vapor retarder. Repair damage and reseal vapor retarder before placing concrete.
- B. Clean reinforcement of loose rust and mill scale, earth, ice, and other foreign materials that reduce bond to concrete.
- C. Accurately position, support, and secure reinforcement against displacement. Locate and support reinforcement with bar supports to maintain minimum concrete cover. Do not tack weld crossing reinforcing bars.
- D. Set wire ties with ends directed into concrete, not toward exposed concrete surfaces.
- E. Install welded-wire reinforcement in longest practicable lengths on bar supports spaced to minimize sagging. Lap edges and ends of adjoining sheets at least one mesh spacing. Offset laps of adjoining sheet widths to prevent continuous laps in either direction. Lace overlaps with wire.

3.6 JOINTS

- A. General: Construct joints true to line with faces perpendicular to surface plane of concrete.
- B. Construction Joints: Install so strength and appearance of concrete are not impaired, at locations indicated or as approved by Architect.
 - 1. Place joints perpendicular to main reinforcement. Continue reinforcement across construction joints unless otherwise indicated.
 - 2. Form keyed joints as indicated. Embed keys at least 1-1/2 inches into concrete.
 - 3. Locate joints for grade beams and slabs, as indicated.
 - 4. Space vertical joints in walls as indicated. Locate joints beside piers integral with walls, near corners, and in concealed locations where possible.
 - 5. Use a bonding agent at locations where fresh concrete is placed against hardened or partially hardened concrete surfaces.
- C. Contraction Joints in Slabs-on-Grade: Form weakened-plane contraction joints, sectioning concrete into areas as indicated. Construct contraction joints for a depth equal to at least one-fourth of concrete thickness as follows:
 - 1. Sawed Joints: Form contraction joints with power saws equipped with shatterproof abrasive or diamond-rimmed blades. Cut 1/8-inch- wide joints into concrete when cutting action does not tear, abrade, or otherwise damage surface and before concrete develops random contraction cracks. Cut joints the same day as concrete placement and within 12 hours.
- D. Isolation Joints in Slabs-on-Grade: After removing formwork, install joint-filler strips at slab junctions with vertical surfaces, such as column pedestals, foundation walls, grade beams, and other locations, as indicated.
 - 1. Extend joint-filler strips full width and depth of joint, terminating flush with finished concrete surface unless otherwise indicated.
 - 2. Install joint-filler strips in lengths as long as practicable. Where more than one length is required, lace or clip sections together.
- E. Doweled Joints: Install dowel bars and support assemblies at joints where indicated. Lubricate or asphalt coat one-half of dowel length to prevent concrete bonding to one side of joint.

3.7 WATERSTOPS

- A. Self-Expanding Strip Waterstops: Install in construction joints and at other locations indicated, according to manufacturer's written instructions, adhesive bonding, mechanically fastening, and firmly pressing into place. Install in longest lengths practicable.

3.8 CONCRETE PLACEMENT

- A. Before placing concrete, verify that installation of formwork, reinforcement, and embedded items is complete and that required inspections are completed.
- B. Before test sampling and placing concrete, water may be added at Project site, subject to limitations of ACI 301.
 - 1. Do not add water to concrete after adding high-range water-reducing admixtures to mixture.
- C. Deposit concrete continuously in one layer or in horizontal layers of such thickness that no new concrete will be placed on concrete that has hardened enough to cause seams or planes of weakness. If a section cannot be placed continuously, provide construction joints as indicated. Deposit concrete to avoid segregation.
 - 1. Deposit concrete in horizontal layers of depth to not exceed formwork design pressures and in a manner to avoid inclined construction joints.
 - 2. Consolidate placed concrete with mechanical vibrating equipment according to ACI 301.
 - 3. Do not use vibrators to transport concrete inside forms. Insert and withdraw vibrators vertically at uniformly spaced locations to rapidly penetrate placed layer and at least 6 inches into preceding layer. Do not insert vibrators into lower layers of concrete that have begun to lose plasticity. At each insertion, limit duration of vibration to time necessary to consolidate concrete and complete embedment of reinforcement and other embedded items without causing mixture constituents to segregate.
- D. Deposit and consolidate concrete for floors and slabs in a continuous operation, within limits of construction joints, until placement of a panel or section is complete.
 - 1. Consolidate concrete during placement operations, so concrete is thoroughly worked around reinforcement and other embedded items and into corners.
 - 2. Maintain reinforcement in position on chairs during concrete placement.
 - 3. Screed slab surfaces with a straightedge and strike off to correct elevations.
 - 4. Slope surfaces uniformly to drains where required.
 - 5. Begin initial floating using bull floats or darbies to form a uniform and open-textured surface plane, before excess bleedwater appears on the surface. Do not further disturb slab surfaces before starting finishing operations.

3.9 FINISHING FORMED SURFACES

- A. Rough-Formed Finish: As-cast concrete texture imparted by form-facing material with tie holes and defects repaired and patched. Remove fins and other projections that exceed specified limits on formed-surface irregularities.
 - 1. Apply to concrete surfaces not exposed to public view.
- B. Smooth-Formed Finish: As-cast concrete texture imparted by form-facing material, arranged in an orderly and symmetrical manner with a minimum of seams. Repair and

patch tie holes and defects. Remove fins and other projections that exceed specified limits on formed-surface irregularities.

1. Apply to concrete surfaces exposed to public view.
- C. Related Unformed Surfaces: At tops of walls, horizontal offsets, and similar unformed surfaces adjacent to formed surfaces, strike off smooth and finish with a texture matching adjacent formed surfaces. Continue final surface treatment of formed surfaces uniformly across adjacent unformed surfaces unless otherwise indicated.
- D. Rubbed Finish: Apply the following to smooth-formed-finished as-cast concrete:
1. Grout-Cleaned Finish: Wet concrete surfaces and apply grout of a consistency of thick paint to coat surfaces and fill small holes. Mix 1 part Portland cement to 1-1/2 parts fine sand with a 1:1 mixture of bonding admixture and water. Add white Portland cement in amounts determined by trial patches, so color of dry grout matches adjacent surfaces. Scrub grout into voids and remove excess grout. When grout whitens, rub surface with clean burlap and keep surface damp by fog spray for at least 36 hours.

3.10 FINISHING FLOORS AND SLABS

- A. General: Comply with ACI 302.1R recommendations for screeding, restraightening, and finishing operations for concrete surfaces. Do not wet concrete surfaces.
- B. Scratch Finish: While still plastic, texture concrete surface that has been screeded and bull-floated or darbied. Use stiff brushes, brooms, or rakes to produce a profile amplitude of 1/4 inch in one direction.
1. Apply scratch finish to surfaces to receive mortar setting beds for bonded cementitious floor finishes.
- C. Float Finish: Consolidate surface with power-driven floats or by hand floating if area is small or inaccessible to power driven floats. Restraighten, cut down high spots, and fill low spots. Repeat float passes and restraightening until surface is left with a uniform, smooth, granular texture.
1. Apply float finish to surfaces to receive trowel finish.
 2. Apply to slabs-on-grade.
 3. Apply to suspended concrete slabs.
- D. Trowel Finish: After applying float finish, apply first troweling and consolidate concrete by hand or power-driven trowel. Continue troweling passes and restraighten until surface is free of trowel marks and uniform in texture and appearance. Grind smooth any surface defects that would telegraph through applied coatings or floor coverings.
1. Apply a trowel finish to non-air entrained surfaces exposed to view or to be covered with resilient flooring, carpet, ceramic or quarry tile.
 2. Finish surfaces to the following tolerances, according to ASTM E 1155, for a randomly trafficked floor surface:

- a. Specified overall values of flatness, F(F) 25; and of levelness, F(L) 20; with minimum local values of flatness, F(F) 17; and of levelness, F(L) 15, unless otherwise noted.
 - b. Specified overall values of flatness, F(F) 40; and of levelness, F(L) 25; with minimum local values of flatness, F(F) 24; and of levelness, F(L) 17; for slab-on-grade.
 - c. Specified overall values of flatness, F(F) 30; and of levelness, F(L) 20; with minimum local values of flatness, F(F) 24; and of levelness, F(L) 15; for suspended slabs.
- E. Fine-Broom Finish: Apply a first trowel or float finish to surfaces where ceramic or quarry tile is to be installed by either thickset or thin-set method. While concrete is still plastic, slightly scarify surface with a fine broom.
1. Comply with flatness and levelness tolerances for trowel-finished floor surfaces.
- F. Broom Finish: Apply a broom finish to exterior concrete platforms, steps, ramps, and elsewhere as indicated.
1. Immediately after float finishing, slightly roughen trafficked surface by brooming with fiber-bristle broom perpendicular to main traffic route. Coordinate required final finish with Architect before application.

3.11 MISCELLANEOUS CONCRETE ITEMS

- A. Filling In: Fill in holes and openings left in concrete structures after work of other trades is in place unless otherwise indicated. Mix, place, and cure concrete, as specified, to blend with in-place construction. Provide other miscellaneous concrete filling indicated or required to complete the Work.
- B. Equipment Bases and Foundations:
1. Coordinate sizes and locations of concrete bases with actual equipment provided.
 2. Construct concrete bases to height indicated, and extend base not less than 6 inches in each direction beyond the maximum dimensions of supported equipment unless otherwise indicated or required by equipment manufacturer.
 3. Minimum Compressive Strength: 3000 psi at 28 days (Normal Weight)
 4. Install dowel rods to connect concrete base to concrete floor. Unless otherwise indicated, install dowel rods on 12-inch centers around the full perimeter of concrete base.
 5. Prior to pouring concrete, place, and secure anchorage devices. Use setting drawings, templates, diagrams, instructions, and directions furnished with items to be embedded.
 6. Cast anchor-bolt insert into bases. Install anchor bolts to elevations required for proper attachment to supported equipment.
- C. Steel Pan Stairs: Provide concrete fill for steel pan stair treads, landings, and associated items. Cast-in inserts and accessories as shown on Drawings. Screed, tamp, and trowel finish concrete surfaces. Provide 3000 psi compressive strength normal-weight concrete.

3.12 CONCRETE PROTECTING AND CURING

- A. General: Protect freshly placed concrete from premature drying and excessive cold or hot temperatures. Comply with ACI 306.1 for cold-weather protection and ACI 305.1 for hot-weather protection during curing. For concrete specified to be receive polished finish the outdoor air temperature during the curing period must be limited to 80 deg F.
- B. Evaporation Retarder: Apply evaporation retarder to unformed concrete surfaces if hot, dry, or windy conditions cause moisture loss approaching 0.2 lb/sq. ft. x h before and during finishing operations. Apply according to manufacturer's written instructions after placing, screeding, and bull floating or darbying concrete, but before float finishing.
- C. Formed Surfaces: Cure formed concrete surfaces, including underside of beams, supported slabs and other similar surfaces. If forms remain during curing period, moist cure after loosening forms. If removing forms before end of curing period, continue curing for the remainder of the curing period.
- D. Unformed Surfaces: Begin curing immediately after finishing concrete. Cure unformed surfaces, including floors and slabs, concrete floor toppings, and other surfaces.
- E. Cure concrete according to ACI 308.1, by one or a combination of the following methods:
 - 1. Moisture Curing: Keep surfaces continuously moist for not less than seven days with the following materials:
 - a. Water.
 - b. Continuous water-fog spray.
 - c. Absorptive cover, water saturated, and kept continuously wet. Cover concrete surfaces and edges with 12-inch lap over adjacent absorptive covers.
 - 2. Moisture-Retaining-Cover Curing: Cover concrete surfaces with moisture-retaining cover for curing concrete, placed in widest practicable width, with sides and ends lapped at least 12 inches, and sealed by waterproof tape or adhesive. Cure for not less than seven days. Immediately repair any holes or tears during curing period, using cover material and waterproof tape.
 - a. Moisture cure or use moisture-retaining covers to cure concrete surfaces to receive floor coverings.
 - b. Moisture cure or use moisture-retaining covers to cure concrete surfaces to receive penetrating liquid floor treatments or polished finish.
 - c. Cure concrete surfaces to receive floor coverings with either a moisture-retaining cover or a curing compound that the manufacturer certifies does not interfere with bonding of floor covering used on Project.
 - 3. Curing Compound: Apply uniformly in continuous operation by power spray or roller according to manufacturer's written instructions. Recoat areas subjected to heavy rainfall within three hours after initial application. Maintain continuity of coating and repair damage during curing period.

- a. Removal: After curing period has elapsed, remove curing compound without damaging concrete surfaces by method recommended by curing compound manufacturer unless manufacturer certifies curing compound does not interfere with bonding of floor covering used on Project.
 - b. Use of curing compounds to cure concrete surfaces to receive penetrating liquid floor treatments or polished finished is not permitted.
4. Curing and Sealing Compound: Apply uniformly to floors and slabs indicated in a continuous operation by power spray or roller according to manufacturer's written instructions. Recoat areas subjected to heavy rainfall within three hours after initial application. Repeat process 24 hours later and apply a second coat. Maintain continuity of coating and repair damage during curing period.

3.13 LIQUID FLOOR TREATMENT APPLICATION

- A. Penetrating Liquid Floor Treatment: Prepare, apply and finish penetrating liquid floor treatment according to manufacturer's written instructions.
1. Remove curing compounds, sealers, oil, dirt, laitance, and other contaminants and complete surface repairs.
 2. Do not apply to concrete until cured for minimum amount of time stipulated in manufacturer's written instructions.
 3. Apply liquid until surface is saturated, scrubbing into surface until a gel forms; rewet; and repeat brooming or scrubbing. Rinse with water; remove excess material until surface is dry. Apply a second coat in a similar manner if surface is rough or porous.

3.14 CONCRETE SURFACE REPAIRS

- A. Defective Concrete: Repair and patch defective areas when approved by Architect. Remove and replace concrete that cannot be repaired and patched to Architect's approval.
- B. Repair technique for surfaces exposed to view in the final condition shall be tested on a mockup or surface to be concealed later, before repairing surfaces.
1. Repair test shall be approved by the Architect prior to repairing surfaces.
- C. Repairing Formed Surfaces: Surface defects include color and texture irregularities, cracks, spalls, air bubbles, honeycombs, rock pockets, fins and other projections on the surface, and stains and other discolorations that cannot be removed by cleaning.
1. Immediately after form removal, cut out honeycombs, rock pockets, and voids more than 1/2 inch in any dimension to solid concrete. Limit cut depth to 3/4 inch. Make edges of cuts perpendicular to concrete surface. Clean, dampen with water, and brush-coat holes and voids with bonding agent. Fill and compact with patching

- mortar before bonding agent has dried. Fill form-tie voids with patching mortar or cone plugs secured in place with bonding agent.
2. Repair defects on surfaces exposed to view by blending white portland cement and standard portland cement so that, when dry, patching mortar will match surrounding color. Patch a test area at inconspicuous locations to verify mixture and color match before proceeding with patching. Compact mortar in place and strike off slightly higher than surrounding surface.
 3. Repair defects on concealed formed surfaces that affect concrete's durability and structural performance as determined by Architect.
- D. Repairing Unformed Surfaces: Test unformed surfaces, such as floors and slabs, for finish and verify surface tolerances specified for each surface. Correct low and high areas. Test surfaces sloped to drain for trueness of slope and smoothness; use a sloped template.
1. Repair finished surfaces containing defects. Surface defects include spalls, popouts, honeycombs, rock pockets, crazing and cracks in excess of 0.01 inch wide or that penetrate to reinforcement or completely through unreinforced sections regardless of width, and other objectionable conditions.
 2. After concrete has cured at least 14 days, correct high areas by grinding.
 3. Correct localized low areas during or immediately after completing surface finishing operations by cutting out low areas and replacing with patching mortar. Finish repaired areas to blend into adjacent concrete.
 4. Correct other low areas scheduled to receive floor coverings with a repair underlayment. Prepare, mix, and apply repair underlayment and primer according to manufacturer's written instructions to produce a smooth, uniform, plane, and level surface. Feather edges to match adjacent floor elevations.
 5. Correct other low areas scheduled to remain exposed with a repair topping. Cut out low areas to ensure a minimum repair topping depth of 1/4 inch to match adjacent floor elevations. Prepare, mix, and apply repair topping and primer according to manufacturer's written instructions to produce a smooth, uniform, plane, and level surface.
 6. Repair defective areas, except random cracks and single holes 1 inch or less in diameter, by cutting out and replacing with fresh concrete. Remove defective areas with clean, square cuts and expose steel reinforcement with at least a 3/4-inch clearance all around. Dampen concrete surfaces in contact with patching concrete and apply bonding agent. Mix patching concrete of same materials and mixture as original concrete except without coarse aggregate. Place, compact, and finish to blend with adjacent finished concrete. Cure in same manner as adjacent concrete.
 7. Repair random cracks and single holes 1 inch or less in diameter with patching mortar. Groove top of cracks and cut out holes to sound concrete and clean off dust, dirt, and loose particles. Dampen cleaned concrete surfaces and apply bonding agent. Place patching mortar before bonding agent has dried. Compact patching mortar and finish to match adjacent concrete. Keep patched area continuously moist for at least 72 hours.
- E. Perform structural repairs of concrete, subject to Architect's approval, using epoxy adhesive and patching mortar.

- F. Repair materials and installation not specified above may be used, subject to Architect's approval.

3.15 SPECIAL INSPECTIONS

- A. Special Inspections and tests shall be performed by the Special Inspector or Special Inspection Agency.

- B. Verification and inspection of concrete construction shall be in accordance with the Statement of Special Inspections, Section 1705.3 of the 2018 North Carolina State Building Code and as follows:

1. Concrete Tests: Testing of composite samples of fresh concrete obtained according to ASTM C 172 shall be performed according to the following requirements:

- a. Testing Frequency: Obtain at least one composite sample for each 100 cu. yd. or fraction thereof of each concrete mixture placed each day.

- (1) When frequency of testing will provide fewer than five compressive-strength tests for each concrete mixture, testing shall be conducted from at least five randomly selected batches or from each batch if fewer than five are used.

- b. Slump: ASTM C 143/C 143M; one test at point of placement for each composite sample, but not less than one test for each day's pour of each concrete mixture. Perform additional tests when concrete consistency appears to change.

- c. Air Content: ASTM C 231, pressure method, for normal-weight concrete; ASTM C 173/C 173M, volumetric method, for structural lightweight concrete; one test for each composite sample, but not less than one test for each day's pour of each concrete mixture.

- d. Concrete Temperature: ASTM C 1064/C 1064M; one test at point of delivery for each truck and one test at point of placement for each 25 cu. yd. placed.

- e. Unit Weight: ASTM C 567, fresh unit weight of structural normal-weight concrete; one test for each composite sample, but not less than one test for each day's pour of each concrete mixture.

- f. Compression Test Specimens: ASTM C 31/C 31M.

- (1) Cast and laboratory cure five 4x8 standard cylinder specimens for each composite sample.

- g. Compressive-Strength Tests: ASTM C 39/C 39M; test one laboratory-cured specimen at 7 days and three laboratory-cured specimens at 28 days. Maintain one specimen in reserve for later testing, if required.

- (1) A compressive-strength test shall be the average compressive strength from a set of three specimens obtained from same composite sample and tested at age indicated.

- (2) Strength of each concrete mixture will be satisfactory if every average of any three consecutive compressive-strength tests equals or

exceeds specified compressive strength and no compressive-strength test value falls below specified compressive strength by more than 500 psi.

- h. Measure floor and slab flatness and levelness according to ASTM E 1155 within 48 hours of finishing.
 - i. Test results shall be reported in writing to Architect, concrete manufacturer, and Contractor within 48 hours of testing. Reports of compressive-strength tests shall contain Project identification name and number, date of concrete placement, name of concrete testing and inspecting agency, location of concrete batch in Work, design compressive strength at 28 days, concrete mixture proportions and materials, compressive breaking strength, and type of break for both 7- and 28-day tests.
 - j. Nondestructive Testing: Impact hammer, sonoscope, or other nondestructive device may be permitted by Architect but will not be used as sole basis for approval or rejection of concrete.
 - k. Additional Tests: Testing and inspecting agency shall make additional tests of concrete when test results indicate that slump, air entrainment, compressive strength, or other requirements have not been met, as directed by Architect. Testing and inspecting agency may conduct tests to determine adequacy of concrete by cored cylinders complying with ASTM C 42 or by other methods as directed by Architect.
2. Inspections: Perform inspections of the work to verify compliance with the requirements of the contract documents, including the following:
- a. Steel reinforcement placement.
 - b. Steel reinforcement welding.
 - c. Headed bolts and studs.
 - d. Verification of use of required design mixture.
 - e. Concrete placement, including conveying and depositing.
 - f. Curing procedures and maintenance of curing temperature.
 - g. Verification of concrete strength.
 - h. Concrete batch plant and review procedures for maintaining proper mix proportions and proper mix techniques.
 - i. Concrete delivery tickets at time of delivery to assure conformance to ACI 318.
- C. Correct deficiencies in the Work that test reports and inspections indicate do not comply with the Contract Documents.
- D. Additional testing and inspecting, at Contractor's expense, will be performed to determine compliance of replaced or additional work with specified requirements.

3.16 PROTECTION OF LIQUID FLOOR TREATMENTS

- A. Protect liquid floor treatment from damage and wear during the remainder of construction period. Use protective methods and materials, including temporary covering, recommended in writing by liquid floor treatments installer.

END OF SECTION 03 30 00

SECTION 05 12 00 – STRUCTURAL STEEL FRAMING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:

- 1. Structural steel.
- 2. Field-installed shear connectors and deformed bar anchors.
- 3. Grout for column base plates.

- B. Related Requirements:

- 1. Section 014100 "Special Inspection Services" for administrative and procedural requirements for special inspection services.
- 2. Section 053100 "Steel Decking" for field installation of shear connectors through deck.
- 3. Section 099600 "High-performance Coatings" for surface-preparation and priming requirements of members to receive high performance coatings.

1.3 DEFINITIONS

- A. Structural Steel: Elements of structural-steel frame indicated on Drawings and as described in AISC 303, "Code of Standard Practice for Steel Buildings and Bridges."

1.4 COORDINATION

- A. Coordinate selection of shop primers with topcoats to be applied over them. Comply with paint and coating manufacturers' recommendations to ensure that shop primers and topcoats are compatible with one another.
- B. Coordinate installation of anchorage items to be embedded in or attached to other construction without delaying the Work. Provide setting diagrams, sheet metal templates, instructions, and directions for installation.

1.5 PREINSTALLATION MEETINGS

- A. Preinstallation Conference: Conduct conference at Project site.

1.6 ACTION SUBMITTALS

- A. Shop Drawings: Show fabrication of structural-steel components.
1. Include details of cuts, connections, splices, camber, holes, and other pertinent data.
 2. Provide setting drawings, templates, and directions for installation of anchor bolts and other anchorages to be installed as work of other sections.
 3. Include embedment drawings.
 4. Indicate welds by standard AWS symbols, distinguishing between shop and field welds, and show size, length, and type of each weld. Show backing bars that are to be removed and supplemental fillet welds where backing bars are to remain.
 5. Indicate type, size, and length of bolts, distinguishing between shop and field bolts. Identify pretensioned and slip-critical high-strength bolted connections.
 6. Delegated design submittals must be submitted with or prior to shop drawings. Shop drawings will not be reviewed until delegated design submittals have been submitted.
- B. Delegated-Design Submittal: For structural-steel connections indicated as “delegated design”, include structural calculations signed and sealed by the qualified professional engineer responsible for their preparation. In addition, the professional engineer responsible for connection design shall review the shop drawings prior to submittal for review to verify that the connections as detailed on the shop drawings comply with the connection design requirements of the final calculations. A review letter, signed and sealed by the professional engineer responsible for connection design shall be provided with the shop drawing and calculation submittal stating that this review and verification has been completed.

1.7 INFORMATION SUBMITTALS

- A. Qualification Data: For qualified fabricator.
- B. Welding certificates. Welder certificates signed by Contractor certifying that welders comply with requirements specified under the “Quality Assurance” Article.
- C. Paint Compatibility Certificates: From manufacturers of topcoats applied over shop primers, certifying that shop primers are compatible with topcoats.
- D. Mill test reports for structural steel, including chemical and physical properties.
- E. Product Test Reports: For the following:
1. Bolts, nuts, and washers including mechanical properties and chemical analysis.
 2. Direct-tension indicators.
 3. Tension-control, high-strength, bolt-nut-washer assemblies.
 4. Shear stud connectors.
 5. Deformed Bar Anchors.
 6. Shop primers.

7. Nonshrink grout.

1.8 QUALITY ASSURANCE

- A. Fabricator Qualifications: A qualified fabricator that participates in the AISC Quality Certification Program and is designated an AISC-Certified Plant, Category STD.
 1. Exception: The fabricator maintains detailed fabrication and quality control procedures which provide a basis for inspection control of the workmanship and the fabricator's ability to conform to approved drawings, project specifications and referenced standards.
 - a. The Owner's Special Inspection Agency shall review the procedures to the completeness and adequacy relative to the Code requirements including Special Inspection requirements for the fabricators scope of work.
- B. Installer Qualifications: A qualified installer who participates in the AISC Quality Certification Program and is designated an AISC-Certified Erector, Category CSE.
- C. Welding Qualifications: Qualify procedures and personnel according to AWS D1.1/D1.1M, "Structural Welding Code - Steel."
- D. Comply with applicable provisions of the following specifications and documents:
 1. AISC 303.
 2. AISC 360.
 3. RCSC's "Specification for Structural Joints Using ASTM A 325 or A 490 Bolts."

