

INVITATION FOR BIDS

INSTITUTE FOR ADVANCED LEARNING AND RESEARCH

CONFERENCE FACILITY RENOVATIONS

DANVILLE, VIRGINIA

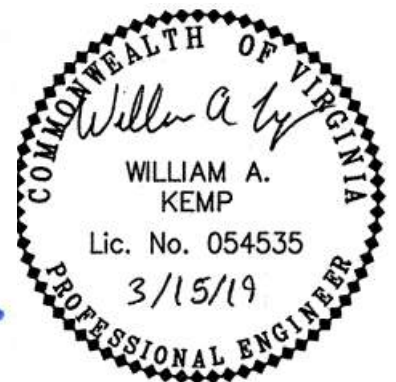
PROJECT NO: 888-18321-000

DEWBERRY ENGINEERS INC.
551 PINEY FOREST ROAD
DANVILLE, VIRGINIA

A/E PROJECT NO. 50100160

DATE: March 15, 2019

SET NO: _____



INSTITUTE FOR ADVANCED LEARNING AND RESEARCH
CONFERENCE FACILITY RENOVATIONS

DANVILLE, VIRGINIA

PROJECT NO: 888-18321-000

March 15, 2019

INVITATION FOR BIDS

BID FORMS ▪ CONDITIONS OF THE CONTRACT ▪ SPECIFICATIONS

INVITATION FOR BIDS FOR
Institute for Advanced Learning and Research
Conference Facility Renovations

PROJECT NO: 885-18321-000

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**Institute for Advanced Learning and Research-“Conference Facility
Renovations”
Invitation to Bid (ITB)**

Project Owner:	Institute for Advanced Learning and Research Foundation Board 150 Slayton Avenue Danville, Virginia 24540
Project Architect:	Dewberry Engineers Inc. 551 Piney Forest Road Danville, Virginia 24540 (434) 797-4497
Project Description:	IALR - Conference Facility Renovations
Reference No.:	ITB No. 2019-03-15
Project Location:	Danville Cyber Park 150 Slayton Avenue Danville, VA 24540
Bid Due Date and Time:	Thursday May 2 nd at 2:00 p.m.
On-Site Pre-Bid Conference:	Wednesday April 10 th at 1:30 p.m. at Institute for Advanced Learning and Research
Bid Bond:	Five Percent of Bid Amount (contingent on Base Bid amount)

The Institute for Advanced Learning and Research Foundation Board (“IALR” or “Owner”) invites bids pursuant to the Virginia Public Procurement Act, Virginia Code §§ 2.2-4301 et seq., from general contractors for the renovations to the existing conference facilities at IALR as described in the Contract Documents (“Project”). The selection process shall be competitive sealed bidding.

- A. Scope of Work: The Project shall include renovations to the existing conference facilities as detailed in the Drawings and Specifications prepared by Dewberry Engineers, Inc. and attached as **Exhibit A** to this Invitation to Bid (“ITB”).
- B. Bid Proposals: Sealed Bids must be mailed or hand delivered to:
- Institute for Advanced Learning and Research
Attn: Procurement Office
Atrium Reception Desk/Procurement
150 Slayton Avenue
Danville, VA 24540

Sealed bids must be received at this location no later than 2:00p.m. local time on May 2, 2019. Bids received after 2:00p.m. local time on May 2, 2019 will be rejected. Oral, telephonic, telegraphic, facsimile, or other electronically transmitted bids will not be considered.

- C. **Contract or Contract Documents:** The Contract Documents will consist of: (i) this ITB, the Instructions to Bidders, any subsequently issued Addenda to this ITB; (ii) the completed and signed Bid Form and Bid Bond; (iii) the Conference Facilities Renovation Agreement attached as **Exhibit B** to this ITB; (iv) the AIA Contract (AIA A201-2017) and Owner's General and Supplementary Conditions attached as **Exhibit C** to this ITB; (v) the Drawings and Specifications prepared by Dewberry Engineers, Inc. and attached as **Exhibit A** to this ITB; (vi) the Performance and Payment Bonds (if required); (vii) any Change Orders or Change Directives; and (viii) any Modifications to the Contract. Each Bidder is solely responsible for making sure that such Bidder has obtained and reviewed the complete set of Contract Documents, including any Addenda to this ITB, before submitting a bid. Prospective Bidders are responsible for checking IALR's website or contacting Pam Patterson at pam.patterson@ialr.org to inquire about any Addenda that may be issued. IALR will not be responsible if the ITB and/or any Addenda are not received by potential Bidders.
- D. **Submission of Bids:** Bids shall be submitted on the Bid Form attached as **Exhibit D**, completed in full in ink or typewritten (one copy only). Bids shall be enclosed in a sealed envelope, addressed to the Owner, and be clearly marked "Proposal for the IALR Conference Facility Renovations". The Bidder's name and address shall also be clearly marked on the envelope. No other information is to be included on the outside of the envelope. IALR will not be responsible for the premature opening of improperly addressed, labeled or misidentified Bids. In addition to submitting a signed and completed Bid Form, each Bidder is to submit a signed and completed copy of this ITB and a signed copy of the Minority & Women-Owned Business, Small Business, and Service Disabled Veteran Business Certification Form, which is attached as **Exhibit E** to this ITB. All Bids submitted in response to this ITB are subject to and shall be deemed to incorporate by reference the terms, conditions, provisions, and requirements of the Contract Documents. Bids and other required bidding documents shall be signed by an authorized representative of Bidder. Bidder agrees that its Contract performance shall be in strict conformance with the Contract Documents.
- E. **Bid Bond; Security:** Pursuant to Virginia Code § 2.2-4336, each Bid with a Base Bid in excess of \$100,000 shall be accompanied by a Bid Bond, payable to the Owner, in the amount of five percent of the total Base Bid. The Bid Bond shall be in substantially the same form as attached hereto as **Exhibit F** and shall be issued by a surety authorized to transact business in the Commonwealth of Virginia having a rating of A-XII or greater and listed in the most recent Federal Registry of Sureties maintained by the United States Treasury. When the Agreement is executed with the successful Bidder, the bid bonds of the other Bidders will be returned. The Bid Bond of the successful Bidder will be retained until the Labor and Materials Payment Bond and Performance Bond have been executed and approved, after which the Bid Bond will be returned. Pursuant to Virginia Code § 2.2-4338, a certified check, cashier's check, or cash escrow in the face amount required for the bond may be used in lieu of a sealed surety Bid Bond.
- F. **Pre-Bid Conference:** There will be an on-site Pre-Bid Conference for all interested Bidders. This conference will convene at 1:30, local prevailing time, on Wednesday April 10th at 1:30 pm at the Institute for advanced Learning and Research. As a part of the Pre-Bid Conference, a tour and inspection of the project site will be made. Attendance at this conference is required for submitting a bid.
- G. **Bid Opening:** The Bids will be opened in a public opening of Bids at the designated time and location and read aloud at that time and place.
1. The Owner will evaluate the Bids and award the Contract after due consideration of the Bid amounts and the criteria set forth herein and in the Instructions to Bidders, including without limitation the ability of the Contractor to complete the Project in the allotted time.
 2. The Owner may waive any informalities or irregularities, cancel this invitation to bid, reject any or all Bids, and/or rebid the Project at any time prior to the award of the Contract.
 3. Any Bid may be withdrawn or modified prior to the scheduled time for the opening of Bids.

4. Any Bid received after the time and date specified shall not be considered and will be returned to the Bidder unopened.
 5. Unless otherwise noted, no Bidder may withdraw a Bid within sixty (60) days after the actual date of the opening thereof. Should the Contract not be awarded within this specified time period, the time may be extended by mutual agreement of the Owner and the Bidder.
- H. Contract Award: Any award will be made to the Lowest Responsive and Responsible Bidder. To determine the Lowest Responsive and Responsible Bidder who may be awarded a Contract for the Work, the criteria set forth in or requested pursuant to this ITB and the Instructions to Bidders may be considered.
- I. Legal Compliance; Licenses: Bidders and all subcontractors are required to comply with all applicable city, state, and federal laws, ordinances, and regulations; and are required to be properly licensed under Virginia Code § 54.1-1100, et seq.
- J. Withdrawal of Bid Due to Error: Bids may not be withdrawn for a period of sixty (60) calendar days after the opening of bids unless the Bid is substantially lower than the other bids because of a clerical error as defined in Virginia Code § 2.2-4330. Pursuant to Virginia Code § 2.2-4330(B)(1), the Bidder shall give to the Owner notice in writing of the Bidder's claim of right to withdraw the bid within two (2) business days after the opening of bids and shall submit the original work papers, documents, and material used in the preparation of the Bid with such notice. Other applicable provisions of Virginia Code § 2.2-4330 shall apply to any errors in bids or any requested withdrawal due to errors in Bids.
- K. Negotiation With Lowest Bidder: If award of a Contract to the lowest responsive and responsible bidder is precluded because of limitations on available funds, then under the provisions of Virginia Code § 2.2-4318, the Owner reserves the right to negotiate with such Bidder to obtain a contract price within the available funds.
- L. Time of Completion: Bidder agrees to obtain Substantial Completion for this project within 120 (one hundred twenty) consecutive calendar days after the date specified in the "Notice to Proceed." In addition, Bidder further agrees to obtain Final Completion for this project within 30 consecutive calendar days of the date of Substantial Completion. All bidders are cautioned that time is of the essence in completing the Project and that the Owner will suffer loss or damages if the Project is not substantially and finally completed within the periods of time stipulated in the Project schedule found in the Contract Documents. By bidding on the Project, each Bidder certifies that it can complete the Project in the allotted time.
- M. Liquidated Damages: Bidder agrees to pay as Liquidated Damages the sum of \$500.00 for each consecutive calendar day that the Project extends beyond the designated date for Substantial Completion. In addition, Bidder further agrees to pay the sum of \$500.00 for each consecutive calendar day that this Project extends beyond the date of Final Completion.
- N. Inquiries: If any potential Bidder has questions about the submission requirements or the Project, the Respondent should contact the person designated below in writing as soon as possible but no later than three working days before the bid due date. All questions regarding the procurement procedure shall be submitted in writing to Pam Patterson, Executive Administrative Assistant, Institute for Advanced Learning & Research, 150 Slayton Avenue, Danville, VA 24540, pam.patterson@ialr.org. All technical questions regarding the Contract Documents shall be submitted in writing to Larry Hasson, Dewberry Engineers, Inc., 551 Piney Forest Road, Danville, Virginia 24540, lhasson@dewberry.com, with a copy provided to Pam Patterson at pam.patterson@ialr.org.

- O. Addenda: Any interpretations, amendments, corrections or revisions to this ITB will be made only by written Addendum issued by IALR. Interpretations, amendments, corrections or revisions of this ITB made in any other manner will not be binding, and Bidders must not rely upon such interpretations, amendments, corrections or revisions. Bidders are solely responsible for ensuring that they have any and all Addenda issued prior to submitting their Bids. IALR disclaims any responsibility for a Bidder's failure to receive any Addenda.
- P. Certification: Bidder's signature on your the Bid Form and this ITB certifies that you have either inspected the job site or voluntarily declined the inspection, are aware of the conditions under which the work must be accomplished, that you are aware of and understand the requirements for the Project, and that you fully understand this solicitation. It is the responsibility of each Bidder to inquire about and clarify any requirements of this solicitation that are not understood. Failure to understand the requirements of this solicitation will not relieve the Contractor of any responsibilities under any contract. Claims, as a result of failure to inspect the job site or failure to obtain clarification of requirements, will not be considered by the IALR.
- Q. Retainage: Pursuant to Virginia Code § 2.2-4333, any Contract awarded pursuant to this Invitation to Bid shall be subject to a 5% retainage.
- R. Bonding; Security: Pursuant to Virginia Code § 2.2-4337, if the Contract Sum exceeds \$100,000, then a performance bond in the amount of the Contract Sum and in substantially the same form as attached hereto as **Exhibit G** and a payment bond in the amount of the Contract Sum and in substantially the same form as attached hereto as **Exhibit H** will be required from the successful Bidder. The performance and payment bonds shall be issued by a surety authorized to transact business in the Commonwealth of Virginia having a rating of A-XII or greater and listed in the most recent Federal Registry of Sureties maintained by the United States Treasury. Pursuant to Virginia Code § 2.2-4338, a certified check, cashier's check or cash escrow in the face amount otherwise required for the bond may be utilized in lieu of a bond.
- S. Award Announcement: If an award of a Contract is made, Notice of the Award will be made by posting a notice on the IALR website. Posting on IALR's website is the only notice that will be provided of the award or decision to award a contracts pursuant to this ITB.
- T. Non-Discrimination; Drug-Free Workplace: The successful Bidder shall comply with the nondiscrimination provisions of Virginia Code § 2.2-4311 and the drug-free workplace provisions of Virginia Code § 2.2-4312.
- U. Faith-Based Organizations: Pursuant to Virginia Code § 2.2-4343.1, be advised that the IALR does not discriminate against faith-based organizations.
- V. SCC Registration: Pursuant to Virginia Code § 2.2-4311.2, the Bidder must be registered with the State Corporation Commission if so required by Title 13.1 or Title 50 of the Virginia Code or otherwise required by law.

By submitting a Bid, each Bidder agrees that this is a solicitation of Bids and each Bidder agrees to be solely responsible for the cost or expense of its Bid and IALR shall have no responsibility for such costs or expenses.

The undersigned hereby certifies that no person interested in this Bid is directly or indirectly interested in or connected with any other Bidder or Bid for said Work, and no representative, officer, or employee of the Owner is directly or indirectly interested therein, or in any portion thereof.

The undersigned hereby certifies that this Bid is genuine and not collusive or sham; that said Bidder has not colluded, conspired, connived or agreed, directly or indirectly, with any Bidder or person, to put in a sham Bid, or so that such other person shall refrain from bidding; and has not in any manner, directly or indirectly, sought by agreement or collusion, or communications, or conference, with any person, to fix the Bid price of the undersigned or of any other Bidders, or to fix any overhead, profit or cost element of said Bid price, or of that of any other Bidder, or to secure any advantage against the Owner or any person interested in the proposed Contract; and that all statements contained in said Bid are true. The Bidder certifies that this Bid has been arrived at independently, without consultation, communication, or agreement with any other Bidder concerning any matter relating to this Bid.

The undersigned hereby certifies that neither it nor its agent nor any other party on its behalf has paid or agreed to pay, directly or indirectly, a person, firm, or corporation, any money or valuable consideration for assistance in procuring or attempting to procure the Contract herein referred to, and further agrees that no such money or reward shall be hereafter paid.

The undersigned certifies that this person/firm/corporation is not currently barred from bidding on contracts by any public body in the Commonwealth of Virginia, nor is this person/firm/corporation a part of any firm/corporation that is currently barred from bidding on contracts by any public body in the Commonwealth of Virginia. Bidder has attached an explanation of any previous disbarment(s) and copies of notice(s) of reinstatement(s).

NAME AND ADDRESS OF BIDDER:

_____ **DATE:** _____

_____ **BY:** _____
(SIGNATURE)

_____ **NAME:** _____
(PLEASE PRINT)

EMAIL: _____ **TITLE:** _____

PHONE: _____

STATE CONTRACTOR'S LICENSE CLASS: _____

STATE CONTRACTOR'S LICENSE NUMBER: _____

FEIN: _____

VIRGINIA SCC NUMBER (IF ANY): _____

LATE PROPOSALS WILL BE REJECTED



AIA[®] Document A701[™] – 2018

Instructions to Bidders

for the following Project:

(Name, location, and detailed description)

IALR – Conference Facility Renovations
150 Slayton Avenue
Danville, VA 24540

THE OWNER:

(Name, legal status, address, and other information)

THE ARCHITECT:

(Name, legal status, address, and other information)

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ADDITIONS AND DELETIONS:

The author of this document has added information needed for its completion. The author may also have revised the text of the original AIA standard form. An *Additions and Deletions Report* that notes added information as well as revisions to the standard form text is available from the author and should be reviewed. A vertical line in the left margin of this document indicates where the author has added necessary information and where the author has added to or deleted from the original AIA text.

This document has important legal consequences. Consultation with an attorney is encouraged with respect to its completion or modification.

FEDERAL, STATE, AND LOCAL LAWS MAY IMPOSE REQUIREMENTS ON PUBLIC PROCUREMENT CONTRACTS. CONSULT LOCAL AUTHORITIES OR AN ATTORNEY TO VERIFY REQUIREMENTS APPLICABLE TO THIS PROCUREMENT BEFORE COMPLETING THIS FORM.

It is intended that AIA Document G612[™]–2017, Owner's Instructions to the Architect, Parts A and B will be completed prior to using this document.

ARTICLE 1 DEFINITIONS

§ 1.1 Bidding Documents include the Bidding Requirements and the Proposed Contract Documents. The Bidding Requirements consist of the advertisement or invitation to bid, Instructions to Bidders, supplementary instructions to bidders, the bid form, and any other bidding forms. The Proposed Contract Documents consist of the unexecuted form of Agreement between the Owner and Contractor and that Agreement's Exhibits, Conditions of the Contract (General, Supplementary and other Conditions), Drawings, Specifications, all Addenda, and all other documents enumerated in Article 8 of these Instructions.

§ 1.2 Definitions set forth in the General Conditions of the Contract for Construction, or in other Proposed Contract Documents apply to the Bidding Documents.

§ 1.3 Addenda are written or graphic instruments issued by the Architect, which, by additions, deletions, clarifications, or corrections, modify or interpret the Bidding Documents.

§ 1.4 A Bid is a complete and properly executed proposal to do the Work for the sums stipulated therein, submitted in accordance with the Bidding Documents.

§ 1.5 The Base Bid is the sum stated in the Bid for which the Bidder offers to perform the Work described in the Bidding Documents, to which Work may be added or deleted by sums stated in Alternate Bids.

§ 1.6 An Alternate Bid (or Alternate) is an amount stated in the Bid to be added to or deducted from, or that does not change, the Base Bid if the corresponding change in the Work, as described in the Bidding Documents, is accepted.

§ 1.7 A Unit Price is an amount stated in the Bid as a price per unit of measurement for materials, equipment, or services, or a portion of the Work, as described in the Bidding Documents.

§ 1.8 A Bidder is a person or entity who submits a Bid and who meets the requirements set forth in the Bidding Documents.

§ 1.9 A Sub-bidder is a person or entity who submits a bid to a Bidder for materials, equipment, or labor for a portion of the Work.

ARTICLE 2 BIDDER'S REPRESENTATIONS

§ 2.1 By submitting a Bid, the Bidder represents that:

- .1 the Bidder has read and understands the Bidding Documents;
- .2 the Bidder understands how the Bidding Documents relate to other portions of the Project, if any, being bid concurrently or presently under construction;
- .3 the Bid complies with the Bidding Documents;
- .4 the Bidder has visited the site, become familiar with local conditions under which the Work is to be performed, and has correlated the Bidder's observations with the requirements of the Proposed Contract Documents;
- .5 the Bid is based upon the materials, equipment, and systems required by the Bidding Documents without exception; and
- .6 the Bidder has read and understands the provisions for liquidated damages, if any, set forth in the form of Agreement between the Owner and Contractor.

ARTICLE 3 BIDDING DOCUMENTS

§ 3.1 Distribution

§ 3.1.1 Bidders shall obtain complete Bidding Documents, as indicated below, from the issuing office designated in the advertisement or invitation to bid, for the deposit sum, if any, stated therein.

(Indicate how, such as by email, website, host site/platform, paper copy, or other method Bidders shall obtain Bidding Documents.)

§ 3.1.2 Any required deposit shall be refunded to Bidders who submit a bona fide Bid and return the paper Bidding Documents in good condition within ten days after receipt of Bids. The cost to replace missing or damaged paper documents will be deducted from the deposit. A Bidder receiving a Contract award may retain the paper Bidding Documents, and the Bidder's deposit will be refunded.

§ 3.1.3 Bidding Documents will not be issued directly to Sub-bidders unless specifically offered in the advertisement or invitation to bid, or in supplementary instructions to bidders.

§ 3.1.4 Bidders shall use complete Bidding Documents in preparing Bids. Neither the Owner nor Architect assumes responsibility for errors or misinterpretations resulting from the use of incomplete Bidding Documents.

§ 3.1.5 The Bidding Documents will be available for the sole purpose of obtaining Bids on the Work. No license or grant of use is conferred by distribution of the Bidding Documents.

§ 3.2 Modification or Interpretation of Bidding Documents

§ 3.2.1 The Bidder shall carefully study the Bidding Documents, shall examine the site and local conditions, and shall notify the Architect of errors, inconsistencies, or ambiguities discovered and request clarification or interpretation pursuant to Section 3.2.2.

§ 3.2.2 Requests for clarification or interpretation of the Bidding Documents shall be submitted by the Bidder in writing and shall be received by the Architect at least seven days prior to the date for receipt of Bids.
(Indicate how, such as by email, website, host site/platform, paper copy, or other method Bidders shall submit requests for clarification and interpretation.)

§ 3.2.3 Modifications and interpretations of the Bidding Documents shall be made by Addendum. Modifications and interpretations of the Bidding Documents made in any other manner shall not be binding, and Bidders shall not rely upon them.

§ 3.3 Substitutions

§ 3.3.1 The materials, products, and equipment described in the Bidding Documents establish a standard of required function, dimension, appearance, and quality to be met by any proposed substitution.

§ 3.3.2 Substitution Process

§ 3.3.2.1 Written requests for substitutions shall be received by the Architect at least ten days prior to the date for receipt of Bids. Requests shall be submitted in the same manner as that established for submitting clarifications and interpretations in Section 3.2.2.

§ 3.3.2.2 Bidders shall submit substitution requests on a Substitution Request Form if one is provided in the Bidding Documents.

§ 3.3.2.3 If a Substitution Request Form is not provided, requests shall include (1) the name of the material or equipment specified in the Bidding Documents; (2) the reason for the requested substitution; (3) a complete description of the proposed substitution including the name of the material or equipment proposed as the substitute, performance and test data, and relevant drawings; and (4) any other information necessary for an evaluation. The request shall include a statement setting forth changes in other materials, equipment, or other portions of the Work, including changes in the work of other contracts or the impact on any Project Certifications (such as LEED), that will result from incorporation of the proposed substitution.

§ 3.3.3 The burden of proof of the merit of the proposed substitution is upon the proposer. The Architect's decision of approval or disapproval of a proposed substitution shall be final.

§ 3.3.4 If the Architect approves a proposed substitution prior to receipt of Bids, such approval shall be set forth in an Addendum. Approvals made in any other manner shall not be binding, and Bidders shall not rely upon them.

§ 3.3.5 No substitutions will be considered after the Contract award unless specifically provided for in the Contract Documents.

§ 3.4 Addenda

§ 3.4.1 Addenda will be transmitted to Bidders known by the issuing office to have received complete Bidding Documents.

(Indicate how, such as by email, website, host site/platform, paper copy, or other method Addenda will be transmitted.)

§ 3.4.2 Addenda will be available where Bidding Documents are on file.

§ 3.4.3 Addenda will be issued no later than four days prior to the date for receipt of Bids, except an Addendum withdrawing the request for Bids or one which includes postponement of the date for receipt of Bids.

§ 3.4.4 Prior to submitting a Bid, each Bidder shall ascertain that the Bidder has received all Addenda issued, and the Bidder shall acknowledge their receipt in the Bid.

ARTICLE 4 BIDDING PROCEDURES

§ 4.1 Preparation of Bids

§ 4.1.1 Bids shall be submitted on the forms included with or identified in the Bidding Documents.

§ 4.1.2 All blanks on the bid form shall be legibly executed. Paper bid forms shall be executed in a non-erasable medium.

§ 4.1.3 Sums shall be expressed in both words and numbers, unless noted otherwise on the bid form. In case of discrepancy, the amount entered in words shall govern.

§ 4.1.4 Edits to entries made on paper bid forms must be initialed by the signer of the Bid.

§ 4.1.5 All requested Alternates shall be bid. If no change in the Base Bid is required, enter "No Change" or as required by the bid form.

§ 4.1.6 Where two or more Bids for designated portions of the Work have been requested, the Bidder may, without forfeiture of the bid security, state the Bidder's refusal to accept award of less than the combination of Bids stipulated by the Bidder. The Bidder shall neither make additional stipulations on the bid form nor qualify the Bid in any other manner.

§ 4.1.7 Each copy of the Bid shall state the legal name and legal status of the Bidder. As part of the documentation submitted with the Bid, the Bidder shall provide evidence of its legal authority to perform the Work in the jurisdiction where the Project is located. Each copy of the Bid shall be signed by the person or persons legally authorized to bind the Bidder to a contract. A Bid by a corporation shall further name the state of incorporation and have the corporate seal affixed. A Bid submitted by an agent shall have a current power of attorney attached, certifying the agent's authority to bind the Bidder.

§ 4.1.8 A Bidder shall incur all costs associated with the preparation of its Bid.

§ 4.2 Bid Security

§ 4.2.1 Each Bid shall be accompanied by the following bid security:

(Insert the form and amount of bid security.)

§ 4.2.2 The Bidder pledges to enter into a Contract with the Owner on the terms stated in the Bid and shall, if required, furnish bonds covering the faithful performance of the Contract and payment of all obligations arising thereunder. Should the Bidder refuse to enter into such Contract or fail to furnish such bonds if required, the amount of the bid security shall be forfeited to the Owner as liquidated damages, not as a penalty. In the event the Owner fails to comply with Section 6.2, the amount of the bid security shall not be forfeited to the Owner.

§ 4.2.3 If a surety bond is required as bid security, it shall be written on AIA Document A310™, Bid Bond, unless otherwise provided in the Bidding Documents. The attorney-in-fact who executes the bond on behalf of the surety shall affix to the bond a certified and current copy of an acceptable power of attorney. The Bidder shall provide surety bonds from a company or companies lawfully authorized to issue surety bonds in the jurisdiction where the Project is located.

§ 4.2.4 The Owner will have the right to retain the bid security of Bidders to whom an award is being considered until (a) the Contract has been executed and bonds, if required, have been furnished; (b) the specified time has elapsed so that Bids may be withdrawn; or (c) all Bids have been rejected. However, if no Contract has been awarded or a Bidder has not been notified of the acceptance of its Bid, a Bidder may, beginning days after the opening of Bids, withdraw its Bid and request the return of its bid security.

§ 4.3 Submission of Bids

§ 4.3.1 A Bidder shall submit its Bid as indicated below:

(Indicate how, such as by website, host site/platform, paper copy, or other method Bidders shall submit their Bid.)

§ 4.3.2 Paper copies of the Bid, the bid security, 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 shall be identified with the Project name, the Bidder's name and address, 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.

§ 4.3.3 Bids shall be submitted by the date and time and at the place indicated in the invitation to bid. Bids submitted after the date and time for receipt of Bids, or at an incorrect place, will not be accepted.

§ 4.3.4 The Bidder shall assume full responsibility for timely delivery at the location designated for receipt of Bids.

§ 4.3.5 A Bid submitted by any method other than as provided in this Section 4.3 will not be accepted.

§ 4.4 Modification or Withdrawal of Bid

§ 4.4.1 Prior to the date and time designated for receipt of Bids, a Bidder may submit a new Bid to replace a Bid previously submitted, or withdraw its Bid entirely, by notice to the party designated to receive the Bids. Such notice shall be received and duly recorded by the receiving party on or before the date and time set for receipt of Bids. The receiving party shall verify that replaced or withdrawn Bids are removed from the other submitted Bids and not considered. Notice of submission of a replacement Bid or withdrawal of a Bid shall be worded so as not to reveal the amount of the original Bid.

§ 4.4.2 Withdrawn Bids may be resubmitted up to the date and time designated for the receipt of Bids in the same format as that established in Section 4.3, provided they fully conform with these Instructions to Bidders. Bid security shall be in an amount sufficient for the Bid as resubmitted.

§ 4.4.3 After the date and time designated for receipt of Bids, a Bidder who discovers that it made a clerical error in its Bid shall notify the Architect of such error within two days, or pursuant to a timeframe specified by the law of the jurisdiction where the Project is located, requesting withdrawal of its Bid. Upon providing evidence of such error to the reasonable satisfaction of the Architect, the Bid shall be withdrawn and not resubmitted. If a Bid is withdrawn pursuant to this Section 4.4.3, the bid security will be attended to as follows:

(State the terms and conditions, such as Bid rank, for returning or retaining the bid security.)

ARTICLE 5 CONSIDERATION OF BIDS

§ 5.1 Opening of Bids

If stipulated in an advertisement or invitation to bid, or when otherwise required by law, Bids properly identified and received within the specified time limits will be publicly opened and read aloud. A summary of the Bids may be made available to Bidders.

§ 5.2 Rejection of Bids

Unless otherwise prohibited by law, the Owner shall have the right to reject any or all Bids.

§ 5.3 Acceptance of Bid (Award)

§ 5.3.1 It is the intent of the Owner to award a Contract to the lowest responsive and responsible Bidder, provided the Bid has been submitted in accordance with the requirements of the Bidding Documents. Unless otherwise prohibited by law, the Owner shall have the right to waive informalities and irregularities in a Bid received and to accept the Bid which, in the Owner's judgment, is in the Owner's best interests.

§ 5.3.2 Unless otherwise prohibited by law, the Owner shall have the right to accept Alternates in any order or combination, unless otherwise specifically provided in the Bidding Documents, and to determine the lowest responsive and responsible Bidder on the basis of the sum of the Base Bid and Alternates accepted.

ARTICLE 6 POST-BID INFORMATION

§ 6.1 Contractor's Qualification Statement

Bidders to whom award of a Contract is under consideration shall submit to the Architect, upon request and within the timeframe specified by the Architect, a properly executed AIA Document A305™, Contractor's Qualification Statement, unless such a Statement has been previously required and submitted for this Bid.

§ 6.2 Owner's Financial Capability

A Bidder to whom award of a Contract is under consideration may request in writing, fourteen days prior to the expiration of the time for withdrawal of Bids, that the Owner furnish to the Bidder reasonable evidence that financial arrangements have been made to fulfill the Owner's obligations under the Contract. The Owner shall then furnish such reasonable evidence to the Bidder no later than seven days prior to the expiration of the time for withdrawal of Bids. Unless such reasonable evidence is furnished within the allotted time, the Bidder will not be required to execute the Agreement between the Owner and Contractor.

§ 6.3 Submittals

§ 6.3.1 After notification of selection for the award of the Contract, the Bidder shall, as soon as practicable or as stipulated in the Bidding Documents, submit in writing to the Owner through the Architect:

- .1 a designation of the Work to be performed with the Bidder's own forces;
- .2 names of the principal products and systems proposed for the Work and the manufacturers and suppliers of each; and
- .3 names of persons or entities (including those who are to furnish materials or equipment fabricated to a special design) proposed for the principal portions of the Work.

§ 6.3.2 The Bidder will be required to establish to the satisfaction of the Architect and Owner the reliability and responsibility of the persons or entities proposed to furnish and perform the Work described in the Bidding Documents.

§ 6.3.3 Prior to the execution of the Contract, the Architect will notify the Bidder if either the Owner or Architect, after due investigation, has reasonable objection to a person or entity proposed by the Bidder. If the Owner or Architect has reasonable objection to a proposed person or entity, the Bidder may, at the Bidder's option, withdraw the Bid or submit an acceptable substitute person or entity. The Bidder may also submit any required adjustment in the Base Bid or Alternate Bid to account for the difference in cost occasioned by such substitution. The Owner may accept the adjusted bid price or disqualify the Bidder. In the event of either withdrawal or disqualification, bid security will not be forfeited.

§ 6.3.4 Persons and entities proposed by the Bidder and to whom the Owner and Architect have made no reasonable objection must be used on the Work for which they were proposed and shall not be changed except with the written consent of the Owner and Architect.

ARTICLE 7 PERFORMANCE BOND AND PAYMENT BOND

§ 7.1 Bond Requirements

§ 7.1.1 If stipulated in the Bidding Documents, the Bidder shall furnish bonds covering the faithful performance of the Contract and payment of all obligations arising thereunder.

§ 7.1.2 If the furnishing of such bonds is stipulated in the Bidding Documents, the cost shall be included in the Bid. If the furnishing of such bonds is required after receipt of bids and before execution of the Contract, the cost of such bonds shall be added to the Bid in determining the Contract Sum.

§ 7.1.3 The Bidder shall provide surety bonds from a company or companies lawfully authorized to issue surety bonds in the jurisdiction where the Project is located.

§ 7.1.4 Unless otherwise indicated below, the Penal Sum of the Payment and Performance Bonds shall be the amount of the Contract Sum.

(If Payment or Performance Bonds are to be in an amount other than 100% of the Contract Sum, indicate the dollar amount or percentage of the Contract Sum.)

§ 7.2 Time of Delivery and Form of Bonds

§ 7.2.1 The Bidder shall deliver the required bonds to the Owner not later than three days following the date of execution of the Contract. If the Work is to commence sooner in response to a letter of intent, the Bidder shall, prior to commencement of the Work, submit evidence satisfactory to the Owner that such bonds will be furnished and delivered in accordance with this Section 7.2.1.

§ 7.2.2 Unless otherwise provided, the bonds shall be written on AIA Document A312, Performance Bond and Payment Bond.

§ 7.2.3 The bonds shall be dated on or after the date of the Contract.

§ 7.2.4 The Bidder shall require the attorney-in-fact who executes the required bonds on behalf of the surety to affix to the bond a certified and current copy of the power of attorney.

ARTICLE 8 ENUMERATION OF THE PROPOSED CONTRACT DOCUMENTS

§ 8.1 Copies of the proposed Contract Documents have been made available to the Bidder and consist of the following documents:

- .1** AIA Document A101™–2017, Standard Form of Agreement Between Owner and Contractor, unless otherwise stated below.
(Insert the complete AIA Document number, including year, and Document title.)
- .2** AIA Document A101™–2017, Exhibit A, Insurance and Bonds, unless otherwise stated below.
(Insert the complete AIA Document number, including year, and Document title.)
- .3** AIA Document A201™–2017, General Conditions of the Contract for Construction, unless otherwise stated below.
(Insert the complete AIA Document number, including year, and Document title.)
- .4** AIA Document E203™–2013, Building Information Modeling and Digital Data Exhibit, dated as indicated below:
(Insert the date of the E203-2013.)
- .5** Drawings

Number	Title	Date	
.6	Specifications		
Section	Title	Date	Pages

.7 Addenda:

Number	Date	Pages
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.8 Other Exhibits:

(Check all boxes that apply and include appropriate information identifying the exhibit where required.)

☐ AIA Document E204™-2017, Sustainable Projects Exhibit, dated as indicated below:
(Insert the date of the E204-2017.)

☐ The Sustainability Plan:

Title	Date	Pages
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☐ Supplementary and other Conditions of the Contract:

Document	Title	Date	Pages
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.9 Other documents listed below:

(List here any additional documents that are intended to form part of the Proposed Contract Documents.)

Additions and Deletions Report for

AIA® Document A701™ – 2018

This Additions and Deletions Report, as defined on page 1 of the associated document, reproduces below all text the author has added to the standard form AIA document in order to complete it, as well as any text the author may have added to or deleted from the original AIA text. Added text is shown underlined. Deleted text is indicated with a horizontal line through the original AIA text.

Note: This Additions and Deletions Report is provided for information purposes only and is not incorporated into or constitute any part of the associated AIA document. This Additions and Deletions Report and its associated document were generated simultaneously by AIA software at 09:23:15 ET on 03/25/2019.

PAGE 1

IALR – Conference Facility Renovations
150 Slayton Avenue
Danville, VA 24540

Certification of Document's Authenticity

AIA® Document D401™ – 2003

I, , hereby certify, to the best of my knowledge, information and belief, that I created the attached final document simultaneously with its associated Additions and Deletions Report and this certification at 09:23:15 ET on 03/25/2019 under Order No. 8065734178 from AIA Contract Documents software and that in preparing the attached final document I made no changes to the original text of AIA® Document A701™ – 2018, Instructions to Bidders , as published by the AIA in its software, other than those additions and deletions shown in the associated Additions and Deletions Report.

(Signed)

(Title)

(Dated)

SUPPLEMENTARY INSTRUCTIONS TO BIDDERS

The following supplements modify the "Instructions to Bidders", AIA Document A701-2018. Where a portion of the Instructions to Bidders is modified or deleted by these Supplementary Instructions, the unaltered portions of Instructions to Bidders shall remain in effect.

A. ARTICLE 2; BIDDERS REPRESENTATIONS

1. §2.1

- a. Add the following Subparagraph 2.1.5 to 2.1:

§2.1.5 The Bidder certifies that this Bid Proposal has been arrived at independently, without consultation, communication, or agreement with any other Bidder concerning any matter relating to this Bid.

B. ARTICLE 3; BIDDING DOCUMENTS

1. §3.1 COPIES

- a. Delete Subparagraph 3.1.1 and substitute the following:

§3.1.1 Bidders may obtain complete sets of the Bidding Documents from the issuing office designated in the Invitation to Bid for the deposit sum stated therein.

C. ARTICLE 5; CONSIDERATION OF BIDS

1. §5.3 ACCEPTANCE OF BID (AWARD)

- a. Add the following Subparagraphs 5.3.3, 5.3.4, and 5.3.5 to 5.3:

§5.3.3 The party to whom the contract is awarded shall be required to execute the Agreement and obtain the Performance Bond and Labor and Material Payment Bond within 10 calendar days from the date when the Notice of Award is delivered to the bidder. The Notice of Award shall be accompanied by the necessary Agreement and Bond forms. In case of failure of the Bidder to execute the Agreement, the Owner may consider the Bidder in default, in which case the Bid Bond accompanying the Proposal shall become the property of the Owner.

§5.3.4 The Owner, within 10 calendar days of receipt of acceptable Performance Bond, Labor and Material Payment Bond, and Agreement signed by the party to whom the Contract was awarded, will sign the Agreement and return an executed copy to such party. Should the Owner not execute the Agreement within such period, the Bidder may, by written notice, withdraw the signed Agreement. Such notice of withdrawal shall be effective upon receipt of the notice by the Owner.

§5.3.5 The Notice to Proceed shall be issued within 10 calendar days of the execution of the Agreement by the Owner. Should there be reasons why the Notice to Proceed cannot be issued within such period, the time may be extended by mutual agreement between the Owner and Contractor. If the Notice to Proceed has not been issued within the 10 day

period or within the period mutually agreed upon, the Contractor may terminate the Agreement without further liability on the part of either party.

D. ARTICLE 6; POST-BID INFORMATION

1. §6.1 CONTRACTOR'S QUALIFICATION STATEMENT

- a. Add the following Subparagraph 6.1.2 to 6.1:

§6.1.2 The Owner may make such investigations as deemed necessary to determine the ability of the Bidder to perform the Work. The Bidder shall furnish to the Owner all such information and data for this purpose as the Owner may request. The Owner reserves the right to reject any Bid if evidence submitted by or investigation of such Bidder fails to satisfy the Owner that such Bidder is properly qualified to carry out the obligations of the Agreement and to complete the Work described therein.

**E. ARTICLE 8; FORM OF AGREEMENT BETWEEN OWNER AND CONTRACTOR
[Delete if AIA A101-2007 is used.]**

1. Delete this paragraph and insert the following:

Unless otherwise required in the Bidding Documents, the Agreement for the Work will be written on AIA Document A107-2007, Abbreviated Form of Agreement Between Owner and Contractor AIA.

END OF SUPPLEMENTARY INSTRUCTIONS TO BIDDERS

EXHIBIT B

Institute for Advanced Learning and Research Conference Facilities Renovation

Conference Facilities Renovation Agreement

This Agreement dated _____, 2019, is made and entered into by and between _____, hereinafter referred to as "Contractor", and the INSTITUTE FOR ADVANCED LEARNING AND RESEARCH, a political subdivision of the Commonwealth of Virginia hereinafter referred to as "Owner" or "IALR".