1.9 DELIVERY, STORAGE, AND HANDLING

- A. Store materials to permit easy access for inspection and identification. Keep steel members off ground and spaced by using pallets, dunnage, or other supports and spacers. Protect steel members and packaged materials from corrosion and deterioration.
 1. Do not store materials on structure in a manner that might cause distortion, damage, or overload to members or supporting structures. Repair or replace damaged materials or structures as directed.
- B. Store fasteners in a protected place in sealed containers with manufacturer's labels intact.
 1. Fasteners may be repackaged provided Owner's testing and inspecting agency observes repackaging and seals containers.
 2. Clean and relubricate bolts and nuts that become dry or rusty before use.
 3. Comply with manufacturers' written recommendations for cleaning and lubricating ASTM F 1852 fasteners and for retesting fasteners after lubrication

1.10 PERFORMANCE REQUIREMENTS

- A. Connections: Provide details of simple shear, braced frame, moment frame and lintel/girt connections required by the Contract Documents to be selected or completed by structural-steel fabricator, including comprehensive engineering design by a qualified professional engineer, to withstand loads indicated and comply with other information and restrictions indicated.
 - 1. Select and complete connections using schematic details indicated and AISC 360.
 - 2. Use LRFD; data are given at strength-load level.
- B. Construction: Braced frames, $R = 3.0$.

PART 2 - PRODUCTS

2.1 STRUCTURAL-STEEL MATERIALS

- A. W-Shapes: ASTM A 992, Grade 50.
- B. Channels, Angles: ASTM A 36, Grade 36.
- C. Plate and Bar: ASTM A 36, Grade 36.
- D. Cold-Formed Hollow Structural Sections: ASTM A 500, Grade C, structural tubing, square, and rectangular.
- E. Cold-Formed Hollow Structural Sections: ASTM A 500, Grade B, structural round shape.
- F. Welding Electrodes: Comply with AWS requirements.

2.2 BOLTS, CONNECTORS, AND ANCHORS

- A. High-Strength Bolts, Nuts, and Washers: ASTM A 325, Type 1, heavy-hex steel structural bolts; ASTM A 563, Grade C, heavy-hex carbon-steel nuts; and ASTM F 436, Type 1, hardened carbon-steel washers; all with plain finish.
- B. Tension-Control, High-Strength Bolt-Nut-Washer Assemblies: ASTM F 1852, Type 1, heavy-hex round head assemblies consisting of steel structural bolts with splined ends, heavy-hex carbon-steel nuts, and hardened carbon-steel washers.
 - 1. Finish: Plain, unless otherwise noted.
- C. Shear Connectors: ASTM A 108, Grades 1015 through 1020, headed-stud type, cold-finished carbon steel; AWS D1.1/D1.1M, Type B.
- D. Deformed Bar Anchors: ASTM A 1064; AWS D1.1, Type C.
- E. Headed Anchor Rods: ASTM F 1554, Grade 36, weldable, straight.

1. Nuts: ASTM A 563 heavy-hex carbon steel.
2. Plate Washers: ASTM A 36/A 36M carbon steel.
3. Washers: ASTM F 436, Type 1, hardened carbon steel.
4. Finish: Plain.

2.3 PRIMER

- A. Primer: Fabricator's standard lead- and chromate-free, nonasphaltic, rust-inhibiting primer complying with MPI#79 and requirements for low-emitting materials, compatible with topcoat where members are exposed on interior.
- B. At all structural steel and miscellaneous steel framing in natatorium and associated pool equipment and storage rooms, provide the following:
 1. SSPC-SP6 Commercial Blast Cleaning.
 2. One coat of Tnemec Series 90-97 Tneme-Zinc at 2.5 – 3.5 dry mils.
 3. One coat of Tnemec Series 161 Tneme-Fascure at 4.0 – 5.0 dry mils.
 4. Refer to High Performance Coatings specification section for field painting.
- C. For all steel to receive field-applied insulating coating, refer to High Performance Coatings specification section for primer and coating system.
- D. For all steel to receive field-applied intumescent or spray-applied fireproofing, refer to Division 7 fireproofing specification sections for primer and coating systems.
- E. Galvanizing Repair Paint: ASTM A 780.

2.4 BLACK ASPHALTUM PAINT

- A. Ultra high bond, single-component coal tar mastic for protecting steel below grade.

2.5 GROUT

- A. Nonmetallic, Shrinkage-Resistant Grout: ASTM C 1107, factory-packaged, nonmetallic aggregate grout, noncorrosive and nonstaining, mixed with water to consistency suitable for application and a 30-minute working time.
 1. 5,500 psi minimum compressive strength.

2.6 FABRICATION

- A. Structural Steel: Fabricate and assemble in shop to greatest extent possible. Fabricate according to AISC's "Code of Standard Practice for Steel Buildings and Bridges" and AISC 360.
 1. Camber structural-steel members where indicated.
 2. Fabricate beams with rolling camber up.

3. Identify high-strength structural steel according to ASTM A 6/A 6M and maintain markings until structural steel has been erected.
 4. Mark and match-mark materials for field assembly.
 5. Complete structural-steel assemblies, including welding of units, before starting shop-priming operations.
- B. Thermal Cutting: Perform thermal cutting by machine to greatest extent possible.
1. Plane thermally cut edges to be welded to comply with requirements in AWS D1.1/D1.1M.
- C. Bolt Holes: Cut, drill or punch standard bolt holes perpendicular to metal surfaces.
- D. Finishing: Accurately finish ends of columns and other members transmitting bearing loads.
- E. Cleaning: Clean and prepare steel surfaces that are to remain unpainted according to SSPC SP 2, "Hand Tool Cleaning." Clean and prepare steel surfaces that are to receive hot-dip galvanization according to SSPC-SP 2, "Hand Tool Cleaning" prior to galvanizing.
- F. Shear Connectors: Prepare steel surfaces as recommended by manufacturer of shear connectors. Use automatic end welding of headed-stud shear connectors according to AWS D1.1/D1.1M and manufacturer's written instructions.
- G. Holes: Provide holes required for securing other work to structural steel and for other work to pass through steel framing members.
1. Cut, drill, or punch holes perpendicular to steel surfaces. Do not thermally cut bolt holes or enlarge holes by burning.
 2. Baseplate Holes: Cut, drill, mechanically thermal cut, or punch holes perpendicular to steel surfaces.
 3. Weld threaded nuts to framing and other specialty items indicated to receive other work.

2.7 SHOP CONNECTIONS

- A. High-Strength Bolts: Shop install high-strength bolts according to RCSC's "Specification for Structural Joints Using ASTM A 325 or A 490 Bolts" for type of bolt and type of joint specified.
1. Joint Type: Snug tightened, unless otherwise indicated.
- B. Weld Connections: Comply with AWS D1.1/D1.1M for tolerances, appearances, welding procedure specifications, weld quality, and methods used in correcting welding work.
1. Assemble and weld built-up sections by methods that will maintain true alignment of axes without exceeding tolerances in AISC 303 for mill material.

2.8 SHOP PRIMING

- A. Shop prime steel surfaces except the following:
1. Surfaces embedded in concrete or mortar. Extend priming of partially embedded members to a depth of 2 inches.
 2. Surfaces to be field welded.
 3. Surfaces of high-strength bolted, slip-critical connections.
 4. Surfaces to receive sprayed fire-resistive materials (applied fireproofing).
 5. Galvanized surfaces.
 6. Surfaces enclosed in interior construction.
- B. Surface Preparation: Clean surfaces to be painted. Remove loose rust and mill scale and spatter, slag, or flux deposits. Prepare surfaces according to the following specifications and standards:
1. SSPC-SP 2, "Hand Tool Cleaning."
 2. SSPC-SP 3, "Power Tool Cleaning."
 3. SSPC-SP 6, "Commercial Blast Cleaning" as noted for Tnemec shop primer and field painted areas.
- C. Priming: Immediately after surface preparation, apply primer according to manufacturer's written instructions and at rate recommended by SSPC to provide a minimum dry film thickness of 1.5 mils. Use priming methods that result in full coverage of joints, corners, edges, and exposed surfaces.
1. Stripe paint corners, crevices, bolts, welds, and sharp edges.
 2. Apply two coats of shop paint to surfaces that are inaccessible after assembly or erection. Change color of second coat to distinguish it from first.

2.9 GALVANIZING

- A. Hot-Dip Galvanized Finish: Clean per requirements provided in specification. Apply zinc coating by the hot-dip process to structural steel according to ASTM A 123/A 123M.
1. Fill vent and drain holes that will be exposed in the finished Work unless they function as weep holes, by plugging with zinc solder and filing off smooth.
 2. Galvanize lintels, lintel assemblies and shelf angles located in exterior walls.

2.10 SPECIAL INSPECTIONS

- A. Special Inspections and tests will be performed by the Owner's Special Inspection Agency.
1. Provide access to places where structural-steel work is being fabricated or produced to perform tests and inspections.
 2. Verify that the fabricator maintains detailed fabrication and quality control procedures that provide a basis for inspection control of the workmanship and that

those procedures are being implemented. This inspection will provide a basis for determination of fabricator's ability to conform to approved drawings, project specifications, and referenced standards.

- a. Exception: Special Inspections will not be required where the work is done on the premises of a qualified fabricator that participates in the AISC Quality Certification Program and is designated an AISC-Certified Plant, Category STD.
3. Approval shall be based upon review of the fabricator's written procedural and quality control manuals and periodic auditing of fabrication practices.
4. At completion of fabrication, the fabricator shall submit a certificate of compliance stating that the work was performed in accordance with the approved construction documents.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verify, with steel Erector present, elevations of concrete- and masonry-bearing surfaces and locations of anchor rods, bearing plates, and other embedments for compliance with requirements.
 1. Prepare a certified survey of bearing surfaces, anchor rods, bearing plates, and other embedments showing dimensions, locations, angles, and elevations.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Provide temporary shores, guys, braces, and other supports during erection to keep structural steel secure, plumb, and in alignment against temporary construction loads and loads equal in intensity to design loads. Remove temporary supports when permanent structural steel, connections, and bracing are in place unless otherwise indicated.
 1. Do not remove temporary shoring supporting composite deck construction until cast-in-place concrete has attained its design compressive strength.

3.3 ERECTION

- A. Set structural steel accurately in locations and to elevations indicated and according to AISC 303 and AISC 360.

- B. Baseplates: Clean concrete- and masonry-bearing surfaces of bond-reducing materials, and roughen surfaces prior to setting plates. Clean bottom surface of plates.
 - 1. Set plates for structural members on wedges, shims, or setting nuts as required.
 - 2. Weld plate washers to top of baseplate.
 - 3. Snug-tighten anchor rods after supported members have been positioned and plumbed. Do not remove wedges or shims but, if protruding, cut off flush with edge of plate before packing with grout.
 - 4. Promptly pack grout solidly between bearing surfaces and plates so no voids remain. Neatly finish exposed surfaces; protect grout and allow to cure. Comply with manufacturer's written installation instructions for shrinkage-resistant grouts.
- C. Apply two heavy coats of black asphaltum paint to all steel below grade.
- D. Maintain erection tolerances of structural steel within AISC 303 "Code of Standard Practice for Steel Buildings and Bridges."
- E. Align and adjust various members that form part of complete frame or structure before permanently fastening. Before assembly, clean bearing surfaces and other surfaces that will be in permanent contact with members. Perform necessary adjustments to compensate for discrepancies in elevations and alignment.
 - 1. Level and plumb individual members of structure.
 - 2. Make allowances for difference between temperature at time of erection and mean temperature when structure is completed and in service.
- F. Splice members only where indicated.
- G. Do not use thermal cutting during erection unless approved by Architect. Finish thermally cut sections within smoothness limits in AWS D1.1/D1.1M.
- H. Do not enlarge unfair holes in members by burning or using drift pins. Ream holes that must be enlarged to admit bolts.
- I. Shear Connectors: Prepare steel surfaces as recommended by manufacturer of shear connectors. Use automatic end welding of headed-stud shear connectors according to AWS D1.1/D1.1M and manufacturer's written instructions.
- J. Deformed Bar Anchors: Prepare steel surfaces as recommended by manufacturer of Deformed Bar Anchors. Use automatic end welding of Deformed Bar Anchors according to AWS D1.1 and manufacturer's written instructions.

3.4 FIELD CONNECTIONS

- A. High-Strength Bolts: Install high-strength bolts according to RCSC's "Specification for Structural Joints Using ASTM A 325 or A 490 Bolts" for type of bolt and type of joint specified.
 - 1. Joint Type: Snug tightened or fully pretensioned, as indicated.

- B. Weld Connections: Comply with AWS D1.1/D1.1M for tolerances, appearances, welding procedure specifications, weld quality, and methods used in correcting welding work.
 - 1. Comply with AISC 303 and AISC 360 for bearing, alignment, adequacy of temporary connections, and removal of paint on surfaces adjacent to field welds.
 - 2. Remove backing bars or runoff tabs where exposed to view in the final condition, back gouge, and grind steel smooth.
 - 3. Assemble and weld built-up sections by methods that will maintain true alignment of axes without exceeding tolerances in AISC 303 "Code of Standard Practice for Steel Buildings and Bridges" for mill material.

3.5 SPECIAL INSPECTIONS

- A. Special Inspections and tests shall be performed by the Special Inspector or Special Inspection Agency.
- B. Where fabrication of structural load-bearing members and assemblies is being performed on the premises of the fabricators shop, special inspection of the fabricated item shall be performed.
 - 1. Verify that the fabricator maintains detailed fabrication and quality control procedures that provide a basis for inspection control of the workmanship and that those procedures are being implemented. This inspection will provide a basis for determination of the fabricator's ability to conform to approved drawings, project specifications, and referenced standards.
 - 2. Exception: Special Inspections will not be required where the work is done on the premises of a fabricator registered and approved to perform such work without special inspection. Approval shall be based upon review of the fabricator's written procedural and quality control manuals and periodic auditing of fabrication practices. At completion of fabrication, the fabricator shall submit a certificate of compliance stating that the work was performed in accordance with the approved construction documents.
- C. Verification and inspection of steel construction shall be in accordance with the requirements of the Statement of Special Inspections, Section 1705.2 of the 2018 North Carolina State Building Code, and as follows:
 - 1. Welding: Welding inspection shall be in compliance with AWS D1.1. In addition to visual inspection, welds may be tested and inspected according to AWS D1.1 and the following inspection procedures, at Special Inspector's option:
 - a. Liquid Penetrant Inspection: ASTM E 165.
 - b. Magnetic Particle Inspection: ASTM E 709; performed on root pass and on finished weld. Cracks or zones of incomplete fusion or penetration will not be accepted.
 - c. Ultrasonic Inspection: ASTM E 164.
 - d. Radiographic Inspection: ASTM E 94.

2. Details: Perform periodic inspections of the erected structural steel framing to verify compliance with the details shown on the construction documents and approved shop drawings such as member locations, size and spacing, connection details, bracing and bolted and welded connections.
3. High Strength Bolts: Bolted connections will be tested and inspected according to RCSC's "Specification for Structural Joints Using ASTM A 325 or A 490 Bolts."
 - a. General: While work is in progress, determine that the requirements for installation of bolts, nuts, washers and bolted parts are met. For bolts requiring pretensioning, observe the preinstallation testing and calibration procedures when such procedures are required by the installation method or by project plans or specifications; determine that all plies of connected materials have been drawn together and properly snugged and monitor the installation of bolts to verify that the selected procedure for installation is properly used to tighten bolts. For joints required to be tightened only to snug-tight condition, verify that the connected materials have been drawn together and properly snugged.
 - b. Periodic monitoring: Monitoring of bolt installation for pretensioning is permitted to be performed on a periodic basis when using the turn-of-nut method with matchmarking techniques, the direct tension indicator method or the alternate design fastener (twist-off bolt) method. Joints designated as snug tight shall be inspected on a periodic basis.
 - c. Continuous monitoring: Monitoring of bolt installation for pretensioning using the calibrated wrench method or the turn-of-nut method without matchmarking shall be performed on a continuous basis.
4. Shear Studs and Deformed Bar Anchors: Test and inspect welded shear connectors and Deformed Bar Anchors according to requirements in AWS D1.1/D1.1M, Type B and C, respectively, for stud welding and as follows:
 - a. Perform bend tests if visual inspections reveal either a less-than-continuous 360-degree flash or welding repairs to any shear connector.
 - b. Conduct tests on additional shear connectors if weld fracture occurs on shear connectors already tested, according to requirements in AWS D1.1/D1.1M.

D. Correct deficiencies in Work that test reports and inspections indicate does not comply with the Contract Documents.

E. Additional testing performed to determine compliance of corrected work with specified requirements shall be at Contractor's expense.

3.6 REPAIRS AND PROTECTION

A. Galvanized Surfaces: Clean areas where galvanizing is damaged or missing and repair galvanizing to comply with ASTM A 780.

- B. Touchup Painting: Immediately after erection, clean exposed areas where primer is damaged or missing and paint with the same material as used for shop priming to comply with SSPC-PA 1 for touching up shop-painted surfaces.
 - 1. Clean and prepare surfaces by SSPC-SP 2 hand-tool cleaning or SSPC-SP 3 power-tool cleaning.

END OF SECTION 05 12 00

SECTION 05 31 00 – STEEL DECKING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section includes the following:

- 1. Composite floor deck.
- 2. Shear studs welded through composite floor deck.

- B. Related Requirements:

- 1. Section "Special Inspection Services" for administrative and procedural requirements for special inspection services.
- 2. Section 033000 "Cast-in-Place Concrete" for normal weight structural concrete fill over steel deck.
- 3. Section 051200 "Structural Steel Framing" for shop- and field-weld shear connectors.
- 4. Section 099123 "Interior Painting" for repair painting of primed deck and finish painting of deck.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of deck, accessory, and product indicated.

- B. Shop Drawings:

- 1. Include layout and types of deck panels, anchorage details, reinforcing channels, pans, cut deck openings, special jointing, accessories, and attachments to other construction.

1.4 INFORMATIONAL SUBMITTALS

- A. Welding certificates.

- B. Product Certificates: For each type of steel deck.

1.5 QUALITY ASSURANCE

- A. Welding Qualifications: Qualify procedures and personnel according to AWS D1.3, "Structural Welding Code - Sheet Steel."
- B. AISI Specifications: Comply with calculated structural characteristics of steel deck in accordance with AISI S100.
- C. FM Global Listing: Provide steel roof deck evaluated by FM Global and listed in its "Approval Guide, Building Materials" for Class 1 fire rating and Class 1-90 windstorm ratings.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Protect steel deck from corrosion, deformation, and other damage during delivery, storage, and handling.
- B. Store products in accordance with SDI MOC3. Stack steel deck on platforms or pallets and slope to provide drainage. Protect with a waterproof covering and ventilate to avoid condensation.
 - 1. Protect and ventilate acoustical cellular roof deck with factory-installed insulation to maintain insulation free of moisture.

1.7 PERFORMANCE REQUIREMENTS

- A. AISI Specifications: Comply with calculated structural characteristics of steel deck according to AISI's "North American Specification for the Design of Cold-Formed Steel Structural Members."
- B. Composite steel deck shall be capable of resisting the following loads:
 - 1. Unshored construction clear span: 9'-1" minimum, with 3-span condition, wet weight of concrete, and 20 PSF construction live load.
 - 2. Superimposed live load: 140 PSF, minimum with 4,000 PSI normal weight concrete fill, and a 10'-0" clear span.
- C. Fire-Resistance Ratings: Comply with ASTM E 119; testing by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.
 - 1. Indicate design designations from UL's "Fire Resistance Directory" or from the listings of another qualified testing agency.

PART 2 - PRODUCTS

2.1 TYPE VLI COMPOSITE FLOOR DECK

- A. Composite Floor Deck: Fabricate panels, without top-flange stiffening grooves, to comply with "SDI Specifications and Commentary for Steel Roof Deck," in SDI Publication No. 31, and with the following:
1. Galvanized Steel Sheet: ASTM A 653/A 653M, Structural Steel (SS), Grade 50, G60 zinc coating.
 2. Deck Profile: Type VLI
 3. Profile Depth: 2 inches.
 4. Design Uncoated-Steel Thickness: As indicated on Drawings.
 5. Span Condition: Triple span or more.
 6. Side Laps: Overlapped.

2.2 ACCESSORIES

- A. General: Provide manufacturer's standard accessory materials for deck that comply with requirements indicated.
- B. Mechanical Fasteners: Corrosion-resistant, low-velocity, power-actuated or pneumatically driven carbon-steel fasteners; or self-drilling, self-threading screws.
- C. Side-Lap Fasteners: Corrosion-resistant, hexagonal washer head; self-drilling, carbon-steel screws, No. 10 minimum diameter.
- D. Miscellaneous Sheet Metal Deck Accessories: Steel sheet, minimum yield strength of 33,000 psi, not less than 0.0359-inch design uncoated thickness, of same material and finish as deck; of profile indicated or required for application.
- E. Pour Stops and Girder Fillers: Steel sheet, minimum yield strength of 33,000 psi, of same material and finish as deck, and of thickness and profile indicated.
- F. Column Closures, End Closures, Z-Closures, and Cover Plates: Steel sheet, of same material, finish, and thickness as deck, unless otherwise indicated.
- G. Flat Sump Plate: Single-piece steel sheet, 0.0747 inch thick, of same material and finish as deck. For drains, cut holes in the field.
- H. Galvanizing Repair Paint: ASTM A 780.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine supporting frame and field conditions for compliance with requirements for installation tolerances and other conditions affecting performance.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION, GENERAL

- A. Install deck panels and accessories according to applicable specifications and commentary in SDI Publication No. 31, manufacturer's written instructions, and requirements in this Section.
- B. Install temporary shoring before placing deck panels, if required to meet deflection limitations.
- C. Locate deck bundles to prevent overloading of supporting members.
- D. Place deck panels on supporting frame and adjust to final position with ends accurately aligned and bearing on supporting frame before being permanently fastened. Do not stretch or contract side-lap interlocks.
- E. Align cellular deck panels over full length of cell runs and align cells at ends of abutting panels.
- F. Place deck panels flat and square and fasten to supporting frame without warp or deflection.
- G. Cut and neatly fit deck panels and accessories around openings and other work projecting through or adjacent to deck.
- H. Provide additional reinforcement and closure pieces at openings as required for strength, continuity of deck, and support of other work.
- I. Comply with AWS requirements and procedures for manual shielded metal arc welding, appearance and quality of welds, and methods used for correcting welding work.
- J. Shear Stud Connectors: Prepare steel surfaces as recommended by manufacturer of shear connectors. Weld using end welding of headed-stud shear connectors in accordance with AWS D1.1 and manufacturer's written instructions.

3.3 FLOOR-DECK INSTALLATION

- A. Fasten floor-deck panels to steel supporting members by arc spot (puddle) welds of the surface diameter indicated and as follows:
 - 1. Weld Diameter: 5/8 inch, nominal.

2. Weld Spacing: Space and locate welds as indicated on Drawings.
- B. Side-Lap and Perimeter Edge Fastening: Fasten side laps and perimeter edges of panels between supports, at intervals indicated, and as follows:
 1. Mechanically fasten side laps with self-drilling, No. 10 diameter or larger, carbon-steel screws.
 2. Spacing: Equally spaced, as indicated on Drawings.
- C. End Bearing: Install deck ends over supporting frame with a minimum end bearing of 1-1/2 inches, with end joints as follows:
 1. End Joints: Butted.
- D. Pour Stops and Girder Fillers: Weld steel sheet pour stops and girder fillers to supporting structure according to SDI recommendations, unless otherwise indicated.
- E. Floor-Deck Closures: Weld steel sheet column closures, cell closures, and Z-closures to deck, according to SDI recommendations, to provide tight-fitting closures at open ends of ribs and sides of deck.

3.4 SPECIAL INSPECTIONS

- A. Special Inspections and tests shall be performed by the Special Inspector or Special Inspection Agency.
- B. Verification and inspection of metal deck construction shall be in accordance with the Schedule of Special Inspections, Section 1705.2 of the 2018 North Carolina State Building Code, and as follows:
 1. Welding: Welding inspection shall be in compliance with AWS D1.3.
 2. Details: Perform periodic inspections of the installed steel decking to verify compliance with the details shown on the construction documents and approved shop drawings such as deck layout, gage, bearing, side laps, end laps and quantity and spacing of welds and screws.
- C. Shear Studs: Test and inspect welded shear connectors according to requirements in AWS D1.1/D1.1M for stud welding and as follows:
 1. Visually verify spacing, quantity, diameter, and final installed length of all shear studs. Visually inspect welds to verify continuous 360-degree flash.
 2. Perform bend tests if visual inspections reveal either a less-than-continuous 360-degree flash or welding repairs to any shear connector.
 3. Conduct tests on additional shear connectors if weld fracture occurs on shear connectors already tested, according to requirements in AWS D1.1/D1.1M.
- C. Correct deficiencies in Work that test reports and inspections indicate does not comply with the Contract Documents.
- D. Remove and replace work that does not comply with specified requirements.

- E. Additional inspecting, at Contractor's expense, will be performed to determine compliance of corrected work with specified requirements.

3.5 REPAIRS AND PROTECTION

- A. Galvanizing Repairs: Prepare and repair damaged galvanized coatings on both surfaces of deck with galvanized repair paint according to ASTM A 780 and manufacturer's written instructions.
- B. Provide final protection and maintain conditions to ensure that steel deck is without damage or deterioration at time of Substantial Completion.

END OF SECTION 05 31 00

SECTION 055113 - METAL PAN STAIRS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Preassembled steel stairs with concrete-filled treads.
2. Steel tuberailings and guards attached to metal stairs.
3. Steel tubehandrails attached to walls adjacent to metal stairs.

1.2 COORDINATION

- A. Coordinate selection of shop primers with topcoats to be applied over them. Comply with paint and coating manufacturers' written instructions to ensure that shop primers and topcoats are compatible with one another.
- B. Coordinate installation of anchorages for metal stairs, railings, and guards.
1. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, blocking for attachment of wall-mounted handrails, and items with integral anchors, that are to be embedded in concrete or masonry.
 2. Deliver such items to Project site in time for installation.
- C. Coordinate locations of hanger rods and struts with other work so they do not encroach on required stair width and are within fire-resistance-rated stair enclosure.
- D. Schedule installation of railings and guards so wall attachments are made only to completed walls.
1. Do not support railings and guards temporarily by any means that do not satisfy structural performance requirements.

1.3 ACTION SUBMITTALS

A. Product Data: For metal pan stairs and the following:

1. Prefilled metal-pan-stair treads.
2. Shop primer products.
3. Nonslip-aggregate concrete finish.
4. Handrail wall brackets.
5. Grout.

B. Shop Drawings:

1. Include plans, elevations, sections, details, and attachments to other work.

2. Indicate sizes of metal sections, thickness of metals, profiles, holes, and field joints.
 3. Include plan at each level.
 4. Indicate locations of anchors, weld plates, and blocking for attachment of wall-mounted handrails.
- C. Delegated Design Submittal: For stairs, railings and guards,, including analysis data signed and sealed by the qualified professional engineer responsible for their preparation.

1.4 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For professional engineer's experience with providing delegated design engineering services of the kind indicated, including documentation that engineer is licensed in the State in which Project is located.
- B. Welding certificates.
- C. Paint Compatibility Certificates: From manufacturers of topcoats applied over shop primers, certifying that shop primers are compatible with topcoats.

1.5 QUALITY ASSURANCE

- A. Installer Qualifications: Fabricator of products.
- B. Welding Qualifications: Qualify procedures and personnel according to the following:
1. AWS D1.1/D1.1M, "Structural Welding Code - Steel."
 2. AWS D1.3/D1.3M, "Structural Welding Code - Sheet Steel."

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Store materials to permit easy access for inspection and identification.
1. Keep steel members off ground and spaced by using pallets, dunnage, or other supports and spacers.
 2. Protect steel members and packaged materials from corrosion and deterioration.
 3. Do not store materials on structure in a manner that might cause distortion, damage, or overload to members or supporting structures.
 - a. Repair or replace damaged materials or structures as directed.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Delegated Design: Engage a qualified professional engineer, as defined in Section

014000 "Quality Requirements," to design stairs, railings and guards,, including attachment to building construction.

- B. Structural Performance of Stairs: Metal stairs withstand the effects of gravity loads and the following loads and stresses within limits and under conditions indicated:
1. Uniform Load: **100 lbf/sq. ft.**
 2. Concentrated Load: **300 lbf** applied on an area of **4 sq. in.**
 3. Uniform and concentrated loads need not be assumed to act concurrently.
 4. Stair Framing: Capable of withstanding stresses resulting from railing and guard loads in addition to loads specified above.
 5. Limit deflection of treads, platforms, and framing members to L/360 or **1/4 inch**, whichever is less.
- C. Structural Performance of Railings and Guards: Railings and guards, including attachment to building construction, withstand the effects of gravity loads and the following loads and stresses within limits and under conditions indicated:
1. Handrails and Top Rails of Guards:
 - a. Uniform load of **50 lbf/ft.** applied in any direction.
 - b. Concentrated load of **200 lbf** applied in any direction.
 - c. Uniform and concentrated loads need not be assumed to act concurrently.
 2. Infill of Guards:
 - a. Concentrated load of **50 lbf** applied horizontally on an area of **1 sq. ft.**
 - b. Infill load and other loads need not be assumed to act concurrently.
- D. Seismic Performance of Stairs: Metal stairs withstand the effects of earthquake motions determined according to ASCE/SEI 7.

2.2 METALS

- A. Metal Surfaces: Provide materials with smooth, flat surfaces unless otherwise indicated. For components exposed to view in the completed Work, provide materials without seam marks, roller marks, rolled trade names, or blemishes.
- B. Steel Plates, Shapes, and Bars: ASTM A36/A36M.
- C. Steel Tubing for Railings and Guards: ASTM A500/A500M (cold formed) or ASTM A513/A513M.
- D. Steel Pipe for Railings and Guards: ASTM A53/A53M, Type F or Type S, Grade A, Standard Weight (Schedule 40), unless another grade and weight are required by structural loads.
- E. Uncoated, Cold-Rolled Steel Sheet: ASTM A1008/A1008M, structural steel, **Grade 25**, unless another grade is required by design loads; exposed.

2.3 FASTENERS

- A. General: Provide Type 304 stainless steel fasteners for exterior use and zinc-plated fasteners with coating complying with ASTM B633 or ASTM F1941/F1941M, Class Fe/Zn 5 where built into exterior walls.
 - 1. Select fasteners for type, grade, and class required.
- B. Fasteners for Anchoring Railings and Guards to Other Construction: Select fasteners of type, grade, and class required to produce connections suitable for anchoring railings and guards to other types of construction indicated and capable of withstanding design loads.
- C. Bolts and Nuts: Regular hexagon-head bolts, ASTM A307, Grade A; with hex nuts, **ASTM A563**; and, where indicated, flat washers.
- D. Anchor Bolts: ASTM F1554, Grade 36, of dimensions indicated; with nuts, **ASTM A563**; and, where indicated, flat washers.
 - 1. Provide mechanically deposited or hot-dip, zinc-coated anchor bolts for stairs indicated to be shop primed with zinc-rich primer.
- E. Post-Installed Anchors: Torque-controlled expansion anchors capable of sustaining, without failure, a load equal to six times the load imposed when installed in unit masonry and four times the load imposed when installed in concrete, as determined by testing according to ASTM E488/E488M, conducted by a qualified independent testing agency.
 - 1. Material for Interior Locations: Carbon-steel components zinc plated to comply with ASTM B633 or ASTM F1941/F1941M, Class Fe/Zn 5, unless otherwise indicated.

2.4 MISCELLANEOUS MATERIALS

- A. Welding Electrodes: Comply with AWS requirements.
- B. Shop Primers: Provide primers that comply with Section 099113 "Exterior Painting" and Section 099123 "Interior Painting."
- C. Universal Shop Primer: Fast-curing, lead- and chromate-free, universal modified-alkyd primer complying with MPI#79 and compatible with topcoat.
 - 1. Use primer containing pigments that make it easily distinguishable from zinc-rich primer.
- D. Zinc-Rich Primer: Comply with SSPC-Paint 20, Type II, Level 2, and compatible with topcoat.
- E. Bituminous Paint: Cold-applied asphalt emulsion complying with ASTM D1187/D1187M.

- F. Nonmetallic, Shrinkage-Resistant Grout: ASTM C1107/C1107M, factory-packaged, nonmetallic aggregate grout; recommended by manufacturer for interior use; noncorrosive and nonstaining; mixed with water to consistency suitable for application and a 30-minute working time.
- G. Prefilled Concrete Treads:
 - 1. Concrete Materials and Properties: Comply with requirements in Section 033000 "Cast-in-Place Concrete" for normal-weight, air-entrained, ready-mix concrete with minimum 28-day compressive strength of **3000 psi** and maximum aggregate size of **1/2 inch** unless otherwise indicated.
 - 2. Nonslip-Aggregate Concrete Finish: Factory-packaged abrasive aggregate made from fused, aluminum-oxide grits or crushed emery; rustproof and nonglazing; unaffected by freezing, moisture, or cleaning materials.
 - 3. Plain Steel Welded-Wire Reinforcement: ASTM A1064/A10645M, steel, **6 by 6 inches**, W1.4 by W1.4, unless otherwise indicated on Drawings.
 - 4. Reinforcement Supports: Bolsters, chairs, spacers, and other devices for spacing, supporting, and fastening welded-wire reinforcement in place.
 - a. Manufacture bar supports from steel wire, plastic, or precast concrete according to CRSI's "Manual of Standard Practice," of greater compressive strength than concrete.

2.5 PRECAST CONCRETE TREADS

- A. Concrete Materials and Properties: Comply with requirements in Section 033000 "Cast-in-Place Concrete" for normal-weight, ready-mixed concrete with a minimum 28-day compressive strength of **5000 psi** and a total air content of not less than 4 percent or more than 6 percent.
- B. Reinforcement: Galvanized, welded-wire reinforcement, **2 by 2 inches** by **0.062-inch**-diameter steel wire; comply with ASTM A1064/A1064M, except for minimum wire size.

2.6 FABRICATION, GENERAL

- A. Provide complete stair assemblies, including metal framing, hangers, struts, railings and guards, clips, brackets, bearing plates, and other components necessary to support and anchor stairs and platforms on supporting structure.
 - 1. Join components by welding unless otherwise indicated.
 - 2. Use connections that maintain structural value of joined pieces.
- B. Assemble stairs, railings, and guards in shop to greatest extent possible.
 - 1. Disassemble units only as necessary for shipping and handling limitations.
 - 2. Clearly mark units for reassembly and coordinated installation.
- C. Cut, drill, and punch metals cleanly and accurately.
 - 1. Remove burrs and ease edges to a radius of approximately **1/32 inch** unless

- 2. otherwise indicated.
- 2. Remove sharp or rough areas on exposed surfaces.
- D. Form bent-metal corners to smallest radius possible without causing grain separation or otherwise impairing work.
- E. Form exposed work with accurate angles and surfaces and straight edges.
- F. Weld connections to comply with the following:
 - 1. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.
 - 2. Obtain fusion without undercut or overlap.
 - 3. Remove welding flux immediately.
 - 4. Weld exposed corners and seams continuously unless otherwise indicated.
 - 5. At exposed connections, finish exposed welds to comply with NOMMA's "Voluntary Joint Finish Standards" for Finish #1 - No evidence of welded joint.
- G. Form exposed connections with hairline joints, flush and smooth, using concealed fasteners where possible.
 - 1. Where exposed fasteners are required, use Phillips flat-head (countersunk) screws or bolts unless otherwise indicated.
 - 2. Locate joints where least conspicuous.
 - 3. Fabricate joints that will be exposed to weather in a manner to exclude water.
 - 4. Provide weep holes where water may accumulate internally.

2.7 FABRICATION OF STEEL-FRAMED STAIRS

- A. NAAMM Stair Standard: Comply with NAAMM AMP 510, "Metal Stairs Manual," for Commercial Class, unless more stringent requirements are indicated.
- B. Stair Framing:
 - 1. Stringers: Fabricate of steel channels or steel rectangular tubes.
 - a. Stringer Size: As required to comply with "Performance Requirements" Article.
 - b. Provide closures for exposed ends of channel and rectangular tube stringers.
 - c. Finish: Painted.
 - 2. Platforms: Construct of steel channel or steel rectangular tube headers and miscellaneous framing members as required to comply with "Performance Requirements" Article.
 - a. Provide closures for exposed ends of channel and rectangular tube framing.
 - b. Finish: Painted.

3. Weld stringers to headers; weld framing members to stringers and headers.
- C. Metal Pan Stairs: Form risers, subtread pans, and subplatforms to configurations shown from steel sheet of thickness needed to comply with performance requirements, but not less than **0.067 inch**.
1. Steel Sheet, Uncoated: Cold-rolled steel sheet.
 2. Directly weld metal pans to stringers; locate welds on top of subtreads where they will be concealed by concrete fill. Do not weld risers to stringers.
 3. Shape metal pans to include nosing integral with riser.
 4. At Contractor's option, provide stair assemblies with metal pan subtreads filled with reinforced concrete during fabrication.
 5. Provide subplatforms of configuration indicated or, if not indicated, the same as subtreads. Weld subplatforms to platform framing.
 - a. Smooth Soffit Construction: Construct subplatforms with flat metal under surfaces to produce smooth soffits.

2.8 FABRICATION OF STAIR RAILINGS AND GUARDS

- A. Comply with applicable requirements in Section 055213 "Pipe and Tube Railings."
- B. Fabricate railings and guards to comply with requirements indicated for design, dimensions, details, finish, and member sizes, including wall thickness of member, post spacings, wall bracket spacing, and anchorage, but not less than that needed to withstand indicated loads.
1. Rails and Posts: **1-5/8-inch-** diameter top and bottom rails and **1-1/2-inch-** square posts.
 2. Picket Infill: [**1/2-inch-**][**3/4-inch-**]round pickets spaced to prohibit the passage of a **4-inch** diameter sphere.
- C. Welded Connections: Fabricate railings and guards with welded connections.
1. Cope components at connections to provide close fit, or use fittings designed for this purpose.
 2. Weld all around at connections, including at fittings.
 3. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.
 4. Obtain fusion without undercut or overlap.
 5. Remove flux immediately.
 6. Finish welds to comply with NOMMA's "Voluntary Joint Finish Standards" for Finish #1 - No evidence of a welded joint as shown in NAAMM AMP 521.
- D. Form changes in direction of railings and guards as follows:
1. As detailed.
 2. By bending.
 3. By flush bends.
 4. By radius bends of radius indicated.
- E. For changes in direction made by bending, use jigs to produce uniform curvature for

each repetitive configuration required. Maintain cross section of member throughout entire bend without buckling, twisting, cracking, or otherwise deforming exposed surfaces of components.

- F. Close exposed ends of railing and guard members with prefabricated end fittings.
- G. Provide wall returns at ends of wall-mounted handrails unless otherwise indicated.
 - 1. Close ends of returns unless clearance between end of rail and wall is **1/4 inch** or less.
- H. Connect posts to stair framing by direct welding unless otherwise indicated.
- I. Brackets, Flanges, Fittings, and Anchors: Provide wall brackets, end closures, flanges, miscellaneous fittings, and anchors for interconnecting components and for attaching to other work.
 - 1. Furnish inserts and other anchorage devices for connecting to concrete or masonry work.
 - 2. For nongalvanized railings and guards, provide nongalvanized ferrous-metal fittings, brackets, fasteners, and sleeves, except galvanize anchors embedded in exterior masonry and concrete construction.
 - 3. Provide type of bracket with flange tapped for concealed anchorage to threaded hanger bolt and that provides **1-1/2-inch** clearance from inside face of handrail to finished wall surface.
- J. Fillers: Provide fillers made from steel plate, or other suitably crush-resistant material, where needed to transfer wall bracket loads through wall finishes to structural supports.
 - 1. Size fillers to suit wall finish thicknesses and to produce adequate bearing area to prevent bracket rotation and overstressing of substrate.

2.9 FINISHES

- A. Finish metal stairs after assembly.
- B. Preparation for Shop Priming: Prepare uncoated, ferrous-metal surfaces to comply with SSPC-SP 3, "Power Tool Cleaning."
- C. Apply shop primer to uncoated surfaces of metal stair components, except those with galvanized finishes and those to be embedded in concrete or masonry unless otherwise indicated. Comply with SSPC-PA 1, "Paint Application Specification No. 1: Shop, Field, and Maintenance Painting of Steel," for shop painting.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verify elevations of floors, bearing surfaces and locations of bearing plates, and other

embedments for compliance with requirements.

1. For wall-mounted railings, verify locations of concealed reinforcement within gypsum board and plaster assemblies.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION OF METAL PAN STAIRS

- A. Fastening to In-Place Construction: Provide anchorage devices and fasteners where necessary for securing metal stairs to in-place construction.
1. Include threaded fasteners for concrete and masonry inserts, through-bolts, lag bolts, and other connectors.
- B. Cutting, Fitting, and Placement: Perform cutting, drilling, and fitting required for installing metal stairs. Set units accurately in location, alignment, and elevation, measured from established lines and levels and free of rack.
- C. Install metal stairs by welding stair framing to steel structure or to weld plates cast into concrete unless otherwise indicated.
1. Grouted Baseplates: Clean concrete- and masonry-bearing surfaces of bond-reducing materials, and roughen surfaces prior to setting plates.
 - a. Clean bottom surface of plates.
 - b. Set plates for structural members on wedges, shims, or setting nuts.
 - c. Tighten anchor bolts after supported members have been positioned and plumbed.
 - d. Do not remove wedges or shims but, if protruding, cut off flush with edge of plate before packing with grout.
 - e. Promptly pack grout solidly between bearing surfaces and plates so no voids remain.
 - 1) Neatly finish exposed surfaces; protect grout and allow to cure.
 - 2) Comply with manufacturer's written installation instructions for shrinkage-resistant grouts.
- D. Provide temporary bracing or anchors in formwork for items that are to be built into concrete, masonry, or similar construction.
- E. Fit exposed connections accurately together to form hairline joints.
1. Weld connections that are not to be left as exposed joints but cannot be shop welded because of shipping size limitations.
 2. Do not weld, cut, or abrade surfaces of exterior units that have been hot-dip galvanized after fabrication and are for bolted or screwed field connections.
 3. Comply with requirements for welding in "Fabrication, General" Article.
- F. Place and finish concrete fill for treads and platforms to comply with Section 033000

"Cast-in-Place Concrete."

1. Install abrasive nosings with anchors fully embedded in concrete.
2. Center nosings on tread width.

G. Install precast concrete treads with adhesive supplied by manufacturer.

3.3 INSTALLATION OF RAILINGS AND GUARDS

A. Adjust railing and guard systems before anchoring to ensure matching alignment at abutting joints with tight, hairline joints.

1. Space posts at spacing indicated or, if not indicated, as required by design loads.
2. Plumb posts in each direction, within a tolerance of **1/16 inch in 3 feet**.
3. Align rails and guards so variations from level for horizontal members and variations from parallel with rake of stairs for sloping members do not exceed **1/4 inch in 12 feet**.
4. Secure posts, rail ends, and guard ends to building construction as follows:
 - a. Anchor posts to steel by welding to steel supporting members.
 - b. Anchor handrail and guard ends to concrete and masonry with steel round flanges welded to rail and guard ends and anchored with post-installed anchors and bolts.

B. Install railing gates level, plumb, and secure for full opening without interference.

1. Attach hardware using tamper-resistant or concealed means.
2. Adjust hardware for smooth operation.

C. Attach handrails to wall with wall brackets.

1. Locate brackets as indicated or, if not indicated, at spacing required to support structural loads.
2. Secure wall brackets to building construction as required to comply with performance requirements.

3.4 REPAIR

A. Touchup Painting:

1. Immediately after erection, clean field welds, bolted connections, and abraded areas of shop paint, and paint exposed areas with same material as used for shop painting to comply with SSPC-PA 1 for touching up shop-painted surfaces.
 - a. Apply by brush or spray to provide a minimum **2.0-mil** dry film thickness.
2. Cleaning and touchup painting of field welds, bolted connections, and abraded areas of shop paint are specified in Section 099113 "Exterior Painting" and Section 099123 "Interior Painting."

END OF SECTION 055113

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SECTION 055213 - PIPE AND TUBE RAILINGS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Steel railings.

B. Related Requirements:

1. Section 055113 "Metal Pan Stairs" for steel tube railings associated with metal pan stairs.

1.2 COORDINATION

- A. Coordinate selection of shop primers with topcoats to be applied over them. Comply with paint and coating manufacturers' written recommendations to ensure that shop primers and topcoats are compatible with one another.

- B. Coordinate installation of anchorages for railings. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors, that are to be embedded in concrete or masonry. Deliver such items to Project site in time for installation.

1.3 ACTION SUBMITTALS

A. Product Data:

1. Manufacturer's product lines of mechanically connected railings.
2. Fasteners.
3. Post-installed anchors.
4. Handrail brackets.
5. Shop primer.
6. Intermediate coats and topcoats.
7. Bituminous paint.
8. Nonshrink, nonmetallic grout.
9. Anchoring cement.
10. Metal finishes.
11. Paint products.

- B. Shop Drawings: Include plans, elevations, sections, details, and attachments to other work.

- C. Samples for Initial Selection: For products involving selection of color, texture, or design.

- D. Samples for Verification: For each type of exposed finish required.
 - 1. Sections of each distinctly different linear railing member, including handrails, top rails, posts, and balusters, including finish.
 - 2. Fittings and brackets.
 - 3. Assembled Sample of railing system, made from full-size components, including top rail, post, handrail, and infill. Sample need not be full height.
 - a. Show method of connecting and finishing members at intersections.
- E. Delegated Design Submittal: For railings, including analysis data signed and sealed by the qualified professional engineer responsible for their preparation.

1.4 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For delegated design professional engineer.
- B. Welding certificates.
- C. Mill Certificates: Signed by manufacturers of stainless steel products, certifying that products furnished comply with requirements.
- D. Paint Compatibility Certificates: From manufacturers of topcoats applied over shop primers, certifying that shop primers are compatible with topcoats.
- E. Product Test Reports: For tests on railings performed by a qualified testing agency, in accordance with ASTM E894 and ASTM E935.
- F. Research Reports: For post-installed anchors, from ICC-ES or other qualified testing agency acceptable to authorities having jurisdiction.

1.5 QUALITY ASSURANCE

- A. Welding Qualifications: Qualify procedures and personnel in accordance with the following:
 - 1. AWS D1.1/D1.1M, "Structural Welding Code - Steel."
 - 2. AWS D1.2/D1.2M, "Structural Welding Code - Aluminum."
 - 3. AWS D1.6/D1.6M, "Structural Welding Code - Stainless Steel."

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Protect mechanical finishes on exposed surfaces of railings from damage by applying a strippable, temporary protective covering before shipping.

1.7 FIELD CONDITIONS

- A. Field Measurements: Verify actual locations of walls and other construction contiguous

with railings by field measurements before fabrication.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Delegated Design: Engage a qualified professional engineer, as defined in Section 014000 "Quality Requirements," to design railings, including attachment to building construction.
- B. Structural Performance: Railings, including attachment to building construction, withstand the effects of gravity loads and the following loads and stresses within limits and under conditions indicated:
 - 1. Handrails and Top Rails of Guards:
 - a. Uniform load of **50 lbf/ ft.** applied in any direction.
 - b. Concentrated load of **200 lbf** applied in any direction.
 - c. Uniform and concentrated loads need not be assumed to act concurrently.
 - 2. Infill of Guards:
 - a. Concentrated load of **50 lbf** applied horizontally on an area of **1 sq. ft.**
 - b. Infill load and other loads need not be assumed to act concurrently.

2.2 METALS, GENERAL

- A. Metal Surfaces, General: Provide materials with smooth surfaces, without seam marks, roller marks, rolled trade names, stains, discolorations, or blemishes.
- B. Brackets, Flanges, and Anchors: Cast or formed metal of same type of material and finish as supported rails unless otherwise indicated.
 - 1. Provide type of bracket with flange tapped for concealed anchorage to threaded hanger bolt and that provides **1-1/2-inch** clearance from inside face of handrail to finished wall surface.

2.3 FASTENERS

- A. Fastener Materials:
 - 1. Ungalvanized-Steel Railing Components: Plated steel fasteners complying with ASTM F1941/F1941M, Class Fe/Zn 5 for zinc coating.
 - 2. Finish exposed fasteners to match appearance, including color and texture, of railings.
- B. Fasteners for Anchoring Railings to Other Construction: Select fasteners of type, grade, and class required to produce connections suitable for anchoring railings to

other types of construction and capable of withstanding design loads.

- C. Post-Installed Anchors: Fastener systems with working capacity greater than or equal to the design load, according to an evaluation report acceptable to authorities having jurisdiction, based on ICC-ES AC193 or ICC-ES AC308.
 - 1. Material for Interior Locations: Carbon-steel components zinc-plated to comply with ASTM B633 or ASTM F1941/F1941M, Class Fe/Zn 5, unless otherwise indicated.

2.4 MISCELLANEOUS MATERIALS

- A. Handrail Brackets: Cast stainless steel, center of handrail ~~[2-1/2 inches]~~[3-1/8 inches] from face of railing.
- B. Welding Rods and Bare Electrodes: Select in accordance with AWS specifications for metal alloy welded.
 - 1. For stainless steel railings, provide type and alloy as recommended by producer of metal to be welded and as required for color match, strength, and compatibility in fabricated items.
- C. Shop Primers: Provide primers that comply with Section 099123 "Interior Painting."
- D. Universal Shop Primer: Fast-curing, lead- and chromate-free, universal modified-alkyd primer complying with MPI#79 and compatible with topcoat.
 - 1. Use primer containing pigments that make it easily distinguishable from zinc-rich primer.
- E. Epoxy Zinc-Rich Primer: Complying with MPI#20 and compatible with topcoat.
- F. Intermediate Coats and Topcoats: Provide products that comply with Section 099123 "Interior Painting."
- G. Bituminous Paint: Cold-applied asphalt emulsion, complying with ASTM D1187/D1187M.
- H. Nonshrink, Nonmetallic Grout: Factory-packaged, nonstaining, noncorrosive, nongaseous grout, complying with ASTM C1107/C1107M. Provide grout specifically recommended by manufacturer for interior and exterior applications.
- I. Anchoring Cement: Factory-packaged, nonshrink, nonstaining, hydraulic-controlled expansion cement formulation for mixing with water at Project site to create pourable anchoring, patching, and grouting compound.

2.5 FABRICATION

- A. General: Fabricate railings to comply with requirements indicated for design, dimensions, member sizes and spacing, details, finish, and anchorage, but not less than that required to support structural loads.