RECITALS:

WHEREAS, IALR issued an Invitation to Bid ("ITB") (IALR ITB No. 2019-02-02) for the IALR Conference Facilities Renovation ("Project"); and

WHEREAS, the ITB and other Contract Documents incorporated therein and herein contain terms, conditions, requirements, Drawings, and Specifications applicable to the Project; and

WHEREAS, the Contractor was the Lowest Responsive and Responsible Bidder on the Project; and

WHEREAS, IALR has awarded the Contract for the Project to the Contractor; and

WHEREAS, the Contractor has furnished any requisite performance and payment bonds, with surety, each in the amount of One Hundred Percent (100%) of the Contract Sum, payable to IALR as required by the Contract Documents.

Now, therefore, for and in consideration of the mutual promises and covenants contained herein, the parties hereto agree as follows:

I. Scope of Work

The Contractor shall perform all required Work and shall furnish and provide all labor, materials, necessary tools, expendable equipment and utility and transportation service and all else required to complete the asphalt and concrete paving of the IALR parking lot (IALR ITB No. 2019-02-02), all in strict accordance with the Contract Documents, the terms which are incorporated herein by reference. It is understood and agreed that said labor, materials, tools, equipment and service shall be furnished and said Work performed and completed under the direction and supervision of the Contractor and subject to the approval of IALR or its Authorized Representative.

II. Contract Documents

The "Contract" and "Contract Documents" shall include: (i) the ITB, the Instructions to Bidders, any subsequently issued Addenda to the ITB; (ii) the completed and signed Bid Form and Bid Bond (if required); (iii) this Agreement; (iv) the Owner's General and Supplementary Conditions attached as **Exhibit C** to the ITB; (v) the Drawings and Specifications prepared by Dewberry Engineers, Inc. and attached as **Exhibit A** to the ITB; (vi) the Performance and Payment Bonds (if required); (vii) any Change Orders or Change Directives; and (viii) any Modifications to the Contract. Anything called for by one of the Contract Documents and not called for by the others shall be of like effect as if required or called for by all Contract Documents. To the extent practicable, the terms and conditions of the Contract Documents will be read consistently with each other. In the case of conflict between the terms and

EXHIBIT B

conditions of the Contract Documents, the Order of Precedence of the Contract Documents shall be as follows: (i) this Agreement, including any Modifications, Change Orders or Change Directives; (ii) the Drawings and Specifications; (iii) the General Conditions; (iv) the completed and signed Bid Form; (v) any Addenda; (vi) the Invitation to Bid and Instructions to Bidders; and (vii) the Bonds.

III. Guarantee

All goods, materials and equipment furnished by the Contractor, and all Work performed by the Contractor are hereby guaranteed by the Contractor to be free from defects owing to faulty materials or workmanship for a period of one year after date of completion of the Work. All Work that proves defective, by reason of faulty material or workmanship within said period of one year, shall be replaced by the Contractor free of cost to IALR. These guarantees shall not operate as a waiver of any of IALR's rights and remedies for default under or breach of the Contract which rights and remedies may be exercised at any time within the period of any applicable statute of limitations. This guarantee shall be in addition to any and all other warranties and guarantees contained in the other Contract Documents.

IV. Substantial Completion; Final Completion

The Contractor shall commence Work under this Contract on the Project on the date specified in the Notice to Proceed issued by the Owner or Architect ("Commencement Date"). The Contractor shall start the Work promptly upon the receipt of the Notice to Proceed and shall prosecute the Work regularly, diligently, and uninterruptedly at a rate of progress that will ensure full completion thereof in the shortest length of time consistent with the Contract Documents. The Contractor shall obtain Substantial Completion for this Project within 120 (one hundred twenty) consecutive calendar days after the Commencement Date specified in the Notice to Proceed. The Contractor shall obtain Final Completion for this project within thirty (30) consecutive calendar days of the date of Substantial Completion. Time is of the essence in completing the required Work and the Owner will suffer loss or damages if the Work is not substantially and finally completed within the period of time stipulated in the Contract Documents.

V. Fixed Price Contract; Provisions as to Contract Price

A. This is a fixed price Contract. IALR shall pay Contractor the fixed price of _____ Dollars (\$_____) for all Work on the Project ("Contract Sum"). No increase in the Contract Sum shall be made except by a written Change Order, Change Directive, or Modification executed by IALR's Authorized Representative.

B. The Contractor represents and warrants that he has visited the site and become familiar with and is satisfied as to the general location and site conditions that may affect cost, progress, performance, furnishing, and completion of the Project. The Contractor represents and warrants that he is familiar with and will comply with all federal, state, and local laws and regulations that may affect cost, progress, performance, furnishing, and completion of the Project. The Contractor shall bear all costs resulting from the amount or character of the Work being different, or because the nature of the premises on which the Work is done is different from what was expected or on account of the weather, or similar causes.

C. The Contract Sum may be subject to reductions imposed by IALR for:

1. Monies expended by IALR for failure of the Contractor to complete all Work items clearly defined in the Contract Documents.
2. Monies expended by IALR to correct defective Work of the Contractor.
3. Monies due IALR for damages, delays or disruptions arising from the Contractor's negligent performance of the Work.

EXHIBIT B

4. Monies due IALR for extra charges or engineering costs attributed to the Contractor's negligent management of the Work.

5. Monies deducted from the Contract by Change Orders.

6. Monies due IALR for accrued Liquidated Damages.

7. Monies due IALR from the Contractor's failure to provide required bonds or insurance.

8. Any and all costs incurred by IALR for which the Contractor is at fault.

D. IALR shall provide the Contractor written notice stating the reasons for and amount of all proposed Contract deductions. If practical, IALR will provide the Contractor reasonable time to correct or remedy all claims by IALR prior to monies being withheld.

VI. Payment

A. Unless otherwise agreed, payment to the Contractor shall be made at one time following Final Completion. Payment shall consist of the entire Contract Sum, less any sums the Owner is entitled to deduct. Payment shall be paid by the Owner to the Contractor within thirty (30) days after Final Completion of the Project, provided the Contract has been completely and duly performed and the Owner has accepted in writing all said work. Payment shall not constitute acceptance by Owner of defective or nonconforming Work or a waiver of any warranty.

B. Notwithstanding the foregoing, the Contractor may apply for, and the Owner will consider such applications for, progress payments; provided, however, that the Architect agrees the progress payments are appropriate given the Work completed to date. Progress payments shall be subject to a 5% retainage.

C. Applications for Payment shall be submitted by the Contractor directly to the payment address listed below:

Institute for Advanced Learning & Research
ATTN: Accounts Payable
150 Slayton Avenue
Danville, VA 24540

VII. Work Hours

Regular working hours shall be between 7:00 am and 7:00 pm, Monday through Friday. Work outside of these hours, on weekends, and on holidays must be pre-approved by IALR's Authorized Representative.

VIII. Liquidated Damages

A. Pursuant to the Contract Documents, should the Contractor fail to Substantially Complete the Project by the Substantial Completion Date, the Contractor shall pay to the Owner as liquidated damages Five Hundred Dollars (\$500.00) for each calendar day thereafter until the Project is Substantially Complete. Should the Contractor fail to Finally Complete the Project by the Final Completion Date, the Contractor shall pay to the Owner as liquidated damages Five Hundred Dollars (\$500.00) for each calendar day thereafter until the Project is Finally Complete.

B. The Owner and Contractor acknowledge and agree that the Owner will suffer significant financial loss and other damage if any delays occur in the Substantial Completion and/or Final Completion of the Project. Accordingly, the Owner and Contractor agree to the liquidated damage

EXHIBIT B

provisions in this section. These liquidated damages provisions are not the Owner's exclusive remedy against the Contractor. The parties acknowledge and agree that the liquidated damages provided in this section are reasonable in amounts under all relevant circumstances, including the nature, dimension, scope, cost and scale of the Project as a whole. The parties agree and acknowledge that the liquidated damages specified in this section are not intended, designed or drafted to penalize the Contractor.

IX. Nonwaiver

Contractor agrees that the IALR's waiver or failure to enforce or require performance of any term or condition of this Contract or the IALR's waiver of any particular breach of this Contract by the Contractor extends to that instance only. Such waiver or failure is not and shall not be a waiver of any of the terms or conditions of this Contract or a waiver of any other breaches of the Contract by the Contractor and does not bar IALR from requiring the Contractor to comply with all the terms and conditions of the Contract and does not bar IALR from asserting any and all rights and/or remedies it has or might have against the Contractor under this Contract or by law.

X. Forum Selection and Choice of Law

By virtue of entering into this Contract, the Contractor submits itself to a court of competent jurisdiction in the City of Danville, Virginia, and further agrees that this Contract is controlled by the laws of the Commonwealth of Virginia and that all claims, disputes, and other matters shall only be decided by such court according to the laws of the Commonwealth of Virginia.

XI. Severability

If any provision of this Contract, or the application of any provision hereof to a particular entity or circumstance, shall be held to be invalid or unenforceable by a court of competent jurisdiction, the remaining provisions of the Contract shall not be affected and all other terms and conditions of the Contract shall be valid and enforceable to the fullest extent permitted by law.

XII. Entire Contract

This Agreement and the other Contract Documents enumerated herein constitute the entire and integrated Contract between the parties and is not severable, except as set forth in paragraph XI, and may be modified only by written agreement properly executed by the parties.

XIII. Assignment

Contractor may not assign or transfer this Contract in whole or in part except with the prior written consent of IALR. If consent to assign is given by IALR, no such Assignment shall in any way release or relieve the Contractor from any of the covenants, obligations, or undertakings contained in this Contract and the Contractor shall remain liable for the Contract for the entire term thereof.

XIV. Compliance with all Laws

The Contractor shall comply with all federal, state and local statutes, ordinances, and regulations, now in effect or hereafter adopted, in the performance of the Work set forth herein. The Contractor represents that it possesses all necessary licenses and permits required to conduct its business and will acquire any additional license and permits necessary for the performance of the Agreement prior to the initiation of Work. If the Contractor is a corporation, it further expressly represents that it is a corporation in good standing in the Commonwealth of Virginia and will remain in good standing throughout the term

EXHIBIT B

of the Contract. The Contractor shall at all times observe all health and safety measures and precautions necessary for the sanitary and safe performance of the Work.

IN WITNESS WHEREOF, the parties hereto have signed this Contract by their authorized representatives.

Name of Contractor

By: _____

Its: _____

(Contractor's Corporate Seal)

**INSTITUTE FOR ADVANCED
LEARNING AND RESEARCH**

By: _____

Its: _____



AIA® Document A201™ – 2017

General Conditions of the Contract for Construction

for the following PROJECT:

(Name and location or address)

IALR – Conference Facility Renovations
Institute for Advanced Learning and Research
150 Slayton Avenue
Danville, VA 24540

THE OWNER:

(Name, legal status and address)

Institute for Advanced Learning and Research Foundation Board
150 Slayton Avenue
Danville, VA 24540

THE ARCHITECT:

(Name, legal status and address)

Dewberry Engineers Inc.
551 Piney Forest Road
Danville, VA 24540

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ADDITIONS AND DELETIONS:

The author of this document has added information needed for its completion. The author may also have revised the text of the original AIA standard form. An *Additions and Deletions Report* that notes added information as well as revisions to the standard form text is available from the author and should be reviewed. A vertical line in the left margin of this document indicates where the author has added necessary information and where the author has added to or deleted from the original AIA text.

This document has important legal consequences. Consultation with an attorney is encouraged with respect to its completion or modification.

For guidance in modifying this document to include supplementary conditions, see AIA Document A503™, Guide for Supplementary Conditions.

Init.

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User Notes:

(1718508112)

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ARTICLE 1 GENERAL PROVISIONS

§ 1.1 Basic Definitions

§ 1.1.1 The Contract Documents

The Contract Documents are enumerated in the Agreement between the Owner and Contractor (hereinafter the Agreement) and consist of the Agreement, Conditions of the Contract (General, Supplementary and other Conditions), Drawings, Specifications, Addenda issued prior to execution of the Contract, other documents listed in the Agreement, and Modifications issued after execution of the Contract. A Modification is (1) a written amendment to the Contract signed by both parties, (2) a Change Order, (3) a Construction Change Directive, or (4) a written order for a minor change in the Work issued by the Architect. Unless specifically enumerated in the Agreement, the Contract Documents do not include the advertisement or invitation to bid, Instructions to Bidders, sample forms, other information furnished by the Owner in anticipation of receiving bids or proposals, the Contractor's bid or proposal, or portions of Addenda relating to bidding or proposal requirements.

§ 1.1.2 The Contract

The Contract Documents form the Contract for Construction. The Contract represents the entire and integrated agreement between the parties hereto and supersedes prior negotiations, representations, or agreements, either written or oral. The Contract may be amended or modified only by a Modification. The Contract Documents shall not be construed to create a contractual relationship of any kind (1) between the Contractor and the Architect or the Architect's consultants, (2) between the Owner and a Subcontractor or a Sub-subcontractor, (3) between the Owner and the Architect or the Architect's consultants, or (4) between any persons or entities other than the Owner and the Contractor. The Architect shall, however, be entitled to performance and enforcement of obligations under the Contract intended to facilitate performance of the Architect's duties.

§ 1.1.3 The Work

The term "Work" means the construction and services required by the Contract Documents, whether completed or partially completed, and includes all other labor, materials, equipment, and services provided or to be provided by the Contractor to fulfill the Contractor's obligations. The Work may constitute the whole or a part of the Project.

§ 1.1.4 The Project

The Project is the total construction of which the Work performed under the Contract Documents may be the whole or a part and which may include construction by the Owner and by Separate Contractors.

§ 1.1.5 The Drawings

The Drawings are the graphic and pictorial portions of the Contract Documents showing the design, location and dimensions of the Work, generally including plans, elevations, sections, details, schedules, and diagrams.

§ 1.1.6 The Specifications

The Specifications are that portion of the Contract Documents consisting of the written requirements for materials, equipment, systems, standards and workmanship for the Work, and performance of related services.

§ 1.1.7 Instruments of Service

Instruments of Service are representations, in any medium of expression now known or later developed, of the tangible and intangible creative work performed by the Architect and the Architect's consultants under their respective professional services agreements. Instruments of Service may include, without limitation, studies, surveys, models, sketches, drawings, specifications, and other similar materials.

§ 1.1.8 Initial Decision Maker

The Initial Decision Maker is the person identified in the Agreement to render initial decisions on Claims in accordance with Section 15.2. The Initial Decision Maker shall not show partiality to the Owner or Contractor and shall not be liable for results of interpretations or decisions rendered in good faith.

§ 1.2 Correlation and Intent of the Contract Documents

§ 1.2.1 The intent of the Contract Documents is to include all items necessary for the proper execution and completion of the Work by the Contractor. The Contract Documents are complementary, and what is required by one shall be as binding as if required by all; performance by the Contractor shall be required only to the extent consistent with the Contract Documents and reasonably inferable from them as being necessary to produce the indicated results.

§ 1.2.1.1 The invalidity of any provision of the Contract Documents shall not invalidate the Contract or its remaining provisions. If it is determined that any provision of the Contract Documents violates any law, or is otherwise invalid or unenforceable, then that provision shall be revised to the extent necessary to make that provision legal and enforceable. In such case the Contract Documents shall be construed, to the fullest extent permitted by law, to give effect to the parties' intentions and purposes in executing the Contract.

§ 1.2.2 Organization of the Specifications into divisions, sections and articles, and arrangement of Drawings shall not control the Contractor in dividing the Work among Subcontractors or in establishing the extent of Work to be performed by any trade.

§ 1.2.3 Unless otherwise stated in the Contract Documents, words that have well-known technical or construction industry meanings are used in the Contract Documents in accordance with such recognized meanings.

§ 1.3 Capitalization

Terms capitalized in these General Conditions include those that are (1) specifically defined, (2) the titles of numbered articles, or (3) the titles of other documents published by the American Institute of Architects.

§ 1.4 Interpretation

In the interest of brevity the Contract Documents frequently omit modifying words such as "all" and "any" and articles such as "the" and "an," but the fact that a modifier or an article is absent from one statement and appears in another is not intended to affect the interpretation of either statement.

§ 1.5 Ownership and Use of Drawings, Specifications, and Other Instruments of Service

§ 1.5.1 The Architect and the Architect's consultants shall be deemed the authors and owners of their respective Instruments of Service, including the Drawings and Specifications, and retain all common law, statutory, and other reserved rights in their Instruments of Service, including copyrights. The Contractor, Subcontractors, Sub-subcontractors, and suppliers shall not own or claim a copyright in the Instruments of Service. Submittal or distribution to meet official regulatory requirements or for other purposes in connection with the Project is not to be construed as publication in derogation of the Architect's or Architect's consultants' reserved rights.

§ 1.5.2 The Contractor, Subcontractors, Sub-subcontractors, and suppliers are authorized to use and reproduce the Instruments of Service provided to them, subject to any protocols established pursuant to Sections 1.7 and 1.8, solely and exclusively for execution of the Work. All copies made under this authorization shall bear the copyright notice, if any, shown on the Instruments of Service. The Contractor, Subcontractors, Sub-subcontractors, and suppliers may not use the Instruments of Service on other projects or for additions to the Project outside the scope of the Work without the specific written consent of the Owner, Architect, and the Architect's consultants.

§ 1.6 Notice

§ 1.6.1 Except as otherwise provided in Section 1.6.2, where the Contract Documents require one party to notify or give notice to the other party, such notice shall be provided in writing to the designated representative of the party to whom the notice is addressed and shall be deemed to have been duly served if delivered in person, by mail, by courier, or by electronic transmission if a method for electronic transmission is set forth in the Agreement.

§ 1.6.2 Notice of Claims as provided in Section 15.1.3 shall be provided in writing and shall be deemed to have been duly served only if delivered to the designated representative of the party to whom the notice is addressed by certified or registered mail, or by courier providing proof of delivery.

§ 1.7 Digital Data Use and Transmission

The parties shall agree upon protocols governing the transmission and use of Instruments of Service or any other information or documentation in digital form. The parties will use AIA Document E203™–2013, Building Information Modeling and Digital Data Exhibit, to establish the protocols for the development, use, transmission, and exchange of digital data.

§ 1.8 Building Information Models Use and Reliance

Any use of, or reliance on, all or a portion of a building information model without agreement to protocols governing the use of, and reliance on, the information contained in the model and without having those protocols set forth in AIA Document E203™–2013, Building Information Modeling and Digital Data Exhibit, and the requisite AIA Document

G202™-2013, Project Building Information Modeling Protocol Form, shall be at the using or relying party's sole risk and without liability to the other party and its contractors or consultants, the authors of, or contributors to, the building information model, and each of their agents and employees.

ARTICLE 2 OWNER

§ 2.1 General

§ 2.1.1 The Owner is the person or entity identified as such in the Agreement and is referred to throughout the Contract Documents as if singular in number. The Owner shall designate in writing a representative who shall have express authority to bind the Owner with respect to all matters requiring the Owner's approval or authorization. Except as otherwise provided in Section 4.2.1, the Architect does not have such authority. The term "Owner" means the Owner or the Owner's authorized representative.

§ 2.1.2 The Owner shall furnish to the Contractor, within fifteen days after receipt of a written request, information necessary and relevant for the Contractor to evaluate, give notice of, or enforce mechanic's lien rights. Such information shall include a correct statement of the record legal title to the property on which the Project is located, usually referred to as the site, and the Owner's interest therein.

§ 2.2 Evidence of the Owner's Financial Arrangements

§ 2.2.1 Prior to commencement of the Work and upon written request by the Contractor, the Owner shall furnish to the Contractor reasonable evidence that the Owner has made financial arrangements to fulfill the Owner's obligations under the Contract. The Contractor shall have no obligation to commence the Work until the Owner provides such evidence. If commencement of the Work is delayed under this Section 2.2.1, the Contract Time shall be extended appropriately.

§ 2.2.2 Following commencement of the Work and upon written request by the Contractor, the Owner shall furnish to the Contractor reasonable evidence that the Owner has made financial arrangements to fulfill the Owner's obligations under the Contract only if (1) the Owner fails to make payments to the Contractor as the Contract Documents require; (2) the Contractor identifies in writing a reasonable concern regarding the Owner's ability to make payment when due; or (3) a change in the Work materially changes the Contract Sum. If the Owner fails to provide such evidence, as required, within fourteen days of the Contractor's request, the Contractor may immediately stop the Work and, in that event, shall notify the Owner that the Work has stopped. However, if the request is made because a change in the Work materially changes the Contract Sum under (3) above, the Contractor may immediately stop only that portion of the Work affected by the change until reasonable evidence is provided. If the Work is stopped under this Section 2.2.2, the Contract Time shall be extended appropriately and the Contract Sum shall be increased by the amount of the Contractor's reasonable costs of shutdown, delay and start-up, plus interest as provided in the Contract Documents.

§ 2.2.3 After the Owner furnishes evidence of financial arrangements under this Section 2.2, the Owner shall not materially vary such financial arrangements without prior notice to the Contractor.

§ 2.2.4 Where the Owner has designated information furnished under this Section 2.2 as "confidential," the Contractor shall keep the information confidential and shall not disclose it to any other person. However, the Contractor may disclose "confidential" information, after seven (7) days' notice to the Owner, where disclosure is required by law, including a subpoena or other form of compulsory legal process issued by a court or governmental entity, or by court or arbitrator(s) order. The Contractor may also disclose "confidential" information to its employees, consultants, sureties, Subcontractors and their employees, Sub-subcontractors, and others who need to know the content of such information solely and exclusively for the Project and who agree to maintain the confidentiality of such information.

§ 2.3 Information and Services Required of the Owner

§ 2.3.1 Except for permits and fees that are the responsibility of the Contractor under the Contract Documents, including those required under Section 3.7.1, the Owner shall secure and pay for necessary approvals, easements, assessments and charges required for construction, use or occupancy of permanent structures or for permanent changes in existing facilities.

§ 2.3.2 The Owner shall retain an architect lawfully licensed to practice architecture, or an entity lawfully practicing architecture, in the jurisdiction where the Project is located. That person or entity is identified as the Architect in the Agreement and is referred to throughout the Contract Documents as if singular in number.

§ 2.3.3 If the employment of the Architect terminates, the Owner shall employ a successor to whom the Contractor has no reasonable objection and whose status under the Contract Documents shall be that of the Architect.

§ 2.3.4 The Owner shall furnish surveys describing physical characteristics, legal limitations and utility locations for the site of the Project, and a legal description of the site. The Contractor shall be entitled to rely on the accuracy of information furnished by the Owner but shall exercise proper precautions relating to the safe performance of the Work.

§ 2.3.5 The Owner shall furnish information or services required of the Owner by the Contract Documents with reasonable promptness. The Owner shall also furnish any other information or services under the Owner's control and relevant to the Contractor's performance of the Work with reasonable promptness after receiving the Contractor's written request for such information or services.

§ 2.3.6 Unless otherwise provided in the Contract Documents, the Owner shall furnish to the Contractor one copy of the Contract Documents for purposes of making reproductions pursuant to Section 1.5.2.

§ 2.4 Owner's Right to Stop the Work

If the Contractor fails to correct Work that is not in accordance with the requirements of the Contract Documents as required by Section 12.2 or repeatedly fails to carry out Work in accordance with the Contract Documents, the Owner may issue a written order to the Contractor to stop the Work, or any portion thereof, until the cause for such order has been eliminated; however, the right of the Owner to stop the Work shall not give rise to a duty on the part of the Owner to exercise this right for the benefit of the Contractor or any other person or entity, except to the extent required by Section 6.1.3.

§ 2.5 Owner's Right to Carry Out the Work

If the Contractor defaults or neglects to carry out the Work in accordance with the Contract Documents and fails within a ten-day period after receipt of notice from the Owner to commence and continue correction of such default or neglect with diligence and promptness, the Owner may, without prejudice to other remedies the Owner may have, correct such default or neglect. Such action by the Owner and amounts charged to the Contractor are both subject to prior approval of the Architect and the Architect may, pursuant to Section 9.5.1, withhold or nullify a Certificate for Payment in whole or in part, to the extent reasonably necessary to reimburse the Owner for the reasonable cost of correcting such deficiencies, including Owner's expenses and compensation for the Architect's additional services made necessary by such default, neglect, or failure. If current and future payments are not sufficient to cover such amounts, the Contractor shall pay the difference to the Owner. If the Contractor disagrees with the actions of the Owner or the Architect, or the amounts claimed as costs to the Owner, the Contractor may file a Claim pursuant to Article 15.

ARTICLE 3 CONTRACTOR

§ 3.1 General

§ 3.1.1 The Contractor is the person or entity identified as such in the Agreement and is referred to throughout the Contract Documents as if singular in number. The Contractor shall be lawfully licensed, if required in the jurisdiction where the Project is located. The Contractor shall designate in writing a representative who shall have express authority to bind the Contractor with respect to all matters under this Contract. The term "Contractor" means the Contractor or the Contractor's authorized representative.

§ 3.1.2 The Contractor shall perform the Work in accordance with the Contract Documents.

§ 3.1.3 The Contractor shall not be relieved of its obligations to perform the Work in accordance with the Contract Documents either by activities or duties of the Architect in the Architect's administration of the Contract, or by tests, inspections or approvals required or performed by persons or entities other than the Contractor.

§ 3.2 Review of Contract Documents and Field Conditions by Contractor

§ 3.2.1 Execution of the Contract by the Contractor is a representation that the Contractor has visited the site, become generally familiar with local conditions under which the Work is to be performed, and correlated personal observations with requirements of the Contract Documents.

§ 3.2.2 Because the Contract Documents are complementary, the Contractor shall, before starting each portion of the Work, carefully study and compare the various Contract Documents relative to that portion of the Work, as well as the information furnished by the Owner pursuant to Section 2.3.4, shall take field measurements of any existing conditions related to that portion of the Work, and shall observe any conditions at the site affecting it. These obligations are for the purpose of facilitating coordination and construction by the Contractor and are not for the purpose of discovering errors, omissions, or inconsistencies in the Contract Documents; however, the Contractor shall promptly report to the Architect any errors, inconsistencies or omissions discovered by or made known to the Contractor as a request for information in such form as the Architect may require. It is recognized that the Contractor's review is made in the Contractor's capacity as a contractor and not as a licensed design professional, unless otherwise specifically provided in the Contract Documents.

§ 3.2.3 The Contractor is not required to ascertain that the Contract Documents are in accordance with applicable laws, statutes, ordinances, codes, rules and regulations, or lawful orders of public authorities, but the Contractor shall promptly report to the Architect any nonconformity discovered by or made known to the Contractor as a request for information in such form as the Architect may require.

§ 3.2.4 If the Contractor believes that additional cost or time is involved because of clarifications or instructions the Architect issues in response to the Contractor's notices or requests for information pursuant to Sections 3.2.2 or 3.2.3, the Contractor shall submit Claims as provided in Article 15. If the Contractor fails to perform the obligations of Sections 3.2.2 or 3.2.3, the Contractor shall pay such costs and damages to the Owner, subject to Section 15.1.7, as would have been avoided if the Contractor had performed such obligations. If the Contractor performs those obligations, the Contractor shall not be liable to the Owner or Architect for damages resulting from errors, inconsistencies or omissions in the Contract Documents, for differences between field measurements or conditions and the Contract Documents, or for nonconformities of the Contract Documents to applicable laws, statutes, ordinances, codes, rules and regulations, and lawful orders of public authorities.

§ 3.3 Supervision and Construction Procedures

§ 3.3.1 The Contractor shall supervise and direct the Work, using the Contractor's best skill and attention. The Contractor shall be solely responsible for, and have control over, construction means, methods, techniques, sequences, and procedures, and for coordinating all portions of the Work under the Contract. If the Contract Documents give specific instructions concerning construction means, methods, techniques, sequences, or procedures, the Contractor shall evaluate the jobsite safety thereof and shall be solely responsible for the jobsite safety of such means, methods, techniques, sequences, or procedures. If the Contractor determines that such means, methods, techniques, sequences or procedures may not be safe, the Contractor shall give timely notice to the Owner and Architect, and shall propose alternative means, methods, techniques, sequences, or procedures. The Architect shall evaluate the proposed alternative solely for conformance with the design intent for the completed construction. Unless the Architect objects to the Contractor's proposed alternative, the Contractor shall perform the Work using its alternative means, methods, techniques, sequences, or procedures.

§ 3.3.2 The Contractor shall be responsible to the Owner for acts and omissions of the Contractor's employees, Subcontractors and their agents and employees, and other persons or entities performing portions of the Work for, or on behalf of, the Contractor or any of its Subcontractors.

§ 3.3.3 The Contractor shall be responsible for inspection of portions of Work already performed to determine that such portions are in proper condition to receive subsequent Work.

§ 3.4 Labor and Materials

§ 3.4.1 Unless otherwise provided in the Contract Documents, the Contractor shall provide and pay for labor, materials, equipment, tools, construction equipment and machinery, water, heat, utilities, transportation, and other facilities and services necessary for proper execution and completion of the Work, whether temporary or permanent and whether or not incorporated or to be incorporated in the Work.

§ 3.4.2 Except in the case of minor changes in the Work approved by the Architect in accordance with Section 3.12.8 or ordered by the Architect in accordance with Section 7.4, the Contractor may make substitutions only with the consent of the Owner, after evaluation by the Architect and in accordance with a Change Order or Construction Change Directive.

§ 3.4.3 The Contractor shall enforce strict discipline and good order among the Contractor's employees and other persons carrying out the Work. The Contractor shall not permit employment of unfit persons or persons not properly skilled in tasks assigned to them.

§ 3.5 Warranty

§ 3.5.1 The Contractor warrants to the Owner and Architect that materials and equipment furnished under the Contract will be of good quality and new unless the Contract Documents require or permit otherwise. The Contractor further warrants that the Work will conform to the requirements of the Contract Documents and will be free from defects, except for those inherent in the quality of the Work the Contract Documents require or permit. Work, materials, or equipment not conforming to these requirements may be considered defective. The Contractor's warranty excludes remedy for damage or defect caused by abuse, alterations to the Work not executed by the Contractor, improper or insufficient maintenance, improper operation, or normal wear and tear and normal usage. If required by the Architect, the Contractor shall furnish satisfactory evidence as to the kind and quality of materials and equipment.

§ 3.5.2 All material, equipment, or other special warranties required by the Contract Documents shall be issued in the name of the Owner, or shall be transferable to the Owner, and shall commence in accordance with Section 9.8.4.

§ 3.6 Taxes

The Contractor shall pay sales, consumer, use and similar taxes for the Work provided by the Contractor that are legally enacted when bids are received or negotiations concluded, whether or not yet effective or merely scheduled to go into effect.

§ 3.7 Permits, Fees, Notices and Compliance with Laws

§ 3.7.1 Unless otherwise provided in the Contract Documents, the Contractor shall secure and pay for the building permit as well as for other permits, fees, licenses, and inspections by government agencies necessary for proper execution and completion of the Work that are customarily secured after execution of the Contract and legally required at the time bids are received or negotiations concluded.

§ 3.7.2 The Contractor shall comply with and give notices required by applicable laws, statutes, ordinances, codes, rules and regulations, and lawful orders of public authorities applicable to performance of the Work.

§ 3.7.3 If the Contractor performs Work knowing it to be contrary to applicable laws, statutes, ordinances, codes, rules and regulations, or lawful orders of public authorities, the Contractor shall assume appropriate responsibility for such Work and shall bear the costs attributable to correction.

§ 3.7.4 Concealed or Unknown Conditions

If the Contractor encounters conditions at the site that are (1) subsurface or otherwise concealed physical conditions that differ materially from those indicated in the Contract Documents or (2) unknown physical conditions of an unusual nature that differ materially from those ordinarily found to exist and generally recognized as inherent in construction activities of the character provided for in the Contract Documents, the Contractor shall promptly provide notice to the Owner and the Architect before conditions are disturbed and in no event later than 14 days after first observance of the conditions. The Architect will promptly investigate such conditions and, if the Architect determines that they differ materially and cause an increase or decrease in the Contractor's cost of, or time required for, performance of any part of the Work, will recommend that an equitable adjustment be made in the Contract Sum or Contract Time, or both. If the Architect determines that the conditions at the site are not materially different from those indicated in the Contract Documents and that no change in the terms of the Contract is justified, the Architect shall promptly notify the Owner and Contractor, stating the reasons. If either party disputes the Architect's determination or recommendation, that party may submit a Claim as provided in Article 15.

§ 3.7.5 If, in the course of the Work, the Contractor encounters human remains or recognizes the existence of burial markers, archaeological sites or wetlands not indicated in the Contract Documents, the Contractor shall immediately suspend any operations that would affect them and shall notify the Owner and Architect. Upon receipt of such notice, the Owner shall promptly take any action necessary to obtain governmental authorization required to resume the operations. The Contractor shall continue to suspend such operations until otherwise instructed by the Owner but shall continue with all other operations that do not affect those remains or features. Requests for adjustments in the Contract Sum and Contract Time arising from the existence of such remains or features may be made as provided in Article 15.

§ 3.8 Allowances

§ 3.8.1 The Contractor shall include in the Contract Sum all allowances stated in the Contract Documents. Items covered by allowances shall be supplied for such amounts and by such persons or entities as the Owner may direct, but the Contractor shall not be required to employ persons or entities to whom the Contractor has reasonable objection.

§ 3.8.2 Unless otherwise provided in the Contract Documents,

- .1 allowances shall cover the cost to the Contractor of materials and equipment delivered at the site and all required taxes, less applicable trade discounts;
- .2 Contractor's costs for unloading and handling at the site, labor, installation costs, overhead, profit, and other expenses contemplated for stated allowance amounts shall be included in the Contract Sum but not in the allowances; and
- .3 whenever costs are more than or less than allowances, the Contract Sum shall be adjusted accordingly by Change Order. The amount of the Change Order shall reflect (1) the difference between actual costs and the allowances under Section 3.8.2.1 and (2) changes in Contractor's costs under Section 3.8.2.2.

§ 3.8.3 Materials and equipment under an allowance shall be selected by the Owner with reasonable promptness.

§ 3.9 Superintendent

§ 3.9.1 The Contractor shall employ a competent superintendent and necessary assistants who shall be in attendance at the Project site during performance of the Work. The superintendent shall represent the Contractor, and communications given to the superintendent shall be as binding as if given to the Contractor.

§ 3.9.2 The Contractor, as soon as practicable after award of the Contract, shall notify the Owner and Architect of the name and qualifications of a proposed superintendent. Within 14 days of receipt of the information, the Architect may notify the Contractor, stating whether the Owner or the Architect (1) has reasonable objection to the proposed superintendent or (2) requires additional time for review. Failure of the Architect to provide notice within the 14-day period shall constitute notice of no reasonable objection.

§ 3.9.3 The Contractor shall not employ a proposed superintendent to whom the Owner or Architect has made reasonable and timely objection. The Contractor shall not change the superintendent without the Owner's consent, which shall not unreasonably be withheld or delayed.

§ 3.10 Contractor's Construction and Submittal Schedules

§ 3.10.1 The Contractor, promptly after being awarded the Contract, shall submit for the Owner's and Architect's information a Contractor's construction schedule for the Work. The schedule shall contain detail appropriate for the Project, including (1) the date of commencement of the Work, interim schedule milestone dates, and the date of Substantial Completion; (2) an apportionment of the Work by construction activity; and (3) the time required for completion of each portion of the Work. The schedule shall provide for the orderly progression of the Work to completion and shall not exceed time limits current under the Contract Documents. The schedule shall be revised at appropriate intervals as required by the conditions of the Work and Project.

§ 3.10.2 The Contractor, promptly after being awarded the Contract and thereafter as necessary to maintain a current submittal schedule, shall submit a submittal schedule for the Architect's approval. The Architect's approval shall not be unreasonably delayed or withheld. The submittal schedule shall (1) be coordinated with the Contractor's construction schedule, and (2) allow the Architect reasonable time to review submittals. If the Contractor fails to submit a submittal schedule, or fails to provide submittals in accordance with the approved submittal schedule, the Contractor shall not be entitled to any increase in Contract Sum or extension of Contract Time based on the time required for review of submittals.

§ 3.10.3 The Contractor shall perform the Work in general accordance with the most recent schedules submitted to the Owner and Architect.

§ 3.11 Documents and Samples at the Site

The Contractor shall make available, at the Project site, the Contract Documents, including Change Orders, Construction Change Directives, and other Modifications, in good order and marked currently to indicate field changes and selections made during construction, and the approved Shop Drawings, Product Data, Samples, and similar required submittals. These shall be in electronic form or paper copy, available to the Architect and Owner, and

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delivered to the Architect for submittal to the Owner upon completion of the Work as a record of the Work as constructed.

§ 3.12 Shop Drawings, Product Data and Samples

§ 3.12.1 Shop Drawings are drawings, diagrams, schedules, and other data specially prepared for the Work by the Contractor or a Subcontractor, Sub-subcontractor, manufacturer, supplier, or distributor to illustrate some portion of the Work.

§ 3.12.2 Product Data are illustrations, standard schedules, performance charts, instructions, brochures, diagrams, and other information furnished by the Contractor to illustrate materials or equipment for some portion of the Work.

§ 3.12.3 Samples are physical examples that illustrate materials, equipment, or workmanship, and establish standards by which the Work will be judged.

§ 3.12.4 Shop Drawings, Product Data, Samples, and similar submittals are not Contract Documents. Their purpose is to demonstrate how the Contractor proposes to conform to the information given and the design concept expressed in the Contract Documents for those portions of the Work for which the Contract Documents require submittals. Review by the Architect is subject to the limitations of Section 4.2.7. Informational submittals upon which the Architect is not expected to take responsive action may be so identified in the Contract Documents. Submittals that are not required by the Contract Documents may be returned by the Architect without action.

§ 3.12.5 The Contractor shall review for compliance with the Contract Documents, approve, and submit to the Architect, Shop Drawings, Product Data, Samples, and similar submittals required by the Contract Documents, in accordance with the submittal schedule approved by the Architect or, in the absence of an approved submittal schedule, with reasonable promptness and in such sequence as to cause no delay in the Work or in the activities of the Owner or of Separate Contractors.

§ 3.12.6 By submitting Shop Drawings, Product Data, Samples, and similar submittals, the Contractor represents to the Owner and Architect that the Contractor has (1) reviewed and approved them, (2) determined and verified materials, field measurements and field construction criteria related thereto, or will do so, and (3) checked and coordinated the information contained within such submittals with the requirements of the Work and of the Contract Documents.

§ 3.12.7 The Contractor shall perform no portion of the Work for which the Contract Documents require submittal and review of Shop Drawings, Product Data, Samples, or similar submittals, until the respective submittal has been approved by the Architect.

§ 3.12.8 The Work shall be in accordance with approved submittals except that the Contractor shall not be relieved of responsibility for deviations from the requirements of the Contract Documents by the Architect's approval of Shop Drawings, Product Data, Samples, or similar submittals, unless the Contractor has specifically notified the Architect of such deviation at the time of submittal and (1) the Architect has given written approval to the specific deviation as a minor change in the Work, or (2) a Change Order or Construction Change Directive has been issued authorizing the deviation. The Contractor shall not be relieved of responsibility for errors or omissions in Shop Drawings, Product Data, Samples, or similar submittals, by the Architect's approval thereof.

§ 3.12.9 The Contractor shall direct specific attention, in writing or on resubmitted Shop Drawings, Product Data, Samples, or similar submittals, to revisions other than those requested by the Architect on previous submittals. In the absence of such notice, the Architect's approval of a resubmission shall not apply to such revisions.