- B. Shop assemble railings to greatest extent possible to minimize field splicing and assembly. Disassemble units only as necessary for shipping and handling limitations.
 - 1. Clearly mark units for reassembly and coordinated installation.
 - 2. Use connections that maintain structural value of joined pieces.
- C. Cut, drill, and punch metals cleanly and accurately.
 - 1. Remove burrs and ease edges to a radius of approximately **1/32 inch** unless otherwise indicated.
 - 2. Remove sharp or rough areas on exposed surfaces.
- D. Form work true to line and level with accurate angles and surfaces.
- E. Cut, reinforce, drill, and tap as indicated to receive finish hardware, screws, and similar items.
- F. Connections: Fabricate railings with welded connections unless otherwise indicated.
- G. Welded Connections: Cope components at connections to provide close fit, or use fittings designed for this purpose. Weld all around at connections, including at fittings.
 - 1. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.
 - 2. Obtain fusion without undercut or overlap.
 - 3. Remove flux immediately.
 - 4. At exposed connections, finish exposed welds to comply with NOMMA's "Voluntary Joint Finish Standards" for Finish #1 welds; ornamental quality with no evidence of a welded joint.
- H. Form changes in direction as follows:
 - 1. As detailed.
 - 2. By bending.
 - 3. By flush bends.
 - 4. By radius bends of radius indicated.
 - 5. By bending to smallest radius that will not result in distortion of railing member.
- I. Bend members in jigs to produce uniform curvature for each configuration required. Maintain cross section of member throughout entire bend without buckling, twisting, cracking, or otherwise deforming exposed surfaces of components.
- J. Close exposed ends of hollow railing members with prefabricated cap and end fittings of same metal and finish as railings.
- K. Provide wall returns at ends of wall-mounted handrails unless otherwise indicated. Close ends of returns unless clearance between end of rail and wall is **1/4 inch** or less.
- L. Brackets, Flanges, Fittings, and Anchors: Provide wall brackets, flanges, miscellaneous fittings, and anchors to interconnect railing members to other work unless otherwise indicated.

- M. Provide inserts and other anchorage devices for connecting railings to concrete or masonry work.
 - 1. Fabricate anchorage devices capable of withstanding loads imposed by railings.
 - 2. Coordinate anchorage devices with supporting structure.
- N. For railing posts set in concrete, provide stainless steel sleeves not less than **6 inches** long with inside dimensions not less than **1/2 inch** greater than outside dimensions of post, with metal plate forming bottom closure.
- O. Toe Boards: Where indicated, provide toe boards at railings around openings and at edge of open-sided floors and platforms. Fabricate to dimensions and details indicated.

2.6 STEEL AND IRON FINISHES

- A. For nongalvanized-steel railings, provide nongalvanized ferrous-metal fittings, brackets, fasteners, and sleeves; however, hot-dip galvanize anchors to be embedded in exterior concrete or masonry.
- B. Preparation for Shop Priming: Prepare uncoated ferrous-metal surfaces to comply with **[SSPC-SP 6/NACE No. 3.]****[SSPC-SP 3.]****[requirements indicated below:]**
 - 1. Railings Indicated To Receive Zinc-Rich Primer: SSPC-SP 6/NACE No. 3.
 - 2. Railings Indicated To Receive Primers Specified in Section 099600 "High-Performance Coatings": SSPC-SP 6/NACE No. 3.
 - 3. Other Railings: SSPC-SP 3.
- C. Primer Application: Apply shop primer to prepared surfaces of railings unless otherwise indicated. Comply with requirements in SSPC-PA 1 for shop painting. Primer need not be applied to surfaces to be embedded in concrete or masonry.
 - 1. Shop prime uncoated railings with primers specified in Section 099123 "Interior Painting".

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

- A. Perform cutting, drilling, and fitting required for installing railings.
 - 1. Fit exposed connections together to form tight, hairline joints.
 - 2. Install railings level, plumb, square, true to line; without distortion, warp, or rack.
 - 3. Set railings accurately in location, alignment, and elevation; measured from established lines and levels.
 - 4. Do not weld, cut, or abrade surfaces of railing components that are coated or finished after fabrication and that are intended for field connection by mechanical or other means without further cutting or fitting.
 - 5. Set posts plumb within a tolerance of **1/16 inch in 3 feet**.
 - 6. Align rails so variations from level for horizontal members and variations from parallel with rake of steps and ramps for sloping members do not exceed **1/4**

inch in 12 feet.

- B. Control of Corrosion: Prevent galvanic action and other forms of corrosion by insulating metals and other materials from direct contact with incompatible materials.
 - 1. Coat concealed surfaces of aluminum that will be in contact with grout, concrete, masonry, wood, or dissimilar metals, with a heavy coat of bituminous paint.
- C. Adjust railings before anchoring to ensure matching alignment at abutting joints.
- D. Fastening to In-Place Construction: Use anchorage devices and fasteners where necessary for securing railings and for properly transferring loads to in-place construction.

3.2 RAILING CONNECTIONS

- A. Welded Connections: Use fully welded joints for permanently connecting railing components. Comply with requirements for welded connections in "Fabrication" Article, whether welding is performed in the shop or in the field.
- B. Expansion Joints: Install expansion joints at locations indicated but not farther apart than required to accommodate thermal movement. Provide slip-joint internal sleeve, extending **2 inches** beyond joint on either side; fasten internal sleeve securely to one side; and locate joint within **6 inches** of post.

3.3 ANCHORING POSTS

- A. Use stainless steel pipe sleeves preset and anchored into concrete for installing posts. After posts are inserted into sleeves, fill annular space between post and sleeve with nonshrink, nonmetallic grout or anchoring cement, mixed and placed to comply with anchoring material manufacturer's written instructions.
- B. Form or core-drill holes not less than **5 inches** deep and **3/4 inch** larger than OD of post for installing posts in concrete. Clean holes of loose material, insert posts, and fill annular space between post and concrete with nonshrink, nonmetallic grout or anchoring cement, mixed and placed to comply with anchoring material manufacturer's written instructions.
- C. Cover anchorage joint with flange of same metal as post, welded to post after placing anchoring material.
- D. Leave anchorage joint exposed with **1/8-inch** buildup, sloped away from post.
- E. Anchor posts to metal surfaces with flanges, angle type, or floor type, as required by conditions, connected to posts and to metal supporting members as follows:
 - 1. For steel railings, weld flanges to post and bolt to metal supporting surfaces.
 - 2. For aluminum railings, attach posts as indicated, using fittings designed and engineered for this purpose.
 - 3. For stainless steel railings, weld flanges to post and bolt to supporting surfaces.

- F. Install removable railing sections, where indicated, in slip-fit stainless steel sockets cast in concrete.

3.4 ATTACHING RAILINGS

- A. Attach handrails to walls with wall brackets, except where end flanges are used. Provide brackets with **1-1/2-inch** clearance from inside face of handrail and finished wall surface.
 - 1. Use type of bracket with flange tapped for concealed anchorage to threaded hanger bolt.
 - 2. Locate brackets as indicated or, if not indicated, at spacing required to support structural loads.

3.5 REPAIR

- A. Touchup Painting:
 - 1. Immediately after erection, clean field welds, bolted connections, and abraded areas of shop paint, and paint exposed areas with the same material used for shop painting to comply with SSPC-PA 1 for touching up shop-painted surfaces.
 - a. Apply by brush or spray to provide a minimum **2.0-mil** dry film thickness.
 - 2. Cleaning and touchup painting of field welds, bolted connections, and abraded areas of shop paint are specified in Section 099123 "Interior Painting."

3.6 CLEANING

- A. Clean stainless steel by washing thoroughly with clean water and soap and rinsing with clean water.

3.7 PROTECTION

- A. Protect finishes of railings from damage during construction period with temporary protective coverings approved by railing manufacturer. Remove protective coverings at time of Substantial Completion.
- B. Restore finishes damaged during installation and construction period, so no evidence remains of correction work. Return items that cannot be refinished in the field to the shop; make required alterations and refinish entire unit, or provide new units.

END OF SECTION 055213

SECTION 099123 - INTERIOR PAINTING

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes: Surface preparation of interior substrates and application of the following:
 - 1. Primers.
 - 2. Water-based finish coatings.
- B. Related Requirements:
 - 1. Section 051200 "Structural Steel Framing" for shop priming structural steel substrates.
 - 2. Section 055113 "Metal Pan Stairs" for shop priming metal pan stairs.
 - 3. Section 055213 "Pipe and Tube Railings" for shop painting pipe and tube railings.

1.2 ACTION SUBMITTALS

- A. Product Data: For each type of product.
 - 1. Include preparation requirements and application instructions.
 - 2. Indicate VOC content.
- B. Samples: For each type of topcoat product.
- C. Samples for Initial Selection: For each type of topcoat product.
- D. Samples for Verification: For each type of paint system and each color and gloss of topcoat. Submit paint manufacturer's standard printed cards for verification Samples.
 - 1. Submit Samples on rigid backing, **8 inches** square.
 - 2. Apply coats on Samples in steps to show each coat required for system.
 - 3. Label each coat of each Sample.
 - 4. Label each Sample for location and application area.
- E. Product List: Cross-reference to paint system and locations of application areas. Use same designations indicated on Drawings and in applicable interior painting schedule articles to cross-reference paint systems specified in this Section. Include color designations.

1.3 MAINTENANCE MATERIAL SUBMITTALS

- A. Furnish extra materials that match paint products applied and that are packaged with

protective covering for storage and identified with labels describing contents.

1. Paint Products: 5 percent, but not less than **1 gal.** of each material and color applied.

1.4 MOCKUPS

- A. Apply mockups of each paint system indicated and each color and finish selected to verify selections made under Sample submittals, to demonstrate aesthetic effects, and to set quality standards for materials and execution.
 1. Architect will select one surface to represent surfaces and conditions for application of each paint system.
 - a. Vertical and Horizontal Surfaces: Provide samples of at least **100 sq. ft.**
 - b. Other Items: Architect will designate items or areas required.
 2. Final approval of color selections will be based on mockups.
 - a. If preliminary color selections are not approved, apply additional mockups of additional colors selected by Architect at no added cost to Owner.
 3. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Owner specifically approves such deviations by Change Order.
 4. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. 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.**
 1. Maintain containers in clean condition, free of foreign materials and residue.
 2. Remove rags and waste from storage areas daily.

1.6 FIELD CONDITIONS

- A. Apply paints only when temperature of surfaces to be painted and ambient air temperatures are between **50 and 95 deg F.**
- B. Do not apply paints when relative humidity exceeds 85 percent; at temperatures of less than **5 deg F** above the dew point; or to damp or wet surfaces.

PART 2 - PRODUCTS

2.1 SOURCE LIMITATIONS

- A. Obtain each paint product from single source from single manufacturer.

2.2 MANUFACTURERS

- A. Basis-of-Design Product: Subject to compliance with requirements, provide Benjamin Moore & Co. ; Interior paint. or a comparable product by one of the following:
 - 1. PPG Paints.
 - 2. Sherwin-Williams Company (The).
- B. Products: Subject to compliance with requirements, provide product listed in the Interior Painting Schedule for the paint category indicated

2.3 INTERIOR PAINTS, GENERAL

- A. Interior Paints: Subject to compliance with requirements, provide one of the products listed in product types below and applicable interior painting schedule articles for the paint category indicated.
- B. Material Compatibility:
 - 1. Materials for use within each paint system must be compatible with one another and substrates indicated, under conditions of service and application as demonstrated by manufacturer based on testing and field experience.
 - 2. For each coat in a paint system, provide products recommended in writing by topcoat manufacturer for use in paint system and on substrate indicated.
 - 3. Flat Paints and Coatings: 50 g/L.
 - 4. Nonflat Paints and Coatings: 50 g/L.
 - 5. Primers, Sealers, and Undercoaters: 100 g/L.
 - 6. Rust-Preventive Coatings: 100 g/L.
 - 7. Zinc-Rich Industrial Maintenance Primers: 100 g/L.
 - 8. Pretreatment Wash Primers: 420 g/L.
 - 9. Floor Coatings: 50 g/L.
 - 10. Shellacs, Clear: 730 g/L.
 - 11. Shellacs, Pigmented: 550 g/L.
 - 12. Low-Emitting Materials: Verify VOC emissions comply with requirements of the California Department of Public Health's "Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers." Verify formaldehyde emissions do not exceed 9 mcg/cu. m or 7 ppb, whichever is less.
 - 13. Verify VOC content does not exceed limits of authorities having jurisdiction and the following:

- a. Flat Coatings: 50 g/L.
 - b. Nonflat Coatings: 100 g/L.
 - c. Nonflat - High-Gloss Coatings: 150 g/L.
 - d. Concrete/Masonry Sealers: 100 g/L.
 - e. Floor Coatings: 100 g/L.
 - f. Industrial Maintenance Coatings: 250 g/L.
 - g. Low-Solids Coatings: 120 g/L.
 - h. Mastic Texture Coatings: 100 g/L.
 - i. Metallic Pigmented Coatings: 500 g/L.
 - j. Pretreatment Wash Primers: 420 g/L.
 - k. Primers, Sealers, and Undercoaters: 100 g/L.
 - l. Reactive Penetrating Sealers: 350 g/L.
 - m. Recycled Coatings: 250 g/L.
 - n. Rust-Preventive Coatings: 250 g/L.
- C. Colors: As selected by Architect from manufacturer's full range.
1. 100 percent of surface area will be painted with deep tones.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates and conditions, with Applicator present, for compliance with requirements for maximum moisture content and other conditions affecting performance of the Work.
- B. Maximum Moisture Content of Substrates: When measured with an electronic moisture meter as follows:
 1. Concrete: 12 percent.
- C. Verify suitability of substrates, including surface conditions and compatibility, with finishes and primers. Proceed with coating application only after unsatisfactory conditions have been corrected.
 1. Application of coating indicates acceptance of surfaces and conditions.

3.2 PREPARATION

- A. Comply with manufacturer's written instructions applicable to substrates and paint systems indicated.
- B. Remove hardware, covers, plates, and similar items already in place that are removable and 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.
 1. After completing painting operations, use workers skilled in the trades involved to

reinstall items that were removed. Remove surface-applied protection if any.

- C. Clean substrates of substances that could impair bond of paints, including dust, dirt, oil, grease, and incompatible paints and encapsulants.
 - 1. Remove incompatible primers and reprime substrate with compatible primers or apply tie coat as required to produce paint systems indicated.
- D. Concrete Substrates: Remove release agents, curing compounds, efflorescence, and chalk. Do not paint surfaces if moisture content or alkalinity of surfaces to be painted exceeds that permitted in manufacturer's written instructions.
- E. Steel Substrates: Remove loose rust, loose mill scale, loose shop primer, and other loose foreign matter. Clean using methods recommended in writing by paint manufacturer but not less than the following:
 - 1. SSPC-SP 2.
 - 2. SSPC-SP 3.
 - 3. SSPC-SP 7/NACE No. 4.
 - 4. SSPC-SP 11.
- F. Shop-Primed Steel Substrates: Clean field welds, bolted connections, and areas where shop paint is abraded. Paint exposed areas with the same material as used for shop priming to comply with SSPC-PA 1 for touching up shop-primed surfaces.

3.3 APPLICATION OF INTERIOR PAINT PRODUCTS

- A. Apply paints in accordance with manufacturer's written instructions.
 - 1. Use applicators and techniques suited for paint and substrate indicated.
 - 2. 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.
 - 3. Paint front and backsides of access panels, removable or hinged covers, and similar hinged items to match exposed surfaces.
 - 4. Paint entire exposed surface of window frames and sashes.
 - 5. Do not paint over labels of independent testing agencies or equipment name, identification, performance rating, or nomenclature plates.
 - 6. Primers specified in the applicable interior painting schedule articles may be omitted on items that are factory primed or factory finished if compatible with intermediate and topcoat coatings and acceptable to intermediate and topcoat paint manufacturers.
- B. 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.
- C. If undercoats or other conditions show through topcoat, apply additional coats until cured film has a uniform paint finish, color, and appearance.

- D. 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.
- E. Painting Fire-Suppression, Plumbing, HVAC, Electrical, Communication, and Electronic Safety and Security Work:
 - 1. Paint the following work where exposed to view in occupied spaces:
 - a. Equipment, including panelboards.
 - b. Uninsulated metal piping.
 - c. Uninsulated plastic piping.
 - d. Pipe hangers and supports.
 - e. Metal conduit.
 - f. Plastic conduit.
 - g. Duct, equipment, and pipe insulation having cotton or canvas insulation covering or other paintable jacket material.
 - h. Other items as directed by Architect.
 - 2. Paint portions of internal surfaces of metal ducts, without liner, behind air inlets and outlets that are visible from occupied spaces.

3.4 FIELD QUALITY CONTROL

- A. Dry-Film Thickness Testing: Owner may engage the services of a qualified testing and inspecting agency to inspect and test paint for dry-film thickness.
 - 1. Touch up and restore painted surfaces damaged by testing.
 - 2. If test results show that dry-film thickness of applied paint does not comply with paint manufacturer's written recommendations, apply additional coats as needed to provide dry-film thickness that complies with paint manufacturer's written recommendations.
 - 3. Cost of retesting is Contractor's responsibility.

3.5 CLEANING AND PROTECTION

- A. At end of each workday, remove rubbish, empty cans, rags, and other discarded materials from Project site.
 - 1. Do not clean equipment with free-draining water and prevent solvents, thinners, cleaners, and other contaminants from entering into waterways, sanitary and storm drain systems, and ground.
 - 2. Dispose of contaminants in accordance with requirements of authorities having jurisdiction.
 - 3. Allow empty paint cans to dry before disposal.
 - 4. Collect waste paint by type and deliver to recycling or collection facility.
- B. After completing paint application, clean spattered surfaces. Remove spattered paints by washing, scraping, or other methods. Do not scratch or damage adjacent finished surfaces.

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

3.6 INTERIOR PAINTING SCHEDULE, METAL SUBSTRATES

A. Steel and Iron Substrates:

- 1. Institutional Low-Odor/VOC Latex System :
 - a. Prime Coat: Water-based rust-inhibitive primer.
 - b. Intermediate Coat: Matching topcoat.
 - c. Topcoat: Interior, latex, institutional low odor/VOC, semigloss.

END OF SECTION 099123

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SECTION 104416 - FIRE EXTINGUISHERS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section includes portable, hand-carried fire extinguishers and mounting brackets.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product. Include rating and classification, material descriptions, dimensions of individual components and profiles, and finishes for fire extinguisher and mounting bracket.
- B. Product Schedule: For fire extinguishers. Coordinate final fire-extinguisher schedule with fire-protection cabinet schedule to ensure proper fit and function.

1.4 INFORMATIONAL SUBMITTALS

- A. Warranty: Sample of special warranty.

1.5 CLOSEOUT SUBMITTALS

- A. Operation and Maintenance Data: For fire extinguishers to include in maintenance manuals.

1.6 COORDINATION

- A. Coordinate type and capacity of fire extinguishers with fire-protection cabinets to ensure fit and function.

1.7 WARRANTY

- A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace fire extinguishers that fail in materials or workmanship within specified warranty period.

1. Failures include, but are not limited to, the following:
 - a. Failure of hydrostatic test according to NFPA 10 when testing interval required by NFPA 10 is within the warranty period.
 - b. Faulty operation of valves or release levers.
2. Warranty Period: Six years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. NFPA Compliance: Fabricate and label fire extinguishers to comply with NFPA 10, "Portable Fire Extinguishers."
- B. Fire Extinguishers: Listed and labeled for type, rating, and classification by an independent testing agency acceptable to authorities having jurisdiction.
 1. Provide fire extinguishers approved, listed, and labeled by FM Global.

2.2 PORTABLE, HAND-CARRIED FIRE EXTINGUISHERS

- A. Fire Extinguishers: Type, size, and capacity for each mounting bracket indicated.
 1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
 - a. JL Industries, Inc.; a division of the Activar Construction Products Group.
 - b. Kidde Residential and Commercial Division.
 - c. Larsens Manufacturing Company.
 - d. Nystrom.
 2. Source Limitations: Obtain fire extinguishers, fire-protection cabinets, and accessories, from single source from single manufacturer.
 3. Valves: Manufacturer's standard.
 4. Handles and Levers: Manufacturer's standard.
 5. Instruction Labels: Include pictorial marking system complying with NFPA 10, Appendix B, and bar coding for documenting fire-extinguisher location, inspections, maintenance, and recharging.
- B. Multipurpose Dry-Chemical Type: UL-rated 4-A:80-B:C, 10-lb nominal capacity, with monoammonium phosphate-based dry chemical in manufacturer's standard enameled container.

2.3 MOUNTING BRACKETS

- A. Mounting Brackets: Manufacturer's standard steel, designed to secure fire extinguisher

to wall or structure, of sizes required for types and capacities of fire extinguishers indicated, with black baked-enamel finish.

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
 - a. JL Industries, Inc.; a division of the Activar Construction Products Group.
 - b. Kidde Residential and Commercial Division.
 - c. Larsens Manufacturing Company.
 - d. Nystrom.
 2. Source Limitations: Obtain mounting brackets and fire extinguishers from single source from single manufacturer.
- B. Identification: Lettering complying with authorities having jurisdiction for letter style, size, spacing, and location. Locate as indicated by Architect.
1. Identify bracket-mounted fire extinguishers with the words "FIRE EXTINGUISHER" in red letter decals applied to mounting surface.
 - a. Orientation: Vertical.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine fire extinguishers for proper charging and tagging.
 1. Remove and replace damaged, defective, or undercharged fire extinguishers.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

- A. General: Install fire extinguishers and mounting brackets in locations indicated and in compliance with requirements of authorities having jurisdiction.
 1. Mounting Height: Top of fire extinguisher to be at 42 inches above finished floor.

END OF SECTION 104416

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SECTION 144600 - VERTICAL RECIPROCATING CONVEYOR

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Design, fabrication, and installation of one (1) vertical reciprocating conveyor (VRC) including drive unit, controls, gates, enclosures and all required components and accessories for a complete VRC system.

B. Related Requirements:

1. Section 024119 "Selective Demolition" for demolition specifications.
2. Section 033000 "Cast In Place Concrete" for concrete specifications.
3. Division 26 Sections for electrical specifications.

1.2 COORDINATION

- ##### A. Coordinate installation with installation of storage mezzanine.

1.3 REFERENCES

- ##### A. ASME – American Society of Mechanical Engineers (ASME B20.1).
- ##### B. AWS - American Welding Society.
- ##### C. NEMA – National Electrical Manufacturers Association.

1.4 ACTION SUBMITTALS

- ##### A. Product Data: For VRC including all components, outline drawing, capacity, safety features, and finishes.
- ##### B. Shop Drawings:
1. Include plans, elevations, sections of the VRC, base plate and lateral load values, and coordination with building structure and mezzanine structure.
 2. Include VRC Specification Sheet, including scope of work, operating and control voltages, lift speed, type of paint, and specific project notes.
 3. Delegated Design Submittal: For VRC, including analysis data signed and sealed by the qualified professional engineer responsible for their preparation.

1.5 INFORMATION SUBMITTALS

- A. Qualification Data: For professional engineer's experience with providing delegated design engineering services of the kind indicated, including documentation that engineer is licensed in the State in which Project is located.
- B. Qualification Data: For Installer.
- C. Seismic Qualification Certificates from manufacturer.
- D. Welding certificates.
- E. Sample Warranty.

1.6 CLOSEOUT SUBMITTALS PROVIDED WITH EQUIPMENT

- A. Electrical Schematic Drawing including control panel layout and Bill of Materials reflecting original manufactured part numbers.
- B. Installation Manual and Electrical Installation Guide.
- C. Owner's Manual including spare parts list, exploded parts drawings, operating instructions, maintenance schedule, service and troubleshooting guidelines.
- D. Inspection and Acceptance Certificates and Operating Permits: As required by authorities having jurisdiction.

1.7 QUALITY ASSURANCE

- A. Installer Qualifications: Fabricator of products.
- B. Welding Qualifications: Qualify procedures and personnel according to the following:
 - 1. AWS D1.1/D1.1M, "Structural Welding Code – Steel."
 - 2. AWS D1.3/D1.3M, "Structural Welding Code – Sheet Steel."
- C. Manufacturer must guarantee compliance with ASME B20.1 Safety Standard for Conveyors and Related Equipment. Manufacturer further guarantees to repurchase the equipment at full purchase price in the event that Owner is unable to use the equipment due to lack of elevator code compliance.
- D. Manufacturer must guarantee compliance with 2018 North Carolina State Building Code.
- E. Installer shall have the approval of the manufacturer in the installation of vertical reciprocating conveyors.

1.8 WARRANTY

- A. Manufacturer's Special Warranty: Manufacturer agrees to repair, restore, or replace work that fails in materials or workmanship within specified warranty period.
 - 1. Structure – lifetime parts and labor.
 - 2. Manufactured components – one (1) year parts and labor from the date of Substantial Completion.
 - 3. Purchased components – one (1) year parts and labor from the date of Substantial Completion.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Regulatory Requirements: Comply with ASME B20.1.
- B. Seismic Performance: VRC system shall withstand the effects of earthquake motions determined in accordance with ASCE/SE17.
 - 1. Project Seismic Design Category: As indicated on Drawings.

2.2 VERTICAL RECIPROCATING CONVEYOR

- A. Basis-of-Design Product: Subject to compliance with requirements, provide Delta Lift VRC by WILDECK, or one of the following comparable products:
 - 1. Series F VRC by PFlow Industries, Inc.
 - 2. Autoquip Model FLT by Autoquip Corporation.
- B. Source Limitations: Obtain VRC from single manufacturer.
 - 1. Major components shall be manufactured by single manufacturer.

2.3 VRC MECHANICAL SPECIFICATION

- A. Lifting Capacity: The VRC shall be rated at a live-load capacity of 2,200 lbs.
- B. Lifting Speed: The VRC shall have a lifting speed of 15 feet per minute when loaded to capacity.
- C. Carriage Platform: Standard dimension is 5'-0" wide by 6'-0" deep by 7'-0" high. The operating sides will be open and the non-operating sides will be galvanized diamond pattern steel panels. The roof of the carriage platform is constructed of expanded metal.
- D. Load Patterns: "C" or "Z" load patterns.

- E. Lift Structure: The VRC shall have a minimum (2) structural wide-flange steel members integrated into the perimeter enclosures and lift structure.
- F. Perimeter Safety Enclosures: Enclosures are integral to the VRC system and are a combination of galvanized diamond pattern steel panels and flattened expanded metal which will reject a ball 1/2" in diameter.
- G. Gates: Gates are required on all operating sides of the VRC at each level of operation. Integrated into the VRC design and set up at the factory. One (1) each, are provided at the two (2) operating levels
 - 1. The gates shall be (vertical acting) (swing) (slide) type.
 - 2. Each gate shall be equipped with an electro-mechanical interlock to prevent opening of the gate unless the carriage is present, and to prevent operation of the VRC unless all gates are closed.
- H. Levels: The unit will access the lower level and one (1) stop above ground (additional floor level stops are available as an option).
- I. Top Lifting Height: The VRC shall have a maximum lift height of 19 feet with a total of (2) operating levels.
- J. Overhead Clearance: 7'-6" (based on a standard 7'- 0" load height) NO OVERHEAD MACHINERY is accomplished with a side mounted motor.
- K. Deflection Under Load: When loaded to rated capacity, no portion of the VRC shall exhibit permanent deformations.
- L. Lifting Means: Raising and lowering of the carriage shall be provided by chain over sprocket with common drive shaft connected to an efficient helical gear reducer assembly. The lifting chains shall be in a guidance assembly.
- M. Safety Cams: Safety cams shall be mounted on the platform and connected directly to the lifting chains. The cams shall prevent the platform from falling more than 6" if tension is lost in the chains.
- N. Signs: "NO RIDER" signs shall be provided. Lettering shall be a minimum of 2" high for visibility.
- O. Approach Ramp: The manufacturer shall supply a steel fabricated approach ramp to be installed within 1" of the VRC platform at the ground level.

2.4 VRC ELECTRICAL SPECIFICATION

- A. Electrical Motor:
 - 1. 2 HP. Standard voltage is 460 volt/ 3 phase / 60Hz.
 - 2. Motor horsepower shall be sized for the rated live load and specified speed.
 - 3. All motors are three phase and shall be designed for continuous duty at ambient temperatures from 32° to 102° Fahrenheit.

4. The motor shall not automatically restart when the overload device is reset.
5. The motor shall be equipped with a heavy-duty, fast-acting, fail-safe brake to ensure the brake will hold in case of power failure.

B. Controls

1. Each operating floor level shall be equipped with a momentary contact push-button control station with call, send, and mushroom style E-stop operators for manual control of lift operation.
2. An internally pre-wired, NEMA 12 rated main control panel shall be provided with step-down transformer, reversing motor starter, overload relay, instantaneous current sensing jam relay, inrush bypass timer, field wiring terminal block, and positive acting brake contacts.
3. Travel Limit Switch: The VRC shall be equipped with a floor level, upper level, and overtravel limit switch to control positioning of the VRC platform.
4. Chain Tension Safety Device: Monitors each chain and shuts off motor while engaging brake in the event of a slack, taut, or broken chain.

- C. Power Source: Owner shall terminate high voltage power within 10' of the location designated for installation of the VRC.

2.5 FINISHES

- A. All carbon steel surfaces shall be coated with an industrial enamel finish over primer. Color to be selected by Architect from manufacturers standard colors.
- B. Prior to painting, all dirt, mill scale, oil, and grease shall be removed from carbon steel surfaces by a combination of brushing, wiping, and use of solvents.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Prior to commencing installation of the VRC, the installer shall visually examine the conditions under which the VRC is to be installed and notify the Architect in writing of conditions detrimental to the proper and timely completion of the work.
- B. Proceed with the installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

- A. Install the VRC, enclosures, and gates as indicated on the approved shop drawing.
- B. Comply with manufacturer's detailed installation instructions when installing the equipment.

3.3 FIELD QUALITY CONTROL

A. Inspection:

1. Upon completion of installation, the VRC shall be inspected by VRC manufacturer's representative to verify that it meets all requirements of Parts 1, 2, and 3 of this Section.
2. Obtain approval and inspection from authorities having jurisdiction, including required applications, submittals, and review fees.

B. Tests:

1. Operating Load Test: The Contractor will provide a max 2,200 pound test load and load the VRC at the ground level. The loaded VRC platform shall be conveyed to an upper floor level and returned to the ground level to assure proper operation. If the VRC conveyor cannot lift or lower the load, the VRC shall fail the test.
2. Performance Test: This Test is to be performed in conjunction with Test 1 above. During the demonstration of the lifting and lowering test, the Contractor shall measure the time required to lift and lower the capacity load. The Contractor will average times for lifting and lowering the load and calculate the average lifting and lowering speed. If the VRC does not lift the load within 10% of the specified speed, or if the lowering speed exceeds the lifting speed by more than 10%, the VRC shall fail the test.
3. Stationary Load Test: This Test is to be performed in conjunction with Test 1 above. The loaded VRC platform remain stationary at an upper level for a minimum of one (1) hour. After the one (1) hour period, the VRC will be inspected for deflection of the components or drift of the platform. If deformation or downward drift is evident, the VRC shall fail the test.
4. Coordinate schedule for tests so that Contractor, VRC manufacturer's representative, Architect, and Owner are present on site during tests.
5. If the VRC fails inspections and/or tests, Contractor will correct the work and will be responsible for costs related to re-inspection and re-testing.

3.4 DEMONSTRATION

- A. A VRC manufacturer's representative shall train Owner's personnel to operate, adjust and maintain VRC.

3.5 ADJUST AND CLEANUP

- A. Touch up all scratches, abrasions, and other defects in the per-finished surfaces with the same material color as that used in the factory-applied finish.
- B. Remove and dispose of all rubbish and debris caused by the work under this section.
- C. Verify that equipment is properly installed and guarded per ASME B20.1.

END OF SECTION 144600

SECTION 210500 - COMMON WORK RESULTS FOR FIRE SUPPRESSION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section includes the following:
 - 1. Piping materials and installation instructions common to most piping systems.
 - 2. Sleeves.
 - 3. Escutcheons.
 - 4. Grout.
 - 5. Fire-suppression equipment and piping demolition.
 - 6. Equipment installation requirements common to equipment sections.
 - 7. Painting and finishing.
 - 8. Concrete bases.
 - 9. Supports and anchorages.

1.3 DEFINITIONS

- A. Finished Spaces: Spaces other than mechanical and electrical equipment rooms, furred spaces, pipe chases, unheated spaces immediately below roof, spaces above ceilings, unexcavated spaces, crawlspaces, and tunnels.
- B. Exposed, Interior Installations: Exposed to view indoors. Examples include finished occupied spaces and mechanical equipment rooms.
- C. Exposed, Exterior Installations: Exposed to view outdoors or subject to outdoor ambient temperatures and weather conditions. Examples include rooftop locations.
- D. Concealed, Interior Installations: Concealed from view and protected from physical contact by building occupants. Examples include above ceilings and in chases.
- E. Concealed, Exterior Installations: Concealed from view and protected from weather conditions and physical contact by building occupants but subject to outdoor ambient temperatures. Examples include installations within unheated shelters.

1.4 SUBMITTALS

- A. Product Data: For the following:
 - 1. Piping materials Escutcheons.
 - 2. Welding certificates.

1.5 QUALITY ASSURANCE

- A. Steel Support Welding: Qualify processes and operators according to AWS D1.1, "Structural Welding Code--Steel."
- B. Steel Pipe Welding: Qualify processes and operators according to ASME Boiler and Pressure Vessel Code: Section IX, "Welding and Brazing Qualifications."
 - 1. Comply with provisions in ASME B31 Series, "Code for Pressure Piping."
 - 2. Certify that each welder has passed AWS qualification tests for welding processes involved and that certification is current.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Deliver pipes and tubes with factory-applied end caps. Maintain end caps through shipping, storage, and handling to prevent pipe end damage and to prevent entrance of dirt, debris, and moisture.

1.7 COORDINATION

- A. Arrange for pipe spaces, chases, slots, and openings in building structure during progress of construction, to allow for fire-suppression installations.
- B. Coordinate installation of required supporting devices and set sleeves in poured-in-place concrete and other structural components as they are constructed.
- C. Coordinate requirements for access panels and doors for fire-suppression items requiring access that are concealed behind finished surfaces.
- D. Coordinate locations of flexible couplings on both sides of fire rated partitions to limit the number of sway braces required.
- E. Coordinate all seismic braces with other trades and building structure.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

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

2.2 PIPE, TUBE, AND FITTINGS

- A. Refer to individual Division 21 piping Sections for pipe, tube, and fitting materials and joining methods.
- B. Pipe Threads: ASME B1.20.1 for factory-threaded pipe and pipe fittings.

2.3 JOINING MATERIALS

- A. Refer to individual Division 21 piping Sections for special joining materials not listed below.
- B. Pipe-Flange Gasket Materials: Suitable for chemical and thermal conditions of piping system contents.
 - 1. ASME B16.21, nonmetallic, flat, asbestos-free, 1/8-inch (3.2-mm) maximum thickness unless thickness or specific material is indicated.
 - a. Full-Face Type: For flat-face, Class 125, cast-iron and cast-bronze flanges.
 - b. Narrow-Face Type: For raised-face, Class 250, cast-iron and steel flanges.
 - 2. AWWA C110, rubber, flat face, 1/8 inch (3.2 mm) thick, unless otherwise indicated; and full-face or ring type, unless otherwise indicated.
- C. Flange Bolts and Nuts: ASME B18.2.1, carbon steel, unless otherwise indicated.
- D. Plastic, Pipe-Flange Gasket, Bolts, and Nuts: Type and material recommended by piping system manufacturer, unless otherwise indicated.
- E. Solder Filler Metals: ASTM B 32, lead-free alloys. Include water-flushable flux according to ASTM B 813.
- F. Brazing Filler Metals: AWS A5.8, BCuP Series, copper-phosphorus alloys for general-duty brazing, unless otherwise indicated; and AWS A5.8, BAg1, silver alloy for refrigerant piping, unless otherwise indicated.
- G. Welding Filler Metals: Comply with AWS D10.12 for welding materials appropriate for wall thickness and chemical analysis of steel pipe being welded.

2.4 SLEEVES

- A. Galvanized-Steel Sheet: 0.0239-inch (0.6-mm) minimum thickness; round tube closed with welded longitudinal joint.
- B. Steel Pipe: ASTM A 53, Type E, Grade B, Schedule 40, galvanized, plain ends.
- C. Cast Iron: Cast or fabricated "wall pipe" equivalent to ductile-iron pressure pipe, with plain ends and integral waterstop, unless otherwise indicated.

2.5 ESCUTCHEONS

- A. Description: Manufactured wall and ceiling escutcheons and floor plates, with an ID to closely fit around pipe, tube, and insulation of insulated piping and an OD that completely covers opening.

- B. One-Piece, Deep-Pattern Type: Deep-drawn, box-shaped brass with polished chrome-plated finish.
- C. One-Piece, Cast-Brass Type: With set screw.
 - 1. Finish: Polished chrome-plated.
- D. Split-Casting, Cast-Brass Type: With concealed hinge and set screw.
 - 1. Finish: Polished chrome-plated.
- E. Split-Plate, Stamped-Steel Type: With exposed-rivet hinge, set screw or spring clips, and chrome-plated finish.
- F. One-Piece, Floor-Plate Type: Cast-iron floor plate.
- G. Split-Casting, Floor-Plate Type: Cast brass with concealed hinge and set screw.

PART 3 - EXECUTION

3.1 PIPING SYSTEMS - COMMON REQUIREMENTS

- A. Install piping according to the following requirements and Division 21 Sections specifying piping systems.
- B. Drawing plans, schematics, and diagrams indicate general location and arrangement of piping systems. Indicated locations and arrangements are to be used to size pipe and calculate friction loss, expansion, and other design considerations. Install piping as indicated unless deviations to layout are approved on Coordination Drawings.
- C. Install piping in concealed locations, unless otherwise indicated and except in equipment rooms and service areas.
- D. Install piping indicated to be exposed and piping in equipment rooms and service areas at right angles or parallel to building walls. Diagonal runs are prohibited unless specifically indicated otherwise.
- E. Install piping above accessible ceilings to allow sufficient space for ceiling panel removal.
- F. Install piping to permit valve servicing.
- G. Install piping at indicated slopes.
- H. Install piping free of sags and bends.
- I. Install fittings for changes in direction and branch connections.
- J. Install piping to allow application of insulation.

- K. Select system components with pressure rating equal to or greater than system operating pressure.
- L. Install escutcheons for penetrations of walls, ceilings, and floors according to the following:
 - 1. New Piping:
 - a. Bare Piping at Wall and Floor Penetrations in Finished Spaces: One-piece, stamped-steel type.
 - b. Bare Piping in Unfinished Service Spaces: One-piece, stamped-steel type with concealed or exposed-rivet hinge and set screw or spring clips.
 - c. Bare Piping in Equipment Rooms: One-piece, stamped-steel type with set screw or spring clips.
 - d. Bare Piping at Floor Penetrations in Equipment Rooms: One-piece, floor-plate type.
- M. Sleeves are not required for core-drilled holes.
- N. Permanent sleeves are not required for holes formed by removable PE sleeves.
- O. Install sleeves for pipes passing through concrete and masonry walls and concrete floor and roof slabs.
- P. Install sleeves for pipes passing through concrete and masonry walls, gypsum-board partitions, and concrete floor and roof slabs.
 - 1. Cut sleeves to length for mounting flush with both surfaces.
- Q. Fire-Barrier Penetrations: Maintain indicated fire rating of walls, partitions, ceilings, and floors at pipe penetrations. Seal pipe penetrations with firestop materials. Refer to Division 07 Section "Penetration Firestopping" for materials. Provide flexible couplings within 12" of either side of wall to eliminate sleeves in these locations.
- R. Verify final equipment locations for roughing-in.

3.2 PIPING JOINT CONSTRUCTION

- A. Join pipe and fittings according to the following requirements and Division 21 Sections specifying piping systems.
- B. Ream ends of pipes and tubes and remove burrs. Bevel plain ends of steel pipe.
- C. Remove scale, slag, dirt, and debris from inside and outside of pipe and fittings before assembly.
- D. Soldered Joints: Apply ASTM B 813, water-flushable flux, unless otherwise indicated, to tube end. Construct joints according to ASTM B 828 or CDA's "Copper Tube Handbook," using lead-free solder alloy complying with ASTM B 32.

- E. Brazed Joints: Construct joints according to AWS's "Brazing Handbook," "Pipe and Tube" Chapter, using copper-phosphorus brazing filler metal complying with AWS A5.8.
- F. Threaded Joints: Thread pipe with tapered pipe threads according to ASME B1.20.1. Cut threads full and clean using sharp dies. Ream threaded pipe ends to remove burrs and restore full ID. Join pipe fittings and valves as follows:
 - 1. Apply appropriate tape or thread compound to external pipe threads unless dry seal threading is specified.
 - 2. Damaged Threads: Do not use pipe or pipe fittings with threads that are corroded or damaged. Do not use pipe sections that have cracked or open welds.
- G. Welded Joints: Construct joints according to AWS D10.12, using qualified processes and welding operators according to Part 1 "Quality Assurance" Article.
- H. Flanged Joints: Select appropriate gasket material, size, type, and thickness for service application. Install gasket concentrically positioned. Use suitable lubricants on bolt threads.

3.3 PAINTING

- A. Painting of fire-suppression systems, equipment, and components is specified in Division 09 Sections "Interior Painting" and "Exterior Painting."
- B. Damage and Touchup: Repair marred and damaged factory-painted finishes with materials and procedures to match original factory finish.

3.4 ERECTION OF METAL SUPPORTS AND ANCHORAGES

- A. Cut, fit, and place miscellaneous metal supports accurately in location, alignment, and elevation to support and anchor fire-suppression materials and equipment.
- B. Field Welding: Comply with AWS D1.1.
- C. Provide seismic restraints per NFPA 13 chapter 9.

END OF SECTION 210500

SECTION 211000 - WET-PIPE SPRINKLER SYSTEMS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. This Section specifies wet-pipe sprinkler systems for buildings and structures.
- B. Products specified in this Section with installation not in Contract include sprinkler cabinets with spare sprinklers and sprinkler wrenches. Deliver to the Owner's maintenance personnel.

1.3 DEFINITIONS

- A. Pipe sizes used in this Section are nominal pipe size (NPS) specified in inches. Tube sizes are standard tube size specified in inches. Equivalent or approximate SI (metric) sizes are indicated in millimeters (mm) in parentheses.
- B. Working plans as used in this Section refer to documents (including drawings and calculations) prepared pursuant to requirements in NFPA 13 for obtaining approval of authority having jurisdiction.
- C. Other definitions for fire protection systems are included in referenced NFPA standards.

1.4 SYSTEM DESCRIPTION

- A. Wet-Pipe Sprinkler System: System with automatic sprinklers attached to piping system containing water and connected to water supply so that water discharges immediately from sprinklers when they are opened by fire.
- B. Sprinkler System Protection Limits: All spaces within areas indicated. Include closets, toilet areas, and special applications areas.

1.5 SYSTEM PERFORMANCE REQUIREMENTS

- A. Obtain approval from Authority Having Jurisdiction for fire protection systems specified.
- B. Minimum Pipe Sizes: Not smaller than sizes indicated for connection to water supply piping, standpipes, and branches from standpipes to sprinklers.

- C. The water supply is to be taken from the flow data shown on the drawings. Allow 10% cushion. Calculations start at the existing water lines outside the buildings and must include all valves and fittings. Use the "1.4 Rule", and include a 100 gpm hose stream allowance for light hazard and 250 gpm hose stream for ordinary hazard. Limit water velocity to 25fps, except use 18fps for any segment with a vane type water-flow switch (to comply with UL listing).
- D. Hydraulically design sprinkler systems according to:
 - 1. Sprinkler System Occupancy Ordinary Hazard Group 2 Classification.
 - 2. Minimum Density Requirements for Automatic Sprinkler System Hydraulic Design: Refer to sprinkler design data on Sheet FP001.
 - 3. Maximum Sprinkler Spacing: Refer to sprinkler design data on Sheet FP001.
- E. Components and Installation: Capable of producing piping systems with the following minimum working pressure ratings except where indicated otherwise.
 - 1. Sprinkler Systems: 175 psig.

1.6 SUBMITTALS

- A. Product data for fire protection system components. Include the following:
 - 1. Valves.
 - 2. Specialty valves, accessories, and devices.
 - 3. Alarm devices. Include electrical data.
 - 4. Sprinklers, escutcheons, and guards. Include sprinkler flow characteristics, mounting, finish, and other data.
- B. The sprinkler contractor must submit "working plans or shop/fabrication drawings" and hydraulic calculations to Sigma Engineered Solutions for review, prior to any fabrication or installation work. No fabrication and or installation shall begin without approved submittals from Sigma Engineered Solutions, PC and AHJ.
- C. Test reports and certificates as described in NFPA 13. Include "Contractor's Material & Test Certificate for Aboveground Piping" and "Contractor's Material & Test Certificate for Underground Piping."
- D. Maintenance data for each type of fire protection specialty specified, for inclusion in Operating and Maintenance Manual specified in Division 1.
- E. 2 copies of NFPA 25 "Standard for Inspection, Testing and Maintenance of Water Based Fire Protection Systems." Deliver to Owner's maintenance personnel.

1.7 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Firms whose equipment, specialties, and accessories are listed by product name and manufacturer in UL Fire Protection Equipment Directory and FM Approval Guide and that conform to other requirements indicated.

- B. Listing/Approval Stamp, Label, or Other Marking: On equipment, specialties, and accessories made to specified standards.
- C. Listing and Labeling: Equipment, specialties, and accessories that are listed and labeled.
 - 1. The Terms "Listed" and "Labeled": As defined in "National Electrical Code," Article 100.
 - 2. Listing and Labeling Agency Qualifications: A "Nationally Recognized Testing Laboratory" (NRTL) as defined in OSHA Regulation 1910.7.
- D. Comply with requirements of authority having jurisdiction for submittals, approvals, materials, hose threads, installation, inspections, and testing.
- E. Comply with requirements of the North Carolina Department of Insurance for submittals, approvals, materials, installation, inspections, and testing.
- F. Installer's Qualifications: Firms qualified to install and alter fire protection piping, equipment, specialties, and accessories, and repair and service equipment. A qualified firm is one that is experienced (minimum of 5 previous projects similar in size and scope to this Project) in such work, familiar with precautions required, and in compliance with the requirements of the authority having jurisdiction. Submit evidence of qualifications to the Sigma Engineered Solutions upon request"
- G. NFPA Standards: Equipment, specialties, accessories, installation, and testing complying with the following:
 - 1. NFPA 13 "Standard for the Installation of Sprinkler Systems."
 - 2. NFPA 26 "Recommended Practice for the Supervision of Valves Controlling Water Supplies for Fire Protection."
 - 3. NFPA 70 "National Electrical Code."

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1. Specialty Valves:
 - a. ASCOA Fire Systems, Figgie International Co.
 - b. Central Sprinkler Corp.
 - c. Firematic Sprinkler Devices, Inc.
 - d. Gem Sprinkler Co. Div., Grinnell Corp.
 - e. Globe Fire Sprinkler Corp.
 - f. Reliable Automatic Sprinkler Co., Inc.
 - g. Star Sprinkler Corp.

- h. Viking Corp.
- 2. Sprinklers:
 - a. ASCOA Fire Systems, Figgie International Co.
 - b. Firematic Sprinkler Devices, Inc.
 - c. Gem Sprinkler Co. Div., Grinnell Corp.
 - d. Globe Fire Sprinkler Corp.
 - e. Reliable Automatic Sprinkler Co., Inc.
 - f. Star Sprinkler Corp.
 - g. Victaulic Company of America.
 - h. Viking Corp.
- 3. Grooved Couplings for Steel Piping:
 - a. Grinnell Supply Sales Co., Grinnell Corp.
 - b. Gustin-Bacon Div., Tyler Pipe Subsid., Tyler Corp.
 - c. Sprink-Line by Sprink, Inc.
 - d. Stockham Valves and Fittings, Inc.
 - e. Victaulic Company of America.

2.2 PIPES AND TUBES

- A. Refer to Part 3 Articles "Piping Installation" for identification of systems where pipe and fitting materials specified below are used.
- B. All piping shall be as follows:
 - 1. 2 1/2" through 8" pipe size: ASTM A135, schedule 10 black steel, grooved or welded joints and fittings.
 - 2. 2" and smaller pipe size: ASTM A135, schedule 40 black steel pipe with standard weight cast iron or malleable iron threaded joints and fittings, or schedule 40 black steel welded joints and fittings. Mechanical tees, grooved or threaded may be used.

2.3 PIPE AND TUBE FITTINGS

- A. NO SADDLE FITTINGS AND NO MECHANICAL TEES.
- B. Cast-Iron Threaded Flanges: ASME B16.1, Class 125, raised ground face, bolt holes spot faced.
- C. Ductile-Iron and Gray-Iron Flanged Fittings: AWWA C110, 125-psig minimum pressure rating, with AWWA C104 cement-mortar lining.
- D. Cast-Iron Threaded Fittings: ASME B16.4, Class 125, standard pattern, with threads according to ASME B1.20.1.

- E. Malleable-Iron Threaded Fittings: ASME B16.3, Class 150, standard pattern, with threads according to ASME B1.20.1.
- F. Grooved-End Fittings for Ductile-Iron Pipe: ASTM A 536 ductile-iron or ASTM A 47 malleable-iron, AWWA pipe-size, designed to accept AWWA C606 grooved couplings. Include cement lining or Food and Drug Administration (FDA)-approved interior coating.
- G. Steel Fittings: ASTM A 234/A 234M, seamless or welded; ASME B16.9, buttwelding; or ASME B16.11, socket-welding type for welded joints.
- H. Steel Flanges and Flanged Fittings: ASME B16.5.
- I. Grooved-End Fittings for Steel Pipe: UL-listed and FM-approved, ASTM A 536, Grade 65-45-12 ductile iron or ASTM A 47 Grade 32510 malleable iron, with grooves or shoulders designed to accept grooved couplings.

2.4 JOINING MATERIALS

- A. Flanged Joints for Ductile-Iron Pipe and Ductile-Iron or Cast-Iron Fittings: AWWA C115 ductile-iron or gray-iron pipe flanges, rubber gaskets, and high-strength steel bolts and nuts.
- B. Couplings for Grooved-End Steel Pipe and Grooved-End Ferrous Fittings: UL 213, AWWA C606, ASTM A 536 ductile-iron or ASTM A 47 malleable-iron housing, with enamel finish. Include synthetic-rubber gasket with central-cavity, pressure-responsive design; ASTM A 183 carbon-steel bolts and nuts; and locking pin, toggle, or lugs to secure grooved pipe and fittings.
- C. Couplings for Grooved-End Ductile-Iron Pipe and Fittings: UL 213, AWWA C606, ASTM A 536 ductile-iron housing, with enamel finish. Include synthetic-rubber gasket with central-cavity, pressure-responsive design, and ASTM A 183 carbon-steel bolts and nuts to secure grooved pipe and fittings.

2.5 SPRINKLERS

- A. NO FLEX SPRINKLER HEADS.
- B. Automatic Sprinklers: With heat-responsive element conforming to:
 - 1. UL 199, for applications except residential.
- C. Sprinkler types and categories are as indicated on plans and as required by application. Furnish automatic sprinklers with nominal 1/2-inch orifice for "Ordinary" temperature classification rating except where otherwise indicated and required by application.
- D. Sprinkler types, features, and options include:

1. Quick response recessed pendent sprinklers in lay in ceiling.
2. Quick response upright sprinklers in areas with exposed piping.
3. Quick response dry sidewall sprinklers where indicated.

E. Sprinkler Finishes: As indicated on plans.

F. Sprinkler Escutcheons: Materials, types, and finishes for following sprinkler mounting applications. Escutcheons for concealed type sprinklers are specified with sprinklers. In layin ceilings escutcheons shall be suitable for easy ceiling tile replacement.