§ 3.12.10 The Contractor shall not be required to provide professional services that constitute the practice of architecture or engineering unless such services are specifically required by the Contract Documents for a portion of the Work or unless the Contractor needs to provide such services in order to carry out the Contractor's responsibilities for construction means, methods, techniques, sequences, and procedures. The Contractor shall not be required to provide professional services in violation of applicable law.

§ 3.12.10.1 If professional design services or certifications by a design professional related to systems, materials, or equipment are specifically required of the Contractor by the Contract Documents, the Owner and the Architect will specify all performance and design criteria that such services must satisfy. The Contractor shall be entitled to rely

upon the adequacy and accuracy of the performance and design criteria provided in the Contract Documents. The Contractor shall cause such services or certifications to be provided by an appropriately licensed design professional, whose signature and seal shall appear on all drawings, calculations, specifications, certifications, Shop Drawings, and other submittals prepared by such professional. Shop Drawings, and other submittals related to the Work, designed or certified by such professional, if prepared by others, shall bear such professional's written approval when submitted to the Architect. The Owner and the Architect shall be entitled to rely upon the adequacy and accuracy of the services, certifications, and approvals performed or provided by such design professionals, provided the Owner and Architect have specified to the Contractor the performance and design criteria that such services must satisfy. Pursuant to this Section 3.12.10, the Architect will review and approve or take other appropriate action on submittals only for the limited purpose of checking for conformance with information given and the design concept expressed in the Contract Documents.

§ 3.12.10.2 If the Contract Documents require the Contractor's design professional to certify that the Work has been performed in accordance with the design criteria, the Contractor shall furnish such certifications to the Architect at the time and in the form specified by the Architect.

§ 3.13 Use of Site

The Contractor shall confine operations at the site to areas permitted by applicable laws, statutes, ordinances, codes, rules and regulations, lawful orders of public authorities, and the Contract Documents and shall not unreasonably encumber the site with materials or equipment.

§ 3.14 Cutting and Patching

§ 3.14.1 The Contractor shall be responsible for cutting, fitting, or patching required to complete the Work or to make its parts fit together properly. All areas requiring cutting, fitting, or patching shall be restored to the condition existing prior to the cutting, fitting, or patching, unless otherwise required by the Contract Documents.

§ 3.14.2 The Contractor shall not damage or endanger a portion of the Work or fully or partially completed construction of the Owner or Separate Contractors by cutting, patching, or otherwise altering such construction, or by excavation. The Contractor shall not cut or otherwise alter construction by the Owner or a Separate Contractor except with written consent of the Owner and of the Separate Contractor. Consent shall not be unreasonably withheld. The Contractor shall not unreasonably withhold, from the Owner or a Separate Contractor, its consent to cutting or otherwise altering the Work.

§ 3.15 Cleaning Up

§ 3.15.1 The Contractor shall keep the premises and surrounding area free from accumulation of waste materials and rubbish caused by operations under the Contract. At completion of the Work, the Contractor shall remove waste materials, rubbish, the Contractor's tools, construction equipment, machinery, and surplus materials from and about the Project.

§ 3.15.2 If the Contractor fails to clean up as provided in the Contract Documents, the Owner may do so and the Owner shall be entitled to reimbursement from the Contractor.

§ 3.16 Access to Work

The Contractor shall provide the Owner and Architect with access to the Work in preparation and progress wherever located.

§ 3.17 Royalties, Patents and Copyrights

The Contractor shall pay all royalties and license fees. The Contractor shall defend suits or claims for infringement of copyrights and patent rights and shall hold the Owner and Architect harmless from loss on account thereof, but shall not be responsible for defense or loss when a particular design, process, or product of a particular manufacturer or manufacturers is required by the Contract Documents, or where the copyright violations are contained in Drawings, Specifications, or other documents prepared by the Owner or Architect. However, if an infringement of a copyright or patent is discovered by, or made known to, the Contractor, the Contractor shall be responsible for the loss unless the information is promptly furnished to the Architect.

§ 3.18 Indemnification

§ 3.18.1 To the fullest extent permitted by law, the Contractor shall indemnify and hold harmless the Owner, Architect, Architect's consultants, and agents and employees of any of them from and against claims, damages, losses, and expenses, including but not limited to attorneys' fees, arising out of or resulting from performance of the Work, provided that such claim, damage, loss, or expense is attributable to bodily injury, sickness, disease or death, or to injury to or destruction of tangible property (other than the Work itself), but only to the extent caused by the negligent acts or omissions of the Contractor, a Subcontractor, anyone directly or indirectly employed by them, or anyone for whose acts they may be liable, regardless of whether or not such claim, damage, loss, or expense is caused in part by a party indemnified hereunder. Such obligation shall not be construed to negate, abridge, or reduce other rights or obligations of indemnity that would otherwise exist as to a party or person described in this Section 3.18.

§ 3.18.2 In claims against any person or entity indemnified under this Section 3.18 by an employee of the Contractor, a Subcontractor, anyone directly or indirectly employed by them, or anyone for whose acts they may be liable, the indemnification obligation under Section 3.18.1 shall not be limited by a limitation on amount or type of damages, compensation, or benefits payable by or for the Contractor or a Subcontractor under workers' compensation acts, disability benefit acts, or other employee benefit acts.

ARTICLE 4 ARCHITECT

§ 4.1 General

§ 4.1.1 The Architect is the person or entity retained by the Owner pursuant to Section 2.3.2 and identified as such in the Agreement.

§ 4.1.2 Duties, responsibilities, and limitations of authority of the Architect as set forth in the Contract Documents shall not be restricted, modified, or extended without written consent of the Owner, Contractor, and Architect. Consent shall not be unreasonably withheld.

§ 4.2 Administration of the Contract

§ 4.2.1 The Architect will provide administration of the Contract as described in the Contract Documents and will be an Owner's representative during construction until the date the Architect issues the final Certificate for Payment. The Architect will have authority to act on behalf of the Owner only to the extent provided in the Contract Documents.

§ 4.2.2 The Architect will visit the site at intervals appropriate to the stage of construction, or as otherwise agreed with the Owner, to become generally familiar with the progress and quality of the portion of the Work completed, and to determine in general if the Work observed is being performed in a manner indicating that the Work, when fully completed, will be in accordance with the Contract Documents. However, the Architect will not be required to make exhaustive or continuous on-site inspections to check the quality or quantity of the Work. The Architect will not have control over, charge of, or responsibility for the construction means, methods, techniques, sequences or procedures, or for the safety precautions and programs in connection with the Work, since these are solely the Contractor's rights and responsibilities under the Contract Documents.

§ 4.2.3 On the basis of the site visits, the Architect will keep the Owner reasonably informed about the progress and quality of the portion of the Work completed, and promptly report to the Owner (1) known deviations from the Contract Documents, (2) known deviations from the most recent construction schedule submitted by the Contractor, and (3) defects and deficiencies observed in the Work. The Architect will not be responsible for the Contractor's failure to perform the Work in accordance with the requirements of the Contract Documents. The Architect will not have control over or charge of, and will not be responsible for acts or omissions of, the Contractor, Subcontractors, or their agents or employees, or any other persons or entities performing portions of the Work.

§ 4.2.4 Communications

The Owner and Contractor shall include the Architect in all communications that relate to or affect the Architect's services or professional responsibilities. The Owner shall promptly notify the Architect of the substance of any direct communications between the Owner and the Contractor otherwise relating to the Project. Communications by and with the Architect's consultants shall be through the Architect. Communications by and with Subcontractors and suppliers shall be through the Contractor. Communications by and with Separate Contractors shall be through the Owner. The Contract Documents may specify other communication protocols.

§ 4.2.5 Based on the Architect's evaluations of the Contractor's Applications for Payment, the Architect will review and certify the amounts due the Contractor and will issue Certificates for Payment in such amounts.

§ 4.2.6 The Architect has authority to reject Work that does not conform to the Contract Documents. Whenever the Architect considers it necessary or advisable, the Architect will have authority to require inspection or testing of the Work in accordance with Sections 13.4.2 and 13.4.3, whether or not the Work is fabricated, installed or completed. However, neither this authority of the Architect nor a decision made in good faith either to exercise or not to exercise such authority shall give rise to a duty or responsibility of the Architect to the Contractor, Subcontractors, suppliers, their agents or employees, or other persons or entities performing portions of the Work.

§ 4.2.7 The Architect will review and approve, or take other appropriate action upon, the Contractor's submittals such as Shop Drawings, Product Data, and Samples, but only for the limited purpose of checking for conformance with information given and the design concept expressed in the Contract Documents. The Architect's action will be taken in accordance with the submittal schedule approved by the Architect or, in the absence of an approved submittal schedule, with reasonable promptness while allowing sufficient time in the Architect's professional judgment to permit adequate review. Review of such submittals is not conducted for the purpose of determining the accuracy and completeness of other details such as dimensions and quantities, or for substantiating instructions for installation or performance of equipment or systems, all of which remain the responsibility of the Contractor as required by the Contract Documents. The Architect's review of the Contractor's submittals shall not relieve the Contractor of the obligations under Sections 3.3, 3.5, and 3.12. The Architect's review shall not constitute approval of safety precautions or of any construction means, methods, techniques, sequences, or procedures. The Architect's approval of a specific item shall not indicate approval of an assembly of which the item is a component.

§ 4.2.8 The Architect will prepare Change Orders and Construction Change Directives, and may order minor changes in the Work as provided in Section 7.4. The Architect will investigate and make determinations and recommendations regarding concealed and unknown conditions as provided in Section 3.7.4.

§ 4.2.9 The Architect will conduct inspections to determine the date or dates of Substantial Completion and the date of final completion; issue Certificates of Substantial Completion pursuant to Section 9.8; receive and forward to the Owner, for the Owner's review and records, written warranties and related documents required by the Contract and assembled by the Contractor pursuant to Section 9.10; and issue a final Certificate for Payment pursuant to Section 9.10.

§ 4.2.10 If the Owner and Architect agree, the Architect will provide one or more Project representatives to assist in carrying out the Architect's responsibilities at the site. The Owner shall notify the Contractor of any change in the duties, responsibilities and limitations of authority of the Project representatives.

§ 4.2.11 The Architect will interpret and decide matters concerning performance under, and requirements of, the Contract Documents on written request of either the Owner or Contractor. The Architect's response to such requests will be made in writing within any time limits agreed upon or otherwise with reasonable promptness.

§ 4.2.12 Interpretations and decisions of the Architect will be consistent with the intent of, and reasonably inferable from, the Contract Documents and will be in writing or in the form of drawings. When making such interpretations and decisions, the Architect will endeavor to secure faithful performance by both Owner and Contractor, will not show partiality to either, and will not be liable for results of interpretations or decisions rendered in good faith.

§ 4.2.13 The Architect's decisions on matters relating to aesthetic effect will be final if consistent with the intent expressed in the Contract Documents.

§ 4.2.14 The Architect will review and respond to requests for information about the Contract Documents. The Architect's response to such requests will be made in writing within any time limits agreed upon or otherwise with reasonable promptness. If appropriate, the Architect will prepare and issue supplemental Drawings and Specifications in response to the requests for information.

ARTICLE 5 SUBCONTRACTORS

§ 5.1 Definitions

§ 5.1.1 A Subcontractor is a person or entity who has a direct contract with the Contractor to perform a portion of the Work at the site. The term "Subcontractor" is referred to throughout the Contract Documents as if singular in number and means a Subcontractor or an authorized representative of the Subcontractor. The term "Subcontractor" does not include a Separate Contractor or the subcontractors of a Separate Contractor.

§ 5.1.2 A Sub-subcontractor is a person or entity who has a direct or indirect contract with a Subcontractor to perform a portion of the Work at the site. The term "Sub-subcontractor" is referred to throughout the Contract Documents as if singular in number and means a Sub-subcontractor or an authorized representative of the Sub-subcontractor.

§ 5.2 Award of Subcontracts and Other Contracts for Portions of the Work

§ 5.2.1 Unless otherwise stated in the Contract Documents, the Contractor, as soon as practicable after award of the Contract, shall notify the Owner and Architect of the persons or entities proposed for each principal portion of the Work, including those who are to furnish materials or equipment fabricated to a special design. Within 14 days of receipt of the information, the Architect may notify the Contractor whether the Owner or the Architect (1) has reasonable objection to any such proposed person or entity or (2) requires additional time for review. Failure of the Architect to provide notice within the 14-day period shall constitute notice of no reasonable objection.

§ 5.2.2 The Contractor shall not contract with a proposed person or entity to whom the Owner or Architect has made reasonable and timely objection. The Contractor shall not be required to contract with anyone to whom the Contractor has made reasonable objection.

§ 5.2.3 If the Owner or Architect has reasonable objection to a person or entity proposed by the Contractor, the Contractor shall propose another to whom the Owner or Architect has no reasonable objection. If the proposed but rejected Subcontractor was reasonably capable of performing the Work, the Contract Sum and Contract Time shall be increased or decreased by the difference, if any, occasioned by such change, and an appropriate Change Order shall be issued before commencement of the substitute Subcontractor's Work. However, no increase in the Contract Sum or Contract Time shall be allowed for such change unless the Contractor has acted promptly and responsively in submitting names as required.

§ 5.2.4 The Contractor shall not substitute a Subcontractor, person, or entity for one previously selected if the Owner or Architect makes reasonable objection to such substitution.

§ 5.3 Subcontractual Relations

By appropriate written agreement, the Contractor shall require each Subcontractor, to the extent of the Work to be performed by the Subcontractor, to be bound to the Contractor by terms of the Contract Documents, and to assume toward the Contractor all the obligations and responsibilities, including the responsibility for safety of the Subcontractor's Work that the Contractor, by these Contract Documents, assumes toward the Owner and Architect. Each subcontract agreement shall preserve and protect the rights of the Owner and Architect under the Contract Documents with respect to the Work to be performed by the Subcontractor so that subcontracting thereof will not prejudice such rights, and shall allow to the Subcontractor, unless specifically provided otherwise in the subcontract agreement, the benefit of all rights, remedies, and redress against the Contractor that the Contractor, by the Contract Documents, has against the Owner. Where appropriate, the Contractor shall require each Subcontractor to enter into similar agreements with Sub-subcontractors. The Contractor shall make available to each proposed Subcontractor, prior to the execution of the subcontract agreement, copies of the Contract Documents to which the Subcontractor will be bound, and, upon written request of the Subcontractor, identify to the Subcontractor terms and conditions of the proposed subcontract agreement that may be at variance with the Contract Documents. Subcontractors will similarly make copies of applicable portions of such documents available to their respective proposed Sub-subcontractors.

§ 5.4 Contingent Assignment of Subcontracts

§ 5.4.1 Each subcontract agreement for a portion of the Work is assigned by the Contractor to the Owner, provided that

- .1 assignment is effective only after termination of the Contract by the Owner for cause pursuant to Section 14.2 and only for those subcontract agreements that the Owner accepts by notifying the Subcontractor and Contractor; and
- .2 assignment is subject to the prior rights of the surety, if any, obligated under bond relating to the Contract.

When the Owner accepts the assignment of a subcontract agreement, the Owner assumes the Contractor's rights and obligations under the subcontract.

§ 5.4.2 Upon such assignment, if the Work has been suspended for more than 30 days, the Subcontractor's compensation shall be equitably adjusted for increases in cost resulting from the suspension.

§ 5.4.3 Upon assignment to the Owner under this Section 5.4, the Owner may further assign the subcontract to a successor contractor or other entity. If the Owner assigns the subcontract to a successor contractor or other entity, the Owner shall nevertheless remain legally responsible for all of the successor contractor's obligations under the subcontract.

ARTICLE 6 CONSTRUCTION BY OWNER OR BY SEPARATE CONTRACTORS

§ 6.1 Owner's Right to Perform Construction and to Award Separate Contracts

§ 6.1.1 The term "Separate Contractor(s)" shall mean other contractors retained by the Owner under separate agreements. The Owner reserves the right to perform construction or operations related to the Project with the Owner's own forces, and with Separate Contractors retained under Conditions of the Contract substantially similar to those of this Contract, including those provisions of the Conditions of the Contract related to insurance and waiver of subrogation.

§ 6.1.2 When separate contracts are awarded for different portions of the Project or other construction or operations on the site, the term "Contractor" in the Contract Documents in each case shall mean the Contractor who executes each separate Owner-Contractor Agreement.

§ 6.1.3 The Owner shall provide for coordination of the activities of the Owner's own forces and of each Separate Contractor with the Work of the Contractor, who shall cooperate with them. The Contractor shall participate with any Separate Contractors and the Owner in reviewing their construction schedules. The Contractor shall make any revisions to its construction schedule deemed necessary after a joint review and mutual agreement. The construction schedules shall then constitute the schedules to be used by the Contractor, Separate Contractors, and the Owner until subsequently revised.

§ 6.1.4 Unless otherwise provided in the Contract Documents, when the Owner performs construction or operations related to the Project with the Owner's own forces or with Separate Contractors, the Owner or its Separate Contractors shall have the same obligations and rights that the Contractor has under the Conditions of the Contract, including, without excluding others, those stated in Article 3, this Article 6, and Articles 10, 11, and 12.

§ 6.2 Mutual Responsibility

§ 6.2.1 The Contractor shall afford the Owner and Separate Contractors reasonable opportunity for introduction and storage of their materials and equipment and performance of their activities, and shall connect and coordinate the Contractor's construction and operations with theirs as required by the Contract Documents.

§ 6.2.2 If part of the Contractor's Work depends for proper execution or results upon construction or operations by the Owner or a Separate Contractor, the Contractor shall, prior to proceeding with that portion of the Work, promptly notify the Architect of apparent discrepancies or defects in the construction or operations by the Owner or Separate Contractor that would render it unsuitable for proper execution and results of the Contractor's Work. Failure of the Contractor to notify the Architect of apparent discrepancies or defects prior to proceeding with the Work shall constitute an acknowledgment that the Owner's or Separate Contractor's completed or partially completed construction is fit and proper to receive the Contractor's Work. The Contractor shall not be responsible for discrepancies or defects in the construction or operations by the Owner or Separate Contractor that are not apparent.

§ 6.2.3 The Contractor shall reimburse the Owner for costs the Owner incurs that are payable to a Separate Contractor because of the Contractor's delays, improperly timed activities or defective construction. The Owner shall be responsible to the Contractor for costs the Contractor incurs because of a Separate Contractor's delays, improperly timed activities, damage to the Work or defective construction.

§ 6.2.4 The Contractor shall promptly remedy damage that the Contractor wrongfully causes to completed or partially completed construction or to property of the Owner or Separate Contractor as provided in Section 10.2.5.

§ 6.2.5 The Owner and each Separate Contractor shall have the same responsibilities for cutting and patching as are described for the Contractor in Section 3.14.

§ 6.3 Owner's Right to Clean Up

If a dispute arises among the Contractor, Separate Contractors, and the Owner as to the responsibility under their respective contracts for maintaining the premises and surrounding area free from waste materials and rubbish, the Owner may clean up and the Architect will allocate the cost among those responsible.

ARTICLE 7 CHANGES IN THE WORK

§ 7.1 General

§ 7.1.1 Changes in the Work may be accomplished after execution of the Contract, and without invalidating the Contract, by Change Order, Construction Change Directive or order for a minor change in the Work, subject to the limitations stated in this Article 7 and elsewhere in the Contract Documents.

§ 7.1.2 A Change Order shall be based upon agreement among the Owner, Contractor, and Architect. A Construction Change Directive requires agreement by the Owner and Architect and may or may not be agreed to by the Contractor. An order for a minor change in the Work may be issued by the Architect alone.

§ 7.1.3 Changes in the Work shall be performed under applicable provisions of the Contract Documents. The Contractor shall proceed promptly with changes in the Work, unless otherwise provided in the Change Order, Construction Change Directive, or order for a minor change in the Work.

§ 7.2 Change Orders

§ 7.2.1 A Change Order is a written instrument prepared by the Architect and signed by the Owner, Contractor, and Architect stating their agreement upon all of the following:

- .1 The change in the Work;
- .2 The amount of the adjustment, if any, in the Contract Sum; and
- .3 The extent of the adjustment, if any, in the Contract Time.

§ 7.3 Construction Change Directives

§ 7.3.1 A Construction Change Directive is a written order prepared by the Architect and signed by the Owner and Architect, directing a change in the Work prior to agreement on adjustment, if any, in the Contract Sum or Contract Time, or both. The Owner may by Construction Change Directive, without invalidating the Contract, order changes in the Work within the general scope of the Contract consisting of additions, deletions, or other revisions, the Contract Sum and Contract Time being adjusted accordingly.

§ 7.3.2 A Construction Change Directive shall be used in the absence of total agreement on the terms of a Change Order.

§ 7.3.3 If the Construction Change Directive provides for an adjustment to the Contract Sum, the adjustment shall be based on one of the following methods:

- .1 Mutual acceptance of a lump sum properly itemized and supported by sufficient substantiating data to permit evaluation;
- .2 Unit prices stated in the Contract Documents or subsequently agreed upon;
- .3 Cost to be determined in a manner agreed upon by the parties and a mutually acceptable fixed or percentage fee; or
- .4 As provided in Section 7.3.4.

§ 7.3.4 If the Contractor does not respond promptly or disagrees with the method for adjustment in the Contract Sum, the Architect shall determine the adjustment on the basis of reasonable expenditures and savings of those performing the Work attributable to the change, including, in case of an increase in the Contract Sum, an amount for overhead and profit as set forth in the Agreement, or if no such amount is set forth in the Agreement, a reasonable amount. In such case, and also under Section 7.3.3.3, the Contractor shall keep and present, in such form as the Architect may prescribe, an itemized accounting together with appropriate supporting data. Unless otherwise provided in the Contract Documents, costs for the purposes of this Section 7.3.4 shall be limited to the following:

- .1 Costs of labor, including applicable payroll taxes, fringe benefits required by agreement or custom, workers' compensation insurance, and other employee costs approved by the Architect;
- .2 Costs of materials, supplies, and equipment, including cost of transportation, whether incorporated or consumed;
- .3 Rental costs of machinery and equipment, exclusive of hand tools, whether rented from the Contractor or others;
- .4 Costs of premiums for all bonds and insurance, permit fees, and sales, use, or similar taxes, directly related to the change; and
- .5 Costs of supervision and field office personnel directly attributable to the change.

§ 7.3.5 If the Contractor disagrees with the adjustment in the Contract Time, the Contractor may make a Claim in accordance with applicable provisions of Article 15.

§ 7.3.6 Upon receipt of a Construction Change Directive, the Contractor shall promptly proceed with the change in the Work involved and advise the Architect of the Contractor's agreement or disagreement with the method, if any, provided in the Construction Change Directive for determining the proposed adjustment in the Contract Sum or Contract Time.

§ 7.3.7 A Construction Change Directive signed by the Contractor indicates the Contractor's agreement therewith, including adjustment in Contract Sum and Contract Time or the method for determining them. Such agreement shall be effective immediately and shall be recorded as a Change Order.

§ 7.3.8 The amount of credit to be allowed by the Contractor to the Owner for a deletion or change that results in a net decrease in the Contract Sum shall be actual net cost as confirmed by the Architect. When both additions and credits covering related Work or substitutions are involved in a change, the allowance for overhead and profit shall be figured on the basis of net increase, if any, with respect to that change.

§ 7.3.9 Pending final determination of the total cost of a Construction Change Directive to the Owner, the Contractor may request payment for Work completed under the Construction Change Directive in Applications for Payment. The Architect will make an interim determination for purposes of monthly certification for payment for those costs and certify for payment the amount that the Architect determines, in the Architect's professional judgment, to be reasonably justified. The Architect's interim determination of cost shall adjust the Contract Sum on the same basis as a Change Order, subject to the right of either party to disagree and assert a Claim in accordance with Article 15.

§ 7.3.10 When the Owner and Contractor agree with a determination made by the Architect concerning the adjustments in the Contract Sum and Contract Time, or otherwise reach agreement upon the adjustments, such agreement shall be effective immediately and the Architect will prepare a Change Order. Change Orders may be issued for all or any part of a Construction Change Directive.

§ 7.4 Minor Changes in the Work

The Architect may order minor changes in the Work that are consistent with the intent of the Contract Documents and do not involve an adjustment in the Contract Sum or an extension of the Contract Time. The Architect's order for minor changes shall be in writing. If the Contractor believes that the proposed minor change in the Work will affect the Contract Sum or Contract Time, the Contractor shall notify the Architect and shall not proceed to implement the change in the Work. If the Contractor performs the Work set forth in the Architect's order for a minor change without prior notice to the Architect that such change will affect the Contract Sum or Contract Time, the Contractor waives any adjustment to the Contract Sum or extension of the Contract Time.

ARTICLE 8 TIME

§ 8.1 Definitions

§ 8.1.1 Unless otherwise provided, Contract Time is the period of time, including authorized adjustments, allotted in the Contract Documents for Substantial Completion of the Work.

§ 8.1.2 The date of commencement of the Work is the date established in the Agreement.

§ 8.1.3 The date of Substantial Completion is the date certified by the Architect in accordance with Section 9.8.

§ 8.1.4 The term "day" as used in the Contract Documents shall mean calendar day unless otherwise specifically defined.

§ 8.2 Progress and Completion

§ 8.2.1 Time limits stated in the Contract Documents are of the essence of the Contract. By executing the Agreement, the Contractor confirms that the Contract Time is a reasonable period for performing the Work.

§ 8.2.2 The Contractor shall not knowingly, except by agreement or instruction of the Owner in writing, commence the Work prior to the effective date of insurance required to be furnished by the Contractor and Owner.

§ 8.2.3 The Contractor shall proceed expeditiously with adequate forces and shall achieve Substantial Completion within the Contract Time.

§ 8.3 Delays and Extensions of Time

§ 8.3.1 If the Contractor is delayed at any time in the commencement or progress of the Work by (1) an act or neglect of the Owner or Architect, of an employee of either, or of a Separate Contractor; (2) by changes ordered in the Work; (3) by labor disputes, fire, unusual delay in deliveries, unavoidable casualties, adverse weather conditions documented in accordance with Section 15.1.6.2, or other causes beyond the Contractor's control; (4) by delay authorized by the Owner pending mediation and binding dispute resolution; or (5) by other causes that the Contractor asserts, and the Architect determines, justify delay, then the Contract Time shall be extended for such reasonable time as the Architect may determine.

§ 8.3.2 Claims relating to time shall be made in accordance with applicable provisions of Article 15.

§ 8.3.3 This Section 8.3 does not preclude recovery of damages for delay by either party under other provisions of the Contract Documents.

ARTICLE 9 PAYMENTS AND COMPLETION

§ 9.1 Contract Sum

§ 9.1.1 The Contract Sum is stated in the Agreement and, including authorized adjustments, is the total amount payable by the Owner to the Contractor for performance of the Work under the Contract Documents.

§ 9.1.2 If unit prices are stated in the Contract Documents or subsequently agreed upon, and if quantities originally contemplated are materially changed so that application of such unit prices to the actual quantities causes substantial inequity to the Owner or Contractor, the applicable unit prices shall be equitably adjusted.

§ 9.2 Schedule of Values

Where the Contract is based on a stipulated sum or Guaranteed Maximum Price, the Contractor shall submit a schedule of values to the Architect before the first Application for Payment, allocating the entire Contract Sum to the various portions of the Work. The schedule of values shall be prepared in the form, and supported by the data to substantiate its accuracy, required by the Architect. This schedule, unless objected to by the Architect, shall be used as a basis for reviewing the Contractor's Applications for Payment. Any changes to the schedule of values shall be submitted to the Architect and supported by such data to substantiate its accuracy as the Architect may require, and unless objected to by the Architect, shall be used as a basis for reviewing the Contractor's subsequent Applications for Payment.

§ 9.3 Applications for Payment

§ 9.3.1 At least ten days before the date established for each progress payment, the Contractor shall submit to the Architect an itemized Application for Payment prepared in accordance with the schedule of values, if required under Section 9.2, for completed portions of the Work. The application shall be notarized, if required, and supported by all data substantiating the Contractor's right to payment that the Owner or Architect require, such as copies of requisitions, and releases and waivers of liens from Subcontractors and suppliers, and shall reflect retainage if provided for in the Contract Documents.

§ 9.3.1.1 As provided in Section 7.3.9, such applications may include requests for payment on account of changes in the Work that have been properly authorized by Construction Change Directives, or by interim determinations of the Architect, but not yet included in Change Orders.

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§ 9.3.1.2 Applications for Payment shall not include requests for payment for portions of the Work for which the Contractor does not intend to pay a Subcontractor or supplier, unless such Work has been performed by others whom the Contractor intends to pay.

§ 9.3.2 Unless otherwise provided in the Contract Documents, payments shall be made on account of materials and equipment delivered and suitably stored at the site for subsequent incorporation in the Work. If approved in advance by the Owner, payment may similarly be made for materials and equipment suitably stored off the site at a location agreed upon in writing. Payment for materials and equipment stored on or off the site shall be conditioned upon compliance by the Contractor with procedures satisfactory to the Owner to establish the Owner's title to such materials and equipment or otherwise protect the Owner's interest, and shall include the costs of applicable insurance, storage, and transportation to the site, for such materials and equipment stored off the site.

§ 9.3.3 The Contractor warrants that title to all Work covered by an Application for Payment will pass to the Owner no later than the time of payment. The Contractor further warrants that upon submittal of an Application for Payment all Work for which Certificates for Payment have been previously issued and payments received from the Owner shall, to the best of the Contractor's knowledge, information, and belief, be free and clear of liens, claims, security interests, or encumbrances, in favor of the Contractor, Subcontractors, suppliers, or other persons or entities that provided labor, materials, and equipment relating to the Work.

§ 9.4 Certificates for Payment

§ 9.4.1 The Architect will, within seven days after receipt of the Contractor's Application for Payment, either (1) issue to the Owner a Certificate for Payment in the full amount of the Application for Payment, with a copy to the Contractor; or (2) issue to the Owner a Certificate for Payment for such amount as the Architect determines is properly due, and notify the Contractor and Owner of the Architect's reasons for withholding certification in part as provided in Section 9.5.1; or (3) withhold certification of the entire Application for Payment, and notify the Contractor and Owner of the Architect's reason for withholding certification in whole as provided in Section 9.5.1.

§ 9.4.2 The issuance of a Certificate for Payment will constitute a representation by the Architect to the Owner, based on the Architect's evaluation of the Work and the data in the Application for Payment, that, to the best of the Architect's knowledge, information, and belief, the Work has progressed to the point indicated, the quality of the Work is in accordance with the Contract Documents, and that the Contractor is entitled to payment in the amount certified. The foregoing representations are subject to an evaluation of the Work for conformance with the Contract Documents upon Substantial Completion, to results of subsequent tests and inspections, to correction of minor deviations from the Contract Documents prior to completion, and to specific qualifications expressed by the Architect. However, the issuance of a Certificate for Payment will not be a representation that the Architect has (1) made exhaustive or continuous on-site inspections to check the quality or quantity of the Work; (2) reviewed construction means, methods, techniques, sequences, or procedures; (3) reviewed copies of requisitions received from Subcontractors and suppliers and other data requested by the Owner to substantiate the Contractor's right to payment; or (4) made examination to ascertain how or for what purpose the Contractor has used money previously paid on account of the Contract Sum.

§ 9.5 Decisions to Withhold Certification

§ 9.5.1 The Architect may withhold a Certificate for Payment in whole or in part, to the extent reasonably necessary to protect the Owner, if in the Architect's opinion the representations to the Owner required by Section 9.4.2 cannot be made. If the Architect is unable to certify payment in the amount of the Application, the Architect will notify the Contractor and Owner as provided in Section 9.4.1. If the Contractor and Architect cannot agree on a revised amount, the Architect will promptly issue a Certificate for Payment for the amount for which the Architect is able to make such representations to the Owner. The Architect may also withhold a Certificate for Payment or, because of subsequently discovered evidence, may nullify the whole or a part of a Certificate for Payment previously issued, to such extent as may be necessary in the Architect's opinion to protect the Owner from loss for which the Contractor is responsible, including loss resulting from acts and omissions described in Section 3.3.2, because of

- .1 defective Work not remedied;
- .2 third party claims filed or reasonable evidence indicating probable filing of such claims, unless security acceptable to the Owner is provided by the Contractor;
- .3 failure of the Contractor to make payments properly to Subcontractors or suppliers for labor, materials or equipment;

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- .4 reasonable evidence that the Work cannot be completed for the unpaid balance of the Contract Sum;
- .5 damage to the Owner or a Separate Contractor;
- .6 reasonable evidence that the Work will not be completed within the Contract Time, and that the unpaid balance would not be adequate to cover actual or liquidated damages for the anticipated delay; or
- .7 repeated failure to carry out the Work in accordance with the Contract Documents.

§ 9.5.2 When either party disputes the Architect's decision regarding a Certificate for Payment under Section 9.5.1, in whole or in part, that party may submit a Claim in accordance with Article 15.

§ 9.5.3 When the reasons for withholding certification are removed, certification will be made for amounts previously withheld.

§ 9.5.4 If the Architect withholds certification for payment under Section 9.5.1.3, the Owner may, at its sole option, issue joint checks to the Contractor and to any Subcontractor or supplier to whom the Contractor failed to make payment for Work properly performed or material or equipment suitably delivered. If the Owner makes payments by joint check, the Owner shall notify the Architect and the Contractor shall reflect such payment on its next Application for Payment.

§ 9.6 Progress Payments

§ 9.6.1 After the Architect has issued a Certificate for Payment, the Owner shall make payment in the manner and within the time provided in the Contract Documents, and shall so notify the Architect.

§ 9.6.2 The Contractor shall pay each Subcontractor, no later than seven days after receipt of payment from the Owner, the amount to which the Subcontractor is entitled, reflecting percentages actually retained from payments to the Contractor on account of the Subcontractor's portion of the Work. The Contractor shall, by appropriate agreement with each Subcontractor, require each Subcontractor to make payments to Sub-subcontractors in a similar manner.

§ 9.6.3 The Architect will, on request, furnish to a Subcontractor, if practicable, information regarding percentages of completion or amounts applied for by the Contractor and action taken thereon by the Architect and Owner on account of portions of the Work done by such Subcontractor.

§ 9.6.4 The Owner has the right to request written evidence from the Contractor that the Contractor has properly paid Subcontractors and suppliers amounts paid by the Owner to the Contractor for subcontracted Work. If the Contractor fails to furnish such evidence within seven days, the Owner shall have the right to contact Subcontractors and suppliers to ascertain whether they have been properly paid. Neither the Owner nor Architect shall have an obligation to pay, or to see to the payment of money to, a Subcontractor or supplier, except as may otherwise be required by law.

§ 9.6.5 The Contractor's payments to suppliers shall be treated in a manner similar to that provided in Sections 9.6.2, 9.6.3 and 9.6.4.

§ 9.6.6 A Certificate for Payment, a progress payment, or partial or entire use or occupancy of the Project by the Owner shall not constitute acceptance of Work not in accordance with the Contract Documents.

§ 9.6.7 Unless the Contractor provides the Owner with a payment bond in the full penal sum of the Contract Sum, payments received by the Contractor for Work properly performed by Subcontractors or provided by suppliers shall be held by the Contractor for those Subcontractors or suppliers who performed Work or furnished materials, or both, under contract with the Contractor for which payment was made by the Owner. Nothing contained herein shall require money to be placed in a separate account and not commingled with money of the Contractor, create any fiduciary liability or tort liability on the part of the Contractor for breach of trust, or entitle any person or entity to an award of punitive damages against the Contractor for breach of the requirements of this provision.

§ 9.6.8 Provided the Owner has fulfilled its payment obligations under the Contract Documents, the Contractor shall defend and indemnify the Owner from all loss, liability, damage or expense, including reasonable attorney's fees and litigation expenses, arising out of any lien claim or other claim for payment by any Subcontractor or supplier of any tier. Upon receipt of notice of a lien claim or other claim for payment, the Owner shall notify the Contractor. If approved by the applicable court, when required, the Contractor may substitute a surety bond for the property against which the lien or other claim for payment has been asserted.

§ 9.7 Failure of Payment

If the Architect does not issue a Certificate for Payment, through no fault of the Contractor, within seven days after receipt of the Contractor's Application for Payment, or if the Owner does not pay the Contractor within seven days after the date established in the Contract Documents, the amount certified by the Architect or awarded by binding dispute resolution, then the Contractor may, upon seven additional days' notice to the Owner and Architect, stop the Work until payment of the amount owing has been received. The Contract Time shall be extended appropriately and the Contract Sum shall be increased by the amount of the Contractor's reasonable costs of shutdown, delay and start-up, plus interest as provided for in the Contract Documents.

§ 9.8 Substantial Completion

§ 9.8.1 Substantial Completion is the stage in the progress of the Work when the Work or designated portion thereof is sufficiently complete in accordance with the Contract Documents so that the Owner can occupy or utilize the Work for its intended use.

§ 9.8.2 When the Contractor considers that the Work, or a portion thereof which the Owner agrees to accept separately, is substantially complete, the Contractor shall prepare and submit to the Architect a comprehensive list of items to be completed or corrected prior to final payment. Failure to include an item on such list does not alter the responsibility of the Contractor to complete all Work in accordance with the Contract Documents.

§ 9.8.3 Upon receipt of the Contractor's list, the Architect will make an inspection to determine whether the Work or designated portion thereof is substantially complete. If the Architect's inspection discloses any item, whether or not included on the Contractor's list, which is not sufficiently complete in accordance with the Contract Documents so that the Owner can occupy or utilize the Work or designated portion thereof for its intended use, the Contractor shall, before issuance of the Certificate of Substantial Completion, complete or correct such item upon notification by the Architect. In such case, the Contractor shall then submit a request for another inspection by the Architect to determine Substantial Completion.

§ 9.8.4 When the Work or designated portion thereof is substantially complete, the Architect will prepare a Certificate of Substantial Completion that shall establish the date of Substantial Completion; establish responsibilities of the Owner and Contractor for security, maintenance, heat, utilities, damage to the Work and insurance; and fix the time within which the Contractor shall finish all items on the list accompanying the Certificate. Warranties required by the Contract Documents shall commence on the date of Substantial Completion of the Work or designated portion thereof unless otherwise provided in the Certificate of Substantial Completion.

§ 9.8.5 The Certificate of Substantial Completion shall be submitted to the Owner and Contractor for their written acceptance of responsibilities assigned to them in the Certificate. Upon such acceptance, and consent of surety if any, the Owner shall make payment of retainage applying to the Work or designated portion thereof. Such payment shall be adjusted for Work that is incomplete or not in accordance with the requirements of the Contract Documents.

§ 9.9 Partial Occupancy or Use

§ 9.9.1 The Owner may occupy or use any completed or partially completed portion of the Work at any stage when such portion is designated by separate agreement with the Contractor, provided such occupancy or use is consented to by the insurer and authorized by public authorities having jurisdiction over the Project. Such partial occupancy or use may commence whether or not the portion is substantially complete, provided the Owner and Contractor have accepted in writing the responsibilities assigned to each of them for payments, retainage, if any, security, maintenance, heat, utilities, damage to the Work and insurance, and have agreed in writing concerning the period for correction of the Work and commencement of warranties required by the Contract Documents. When the Contractor considers a portion substantially complete, the Contractor shall prepare and submit a list to the Architect as provided under Section 9.8.2. Consent of the Contractor to partial occupancy or use shall not be unreasonably withheld. The stage of the progress of the Work shall be determined by written agreement between the Owner and Contractor or, if no agreement is reached, by decision of the Architect.

§ 9.9.2 Immediately prior to such partial occupancy or use, the Owner, Contractor, and Architect shall jointly inspect the area to be occupied or portion of the Work to be used in order to determine and record the condition of the Work.

§ 9.9.3 Unless otherwise agreed upon, partial occupancy or use of a portion or portions of the Work shall not constitute acceptance of Work not complying with the requirements of the Contract Documents.

§ 9.10 Final Completion and Final Payment

§ 9.10.1 Upon receipt of the Contractor's notice that the Work is ready for final inspection and acceptance and upon receipt of a final Application for Payment, the Architect will promptly make such inspection. When the Architect finds the Work acceptable under the Contract Documents and the Contract fully performed, the Architect will promptly issue a final Certificate for Payment stating that to the best of the Architect's knowledge, information and belief, and on the basis of the Architect's on-site visits and inspections, the Work has been completed in accordance with the Contract Documents and that the entire balance found to be due the Contractor and noted in the final Certificate is due and payable. The Architect's final Certificate for Payment will constitute a further representation that conditions listed in Section 9.10.2 as precedent to the Contractor's being entitled to final payment have been fulfilled.

§ 9.10.2 Neither final payment nor any remaining retained percentage shall become due until the Contractor submits to the Architect (1) an affidavit that payrolls, bills for materials and equipment, and other indebtedness connected with the Work for which the Owner or the Owner's property might be responsible or encumbered (less amounts withheld by Owner) have been paid or otherwise satisfied, (2) a certificate evidencing that insurance required by the Contract Documents to remain in force after final payment is currently in effect, (3) a written statement that the Contractor knows of no reason that the insurance will not be renewable to cover the period required by the Contract Documents, (4) consent of surety, if any, to final payment, (5) documentation of any special warranties, such as manufacturers' warranties or specific Subcontractor warranties, and (6) if required by the Owner, other data establishing payment or satisfaction of obligations, such as receipts and releases and waivers of liens, claims, security interests, or encumbrances arising out of the Contract, to the extent and in such form as may be designated by the Owner. If a Subcontractor refuses to furnish a release or waiver required by the Owner, the Contractor may furnish a bond satisfactory to the Owner to indemnify the Owner against such lien, claim, security interest, or encumbrance. If a lien, claim, security interest, or encumbrance remains unsatisfied after payments are made, the Contractor shall refund to the Owner all money that the Owner may be compelled to pay in discharging the lien, claim, security interest, or encumbrance, including all costs and reasonable attorneys' fees.

§ 9.10.3 If, after Substantial Completion of the Work, final completion thereof is materially delayed through no fault of the Contractor or by issuance of Change Orders affecting final completion, and the Architect so confirms, the Owner shall, upon application by the Contractor and certification by the Architect, and without terminating the Contract, make payment of the balance due for that portion of the Work fully completed, corrected, and accepted. If the remaining balance for Work not fully completed or corrected is less than retainage stipulated in the Contract Documents, and if bonds have been furnished, the written consent of the surety to payment of the balance due for that portion of the Work fully completed and accepted shall be submitted by the Contractor to the Architect prior to certification of such payment. Such payment shall be made under terms and conditions governing final payment, except that it shall not constitute a waiver of Claims.

§ 9.10.4 The making of final payment shall constitute a waiver of Claims by the Owner except those arising from

- .1 liens, Claims, security interests, or encumbrances arising out of the Contract and unsettled;
- .2 failure of the Work to comply with the requirements of the Contract Documents;
- .3 terms of special warranties required by the Contract Documents; or
- .4 audits performed by the Owner, if permitted by the Contract Documents, after final payment.

§ 9.10.5 Acceptance of final payment by the Contractor, a Subcontractor, or a supplier, shall constitute a waiver of claims by that payee except those previously made in writing and identified by that payee as unsettled at the time of final Application for Payment.

ARTICLE 10 PROTECTION OF PERSONS AND PROPERTY

§ 10.1 Safety Precautions and Programs

The Contractor shall be responsible for initiating, maintaining, and supervising all safety precautions and programs in connection with the performance of the Contract.

§ 10.2 Safety of Persons and Property

§ 10.2.1 The Contractor shall take reasonable precautions for safety of, and shall provide reasonable protection to prevent damage, injury, or loss to

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- .1 employees on the Work and other persons who may be affected thereby;
- .2 the Work and materials and equipment to be incorporated therein, whether in storage on or off the site, under care, custody, or control of the Contractor, a Subcontractor, or a Sub-subcontractor; and
- .3 other property at the site or adjacent thereto, such as trees, shrubs, lawns, walks, pavements, roadways, structures, and utilities not designated for removal, relocation, or replacement in the course of construction.

§ 10.2.2 The Contractor shall comply with, and give notices required by applicable laws, statutes, ordinances, codes, rules and regulations, and lawful orders of public authorities, bearing on safety of persons or property or their protection from damage, injury, or loss.

§ 10.2.3 The Contractor shall implement, erect, and maintain, as required by existing conditions and performance of the Contract, reasonable safeguards for safety and protection, including posting danger signs and other warnings against hazards; promulgating safety regulations; and notifying the owners and users of adjacent sites and utilities of the safeguards.

§ 10.2.4 When use or storage of explosives or other hazardous materials or equipment, or unusual methods are necessary for execution of the Work, the Contractor shall exercise utmost care and carry on such activities under supervision of properly qualified personnel.

§ 10.2.5 The Contractor shall promptly remedy damage and loss (other than damage or loss insured under property insurance required by the Contract Documents) to property referred to in Sections 10.2.1.2 and 10.2.1.3 caused in whole or in part by the Contractor, a Subcontractor, a Sub-subcontractor, or anyone directly or indirectly employed by any of them, or by anyone for whose acts they may be liable and for which the Contractor is responsible under Sections 10.2.1.2 and 10.2.1.3. The Contractor may make a Claim for the cost to remedy the damage or loss to the extent such damage or loss is attributable to acts or omissions of the Owner or Architect or anyone directly or indirectly employed by either of them, or by anyone for whose acts either of them may be liable, and not attributable to the fault or negligence of the Contractor. The foregoing obligations of the Contractor are in addition to the Contractor's obligations under Section 3.18.

§ 10.2.6 The Contractor shall designate a responsible member of the Contractor's organization at the site whose duty shall be the prevention of accidents. This person shall be the Contractor's superintendent unless otherwise designated by the Contractor in writing to the Owner and Architect.

§ 10.2.7 The Contractor shall not permit any part of the construction or site to be loaded so as to cause damage or create an unsafe condition.

§ 10.2.8 Injury or Damage to Person or Property

If either party suffers injury or damage to person or property because of an act or omission of the other party, or of others for whose acts such party is legally responsible, notice of the injury or damage, whether or not insured, shall be given to the other party within a reasonable time not exceeding 21 days after discovery. The notice shall provide sufficient detail to enable the other party to investigate the matter.

§ 10.3 Hazardous Materials and Substances

§ 10.3.1 The Contractor is responsible for compliance with any requirements included in the Contract Documents regarding hazardous materials or substances. If the Contractor encounters a hazardous material or substance not addressed in the Contract Documents and if reasonable precautions will be inadequate to prevent foreseeable bodily injury or death to persons resulting from a material or substance, including but not limited to asbestos or polychlorinated biphenyl (PCB), encountered on the site by the Contractor, the Contractor shall, upon recognizing the condition, immediately stop Work in the affected area and notify the Owner and Architect of the condition.

§ 10.3.2 Upon receipt of the Contractor's notice, the Owner shall obtain the services of a licensed laboratory to verify the presence or absence of the material or substance reported by the Contractor and, in the event such material or substance is found to be present, to cause it to be rendered harmless. Unless otherwise required by the Contract Documents, the Owner shall furnish in writing to the Contractor and Architect the names and qualifications of persons or entities who are to perform tests verifying the presence or absence of the material or substance or who are to perform the task of removal or safe containment of the material or substance. The Contractor and the Architect will

promptly reply to the Owner in writing stating whether or not either has reasonable objection to the persons or entities proposed by the Owner. If either the Contractor or Architect has an objection to a person or entity proposed by the Owner, the Owner shall propose another to whom the Contractor and the Architect have no reasonable objection. When the material or substance has been rendered harmless, Work in the affected area shall resume upon written agreement of the Owner and Contractor. By Change Order, the Contract Time shall be extended appropriately and the Contract Sum shall be increased by the amount of the Contractor's reasonable additional costs of shutdown, delay, and start-up.

§ 10.3.3 To the fullest extent permitted by law, the Owner shall indemnify and hold harmless the Contractor, Subcontractors, Architect, Architect's consultants, and agents and employees of any of them from and against claims, damages, losses, and expenses, including but not limited to attorneys' fees, arising out of or resulting from performance of the Work in the affected area if in fact the material or substance presents the risk of bodily injury or death as described in Section 10.3.1 and has not been rendered harmless, provided that such claim, damage, loss, or expense is attributable to bodily injury, sickness, disease or death, or to injury to or destruction of tangible property (other than the Work itself), except to the extent that such damage, loss, or expense is due to the fault or negligence of the party seeking indemnity.

§ 10.3.4 The Owner shall not be responsible under this Section 10.3 for hazardous materials or substances the Contractor brings to the site unless such materials or substances are required by the Contract Documents. The Owner shall be responsible for hazardous materials or substances required by the Contract Documents, except to the extent of the Contractor's fault or negligence in the use and handling of such materials or substances.

§ 10.3.5 The Contractor shall reimburse the Owner for the cost and expense the Owner incurs (1) for remediation of hazardous materials or substances the Contractor brings to the site and negligently handles, or (2) where the Contractor fails to perform its obligations under Section 10.3.1, except to the extent that the cost and expense are due to the Owner's fault or negligence.

§ 10.3.6 If, without negligence on the part of the Contractor, the Contractor is held liable by a government agency for the cost of remediation of a hazardous material or substance solely by reason of performing Work as required by the Contract Documents, the Owner shall reimburse the Contractor for all cost and expense thereby incurred.

§ 10.4 Emergencies

In an emergency affecting safety of persons or property, the Contractor shall act, at the Contractor's discretion, to prevent threatened damage, injury, or loss. Additional compensation or extension of time claimed by the Contractor on account of an emergency shall be determined as provided in Article 15 and Article 7.

ARTICLE 11 INSURANCE AND BONDS

§ 11.1 Contractor's Insurance and Bonds

§ 11.1.1 The Contractor shall purchase and maintain insurance of the types and limits of liability, containing the endorsements, and subject to the terms and conditions, as described in the Agreement or elsewhere in the Contract Documents. The Contractor shall purchase and maintain the required insurance from an insurance company or insurance companies lawfully authorized to issue insurance in the jurisdiction where the Project is located. The Owner, Architect, and Architect's consultants shall be named as additional insureds under the Contractor's commercial general liability policy or as otherwise described in the Contract Documents.

§ 11.1.2 The Contractor shall provide surety bonds of the types, for such penal sums, and subject to such terms and conditions as required by the Contract Documents. The Contractor shall purchase and maintain the required bonds from a company or companies lawfully authorized to issue surety bonds in the jurisdiction where the Project is located.

§ 11.1.3 Upon the request of any person or entity appearing to be a potential beneficiary of bonds covering payment of obligations arising under the Contract, the Contractor shall promptly furnish a copy of the bonds or shall authorize a copy to be furnished.

§ 11.1.4 Notice of Cancellation or Expiration of Contractor's Required Insurance. Within three (3) business days of the date the Contractor becomes aware of an impending or actual cancellation or expiration of any insurance required by the Contract Documents, the Contractor shall provide notice to the Owner of such impending or actual cancellation or

expiration. Upon receipt of notice from the Contractor, the Owner shall, unless the lapse in coverage arises from an act or omission of the Owner, have the right to stop the Work until the lapse in coverage has been cured by the procurement of replacement coverage by the Contractor. The furnishing of notice by the Contractor shall not relieve the Contractor of any contractual obligation to provide any required coverage.

§ 11.2 Owner's Insurance

§ 11.2.1 The Owner shall purchase and maintain insurance of the types and limits of liability, containing the endorsements, and subject to the terms and conditions, as described in the Agreement or elsewhere in the Contract Documents. The Owner shall purchase and maintain the required insurance from an insurance company or insurance companies lawfully authorized to issue insurance in the jurisdiction where the Project is located.

§ 11.2.2 Failure to Purchase Required Property Insurance. If the Owner fails to purchase and maintain the required property insurance, with all of the coverages and in the amounts described in the Agreement or elsewhere in the Contract Documents, the Owner shall inform the Contractor in writing prior to commencement of the Work. Upon receipt of notice from the Owner, the Contractor may delay commencement of the Work and may obtain insurance that will protect the interests of the Contractor, Subcontractors, and Sub-Subcontractors in the Work. When the failure to provide coverage has been cured or resolved, the Contract Sum and Contract Time shall be equitably adjusted. In the event the Owner fails to procure coverage, the Owner waives all rights against the Contractor, Subcontractors, and Sub-subcontractors to the extent the loss to the Owner would have been covered by the insurance to have been procured by the Owner. The cost of the insurance shall be charged to the Owner by a Change Order. If the Owner does not provide written notice, and the Contractor is damaged by the failure or neglect of the Owner to purchase or maintain the required insurance, the Owner shall reimburse the Contractor for all reasonable costs and damages attributable thereto.

§ 11.2.3 Notice of Cancellation or Expiration of Owner's Required Property Insurance. Within three (3) business days of the date the Owner becomes aware of an impending or actual cancellation or expiration of any property insurance required by the Contract Documents, the Owner shall provide notice to the Contractor of such impending or actual cancellation or expiration. Unless the lapse in coverage arises from an act or omission of the Contractor: (1) the Contractor, upon receipt of notice from the Owner, shall have the right to stop the Work until the lapse in coverage has been cured by the procurement of replacement coverage by either the Owner or the Contractor; (2) the Contract Time and Contract Sum shall be equitably adjusted; and (3) the Owner waives all rights against the Contractor, Subcontractors, and Sub-subcontractors to the extent any loss to the Owner would have been covered by the insurance had it not expired or been cancelled. If the Contractor purchases replacement coverage, the cost of the insurance shall be charged to the Owner by an appropriate Change Order. The furnishing of notice by the Owner shall not relieve the Owner of any contractual obligation to provide required insurance.

§ 11.3 Waivers of Subrogation

§ 11.3.1 The Owner and Contractor waive all rights against (1) each other and any of their subcontractors, sub-subcontractors, agents, and employees, each of the other; (2) the Architect and Architect's consultants; and (3) Separate Contractors, if any, and any of their subcontractors, sub-subcontractors, agents, and employees, for damages caused by fire, or other causes of loss, to the extent those losses are covered by property insurance required by the Agreement or other property insurance applicable to the Project, except such rights as they have to proceeds of such insurance. The Owner or Contractor, as appropriate, shall require similar written waivers in favor of the individuals and entities identified above from the Architect, Architect's consultants, Separate Contractors, subcontractors, and sub-subcontractors. The policies of insurance purchased and maintained by each person or entity agreeing to waive claims pursuant to this section 11.3.1 shall not prohibit this waiver of subrogation. This waiver of subrogation shall be effective as to a person or entity (1) even though that person or entity would otherwise have a duty of indemnification, contractual or otherwise, (2) even though that person or entity did not pay the insurance premium directly or indirectly, or (3) whether or not the person or entity had an insurable interest in the damaged property.

§ 11.3.2 If during the Project construction period the Owner insures properties, real or personal or both, at or adjacent to the site by property insurance under policies separate from those insuring the Project, or if after final payment property insurance is to be provided on the completed Project through a policy or policies other than those insuring the Project during the construction period, to the extent permissible by such policies, the Owner waives all rights in accordance with the terms of Section 11.3.1 for damages caused by fire or other causes of loss covered by this separate property insurance.

§ 11.4 Loss of Use, Business Interruption, and Delay in Completion Insurance

The Owner, at the Owner's option, may purchase and maintain insurance that will protect the Owner against loss of use of the Owner's property, or the inability to conduct normal operations, due to fire or other causes of loss. The Owner waives all rights of action against the Contractor and Architect for loss of use of the Owner's property, due to fire or other hazards however caused.

§ 11.5 Adjustment and Settlement of Insured Loss

§ 11.5.1 A loss insured under the property insurance required by the Agreement shall be adjusted by the Owner as fiduciary and made payable to the Owner as fiduciary for the insureds, as their interests may appear, subject to requirements of any applicable mortgagee clause and of Section 11.5.2. The Owner shall pay the Architect and Contractor their just shares of insurance proceeds received by the Owner, and by appropriate agreements the Architect and Contractor shall make payments to their consultants and Subcontractors in similar manner.

§ 11.5.2 Prior to settlement of an insured loss, the Owner shall notify the Contractor of the terms of the proposed settlement as well as the proposed allocation of the insurance proceeds. The Contractor shall have 14 days from receipt of notice to object to the proposed settlement or allocation of the proceeds. If the Contractor does not object, the Owner shall settle the loss and the Contractor shall be bound by the settlement and allocation. Upon receipt, the Owner shall deposit the insurance proceeds in a separate account and make the appropriate distributions. Thereafter, if no other agreement is made or the Owner does not terminate the Contract for convenience, the Owner and Contractor shall execute a Change Order for reconstruction of the damaged or destroyed Work in the amount allocated for that purpose. If the Contractor timely objects to either the terms of the proposed settlement or the allocation of the proceeds, the Owner may proceed to settle the insured loss, and any dispute between the Owner and Contractor arising out of the settlement or allocation of the proceeds shall be resolved pursuant to Article 15. Pending resolution of any dispute, the Owner may issue a Construction Change Directive for the reconstruction of the damaged or destroyed Work.

ARTICLE 12 UNCOVERING AND CORRECTION OF WORK

§ 12.1 Uncovering of Work

§ 12.1.1 If a portion of the Work is covered contrary to the Architect's request or to requirements specifically expressed in the Contract Documents, it must, if requested in writing by the Architect, be uncovered for the Architect's examination and be replaced at the Contractor's expense without change in the Contract Time.

§ 12.1.2 If a portion of the Work has been covered that the Architect has not specifically requested to examine prior to its being covered, the Architect may request to see such Work and it shall be uncovered by the Contractor. If such Work is in accordance with the Contract Documents, the Contractor shall be entitled to an equitable adjustment to the Contract Sum and Contract Time as may be appropriate. If such Work is not in accordance with the Contract Documents, the costs of uncovering the Work, and the cost of correction, shall be at the Contractor's expense.

§ 12.2 Correction of Work

§ 12.2.1 Before Substantial Completion

The Contractor shall promptly correct Work rejected by the Architect or failing to conform to the requirements of the Contract Documents, discovered before Substantial Completion and whether or not fabricated, installed or completed. Costs of correcting such rejected Work, including additional testing and inspections, the cost of uncovering and replacement, and compensation for the Architect's services and expenses made necessary thereby, shall be at the Contractor's expense.

§ 12.2.2 After Substantial Completion

§ 12.2.2.1 In addition to the Contractor's obligations under Section 3.5, if, within one year after the date of Substantial Completion of the Work or designated portion thereof or after the date for commencement of warranties established under Section 9.9.1, or by terms of any applicable special warranty required by the Contract Documents, any of the Work is found to be not in accordance with the requirements of the Contract Documents, the Contractor shall correct it promptly after receipt of notice from the Owner to do so, unless the Owner has previously given the Contractor a written acceptance of such condition. The Owner shall give such notice promptly after discovery of the condition. During the one-year period for correction of Work, if the Owner fails to notify the Contractor and give the Contractor an opportunity to make the correction, the Owner waives the rights to require correction by the Contractor and to make a claim for breach of warranty. If the Contractor fails to correct nonconforming Work within a reasonable time during

that period after receipt of notice from the Owner or Architect, the Owner may correct it in accordance with Section 2.5.

§ 12.2.2.2 The one-year period for correction of Work shall be extended with respect to portions of Work first performed after Substantial Completion by the period of time between Substantial Completion and the actual completion of that portion of the Work.

§ 12.2.2.3 The one-year period for correction of Work shall not be extended by corrective Work performed by the Contractor pursuant to this Section 12.2.

§ 12.2.3 The Contractor shall remove from the site portions of the Work that are not in accordance with the requirements of the Contract Documents and are neither corrected by the Contractor nor accepted by the Owner.

§ 12.2.4 The Contractor shall bear the cost of correcting destroyed or damaged construction of the Owner or Separate Contractors, whether completed or partially completed, caused by the Contractor's correction or removal of Work that is not in accordance with the requirements of the Contract Documents.

§ 12.2.5 Nothing contained in this Section 12.2 shall be construed to establish a period of limitation with respect to other obligations the Contractor has under the Contract Documents. Establishment of the one-year period for correction of Work as described in Section 12.2.2 relates only to the specific obligation of the Contractor to correct the Work, and has no relationship to the time within which the obligation to comply with the Contract Documents may be sought to be enforced, nor to the time within which proceedings may be commenced to establish the Contractor's liability with respect to the Contractor's obligations other than specifically to correct the Work.

§ 12.3 Acceptance of Nonconforming Work

If the Owner prefers to accept Work that is not in accordance with the requirements of the Contract Documents, the Owner may do so instead of requiring its removal and correction, in which case the Contract Sum will be reduced as appropriate and equitable. Such adjustment shall be effected whether or not final payment has been made.

ARTICLE 13 MISCELLANEOUS PROVISIONS

§ 13.1 Governing Law

The Contract shall be governed by the law of the place where the Project is located, excluding that jurisdiction's choice of law rules. If the parties have selected arbitration as the method of binding dispute resolution, the Federal Arbitration Act shall govern Section 15.4.

§ 13.2 Successors and Assigns

§ 13.2.1 The Owner and Contractor respectively bind themselves, their partners, successors, assigns, and legal representatives to covenants, agreements, and obligations contained in the Contract Documents. Except as provided in Section 13.2.2, neither party to the Contract shall assign the Contract as a whole without written consent of the other. If either party attempts to make an assignment without such consent, that party shall nevertheless remain legally responsible for all obligations under the Contract.

§ 13.2.2 The Owner may, without consent of the Contractor, assign the Contract to a lender providing construction financing for the Project, if the lender assumes the Owner's rights and obligations under the Contract Documents. The Contractor shall execute all consents reasonably required to facilitate the assignment.

§ 13.3 Rights and Remedies

§ 13.3.1 Duties and obligations imposed by the Contract Documents and rights and remedies available thereunder shall be in addition to and not a limitation of duties, obligations, rights, and remedies otherwise imposed or available by law.

§ 13.3.2 No action or failure to act by the Owner, Architect, or Contractor shall constitute a waiver of a right or duty afforded them under the Contract, nor shall such action or failure to act constitute approval of or acquiescence in a breach thereunder, except as may be specifically agreed upon in writing.

§ 13.4 Tests and Inspections

§ 13.4.1 Tests, inspections, and approvals of portions of the Work shall be made as required by the Contract Documents and by applicable laws, statutes, ordinances, codes, rules, and regulations or lawful orders of public authorities. Unless otherwise provided, the Contractor shall make arrangements for such tests, inspections, and approvals with an independent testing laboratory or entity acceptable to the Owner, or with the appropriate public authority, and shall bear all related costs of tests, inspections, and approvals. The Contractor shall give the Architect timely notice of when and where tests and inspections are to be made so that the Architect may be present for such procedures. The Owner shall bear costs of tests, inspections, or approvals that do not become requirements until after bids are received or negotiations concluded. The Owner shall directly arrange and pay for tests, inspections, or approvals where building codes or applicable laws or regulations so require.

§ 13.4.2 If the Architect, Owner, or public authorities having jurisdiction determine that portions of the Work require additional testing, inspection, or approval not included under Section 13.4.1, the Architect will, upon written authorization from the Owner, instruct the Contractor to make arrangements for such additional testing, inspection, or approval, by an entity acceptable to the Owner, and the Contractor shall give timely notice to the Architect of when and where tests and inspections are to be made so that the Architect may be present for such procedures. Such costs, except as provided in Section 13.4.3, shall be at the Owner's expense.

§ 13.4.3 If procedures for testing, inspection, or approval under Sections 13.4.1 and 13.4.2 reveal failure of the portions of the Work to comply with requirements established by the Contract Documents, all costs made necessary by such failure, including those of repeated procedures and compensation for the Architect's services and expenses, shall be at the Contractor's expense.

§ 13.4.4 Required certificates of testing, inspection, or approval shall, unless otherwise required by the Contract Documents, be secured by the Contractor and promptly delivered to the Architect.

§ 13.4.5 If the Architect is to observe tests, inspections, or approvals required by the Contract Documents, the Architect will do so promptly and, where practicable, at the normal place of testing.

§ 13.4.6 Tests or inspections conducted pursuant to the Contract Documents shall be made promptly to avoid unreasonable delay in the Work.

§ 13.5 Interest

Payments due and unpaid under the Contract Documents shall bear interest from the date payment is due at the rate the parties agree upon in writing or, in the absence thereof, at the legal rate prevailing from time to time at the place where the Project is located.

ARTICLE 14 TERMINATION OR SUSPENSION OF THE CONTRACT

§ 14.1 Termination by the Contractor

§ 14.1.1 The Contractor may terminate the Contract if the Work is stopped for a period of 30 consecutive days through no act or fault of the Contractor, a Subcontractor, a Sub-subcontractor, their agents or employees, or any other persons or entities performing portions of the Work, for any of the following reasons:

- .1 Issuance of an order of a court or other public authority having jurisdiction that requires all Work to be stopped;
- .2 An act of government, such as a declaration of national emergency, that requires all Work to be stopped;
- .3 Because the Architect has not issued a Certificate for Payment and has not notified the Contractor of the reason for withholding certification as provided in Section 9.4.1, or because the Owner has not made payment on a Certificate for Payment within the time stated in the Contract Documents; or
- .4 The Owner has failed to furnish to the Contractor reasonable evidence as required by Section 2.2.

§ 14.1.2 The Contractor may terminate the Contract if, through no act or fault of the Contractor, a Subcontractor, a Sub-subcontractor, their agents or employees, or any other persons or entities performing portions of the Work, repeated suspensions, delays, or interruptions of the entire Work by the Owner as described in Section 14.3, constitute in the aggregate more than 100 percent of the total number of days scheduled for completion, or 120 days in any 365-day period, whichever is less.

§ 14.1.3 If one of the reasons described in Section 14.1.1 or 14.1.2 exists, the Contractor may, upon seven days' notice to the Owner and Architect, terminate the Contract and recover from the Owner payment for Work executed, as well as reasonable overhead and profit on Work not executed, and costs incurred by reason of such termination.

§ 14.1.4 If the Work is stopped for a period of 60 consecutive days through no act or fault of the Contractor, a Subcontractor, a Sub-subcontractor, or their agents or employees or any other persons or entities performing portions of the Work because the Owner has repeatedly failed to fulfill the Owner's obligations under the Contract Documents with respect to matters important to the progress of the Work, the Contractor may, upon seven additional days' notice to the Owner and the Architect, terminate the Contract and recover from the Owner as provided in Section 14.1.3.

§ 14.2 Termination by the Owner for Cause

§ 14.2.1 The Owner may terminate the Contract if the Contractor

- .1 repeatedly refuses or fails to supply enough properly skilled workers or proper materials;
- .2 fails to make payment to Subcontractors or suppliers in accordance with the respective agreements between the Contractor and the Subcontractors or suppliers;
- .3 repeatedly disregards applicable laws, statutes, ordinances, codes, rules and regulations, or lawful orders of a public authority; or
- .4 otherwise is guilty of substantial breach of a provision of the Contract Documents.

§ 14.2.2 When any of the reasons described in Section 14.2.1 exist, and upon certification by the Architect that sufficient cause exists to justify such action, the Owner may, without prejudice to any other rights or remedies of the Owner and after giving the Contractor and the Contractor's surety, if any, seven days' notice, terminate employment of the Contractor and may, subject to any prior rights of the surety:

- .1 Exclude the Contractor from the site and take possession of all materials, equipment, tools, and construction equipment and machinery thereon owned by the Contractor;
- .2 Accept assignment of subcontracts pursuant to Section 5.4; and
- .3 Finish the Work by whatever reasonable method the Owner may deem expedient. Upon written request of the Contractor, the Owner shall furnish to the Contractor a detailed accounting of the costs incurred by the Owner in finishing the Work.

§ 14.2.3 When the Owner terminates the Contract for one of the reasons stated in Section 14.2.1, the Contractor shall not be entitled to receive further payment until the Work is finished.

§ 14.2.4 If the unpaid balance of the Contract Sum exceeds costs of finishing the Work, including compensation for the Architect's services and expenses made necessary thereby, and other damages incurred by the Owner and not expressly waived, such excess shall be paid to the Contractor. If such costs and damages exceed the unpaid balance, the Contractor shall pay the difference to the Owner. The amount to be paid to the Contractor or Owner, as the case may be, shall be certified by the Initial Decision Maker, upon application, and this obligation for payment shall survive termination of the Contract.

§ 14.3 Suspension by the Owner for Convenience

§ 14.3.1 The Owner may, without cause, order the Contractor in writing to suspend, delay or interrupt the Work, in whole or in part for such period of time as the Owner may determine.

§ 14.3.2 The Contract Sum and Contract Time shall be adjusted for increases in the cost and time caused by suspension, delay, or interruption under Section 14.3.1. Adjustment of the Contract Sum shall include profit. No adjustment shall be made to the extent

- .1 that performance is, was, or would have been, so suspended, delayed, or interrupted, by another cause for which the Contractor is responsible; or
- .2 that an equitable adjustment is made or denied under another provision of the Contract.

§ 14.4 Termination by the Owner for Convenience

§ 14.4.1 The Owner may, at any time, terminate the Contract for the Owner's convenience and without cause.

§ 14.4.2 Upon receipt of notice from the Owner of such termination for the Owner's convenience, the Contractor shall

- .1 cease operations as directed by the Owner in the notice;

- .2 take actions necessary, or that the Owner may direct, for the protection and preservation of the Work; and
- .3 except for Work directed to be performed prior to the effective date of termination stated in the notice, terminate all existing subcontracts and purchase orders and enter into no further subcontracts and purchase orders.

§ 14.4.3 In case of such termination for the Owner's convenience, the Owner shall pay the Contractor for Work properly executed; costs incurred by reason of the termination, including costs attributable to termination of Subcontracts; and the termination fee, if any, set forth in the Agreement.

ARTICLE 15 CLAIMS AND DISPUTES

§ 15.1 Claims

§ 15.1.1 Definition

A Claim is a demand or assertion by one of the parties seeking, as a matter of right, payment of money, a change in the Contract 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 Owner and Contractor arising out of or relating to the Contract. The responsibility to substantiate Claims shall rest with the party making the Claim. This Section 15.1.1 does not require the Owner to file a Claim in order to impose liquidated damages in accordance with the Contract Documents.

§ 15.1.2 Time Limits on Claims

The Owner and Contractor shall commence all Claims and causes of action against the other and arising out of or related to the Contract, whether in contract, tort, breach of warranty or otherwise, in accordance with the requirements of the binding dispute resolution method selected in the Agreement and within the period specified by applicable law, but in any case not more than 10 years after the date of Substantial Completion of the Work. The Owner and Contractor waive all Claims and causes of action not commenced in accordance with this Section 15.1.2.

§ 15.1.3 Notice of Claims

§ 15.1.3.1 Claims by either the Owner or Contractor, where the condition giving rise to the Claim is first discovered prior to expiration of the period for correction of the Work set forth in Section 12.2.2, shall be initiated by notice to the other party and to the Initial Decision Maker with a copy sent to the Architect, if the Architect is not serving as the Initial Decision Maker. Claims by either party under this Section 15.1.3.1 shall be initiated within 21 days after occurrence of the event giving rise to such Claim or within 21 days after the claimant first recognizes the condition giving rise to the Claim, whichever is later.

§ 15.1.3.2 Claims by either the Owner or Contractor, where the condition giving rise to the Claim is first discovered after expiration of the period for correction of the Work set forth in Section 12.2.2, shall be initiated by notice to the other party. In such event, no decision by the Initial Decision Maker is required.

§ 15.1.4 Continuing Contract Performance

§ 15.1.4.1 Pending final resolution of a Claim, except as otherwise agreed in writing or as provided in Section 9.7 and Article 14, the Contractor shall proceed diligently with performance of the Contract and the Owner shall continue to make payments in accordance with the Contract Documents.

§ 15.1.4.2 The Contract Sum and Contract Time shall be adjusted in accordance with the Initial Decision Maker's decision, subject to the right of either party to proceed in accordance with this Article 15. The Architect will issue Certificates for Payment in accordance with the decision of the Initial Decision Maker.

§ 15.1.5 Claims for Additional Cost

If the Contractor wishes to make a Claim for an increase in the Contract Sum, notice as provided in Section 15.1.3 shall be given before proceeding to execute the portion of the Work that is the subject of the Claim. Prior notice is not required for Claims relating to an emergency endangering life or property arising under Section 10.4.

§ 15.1.6 Claims for Additional Time

§ 15.1.6.1 If the Contractor wishes to make a Claim for an increase in the Contract Time, notice as provided in Section 15.1.3 shall be given. The Contractor's Claim shall include an estimate of cost and of probable effect of delay on progress of the Work. In the case of a continuing delay, only one Claim is necessary.

§ 15.1.6.2 If adverse weather conditions are the basis for a Claim for additional time, such Claim shall be documented by data substantiating that weather conditions were abnormal for the period of time, could not have been reasonably anticipated, and had an adverse effect on the scheduled construction.

§ 15.1.7 Waiver of Claims for Consequential Damages

The Contractor and Owner waive Claims against each other for consequential damages arising out of or relating to this Contract. This mutual waiver includes

- .1 damages incurred by the Owner for rental expenses, for losses of use, income, profit, financing, business and reputation, and for loss of management or employee productivity or of the services of such persons; and
- .2 damages incurred by the Contractor for principal office expenses including the compensation of personnel stationed there, for losses of financing, business and reputation, and for loss of profit, except anticipated profit arising directly from the Work.

This mutual waiver is applicable, without limitation, to all consequential damages due to either party's termination in accordance with Article 14. Nothing contained in this Section 15.1.7 shall be deemed to preclude assessment of liquidated damages, when applicable, in accordance with the requirements of the Contract Documents.

§ 15.2 Initial Decision

§ 15.2.1 Claims, excluding those where the condition giving rise to the Claim is first discovered after expiration of the period for correction of the Work set forth in Section 12.2.2 or arising under Sections 10.3, 10.4, and 11.5, shall be referred to the Initial Decision Maker for initial decision. The Architect will serve as the Initial Decision Maker, unless otherwise indicated in the Agreement. Except for those Claims excluded by this Section 15.2.1, an initial decision shall be required as a condition precedent to mediation of any Claim. If an initial decision has not been rendered within 30 days after the Claim has been referred to the Initial Decision Maker, the party asserting the Claim may demand mediation and binding dispute resolution without a decision having been rendered. Unless the Initial Decision Maker and all affected parties agree, the Initial Decision Maker will not decide disputes between the Contractor and persons or entities other than the Owner.

§ 15.2.2 The Initial Decision Maker will review Claims and within ten days of the receipt of a Claim take one or more of the following actions: (1) request additional supporting data from the claimant or a response with supporting data from the other party, (2) reject the Claim in whole or in part, (3) approve the Claim, (4) suggest a compromise, or (5) advise the parties that the Initial Decision Maker is unable to resolve the Claim if the Initial Decision Maker lacks sufficient information to evaluate the merits of the Claim or if the Initial Decision Maker concludes that, in the Initial Decision Maker's sole discretion, it would be inappropriate for the Initial Decision Maker to resolve the Claim.

§ 15.2.3 In evaluating Claims, the Initial Decision Maker may, but shall not be obligated to, consult with or seek information from either party or from persons with special knowledge or expertise who may assist the Initial Decision Maker in rendering a decision. The Initial Decision Maker may request the Owner to authorize retention of such persons at the Owner's expense.

§ 15.2.4 If the Initial Decision Maker requests a party to provide a response to a Claim or to furnish additional supporting data, such party shall respond, within ten days after receipt of the request, and shall either (1) provide a response on the requested supporting data, (2) advise the Initial Decision Maker when the response or supporting data will be furnished, or (3) advise the Initial Decision Maker that no supporting data will be furnished. Upon receipt of the response or supporting data, if any, the Initial Decision Maker will either reject or approve the Claim in whole or in part.

§ 15.2.5 The Initial Decision Maker will render an initial decision approving or rejecting the Claim, or indicating that the Initial Decision Maker is unable to resolve the Claim. This initial decision shall (1) be in writing; (2) state the reasons therefor; and (3) notify the parties and the Architect, if the Architect is not serving as the Initial Decision Maker, of any change in the Contract Sum or Contract Time or both. The initial decision shall be final and binding on the parties but subject to mediation and, if the parties fail to resolve their dispute through mediation, to binding dispute resolution.

§ 15.2.6 Either party may file for mediation of an initial decision at any time, subject to the terms of Section 15.2.6.1.

§ 15.2.6.1 Either party may, within 30 days from the date of receipt of an initial decision, demand in writing that the other party file for mediation. If such a demand is made and the party receiving the demand fails to file for mediation within 30 days after receipt thereof, then both parties waive their rights to mediate or pursue binding dispute resolution proceedings with respect to the initial decision.

§ 15.2.7 In the event of a Claim against the Contractor, the Owner may, but is not obligated to, notify the surety, if any, of the nature and amount of the Claim. If the Claim relates to a possibility of a Contractor's default, the Owner may, but is not obligated to, notify the surety and request the surety's assistance in resolving the controversy.

§ 15.2.8 If a Claim relates to or is the subject of a mechanic's lien, the party asserting such Claim may proceed in accordance with applicable law to comply with the lien notice or filing deadlines.

§ 15.3 Mediation

§ 15.3.1 Claims, disputes, or other matters in controversy arising out of or related to the Contract, except those waived as provided for in Sections 9.10.4, 9.10.5, and 15.1.7, shall be subject to mediation as a condition precedent to binding dispute resolution.

§ 15.3.2 The parties shall endeavor to resolve their Claims by mediation which, unless the parties mutually agree otherwise, shall be administered by the American Arbitration Association in accordance with its Construction Industry Mediation Procedures in effect on the date of the Agreement. A request for mediation shall be made in writing, delivered to the other party to the Contract, and filed with the person or entity administering the mediation. The request may be made concurrently with the filing of binding dispute resolution proceedings but, in such event, mediation shall proceed in advance of binding dispute resolution proceedings, which shall be stayed pending mediation for a period of 60 days from the date of filing, unless stayed for a longer period by agreement of the parties or court order. If an arbitration is stayed pursuant to this Section 15.3.2, the parties may nonetheless proceed to the selection of the arbitrator(s) and agree upon a schedule for later proceedings.

§ 15.3.3 Either party may, within 30 days from the date that mediation has been concluded without resolution of the dispute or 60 days after mediation has been demanded without resolution of the dispute, demand in writing that the other party file for binding dispute resolution. If such a demand is made and the party receiving the demand fails to file for binding dispute resolution within 60 days after receipt thereof, then both parties waive their rights to binding dispute resolution proceedings with respect to the initial decision.

§ 15.3.4 The parties shall share the mediator's fee and any filing fees equally. The mediation shall be held in the place where the Project is located, unless another location is mutually agreed upon. Agreements reached in mediation shall be enforceable as settlement agreements in any court having jurisdiction thereof.

§ 15.4 Arbitration

§ 15.4.1 If the parties have selected arbitration as the method for binding dispute resolution in the Agreement, any Claim subject to, but not resolved by, mediation shall be subject to arbitration which, unless the parties mutually agree otherwise, shall be administered by the American Arbitration Association in accordance with its Construction Industry Arbitration Rules in effect on the date of the Agreement. The Arbitration shall be conducted in the place where the Project is located, unless another location is mutually agreed upon. A demand for arbitration shall be made in writing, delivered to the other party to the Contract, and filed with the person or entity administering the arbitration. The party filing a notice of demand for arbitration must assert in the demand all Claims then known to that party on which arbitration is permitted to be demanded.