1. Ceiling Pendent Mounting: Finish as indicated on plans, 2-piece, recessed.

2.6 SPECIALTY SPRINKLER FITTINGS

- A. Specialty Fittings: UL-listed and FM-approved, made of steel, ductile iron, or other materials compatible with system materials and applications where used.
- B. Mechanical-Cross Fittings: UL 213, ductile-iron housing with pressure-responsive gaskets, bolts, and threaded or grooved outlets.
- C. Drop-Nipple Fittings: UL 1474, with threaded inlet, threaded outlet, and seals; adjustable.
- D. Sprinkler Alarm Test Fittings: Ductile-iron housing with 1-1/2-inch inlet and outlet, integral test valves, combination orifice and sight glass, and threaded or locking-lug ends.

2.7 PRESSURE GAGES

- A. Pressure Gages: UL 393, 3-1/2 to 4-1/2 inches diameter dial with dial range of 0-250 psig.

2.8 SEISMIC SWAY BRACES

- A. Pressure Gages: UL 393, 3-1/2 to 4-1/2 inches diameter dial with dial range of 0-250 psig.

PART 3 - EXECUTION

3.1 VALVE APPLICATIONS

- A. Drawings indicate valve types to be used. Where specific valve types are not indicated, the following requirements apply:
 1. Shutoff Duty: Use ball or butterfly valves.
 2. Throttling Duty: Use globe, ball, or butterfly valves.

3.2 JOINT CONSTRUCTION

- A. Grooved-End Pipe and Grooved-End Fitting Joints: Use grooved-end fittings and grooved couplings that are made by the same manufacturer and that are listed for use together. Groove pipe and assemble joints with grooved coupling, gasket, lubricant, and bolts according to coupling and fitting manufacturer's written instructions.
 - 1. Groove Type: Rolled.
- B. Dissimilar Materials Piping Joints: Make joints using adapters compatible with both piping materials.

3.3 PIPING INSTALLATIONS

- A. Locations and Arrangements: Drawings indicate general location and arrangement of piping and are provided for informational purposes. Every fitting and length of pipe may not be shown on the contract documents. It is the contractor's responsibilities to review the contract documents and coordinate the fire protection system installation with the building architectural, structural, mechanical and electrical systems. The contractor shall create "working plans or shop/fabrication drawings" showing all pipe sizes, location, routing and elevations that are a result of this coordination effort. Necessary offsets or changes in pipe routing from the contract documents that are required to properly install the fire protection system as to take up minimum space shall be furnished and install by the contractor with no additional expense to the owner. Install piping as indicated, as far as practical.
 - 1. Deviations from approved "working plans" for sprinkler piping require written approval from authority with jurisdiction. File written approval with the engineer/owner's representative prior to deviating from approved "working plans."
- B. Use approved fittings to make changes in direction, branch takeoffs from mains, and reductions in pipe sizes.
- C. Install unions adjacent to each valve in pipes 2 inches and smaller. Unions are not required on flanged devices or in piping installations using grooved couplings.
- D. Install flanges or flange adapters on valves, apparatus, and equipment having 2-1/2-inch and larger connections.
- E. Install "Inspector's Test Connections" in sprinkler piping, complete with shutoff valve, sized and located according to NFPA 13 and plumb to gang drain. Inspector's Test Connections should be operable from floor level whenever possible. Test Connections are permitted to be locked if vandalism is a concern.
- F. Install sprinkler piping with drains for complete system drainage, and isolation drainage as shown on the Drawings.
- G. Install sprinkler zone control valves, test assemblies, and drain headers.

- H. Install ball drip valves to drain piping between fire department connections and check valves, and where indicated. Drain to suitable drain or outside building.
- I. Install alarm devices including water motor gongs in piping systems.
- J. Hangers and Supports: Comply with NFPA 13. Install according to NFPA 13 and NFPA 14.
 - 1. Install hanger and support spacing and locations for steel piping joined with grooved mechanical couplings according to manufacturer's written instructions for rigid systems.
- K. Install pressure gages on riser or feed main, and at each sprinkler test connection. Include pressure gages with connection not less than 1/4 inch and with soft metal-seated globe valve, arranged for draining pipe between gage and valve. Install gages to permit removal, and install where they will not be subject to freezing.

3.4 SPECIALTY SPRINKLER FITTING INSTALLATIONS

- A. Install specialty sprinkler fittings according to manufacturer's written instructions.

3.5 SPRINKLER APPLICATIONS

- A. Rooms without Ceilings: Upright style sprinklers.
- B. Rooms with Ceilings: Pendent style recessed sprinklers.

3.6 SPRINKLER INSTALLATIONS

- A. Install sprinklers in patterns indicated.
- B. Install sprinklers in suspended ceilings in center of acoustical panels and tiles unless otherwise indicated.
- C. Do not install wet-type sprinklers in areas subject to freezing. Heat tracing is NOT acceptable for dry pipe or preaction valve freeze protection. A heated room or closet must be provided to protect these vital components.

3.7 CONNECTIONS

- A. Connect to specialty valves, hose valves, specialties, and accessories.
- B. Connect water supplies to standpipe and sprinkler systems.

3.8 FIELD QUALITY CONTROL

- A. Perform field acceptance tests of each fire protection system.

1. Flush, test, and inspect sprinkler piping systems according to NFPA 13 Chapter "System Acceptance."
- B. Replace piping system components that do not pass test procedures specified, then retest to demonstrate compliance. Repeat procedure until satisfactory results are obtained.
 1. Report test results promptly and in writing to Engineer and Owner.
 2. Report test results promptly and in writing to authority having jurisdiction when required.

3.9 CLEANING

- A. Clean dirt and debris from sprinklers. Replace sprinklers having paint other than factory finish with new sprinklers. Cleaning and reuse of painted sprinklers is prohibited.

3.10 COMMISSIONING

- A. Starting Procedures: Follow manufacturer's written procedures. If no procedures are prescribed by manufacturer, proceed as follows:
 1. Verify that specialty valves, trim, fittings, controls, and accessories have been installed correctly and operate correctly.
 2. Verify that specified tests of piping are complete.
 3. Check that damaged sprinklers and sprinklers with paint or coating not specified have been replaced with new, correct type of sprinklers.
 4. Check that sprinklers are correct type, have correct finish and temperature ratings, and have guards where required for applications.
 5. Check that potable water supplies have correct type of backflow preventer.
 6. Check that fire department connections have threads compatible with local fire department equipment and have correct pressure rating.
 7. Fill wet-pipe sprinkler systems with water.
 8. Energize circuits to electrical equipment and devices.
 9. Adjust operating controls and pressure settings.
- B. Coordinate with fire alarm system tests. Operate systems as required.

3.11 PAINTING

- A. Exposed piping in sprinkler riser mechanical room shall be painted OSHA red.
- B. Exposed piping in rooms and corridors shall be painted to match existing finishes. Coordinate with owner.

3.12 DEMONSTRATION

- A. Demonstrate equipment, specialties, and accessories. Review operating and maintenance information.
- B. Schedule demonstration with at least 7 days' advance notice.

END OF SECTION 211000

SECTION 260500 - COMMON WORK RESULTS FOR ELECTRICAL

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 DESCRIPTION

- A. The work of this section includes the furnishing and installation of all electrical equipment, materials and devices as shown on the electrical drawings and/or as specified herein, including but not limited to:

1. Conduit and Wire
2. Safety Switches and Fuses
3. Wiring Devices
4. Lighting
5. Fire Alarm Systems

- B. The term "provide" shall mean furnish and install.

- C. Applicable Publications:

1. Where publications are listed in each Section, they form a part of that Section to the extent referenced.
2. When a standard is specified by reference, comply with the requirements and recommendations stated in that standard, except when its requirements are modified by the Contract Documents or applicable codes establish stricter standards.
3. When a code is not specified by reference in a Section, the work of that Section shall comply with applicable codes listed in the General Conditions.
4. The publication date is the publication in effect as of the bid date, except when a specific publication date is specified.
5. Obtain copies of referenced standards direct from publication source, when needed for proper performance of work, or when required for submittal by Contract Documents.

1.3 QUALITY ASSURANCE

- A. Codes and Standards:

1. The installation of all work under this section shall comply with all applicable codes, laws, standards and regulations. Nothing in the specifications shall be construed to permit deviation from these governing items.
2. Electrical material and equipment shall bear the UL label except where UL does not label such types of material and equipment. Materials, equipment and

installation shall meet requirements of applicable codes and standards listed below:

National Electric Code	NEC
National Electrical Safety Code	NESC
Electrical Testing Lab	ETL
Underwriters Laboratories, Inc.	UL
Certified Ballast Manufacturing	CBM
National Electrical Manufacturers Association	NEMA
Illuminating Engineering Society	IES
Institute of Electrical and Electronic Engineers	IEEE
American National Standards Institute	ANSI

B. Qualifications of Workmen:

1. Provide sufficient qualified journeyman electricians who are thoroughly experienced with the materials and methods specified and familiar with the design requirement.
2. At least one qualified journeyman shall be present at all times during the execution of the work.
3. In acceptance or rejection in any portion of the electrical work, no allowance will be made for lack of skill on the part of the workmen.

1.4 INTENT OF DRAWINGS AND SPECIFICATIONS

- A. The implied and stated intent of the drawings and specifications is to establish minimum acceptable quality standards for materials, equipment and workmanship, and to provide operable electrical and mechanical systems in every respect.
- B. The drawings are diagrammatic only, intending to show general arrangement and location of system components. Due to the small scale of the drawings, and to unforeseen job conditions, all required offsets and fittings may not be shown, but shall be provided at no change in contract price.
- C. All work shall be accurately laid out and coordinated with other trades to avoid conflicts and to provide maximum accessibility for operation and maintenance.

1.5 SUBMITTALS

- A. Submit shop drawings of the electrical materials to the Designer for review in accordance with the provisions of Division 01 of these specifications.
- B. The following is a list of those items required to be submitted:
 1. Wiring Devices
 2. Wire, Conduit, Boxes.
 3. Lighting and Lighting Control
 4. Fire Alarm Systems
- C. Contractor shall not begin fabrication or work which requires submittals until return of submittals.

1.6 SUBSTITUTIONS

- A. Refer to the appropriate Division 01 Specification for requirements on Substitutions.

1.7 VISIT TO THE SITE

- A. All persons proposing to submit quotations for work in accordance with these plans and specifications are expected to visit the site of the work covered by the plans and specifications and are to familiarize themselves with existing conditions as they affect the work of this section of the specifications. Claims resulting from a failure to visit the site or inspect the existing conditions will not be considered.

1.8 OPERATING AND MAINTENANCE DATA

- A. Compile product data and related information appropriate for Owner's maintenance and operation of products furnished under Contract.
 - 1. Prepare operating and maintenance data as specified in this section and as referenced in the General Conditions and applicable Section of Division 01 General Requirements.
- B. Instruct Owner's personnel in maintenance of products and in operation of equipment and systems.
- C. Preparation of data shall be done by personnel:
 - 1. Trained and experienced in maintenance and operation of desired products.
 - 2. Familiar with requirements of this Section.
 - 3. Skilled as technical writer to the extent required to communicate essential data.
 - 4. Skilled as draftsman competent to prepare required drawings.
- D. Prepare data in form of an instructional manual for use by Owner's personnel.

1.9 PAINTING

- A. Suitable finish coatings shall be provided under this section of the Specifications on all items of electrical equipment and wiring which are exposed. This shall consist of either an approved factory applied finish or an acceptable finish applied during or after installation. Equipment which is furnished in finishes such as stainless steel or satin aluminum is not to be painted. Exposed equipment and/or wiring in finished areas such as panel covers or surface raceway shall be supplied with factory applied prime coat and shall be professionally painted or enameled as directed to result in a completely coated and attractively finished manner. All such finishing shall be as directed and shall be satisfactory to the Architect/Engineer.
- B. All factory finished steel surfaces; boxes, enclosures, etc., shall be cleaned and retouched or repainted as necessary to provide a rust resistant coating. Where painting or galvanizing is not specifically specified, ferrous devices, bolts, nuts, inserts, etc., shall be galvanized.
- C. All nameplates shall be left unpainted and in a clean condition.

1.10 WIRING AND ELEMENTARY DIAGRAMS

- A. Wiring and elementary diagrams for equipment as shown on the drawings are based on the product of the specified equipment manufacturer and are shown for convenience to aid in estimating the extent of the work involved. The equipment actually installed shall be wired and connected in accordance with the equipment manufacturer's recommendations and shall conform to details in approved wiring diagrams to be furnished by the equipment manufacturer. All equipment so connected shall be made to operate in a safe, proper and efficient manner. Note that control circuitry is not necessarily shown on the drawings but shall be installed in conduit between the points and devices indicated on the diagrams.

1.11 EQUIPMENT TESTS

- A. An operating test of the complete electrical system shall be made. System shall test free from grounds, shorts and other faults. Connections shall be for positive mechanical and electrical connection and continuity. Equipment shall be demonstrated to operate in accordance with the requirements of the plans and specifications. Contractor shall furnish all personnel and test instruments required. Performance of tests shall be made in the presence of the Owner's representative, where requested.
- B. The following tests shall be performed as a minimum:
 - 1. Control and Distribution Equipment:
 - a. Check the wire terminals, clean connections.
 - b. Check all control switches, alarm devices, indicating instruments for proper operation under normal and simulated abnormal conditions.
 - 2. Phase rotation: The connections of all equipment shall be checked for correct phase rotation.
 - 3. Circuit Breakers: The following tests shall be performed:
 - a. Inspect each circuit breaker.
 - b. Check for loose connections.
 - c. Operate each circuit breaker manually.
 - d. Set the adjustable trips to the values specified.
- C. Spot-checks and/or back-checks to verify the testing accuracy shall be made for the Engineer or his agent during job-site visits.
- D. Validity of the ground path shall be assured by constant and careful attention to the thorough tightening of all couplings, connectors, locknuts, screws, bolts, etc. and by frequent checking of the path resistance with a quality low-range ohmmeter. Resistance of the path should not exceed one ohm between any two points. If a reading in excess of this is observed, it shall be discussed with the Engineer for an appraisal of the condition.
- E. After all fixtures, devices and equipment are installed and all connections completed to each panel – disconnect neutral feeder conductor from neutral bar and take a megger reading between neutral bar and grounded can. If this reading is less than 250,000 ohms, disconnect branch circuit (or sub-feeder) neutral wires from this neutral bar.

Test each one separately to the panel can until low reading ones are found. Correct troubles reconnect and retest until at least 250,000 ohms from neutral bar to grounded panel can is achieved with only neutral feeder disconnected. In addition all wiring shall be tested. All phase and neutral conductors shall be tested with a 500 volt megger. Minimum acceptable readings shall be 1,000,000 ohms for conductors #6 awg and smaller; 250,000 ohms for conductors #4 awg and larger. All measurements shall be between the conductor and the grounding conductor.

- F. Upon completion of work, but before final inspection, the Contractor shall send a letter to the engineer and the Owner certifying that these tests have been accomplished and tabulating the megger readings for each panel. During field visits, contractor shall demonstrate installation and make such tests as may be required to satisfy the Designer and Owner that work is installed in accordance with drawings, specifications and instructions.

1.12 WARRANTIES

- A. All equipment installed under this Division of the work shall be warranted for a minimum of one year after project acceptance.
- B. During this warranty period, replace any and all defective equipment and parts at no cost to the Owner.

1.13 BRANCH CIRCUITS

- A. The number of conductors in each run of conduit is indicated on the drawings and where there is a conflict between the number of wires indicated and the actual number required as determined by the functional design requirements, the number of wires determined by the functional design requirements shall govern.
- B. In general, there is a number associated with each branch circuit outlet which identifies the particular branch circuit to which the device served by the outlet is to be connected. The circuit number indicated has been assigned only for reference and guidance, and is not intended to limit panelboard circuitry. All branch circuits shall be connected to breakers in accordance with circuit requirements and good industry practice. The balancing of all loads shall be included in the work of this DIVISION.
- C. Home runs shall not be combined where such would require derating of conductor ampacity. Separate neutrals shall be provided for all branch circuits.

1.14 MOTOR, APPLIANCE AND EQUIPMENT CONNECTIONS

- A. Unless otherwise shown on the drawings or specified herein, it is the intent of this DIVISION to provide all electrical equipment and connections required to protect, properly operate, and control all motors, appliances, electrical devices, and equipment furnished and installed under this and other DIVISIONS of the specifications or shown on the drawings.

1.15 SETTING OF EQUIPMENT

- A. The setting of equipment shall be carefully coordinated with the work and requirements of the other trades involved to ensure compatibility and to avoid conflicts.
- B. Equipment, base mounted on concrete or masonry slabs, pads and piers, or mounted on stands, gratings, platforms, or other, shall not be set in any manner, except on the finished and permanent support.
- C. Support of equipment on studs or by other means, and the placing or building of the supporting slab, pad, pier, stand, grading, or other, "to the equipment", is prohibited.

1.16 ACCESS DOORS

- A. Where inaccessible ceilings or wall spaces are encountered by the Contractor and there is a need for access to junction boxes or other equipment as required by the NEC, the contractor shall provide any and all access doors at no additional cost. Doors shall be sized to meet the requirements of the work to be installed. Provide doors per Section 08 Access Doors and Frames.

1.17 RECORD DRAWINGS/MANUALS

- A. Upon completion of the installation, Contractor shall submit to the Designer marked prints of drawings showing any changes made in circuits, location of equipment, panelboards or any other revision in the Contract Drawings, for the Owner's use in maintenance work and for future additions and expansions. Marked changes shall also include changes due to change orders unless already recorded by revised drawing or bulletin drawing. **Underground conduit installations shall be dimensioned from a fixed point(s) on the drawings in all three (3) dimensions.**
- B. These records shall be submitted in one of two formats: either a clean, legible, marked set of prints with all markings in distinguishable colored pencil such as red; or a set of reverse-run reproducible sepia prints marked in soft pencil so that blue-line prints can be reproduced as required. The format to be used shall be as defined in the General Requirements section of the contract documents. If no format is defined, the marked blue-line prints shall be submitted.
- C. Operation and Maintenance manuals shall be submitted to the Designer at 80% completion. Information included shall be a copy of all submittal data, shop drawings and necessary operating and maintenance instructions and wiring diagrams on all major items of equipment and all special systems (fire alarm, intercom, etc.). Submit these manuals in the quantities and format described in the General Requirements section.

END OF SECTION 260500

SECTION 260519 - LOW-VOLTAGE ELECTRICAL POWER CONDUCTORS AND CABLES

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes the following:

1. Building wires and cables rated 600 V and less.
2. Connectors, splices, and terminations rated 600 V and less.
3. Sleeves and sleeve seals for cables.

1.2 SUBMITTALS

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

1.3 QUALITY ASSURANCE

- A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.
B. Comply with NFPA 70.

PART 2 - PRODUCTS

2.1 CONDUCTORS AND CABLES

- A. Copper Conductors: Comply with NEMA WC 70.
B. Conductor Insulation: Comply with NEMA WC 70 for Types THW, and THHN-THWN.

2.2 CONNECTORS AND SPLICES

- A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
1. AFC Cable Systems, Inc.
 2. Hubbell Power Systems, Inc.
 3. O-Z/Gedney; EGS Electrical Group LLC.
 4. 3M; Electrical Products Division.
 5. Tyco Electronics Corp.
- B. Description: Factory-fabricated connectors and splices of size, ampacity rating, material, type, and class for application and service indicated.

2.3 SLEEVES FOR CABLES

- A. Steel Pipe Sleeves: ASTM A 53/A 53M, Type E, Grade B, Schedule 40, galvanized steel, plain ends.
- B. Cast-Iron Pipe Sleeves: Cast or fabricated "wall pipe," equivalent to ductile-iron pressure pipe, with plain ends and integral waterstop, unless otherwise indicated.
- C. Coordinate sleeve selection and application with selection and application of firestopping specified in Specification Section "Firestopping."

PART 3 - EXECUTION

3.1 CONDUCTOR MATERIAL APPLICATIONS

- A. Feeders: Copper. Solid for No. 10 AWG and smaller; stranded for No. 8 AWG and larger.
- B. Branch Circuits: Copper. Solid or stranded for No. 10 AWG and smaller **except stranded wire shall be provided where wiring is connected to vibrating equipment**; stranded for No. 8 AWG and larger.

3.2 CONDUCTOR INSULATION AND MULTICONDUCTOR CABLE APPLICATIONS AND WIRING METHODS

- A. Exposed Feeders: Type THHN-THWN, single conductors in raceway.
- B. Feeders Concealed in Ceilings, Walls, Partitions, and Crawlspace: Type THHN-THWN, single conductors in raceway.
- C. Feeders Concealed in Concrete, below Slabs-on-Grade, and underground: Type THHN-THWN, single conductors in raceway.
- D. Exposed Branch Circuits, Including in Crawlspace: Type THHN-THWN, single conductors in raceway.
- E. Branch Circuits Concealed in Ceilings, Walls, and Partitions: Type THHN-THWN, single conductors in raceway.
- F. Branch Circuits Concealed in Concrete, below Slabs-on-Grade, and underground: Type THHN-THWN, single conductors in raceway.
- G. Class 1 Control Circuits: Type THHN-THWN, in raceway.
- H. Class 2 Control Circuits: Type THHN-THWN, in raceway.

3.3 INSTALLATION OF CONDUCTORS AND CABLES

- A. Conceal cables in finished walls, ceilings, and floors, unless otherwise indicated.

- B. Use manufacturer-approved pulling compound or lubricant where necessary; compound used must not deteriorate conductor or insulation. Do not exceed manufacturer's recommended maximum pulling tensions and sidewall pressure values.
- C. Use pulling means, including fish tape, cable, rope, and basket-weave wire/cable grips, that will not damage cables or raceway.
- D. Install exposed cables parallel and perpendicular to surfaces of exposed structural members, and follow surface contours where possible.
- E. Support cables according to Division 26 Sections "Hangers and Supports for Electrical Systems."
- F. Identify and color-code conductors and cables according to Division 26 Section "Identification for Electrical Systems."
- G. Tighten electrical connectors and terminals according to manufacturer's published torque-tightening values. If manufacturer's torque values are not indicated, use those specified in UL 486A and UL 486B.
- H. Make splices and taps that are compatible with conductor material and that possess equivalent or better mechanical strength and insulation ratings than unspliced conductors.
- I. Wiring at Outlets: Install conductor at each outlet, with at least 12 inches (300 mm) of slack.

3.4 SLEEVE INSTALLATION FOR ELECTRICAL PENETRATIONS

- A. Coordinate sleeve selection and application with selection and application of firestopping specified in Specification Section "Firestopping."
- B. Concrete Slabs and Walls: Install sleeves for penetrations unless core-drilled holes or formed openings are used. Install sleeves during erection of slabs and walls.
- C. Fire-Rated Assemblies: Install sleeves for penetrations of fire-rated floor and wall assemblies unless openings compatible with firestop system used are fabricated during construction of floor or wall.
- D. Cut sleeves to length for mounting flush with both wall surfaces.
- E. Extend sleeves installed in floors 2 inches (50 mm) above finished floor level.
- F. Size pipe sleeves to provide 1/4-inch (6.4-mm) annular clear space between sleeve and cable unless sleeve seal is to be installed.
- G. Seal space outside of sleeves with grout for penetrations of concrete and masonry and with approved joint compound for gypsum board assemblies.
- H. Interior Penetrations of Non-Fire-Rated Walls and Floors: Seal annular space between sleeve and cable, using joint sealant appropriate for size, depth, and location of joint according to Specification Section "Joint Sealants."

- I. Fire-Rated-Assembly Penetrations: Maintain indicated fire rating of walls, partitions, ceilings, and floors at cable penetrations. Install sleeves and seal with firestop materials according to Specification Section "Penetration Firestopping."
- J. Roof-Penetration Sleeves: Seal penetration of individual cables with flexible boot-type flashing units applied in coordination with roofing work.
- K. Aboveground Exterior-Wall Penetrations: Seal penetrations using sleeves and mechanical sleeve seals. Size sleeves to allow for 1-inch (25-mm) annular clear space between pipe and sleeve for installing mechanical sleeve seals.
- L. Underground Exterior-Wall Penetrations: Install cast-iron "wall pipes" for sleeves. Size sleeves to allow for 1-inch (25-mm) annular clear space between cable and sleeve for installing mechanical sleeve seals.

3.5 SLEEVE-SEAL INSTALLATION

- A. Install to seal underground exterior-wall penetrations.
- B. Use type and number of sealing elements recommended by manufacturer for cable material and size. Position cable in center of sleeve. Assemble mechanical sleeve seals and install in annular space between cable and sleeve. Tighten bolts against pressure plates that cause sealing elements to expand and make watertight seal.

3.6 FIRESTOPPING

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

3.7 FIELD QUALITY CONTROL

- A. Perform tests and inspections and prepare test reports.
- B. Tests and Inspections:
 - 1. After installing conductors and cables and before electrical circuitry has been energized, test service entrance and feeder conductors, and conductors feeding the following critical equipment and services for compliance with requirements of other sections.
- C. Test Reports: Prepare a written report to record the following:
 - 1. Test procedures used.
 - 2. Test results that comply with requirements.
 - 3. Test results that do not comply with requirements and corrective action taken to achieve compliance with requirements.
- D. Remove and replace malfunctioning units and retest as specified above.

END OF SECTION 260519

SECTION 260526 - GROUNDING AND BONDING FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section includes methods and materials for grounding systems and equipment.

1.2 SUBMITTALS

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

1.3 QUALITY ASSURANCE

- A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.
- B. Comply with UL 467 for grounding and bonding materials and equipment.