§ 15.4.1.1 A demand for arbitration shall be made no earlier than concurrently with the filing of a request for mediation, but in no event shall it be made after the date when the institution of legal or equitable proceedings based on the Claim would be barred by the applicable statute of limitations. For statute of limitations purposes, receipt of a written demand for arbitration by the person or entity administering the arbitration shall constitute the institution of legal or equitable proceedings based on the Claim.

§ 15.4.2 The award rendered by the arbitrator or arbitrators shall be final, and judgment may be entered upon it in accordance with applicable law in any court having jurisdiction thereof.

§ 15.4.3 The foregoing agreement to arbitrate and other agreements to arbitrate with an additional person or entity duly consented to by parties to the Agreement, shall be specifically enforceable under applicable law in any court having jurisdiction thereof.

§ 15.4.4 Consolidation or Joinder

§ 15.4.4.1 Subject to the rules of the American Arbitration Association or other applicable arbitration rules, either party may consolidate an arbitration conducted under this Agreement with any other arbitration to which it is a party provided that (1) the arbitration agreement governing the other arbitration permits consolidation, (2) the arbitrations to be consolidated substantially involve common questions of law or fact, and (3) the arbitrations employ materially similar procedural rules and methods for selecting arbitrator(s).

§ 15.4.4.2 Subject to the rules of the American Arbitration Association or other applicable arbitration rules, either party may include by joinder persons or entities substantially involved in a common question of law or fact whose presence is required if complete relief is to be accorded in arbitration, provided that the party sought to be joined consents in writing to such joinder. Consent to arbitration involving an additional person or entity shall not constitute consent to arbitration of any claim, dispute or other matter in question not described in the written consent.

§ 15.4.4.3 The Owner and Contractor grant to any person or entity made a party to an arbitration conducted under this Section 15.4, whether by joinder or consolidation, the same rights of joinder and consolidation as those of the Owner and Contractor under this Agreement.

Additions and Deletions Report for

AIA® Document A201™ – 2017

This Additions and Deletions Report, as defined on page 1 of the associated document, reproduces below all text the author has added to the standard form AIA document in order to complete it, as well as any text the author may have added to or deleted from the original AIA text. Added text is shown underlined. Deleted text is indicated with a horizontal line through the original AIA text.

Note: This Additions and Deletions Report is provided for information purposes only and is not incorporated into or constitute any part of the associated AIA document. This Additions and Deletions Report and its associated document were generated simultaneously by AIA software at 09:20:04 ET on 03/25/2019.

PAGE 1

IALR – Conference Facility Renovations
Institute for Advanced Learning and Research
150 Slayton Avenue
Danville, VA 24540

...

Institute for Advanced Learning and Research Foundation Board
150 Slayton Avenue
Danville, VA 24540

...

Dewberry Engineers Inc.
551 Piney Forest Road
Danville, VA 24540

Certification of Document's Authenticity

AIA® Document D401™ – 2003

I, , hereby certify, to the best of my knowledge, information and belief, that I created the attached final document simultaneously with its associated Additions and Deletions Report and this certification at 09:20:04 ET on 03/25/2019 under Order No. 8065734178 from AIA Contract Documents software and that in preparing the attached final document I made no changes to the original text of AIA® Document A201™ – 2017, General Conditions of the Contract for Construction , as published by the AIA in its software, other than those additions and deletions shown in the associated Additions and Deletions Report.

(Signed)

(Title)

(Dated)

EXHIBIT C

IALR Conference Facilities Renovation Project Owner's General Conditions

These Owner's General Conditions are intended to be read in conjunction with the AIA General Conditions (AIA A201-2007), as amended by the Supplementary Conditions and Additional Supplementary Conditions thereto.

1. DEFINITIONS

1.1 The terms "IALRF", "Foundation" or "Owner" are interchangeable and shall mean the Institute for Advanced Learning and Research Foundation, its officers, trustees, directors, agents, employees, consultants and contractors or its authorized representatives. IALRF is the Owner of the Project.

1.2 The term "IALR" shall mean the Institute for Advanced Learning and Research, its officers, trustees, directors, agents, employees, consultants and contractors or its authorized representatives.

1.3 The term "Architect" or "Engineer" in the Contract Documents shall mean Dewberry Engineers, Inc., the architectural and engineering firm who has contracted with IALRF to provide architectural and engineering services for the Hawkins Expansion.

1.4 The term "Contract Documents" shall mean and include the Invitation to Bid ("ITB"), the Instructions to Bidders, Supplementary Instructions to Bidders, the Bid Proposal, any Addenda to the ITB, the AIA Contract (AIA A101-2017), these Owner's General Conditions, the AIA General Conditions (AIA A201-2007), as amended by the Supplementary Conditions and Additional Supplementary Conditions thereto, the Drawings and Specifications prepared by the Architect, the Bond Forms, any Change Orders or Change Directives, and the Substantial Completion Certificate Form, the Certificate of Final Acceptance, and any other documents referred to in the documents listed above. This definition amends the definition of contract documents contained in the AIA Contract.

1.5 The term "AIA Contract" or "A101 Contract" shall refer to AIA Document A101-2017, Standard Form Agreement Between Owner and Contractor, as amended by the other Contract Documents.

1.6 The term "AIA General Conditions" or "A201 General Conditions" shall refer to AIA Document A201-2007, General Conditions of the Contract for Construction and Supplementary Conditions and Additional Supplementary Conditions thereto, as amended by the other Contract Documents.

1.7 The term "Addenda" in the Contract Documents shall mean written or graphic instruments issued prior to execution of the Contract which modify or interpret the Contract Documents by changes, additions, deletions, clarifications or corrections.

1.8 The term "Contractor" in the Contract Documents shall mean the general contractor as selected by lowest bid.

1.9 The term "Project" shall mean the total construction of the Hawkins Expansion as required in the Contract Documents.

1.10 The term "Work" shall mean the construction and services required by the Contract Documents, whether completed or partially completed, and includes all other labor, materials, equipment, and services reasonably inferable from the Contract Documents as necessary to fulfill the Contractor's obligations and all labor, services, materials or other items required to produce fully connected, complete, operational and functional systems and finishes. The Work may constitute the whole or a part of the Project.

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1.11 The term “Bond Forms” shall mean the performance bond form and the labor and material bond form incorporated into the Contract Documents.

1.12 The term “Subcontractor” shall mean a person, firm, partnership, corporation or other entity having a direct contract with the Contractor or with any other Subcontractor for the performance of any portion of the Work.

1.13 The term “Commencement Date” shall mean the date certain specified in a Notice to Proceed issued by the Contract Administrator to the Contractor for commencement of the Work.

1.14 The term “Contract Time” shall mean the three hundred (300) consecutive, calendar days from the Commencement Date within which the Contractor must Substantially Complete the Project.

1.15 The term “Drawings and Specifications” or “Drawings” shall mean those plans, specifications, drawings, diagrams, elevations, sections, details, schedules, and other technical materials, prepared by the Architect for use by the Contractor in the Work, including without limitation the Drawings, Specifications, and Instruments of Service referenced in AIA General Conditions and those included in Divisions 01 to 10, 12, 21 to 23, 26, and 28 to 33 of the Contract Documents.

2. INDEMNITY PROVISION

2.1 Except as prohibited by Section 11-4.1 of the Code of Virginia (1950), as amended, the Contractor shall indemnify and hold harmless IALRF, IALR, and each of their respective officers, trustees, directors, employees, agents, consultants, and contractors (“IALR Parties”) against any and all liability, losses, damages, claims, causes of action, suits of any nature (including suits by IALRF or IALR against the Contractor), costs, and expenses, including reasonable attorney’s fees and consultant’s fees, resulting from or arising out of the Contractor’s activities or omissions, negligent or otherwise, on the Owner’s property or arising out of or resulting from the materials or services to be provided under this Contract by the Contractor or any Subcontractor. This indemnity provision covers and includes, without limitation, fines and penalties for violations of federal, state or local laws or regulations; personal injury, wrongful death or property damage claims; breach of contract claims; indemnity claims; and other damages, losses and claims of any kind.

2.2 While on the IALR’s property and in its performance of this Contract, the Contractor shall not transport, dispose of or release any hazardous substance, material or waste, except as necessary in performance of its Work under this Contract. The Contractor shall comply with all federal, state and local laws, rules, regulations and ordinances controlling air, water, noise, solid wastes and other pollution, and relating to the storage, transport, release or disposal of hazardous materials, substances or waste.

2.3 Regardless of acquiescence by IALR or IALRF, the Contractor shall indemnify, defend, and hold the IALR Parties harmless from all costs, liabilities, fines or penalties, including attorney’s fees, resulting from the Contractor’s violation of paragraph 2.2 and reimburse the Owner for all costs and expenses incurred by the Owner in eliminating or remedying such violations. The Contractor also agrees to indemnify and hold harmless the IALR Parties from any and all costs, expenses, attorney’s fees and all penalties or civil judgments obtained against any of the IALR Parties as a result of the Contractor’s use or release of any hazardous substance or waste onto the ground, or into the water or air from or upon the IALR’s premises.

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2.4 The Contractor agrees to waive any and all statutes of limitations and statutes of repose applicable to any controversy or dispute arising out of the preceding sections (2.1, 2.2 and 2.3) and the Contractor further agrees that it will not raise or plead a statute of limitations or statute of repose defense against the IALR Parties in any action arising out of the Contractor's failure to comply with the preceding sections.

2.5 Nothing herein shall limit Contractor's other indemnification obligations as stated in the other Contract Documents.

3. PERFORMANCE, PERMITS, AND REGULATIONS

3.1 The Contractor is required to schedule and perform all Work on the Project in a manner that minimizes disruption of operations to the IALR campus.

3.2 The Contractor shall fully comply with all local, state and federal building and fire codes, ordinances, laws and regulations, including without limitation all applicable sections of the Occupational Safety and Health Act (OSHA), the Virginia Uniform Statewide Building Code and Chapter 11 of Title 54.1 of the Code of Virginia (1950), and obtain all required licenses and permits and pay all charges and expenses connected therewith. Contractor will be responsible for securing all necessary licenses, permits and permission from the City of Danville, Virginia and all other federal, state or local government bodies in connection with the Project.

3.3 The Contractor shall be responsible for arranging all inspections by federal, state and local authorities for compliance with all statutory requirements, ordinances and regulations.

3.4 Materials removed from the site shall be legally disposed of by the Contractor.

4. OWNER AND ARCHITECT

4.1 IALRF's Authorized Representative is Mr. Mark Gignac, Executive Director. Mr. Gignac has the sole responsibility and authority for negotiating, placing, and when necessary modifying each and every invitation to bid, contract, purchase order, or other award issued by IALRF with respect to this Project. Any contracts or contract modifications contrary to this provision shall be void and IALRF shall not be bound thereby. Mr. Gignac shall be the only agent of Owner with the authority to extend the Contract Time or increase the Contract Sum; provided, that any such changes will only be effective if made by a prior, written amendment to this Contract. No other IALRF officer, agent or employee may extend the Contract Time or increase the Contract Sum. Mr. Gignac shall be the only agent of Owner to approve Change Orders or issue Change Directives. The Owner's Authorized Representative may be changed at any time upon written notice to Contractor. The Owner's Authorized Representative also may be referred to herein as the Contract Administrator.

4.2 The Architect's authorized representative for is Mr. Larry Hasson. The Architect's authorized representative cannot increase the Contract Sum or extend the Contract Time without the prior, written consent of the Owner's Authorized Representative.

4.3 Nothing in the Contract Documents shall alter the contractual relationship between the Architect and the Owner.

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5. PATENTS

5.1 The Contractor shall protect, indemnify, and hold harmless the IALR Parties from any and all demands for fees, claims, suits, actions or judgments based on the alleged infringement or violation of any patent, invention, article, arrangement or other apparatus that may be used in the performance of the Contract.

6. FUNDING SOURCE

6.1 IALRF's funding for this Project is being obtained, in whole or in part, from grants. The Contractor agrees to comply with the terms of the grant including without implied limitation the purposes of the grant; the quality requirements of the grant; the clawback requirements of the grant; the recordkeeping, reporting, and audit requirements of the grant; and the funding limitations and restrictions in the grant.

7. CONTRACT DOCUMENTS AND DRAWINGS

7.1 The Contractor shall be responsible for determining the location of underground utilities. IALRF does not make any representation with regard to their location. The Contractor assumes full responsibility for the location of all underground utilities.

7.2 The general character and scope of the Work are illustrated by the Drawings and Specifications. The Contractor shall verify that all drawings and plans accurately reflect actual conditions. If the Contractor deems additional detail or information to be needed, he will be responsible for obtaining such detail or information. The Contractor shall carry out the Work in accordance with the Drawings and Specifications and any additional detail drawings and instructions.

7.3 Contractor acknowledges that prior to execution of this Agreement, Contractor has met with the Owner and Architect to review the design for the Work and to identify, address and resolve ambiguities, conflicts, issues and questions, if any, regarding the intended nature and scope of the Work. The description of the Work in further detail by the Architect or the Owner subsequent to the execution of this Agreement, shall entitle the Contractor to an increase in the Contract Sum or an extension of the Contract Time, only to the extent that such later description constitutes a "Material Change" in the Work, which is defined as any one of the following: (i) work of a materially different nature, character, scope or quality (other than refinement), than that set forth in and or reasonably inferable from the Contract Documents listed in this Agreement and/or identified to Contractor in the meetings and discussions involving the Contractor and Owner and/or Architect prior to the execution of this Agreement, as reflected in the meeting minutes or reports provided to or prepared in connection with such meeting; or (ii) a later description of the Work which involves work expressly excluded from the Contract Sum as set forth in the Contract Documents; or (iii) additional work that is required because of a change in applicable laws, codes or regulations enacted after the execution of this Agreement (except those scheduled to go into effect subsequent to the execution of this Agreement about which the Contractor has knowledge). The Contractor shall evaluate and assess the Drawings, Specifications and other descriptions of the Work prepared by the Architect as and when they are issued by the Architect and shall notify the Owner and Architect in writing, within fourteen (14) days of the receipt of the applicable design document if the Contractor believes that such design document includes a Material Change. As promptly as possible thereafter, the Contractor shall also identify to the Owner, in writing, the amount of the increase in the Contract Sum and/or Contract Time that the Contractor claims is needed as a result of the alleged Material Change and shall meet with and assist the Owner and Architect in evaluating the situation.

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7.4 All Contract Documents prepared and/or furnished by Contractor or Owner shall be the exclusive property of Owner and shall not be used for any other project(s).

7.5 Anything called for by one of the Contract Documents and not called for by the others shall be of like effect as if required or called for by all Contract Documents. To the extent practicable, the terms and conditions of the Contract Documents will be read consistently with each other. In the case of conflict between the terms and conditions of the Contract Documents, the Order of Precedence of the Contract Documents shall, unless otherwise expressly stated, be as follows: (i) the Agreement as amended and including all exhibits (including these Owner's General Conditions); (ii) the AIA General Conditions as amended by the Supplementary Conditions and Additional Supplementary Conditions; (iii) the Drawings, Specifications, and other Instruments of Service; (iv) any Addenda; and (v) the Invitation for Bids, Instructions to Bidders, and Bid Forms. For clarity, to the extent there is any conflict between these Owner's General Conditions and the terms or provisions of any other Contract Documents, other than a modification, these Owner's General Conditions shall control.

7.6 The Contract Documents shall be interpreted and construed to call for finished work, tested and ready for operation or use by Owner and its employees, agents, invitees, and licensees.

7.7 The entire Work provided for in the Specifications and other Contract Documents is to be accomplished even though every item and minor detail for the proper installation and successful operation of the entire Project may not be mentioned in the Specifications or shown on the Contract Documents.

8. PERSONNEL

8.1 The Contractor shall assign to the Work and the Project a Superintendent and a Project Manager who shall be subject to the reasonable approval of the Owner and Architect. Once appointed and approved, no such individual shall be replaced on the Project or Work without the prior consent of the Owner's Authorized Representative. The Contractor shall notify the Owner, in writing, of any proposed changes in the staffing for the Project or Work, including the reason(s) for proposing such change.

8.2 Only reliable workers shall be employed as laborers. Should any person employed on the Project by the Contractor appear to the Owner to be incompetent or disorderly, such person shall be removed from the Project immediately upon proper notice to the Contractor from the Owner. Such person shall not again be employed for this Contract.

9. SUBCONTRACTORS

9.1 The Contractor shall be responsible for directing the Work with a high level of competence and efficiency. The Contractor is solely responsible to the Owner for ensuring that the finished Work complies with the Contract Documents. The Contractor shall be solely responsible for health and safety precautions and programs for workers, patrons, pedestrians and others in connection with the Work. No inspection by, knowledge on the part of, or acquiescence by the Owner, Architect, or any other person or entity whatsoever shall relieve the Contractor from its sole responsibility for compliance with the requirements of the Contract or responsibility for health and safety programs and precautions for patrons, pedestrians, workers and others.

9.2 The Contractor shall not be released from any part of its liabilities or obligations under the Contract should any Subcontractor fail to perform in a satisfactory manner the work undertaken by him.

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9.3 The Contractor shall be responsible to the Owner for acts and omissions of the Owner's employees, and of all Subcontractors and their employees. The Contractor shall also be responsible for the coordination of the work of the Subcontractors and suppliers.

9.4 Before any portion of the services shall be subcontracted, the Contractor shall furnish IALRF the names, qualifications and experience of their proposed subcontractor. IALRF must be afforded the right to refuse any subcontractor that the Contractor has selected. The Contractor shall remain fully liable and responsible for the work to be done by its subcontractor(s) and shall assure compliance with all requirements of the Contract.

9.5 The Contractor shall not change any Subcontractor, person or entity previously approved if IALRF makes reasonable objection to such change.

9.6 If IALRF accepts, or fails to object to, any proposed Subcontractor, person or entity proposed by Contractor, such acceptance or failure to object shall not constitute a guarantee of such Subcontractor's, person's, or entity's performance by IALRF, nor shall it alleviate Contractor of responsibility for Subcontractor's actions in performance of the Work.

10. SUBMITTALS AND SHOP DRAWINGS

10.1 Architect's and/or Owner's approval of Submittals and/or Shop Drawings shall not be construed as permitting any departure from Contract requirements, authorizing any increase in price or relieving the Contractor of the responsibility for any error in details, dimensions or otherwise that may exist or for any deviation from the requirements of the Contract Documents in the performance of the Work. Submittals and Shop Drawings include: (i) all drawings, diagrams, illustrations, brochures, schedules, shop drawings, documents, samples, and other data required by the Contract Documents which are prepared by or for the Contractor, Subcontractor, or supplier, and submitted by the Contractor to illustrate the material, equipment or layouts, or some other portion of the Work; (ii) fabrication, erection and setting drawings, manufacturers' standard drawings, schedules, descriptive literature, catalogs, brochures, performance and test results or data, and all other descriptive data pertaining to the materials and equipment as required to demonstrate compliance with the Contract requirements; (iii) other materials identified in Division 01, General Requirements of the Drawings and Specifications or Sections 3.11 or 3.12 of the AIA General Conditions.

11. CHANGES IN THE WORK

11.1 No Change Order, Change Directive, or other modification to any of the Contract Documents shall waive, modify, release or invalidate any condition or provision of the Contract or obligation of Contractor unless such waiver, modification, release or invalidation is expressly stated in the written Change Order, Change Directive, or other document modifying the Contract Documents.

11.2 No change increasing the Contract Sum or extending the Contract Time will be made without the prior, written approval of the Owner's Authorized Representative.

12. STOP WORK ORDER

12.1 Should the Contractor fail to follow the Contract Documents or perform the Work, the Contract Administrator may stop the Work at any time. The Contractor shall suspend work upon receiving a written "Stop Work Order" from the Contract Administrator. After the Contractor has received a written

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“Stop Work Order,” the Work and Contract Time shall not again be started until a written “Resume Work Order” is received by the Contractor.

13. COMPLETION OF WORK; LIQUIDATED DAMAGES

13.1 All work shall be completed in accordance with the terms, timeframes and deadlines required by the Contract Documents, unless modified by Change Order or Change Directive. The Contractor will be liable for any and all damages sustained as a result of any breach of the Contract, including abandonment of the Contract and delayed Substantial or Final Completion of the Project. In the event that the Contractor has not Substantially Completed the Project within three hundred (300) consecutive calendar days after the issuance of the Notice to Proceed, the Owner will assess liquidated damages pursuant to Section 13.3 below and (A) deduct such damage from retainage, Progress Payments, Performance Security or from any obligation then or subsequently due the Contractor or (B) issue a written notice to the Contractor reducing the Contract sum by the amount of said damages, or both. In addition to liquidated damages for delay, the Contractor will also be liable for any and all actual damages sustained as a result of any breach of the Contract other than by delay, including abandonment of the Contract.

13.2 Should any neglect, unnecessary delay or failure to follow the Contract Documents occur which make it apparent that the Contractor will not complete the Work, the Owner may declare the Contract void and have the Work completed and charge the cost thereof to the Contractor.

13.3 The Owner and Contractor acknowledge and agree that time is of the essence and that the Owner will suffer significant financial loss and other damage if any delays occur in the Substantial Completion and/or Final Completion of the Project. Accordingly, the Owner and Contractor agree to the liquidated damage provisions in this section. These liquidated damages provisions are not the Owner’s exclusive remedy against the Contractor. The parties acknowledge and agree that the liquidated damages provided in this section are reasonable in amounts under all relevant circumstances, including the nature, dimension, scope, cost and scale of the Project as a whole. The parties agree and acknowledge that the liquidated damages specified in this section are not intended, designed or drafted to penalize the Contractor. Should the Contractor fail to Substantially Complete the Project by the Substantial Completion Date, the Contractor shall pay to the Owner as liquidated damages One Thousand Dollars (\$500.00) for each calendar day thereafter until the Project is Substantially Complete. Should the Contractor fail to Finally Complete the Project by the Final Completion Date, the Contractor shall pay to the Owner as liquidated damages One Thousand Dollars (\$500.00) for each calendar day thereafter until the Project is Finally Complete. Contractor agrees that the Owner’s exercise of its option under this Agreement to use and occupy all or any portion of the Work prior to its Substantial Completion or final completion shall not toll, waive or diminish in any way the liquidated damages for which Contractor shall be responsible under this Agreement. The liquidated damages set forth above apply only to damages resulting from the Contractor’s failure to achieve Substantial Completion or final completion of the Work by the applicable Contract Time and do not limit or preclude Owner from recovery of any damages of any kind, type or nature to the extent they result from any other breach of contract, negligence or other action or omission of Contractor or its subcontractors, including, but not limited to, any defective, substandard or deficient construction. The Contractor waives any defenses to the validity of this liquidated damages provision including, but not limited to, on the grounds that such liquidated damages are void as penalties or are not reasonably related to actual damages.

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14. PAYMENT PROVISIONS

14.1. This is a fixed price Contract. No increase in the Contract Price shall be made except by a written amendment executed by Owner's Authorized Representative and Contractor. The limitation on increases for fixed price contracts contained in Virginia Code § 2.2-4309 applies to this Contract.

14.2. The Contractor represents and warrants that he has visited the site and become familiar with and is satisfied as to the general location and site conditions that may affect cost, progress, performance, furnishing, and completion of the Project. The Contractor represents and warrants that he is familiar with and will comply with all federal, state, and local laws and regulations that may affect cost, progress, performance, furnishing, and completion of the Project. The Contractor shall bear all costs resulting from the amount or character of the work being different, or because the nature of the premises on which the work is done is different from what was expected or on account of the weather, unknown conditions, or other similar or unexpected causes.

14.3 To insure proper performance of the Contract, IALR shall retain five percent (5%) of each Progress Payment until final acceptance of all work covered by the Contract. The Contractor may request that this retainage be paid into an escrow account pursuant to Section 2.2-4334 of the Code of Virginia (1950), as amended.

14.4 In taking action on the Contractor's Applications for Payment, the Architect shall be entitled to rely on the accuracy and completeness of the information furnished by the Contractor and shall not be deemed to represent that the Architect has made a detailed examination, audit or arithmetic verification of the documentation submitted or other supporting data; that the Architect has made exhaustive or continuous on-site inspections; or that the Architect has made examinations to ascertain how or for what purposes the Contractor has used amounts previously paid on account of the Contractor.

15. PAYMENTS TO SUBCONTRACTORS

15.1 The Contractor shall take one of the two following actions within seven (7) consecutive, calendar days after receiving amounts paid to the Contractor by the Owner for work performed by any Subcontractor under this Contract:

- (i) Pay the Subcontractor for the proportionate share of the total payment received from IALR attributable to the work performed by the Subcontractor under that subcontract; or
- (ii) Notify IALR and Subcontractor, in writing, of the Contractor's intention to withhold all or a part of the Subcontractor's payment and explain the reason for nonpayment.

15.2 The Contractor shall pay interest at the rate of one (1) percent per month to the Subcontractor on all amounts owed by the Contractor that remain unpaid after seven (7) consecutive, calendar days following receipt by the Contractor of payment from IALR for work performed by the Subcontractor under that subcontract, except for amounts withheld as allowed in subsection (ii) above.

15.3 The Contractor shall insert in each of its subcontracts a provision requiring each Subcontractor to include or otherwise be subject to the same payment and interest requirements with respect to each lower-tier Subcontractor.

15.4 The Contractor's obligation to pay an interest charge to a Subcontractor pursuant to this Section shall not be construed to be an obligation of the Owner. This Contract may not be modified for the purpose of providing reimbursement for such interest charge. A cost reimbursement claim may not include any amount for reimbursement for such interest charge.

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15.5 Contractor shall indemnify, defend and hold the IALR Parties harmless for any claims, demands, damages, losses and expenses, including, without limitation, reasonable attorney's fees, resulting from failure of the Contractor to make prompt payments to all persons supplying the Contractor with equipment, labor, tools or materials in prosecution and completion of the Work provided for in the Contract. In the event of such claims, Owner may, after providing written notice to the Contractor, withhold from any progress and/or final payment the unpaid sum of money deemed sufficient to pay all lawful claims and associated costs in connection with the Contract.

15.6 Contractor agrees that neither payment, final or otherwise, partial or entire occupancy of the premises by IALRF or IALR, nor acceptance of the Work under this Contract shall be an acceptance of any Work which does not conform to the requirements of the Contract, nor shall such acceptance, occupancy, or payment relieve Contractor of any responsibility for any errors or omissions in connection with the Project, operate as a waiver of any rights under this Contract or of any cause of action arising out of the performance of this Contract, or operate to release Contractor from any obligation under the Contract.

16. GUARANTEES AND WARRANTIES OF WORK

16.1 The Contractor's workmanship and oversight of its Subcontractors shall be of the highest quality found in the construction trade or industry in every respect. All items of Work shall be done by workers skilled in the particular task to which they are assigned. In the acceptance or rejection of Work, no allowance will be made for lack of skill on the part of workers. Poor or inferior workmanship (as determined by the Owner, Architect, or other inspecting authorities) shall be removed and replaced to conform to the highest quality standards of the trades concerned, or otherwise corrected to the satisfaction of the Contract Administrator, the Owner, or other inspecting authority, all at the Contractor's sole expense.

16.2 The Contractor warrants and guarantees the Work against defects or deficiencies in all material and workmanship and shall maintain, repair or replace, at its expense any Work, material or part that is found by the Owner or the Architect to be defective, within a period of one (1) year from the date of final acceptance of the Project.

16.3 The Contractor warrants that, unless otherwise specified, all material and equipment incorporated in the Work under the Contract shall be new, in first class condition, and in strict accordance with the Contract Documents. The Contractor further warrants that all workmanship shall be of the highest quality found in the construction trade or industry and in strict accordance with the Contract Documents and shall be performed by persons highly qualified at their respective trades.

16.4 The Contractor shall review all materials and methods of construction specified or indicated in the Contract Documents, including those recommended by manufacturers, and shall advise the Owner (1) if the specified or indicated material or method deviates from good construction practice, (2) if employing such material or method will violate any warranties, or (3) if the Contractor has any other objection to such material or method. The Contractor shall propose alternative materials or methods for those which violate the warranties or to which the Contractor takes objection, submitting the names of substitute products and relevant data on which he can issue the specified warranty. Should the Contractor fail to notify the Owner of its objections prior to the execution of the Contract, it will be deemed to have agreed to warrant all work specified or shown.

16.5 Work not conforming to these warranties shall be considered defective.

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16.6 These warranties and guarantees of material and workmanship are separate and independent from and in addition to any of the Contractor's other guarantees or obligations that arise out of this Contract or any applicable law. In addition to the foregoing warranties and stipulations, the Contractor shall comply with all other warranties and guarantees noted in any portion of the Contract Documents, the more stringent requirement governing.

16.7 If, within any warranty or guarantee period, defects are noticed by the Owner, which require repairs or changes in connection with the guaranteed Work, those repairs or changes being in the opinion of the Owner rendered necessary as the result of the use of material, equipment, or workmanship which is defective, inferior, or not in accordance with the terms of the Contract, the Contractor shall, promptly upon receipt of notice from the Owner, (such notice being given not more than four (4) weeks after the expiration of any such guarantee period), and without any expense to the Owner:

- a. Place in satisfactory condition in every particular all of such guaranteed work and correct all defects therein; and
- b. Make good all damage to the structure, contents of the structure, site and equipment which in the opinion of the Owner is the result of the use of material, equipment, or workmanship which are inferior, defective, or not in accordance with the terms of the Contract; and
- c. Make good any work or material or the equipment and contents of structures or the site disturbed in fulfilling any such guarantee.

16.8 In any case where in fulfilling the requirements of the Contract or any guarantee embraced in or required thereby, the Contractor disturbs any Work guaranteed under the Contract, it shall restore such Work to a condition satisfactory to the Owner and guarantee such restored Work to the same extent as it was guaranteed under such other Contract.

16.9 If the Contractor, after notice, fails to proceed promptly to comply with the terms of the guarantee, the Owner may have the defects corrected by the Owner or other contractor and the Contractor shall be liable for all costs and expenses incurred in doing so.

16.10 Nothing contained in this section shall be construed to shorten any applicable statutes of limitation with respect to any obligations which the Contractor has under the Contract Documents or the law of Virginia, including liability for defective Work.

17. CONTRACT DISPUTES

17.1 Contractual claims by the Contractor, whether for money or other relief, shall be submitted by the Contractor in writing to the Owner no later than sixty (60) days after final payment. However, written notice of the Contractor's intention to file such a claim must be given to the Owner's Authorized Representative at the time of the occurrence or beginning of the work upon which the claim is based. The Contractor may not institute legal action prior to receipt of Owner's decision on the claim unless the Owner fails to render such decision within One Hundred Twenty (120) days. The decision of the Owner, when signed by its Executive Director or chairman, shall be final and conclusive unless the Contractor within six (6) months of the date of the final decision on a claim initiates legal action as provided in Section 2.2-4364 of the Code of Virginia (1950), as amended. Failure of the Owner to render a decision within One Hundred Twenty (120) days shall not result in any other relief or penalty. The sole result of Owner's failure to render a decision within One Hundred Twenty (120) days shall be to extend to the Contractor the right to institute immediate legal action. No administrative appeals procedure (other than the mandatory procedure set forth above in this section) pursuant to Section 2.2-4365 of the Code of Virginia (1950), as amended, has been established for contractual claims under this Contract. This

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provision amends and supersedes any contrary provision in the AIA Contract or AIA General Conditions requiring arbitration or any other non-voluntary alternate dispute resolution.

17.2 If a claim is made during prior to completion of the Work, Contractor shall proceed diligently with performance of the Contract and the Owner shall continue to payments in accordance with the Contract Documents, except for any amount in dispute.

18. OWNER'S RIGHT TO TERMINATE CONTRACT FOR CAUSE

18.1 If the Contractor should be adjudged bankrupt, or should make a general assignment for the benefit of its creditors, or if a receiver should be appointed on account of its insolvency, the Owner may terminate the Contract. If the Contractor should persistently or repeatedly refuse, or fail, to: supply enough properly skilled workers or proper materials; make prompt payment to subcontractors or suppliers of material or labor; disregard laws, ordinances or the written instructions of the Architect or Owner; or otherwise violate any provision of the Contract, the Owner may terminate the Contract, upon five (5) calendar days written notice to the Contractor. The provisions of this paragraph 18.1 shall not limit IALR's right to terminate the Contract under any other provision of the Contract Documents.

18.2 Notice of termination may be served upon the Contractor by mail or any other means at its last known places of business in Virginia or elsewhere, by delivery to any officer or employee wherever he or she may be found, or, if no such officer, employee or place of business is known or can be found by reasonable inquiry within three (3) business days, by posting the notice at the job site. Failure to accept or pick up registered or certified mail addressed to the last known address shall be deemed to be delivery.

18.3 Upon termination of the Contract, the Owner shall take possession of the premises and of all materials, tools and appliances thereon and finish the Work by whatever method it may deem expedient. In such case the Contractor shall not be entitled to receive any further payment. If the expense of finishing the Project, including compensation for additional managerial and administrative services shall exceed the unpaid balance of the Contract price, the Contractor shall pay the difference to the Owner, together with any other expenses of terminating the Contract and having it completed by others.

18.4 If it should be judicially determined that the Owner improperly terminated this Contract for cause, the termination shall be deemed to be a termination for the convenience of the Owner. Termination of the Contract under this section is without prejudice to any other right or remedy of the Owner.

19. TERMINATION BY OWNER FOR CONVENIENCE

19.1 Owner may terminate this Contract at any time without cause, in whole or in part, upon giving the Contractor notice of such termination. Upon such termination, the Contractor shall immediately cease work and remove from the Project site all of its labor forces and such of its materials as Owner elects not to purchase or to assume in the manner hereinafter provided. Upon such termination, the Contractor shall take such steps as Owner may require to assign to the Owner the Contractor's interest in all subcontracts and purchase orders designated by Owner. After all such steps have been take to Owner's satisfaction, the Contractor shall receive as full compensation for termination and assignment the following:

- (a) All amounts then otherwise due under the terms of this Contract.
- (b) Amounts due for work performed subsequent to the latest Application for Payment through the date of termination.

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(c) Reasonable compensation for the actual cost of demobilization incurred by the Contractor as a direct result of such termination. The Contractor shall not be entitled to any compensation for lost profits or for any other type of compensation or damage other than those provided by the preceding sentence. Upon payment of the foregoing, Owner shall have no further obligations to Contractor of any nature.

19.2 In no event shall termination for convenience of the Owner terminate the obligation of the Contractor's Surety on its payment and performance bonds.

20. "ALL RISK" BUILDERS RISK INSURANCE

20.1 The Contractor, at its cost, shall obtain and maintain in the names of the IALR Parties and the Contractor "All Risk" Builder's Risk Insurance upon the entire structure or structures on which the Work of this Contract is to be done and upon all material in or adjacent thereto which is intended for use thereon, to one hundred percent (100%) of the insurable value thereof.

21. OTHER CONDITIONS

(1) ANTI-DISCRIMINATION: During the performance of this Contract the Contractor agrees as follows:

a. The Contractor will not discriminate against any employee or applicant for employment because of race, religion, color, sex, national origin, age, disability, or any other basis prohibited by state or federal law relating to discrimination in employment, except where there is a bona fide occupational qualification reasonably necessary to the normal operation of the Contractor. The Contractor agrees to post in conspicuous places, available to employees, notices setting forth the provisions of this nondiscrimination clause.

b. The Contractor, in all solicitations or advertisements for employees placed by or on behalf of the Contractor, will state that such Contractor is an equal opportunity employer.

c. Notices, advertisements and solicitations placed in accordance with federal law, rule or regulation shall be deemed sufficient for the purpose of meeting these requirements.

d. The Contractor will include the provisions of the above 1, 2 and 3 in every subcontract or purchase order over \$10,000 in connection with this Contract so that the provisions will be binding upon each subcontractor or vendor.

(2) DRUG-FREE WORKPLACE: During the performance of this Contract, the Contractor shall (i) provide a drug-free workplace for the Contractor's employees; (ii) post in conspicuous places, available to employees, a statement notifying employees that the unlawful manufacture, sale, distribution, dispensation, possession, or use of a controlled substance or marijuana is prohibited in the Contractor's workplace and specifying the actions that will be taken against employees for violations of such prohibition; (iii) state in all solicitations or advertisements for employees placed by or on behalf of the Contractor that the Contractor maintains a drug-free workplace; and (iv) include the provisions of the foregoing clauses in every subcontract or purchase order of over \$10,000 in connection with this Contract, so that the provisions will be binding upon each subcontractor or vendor.

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(3) **IMMIGRATION REFORM AND CONTROL ACT OF 1986:** The Contractor represents and warrants it does not and will not during the performance of this Contract employ illegal alien workers or otherwise violate the provisions of the federal Immigration Reform and Control Act of 1986 or any other federal law regarding the employment of illegal aliens or undocumented workers.

(4) **FAITH-BASED ORGANIZATIONS:** Pursuant to § 2.2-4343.1 of the Virginia Code, Owner advises Contractor that Owner does not discriminate against faith-based organizations.

(5) **TRADE SECRETS:** This Contract may be subject to Virginia Code § 2.2-4342, as amended, regarding public inspection of records and the procedures a contractor must follow to protect trade secrets and proprietary information.

(6) **SUBROGATION:** Any and all waivers of subrogation by Owner contained in the Contract Documents, including without limitation the General Conditions, are hereby deleted. Any and all binding arbitration provisions contained in the Contract Documents are hereby deleted.

(7) **APPLICABLE LAWS AND COURTS:** This Contract shall be governed in all respects by the laws of the Commonwealth of Virginia and any litigation between the parties arising under this Contract shall be brought in a court of competent jurisdiction in the City of Danville, Virginia. The Contractor shall comply with all applicable federal, state and local laws, codes, rules and regulations, including without limitation the Virginia Public Procurement Act, Virginia Code §§ 2.2-4300 through 2.2-4377.

(8) **ETHICS IN PUBLIC CONTRACTING:** The Contractor represents and warrants the following: (i) neither it nor any of its employees or agents enters this Contract as a result of any collusion or fraud; (ii) neither it nor any of its employees or agents has been offered or received any kickbacks or inducements in connection with this Contract; and (iii) neither it nor any of its employees or agents has conferred on any person having official responsibility for this transaction any payment, loan, subscription, advance, deposit of money, services or anything of more than nominal value, present or promised, unless consideration of substantially equal or greater value was exchanged. The Contractor shall not offer or give a gratuity of any type to any IALR employee or agent.

(9) **DEBARMENT STATUS:** The Contractor represents and warrants that it is not currently debarred by the Commonwealth of Virginia from entering into contracts with public bodies for the type of construction and/or services covered by this Contract, nor is it an agent of any person or entity that is currently so debarred.

(10) **INSURANCE:** The Contractor shall furnish to IALRF with certificates of insurance for the insurance coverages required in the Contract Documents. Each such certificate shall provide that no such policy of insurance may be canceled or otherwise terminated, except upon thirty (30) days prior written notice to IALR.

(11) **AUDIT:** The Contractor shall retain all books, records, and other documents relative to this Contract for five (5) years after final payment, or until audited by IALRF, IALR or the Commonwealth of Virginia. IALR, IALRF and/or such third party auditors shall have full access to and the right to examine any of said materials during said period.

(12) **THIRD-PARTY BENEFICIARIES:** The parties covenant and agree that IALR expressly is a third party beneficiary under this Contract and may act to enforce all of the Owner's rights and privileges under this Agreement. Besides IALR: (i) no other individual or entity shall be considered,

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deemed or otherwise recognized to be a third-party beneficiary of this Contract; (ii) the provisions of this Contract are not intended to be for the benefit of any individual or entity other than the Owner, IALR or the Contractor; (iii) no other individual or entity shall obtain any right to make any claim against the Owner or the Contractor under the provisions of this Contract; and (iv) no provision of this Contract shall be construed or interpreted to confer third-party beneficiary status on any other individual or entity.

(13) **IALR CAMPUS:** IALR's campus will remain open and fully operational throughout all phases of the Project. The Contractor must perform its work in such a manner that will avoid impacting IALR's ongoing operations in other buildings on its campus

(14) **UNREASONABLE/EXCESSIVE CHARGES:** Charges which appear to be unreasonable or which are in excess of either (i) the Contract Price or (ii) any increase in the Contract Price approved in advance in writing by the Contract Administrator will be researched and challenged, and that portion of the invoice held in abeyance until the matter is resolved. Upon determining that invoiced charges are not reasonable or are excessive, IALRF shall promptly notify the Contractor, in writing, as to those charges which it considers unreasonable and/or excessive and the basis for the determination.

(15) **INSPECTIONS:** The Contractor shall be responsible for arranging and obtaining all inspections by federal, state, and/or local authorities that may be necessary during or at the conclusion of the Project.

(16) **PERFORMANCE AND PAYMENT BONDS:** Pursuant to Virginia Code § 2.2-4337, the Contractor shall obtain a Performance Bond and a Labor and Materials Payment Bond in substantially the same form as attached hereto, each in an amount equal to 100% of the Contract Price.

(17) **CONFIDENTIALITY:** The Contractor acknowledges and agrees that he (and any other persons in his employment) must maintain the confidentiality of all IALR, IALRF, or third party information, business affairs, programs, partners, vendors, finances, properties, intellectual property, trade secrets, methods of operation, computer programs, and documents, whether written, oral, or otherwise (hereinafter referred to as Confidential Information), to which he may come in contact with during or after the Contract period.

(18) **SOVEREIGN IMMUNITY; PUBLIC POLICY:** Nothing contained in the Contract Documents is intended to waive, or shall be construed as a waiver of, the sovereign immunity of IALR.

(19) **INDEPENDENT CONTRACTORS:** The parties hereto are independent contractors and are not agents, partners, or joint venturers. Neither party shall have the ability to bind the other to any contract with a third party and neither party shall hold itself out to any third party as having the right to bind the other party to any contract.

(20) **SUCCESSORS; ASSIGNS:** The Contract shall be binding upon and shall inure to the benefit of the parties hereto and their respective executors, administrators, heirs, successors-in-title, successors and assigns.

(21) **ASSIGNMENT:** The Contractor shall not assign any of its rights, duties or obligations under the Contract or Contract Documents without the prior written consent of IALRF. Owner may assign any of its rights and duties to a third party.

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(22) **SEVERABILITY:** Should any provision of this Contract be held unenforceable for any reason, it shall be deemed severed from the Contract, the remainder of which shall remain valid and enforceable.

(23) **NON-WAIVER:** The failure of IALRF to insist upon strict performance of any of the terms or provisions of this Contract or to exercise any option, right or remedy contained in this Contract shall not be construed as a waiver or relinquishment for the future of such term, provision, option, right or remedy. The waiver by IALRF of a breach of any provision hereof shall not be taken or held to be a waiver of any succeeding breach of such provision or as a waiver of the provision itself.

(24) **ATTORNEY'S FEES AND COSTS:** The Contractor shall pay all costs, litigation-related expenses, reasonable attorney's fees and consultants' fees incurred by IALRF or IALR in the event either of them, as plaintiff, defendant or otherwise, prevails in whole or in part against the Contractor or any Subcontractor in any judicial or administrative action or suit arising under this Contract or concerning any services or products supplied by Contractor. This provision for attorney's fees, expenses and costs shall be in addition to any other remedies available to IALR or IALRF under the Contract Documents, at law, or in equity.

(25) **ANTI-KICKBACK PROVISION:** Consultant represents and warrants that this contract has been awarded without collusion or fraud and it has not offered or received any kickbacks or inducements from any other offeror, supplier, or subcontractor in connection with its proposal, and that it has not conferred on any IALR or IALRF employee having official responsibility for this procurement transaction any payment, loan, subscription, advance, deposit of money, services or anything of more than nominal value, present or promised, unless consideration of substantially equal or greater value was exchanged.

(26) **HEADINGS:** The paragraph titles are inserted herein only as a matter of convenience and for reference and in no way define, limit or describe the scope or intent of this Contract nor in any way affect this Contract.

(27) **ENTIRE AGREEMENT:** The Contract Documents contain the entire understanding of the parties and supersede all prior and contemporaneous negotiations, correspondence, understandings and agreements of the parties relating to the subject matter hereof. No waiver or modification of this Contract or of any covenant, condition or limitation herein shall be valid against IALR or IALRF unless in writing and signed by IALRF's Authorized Representative. This Contract may not be amended without the specific written consent of both parties. The parties agree that the provisions of this section may not be waived except as herein provided.

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INSTITUTE FOR ADVANCED LEARNING AND RESEARCH FOUNDATION CONFERENCE FACILITY RENOVATIONS ADDITIONAL SUPPLEMENTARY CONDITIONS

The following Additional Supplementary Conditions modify the "General Conditions of the Contract for Construction" AIA Document A201-2007 ("AIA General Conditions"). These Additional Supplementary Conditions are in addition to the Supplementary Conditions to the A201-2007 contained in the bid package. Where a portion of the AIA General Conditions or the prior Supplementary Conditions is modified or deleted by these Additional Supplementary Conditions, the unaltered portions of the AIA General Conditions or the Supplementary Conditions, as the case may be, shall remain in effect. Italicized provisions were included in the Supplementary Conditions.

ARTICLE 1; GENERAL PROVISIONS

§ 1.1 BASIC DEFINITIONS

- a. Delete Subparagraph 1.1.1 and replace it with the following:

§ 1.1.1 THE CONTRACT DOCUMENTS

The Contract Documents will consist of the Invitation to Bid (ITB), the Instructions to Bidders, Supplementary Instructions to Bidders, the Bid Proposal, any Addenda to the ITB, the AIA Contract (AIA A101-2017), the Owner's General Conditions, the AIA General Conditions (AIA A201-2007) and Supplementary Conditions and Additional Supplementary Conditions thereto, the Drawings and Specifications prepared by the Architect, the Bond Forms, any Change Orders or Change Directives, and the Substantial Completion Certificate Form, the Certificate of Final Acceptance, and any other documents referred to in the documents listed above.

- b. Delete Subparagraph 1.1.3 and replace it with the following:

§ 1.1.3 THE WORK

The term "Work" means the construction and services required by the Contract Documents, whether completed or partially completed, and includes all other labor, materials, equipment and services reasonably inferable from the Contract Documents as necessary to fulfill the Contractor's obligations and all labor, services, materials or other items required to produce fully connected, complete, operational and functional systems and finishes. The Work may constitute the whole or a part of the Project.

- c. *Add the following Subparagraphs 1.1.5.1, 1.1.5.2, 1.1.5.3, and 1.1.5.4 to 1.1.5:*

§ 1.1.5.1 Dimensions indicated on the Drawings shall be followed. Do not scale Drawings. Conflicts, discrepancies, and omissions shall be resolved prior to ordering or installing materials and equipment.

§ 1.1.5.2 Provide critical clearances, tolerances, and dimensions as indicated. These critical dimensions are not optional. The Architect shall be advised immediately if existing conditions do not permit critical dimensions as shown. No consideration will be given any

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claim based on differences between the actual dimensions and those indicated on the Drawings.

§ 1.1.5.3 Any modifications to the Drawings shall be approved by the Architect. The Architect's decision in matters relating to artistic effect and structural integrity will be final if consistent with the intent of the Contract Documents.

§ 1.1.5.4 The Drawings are developed to communicate design intent. Assemblies or components required to achieve this design intent are subject to approval by the Architect.

§ 1.2 CORRELATION AND INTENT OF THE CONTRACT DOCUMENTS

- a. Add the following language at the end of Subparagraph 1.2.1 after “results”:

“and to perform the Work consistent with the provisions of Section 1.1.3 of these General Conditions above. All Work mentioned or indicated in the Contract Documents shall be performed by or on behalf of Contractor as part of this Contract, unless it is specifically indicated in the Contract Documents that such Work is to be performed by others.”

- b. Add the following Subparagraphs 1.2.1.1, 1.2.1.2, and 1.2.1.3 to 1.2.1:

§ 1.2.1.1 Wherever in the Contract Documents the words “as approved,” “as directed,” “as required,” “acceptable,” “satisfactory” and other similar words are used with reference to the Work or its performance, and without further qualification, they shall mean as approved, as directed, and as required by the Architect and Owner and acceptable, satisfactory, etc., to the Architect and Owner.

§ 1.2.1.2 In case of conflict in the Contract Documents, the Architect shall interpret or construe the Contract Documents so as to assure the most substantial and complete performance of the Work.

§ 1.2.1.3 The general character of the detailed work is shown on the Drawings, but the Contractor may propose minor modifications on the Shop Drawings or mark-ups. The Contractor shall work out any detail in relation to its location and its connection to other parts of the Work. Where on any drawings a portion of the Work is drawn out and the remainder is indicated in outline, the parts drawn out shall also apply to all other like portions of the Work. Where details or conditions are indicated, such details or conditions shall be continued throughout the courses or parts in which they occur and shall also apply to all other similar parts of the Work unless otherwise indicated or specifically noted.

- c. Add the following Subparagraph 1.2.4 to 1.2:

§ 1.2.4 *In the Contract Documents where discrepancies are apparent, detailed information is lacking, or interpretation is not clear, the Contractor shall secure required information from the Architect before proceeding with the Work. Items that are detailed and/or specified but not distinctly located on the Drawings shall be located by the Architect.*

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§ 1.5 OWNERSHIP AND USE OF DRAWINGS, SPECIFICATIONS AND OTHER INSTRUMENTS OF SERVICE

- a. Delete Subparagraph 1.5.1 and replace it with the following:

§ 1.5.1 Owner owns the Instruments of Service, including the Drawings and Specifications, and will retain all common law, statutory and other reserved rights, including copyrights. They may only be used for this Project. The Contractor, Subcontractors, Sub-subcontractors, and material or equipment suppliers shall not own or claim a copyright in the Instruments of Service. Submittal or distribution to meet official regulatory requirements or for other purposes in connection with this Project is not to be construed as publication in derogation of the Architect's, Owner's or Architect's consultants' reserved rights.

ARTICLE 2; OWNER

§ 2.1 GENERAL

- a. Add the following at the end of Subparagraph 2.1.1:

All written communications on the Project shall be directed to and include the Owner and all significant issues with respect to the Work and/or this Contract shall be communicated by Contractor directly to Owner. Contractor acknowledges that neither Architect nor any other consultant to Owner has authority to authorize any increase in the Contract Sum, any adjustment to the Contract Time, or any additional compensation or payment to Contractor without the prior and written approval of Owner.

- b. Delete Subparagraph 2.1.2 in its entirety.

§ 2.2 INFORMATION AND SERVICES REQUIRED OF THE OWNER

- a. Delete Subparagraph 2.2.1 in its entirety.
- b. Delete Subparagraph 2.2.3 in its entirety.
- c. Delete the last sentence of Subparagraph 2.2.4.
- d. *Delete Subparagraph 2.2.5 and substitute the following:*

§ 2.2.5 The Contractor will be furnished free of charge 6 copies of Drawings and Project Manuals. Additional sets will be furnished at the cost of reproduction, postage, and handling.

§ 2.3 OWNER'S RIGHT TO STOP WORK

- a. Delete "repeatedly" from the second line of Subparagraph 2.3.

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§ 2.4 OWNER’S RIGHT TO CARRY OUT THE WORK

- a. In Subparagraph 2.4, delete the following sentence from lines 6 and 7, “Such action by the Owner and amounts charged to the Contractor are both subject to prior approval of the Architect,” and replace it with “The Owner will notify the Architect of such action and the amount to be charged to the Contractor and will consider any comments of the Architect.”

ARTICLE 3; CONTRACTOR

§ 3.1 GENERAL

- a. Add the following language at the end of Subparagraph 3.1.1:

Contractor shall not assign or change supervisory personnel or utilize any organizational chain of command to the extent disapproved by Owner. Contractor’s superintendent and project manager shall not be discontinued, replaced or re-assigned without the prior written consent of Owner, which such consent shall not be unreasonably withheld.

§ 3.2 REVIEW OF CONTRACT DOCUMENTS AND FIELD CONDITIONS BY CONTRACTOR

- a. Edit Subparagraph 3.2.1 as follows:

On line 2, delete the word “generally.” Add the following language to the end of the Subparagraph: “Contractor has evaluated and satisfied itself as to the conditions and limitations under which the Work is to be performed including, without limitation (1) the location, condition, layout and physical conditions of the Project site and surrounding area, (2) generally prevailing climatic conditions, (3) availability and cost of materials, tools and equipment, (4) geotechnical data, soil and subsurface conditions, (5) parking, traffic and logistics, and (6) other similar issues. Contractor shall not be entitled to any adjustment in the Contract Time in connection with any failure of Contractor or any Subcontractor to comply with the requirements, or on account of the conditions of this subsection 3.2.1.”

- b. After Subparagraph 3.2.2, add the following Subparagraphs:

§ 3.2.2.1 Dimensions of the Work shall not be determined by scale or rule. Figured dimensions shall be used at all times.

§ 3.2.2.2 The Contractor shall verify all dimensions by measurement at the job site and shall take any and all other measurements necessary to verify the Drawings and to properly lay out the Work.

§ 3.2.2.3 The Contractor shall study the Contract Documents sufficiently in advance of the actual layout of the Work to allow the Contract Documents to be interpreted or modified by the Architect.

- c. Add the following to the end of Subparagraph 3.2.4 after “public authorities”:

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, unless Contractor recognized (or based on the standards of performance ordinarily provided by general contractors working under the same or similar conditions, should have recognized) such error, inconsistency, omission or difference and failed to report it to (and obtain direction from) Owner and Architect prior to proceeding with the affected Work.

- d. Add Subparagraph 3.2.5 as follows;

§ 3.2.5 Owner shall be entitled to reimbursement from Contractor for amounts paid to the Architect for the Architect's evaluating and responding to Contractor's requests for information that are not prepared in accordance with the Contract Documents or where the requested information was available to Contractor from a careful study and comparison of the Contract Documents, field conditions other Owner-provided information, Contractor-prepared coordination drawings, or prior Project correspondence or documentation.

§ 3.3 SUPERVISION AND CONSTRUCTION PROCEDURES

- a. Delete the last sentence of Subparagraph 3.3.1.
- b. Delete "to the Owner" from the first line of Subparagraph 3.3.2.

§ 3.4 LABOR AND MATERIALS

- a. Add the following Subparagraphs 3.4.1.1 and 3.4.1.2 to 3.4.1:

§ 3.4.1.1 *The Contractor shall use only new materials for the Work of this Project. Reuse of existing materials or the use of other salvaged materials is acceptable only where specifically noted in the Construction Documents.*

§3.4.1.2 *The Contractor shall provide all special trims, moldings, and special shaped materials which are required for the satisfactory completion of the Work. The Contractor shall provide all necessary fasteners, bracing, and supports required for the stable and secure installation of the Work.*

- b. Delete Subparagraph 3.4.2 and substitute the following:

§ 3.4.2 *After the Contract has been executed, the Owner and Architect will consider a formal request for the substitution of products in place of those specified only under the conditions set forth in the General Requirements (Division 01 of the Specifications). By making requests for substitutions, the Contractor:*

.1 represents that the Contractor has personally investigated the proposed substitute product and determined that it is equal or superior in all respects to that specified;

.2 represents that the Contractor will provide the same warranty for the substitution that the Contractor would for that specified;

.3 certifies that the cost data presented is complete and includes all related costs under this Contract except the Architect's redesign costs, and waives all claims for

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*additional costs related to the substitution which subsequently become apparent;
and
.4 will coordinate the installation of the accepted substitute, making such changes
as may be required for the Work to be complete in all respects.*

The approval of any substitution must be in writing and signed by the Owner's Authorized Representative.

- c. Add Subparagraph 3.4.2.1 as follows:

§ 3.4.2.1 Owner shall be entitled to reimbursement from Contractor for amounts paid to the Architect for reviewing Contractor's proposed substitutions and to make agreed-upon changes in the Drawings and Specifications resulting from such substitutions.

§ 3.5 WARRANTY

- a. At the end of Subparagraph 3.5 add the following sentence:

All guarantees or warranties of equipment, systems or materials furnished to Contractor or Subcontractors by any manufacturer or supplier shall be deemed to run to the benefit of Owner and are (and shall be) assigned to Owner. These warranties are in addition to, not in lieu of, all other warranties and guarantees contained in or required by the Contract Documents.

§ 3.7 PERMITS, FEES, NOTICES, AND COMPLIANCE WITH LAWS

- a. Delete Subparagraph 3.7.4 and replace it with the following:

§ 3.7.4 Concealed or Unknown Conditions. By executing the Agreement, Contractor represents that it has visited the site where the Work is to be constructed, has examined carefully all the Contract Documents upon which the Contract Sum is based, has reviewed all information, data and documents regarding the conditions at the site made available to Contractor by Owner prior to the execution of the Agreement and has acquainted itself with all other conditions relevant to the Work, including, but not limited to any physical conditions or logistical restraints relating to or affecting the means, methods, staging, layout, delivery or performance of the Work. If the Contractor encounters conditions at the site that are different from those about which Contractor had notice based on the information made available to Contractor by Owner or Architect prior to the execution of the Agreement (including, but not limited to the information set forth in the Contract Documents or in reports, studies or evaluations referenced therein or provided by Owner or Architect to Contractor) and/or based on a reasonably prudent visit to and examination of the site prior to the execution of the Agreement and/or based on facts or circumstances disclosed by the information provided to Contractor by Owner or Architect or other conditions discovered at the site by Contractor prior to commencement of the Work, such as (1) subsurface or otherwise concealed physical conditions that differ materially from those indicated in the information provided to Contractor or (2) undisclosed and unknown physical conditions of an unusual nature, that differ materially from those ordinarily found to exist and generally recognized as inherent in construction activities of the character

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provided for in the Contract Documents, the Contractor shall provide notice to the Owner and the Architect before such conditions are disturbed and in no event later than fourteen (14) days after first observance of the conditions. The Contractor shall perform no Work involving or affected by such condition until after notifying Owner and receiving specific directions from Owner as to the performance of such Work. The Architect and Owner will then investigate such conditions and, if they differ materially from those about which Contractor had notice based on the information made available to Contractor by Owner or Architect prior to the execution of the Agreement and cause an increase in the Cost of the Work, or a delay in the performance of the Work, Contractor shall be entitled to an increase in the Contract Sum calculated pursuant to the applicable provisions of this Agreement, together with an extension of the Contract Time measured by the number of days or portions thereof, if any, that the Substantial Completion of the Work is actually delayed as a direct result of the existence of the obstruction, difficulty, or condition (provided, however, that if the required extension of time is not granted, Contractor shall be entitled only to the damage remedies set forth herein). If the conditions at the site are not materially different from those about which Contractor had notice based on the information made available to Contractor by Owner prior to the execution of the Agreement, Owner shall so notify Contractor, stating the reasons, and Contractor may thereafter dispute the determination as provided in Article 15 of these General Conditions.

§ 3.8 ALLOWANCES

- a. Delete the first sentence of Subparagraph 3.8.1 and replace it with the following:

§ 3.8.1 The Contractor shall include in the Contract Sum only those allowances expressly identified in (and allowed by) the Agreement.

§ 3.9 SUPERINTENDENT

- a. Delete “and timely” from the second line of Subparagraph 3.9.3.

§ 3.11 DOCUMENTS AND SAMPLES AT THE SITE

- a. Add the following sentences to the end of Subparagraph 3.11:

Among other things, the marked documents shall reflect (i) all deviations from the Drawings made during construction, (ii) details in the Work not previously shown on the Drawings, (iii) changes to existing conditions or existing conditions found to differ from those shown on the Drawings, and (iv) the actual installed position of equipment, controls and other system information required for Owner’s use and maintenance of the Work. These shall be delivered to Owner and Architect upon Substantial Completion of the Work (or any termination of this Contract).

§ 3.12 SHOP DRAWINGS, PRODUCT DATA AND SAMPLES

- a. Add Subparagraph 3.12.11 as follows:

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§ 3.12.11 The Architect's review of Contractor's submittals will be limited to examination of an initial submittal and one (1) resubmittal. Owner shall be entitled to obtain reimbursement from Contractor for amounts paid to the Architect for evaluation of any additional resubmittals.

- b. Add Subparagraph 3.12.12 as follows:

§ 3.12.12 The Contractor shall not reproduce all or any portion of the Contract Documents. Unless otherwise directed or specified, three (3) copies of each Shop Drawing shall be submitted with each submittal or re-submittal. Unless otherwise directed or specified, three (3) copies of Product Data shall be submitted with each submittal or re-submittal. Unless otherwise directed or specified, samples shall be submitted in duplicate and shall be properly labeled, bearing the name and quality of material, name of manufacturer, name of Project, name of Contractor, and date of submission.

§ 3.14 CUTTING AND PATCHING

- a. *Add the following Subparagraph 3.14.3 to 3.14:*

§ 3.14.3 *All patching shall be performed by mechanics of the trades dictated by the materials used in the patching operations.*

§ 3.15 CLEANING UP

- a. Add the following sentences at the end of Subparagraph 3.15.1:

Contractor shall maintain parking lots and sidewalks around the Project site in a clean condition and shall comply with all erosion control, stormwater runoff and dust control ordinances and regulations. Contractor shall remove all spillage and tracking arising from performance of the Work from such areas and shall establish a regular maintenance program to minimize accumulation of dirt and dust upon such areas.

- b. *Add the following Subparagraph 3.15.3 to 3.15:*

§ 3.15.3 *The General Construction Contractor shall leave the completed Work in conditions for occupancy by the Owner such that no cleaning, waxing, polishing, or other janitorial operations are required.* The Contractor shall provide an onsite waste receptacle or receptacles of sufficient size and capacity to dispose of waste materials and rubbish that accumulate on the site. These receptacles shall be emptied on a regular basis, as needed. The Contractor shall dispose of all waste materials and rubbish at approved site for waste disposal.

- c. Add the following Subparagraph 3.15.4 to 3.15:

§ 3.15.4 Contractor shall be solely responsible for protecting and securing materials and equipment stored on the site. Contractor shall require all persons performing work on the Project to comply with any and all policies and rules established by Owner relating to access or behavior on the Project site including any policies or rules regulating parking,

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access to the building, emergency ingress, egress or parking, noise, smoking, hygiene, food services, visitor privileges, restricted areas and elevator use, and privacy and confidentiality. The duty of Contractor to maintain discipline and good order in compliance with Owner's policies rules and regulations pursuant to the Contract Documents shall apply to Contractor's employees and to Subcontractors, sub-subcontractors, materialmen and suppliers, and their respective employees.

§ 3.18 INDEMNIFICATION

- a. Delete Subparagraph 3.18.1 and replace it with the following:

§ 3.18.1 To the fullest extent permitted by law the Contractor shall indemnify and hold harmless the Owner, the Institute for Advanced Learning and Research, Architect, Architect's consultants, Owner's Lender and each of their respective agents, officers, officials and employees of any of them from and against all claims, costs, losses, fines, penalties, judgments, claims, liabilities and damages, (including but not limited to all fees and charges of engineers, architects, attorneys' and other professionals and all court or other dispute resolution costs) arising out of or relating to: (i) the performance of the Work, if and to the fullest extent that any such claim, damage, loss or expense is caused, in whole or in part, by the acts, omissions, breach of contract or negligence of the Contractor, any Subcontractor or anyone for whose acts any of them may be liable; (ii) any infringement of patent rights or copyrights incident to the use in the performance of the Work or resulting from the incorporation in the Work of any invention, design, process, product, or device, not specified in the Contract Documents (iii) any Work performed by Contractor that it is contrary to laws or regulations, including without limitation (a) any violation of or failure to comply with any law, statute, ordinance, rule, regulation, code or requirement of the Work by Contractor, any Subcontractor or any person or entity for whom either is responsible; (b) any means, methods, techniques, procedures or sequences of execution or performance of Work; and/or (c) any failure to secure or pay for any permits, fees, licenses, approvals and inspections Contractor is required to provide by the Contract Documents, or any violation of any permit or other approval of a public authority applicable to the Work, by Contractor, any Subcontractor or any person or entity for whom either is responsible; (iv) any claim or action, legal or equitable, brought by other occupants or adjacent landowners against Owner or any other party indemnified hereunder to the full extent caused, in whole or in part, by or based upon Contractor's performance of the Work or failure to perform the Work; (v) any claim, damage, loss or expense attributable to bodily injury, sickness, disease or death, or injury to or destruction of tangible property (other than the Work itself), if and to the full extent that any such claim, damage, loss or expense is caused, in whole or in part, by the acts, omissions, breach of contract or negligence of the Contractor, any Subcontractor, or anyone for whose acts any of them may be liable; and (vi) the failure of Contractor to pay any Subcontractor, sub-subcontractor, materialman or supplier as provided in this Contract for Work performed by such person or entity. If any such claim, damage, loss or expense is caused in part by the Owner (or another person or entity for whom Owner is responsible) Contractor shall not be responsible to indemnify Owner for those specific damages, losses or expenses caused by the acts or omissions of Owner (or such other person or entity for whom Owner is responsible) but only to the extent they are so caused by the acts of omissions of Owner or other persons or entities for whom Owner is responsible. The indemnity obligation in this Section shall not be

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construed to negate, abridge, or otherwise reduce any other right or obligation of indemnity which would otherwise exist as to any party or person described in this Section 3.18. This indemnification shall survive acceptance and/or completion of the Work and any termination of this Contract. Nothing herein shall limit Contractor's other indemnification obligations as stated in the Contract Documents.

§ 3.19 DEMOLITION/REMEDATION

- a. Add new **§ 3.19 DEMOLITION/REMEDATION** and new Subparagraph 3.19.1 as follows:

§ 3.19.1 If the Work involves demolition and/or remediation or disposal of hazardous materials, then Contractor shall ensure that all required approvals, permits, licenses and surveys have been obtained prior to commencing with the applicable Work and shall handle, transport, remove and dispose of all such items in accordance with all applicable EPA, OSHA and other local, municipal, state or federal requirements (using properly licensed and certified personnel as necessary) and shall maintain (and provide to Owner upon request) all documents, manifests and other information reflecting the use, handling and disposal of such materials in accordance with such laws and requirements. Contractor shall be responsible for, and shall indemnify and hold Owner harmless from, all costs, fines, penalties or damages arising from Contractor's failure to comply with the provisions of this Section 3.19.1.

ARTICLE 4; ARCHITECT

§ 4.1 GENERAL

- a. On line 2 of Subparagraph 4.1.2, delete the word "Contractor."
- b. On lines 1 and 2 of Subparagraph 4.1.3, delete the words "as to whom the Contractor makes no reasonable objection and".

§ 4.2 ADMINISTRATION OF THE CONTRACT

- a. On line 2 of Subparagraph 4.2.2, delete the word "generally."
- b. Add new Subparagraph 4.2.2.1 as follows:

§ 4.2.2.1 Owner is entitled to reimbursement from Contractor for amounts paid to the Architect for site visits made necessary by the fault of Contractor or by defects and deficiencies in the Work.
- c. On line 1 of Subparagraph 4.2.9, delete the word "determine" and replace it with "assist the owner in determining".
- d. Delete the last sentence of Subparagraph 4.2.12, which begins with the word "When", and replace it with the following sentence: "In its capacity as interpreter and judge, the Architect shall use its best efforts to secure faithful performance by the Contractor."

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- e. In Subparagraph 4.2.13, delete the word “Architect’s” and replace it with the word “Owner’s.”

ARTICLE 5; SUBCONTRACTORS

§ 5.2 AWARD OF SUBCONTRACTS AND OTHER CONTRACTS FOR PORTIONS OF THE WORK

- a. *Add the following Subparagraph 5.2.1.1 to 5.2.1:*

§ 5.2.1.1 The list of Subcontractors and materials suppliers shall be submitted to the Architect not later than 10 calendar days after receipt of Notice to Proceed.
- b. On line 2 of Subparagraph 5.2.2, delete the words “and timely.”
- c. In Subparagraph 5.2.3, delete everything after the first sentence.

§ 5.4 CONTINGENT ASSIGNMENT OF SUBCONTRACTS

- a. Delete Subparagraph 5.4.2 in its entirety.

ARTICLE 7; CHANGES IN THE WORK

§ 7.1 GENERAL

- a. Delete Subparagraph 7.1.2 and replace it with the following:

§ 7.1.2 A Change Order shall be based upon agreement among the Owner and Contractor; a Construction Change Directive may be issued by the Owner and may or may not be agreed to by the Contractor; an order for a minor change in the Work may be issued by the Architect alone.
- b. In Subparagraph 7.1.3, delete “promptly” and replace it with “diligently and without delay to perform such changes”.
- c. *Add the following Subparagraph 7.1.4 to 7.1:*

§ 7.1.4 If changes in the work provide for an adjustment in the Contract Amount, the adjustment (increase or decrease) shall be based on the following, unless otherwise noted:
 - .1 Material quantities and unit prices (separated into trades; include sales tax).*
 - .2 Labor costs (employees hourly pay rate not billing rate).*
 - .3 Labor burden, applied to labor only, including but not limited to, worker’s compensation and public liability, social security tax, old age and unemployment insurance, union welfare fund and fringe benefits. Contractor shall be required to substantiate the labor burden percentage applied to any change in contract amount. Labor burden percentage shall not exceed 30 percent in any case.*
 - .4 Construction equipment cost.*

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.5 Overhead and profit combined (on claims for net increase only), as defined in Subparagraph 7.3.11.

.6 Cost of Premiums/Bonds (for General Contractor only). Evidence of additional premium/bond costs shall be submitted with claim.

- d. Add the following Subparagraph 7.1.5 to 7.1:

§ 7.1.5 Any change in the work which will result in an increase or decrease in the price must be approved in writing by the Owner's Authorized Representative.

§ 7.3 CONSTRUCTION CHANGE DIRECTIVES

- a. *In the first sentence of Subparagraph 7.3.7, delete the words "an amount for overhead and profit as set forth in the Agreement, or if no such amount is set forth in the Agreement, a reasonable amount" and substitute "an allowance for overhead and profit in accordance with Clause 7.3.11.1 through 7.3.11.6 below."*

- b. Add the following Subparagraph 7.3.11 to 7.3:

§ 7.3.11 *In Subparagraph 7.3.7, the allowance for the combined overhead and profit included in the total cost to the Owner shall not exceed the following:*

.1 For the Contractor, for Work performed by the Contractor's own forces, 20 percent of the cost.

.2 For the Contractor, for Work performed by the Contractor's Subcontractors, 10 percent of the amount due the Subcontractor.

.3 For each Subcontractor or Sub-subcontractor involved, for Work performed by that Subcontractor's or Sub-subcontractor's own forces, 15 percent of the cost.

.4 For each Subcontractor, for Work performed by the Subcontractor's Sub-subcontractors, 10 percent of the amount due the Sub-subcontractor.

.5 Cost to which overhead and profit is to be applied shall be determined in accordance with Subparagraph 7.3.7.

.6 In order to facilitate checking of quotations for extras or credits, all proposals, except those so minor that their propriety can be seen by inspection, shall be accompanied by complete itemization of costs including labor, materials, and Subcontracts. Labor and materials shall be itemized in the manner described above. Where major cost items are Subcontracts, they shall be itemized also. In no case will a change involving over \$100 be approved without such itemization.

ARTICLE 8; TIME

§ 8.1 DEFINITIONS

- a. In Subparagraph 8.1.2, add the following to the end of the section: "The date shall not be postponed by the failure to act of the Contractor or of persons or entities for whom the Contractor is responsible."

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§ 8.2 PROGRESS AND COMPLETION

- a. On line 3 of Subparagraph 8.2.2, delete the words “and Owner.”

§ 8.3 DELAYS AND EXTENSIONS OF TIME

- a. In Subparagraph 8.3.1, on line 4 delete the words “or by delay authorized by the Owner pending mediation and arbitration;” and, on line 6, after the words “Architect may determine,” insert the words “and the Owner shall agree.”

- b. *Add the following Subparagraphs 8.3.2.1 and 8.3.2.2 to 8.3.2:*

§ 8.3.2.1 Weather will be taken into account for purposes of ascertaining delays to the extent that actual construction operations are delayed. "Adverse weather" is defined as weather which is more severe than the average weather for the particular time(s) and date(s) in question as compared to the last 5-year average. The "average" shall be based on the "local climatological data" published by the National Oceanic and Atmospheric Administration for the Project area. It shall be the responsibility of the Contractor to furnish all data necessary to support his request.

§ 8.3.2.2 The Architect shall have sole discretion in appraising the request for time extensions and any extensions granted will be prorated to reflect the actual delay caused by that individual increment of construction relative to the overall progress of the Project. For example, a 3-day extension due to weather, affecting the site work, will be prorated based on the percentage of site work relative to the total Project.

- c. *Add the following Subparagraph 8.3.4 to 8.3:*

§ 8.3.4 The Contractor shall not be entitled to additional compensation as a result of time extensions approved by the Architect or Owner.

ARTICLE 9; PAYMENTS AND COMPLETION

§ 9.3 APPLICATIONS FOR PAYMENT

- a. Add the following sentence at the end of Subparagraph 9.3.1:

The form of Application for Payment shall be a current authorized edition of the AIA Document G 702-1992, Application Certification for Payment, supported by a current authorized edition of AIA Document G 703-1992, Continuation Sheet.

- b. *Add the following Subparagraph 9.3.1.3 to 9.3.1:*

§ 9.3.1.3 Until Substantial Completion, the Owner shall pay 95 percent of the amount due the Contractor on account of progress payments.

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§ 9.5 DECISIONS TO WITHHOLD CERTIFICATION

- a. Add the following Subparagraph 9.5.4 to Section 9.5:

§ 9.5.4 Notwithstanding any other provision of this Contract, and notwithstanding the issuance of a Certificate for Payment by the Architect, the Owner may decide to deny or withhold payment or, because of subsequently discovered evidence or subsequent observations, may nullify payment previously made, for any of the reasons set forth in Section 9.5.1 above,. If Contractor and Owner cannot agree on a revised amount, Owner will make payment for the amount for which Owner is in agreement. When the reasons for not making payment are removed, payment shall be made for amounts withheld because of them in response to the next filed Application for Payment.

§ 9.6 PROGRESS PAYMENTS

- a. Add the following sentence to the end of Subparagraph 9.6.1: “Owner will make payments, less 5% retainage, to the Contractor approximately 45 days after the Contractors Application for Payment has been approved by the Architect.”

§ 9.7 FAILURE OF PAYMENT

- a. In Subparagraph 9.7, on lines 3 and 4, delete the words “or awarded by binding dispute resolution.” Delete the last sentence in Subparagraph 9.7.

§ 9.8 SUBSTANTIAL COMPLETION

- a. Delete Subparagraph 9.8.1 and replace it with the following:

§ 9.8.1 Substantial Completion is the stage in the progress of the Work when the Work or designated portion thereof is: (i) sufficiently complete in accordance with the Contract Documents so that the Owner can occupy or utilize the Work for its intended use, except and only for minor items that may be completed without disruption or interference to the ability to use the Work; (ii) all required approvals and permits for occupancy, use and completion of the Work (including a temporary or permanent certificate of occupancy) shall have been issued by appropriate governmental authorities; (iii) the Architect has certified that the Work is complete as required by subsection (i) above; and (iv) all operational systems and elements that are part of the Work, including mechanical, electrical and support systems, are functioning as required by the Contract Documents.

- b. Add new Subparagraph 9.8.1.1 as follows:

§ 9.8.1.1 With respect to subsection (ii) in Section 9.8.1 above, if any approval, permit or certificate of occupancy issued as part of Substantial Completion is temporary or conditional, Contractor shall be responsible to perform, subsequent to Substantial Completion and as a condition to Final Completion and Final Payment, all Work required to satisfy the conditions set forth in any such temporary or conditional approval, permit or certificate. In this regard, the Contractor shall not be responsible for assuring the actual issuance of a final approval or certificate by the applicable governmental authority, but

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shall be responsible for the performance of all Work and any other obligations of Contractor under this Contract or applicable law that are required to satisfy the conditions set forth in the temporary or conditional approval or certificate.

- c. Add new Subparagraph 9.8.1.2 as follows:

§ 9.8.1.2 The Owner's receiving a Certificate of Occupancy is a condition precedent to Contractor's achieving Substantial Completion.

- d. Add new Subparagraph 9.8.3.1 as follows:

§ 9.8.3.1 The Architect will perform no more than one (1) inspection to determine whether the Work or a designated portion thereof has attained Substantial Completion in accordance with the Contract Documents. Owner is entitled to reimbursement from Contractor for amounts paid to the Architect for any additional inspections.

- e. *Add the following sentence to Subparagraph 9.8.5:*

The payment shall be sufficient to increase the total payments to 100 percent of the Contract Sum, less such amounts as the Architect shall determine for complete Work and unsettled claims.

§ 9.10 FINAL COMPLETION AND FINAL PAYMENT

- a. Add new Subparagraph 9.10.1.1 as follows:

§ 9.10.1.1 The Architect will perform no more than one (1) inspection to determine whether the Work or designated portion thereof has attained Final Completion in accordance with the Contract Documents. Owner is entitled to reimbursement from Contractor for amounts paid to the Architect for any additional inspections.

- b. Delete Subparagraph 9.10.2 and replace it with the following:

§ 9.10.2 As used herein, "Final Completion" shall mean and require and neither final payment nor any remaining retained percentage shall become due until (1) the proper and full completion of all of the Work, including but not limited to satisfactory operation of all equipment and systems and completion or correction of all punch list items, (2) delivery of all maintenance and operations manuals, the as-built drawings required by Section 3.11 of these General Conditions, and all warranties and guarantees (and assignments thereof) as required by the Contract Documents; (3) issuance of all final and unconditional approvals and certificates required from any authorities with jurisdiction over the Work, including final and unconditional certificates of occupancy (subject only to the provisions of Section 9.8.1.1 above); (4) removal of all rubbish, tools, scaffolding and surplus materials on the site and correction of all property damage that is the responsibility of Contractor pursuant to the Contract Documents; (5) delivery of final as-built survey of the Work as situated on the site; (6) delivery of executed releases (effective upon receipt of final payment) signed by all Subcontractors who may be entitled to a claim against Owner or the Project; (7) delivery of an executed release signed by Contractor discharging and waiving all

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claims, damages, causes of action, and/or suits which Contractor may have against Owner or Owner's property relating to the Project or the Work effective upon receipt of the final payment; (8) an affidavit that payrolls, bills for materials and equipment, and other indebtedness connected with the Work for which the Owner or the Owner's property might be responsible or encumbered (less amounts withheld by Owner) have been paid or otherwise satisfied; (9) a certificate evidencing that insurance required by the Contract Documents to remain in force after final payment is currently in effect and will not be canceled or allowed to expire until at least 30 days' prior written notice has been given to the Owner; (10) a written statement that the Contractor knows of no substantial reason that the insurance will not be renewable to cover the period required by the Contract Documents; (11) consent of surety, if any, to final payment; and (12), if required by the Owner, other data establishing payment or satisfaction of obligations, such as receipts, releases and waivers of liens, claims, security interests or encumbrances arising out of the Contract, to the extent and in such form as may be designated by the Owner. If a Subcontractor refuses to furnish a release or waiver required by the Owner, the Contractor may furnish a bond satisfactory to the Owner to indemnify the Owner against such lien. If such lien remains unsatisfied after payments are made, the Contractor shall refund to the Owner all money that the Owner may be compelled to pay in discharging such lien, including all costs and reasonable attorneys' fees.

c. Delete Subparagraph 9.10.4 in its entirety.

d. Add Subparagraph 9.10.6 to 9.10 as follows:

§ 9.10.6 Applications for Final Payment shall be accompanied by executed and notarized copies of AIA Document G706, Contractor's Affidavit of Payment of Debts and Claims, AIA Document G706A, Contractor's Affidavit of Release of Liens, and AIA Document G707, Consent of Surety Company to Final Payment. In addition, Contractor shall furnish separate Releases or Waivers of Liens from each Subcontractor and materials and equipment supplier involved in its portion of the Work.

e. Add Subparagraph 9.10.7 to 9.10 as follows:

§ 9.10.7 Subsequent to Substantial Completion of the Work and during Owner's initial occupancy and use of the Project, Contractor shall schedule and conduct with Owner and Architect a complete review, commissioning, demonstration, start-up and operational shakedown of all equipment and mechanical and electrical systems installed by Contractor or its Subcontractors on the Project, (including all specific commissioning activities required by the Contract Documents) and shall also review the operation and maintenance of such systems with Owner's maintenance contractors. Subsequent to this review, the Contractor, with reasonable promptness and at no cost to Owner, shall make all adjustments or corrections and shall balance all systems in order to make all equipment and systems perform as required by the Contract Documents based on the actual use and occupancy of the Project by the Owner. If necessary, or requested by the Architect or Owner, Contractor shall require the Subcontractor, supplier or materialmen responsible for any such equipment or system to participate in the review and/or to perform the adjustments, corrections or balancing required.