PART 2 - PRODUCTS

2.1 CONDUCTORS

- A. Insulated Conductors: Copper wire or cable insulated for 600 V unless otherwise required by applicable Code or authorities having jurisdiction.
- B. Bare Copper Conductors:
 - 1. Solid Conductors: ASTM B 3.
 - 2. Stranded Conductors: ASTM B 8.

2.2 CONNECTORS

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

PART 3 - EXECUTION

3.1 APPLICATIONS

- A. Conductors: Install solid conductor for No. 10 AWG and smaller, and stranded conductors for No. 8 AWG and larger, unless otherwise indicated.

3.2 EQUIPMENT GROUNDING

- A. Install insulated equipment grounding conductors with the following items, in addition to those required by NFPA 70:
 - 1. Feeders and branch circuits.
 - 2. Receptacle circuits.
 - 3. Single-phase motor and appliance branch circuits.
 - 4. Three-phase motor and appliance branch circuits.
 - 5. Flexible raceway runs.

3.3 INSTALLATION

- A. Grounding Conductors: Route along shortest and straightest paths possible, unless otherwise indicated or required by Code. Avoid obstructing access or placing conductors where they may be subjected to strain, impact, or damage.
- B. Bonding Straps and Jumpers: Install in locations accessible for inspection and maintenance, except where routed through short lengths of conduit.
 - 1. Bonding to Structure: Bond straps directly to basic structure, taking care not to penetrate any adjacent parts.
 - 2. Bonding to Equipment Mounted on Vibration Isolation Hangers and Supports: Install so vibration is not transmitted to rigidly mounted equipment.
 - 3. Use exothermic-welded connectors for outdoor locations, but if a disconnect-type connection is required, use a bolted clamp.

END OF SECTION 260526

SECTION 260533 - RACEWAY AND BOXES FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL

1.1 SUMMARY

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

1.2 SUBMITTALS

- A. Product Data: For surface raceways, wireways and fittings, floor boxes, hinged-cover enclosures, and cabinets.
- B. Shop Drawings: For custom enclosures and cabinets. Include plans, elevations, sections, details, and attachments to other work.

1.3 QUALITY ASSURANCE

- A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.
- B. Comply with NFPA 70.

PART 2 - PRODUCTS

2.1 METAL CONDUIT AND TUBING

- A. Rigid Steel Conduit: ANSI C80.1.
- B. EMT: ANSI C80.3.
- C. FMC: Zinc-coated steel.
- D. LFMC: Flexible steel conduit with PVC jacket.
- E. Fittings for Conduit (Including all Types and Flexible and Liquidtight), EMT, and Cable: NEMA FB 1; listed for type and size raceway with which used, and for application and environment in which installed.
 - 1. Fittings for EMT: Steel, compression insulated throat type.

2.2 BOXES, ENCLOSURES, AND CABINETS

- A. Sheet Metal Outlet and Device Boxes: NEMA OS 1.

- B. Cast-Metal Outlet and Device Boxes: NEMA FB 1, ferrous alloy, Type FD, with gasketed cover.
- C. Small Sheet Metal Pull and Junction Boxes: NEMA OS 1.
- D. Cast-Metal Access, Pull, and Junction Boxes: NEMA FB 1, galvanized, cast iron with gasketed cover.
- E. Hinged-Cover Enclosures: NEMA 250, Type 1, with continuous-hinge cover with flush latch, unless otherwise indicated.
 - 1. Metal Enclosures: Steel, finished inside and out with manufacturer's standard enamel.

PART 3 - EXECUTION

3.1 RACEWAY APPLICATION

- A. Comply with the following indoor applications, unless otherwise indicated:
 - 1. Exposed, Not Subject to Physical Damage: EMT.
 - 2. Exposed, Not Subject to Severe Physical Damage: EMT.
 - 3. Exposed and Subject to Severe Physical Damage: Rigid steel conduit. Includes raceways in the following locations:
 - a. Warehouse area below 12'-0" and not protected by fencing.
 - b. Mechanical rooms.
 - 4. Concealed in Ceilings and Interior Walls and Partitions: EMT.
 - 5. Connection to Vibrating Equipment (Including Transformers and Hydraulic, Pneumatic, Electric Solenoid, or Motor-Driven Equipment): FMC, except use LFMC in damp or wet locations.
 - 6. Damp or Wet Locations: Rigid steel conduit.
 - 7. Boxes and Enclosures: NEMA 250, Type 1, except use NEMA 250, Type 4, nonmetallic in damp or wet locations.
- B. Minimum Raceway Size 3/4-inch (21-mm) trade size, interior applications, and 1-inch for underground applications and interior telecommunications applications.
- C. Raceway Fittings: Compatible with raceways and suitable for use and location.
 - 1. Rigid Steel Conduit: Use threaded rigid steel conduit fittings, unless otherwise indicated.
 - 2. EMT: Use steel compression fittings; connectors shall have insulated throats.
 - 3. EMT: Where conduits do not terminate in a box or other enclosure, provide with insulated throat connector at termination point.

3.2 INSTALLATION

- A. Comply with NECA 1 for installation requirements applicable to products specified in Part 2 except where requirements on Drawings or in this Article are stricter.
- B. Keep raceways at least 6 inches (150 mm) away from parallel runs of flues and steam or hot-water pipes. Install horizontal raceway runs above water and steam piping.
- C. Complete raceway installation before starting conductor installation.
- D. Support raceways as specified in Division 26 Section "Hangers and Supports for Electrical Systems."
- E. Arrange stub-ups so curved portions of bends are not visible above the finished slab.
- F. Install no more than the equivalent of three 90-degree bends in any conduit run except for communications conduits, for which fewer bends are allowed.
- G. Conceal conduit and EMT within finished walls, ceilings, and floors, unless otherwise indicated.
- H. Raceways Embedded in Slabs:
 - 1. Run conduit larger than 1-inch (27-mm) trade size, parallel or at right angles to main reinforcement. Where at right angles to reinforcement, place conduit close to slab support.
 - 2. Arrange raceways to cross building expansion joints at right angles with expansion fittings.
- I. Raceway Terminations at Locations Subject to Moisture or Vibration: Use insulating bushings to protect conductors, including conductors smaller than No. 4 AWG.
- J. Install pull wires in empty raceways. Use polypropylene or monofilament plastic line with not less than 200-lb (90-kg) tensile strength. Leave at least 12 inches (300 mm) of slack at each end of pull wire.
- K. Install raceway sealing fittings at suitable, approved, and accessible locations and fill them with listed sealing compound. For concealed raceways, install each fitting in a flush steel box with a blank cover plate having a finish similar to that of adjacent plates or surfaces. Install raceway sealing fittings at the following points:
 - 1. Where conduits pass from warm to cold locations, such as boundaries of refrigerated spaces.
 - 2. Where otherwise required by NFPA 70, including service entrance points (NEC230-8).
- L. Flexible Conduit Connections: Use maximum of 72 inches (1830 mm) of flexible conduit for recessed and semi-recessed lighting fixtures, equipment subject to vibration, noise transmission, or movement; and for transformers and motors.
 - 1. Use LFMC in damp or wet locations subject to severe physical damage.

2. Use LFMC in damp or wet locations not subject to severe physical damage.
- M. Recessed Boxes in Masonry Walls: Saw-cut opening for box in center of cell of masonry block, and install box flush with surface of wall.
- N. Where concentric, eccentric or over-sized knockouts are encountered, a grounding-type insulated bushing shall be provided.
- O. GRC shall be terminated with either double lock nuts/bushings or in a threaded hub.
- P. The use of LBs shall be limited as much as possible. Where used for raceway larger than 2" in size, "mogul" type bodies shall be provided.
- Q. Set metal floor boxes level and flush with finished floor surface.
- R. **No flexible conduits or condulets shall be used for Telecommunications cabling installation. In addition, pull boxes must be installed on all Telecommunications raceway where the number of bends exceeds 180 degrees between boxes.**
- S. Boxes and Conduit shall be painted as identified in other sections of the specifications or as detailed on the Drawings. Circuit information on above ceiling boxes shall be clearly indicated with indelible marker on all lighting and power circuits.

3.3 FIRESTOPPING

- A. Apply firestopping to electrical penetrations of fire-rated floor and wall assemblies to restore original fire-resistance rating of assembly. Firestopping materials and installation requirements are specified in Specification Section "Firestopping."

END OF SECTION 260533

SECTION 260553 - IDENTIFICATION FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes the following:

1. Identification for conductors and communication and control cable.
2. Warning labels and signs.
3. Equipment identification labels.

1.2 SUBMITTALS

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

1.3 QUALITY ASSURANCE

A. Comply with ANSI A13.1.

1.4 COORDINATION

A. Coordinate identification names, abbreviations, colors, and other features with requirements in the Contract Documents, Shop Drawings, manufacturer's wiring diagrams, and the Operation and Maintenance Manual, and with those required by codes, standards, and 29 CFR 1910.145. Use consistent designations throughout Project.

PART 2 - PRODUCTS

2.1 CONDUCTOR AND COMMUNICATION- AND CONTROL-CABLE IDENTIFICATION MATERIALS

A. Marker Tape: Vinyl or vinyl -cloth, self-adhesive wraparound type, with circuit identification legend machine printed by thermal transfer or equivalent process.

2.2 WARNING LABELS AND SIGNS

A. Comply with NFPA 70 and 29 CFR 1910.145.

B. Self-Adhesive Warning Labels: Factory printed, multicolor, pressure-sensitive adhesive labels, configured for display on front cover, door, or other access to equipment, unless otherwise indicated.

- C. Baked-Enamel Warning Signs: Preprinted aluminum signs, punched or drilled for fasteners, with colors, legend, and size required for application. 1/4-inch (6.4-mm) grommets in corners for mounting. Nominal size, 7 by 10 inches (180 by 250 mm).
- D. Metal-Backed, Butyrate Warning Signs: Weather-resistant, nonfading, preprinted, cellulose-acetate butyrate signs with 0.0396-inch (1-mm) galvanized-steel backing; and with colors, legend, and size required for application. 1/4-inch (6.4-mm) grommets in corners for mounting. Nominal size, 10 by 14 inches (250 by 360 mm).
- E. Fasteners for Signs: Self-tapping, stainless-steel screws or stainless-steel machine screws with nuts and flat and lock washers.
- F. Warning label and sign shall include, but are not limited to, the following legends:
 - 1. Multiple Power Source Warning: "DANGER - ELECTRICAL SHOCK HAZARD - EQUIPMENT HAS MULTIPLE POWER SOURCES."
 - 2. Workspace Clearance Warning: "WARNING - OSHA REGULATION - AREA IN FRONT OF ELECTRICAL EQUIPMENT MUST BE KEPT CLEAR FOR 36 INCHES (915 mm)."
 - 3. Arc Flash Hazard Warning: "DANGER-ARC FLASH AND SHOCK HAZARD-APPROPRIATE PPE REQUIRED"
 - a. Label shall include a location for the following information to be written in by the Contractor; Flash Hazard Category, Min. Arc Rating, Flash Hazard Boundary.
 - b. Contractor shall refer to the riser diagram for this information and confer with the Designer at the end of the Project to confirm that the values are still valid. Contractor shall finalize labeling after receiving approval of the Designer.

2.3 EQUIPMENT IDENTIFICATION LABELS

- A. Engraved phenolic labels, lettering no less than 3/8" high.

PART 3 - EXECUTION

3.1 APPLICATION

- A. Auxiliary Electrical Systems Conductor and Cable Identification: Use marker tape to identify field-installed alarm, control, signal, sound, intercommunications, voice, and data wiring connections.
 - 1. Identify conductors, cables, and terminals in enclosures and at junctions, terminals, and cable pull points. Identify by system and circuit designation.
 - 2. Use system of designations that is uniform and consistent with system used by manufacturer for factory-installed connections.

- B. Equipment Identification Labels: On each unit of equipment, install unique designation label that is consistent with wiring diagrams, schedules, and Operation and Maintenance Manual. Apply labels to disconnect switches and protection equipment, central or master units, control panels, control stations, terminal cabinets, and racks of each system. Systems include power, lighting, control, communication, signal, monitoring, and alarm systems unless equipment is provided with its own identification.
 - 1. Labeling Instructions:
 - a. Blue surface with white core for 208Y/120 volt equipment.
 - b. Black surface with white core for 480Y/120 volt equipment
 - c. Red surface with white core for life safety equipment
 - 2. Equipment to Be Labeled:
 - a. Panelboards, electrical cabinets, and enclosures.
 - b. Enclosed circuit breakers and disconnect switches.
 - c. Motor starters and VFDs. Division 26 shall provide all labels.
 - d. Fire alarm panel.

3.2 INSTALLATION

- A. Verify identity of each item before installing identification products.
- B. Location: Install identification materials and devices at locations for most convenient viewing without interference with operation and maintenance of equipment.
- C. Apply identification devices to surfaces that require finish after completing finish work.
- D. Self-Adhesive Identification Products: Clean surfaces before application, using materials and methods recommended by manufacturer of identification device.
- E. Attach non-adhesive signs and plastic labels with screws and auxiliary hardware appropriate to the location and substrate.
- F. **Paint conduit and boxes per Wake County Standards. Refer to the Drawings for additional information.**
- G. Color-Coding for Phase Identification, 600 V and Less: Use the colors listed below for ungrounded conductors UNLESS EXISTING COLOR CODING DIFFERS:
 - 1. Color shall be factory applied.
 - 2. Colors for 208Y/120-V Circuits:
 - a. Phase A: Black.
 - b. Phase B: Red.
 - c. Phase C: Blue.
 - d. Neutral: White
 - e. Ground: Green

3. Colors for 480Y/277-V Circuits:
 - a. Phase A: Brown.
 - b. Phase B: Orange.
 - c. Phase C: Yellow.
 - d. Neutral: Gray
 - e. Ground: Green

END OF SECTION 260553

SECTION 262726 - WIRING DEVICES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:
 - 1. Standard-grade receptacles, 125 V, **20 A**.
 - 2. GFCI receptacles, 125 V, 20 A.
 - 3. Wall plates.

1.3 DEFINITIONS

- A. AFCI: Arc-fault circuit interrupter.
- B. BAS: Building automation system.
- C. EMI: Electromagnetic interference.
- D. GFCI: Ground-fault circuit interrupter.
- E. Pigtail: Short lead used to connect a device to a branch-circuit conductor.
- F. RFI: Radio-frequency interference.
- G. SPD: Surge protective device.

1.4 ACTION SUBMITTALS

- A. Product Data: For each type of product.
- B. Shop Drawings: List of legends and description of materials and process used for premarking wall plates.
- C. Samples: One for each type of device and wall plate specified, in each color specified.

1.5 INFORMATIONAL SUBMITTALS

- A. Field quality-control reports.

1.6 CLOSEOUT SUBMITTALS

- A. Operation and Maintenance Data: For wiring devices to include in all manufacturers' packing-label warnings and instruction manuals that include labeling conditions.

PART 2 - PRODUCTS

2.1 GENERAL WIRING-DEVICE REQUIREMENTS

- A. Wiring Devices, Components, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and use.
- B. Comply with NFPA 70.
- C. RoHS compliant.
- D. Comply with NEMA WD 1.
- E. Devices that are manufactured for use with modular plug-in connectors may be substituted under the following conditions:
 - 1. Connectors shall comply with UL 2459 and shall be made with stranding building wire.
 - 2. Devices shall comply with requirements in this Section.
- F. Devices for Owner-Furnished Equipment:
 - 1. Receptacles: Match plug configurations.
 - 2. Cord and Plug Sets: Match equipment requirements.
- G. Device Color:
 - 1. Wiring Devices Connected to Normal Power System: **As selected by Architect** unless otherwise indicated or required by NFPA 70 or device listing.
- H. Wall Plate Color: For plastic covers, match device color.
- I. Source Limitations: Obtain each type of wiring device and associated wall plate from single source from single manufacturer.

2.2 STANDARD-GRADE RECEPTACLES, 125 V, 20 A

- A. Duplex Receptacles, 125 V, 20 A :
 - 1. Description: Two pole, three wire, and self-grounding.

2. Configuration: NEMA WD 6, Configuration 5-20R.
3. Standards: Comply with UL 498 and FS W-C-596.

B. Weather-Resistant Duplex Receptacle, 125 V, 20 A :

1. Description: Two pole, three wire, and self-grounding. Integral shutters that operate only when a plug is inserted in the receptacle. Square face.
2. Configuration: NEMA WD 6, Configuration 5-20R.
3. Standards: Comply with UL 498.
4. Marking: Listed and labeled as complying with NFPA 70, "Receptacles in Damp or Wet Locations" Article.

2.3 GFCI RECEPTACLES, 125 V, 20 A

A. Duplex GFCI Receptacles, 125 V, 20 A :

1. Description: Integral GFCI with "Test" and "Reset" buttons and LED indicator light. Two pole, three wire, and self-grounding.
2. Configuration: NEMA WD 6, Configuration 5-20R.
3. Standards: Comply with UL 498, UL 943 Class A, and FS W-C-596.

2.4 WALL PLATES

A. Single Source: Obtain wall plates from same manufacturer of wiring devices.

B. Single and combination types shall match corresponding wiring devices.

1. Plate-Securing Screws: Metal with head color to match plate finish.
2. Material for Finished Spaces: **0.035-inch- (1-mm-) thick, satin-finished, Type 302 stainless steel.**
3. Material for Unfinished Spaces: **Galvanized steel.**

C. Wet-Location, Weatherproof Cover Plates: NEMA 250, complying with Type 3R, weather-resistant, **die-cast aluminum** with lockable cover.

D. Antimicrobial Cover Plates:

1. Contact surfaces treated with a coating that kills 99.9 percent of certain common bacteria within two hours when regularly and properly cleaned.
2. Tarnish resistant.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Comply with NECA 1, including mounting heights listed in that standard, unless otherwise indicated.

B. Coordination with Other Trades:

1. Protect installed devices and their boxes. Do not place wall finish materials over device boxes, and do not cut holes for boxes with routers that are guided by riding against outside of boxes.
2. Keep outlet boxes free of plaster, drywall joint compound, mortar, cement, concrete, dust, paint, and other material that may contaminate the raceway system, conductors, and cables.
3. Install device boxes in brick or block walls so that the cover plate does not cross a joint unless the joint is troweled flush with the face of the wall.
4. Install wiring devices after all wall preparation, including painting, is complete.

C. Conductors:

1. Do not strip insulation from conductors until right before they are spliced or terminated on devices.
2. Strip insulation evenly around the conductor using tools designed for the purpose. Avoid scoring or nicking of solid wire or cutting strands from stranded wire.
3. The length of free conductors at outlets for devices shall comply with NFPA 70, Article 300, without pigtails.
4. Existing Conductors:
 - a. Cut back and pigtail, or replace all damaged conductors.
 - b. Straighten conductors that remain and remove corrosion and foreign matter.
 - c. Pigtailing existing conductors is permitted, provided the outlet box is large enough.

D. Device Installation:

1. Replace devices that have been in temporary use during construction and that were installed before building finishing operations were complete.
2. Keep each wiring device in its package or otherwise protected until it is time to connect conductors.
3. Do not remove surface protection, such as plastic film and smudge covers, until the last possible moment.
4. Connect devices to branch circuits using pigtails that are not less than **6 inches (152 mm)** in length.
5. When there is a choice, use side wiring with binding-head screw terminals. Wrap solid conductor tightly clockwise, two-thirds to three-fourths of the way around terminal screw.
6. Use a torque screwdriver when a torque is recommended or required by manufacturer.
7. When conductors larger than No. 12 AWG are installed on 15- or 20-A circuits, splice No. 12 AWG pigtails for device connections.
8. Tighten unused terminal screws on the device.
9. When mounting into metal boxes, remove the fiber or plastic washers used to hold device-mounting screws in yokes, allowing metal-to-metal contact.

E. Receptacle Orientation:

1. Install ground pin of vertically mounted receptacles **up**, and on horizontally mounted receptacles to the **right**.
- F. Device Plates: Do not use oversized or extra-deep plates. Repair wall finishes and remount outlet boxes when standard device plates do not fit flush or do not cover rough wall opening.
- G. Arrangement of Devices: Unless otherwise indicated, mount flush, with long dimension vertical and with grounding terminal of receptacles on top. Group adjacent switches under single, multigang wall plates.
- H. Adjust locations of floor service outlets and service poles to suit arrangement of partitions and furnishings.

3.2 GFCI RECEPTACLES

- A. Install non-feed-through GFCI receptacles where protection of downstream receptacles is not required.

3.3 IDENTIFICATION

- A. Comply with Section 260553 "Identification for Electrical Systems."
- B. Identify each receptacle with panelboard identification and circuit number..

3.4 FIELD QUALITY CONTROL

- A. Test Instruments: Use instruments that comply with UL 1436.
- B. Tests for Receptacles:
 1. Line Voltage: Acceptable range is 105 to 132 V.
 2. Percent Voltage Drop under 15-A Load: A value of 6 percent or higher is unacceptable.
 3. Ground Impedance: Values of up to 2 ohms are acceptable.
 4. GFCI Trip: Test for tripping values specified in UL 1436 and UL 943.
 5. Using the test plug, verify that the device and its outlet box are securely mounted.
 6. Tests shall be diagnostic, indicating damaged conductors, high resistance at the circuit breaker, poor connections, inadequate fault-current path, defective devices, or similar problems. Correct circuit conditions, remove malfunctioning units and replace with new ones, and retest as specified above.
- C. Wiring device will be considered defective if it does not pass tests and inspections.
- D. Prepare test and inspection reports.

END OF SECTION 262726

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SECTION 262816 - ENCLOSED SWITCHES AND CIRCUIT BREAKERS

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Fusible switches.
 - 2. Non-fusible switches.

1.2 DEFINITIONS

- A. NC: Normally closed.
- B. NO: Normally open.
- C. SPDT: Single pole, double throw.

1.3 SUBMITTALS

- A. Product Data: For each type of enclosed switch, circuit breaker, accessory, and component indicated.
- B. Shop Drawings: For enclosed switches and circuit breakers. Include plans, elevations, sections, details, and attachments to other work.
 - 1. Wiring Diagrams: For power, signal, and control wiring.
- C. Field quality-control reports.
- D. Operation and maintenance data.

1.4 QUALITY ASSURANCE

- A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified third party testing agency, and marked for intended location and application.
- B. Comply with NFPA 70.

PART 2 - PRODUCTS

2.1 FUSIBLE SWITCHES

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Eaton Electrical Inc.; Cutler-Hammer Business Unit.
 2. General Electric Company; GE Consumer & Industrial - Electrical Distribution.
 3. Square D; a brand of Schneider Electric.
- B. Type HD, Heavy Duty, Single Throw, 600-V ac, 1200 A and Smaller: UL 98 and NEMA KS 1, horsepower rated, with clips or bolt pads to accommodate fuses, lockable handle with capability to accept three padlocks, and provided with a defeatable interlock with cover in closed position.
- C. Accessories:
1. Equipment Ground Kit: Internally mounted and labeled for copper and aluminum ground conductors.
 2. Neutral Kit: Internally mounted; insulated, capable of being grounded and bonded; labeled for copper and aluminum neutral conductors.
 3. Class R Fuse Kit: Provides rejection of other fuse types when Class R fuses are specified.
 4. Lugs: Suitable for number, size, and conductor material.
 5. Auxiliary Form C contact that changes state based on position of handle.

2.2 NONFUSIBLE SWITCHES

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
1. Eaton Electrical Inc.; Cutler-Hammer Business Unit.
 2. General Electric Company; GE Consumer & Industrial - Electrical Distribution.
 3. Square D; a brand of Schneider Electric.
- B. Type HD, Heavy Duty, Single Throw, 600-V ac, 1200 A and Smaller: UL 98 and NEMA KS 1, horsepower rated, lockable handle with capability to accept three padlocks, and provided with a defeatable interlock with cover in closed position.
- C. Accessories:
1. Equipment Ground Kit: Internally mounted and labeled for copper and aluminum ground conductors.
 2. Neutral Kit: Internally mounted; insulated, capable of being grounded and bonded; labeled for copper and aluminum neutral conductors.
 3. Lugs: Suitable for number, size, and conductor material.
 4. Auxiliary Form C contact that changes state based on position of handle.

2.3 ENCLOSURES

- A. Enclosed Switches and Circuit Breakers: NEMA AB 1, NEMA KS 1, NEMA 250, and UL 50, to comply with environmental conditions at installed location.
1. Indoor, Dry and Clean Locations: NEMA 250, Type 1.
 2. **Outdoor Locations: NEMA Type 4X, Stainless Steel.**

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install individual wall-mounted switches and circuit breakers with tops at uniform height unless otherwise indicated.
- B. Temporary Lifting Provisions: Remove temporary lifting eyes, channels, and brackets and temporary blocking of moving parts from enclosures and components.
- C. Install fuses in fusible devices.
- D. Comply with NECA 1.

3.2 IDENTIFICATION

- A. Comply with requirements in Division 26 Section "Identification for Electrical Systems."
 - 1. Identify field-installed conductors, interconnecting wiring, and components; provide warning signs.
 - 2. Label each enclosure with engraved metal or laminated-plastic nameplate.

3.3 FIELD QUALITY CONTROL

- A. Perform tests and inspections.
- B. Acceptance Testing Preparation:
 - 1. Test insulation resistance for each enclosed switch and circuit breaker, component, connecting supply, feeder, and control circuit.
 - 2. Test continuity of each circuit.
- C. Tests and Inspections:
 - 1. Perform each visual and mechanical inspection and electrical test stated in NETA Acceptance Testing Specification. Certify compliance with test parameters.
 - 2. Correct malfunctioning units on-site, where possible, and retest to demonstrate compliance; otherwise, replace with new units and retest.
- D. Enclosed switches and circuit breakers will be considered defective if they do not pass tests and inspections.
- E. Prepare test and inspection report, including a certified report that identifies enclosed switches and circuit breakers and that describes scanning results. Include notation of deficiencies detected, remedial action taken and observations after remedial action.