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ARTICLE 10; PROTECTION OF PERSONS AND PROPERTY

§ 10.2 SAFETY OF PERSONS AND PROPERTY

- a. Add the following Subparagraph 10.2.4.1 to 10.2.4:

§ 10.2.4.1 When use or storage of explosives or other hazardous materials or equipment or unusual methods are necessary, the Contractor shall give the Owner reasonable advance notice.

- b. Add the following Subparagraph 10.2.4.2 to 10.2.4:

§ 10.2.4.2 If the Contract Documents require Contractor to handle materials that under certain circumstances may be designated as hazardous, Contractor shall handle such materials in an appropriate manner.

- c. In Subparagraph 10.2.8, delete “not exceeding 21 days”.

§ 10.3 HAZARDOUS MATERIALS

- a. In Subparagraph 10.3.2, delete everything between the first and last sentences.
- b. Delete Subparagraph 10.3.3 in its entirety.
- c. Delete the second sentence of Subparagraph 10.3.4 in its entirety.
- d. Delete Subparagraph 10.3.6 in its entirety.

§ 10.5 ADDITIONAL SAFETY REQUIREMENTS

- a. Add new **§ 10.5 ADDITIONAL SAFETY REQUIREMENTS** and new Subparagraph 10.5.1 as follows:

§ 10.5.1 Contractor shall erect and maintain, as required by existing conditions and progress of the Work, all reasonable safeguards for safety and protection, including posting danger signs and other warnings against hazards, promulgating safety regulations and notifying owners and users of adjacent utilities, and directing necessary plankings, bridges, shoring, bracing, lights and warning signs necessary for the protection of roadways, adjacent property and the public. Contractor shall comply with the requirements of all building codes and other governing regulations and authorities and shall make all required submittals as required hereby. Contractor shall provide and maintain all cranes, hoists and other apparatus used in connection with the Work in strict conformance with the guidelines and regulations of all governing authorities as well as applicable OSHA requirements.

§ 10.6 WATER INTRUSION

- a. Add new **§ 10.6 WATER INTRUSION** and new Subparagraph 10.6.1 as follows:

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§ 10.6.1 Contractor acknowledges that the nature of the Work requires appropriate protection and procedures to avoid the intrusion of water in the area where the Work is performed. In this regard, Contractor shall develop and implement appropriate moisture intrusion prevention procedures in connection with the Work, which shall remain in effect until Final Completion. These moisture intrusion procedures shall include measures to prevent and manage the intrusion of water and vapor caused by Contractor's performance of the Work so that such conditions do not cause mold or other damage to the Work and shall include procedures for responding and remediating actual water intrusion or mold conditions caused by Contractor's performance of the Work. The moisture intrusion procedures shall require that all window openings be boarded up or otherwise properly closed as appropriate. Contractor shall also employ reasonable methods to discover the presence of leaks caused by performance of the Work. If Contractor discovers water intrusion or mold during construction of the Work, Contractor shall notify Owner in writing of such condition within forty-eight (48) hours of its discovery, shall provide Owner all inspection reports, testing data, photographs, samples or other materials associated with the investigation and remediation of the water intrusion incident or mold condition. Any such conditions encountered shall be remedied

ARTICLE 11; INSURANCE AND BONDS

§ 11.1 CONTRACTOR'S LIABILITY INSURANCE

a. *Add the following Subparagraphs 11.1.1.9 and 11.1.1.10 to 11.1.1:*

§ 11.1.1.9 *Liability Insurance shall include all major divisions of coverage and be on a comprehensive basis including:*

- 1) *Premises Operations (including X, C, and U coverages as applicable).*
- 2) *Independent Contractor's Protective.*
- 3) *Products and Completed Operations.*
- 4) *Personal Injury liability with Employment Exclusion deleted.*
- 5) *Contractual, including without limitation specified provision for Contractor's obligations under Paragraph 3.18 and the Owner's General Conditions.*
- 6) *Owned, non-owned and hired motor vehicles.*
- 7) *Broad Form Property Damage including Completed operations.*

§ 11.1.1.10 *If the General Liability coverages are provided by a Commercial General Liability Policy on a claims-made basis, the policy date or Retroactive Date shall predate the Contract; the termination date of the policy or applicable extended reporting period shall be no earlier than the termination date of coverages required to be maintained after final payment, certified in accordance with Subparagraph 9.10.2.*

b. *On lines 3 and 4 of Subparagraph 11.1.2, delete the words "whether written on an occurrence or claims made basis"*

c. *Add the following Subparagraph 11.1.2.1 to 11.1.2:*

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§ 11.1.2.1 *The insurance required by Subparagraph 11.1.1 shall be written for not less than the following limits, or greater if required by law:*

- 1) *Worker's Compensation:*
 - (a) *State:* *Statutory*
 - (b) *Applicable Federal:* *Statutory*
 - (c) *Employer's Liability:*

\$100,000	<i>Each Accident</i>
\$500,000	<i>Disease, Policy Limit</i>
\$100,000	<i>Disease, Each Employee</i>
- 2) *Comprehensive or Commercial General Liability:*
 - (a) *Limits of Insurance (CSL)*

\$500,000	<i>Each Occurrence</i>
\$1,000,000	<i>Aggregate</i>
 - (b) *Products and Completed Operations to be maintained for 1 year after final payment.*

\$1,000,000	<i>Aggregate</i>
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 - (c) *Property Damage Liability Insurance shall provide X, C, and U coverage.*
 - (d) *Broad Form Property Damage Coverage shall include Completed Operations.*
- 3) *Contractual Liability (Hold Harmless Coverage):*
 - (a) *Limits of Insurance (CSL):*

\$500,000	<i>Each Occurrence</i>
\$1,000,000	<i>Aggregate</i>
- 4) *Personal Injury:*

\$1,000,000	<i>Aggregate</i>
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- 5) *Business Auto Liability (including owned, non-owned, and hired vehicles).*
 - (a) *Limits of Insurance (CSL)*

\$500,000	<i>Liability Limits</i>
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- 6) *If the General Liability coverages are provided by a Commercial Liability policy, the:*
 - (a) *General Aggregates shall be not less than \$1,000,000 and it shall apply, in total, to this Project only.*
 - (b) *Fire Damage Limit shall be not less than \$50,000 on any one fire.*
 - (c) *Medical Expense Limit shall be not less than \$5,000 on any one person.*
- 7) *Umbrella Excess Liability:*

\$1,000,000	<i>Over Primary Insurance</i>
\$10,000	<i>Retention</i>
- 8) *Each policy of liability insurance issued shall designate the Owner and IALR as additional insureds.*

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- 9) All Insurance companies listed on certificates and on bonds, must possess a minimum A.M. rating of A- and the financial size category rating must not be below a VIII.
 - 10) Waiver of Subrogation: All policies shall be endorsed to provide that underwriters and insurance companies of Contractor shall not have any right of subrogation against Owner or Architect or any of its parents, subsidiaries, agents, employees, invitees, servants, subcontractors, insurers, underwriters, and such other parties as they may designate.
 - 11) Primary Insurance: All policies shall be endorsed to provide that coverage provided by Contractor's insurance shall always be primary coverage as respects any insurance maintained by Owner or Engineer.
- d. Add the following sentence to Subparagraph 11.1.3:
- If this insurance is written on the Comprehensive Liability Policy, the Certificates shall be AIA Document G705, Certificate of Insurance. If this insurance is written on a Commercial General Liability policy form, ACORD form 25S will be acceptable.*
- e. Add the following Subparagraph 11.1.5 to 11.1:
- § 11.1.5 The Contractor shall either require each of its Subcontractors to procure and maintain during the life of his Subcontract insurance of the types and amounts described in Subparagraph 11.1.2.1 above or he shall insure the activities of his Subcontractors on his own policy.*

§ 11.2 OWNER'S LIABILITY INSURANCE

- a. Add the following Subparagraph 11.2.1 to 11.2:
- § 11.2.1.1**The Contractor shall purchase and maintain insurance covering the Owner's contingent liability for claims which may arise from operations under the Contract.

§ 11.3 PROPERTY INSURANCE

- a. *Modify the first sentence of Subparagraph 11.3.1 as follows:*
- Delete: "Unless otherwise provided, the Owner", and substitute "The Contractor."*
- Add the following sentence:*
- The form of policy for this coverage shall be Completed Value. If the Owner is damaged by failure of the Contractor to maintain such insurance, then the Contractor shall bear all reasonable costs properly attributable thereto.*
- b. *Delete Subparagraph 11.3.1.2.*

EXHIBIT C

c. Delete Subparagraph 11.3.1.3.

d. Delete Subparagraph 11.3.1.4 and substitute the following:

§ 11.3.1.4 The Contractor shall provide insurance coverage for portions of the Work stored off site after written approval of the Owner at the value established in the approval, and also for portions of the Work in transit.

e. Delete the second sentence of Subparagraph 11.3.3.

f. Delete Subparagraph 11.3.4.

g. Delete Subparagraph 11.3.5.

h. Delete Subparagraph 11.3.6 and substitute the following:

§ 11.3.6 Before an exposure to loss may occur, the Contractor shall file with the Owner 2 certified copies of the policy or policies providing this property Insurance coverage each containing those endorsements specifically related to the Project. Each policy shall contain a provision that the policy will not be cancelled or allowed to expire until at least 30 days prior written notice has been given to the Contractor.

i. Delete Subparagraph 11.3.7.

j. Delete Subparagraph 11.3.8.

k. Delete Subparagraph 11.3.9.

l. Delete Subparagraph 11.3.10.

§ 11.4 PERFORMANCE BOND AND PAYMENT BOND

a. Delete Subparagraph 11.5.1 and substitute the following:

§ 11.4.1 The Contractor shall furnish bonds covering faithful performance of the Contract and payment of obligations arising thereunder. Bonds may be obtained through the Contractor's usual source and the cost thereof shall be included in the Contract Sum. The amount of each bond shall be equal to 100 percent of the Contract Sum.

.1 The Contractor shall deliver the required bonds to the Owner not less than 3 days following the date the Agreement is entered into, or if the Work is to be commenced prior thereto in response to a letter of intent, the Contractor shall, prior to the commencement of the Work, submit evidence satisfactory to the Owner that such bonds will be furnished.

EXHIBIT C

.2 The Contractor shall require the attorney-in-fact who executes the required bonds on behalf of the surety to affix thereto a certified and current copy of the power of attorney.

ARTICLE 13; MISCELLANEOUS PROVISIONS

§ 13.1 GOVERNING LAW

- a. Delete Subparagraph 13.1 and add the following:

§ 13.1 This Contract shall be governed by the law of the Commonwealth of Virginia.

§ 13.3 WRITTEN NOTICE

- a. Add the following sentence at the end of Subparagraph 13.3: “Notice to Owner must be delivered to the Authorized Representative identified in the Contract Documents.”

§ 13.7 TIME LIMITS ON CLAIMS

- a. Delete Subparagraph 13.7 in its entirety.

§ 13.8 EQUAL OPPORTUNITY

- a. Add **§ 13.8 EQUAL OPPORTUNITY** and Subparagraph 13.8.1 as follows:

§ 13.8.1 *The Contractor shall maintain policies of employment as follows:*

.1 The Contractor and the Contractor's Subcontractors shall not discriminate against any employee or applicant for employment because of race, religion, color, sex or national origin. The Contractor shall take affirmative action to ensure that applicants are employed, and that employees are treated during employment without regard to their race, religion, color, sex or national origin. Such action shall include, but not be limited to, the following: employment, upgrading, demotion or transfer; recruitment or recruitment advertising; layoff or termination; rates of pay or other forms of compensation; and selection for training, including apprenticeship. The Contractor agrees to post in conspicuous places, available to employees and applicants for employment, notices setting forth the policies of nondiscrimination.

.2 The Contractor and the Contractor's Subcontractors shall, in all solicitations or advertisements for employees placed by them or on their behalf, state that all applicants will receive consideration for

ARTICLE 14; TERMINATION OR SUSPENSION OF THE CONTRACT

- a. Nothing in this Article 14 shall limit Owner's rights to terminate or suspend the Contract as stated in the Owner's General Conditions. Article 14 is deleted to the extent it contradicts those provisions.

EXHIBIT C

- b. Delete Subparagraph 14.1.1 in its entirety.
- c. Delete Subparagraph 14.1.3 in its entirety.
- d. Delete Subparagraph 14.1.4 in its entirety.
- e. In Subparagraph 14.2.1.4, delete the words “is guilty of a substantial breach of” and replace them with the words “violates any.”
- f. In Subparagraph 14.2.2, delete “upon certification by the Initial Decision Maker that sufficient cause exists to justify such action.”
- g. In Subparagraph 14.2.4, delete the last sentence.
- h. Delete Subparagraph 14.3.2 in its entirety.
- i. In Subparagraph 14.4.3, delete the words “along with reasonable overhead and profit on the Work not executed.”

ARTICLE 15; CLAIMS AND DISPUTES

- a. Contract Disputes will be resolved in accordance with the provisions contained in the Owner’s General Conditions and Virginia Code § 2.2-4363. Article 15 is deleted to the extent it contradicts those provisions.
- b. The parties may mutually agreeing to use any voluntary alternative means of dispute resolution to resolve the contractual dispute. References to mandatory alternative dispute resolution throughout the Contract Documents are deleted in their entirety. Likewise, reference to arbitration in Subparagraph 15.4 of the Supplementary Conditions is deleted.
- c. Subparagraph 15.1.2 is revised to conform to the notice provisions in the Owner’s General Conditions.
- d. Subparagraph 15.1.3 is revised to add “undisputed” before payments in line 3 and to delete the last sentence.
- e. Subparagraph 15.1.6 is revised to add the following after “Contract Documents” in the last sentence: “, nor shall this provision waive any claim for damages covered by applicable insurance, or for damages arising out of the repair of defective work.”
- f. In Subparagraph 15.2.5, delete the last sentence.
- g. Delete Subparagraph 15.2.6 in its entirety.
- h. Delete Subparagraph 15.2.6.1 in its entirety.
- i. Delete Subparagraph 15.2.8 in its entirety.

EXHIBIT C

- j. Section 15.3 MEDIATION, including all Subparagraphs contained therein, is deleted in its entirety.
- k. Section 15.4 ARBITRATION, including all Subparagraphs contained therein, is deleted in its entirety.

EXHIBIT D

**Institute for Advanced Learning and Research
Conference Facility Renovations
Invitation to Bid No. 2019-03-15**

BID FORM

Project: IALR Conference Facility Renovations

To: Institute for Advanced Learning and Research
Attn: Procurement Office
Atrium Reception Desk/Procurement
150 Slayton Avenue
Danville, VA 24540

From: _____ (Bidder's Name & Address)

Date: _____

The Undersigned, having carefully examined the premises and conditions where the Work is to be performed and all matters referred to in the Instructions to Bidders and the other Contract Documents, including the Drawings and Specifications prepared by Dewberry Engineers, Inc., proposes to provide all materials, labor, equipment and services required to complete the Project for the Base Bid of: _____ Dollars (\$ _____), in lawful money of the United States of America. All applicable federal and Commonwealth of Virginia taxes are included in the Base Bid. All local taxes, licenses and fees are included in the Base Bid.

The Undersigned, having carefully examined the premises and conditions where the Work is to be performed and all matters referred to in the Instructions to Bidders and the other Contract Documents, including the Drawings and Specifications prepared by Dewberry Engineers, Inc., proposes to provide all materials, labor, equipment and services required to complete the Add Alternate number 1 for the lump sum cost of: _____ Dollars (\$ _____), in lawful money of the United States of America. All applicable federal and Commonwealth of Virginia taxes are included in the Add Alternate number 1. All local taxes, licenses and fees are included in the Add alternate number 1. Contract will be awarded based off of the combination of the Base Bid and Add alternate number 1. Owner reserves the right to not complete Add Alternate number 1 based on available funds.

Base Bid plus Add Alternate number 1 lump sum cost of: _____ Dollars (\$ _____)

We have included any required Bid Bond. We also have included signed and completed copies of the Invitation to Bid and Minority & Women-Owned Business, Small Business, and Service Disabled Veteran Business Certification Form with this Bid.

The following Addenda (if any) have been received and all requirements of those Addenda have been incorporated into the Base Bid:

1. Addendum # _____ Dated _____. Receipt Acknowledged: _____ (initials)
2. Addendum # _____ Dated _____. Receipt Acknowledged: _____ (initials)

EXHIBIT D

3. Addendum # _____ Dated _____. Receipt Acknowledged: _____ (initials)
4. Addendum # _____ Dated _____. Receipt Acknowledged: _____ (initials)

Bids containing any conditions, omissions, unexplained erasures, alterations or items not called for in the ITB, or irregularities of any kind, may be rejected by IALR as being nonresponsive. No changes are to be made to the Bid Form. Any changes to a Base Bid must be initialed by the person signing the Bid Form.

The attention of each Bidder is directed to Virginia Code sections 54.1-1100, et seq. which requires certain licenses for contractors, tradesmen, and others. Each Bidder is required to determine which license, if any, it is required to have under such sections. Complete the following:

1. Type/Class of Virginia Contractor License: _____
2. Virginia Contractor License No. _____

This offer shall be open to acceptance for sixty (60) days from the date bids are opened. If this bid is accepted by Owner within the time period stated above, we will:

1. Execute the Agreement within ten (10) days of receipt of Notice of Award.
2. Furnish any required performance and payment bonds within ten (10) days of receipt of Notice of Award.

This Bid is made subject to the terms and conditions contained in the Contract Documents. The Undersigned hereby agrees, if this Bid is accepted by IALR, to provide all Work for the Project in accordance with the Contract Documents for the firm, fixed price of the Base Bid stated above and in the required timeframe. If this Bid is accepted, we will obtain Substantial Completion of the Work in 120 consecutive calendar days from receipt of the Notice to Proceed and obtain Final Completion within 30 days of Substantial Completion of the Work.

The undersigned represents and warrants that s/he has read, understands, and agrees to all terms, conditions, and requirements of this Bid, and is authorized to Contract on behalf of firm named below.

NAME AND ADDRESS OF BIDDER:

DATE: _____

BY: _____
(SIGNATURE)

NAME: _____
(PLEASE PRINT)

EMAIL: _____ **TITLE:** _____

PHONE: _____

STATE CONTRACTOR'S LICENSE CLASS: _____

STATE CONTRACTOR'S LICENSE NUMBER: _____

FEIN: _____

VIRGINIA SCC NUMBER (IF ANY): _____

EXHIBIT E

Institute for Advanced Learning and Research Conference Facilities Renovations Project Invitation to Bid No. 2019-03-15

Minority & Women-Owned Business, Small Business, And Service Disabled Veteran Business Certification Form

* SUBMIT WITH BID *

IALR encourages, but does not require, participation by minority and women owned businesses, small businesses, and service disabled veteran businesses in contracting opportunities. The following information will be used to assess the participation of minority and women owned businesses, small businesses, and service disabled veteran businesses in this Project, but it will not be used to evaluate whether a bidder is the lowest responsive and responsible bidder.

The Bidder shall complete the following information:

Is Bidder a qualified minority or women-owned business, small business, or service disabled veteran business as defined in the Virginia Code § 2.2-4310 (MB/WB/SB/DB)? Yes: _____ No: _____.

Regardless of response to this first question Bidder shall complete the following:

Will bidder be using subcontractors on this Project? Yes: _____ No: _____

If yes, please identify any MB/WB/SB/DB you intend to utilize in the completion of the Work required by this Contract (attach additional sheet(s) if necessary):

Name of Firm	Type of Labor, Service or Material Quoted	Amount of Contract Proposed Subcontract
--------------	--	--

If none, please check here: _____.

BIDDER: _____

BY: _____

TYPED NAME: _____

TITLE: _____

DATE: _____

EXHIBIT F

BID BOND

KNOW ALL MEN BY THESE PRESENTS: That _____, the Contractor (“Principal”) whose principal place of business is located at _____ and _____ (“Surety”) whose address for delivery of ‘Notices’ is located at _____ are held and firmly bound unto the Institute for Advanced Learning and Research, the Owner (“Obligee”) in the amount of five percent (5%) of the Amount (Total Base Bid plus all Additive Bid Items) Bid by Principal, for the payment whereof, Principal and Surety bind themselves, their heirs, executors, administrators, successors and assigns, jointly and severally, firmly by these presents.

WHEREAS, the Principal has submitted a bid for the IALR Conference Facilities Renovations Project (IALR ITB No. 2019-03-15);

NOW, THEREFORE, the conditions of this obligation are as follows. This Bid Bond shall guarantee that the Principal will not withdraw his bid during the period of sixty (60) days following the opening of bids; that if his bid is accepted, Principal will enter into a formal contract with the Owner in accordance with the Contract Documents referenced in the Invitation for Bids and Instructions to Bidders (“Contract”); that Principal will submit a properly executed and authorized Performance Bond and Labor and Material Payment Bond (“Bonds”) on the forms included in the Contract Documents; and that in the event of the withdrawal of said bid within said period, or failure to enter into said Contract and give said Bonds at the time the Contract is entered into, Principal and Surety shall be jointly and severally liable to the Owner for the difference between the amount specified in said bid and such larger amount for which the Owner may contract with another party to perform the work covered by said bid, up to the amount of the bid guarantee. This amount represents the damage to the Owner of account of the default of the bidder in any particular thereof.

The Surety represents to the Principal and to the Obligee that it is legally authorized to do business in the Commonwealth of Virginia.

Signed and sealed this ____ day of _____, _____.

Contractor/Principal (SEAL)

Witness

By: _____

Typed Name: _____

Title: _____

Surety (SEAL)

By: _____

Attorney-in-Fact

EXHIBIT F

Typed Name: _____

AFFIDAVIT AND ACKNOWLEDGEMENT OF ATTORNEY-IN-FACT

COMMONWEALTH/STATE OF _____)
) to wit:
CITY/COUNTY OF _____)

I, the undersigned notary public, do certify that _____, whose name is signed to the foregoing Bid Bond in the amount of five percent (5%) of the Total Bid Amount and which names the Institute for Advanced Learning and Research, as Obligee, personally appeared before me today in the above jurisdiction and made oath that he/she is the attorney-in-fact of _____, a _____ corporation which is the Surety in the foregoing bond, that he/she is duly authorized to execute on the above Surety's behalf the foregoing bond pursuant to the Power of Attorney noted above and attached hereto, and on behalf of the surety, he/she acknowledged the foregoing bond before me as the above Surety's act and deed.

She/he has further certified that her/his Power of Attorney has not been revoked.

[Complete if Power is recorded: Clerk's Office: _____
Deed Book/Page No. or Instrument No.: _____]

Given under my hand this _____ day of _____, 20__

My name (printed) is: _____
My registration number is: _____
My commission expires: _____

Notary Public (SEAL)

EXHIBIT G

PERFORMANCE BOND

KNOW ALL MEN BY THESE PRESENTS: That _____, the Contractor (“Principal”) whose principal place of business is located at _____ and _____ (“Surety”) whose address for delivery of ‘Notices’ is located at _____ are held and firmly bound unto the Institute for Advanced Learning and Research, the Owner (“Obligee”) in the amount of _____ Dollars (\$_____) for the payment whereof Principal and Surety bind themselves, their heirs, executors, administrators, successors and assigns, jointly and severally, firmly by these presents.

WHEREAS, Principal has by written agreement dated _____ entered into a contract with Obligee for the IALR Conference Facilities Renovations Project (IALR ITB No. 2019-03-15), which contract (“Contract”) is by reference expressly made a part hereof;

NOW THEREFORE, THE CONDITION OF THIS OBLIGATION is such that, if the Principal shall promptly and faithfully perform said Contract in strict conformity with the plans, specifications and conditions of the Contract, then this obligation shall be null and void; otherwise it shall remain in full force and effect.

Provided, that any alterations which may be made in the terms of the Contract, or in the Work to be done under it, or the giving by the Obligee of any extension of time for the performance of the Contract, or any other alterations, extensions or forbearance on the part of either or both of the Obligee or the Principal to the other shall not in any way release the Principal and the Surety, or either of them, their heirs, executors, administrators, successors or assigns from their liability hereunder, notice to the Surety of any such alterations, extension, or forbearance being hereby waived.

No action shall be brought on this Bond unless brought within one year after: (a) completion of the Contract and all Work thereunder, including expiration of all warranties and guarantees, or (b) discovery of the defect or breach of warranty or guarantee if the action be for such.

The Surety represents to the Principal and to the Obligee that it is legally authorized to do business in the Commonwealth of Virginia.

EXHIBIT G

Signed and sealed this ____ day of _____, _____.

Contractor/Principal (SEAL)

Witness By: _____
Typed Name: _____
Title: _____

Surety (SEAL)

By: _____
Attorney-in-Fact
Typed Name: _____

AFFIDAVIT AND ACKNOWLEDGEMENT OF ATTORNEY-IN-FACT

COMMONWEALTH/STATE OF _____)
_____) to wit:
CITY/COUNTY OF _____)

I, the undersigned notary public, do certify that _____, whose name is signed to the foregoing Performance Bond in the sum of _____ and dated _____ and which names the Institute for Advanced Learning and Research, as Obligee, personally appeared before me today in the above jurisdiction and made oath that he/she is the attorney-in-fact of _____, a _____ corporation which is the Surety in the foregoing bond, that he/she is duly authorized to execute on the above Surety's behalf the foregoing bond pursuant to the Power of Attorney noted above and attached hereto, and on behalf of the surety, he/she acknowledged the foregoing bond before me as the above Surety's act and deed.

She/he has further certified that her/his Power of Attorney has not been revoked.

[Complete if Power is recorded: Clerk's Office: _____
Deed Book/Page No. or Instrument No.: _____]

Given under my hand this ____ day of _____, 20__

Notary Public (SEAL)

My name (printed) is: _____
My registration number is: _____
My commission expires: _____

EXHIBIT G

TERMS AND CONDITIONS OF THE PERFORMANCE BOND

1. The Contractor and the Surety, jointly and severally, bind themselves, their heirs, executors, administrators, successors and assigns to the Owner for the prompt and faithful performance of the Contract, which is incorporated herein by reference.
2. If the Contractor promptly and faithfully performs the Contract in strict conformity with the plans, specifications and conditions of the Contract, the Surety and the Contractor shall have no obligations under this Bond.
3. In the event of the Contractor's Default, and subsequent notification to the Surety pursuant to Section 14.2.2 of the General Conditions, the Surety shall, within fourteen (14) days of receipt of such notice, contact the Owner in writing, and arrange a meeting with the Owner to discuss methods of completing the Contract. See paragraph 4, below, for the options to be discussed. If the Surety fails to arrange a meeting or fails to attend such meeting, the Surety shall be deemed to be in default on this Bond and the Owner may, at its sole discretion, take what measures it deems necessary to protect the Owners interests, without further notice to the Surety, and the Owner shall be entitled to enforce any remedy available to the owner under the Contract or under Virginia law.
4. Within thirty (30) days after such meeting, during which time the Surety may investigate and otherwise analyze the project, and which period shall not toll any Contract Time periods nor operate as a waiver of any of the Owner's rights, the Surety shall, at its own expense, notify the Owner in writing that it is taking one of the following actions, which shall be acceptable to the Owner, at the Owner's sole discretion:
 - 4.1 By written takeover agreement with the Owner, the Surety itself shall undertake to perform and complete the Contract, which it may do through its licensed agents or through licensed independent contractors. If the Owner, at its sole discretion, consents, the Contractor may serve as the Surety's independent contractor (however, due to conflicts with the Virginia Public Procurement Act, the Owner may not directly contract with an otherwise qualified independent contractor produced by the Surety); or
 - 4.2 The Surety may, if acceptable to the Owner and at the Owner's sole discretion, waive its right to perform and complete the Contract, and with reasonable promptness under the circumstances:
 - 4.2.1 Pay to the Owner all amounts for which it may be liable to the Owner as surety on this Performance Bond, including the damages described in paragraph 6 below; or
 - 4.2.2 Deny liability, in whole or in part, and provide written notice thereof to the Owner, citing reasons therefor.
5. If after the meeting described in paragraph 4, above, the Surety does not proceed with reasonable promptness with one of the options provided in subparagraphs 4.1 or 4.2 (including its subparts), above, the Owner may send additional written notice to the Surety demanding that the Surety

EXHIBIT G

perform its obligations under the Bond. If the Surety does not proceed to perform its obligations under the Bond within fifteen (15) days after receipt of said notice, the Surety shall be deemed to be in default on this Bond. Thereafter the Owner shall be entitled to enforce any remedy available to the Owner under the Bond, the Contract or Virginia law. If the Surety proceeds as provided in Subparagraph 4.2, and the Surety and the Owner are unable to agree as to the amount for which the Surety may be liable to the Owner, or if the Surety has denied liability, in whole or in part, the Owner, without further notice, shall be entitled to enforce any remedy available to the Owner under the Bond, the Contract or Virginia law. In such event, the Owner may immediately proceed to complete the work in any manner authorized by law.

6. After the Owner has terminated the Contractor's right to complete the Contract and if the Surety selects to act under subparagraph 4.1 or 4.2 above, then the responsibilities of the Surety to the Owner shall not be greater or less than those of the Contractor under the Contract, and the responsibilities of the Owner to the Surety shall not be greater than or less than those of the Owner under the Contract. To the limit of the amount of this Bond, plus the increased cost of any change orders under the Contract, provided the Owner commits the balance of the Contract Sum to the prompt and faithful completion of the Contract, the Surety is obligated without duplication for:
 - 6.1 The responsibilities of the Contractor for correction of defective work and completion of the Contract;
 - 6.2 Additional legal, design professional and delay costs resulting from the Contractor's Default, and resulting from the actions or failure to act of the Surety under Paragraph 4; and
 - 6.3 Liquidated damages, or if no liquidated damages are specified in the Contract, actual damages caused by delayed performance or non-performance of the Contractor.
7. The Surety shall not be liable to the Owner for obligations of the Contractor that are unrelated to the Contract, and the Balance of the Contract Sum shall not be reduced or set off on account of any such unrelated obligations. No right of action shall accrue on this Bond to any person or entity other than the Owner, its officers, agencies, administrators, successors or assigns.
8. The Surety hereby waives notice of any changes, including changes of time, to the Contract or to related subcontracts, purchase orders and other obligations. The Surety understands and agrees that the penal amount of the bond shall be increased or decreased by any changes to time and amount incorporated into any Change Orders.
9. Any proceeding by the Owner, legal or equitable, under this Bond may be instituted in any court of competent jurisdiction located in the City of Danville, Virginia, as permitted under Section 6.2 of the Agreement and Virginia Code § 2.2-4337 and 2.2-4340, or by the Contractor or Surety, as permitted under the Contract or under Virginia law.
10. Notice to the Surety shall be mailed or delivered to the address shown on the Standard Performance Bond in the space for Surety address for delivery of Notices
11. When this Bond has been furnished to comply with a statutory or other legal requirement in the location where the construction was to be performed, any provision in this Bond conflicting with

EXHIBIT G

said statutory or legal requirement shall be deemed deleted here from and provisions conforming to such statutory or other legal requirement shall be deemed incorporated herein. The intent is that this Bond shall be construed as a statutory bond and not as a common law bond when furnished to comply with statutory requirements.

12. DEFINITIONS

12.1 **Balance of the Contract Sum:** The total amount payable by the Owner to the Contractor under the Contract after all proper adjustments have been made, reduced by all valid and proper payments made to or on behalf of the Contractor under the Contract.

12.2 **Contract:** The agreement between the Owner and the Contractor identified on first page of the Performance Bond, including all Contract Documents and duly executed modifications and change orders thereto.

12.3 **Contractor Default:** A failure of the Contractor to perform as set forth in Section 14.2.1 of the General Conditions, Section 8.6.12 of the Agreement, or elsewhere in the Contract Documents, which has neither been remedied nor expressly waived by the Owner, or otherwise to comply with the terms of the Contract.

13. Nothing in these General Conditions shall prevent a surety from becoming involved in the Contract prior to termination, upon notice from the Owner of the Contractor's failure to promptly and faithfully perform the Contract in strict conformity with the plans, specifications and conditions of the Contract.

EXHIBIT H

LABOR AND MATERIAL PAYMENT BOND

KNOW ALL MEN BY THESE PRESENTS: That _____, the Contractor (“Principal”) whose principal place of business is located at _____ and _____ (“Surety”) whose address for delivery of ‘Notices’ is located at _____ are held and firmly bound unto the Institute for Advanced Learning and Research, the Owner (“Obligee”) in the amount of _____ Dollars (\$_____) for the payment whereof Principal and Surety bind themselves, their heirs, executors, administrators, successors and assigns, jointly and severally, firmly by these presents.

WHEREAS, Principal has by written agreement dated _____ entered into a contract with Obligee for the IALR Conference Facilities Renovations Project (IALR ITB No. 2019-03-15), which contract (“Contract”) is by reference expressly made a part hereof;

NOW THEREFORE, THE CONDITION OF THIS OBLIGATION is such that, if the Principal shall promptly make payment to all claimants as hereinafter defined, for labor performed and material furnished in the prosecution of the Work provided for in the Contract, then this obligation shall be void; otherwise it shall remain in full force and effect, subject, however, to the following conditions.

The Principal and Surety, jointly and severally, hereby agree with Obligee as follows:

1. A claimant is defined as one having a direct contract with the Principal or with a subcontractor of the Principal for labor, material, or both for use in the performance of the Contract. A “subcontractor” of the Principal, for the purposes of this bond only, includes not only those subcontractors having a direct contractual relationship with the Principal, but also any other contractor who undertakes to participate in the Work which the Principal is to perform under the aforesaid Contract, whether there are one or more intervening subcontractors contractually positioned between it and the Principal (for example, a subcontractor). “Labor” and “material” shall include, but not be limited to, public utility services and reasonable rentals of equipment, but only for periods when the equipment rented is actually used at the work site.
2. Any claimant who has a direct contractual relationship with the Principal and who has performed labor or furnished material in accordance with the Contract documents in furtherance of the Work provided in the Contract, who has not been paid in full therefor before the expiration of ninety (90) days after the day on which such claimant performed the last of such labor or furnished the last of such materials for which he claims payment, may bring an action on this bond to recover any amount due him for such labor or material, and may prosecute such action to final judgment and have execution on the judgment. The Obligee need not be a party to such action and shall not be liable for the payment of any costs, fees or expenses of any such suit.
3. Any claimant who has a direct contractual relationship with any subcontractor of the Principal but who has no contractual relationship, express or implied, with the Principal, may bring an action on this bond only if he has given written notice to the Principal within ninety (90) days from the day on which the claimant performed the last of the labor or furnished the last of the materials for which he claims payment, stating with substantial accuracy the amount claimed and the name of the person for whom the Work was performed or to whom the material was furnished. Notice to the Principal shall be served by registered or certified mail, postage prepaid, in an envelope addressed to the Principal at any place where his office is regularly maintained for the transaction of business. Claims for sums withheld as retainages with respect to labor performed or materials furnished shall not be subject to the time limitations stated in this paragraph 3.

EXHIBIT H

4. No suit or action shall be commenced hereunder by any claimant.
 - a. Unless brought within one year after the day on which the person bringing such action last performed labor or last furnished or supplied materials, it being understood, however, that if any limitation embodied in this bond is prohibited by any law controlling the construction hereof, the limitation embodied within this bond shall be deemed to be amended so as to be equal to the minimum period of limitation permitted by such law.
 - b. Other than in a court of competent jurisdiction located in the City of Danville, Virginia, with venue as provided by statute, or in the United States District Court for the district in which the project, or any part thereof is situated.
5. The amount of this bond shall be reduced by and to the extent of any payment or payments made in good faith hereunder.

EXHIBIT H

Signed and sealed this ____ day of _____, _____.

Contractor/Principal (SEAL)

Witness By: _____
Typed Name: _____
Title: _____

Surety (SEAL)

By: _____
Attorney-in-Fact
Typed Name: _____

AFFIDAVIT AND ACKNOWLEDGEMENT OF ATTORNEY-IN-FACT

COMMONWEALTH/STATE OF)
) to wit:
CITY/COUNTY OF)

I, the undersigned notary public, do certify that _____, whose name is signed to the foregoing Labor and Material Bond in the sum of _____ and dated _____ and which names the Institute for Advanced Learning and Research, as Obligee, personally appeared before me today in the above jurisdiction and made oath that he/she is the attorney-in-fact of _____, a _____ corporation which is the Surety in the foregoing bond, that he/she is duly authorized to execute on the above Surety's behalf the foregoing bond pursuant to the Power of Attorney noted above and attached hereto, and on behalf of the surety, he/she acknowledged the foregoing bond before me as the above Surety's act and deed.

She/he has further certified that her/his Power of Attorney has not been revoked.

[Complete if Power is recorded: Clerk's Office: _____
Deed Book/Page No. or Instrument No.: _____]

Given under my hand this ____ day of _____, 20__

Notary Public (SEAL)

My name (printed) is: _____
My registration number is: _____
My commission expires: _____

EXHIBIT I

Institute for Advanced Learning and Research Conference Facilities Renovations Project Invitation to Bid No. 2019-03-15

Contractor's Certification As To Licensure Of Subcontractors

Contractor agrees to comply with Title 54.1, Chapter 11, Code of Virginia (1950), as amended, with respect to licensure of subcontractor employed to work on the Project. Contractor represents that it has verified that all subcontractors, currently identified to work on the Project, hold all required State and local licenses, including State Contractors license and City business license. Contractor agrees that it will verify that any additional subcontractors employed to work on the Project, subsequent to the date of this Certification, hold all required State and local licenses, including State contractors license and City business license. This Certification shall constitute a material part of the Contractor's contract with IALR.

Contractor's Name

By _____

Printed or Typed Name and Title

COMMONWEALTH OF VIRGINIA
CITY/COUNTY of _____

I, _____, a Notary Public in and for the Commonwealth of Virginia, do hereby certify that _____, whose name is signed to the foregoing, has subscribed, sworn to and acknowledged the same before me this _____ day of _____, 20____.

Notary Public

My Commission Expires: _____

SECTION 011000 - SUMMARY

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section Includes:

1. Project information.
2. Work covered by Contract Documents.
3. Work by Owner.
4. Access to site.
5. Work restrictions.
6. Specification and drawing conventions.
7. Miscellaneous provisions.

- B. Related Requirements:

1. Division 01 Section "Temporary Facilities and Controls" for limitations and procedures governing temporary use of Owner's facilities.