END OF SECTION 262816

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SECTION 265100 - INTERIOR LIGHTING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section includes the following:
 - 1. Interior lighting fixtures, lamps, and ballasts.
 - 2. Emergency lighting units.
 - 3. Exit signs.
 - 4. Lighting fixture supports.

1.3 DEFINITIONS

- A. BF: Ballast factor.
- B. CRI: Color-rendering index.
- C. CU: Coefficient of utilization.
- D. HID: High-intensity discharge.
- E. LER: Luminaire efficacy rating.
- F. Luminaire: Complete lighting fixture, including ballast housing if provided.
- G. RCR: Room cavity ratio.

1.4 SUBMITTALS

- A. Product Data: For each type of lighting fixture, arranged in order of fixture designation. Include data on features, accessories, finishes, and the following:
 - 1. Physical description of lighting fixture including dimensions.
 - 2. Emergency lighting units including battery and charger.
 - 3. Ballast.
 - 4. Energy-efficiency data.
 - 5. Life, output, and energy-efficiency data for lamps.
 - 6. Photometric data, in IESNA format, based on laboratory tests of each lighting fixture type, outfitted with lamps, ballasts, and accessories identical to those indicated for the lighting fixture as applied in this Project.
 - a. Photometric data shall be certified by a manufacturer's laboratory with a current accreditation under the National Voluntary Laboratory Accreditation Program (NVLAP) for Energy Efficient Lighting Products.

- B. Shop Drawings: Show details of nonstandard or custom lighting fixtures. Indicate dimensions, weights, methods of field assembly, components, features, and accessories.
 - 1. Wiring Diagrams: Power wiring.
- C. Samples for Verification: Interior lighting fixtures designated for sample submission in Interior Lighting Fixture Schedule. Each sample shall include the following:
 - 1. Lamps: Specified units installed.
 - 2. Accessories: Cords and plugs.
- D. Product Certificates: For each type of ballast for bi-level and dimmer-controlled fixtures, signed by product manufacturer.
- E. Qualification Data: For agencies providing photometric data for lighting fixtures.
- F. Field quality-control test reports.
- G. Operation and Maintenance Data: For lighting equipment and fixtures to include in emergency, operation, and maintenance manuals.
- H. Warranties: Special warranties specified in this Section.

1.5 QUALITY ASSURANCE

- A. Luminaire Photometric Data Testing Laboratory Qualifications: Provided by manufacturers' laboratories that are accredited under the National Volunteer Laboratory Accreditation Program for Energy Efficient Lighting Products.
- B. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.
- C. Comply with NFPA 70.

1.6 COORDINATION

- A. Coordinate layout and installation of lighting fixtures and suspension system with other construction that penetrates ceilings or is supported by them, including HVAC equipment, fire-suppression system, and partition assemblies.

1.7 WARRANTY

- A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace products that fail in materials or workmanship; that corrode; or that fade, stain, perforate, erode, or chalk due to effects of weather or solar radiation within specified warranty period. Manufacturer may exclude lightning damage, hail damage, vandalism, abuse, or unauthorized repairs or alterations from special warranty coverage.
 - 1. Warranty Period for Luminaires: Five years from date of Substantial Completion.

2. Warranty Period for Metal Corrosion: Five years from date of Substantial Completion.
3. Warranty Period for Color Retention: Five years from date of Substantial Completion.
4. LED Luminaire Warranty:
 - a. Provide a comprehensive written 5-year warranty for including luminaire finish, on-site replacement of material, and workmanship. On-site replacement includes transportation, removal, and installation of new products. Finish warranty shall include warranty against failure or substantial deterioration such as blistering, cracking, peeling, chalking, or fading.
 - b. Provide a written 5-year replacement material warranty for defective or non-starting LED source assemblies.
 - c. Provide a written 5-year replacement material warranty on all PSUs.
 - d. Provide a written 5-year replacement warranty for non-maintained illuminance levels on all light sources (LED package, LED array, or LED module) including, but not limited to the LED die, encapsulate, and phosphor. If the expected useful life of the luminaire system as defined in this specification is not maintained, then the manufacturer shall replace the light source(s) or luminaire as needed.
 - e. Provide a written 5-year warranty that LED color shift from initial shall color be less than 0.007 on the CIE 1976 (u',v') diagram

1.8 EXTRA MATERIALS

- A. Furnish extra materials described below that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
 1. LED Modules: 5 for every 100 of each type and rating installed. Furnish at least five (5) of each type.
 2. Drivers: 5 for every 100 of each type and rating installed. Furnish at least five (5) of each type.
 3. Fixture Types: one (1) of each type except Type PA2.

PART 2 - PRODUCTS

2.1 LIGHTING FIXTURES AND COMPONENTS, GENERAL REQUIREMENTS

- A. Recessed Fixtures: Comply with NEMA LE 4 for ceiling compatibility for recessed fixtures.
- B. Fluorescent Fixtures: Comply with UL 1598. Where LER is specified, test according to NEMA LE 5 and NEMA LE 5A as applicable.
- C. Metal Parts: Free of burrs and sharp corners and edges.
- D. Sheet Metal Components: Steel, unless otherwise indicated. Form and support to prevent warping and sagging.

- E. Doors, Frames, and Other Internal Access: Smooth operating, free of light leakage under operating conditions, and designed to permit relamping without use of tools. Designed to prevent doors, frames, lenses, diffusers, and other components from falling accidentally during relamping and when secured in operating position.
- F. Reflecting surfaces shall have minimum reflectance as follows, unless otherwise indicated:
 - 1. White Surfaces: 85 percent.
 - 2. Specular Surfaces: 83 percent.
 - 3. Diffusing Specular Surfaces: 75 percent.
 - 4. Laminated Silver Metallized Film: 90 percent.
- G. Plastic Diffusers, Covers, and Globes:
 - 1. Acrylic Lighting Diffusers: 100 percent virgin acrylic plastic. High resistance to yellowing and other changes due to aging, exposure to heat, and UV radiation.
 - a. Lens Thickness: At least 0.125 inch (3.175 mm) minimum unless different thickness is indicated.
 - b. UV stabilized.
 - 2. Glass: Annealed crystal glass, unless otherwise indicated.

2.2 LED LIGHTING

- A. General:
 - 1. LED light fixtures shall be in accordance with IES, NFPA, UL, as shown on the drawings, and as specified.
 - 2. LED light fixtures shall be Reduction of Hazardous Substances (RoHS)-compliant.
 - 3. LED drivers shall include the following features unless otherwise indicated:
 - a. Minimum efficiency: 85% at full load.
 - b. Minimum Operating Ambient Temperature: -20° C. (-4° F.)
 - c. Input Voltage: 120 - 277V (±10%) at 60 Hz.
 - d. Integral short circuit, open circuit, and overload protection.
 - e. Power Factor: ≥ 0.95.
 - f. Total Harmonic Distortion: ≤ 20%.
 - g. Comply with FCC 47 CFR Part 15.
 - 4. LED modules shall include the following features unless otherwise indicated:
 - a. Comply with IES LM-79 and LM-80 requirements.
 - b. Minimum CRI 80 and color temperature 3000° K unless otherwise specified in LIGHTING FIXTURE SCHEDULE.
 - c. Minimum Rated Life: 50,000 hours per IES L70.
 - d. Light output lumens as indicated in the LIGHTING FIXTURE SCHEDULE.
- B. LED Downlights:

1. Housing, LED driver, and LED module shall be products of the same manufacturer.

2.3 EXIT SIGNS

- A. Description: Comply with UL 924; for sign colors, visibility, luminance, and lettering size, comply with authorities having jurisdiction.
- B. Internally Lighted Signs:
 1. Lamps for AC Operation: LEDs, 70,000 hours minimum rated lamp life.
 2. Self-Powered Exit Signs (Battery Type): Integral automatic charger in a self-contained power pack.
 - a. Battery: Sealed, maintenance-free, nickel-cadmium type.
 - b. Charger: Fully automatic, solid-state type with sealed transfer relay.
 - c. Operation: Relay automatically energizes lamp from battery when circuit voltage drops to 80 percent of nominal voltage or below. When normal voltage is restored, relay disconnects lamps from battery, and battery is automatically recharged and floated on charger.
 - d. Test Push Button: Push-to-test type, in unit housing, simulates loss of normal power and demonstrates unit operability.
 - e. LED Indicator Light: Indicates normal power on. Normal glow indicates trickle charge; bright glow indicates charging at end of discharge cycle.
 - f. Remote Test: Switch in hand-held remote device aimed in direction of tested unit initiates coded infrared signal. Signal reception by factory-installed infrared receiver in tested unit triggers simulation of loss of its normal power supply, providing visual confirmation of either proper or failed emergency response.
 - g. Integral Self-Test: Factory-installed electronic device automatically initiates code-required test of unit emergency operation at required intervals. Test failure is annunciated by an integral audible alarm and flashing red LED.

2.4 EMERGENCY LIGHTING UNITS

- A. Description: Self-contained units complying with UL 924.
 1. Battery: Sealed, maintenance-free, lead-acid type.
 2. Charger: Fully automatic, solid-state type with sealed transfer relay.
 3. Operation: Relay automatically turns lamp on when power supply circuit voltage drops to 80 percent of nominal voltage or below. Lamp automatically disconnects from battery when voltage approaches deep-discharge level. When normal voltage is restored, relay disconnects lamps from battery, and battery is automatically recharged and floated on charger.
 4. Test Push Button: Push-to-test type, in unit housing, simulates loss of normal power and demonstrates unit operability.
 5. LED Indicator Light: Indicates normal power on. Normal glow indicates trickle charge; bright glow indicates charging at end of discharge cycle.
 6. Wire Guard: Heavy-chrome-plated wire guard protects lamp heads or fixtures.

7. Integral Self-Test: Factory-installed electronic device automatically initiates code-required test of unit emergency operation at required intervals. Test failure is annunciated by an integral audible alarm and flashing red LED.

2.5 LIGHTING FIXTURE SUPPORT COMPONENTS

- A. Comply with Division 16 Section "Hangers and Supports for Electrical Systems" for channel- and angle-iron supports and nonmetallic channel and angle supports.
- B. Single-Stem Hangers: 1/2-inch (13-mm) steel tubing with swivel ball fittings and ceiling canopy. Finish same as fixture.
- C. Twin-Stem Hangers: Two, 1/2-inch (13-mm) steel tubes with single canopy designed to mount a single fixture. Finish same as fixture.
- D. Wires: ASTM A 641/A 641M, Class 3, soft temper, zinc-coated steel, 12 gage (2.68 mm).
- E. Rod Hangers: 3/16-inch (5-mm) minimum diameter, cadmium-plated, threaded steel rod.
- F. Hook Hangers: Integrated assembly matched to fixture and line voltage and equipped with threaded attachment, cord, and locking-type plug.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Lighting fixtures: Set level, plumb, and square with ceilings and walls. Install lamps in each fixture.
- B. Support for Lighting Fixtures in or on Grid-Type Suspended Ceilings: Use grid as a support element.
 1. Install a minimum of four ceiling support system rods or wires for each fixture. Locate not more than 6 inches (150 mm) from lighting fixture corners.
 2. Support Clips: Fasten to lighting fixtures and to ceiling grid members at or near each fixture corner with clips that are UL listed for the application.
 3. Fixtures of Sizes Less Than Ceiling Grid: Install as indicated on reflected ceiling plans or center in acoustical panel, and support fixtures independently with at least two 3/4-inch (20-mm) metal channels spanning and secured to ceiling tees.
 4. Install at least one independent support rod or wire from structure to a tab on lighting fixture. Wire or rod shall have breaking strength of the weight of fixture at a safety factor of 3.
- C. Suspended Lighting Fixture Support:
 1. Pendants and Rods: Where longer than 48 inches (1200 mm), brace to limit swinging.
 2. Stem-Mounted, Single-Unit Fixtures: Suspend with twin-stem hangers.

3. Continuous Rows: Use tubing or stem for wiring at one point and tubing or rod for suspension for each unit length of fixture chassis, including one at each end.

D. Adjust aimable lighting fixtures to provide required light intensities.

E. Connect wiring according to Division 26 Section "Low-Voltage Electrical Power Conductors and Cables."

3.2 FIELD QUALITY CONTROL

A. Test for Emergency Lighting: Interrupt power supply to demonstrate proper operation. Verify transfer from normal power to battery and retransfer to normal.

B. Prepare a written report of tests, inspections, observations, and verifications indicating and interpreting results. If adjustments are made to lighting system, retest to demonstrate compliance with standards.

END OF SECTION 265100

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SECTION 283111- DIGITAL, ADDRESSABLE FIRE-ALARM SYSTEM

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Notification appliances.
2. Addressable interface device.

1.2 SYSTEM DESCRIPTION

- A. Noncoded, addressable system, with multiplexed signal transmission, dedicated to fire-alarm service only.

1.3 SUBMITTALS

A. General Submittal Requirements:

1. Submittals shall be approved by authorities having jurisdiction prior to submitting them to Architect.
2. Shop Drawings shall be prepared by persons with the following qualifications:
 - a. Trained and certified by manufacturer in fire-alarm system design.
 - b. NICET-certified fire-alarm technician, Level III minimum.

B. Product Data: For each type of product indicated.

C. Shop Drawings: For fire-alarm system. Include plans, elevations, sections, details, and attachments to other work.

1. Comply with recommendations in the "Documentation" Section of the "Fundamentals of Fire Alarm Systems" Chapter in NFPA 72.
2. Include voltage drop calculations for notification appliance circuits.
3. Include battery-size calculations.
4. Include performance parameters and installation details for each detector, verifying that each detector is listed for complete range of air velocity, temperature, and humidity possible when air-handling system is operating.
5. Include plans, sections, and elevations of heating, ventilating, and air-conditioning ducts, drawn to scale and coordinating installation of duct smoke detectors and access to them. Show critical dimensions that relate to placement and support of sampling tubes, detector housing, and remote status and alarm indicators. Locate detectors according to manufacturer's written recommendations.
6. Include floor plans to indicate final outlet locations showing address of each addressable device. Show size and route of cable and conduits.

D. Qualification Data: For qualified Installer.

- E. Field quality-control reports.
- F. Operation and Maintenance Data: For fire-alarm systems and components to include in emergency, operation, and maintenance manuals. In addition to items specified in Division 01 Section "Operation and Maintenance Data," include the following:
 - 1. Comply with the "Records" Section of the "Inspection, Testing and Maintenance" Chapter in NFPA 72.
 - 2. Provide "Record of Completion Documents" according to NFPA 72 article "Permanent Records" in the "Records" Section of the "Inspection, Testing and Maintenance" Chapter.
 - 3. Record copy of site-specific software.
 - 4. Provide "Maintenance, Inspection and Testing Records" according to NFPA 72 article of the same name and include the following:
 - a. Frequency of testing of installed components.
 - b. Frequency of inspection of installed components.
 - c. Requirements and recommendations related to results of maintenance.
 - d. Manufacturer's user training manuals.
 - 5. Manufacturer's required maintenance related to system warranty requirements.
 - 6. Abbreviated operating instructions for mounting at fire-alarm control unit.
 - 7. Copy of NFPA 25.
- G. Software and Firmware Operational Documentation:
 - 1. Software operating and upgrade manuals.
 - 2. Program Software Backup: On magnetic media or compact disk, complete with data files.
 - 3. Device address list.
 - 4. Printout of software application and graphic screens.

1.4 QUALITY ASSURANCE

- A. Installer Qualifications: Personnel shall be trained and certified by manufacturer for installation of units required for this Project.
- B. Source Limitations for Fire-Alarm System and Components: Obtain fire-alarm system from single source from single manufacturer. Components shall be compatible with, and operate as, an extension of existing system.
- C. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

PART 2 - PRODUCTS

2.1 MANUFACTURER'S/MODELS

- A. Manufacturer's/Models: Subject to compliance with requirements in section 1.3.A above, and to meet UL and NFPA requirements related to use of devices with existing systems, the current manufacturer and corresponding panel models that are acceptable to be incorporated into the contract are limited to the following:

1. Fire Lite MS9200

2.2 FIRE ALARM CONTROL PANEL (FACP)

- A. FACP – Existing system to remain

2.3 AUXILIARY POWER SUPPLY PANELS (APS)

- A. APS - Minimum Requirements: All APS(s) shall operate on 120 VAC, 60 Hz and shall have a continuous rating adequate to power all equipment and functions in full alarm continuously utilizing no more than 80% of the total rated ampere output capacity. Additionally, no more than 80% per individual output circuit ampere capacity shall be utilized. 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 APS shall provide a battery charger for 24 hours of standby using dual rate-charging techniques for fast battery recharge. The APS shall be capable of providing a minimum of 24 hours of standby power with an additional 5 minutes in full alarm output, for powering all connected devices. All APS's shall be capable of providing the following general requirements, features, and functions when utilized as an integral part of the system:

1. Shall be capable of being externally triggered or initiated by the FACP, via an addressable control module, for all required output activations.
2. Shall provide multiple regulated and conditioned +24VDC output circuits capable of being supervised with on board LED's for fault indication per output circuit.
3. Shall provide at least (1) one +24VDC auxiliary type output.
4. Shall be capable of battery supervision with an onboard LED fault indicator.
5. Shall provide ground fault monitoring circuitry.
6. Shall provide at least (1) Form "C" dry contact or other on board form of dry contact output that will change states during any fault condition detected, for connection to (1) one addressable monitoring device for individual APS, FACP supervision.
7. Output circuits shall have the capability of being selectively disabled, via on board switch configurations, during any AC power failures.

- B. Back-up Batteries: Shall be completely maintenance free, sealed lead calcium construction with fully gelled electrolyte. Battery nominal life expectancy of 15 years, minimum, is required. Battery voltage and capacity shall be determined by the measured load calculations required by the APS and related connected equipment. Battery shall have sufficient capacity to power the APS for not less than twenty-four hours standby, plus 5 minutes of full alarm output upon a normal AC power failure.

- C. Enclosures: The APS 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. For convenience, the door may be hinged on either the right or left side (field selectable). Where multiple enclosures are required in the same area, the cabinets shall all be the same size and color. Cabinet doors must be electrically bonded to enclosure it serves.

2.4 ALARM NOTIFICATION APPLIANCES

- A. Audible Devices: Shall be located as shown on the Drawings; sounders located outdoors shall be listed for use in wet locations and shall have the following specifications:
 - 1. Voltage: Shall operate on 24 VDC nominal.
 - 2. Programming: Shall be field programmable without the use of special tools, to provide slow whoop, continuous, three pulse temporal or interrupted tones with an output sound level of at least 90 dBA measured at 10 feet from the device.
 - 3. Mounting: Provide surface mounting devices suitable for mounting in a standard device box unless otherwise indicated on the Drawings.
- B. Strobe Lights (Strobes): Strobes shall be located as shown on the Drawings. Strobes indicated for use outdoors shall be mounted at the indicated elevation and listed for use in wet locations. Strobe lights shall flash in synchronization and shall have the following specifications:
 - 1. Voltage: Strobe lights shall operate on 24 VDC nominal.
 - 2. Maximum pulse duration: 2/10ths of one second.
 - 3. Mounting: Provide surface 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 at 6'-8" (2.3 M) Above Finished Floor (AFF) or 6" (15.3 Cm) Below Finished Ceiling (BFC), whichever is lower. Ceiling mounted devices are not permitted without specific location approvals by the owner.
 - 4. Strobe intensity and flash rate: Must meet minimum requirements of UL 1971. Provide synchronous strobe lights with specific intensity Candela (Cd) rating of 177 Cd in all locations unless indicated otherwise on the drawings.
- C. Audible/Visual Combination Devices: Shall be located as shown on the Drawings and shall comply with all applicable requirements for both Horn and Strobe Lights.

2.5 MONITOR AND CONTROL DEVICES

- A. Addressable Dry Contact Monitor Modules: Addressable Monitor Modules shall be provided to connect (1) one non-addressable device or to supervise a non-addressable IDC zone (either Style D or Style B) of conventional type alarm initiating devices (any Normally Open [N.O.] dry contact device) to one of the Fire Alarm Control Panel Signaling Line Circuit Loops. Monitor modules shall be installed as required by the system configuration. All required monitor modules may not be shown on the Drawings.

1. Indication of Operation: Unless otherwise indicated on the Drawings an LED shall be provided that shall flash under normal conditions, indicating that the Monitor Module is operational and in regular communication with the FACP.
 2. Mounting Requirements: Monitor Modules shall be mounted in a standard 4-inch square, 2-1/8" deep electrical box at the same height requirement as Notification Appliance devices in a clearly visible location.
- B. Addressable Control Modules: Addressable Control Modules shall be provided to supervise and control the operation of (1) 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. Control modules shall be rated for the load they control. (Inductive Loads require inductive rated modules.)
1. Mounting Requirements: Control Modules shall mount in a standard 4-inch square, 2-1/8" deep electrical box, and shall only be installed in conditioned spaces.
 2. Configuration: The control module NAC circuit may be wired for Style Y Class 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 NAC's may be energized at the same time on the same pair of wires.
 3. 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
 4. Test Switch: A magnetic test switch shall be provided to test the module without opening or shorting its NAC wiring.
- C. Isolator Modules: Isolator Modules shall be provided to automatically isolate wire-to-wire short circuits on an SLC loop. The Isolator Module shall limit the number of modules or detectors that may be rendered inoperative by a short circuit fault on the SLC Loop.
1. Operation: Isolator Modules shall operate such that if a wire-to-wire short occurs, the Isolator Module shall automatically open-circuit (disconnect) the SLC loop. When the short circuit condition is corrected, the Isolator Module shall automatically reconnect the isolated section. The Isolator Module shall not require any address setting, and its operations shall be totally automatic. It shall not be necessary to replace or reset an Isolator Module after its normal operation.
 2. Locations: Provide (2) Isolator Modules at the FACP for both ends of each SLC loop. Provide a minimum of one (1) Isolator Module in the field at the mid-point

of the device loop. Provide additional modules necessary to limit the number of devices between isolators to 24.

3. Mounting: The Isolator Module shall mount in standard 4-inch square, 2-1/8" deep electrical boxes, wall mounted at the same height as A/V devices in a clearly viewable area in corridors. It shall provide a single LED that shall flash to indicate that the Isolator is operational and shall illuminate steadily to indicate that a short circuit condition has been detected and isolated.

2.6 MISCELLANEOUS SYSTEM ITEMS

A. Wire:

1. Non-Power-Limited Circuits: Copper conductors with 600V rated, THHN/THWN, color coded insulation.
 - a. Low Voltage Circuits: STRANDED, #18 AWG, minimum.
 - b. Line Voltage Circuits: SOLID, #12 AWG, minimum.
2. Power Limited Circuits: NFPA70, Types FPL, FPLR, or FPLP, as recommended by the manufacturer. Data Loop wire shall be shielded pair #18 AWG, 30 pf/ft capacitance or less, unless specifically prohibited by the manufacturer and stated on the wiring submittal.

PART 3 - EXECUTION

3.1 EQUIPMENT INSTALLATION

- A. Comply with NFPA 72 for installation of fire-alarm equipment.
- B. Audible Alarm-Indicating Devices: Install not less than 6 inches (150 mm) below the ceiling. Install bells and horns on flush-mounted back boxes with the device-operating mechanism concealed behind a grille.
- C. Visible Alarm-Indicating Devices: Install adjacent to each alarm bell or alarm horn and at least 6 inches (150 mm) below the ceiling.
- D. Device Location-Indicating Lights: Locate in public space near the device they monitor.

3.2 CONNECTIONS

- A. Make addressable connections with a supervised interface device to the following devices and systems. Install the interface device less than 3 feet (1 m) from the device controlled. Make an addressable confirmation connection when such feedback is available at the device or system being controlled.
 1. Supervisory connections at valve supervisory switches.
- B. Identify system components, wiring, cabling, and terminals.

- C. Install framed instructions in a location visible from fire-alarm control unit.

3.3 GROUNDING

- A. Ground fire-alarm control unit and associated circuits; comply with IEEE 1100. Install a ground wire from main service ground to fire-alarm control unit.

3.4 FIELD QUALITY CONTROL

- A. Field tests shall be witnessed by authorities having jurisdiction
- B. Tests and Inspections:
 - 1. Visual Inspection: Conduct visual inspection prior to testing.
 - a. Inspection shall be based on completed Record Drawings and system documentation that is required by NFPA 72 in its "Completion Documents, Preparation" Table in the "Documentation" Section of the "Fundamentals of Fire Alarm Systems" Chapter.
 - 2. System Testing: Comply with "Test Methods" Table in the "Testing" Section of the "Inspection, Testing and Maintenance" Chapter in NFPA 72.
 - 3. Factory-authorized service representative shall prepare the "Fire Alarm System Record of Completion" in the "Documentation" Section of the "Fundamentals of Fire Alarm Systems" Chapter in NFPA 72 and the "Inspection and Testing Form" in the "Records" Section of the "Inspection, Testing and Maintenance" Chapter in NFPA 72.
- C. Reacceptance Testing: Perform reacceptance testing to verify the proper operation of added or replaced devices and appliances.
- D. Fire-alarm system will be considered defective if it does not pass tests and inspections.
- E. Prepare test and inspection reports.
- F. Maintenance Test and Inspection: Perform tests and inspections listed for weekly, monthly, quarterly, and semiannual periods. Use forms developed for initial tests and inspections.
- G. Annual Test and Inspection: One year after date of Substantial Completion, test fire-alarm system complying with visual and testing inspection requirements in NFPA 72. Use forms developed for initial tests and inspections.

END OF SECTION 283111

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