1.3 PROJECT INFORMATION

- A. Project Identification: IALR Conference Facility Renovations

1. Project Location: 150 Slayton Avenue, Danville Cyber Park, Danville Va. 24540

- B. Owner: Institute for Advanced Learning and Research Foundation Board

1. Owner's Representative: Robin Barker, Grant & Contract Manager

- C. Architect: Larry W. Hasson, AIA, LEED AP, DBIA Dewberry Engineers Inc.

1.4 WORK COVERED BY CONTRACT DOCUMENTS

- A. The Work of Project is defined by the Contract Documents and consists of the following:

1. Renovations to the existing conference facilities within the existing Institute for Advanced Learning and Research Building. Interior spaces to be renovated include the Great Hall, Executive Conference Room, and Executive Auditorium. Work includes updating architectural finishes and electrical upgrades.

B. Type of Contract:

1. Project will be constructed under a single prime contract.

1.5 WORK BY OWNER

- A. Concurrent Work: Owners consultant will perform the following construction operations at Project site. Those operations will be conducted simultaneously with work under this Contract.
1. Audio visual installation based upon rough-in locations provided under this contract.

1.6 WORK UNDER SEPARATE CONTRACTS

- A. General: Cooperate fully with 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 separate contracts.

1.7 OWNER0FURNISHED PRODUCTS

- A. Owner will furnish products indicated. The Work includes receiving, unloading, handling, storing, protecting, and installing Owner-furnished products.
- B. Owner-Furnished Products:
1. N/A

1.8 ACCESS TO SITE

- A. General: Contractor shall have full use of Project site for construction operations during construction period. Contractor's use of Project site is limited only by Owner's right to perform work or to retain other contractors on portions of Project.
- B. Use of Site: Limit use of Project site to areas within the Contract limits indicated. Do not disturb portions of Project site beyond areas in which the Work is indicated.

1.9 WORK RESTRICTIONS

- A. Work Restrictions, General: Comply with restrictions on construction operations.
1. Comply with limitations on use of public streets and with other requirements of authorities having jurisdiction.
- B. On-Site Work Hours: Limit work in the existing building to normal business working hours of 7:00 a.m. to 6:00 p.m., Monday through Friday, unless otherwise approved by Architect and Owner indicated.
1. Weekend Hours: Per approval of Architect and Owner.
 2. Hours for Utility Shutdowns: Notify Owner 7 days prior to shutdowns.

- C. Existing Utility Interruptions: Do not interrupt utilities serving facilities occupied by the City of Martinsville or others unless permitted under the following conditions and then only after providing temporary utility services according to requirements indicated:
 - 1. Notify Architect and Owner not less than seven (7) days in advance of proposed utility interruptions.
 - 2. Obtain Architect's and Owner's written permission before proceeding with utility interruptions.

1.10 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 01 General Requirements: Requirements of Sections in Division 01 apply to the Work of all Sections in the Specifications.
- C. 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.

1.11 MISCELLANEOUS PROVISIONS

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 011000

SECTION 012500 - SUBSTITUTION PROCEDURES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section includes administrative and procedural requirements for substitutions.
- B. Related Requirements:
 - 1. Division 01 Section "Additive Bid Items" for products selected under an alternate.
 - 2. Division 01 Section "Product Requirements" for requirements for submitting comparable product submittals for products by listed manufacturers.
 - 3. Divisions 02 through 33 Sections for specific requirements and limitations for substitutions.

1.3 DEFINITIONS

- A. Substitutions: Changes in products, materials, equipment, and methods of construction from those required by the Contract Documents and proposed by Contractor.
 - 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 in order to meet other Project requirements but may offer advantage to Contractor or Owner.

1.4 ACTION SUBMITTALS

- A. Substitution Requests: Submit three copies of each request for consideration. Identify product or fabrication or installation method to be replaced. Include Specification Section number and title and Drawing numbers and titles.
 - 1. Substitution Request Form: Use CSI Form 13.1A.
 - 2. Documentation: Show compliance with requirements for substitutions and the following, as applicable:
 - a. Statement indicating why specified product or fabrication or installation cannot be provided, if applicable.

- b. Coordination 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 substitution 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 and 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. Detailed comparison of Contractor's construction schedule using proposed substitution with products specified for the Work, including effect on the overall Contract Time. If specified product or method of construction cannot be provided within the Contract Time, include letter from manufacturer, on manufacturer's letterhead, stating date of receipt of purchase order, lack of availability, or delays in delivery.
 - j. Cost information, including a proposal of change, if any, in the Contract Sum.
 - k. Contractor's certification that proposed substitution complies with requirements in the Contract Documents except as indicated in substitution request, is compatible with related materials, and is appropriate for applications indicated.
 - l. Contractor's waiver of rights to additional payment or time that may subsequently become necessary because of failure of proposed substitution to produce indicated results.
3. 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.

1.5 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.

1.6 PROCEDURES

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

PART 2 - PRODUCTS

2.1 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: Not allowed.

PART 3 - EXECUTION (Not Used)

END OF SECTION 012500

SECTION 012600 - CONTRACT MODIFICATION PROCEDURES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. This Section specifies administrative and procedural requirements for handling and processing Contract modifications.
- B. Related Sections include the following:
 - 1. Division 01 Section "Unit Prices" for administrative requirements for using unit prices.
 - 2. Division 01 Section "Product Requirements" for administrative procedures for handling requests for substitutions made after Contract award.

1.3 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, "Architect's Supplemental Instructions."

1.4 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. Proposal Requests issued by Architect are for information only. Do not consider them instructions either to stop work in progress or to execute the proposed change.
 - 2. Within time specified in Proposal Request 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. Use CSI Form 13.1A as appropriate for submission of quotation.
 - b. 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.
 - c. Indicate applicable taxes, delivery charges, equipment rental, and amounts of trade discounts.
 - d. Include costs of labor and supervision directly attributable to the change.

- e. 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 unforeseen conditions require modifications to the Contract, Contractor may propose changes 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 Division 01 Section "Product Requirements" if the proposed change requires substitution of one product or system for product or system specified.
- C. Proposal Request Form: Use State Form GC-1 "Change Order Estimate (General Contractor)."

1.5 CHANGE ORDER PROCEDURES

- A. On Owner's approval of a Proposal Request, Architect will issue a Change Order for signatures of Owner and Contractor on State Form GC-11 "Construction Change Order."

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 012600

SECTION 012900 - PAYMENT PROCEDURES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. This Section specifies administrative and procedural requirements necessary to prepare and process Applications for Payment.
- B. Related Sections include the following:
 - 1. Division 01 Section "Contract Modification Procedures" for administrative procedures for handling changes to the Contract.
 - 2. Division 01 Section "Construction Progress Documentation" for administrative requirements governing preparation and submittal of Contractor's Construction Schedule and Submittals Schedule.

1.3 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.

1.4 SCHEDULE OF VALUES

- A. Coordination: Coordinate preparation of the Schedule of Values with preparation of Contractor's Construction Schedule.
 - 1. Correlate line items in the Schedule of Values with other required administrative forms and schedules, including the following:
 - a. Application for Payment forms with Continuation Sheets.
 - b. Contractor's Construction Schedule.
 - 2. Submit the Schedule of Values to Architect at earliest possible date but no later than fourteen days before the date scheduled for submittal of initial Applications for Payment.
- B. Format and Content: Use the 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. Identification: Include the following Project identification on the Schedule of Values:

- a. Project name and location.
 - b. Name of Architect.
 - c. Architect's project number.
 - d. Contractor's name and address.
 - e. Date of submittal.
2. Arrange the Schedule of Values in tabular form with separate columns to indicate the following for each item listed:
 - a. Description of the Work.
 - b. Name of vendor.
 - c. Change Orders (numbers) that affect value.
 - d. Dollar value.
3. Provide a breakdown of the Contract Sum in enough detail to facilitate continued evaluation of Applications for Payment and progress reports. Coordinate with the Project Manual table of contents. Provide several line items for principal subcontract amounts, including separate line items for labor and materials, where appropriate.
 - a. Include separate line items under Contractor and principal subcontracts for LEED documentation and other Project closeout requirements in an amount totaling five percent of the Contract Sum and subcontract amount.
4. Round amounts to nearest whole dollar; total shall equal the Contract Sum.
5. 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. If specified, include evidence of insurance or bonded warehousing.
6. Each item in the Schedule of Values and Applications for Payment shall be complete. Include total cost and proportionate share of general overhead and profit for each item.
 - a. Temporary facilities and other major cost items that are not direct cost of actual work-in-place may be shown either as separate line items in the Schedule of Values or distributed as general overhead expense, at Contractor's option.
7. Schedule Updating: Update and resubmit the Schedule of Values before the next Applications for Payment when Change Orders result in a change in the Contract Sum.

1.5 APPLICATIONS FOR PAYMENT

- A. Each Application for Payment shall be consistent with previous applications and payments as certified by Architect and paid for by Owner.
 1. Initial Application for Payment, Application for Payment at time of Substantial Completion, and final Application for Payment involve additional requirements.

- B. Payment Application Times: Progress payments shall be submitted to Architect by the twenty fifth of the month. The period covered by each Application for Payment is one month, ending on the twenty fifth.
- C. Application for Payment Forms: Use AIA Document G702 and AIA Document G703 as form for Applications for Payment.
- D. Application Preparation: Complete every entry on form 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 of Change Orders issued before last day of construction period covered by application.
- E. Transmittal: Submit 5 signed original copies of each Application for Payment to Architect.
 - 1. Transmit each copy with a transmittal form listing attachments and recording appropriate information about application.
- F. 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. Copies of building permits.
 - 5. Initial progress report.
 - 6. Certificates of insurance and insurance policies.
 - 7. Performance and payment bonds.
- G. Application for Payment at Substantial Completion: After issuing the Certificate of Substantial Completion, submit an Application for Payment showing 100 percent completion for portion of the Work claimed as substantially complete.
 - 1. Submit one copy of State Form CO-13.2a "Contractor's Certificate of Substantial Completion" with each copy of pay application.
- H. Final Payment Application: 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. State Form CO-13.2 "Contractor's Certificate of Completion"
 - 3. Evidence that claims have been settled.
 - 4. 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 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. This Section includes administrative provisions for coordinating construction operations on Project including, but not limited to, the following:
 - 1. Coordination Drawings.
 - 2. Administrative and supervisory personnel.
 - 3. Project meetings.
 - 4. Requests for Interpretation (RFIs).
- B. Related Sections include the following:
 - 1. Division 01 Section "Construction Progress Documentation" for preparing and submitting Contractor's Construction Schedule.
 - 2. Division 01 Section "Execution" for procedures for coordinating general installation and field-engineering services, including establishment of benchmarks and control points.
 - 3. Division 01 Section "Closeout Procedures" for coordinating closeout of the Contract.

1.3 DEFINITIONS

- A. RFI: Request from Contractor seeking interpretation or clarification of the Contract Documents.

1.4 COORDINATION

- 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, which 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. Make adequate provisions to accommodate items scheduled for later installation.
 - 3. Where availability of space is limited, coordinate installation of different components to ensure maximum performance and accessibility for required maintenance, service, and repair of all components, including mechanical and electrical.

- B. Prepare memoranda for distribution to each party involved, outlining special procedures required for coordination. Include such items as required notices, reports, and list of attendees at meetings.
- C. 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. Preinstallation conferences.
 - 6. Project closeout activities.
 - 7. Startup and adjustment of systems.
 - 8. Project closeout activities.
- D. Conservation: Coordinate construction activities to ensure that operations are carried out with consideration given to conservation of energy, water, and materials.
 - 1. Salvage materials and equipment involved in performance of, but not actually incorporated into, the Work.

1.5 SUBMITTALS

- A. Coordination Drawings: Prepare Coordination Drawings if limited space availability necessitates maximum utilization of space for efficient installation of different components or if coordination is required for installation of products and materials fabricated by separate entities.
 - 1. Content: Project-specific information, drawn accurately to scale. Do not base Coordination Drawings on reproductions of the Contract Documents or standard printed data. Include the following information, as applicable:
 - a. Indicate functional and spatial relationships of components of architectural, structural, civil, mechanical, and electrical systems.
 - b. Indicate required installation sequences.
 - c. Indicate dimensions shown on the Contract Drawings and make specific note of dimensions that appear to be in conflict with submitted equipment and minimum clearance requirements. Provide alternate sketches to Architect for resolution of such conflicts. Minor dimension changes and difficult installations will not be considered changes to the Contract.
 - 2. Sheet Size: At least 8-1/2 by 11 inches but no larger than 30 by 40 inches.
 - 3. Number of Copies: Submit five opaque copies of each submittal. Architect will return one copy.
 - 4. Refer to individual Sections for Coordination Drawing requirements for Work in those Sections.
- B. Key Personnel Names: Within 15 days of starting construction operations, submit a list of key personnel assignments, including superintendent and other personnel in attendance at Project

site. Identify individuals and their duties and responsibilities; list addresses and telephone numbers, including home and office telephone numbers. Provide names, addresses, and telephone numbers of individuals assigned as standbys in the absence of individuals assigned to Project.

1. Post copies of list in Project meeting room, in temporary field office, and by each temporary telephone. Keep list current at all times.

1.6 ADMINISTRATIVE AND SUPERVISORY PERSONNEL

- A. General: In addition to Project superintendent, provide other administrative and supervisory personnel as required for proper performance of the Work.

1. Include special personnel required for coordination of operations with other contractors.

1.7 PROJECT MEETINGS

- A. General: Schedule and conduct meetings and conferences at Project site, unless otherwise indicated.

1. Attendees: Inform participants and others involved, and individuals whose presence is required, of date and time of each meeting. Notify Owner and Architect of scheduled meeting dates and times.
2. Agenda: Prepare the meeting agenda. Distribute the agenda to all invited attendees.
3. Minutes: Record significant discussions and agreements achieved. Distribute the meeting minutes to everyone concerned, including Owner and Architect, within three days of the meeting.

- B. Preinstallation Conferences: Conduct a preinstallation conference at Project site before each construction activity that requires 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. The Contract Documents.
 - b. Options.
 - c. Related RFIs.
 - d. Related Change Orders.
 - e. Purchases.
 - f. Deliveries.
 - g. Submittals.
 - h. Review of mockups.
 - i. Possible conflicts.
 - j. Compatibility problems.
 - k. Time schedules.

- l. Weather limitations.
 - m. Manufacturer's written recommendations.
 - n. Warranty requirements.
 - o. Compatibility of materials.
 - p. Acceptability of substrates.
 - q. Temporary facilities and controls.
 - r. Space and access limitations.
 - s. Regulations of authorities having jurisdiction.
 - t. Testing and inspecting requirements.
 - u. Installation procedures.
 - v. Coordination with other work.
 - w. Required performance results.
 - x. Protection of adjacent work.
 - y. 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 parties who should have been present.
 - 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.

1.8 REQUESTS FOR INTERPRETATION (RFIs)

- A. Procedure: Immediately on discovery of the need for interpretation of the Contract Documents, and if not possible to request interpretation at Project meeting, prepare and submit an RFI in the form specified.
 - 1. RFIs shall originate with Contractor. RFIs submitted by entities other than Contractor will be returned with no response.
 - 2. Coordinate and submit RFIs in a prompt manner so as to avoid delays in Contractor's work or work of subcontractors.
- B. Content of the RFI: Include a detailed, legible description of item needing interpretation and the following:
 - 1. Project name.
 - 2. Date.
 - 3. Name of Contractor.
 - 4. Name of Architect.
 - 5. RFI number, numbered sequentially.
 - 6. Specification Section number and title and related paragraphs, as appropriate.
 - 7. Drawing number and detail references, as appropriate.
 - 8. Field dimensions and conditions, as appropriate.
 - 9. Contractor's suggested solution(s). If Contractor's solution(s) impact the Contract Time or the Contract Sum, Contractor shall state impact in the RFI.
 - 10. Contractor's signature.

11. Attachments: Include drawings, descriptions, measurements, photos, Product Data, Shop Drawings, and other information necessary to fully describe items needing interpretation.
 - a. Supplementary drawings prepared by Contractor shall include dimensions, thicknesses, structural grid references, and details of affected materials, assemblies, and attachments.
- C. Hard-Copy RFIs: CSI Form 13.2A.
 1. Identify each page of attachments with the RFI number and sequential page number.
- D. Software-Generated RFIs: Software-generated form with substantially the same content as indicated above.
 1. Attachments shall be electronic files in Adobe Acrobat PDF format.
- E. Architect's Action: Architect will review each RFI, determine action required, and return it. Allow seven working days for Architect's response for each RFI. RFIs received after 1:00 p.m. will be considered as received the following working day.
 1. The following RFIs will be returned without action:
 - a. Requests for approval of submittals.
 - b. Requests for approval of substitutions.
 - c. Requests for coordination information already indicated in the Contract Documents.
 - d. Requests for adjustments in the Contract Time or the Contract Sum.
 - e. Requests for interpretation of Architect's actions on submittals.
 - f. Incomplete RFIs or RFIs with numerous errors.
 2. Architect's action may include a request for additional information, in which case Architect's time for response will start again.
 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 Division 01 Section "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.
- F. 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.
- G. RFI Log: Prepare, maintain, and submit a tabular log of RFIs organized by the RFI number. Submit log monthly. 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 dropped and not submitted.

5. RFI description.
6. Date the RFI was submitted.
7. Date Architect's response was received.
8. Identification of related Minor Change in the Work, Construction Change Directive, and Proposal Request, as appropriate.
9. Identification of related Field Order, Work Change Directive, and Proposal Request, as appropriate.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 013100

SECTION 013200 - CONSTRUCTION PROGRESS DOCUMENTATION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. This 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. Field condition reports.
- B. Related Sections include the following:
 - 1. Division 01 Section "Payment Procedures" for submitting the Schedule of Values.
 - 2. Division 01 Section "Submittal Procedures" for submitting schedules and reports.
 - 3. Division 01 Section "Quality Requirements" for submitting a schedule of tests and inspections.

1.3 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 activities are activities on the critical path. They 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. Cost Loading: The allocation of the Schedule of Values for the completion of an activity as scheduled. The sum of costs for all activities must equal the total Contract Sum, unless otherwise approved by Architect.
- C. 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 when activities can be performed and the critical path of Project.
- D. Critical Path: The longest connected chain of interdependent activities through the network schedule that establishes the minimum overall Project duration and contains no float.
- E. Event: The starting or ending point of an activity.

- F. 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.
- G. Fragnet: A partial or fragmentary network that breaks down activities into smaller activities for greater detail.
- H. Major Area: A story of construction, a separate building, or a similar significant construction element.
- I. Milestone: A key or critical point in time for reference or measurement.
- J. Network Diagram: A graphic diagram of a network schedule, showing activities and activity relationships.
- K. Resource Loading: The allocation of manpower and equipment necessary for the completion of an activity as scheduled.

1.4 SUBMITTALS

- A. Preliminary Construction Schedule: Submit five opaque copies.
 - 1. Approval of cost-loaded preliminary construction schedule will not constitute approval of Schedule of Values for cost-loaded activities.
- B. Preliminary Network Diagram: Submit five opaque copies, large enough to show entire network for entire construction period. Show logic ties for activities.
- C. Contractor's Construction Schedule: Submit five opaque copies of initial schedule, large enough to show entire schedule for entire construction period.
- D. Field Condition Reports: Submit five copies at time of discovery of differing conditions.

1.5 QUALITY ASSURANCE

- A. Scheduling Consultant Qualifications: An experienced specialist in CPM scheduling and reporting, with capability of producing CPM reports and diagrams within 24 hours of Architect's request.

1.6 COORDINATION

- A. Coordinate preparation and processing of schedules and reports with performance of construction activities and with scheduling and reporting of separate contractors.

- B. Coordinate Contractor's Construction Schedule with the Schedule of Values, list of subcontracts, payment requests, and other required schedules and reports.
 - 1. Secure time commitments for performing critical elements of the Work from parties involved.
 - 2. Coordinate each construction activity in the network with other activities and schedule them in proper sequence.

PART 2 - PRODUCTS

2.1 CONTRACTOR'S CONSTRUCTION SCHEDULE, GENERAL

- A. Procedures: Comply with procedures contained in AGC's "Construction Planning & Scheduling."
- B. Time Frame: Extend schedule from date established for commencement of the Work to date of Final Completion.
 - 1. Contract completion date shall not be changed by submission of a schedule that shows an early completion date, unless specifically authorized by Change Order.
- C. Activities: Treat each story or separate area as a separate numbered activity for each principal 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 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.
 - a. Dental equipment.
 - b. HVAC equipment
 - c. Electrical switchgear.
 - 3. Submittal Review Time: Include review and resubmittal times indicated in Division 01 Section "Submittal Procedures" in schedule.
 - 4. Startup and Testing Time: Include not less than 30 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.
- D. 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. Work Stages: Indicate important stages of construction for each major portion of the Work, including, but not limited to, the following:
 - a. Subcontract awards.

- b. Submittals.
 - c. Purchases.
 - d. Mockups.
 - e. Fabrication.
 - f. Sample testing.
 - g. Deliveries.
 - h. Installation.
 - i. Tests and inspections.
 - j. Adjusting.
 - k. Curing.
 - l. Startup and placement into final use and operation.
- E. Milestones: Include milestones indicated in the Contract Documents in schedule, including, but not limited to, the Notice to Proceed, Substantial Completion, and Final Completion.
 - F. Contract Modifications: For each proposed contract modification and concurrent with its submission, prepare a time-impact analysis using fragnets to demonstrate the effect of the proposed change on the overall project schedule.
 - G. Computer Software: Prepare schedules using a program that has been developed specifically to manage construction schedules.

2.2 CONTRACTOR'S CONSTRUCTION SCHEDULE (CPM SCHEDULE)

- A. General: Prepare network diagrams using AON (activity-on-node) format.
- B. Preliminary Network Diagram: Submit diagram within 14 days of date established for commencement of the Work. Outline significant construction activities for the first 60 days of construction. Include skeleton diagram for the remainder of the.
- C. CPM Schedule: Prepare Contractor's Construction Schedule using a computerized, 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 30 days after date established for commencement of the Work.
 - a. Failure to include any work item required for performance of this Contract shall not excuse Contractor from completing all work within applicable completion dates, regardless of Architect's approval of the schedule.
 - 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. Include list of nonworking days and holidays incorporated into the schedule.

- D. CPM Schedule Preparation: Prepare a list of all activities required to complete the Work. Using the preliminary 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.
 2. Critical Path Activities: Identify critical path activities, including those for interim completion dates. Scheduled start and completion dates shall 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. Initial Issue of Schedule: Prepare initial network diagram from a list of straight "early start-total float" sort. Identify critical activities. Prepare tabulated reports showing the following:
1. Contractor or subcontractor and the Work or activity.
 2. Description of activity.
 3. Principal 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).
- F. 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.

2.3 REPORTS

- A. Field Condition Reports: Immediately on discovery of a difference between field conditions and the Contract Documents, prepare and submit a detailed report. Submit with a request for interpretation on CSI Form 13.2A. Include a detailed description of the differing conditions, together with recommendations for changing the Contract Documents.

PART 3 - EXECUTION

3.1 CONTRACTOR'S CONSTRUCTION SCHEDULE

- A. Scheduling Consultant: Engage a consultant to provide planning, evaluation, and reporting using CPM scheduling.
 1. In-House Option: Owner may waive the requirement to retain a consultant if Contractor employs skilled personnel with experience in CPM scheduling and reporting techniques. Submit qualifications.
 2. Meetings: Scheduling consultant shall attend all meetings related to Project progress, alleged delays, and time impact.
- B. Contractor's Construction Schedule Updating: At monthly intervals, update schedule to reflect actual construction progress and activities. Issue schedule one week before each regularly scheduled progress meeting.
 1. 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.
 2. As the Work progresses, indicate Actual Completion percentage for each activity.
- C. 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.

END OF SECTION 013200

SECTION 013300 - SUBMITTAL PROCEDURES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. This Section includes administrative and procedural requirements for submitting Shop Drawings, Product Data, Samples, and other submittals.
- B. Related Sections include the following:
 - 1. Division 01 Section "Payment Procedures" for submitting Applications for Payment and the Schedule of Values.
 - 2. Division 01 Section "Project Management and Coordination" for submitting Coordination Drawings.
 - 3. Division 01 Section "Construction Progress Documentation" for submitting schedules and reports, including Contractor's Construction Schedule.
 - 4. Division 01 Section "Quality Requirements" for submitting test and inspection reports and for mockup requirements.
 - 5. Division 01 Section "Closeout Procedures" for submitting warranties.
 - 6. Division 01 Section "Project Record Documents" for submitting Record Drawings, Record Specifications, and Record Product Data.
 - 7. Division 01 Section "Operation and Maintenance Data" for submitting operation and maintenance manuals.
 - 8. Division 01 Section "Demonstration and Training" for submitting videotapes of demonstration of equipment and training of Owner's personnel.
 - 9. Divisions 02 through 49 Sections for specific requirements for submittals in those Sections.

1.3 DEFINITIONS

- A. Action Submittals: Written and graphic information that requires Architect's responsive action.
- B. Informational Submittals: Written information that does not require Architect's responsive action. Submittals may be rejected for not complying with requirements.

1.4 SUBMITTAL PROCEDURES

- A. General: Electronic copies of CAD Drawings of the Contract Drawings may be provided by Architect for Contractor's use in preparing submittals upon request and signature of waiver but

shall not be a substitute for shop drawing submittals and any shop drawings produced using the designers drawings will be rejected and returned to the contractor.

- 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. Coordinate transmittal of different types of submittals for related parts of the Work so processing will not be delayed because of need to review submittals concurrently for coordination.
 - a. Architect reserves the right to withhold action on a submittal requiring coordination with other submittals until related submittals are received.
- C. Processing Time: Allow enough 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 14 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 14 days for review of each resubmittal.
- D. Identification: Place a permanent label or title block on each submittal for identification.
 - 1. Indicate name of firm or entity that prepared each submittal on label or title block.
 - 2. Provide a space approximately 3 by 6 inches on label or beside title block to record Contractor's review and approval markings and action taken by Architect.
 - 3. Include the following information on label for processing and recording action taken:
 - a. Project name.
 - b. Date.
 - c. Name and address of Architect.
 - d. Name and address of Contractor.
 - e. Name and address of subcontractor.
 - f. Name and address of supplier.
 - g. Name of manufacturer.
 - h. Submittal number or other unique identifier, including revision identifier.
 - i. Number and title of appropriate Specification Section.
 - j. Drawing number and detail references, as appropriate.
 - k. Location(s) where product is to be installed, as appropriate.
 - l. Other necessary identification.
- E. Deviations: Highlight, encircle, or otherwise specifically identify deviations from the Contract Documents on submittals.

- F. Additional Copies: Unless additional copies are required for final submittal, and unless Architect observes noncompliance with provisions in the Contract Documents, initial submittal may serve as final submittal.
- G. Transmittal: Package each submittal individually and appropriately for transmittal and handling. Transmit each submittal using a transmittal form. Architect will discard submittals received from sources other than Contractor.
 - 1. Transmittal Form: Provide locations on form for the following information:
 - a. Project name.
 - b. Date.
 - c. Destination (To:).
 - d. Source (From:).
 - e. Names of subcontractor, manufacturer, and supplier.
 - f. Category and type of submittal.
 - g. Submittal purpose and description.
 - h. Specification Section number and title.
 - i. Drawing number and detail references, as appropriate.
 - j. Transmittal number.
 - k. Submittal and transmittal distribution record.
 - l. Remarks.
 - m. Signature of transmitter.
 - 2. On an attached separate sheet, prepared on Contractor's letterhead, record relevant information, requests for data, revisions other than those requested by Architect on previous submittals, and deviations from requirements in the Contract Documents, including minor variations and limitations. Include same label information as related submittal.
- H. Resubmittals: Make resubmittals in same form and number of copies as initial submittal.
 - 1. Note date and content of previous submittal.
 - 2. Note date and content of revision in label or title block and clearly indicate extent of revision.
- I. Distribution: Furnish copies of final submittals to manufacturers, subcontractors, suppliers, fabricators, installers, authorities having jurisdiction, and others as necessary for performance of construction activities. Show distribution on transmittal forms.

1.5 CONTRACTOR'S USE OF ARCHITECT'S PDF FILES

- A. General: **At Contractor's written request, copies of Architect's PDF (NO CADD FILES) files will be provided to Contractor for Contractor's use in connection with Project (per signing of Dewberry agreement).**

PART 2 - PRODUCTS

2.1 ACTION SUBMITTALS

- A. General: Prepare and submit Action Submittals required by individual Specification Sections.
- B. Product Data: Collect information into a single submittal for each element of construction and type of product or equipment.
 - 1. If information must be specially prepared for submittal because standard printed data are not suitable for use, submit as Shop Drawings, not as Product Data.
 - 2. Mark each copy of each submittal to show which products and options are applicable.
 - 3. Include the following information, as applicable:
 - a. Manufacturer's written recommendations.
 - b. Manufacturer's product specifications.
 - c. Manufacturer's installation instructions.
 - d. Standard color charts.
 - e. Manufacturer's catalog cuts.
 - f. Wiring diagrams showing factory-installed wiring.
 - g. Printed performance curves.
 - h. Operational range diagrams.
 - i. Mill reports.
 - j. Standard product operation and maintenance manuals.
 - k. Compliance with specified referenced standards.
 - l. Testing by recognized testing agency.
 - m. Application of testing agency labels and seals.
 - n. Notation of coordination requirements.
 - 4. Submit Product Data before or concurrent with Samples.
 - 5. Number of Copies: Submit sufficient copies of Product Data to allow Architect to retain three copies.
- C. Shop Drawings: Prepare Project-specific information, drawn accurately to scale. Do not base Shop Drawings on reproductions of the Contract Documents or standard printed data.
 - 1. Preparation: Fully illustrate requirements in the Contract Documents. Include the following information, as applicable:
 - a. Dimensions.
 - b. Identification of products.
 - c. Fabrication and installation drawings.
 - d. Roughing-in and setting diagrams.
 - e. Wiring diagrams showing field-installed wiring, including power, signal, and control wiring.
 - f. Shopwork manufacturing instructions.
 - g. Templates and patterns.
 - h. Schedules.
 - i. Design calculations.
 - j. Compliance with specified standards.

- k. Notation of coordination requirements.
 - l. Notation of dimensions established by field measurement.
 - m. Relationship to adjoining construction clearly indicated.
 - n. Seal and signature of professional engineer if specified.
 - o. Wiring Diagrams: Differentiate between manufacturer-installed and field-installed wiring.
 - 2. Sheet Size: Except for templates, patterns, and similar full-size drawings, submit Shop Drawings on sheets at least 8-1/2 by 11 inches but no larger than 30 by 40 inches.
 - 3. Number of Copies: Submit sufficient copies of Shop Drawings to allow Architect to retain three copies.
- D. Samples: Submit Samples for review of kind, color, pattern, and texture for a check of these characteristics with other elements and for a comparison of these characteristics between submittal and actual component as delivered and installed.
- 1. Transmit Samples that contain multiple, related components such as accessories together in one submittal package.
 - 2. Identification: Attach label on unexposed side of Samples that includes the following:
 - a. Generic description of Sample.
 - b. Product name and name of manufacturer.
 - c. Sample source.
 - d. Number and title of appropriate Specification Section.
 - 3. 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.
 - 4. 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 of available choices where color, pattern, texture, or similar characteristics are required to be selected from manufacturer's product line.
 - 5. 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 two sets of Samples.
 - 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.
- E. Contractor's Construction Schedule: Comply with requirements specified in Division 01 Section "Construction Progress Documentation" for Construction Manager's action.
- F. Application for Payment: Comply with requirements specified in Division 01 Section "Payment Procedures."
- G. Schedule of Values: Comply with requirements specified in Division 01 Section "Payment Procedures."
- H. 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, and telephone number of entity performing subcontract or supplying products.
 - 2. Number and title of related Specification Section(s) covered by subcontract.
 - 3. Number of Copies: Submit five copies of subcontractor list, unless otherwise indicated. .

2.2 INFORMATIONAL SUBMITTALS

- A. General: Prepare and submit Informational Submittals required by other Specification Sections.
 - 1. Number of Copies: Submit five copies of each submittal, unless otherwise indicated. Architect will not return copies.
 - 2. Certificates and Certifications: Provide a notarized statement that includes signature of entity responsible for preparing certification. Certificates and certifications shall be signed by an officer or other individual authorized to sign documents on behalf of that entity.
 - 3. Test and Inspection Reports: Comply with requirements specified in Division 01 Section "Quality Requirements."
- B. Coordination Drawings: Comply with requirements specified in Division 01 Section "Project Management and Coordination."
- C. Contractor's Construction Schedule: Comply with requirements specified in Division 01 Section "Construction Progress Documentation."
- D. Qualification Data: Prepare written information that demonstrates capabilities and experience of firm or person. Include lists of completed projects with project names and addresses, names and addresses of architects and owners, and other information specified.

- E. Welding Certificates: Prepare written certification that welding procedures and personnel comply with requirements in the Contract Documents. Submit record of Welding Procedure Specification (WPS) and Procedure Qualification Record (PQR) on AWS forms. Include names of firms and personnel certified.
- F. Installer Certificates: Prepare written statements on manufacturer's letterhead certifying that Installer complies with requirements in the Contract Documents and, where required, is authorized by manufacturer for this specific Project.
- G. Manufacturer Certificates: Prepare written statements on manufacturer's letterhead certifying that manufacturer complies with requirements in the Contract Documents. Include evidence of manufacturing experience where required.
- H. Product Certificates: Prepare written statements on manufacturer's letterhead certifying that product complies with requirements in the Contract Documents.
- I. Material Certificates: Prepare written statements on manufacturer's letterhead certifying that material complies with requirements in the Contract Documents.
- J. Material Test Reports: Prepare reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting test results of material for compliance with requirements in the Contract Documents.
- K. Product Test Reports: Prepare written reports indicating 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.
- L. Research/Evaluation Reports: Prepare written evidence, from a model code organization acceptable to authorities having jurisdiction, that product complies with building code in effect for Project. Include the following information:
 - 1. Name of evaluation organization.
 - 2. Date of evaluation.
 - 3. Time period when report is in effect.
 - 4. Product and manufacturers' names.
 - 5. Description of product.
 - 6. Test procedures and results.
 - 7. Limitations of use.
- M. Schedule of Tests and Inspections: Comply with requirements specified in Division 01 Section "Quality Requirements."
- N. Maintenance Data: Prepare written and graphic instructions and procedures for operation and normal maintenance of products and equipment. Comply with requirements specified in Division 01 Section "Operation and Maintenance Data."
- O. Design Data: Prepare written and graphic information, including, but not limited to, performance and design criteria, list of applicable codes and regulations, and calculations. Include list of assumptions and other performance and design criteria and a summary of loads.

Include load diagrams if applicable. Provide name and version of software, if any, used for calculations. Include page numbers.

- P. Manufacturer's Instructions: Prepare written or published information that documents manufacturer's recommendations, guidelines, and procedures for installing or operating a product or equipment. Include name of product and name, address, and telephone number of manufacturer. Include the following, as applicable:
 - 1. Preparation of substrates.
 - 2. Required substrate tolerances.
 - 3. Sequence of installation or erection.
 - 4. Required installation tolerances.
 - 5. Required adjustments.
 - 6. Recommendations for cleaning and protection.
- Q. Insurance Certificates and Bonds: Prepare written information indicating current status of insurance or bonding coverage. Include name of entity covered by insurance or bond, limits of coverage, amounts of deductibles, if any, and term of the coverage.
- R. Material Safety Data Sheets (MSDSs): Submit information directly to Owner; do not submit to Architect.
 - 1. Architect will not review submittals that include MSDSs and will return the entire submittal for resubmittal.

2.3 DELEGATED DESIGN

- 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.
- B. Delegated-Design Submittal: In addition to Shop Drawings, Product Data, and other required submittals, submit five copies of a statement, 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.

PART 3 - EXECUTION

3.1 CONTRACTOR'S REVIEW

- A. **Review each submittal and check for coordination with other Work of the Contract and for compliance with the Contract Documents. Note corrections and field dimensions. Mark with approval stamp before submitting to Architect.**
- B. Approval Stamp: Stamp each submittal with a uniform, approval stamp. Include Project name and location, submittal number, Specification Section title and number, name of reviewer, date of Contractor's approval, and statement certifying that submittal has been reviewed, checked, and approved for compliance with the Contract Documents.

3.2 ARCHITECT'S ACTION

- A. General: Architect will not review submittals that do not bear Contractor's approval stamp and will return them without action.
- B. Action Submittals: Architect will review each submittal, make marks to indicate corrections or modifications required, and return it. Architect will stamp each submittal with an action stamp and will mark stamp appropriately to indicate action taken.
- C. Informational Submittals: Architect will review each submittal and will not return it, or will return it if it does not comply with requirements. Architect will forward each submittal to appropriate party.
- D. Partial submittals are not acceptable, will be considered nonresponsive, and will be returned without review.
- E. Submittals not required by the Contract Documents may not be reviewed and may be discarded.

END OF SECTION 013300

SECTION 014000 - QUALITY REQUIREMENTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. This Section includes administrative and procedural requirements for quality assurance and quality control.
- B. Testing and inspecting 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. Specific quality-assurance and -control requirements for individual construction activities are specified in the Sections that specify those activities. Requirements in those Sections may also cover production of standard products.
 - 2. Specified tests, inspections, and related actions do not limit Contractor's other quality-assurance and -control procedures that facilitate compliance with the Contract Document requirements.
 - 3. Requirements for Contractor to provide quality-assurance and -control services required by Architect, Owner, or authorities having jurisdiction are not limited by provisions of this Section.
- C. Related Sections include the following:
 - 1. Divisions 02 through 49 Sections for specific test and inspection requirements.

1.3 DEFINITIONS

- A. 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.
- B. 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. Services do not include contract enforcement activities performed by Architect.
- C. Mockups: Full-size, physical assemblies that are constructed on-site. Mockups are used to verify selections made under sample submittals, to demonstrate aesthetic effects and, where indicated, qualities of materials and execution, and to review construction, coordination, testing,

or operation; they are not Samples. Approved mockups establish the standard by which the Work will be judged.

- D. Preconstruction Testing: Tests and inspections that are performed specifically for the Project before products and materials are incorporated into the Work to verify performance or compliance with specified criteria.
- E. Product Testing: Tests and inspections that are performed by an NRTL, an NVLAP, or a testing agency qualified to conduct product testing and acceptable to authorities having jurisdiction, to establish product performance and compliance with industry standards.
- F. Source Quality-Control Testing: Tests and inspections that are performed at the source, i.e., plant, mill, factory, or shop.
- G. Field Quality-Control Testing: Tests and inspections that are performed on-site for installation of the Work and for completed Work.
- H. Testing Agency: An entity engaged to perform specific tests, inspections, or both. Testing laboratory shall mean the same as testing agency.
- I. 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, and similar operations.
 - 1. Using a term such as "carpentry" does not imply that certain construction activities must be performed by accredited or unionized individuals of a corresponding generic name, such as "carpenter." It also does not imply that requirements specified apply exclusively to tradespeople of the corresponding generic name.
- J. Experienced: When used with an entity, "experienced" means having successfully completed a minimum of five previous projects similar in size and scope to this Project; being familiar with special requirements indicated; and having complied with requirements of authorities having jurisdiction.

1.4 SUBMITTALS

- A. Reports: Prepare and submit certified written reports that include the following:
 - 1. Date of issue.
 - 2. Project title and number.
 - 3. Name, address, and telephone number 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 inspecting.

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. Permits, Licenses, and Certificates: For Owner's records, 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.

1.5 QUALITY ASSURANCE

- A. General: Qualifications paragraphs in this Article establish the minimum qualification levels required; individual Specification Sections specify additional requirements.
- B. Installer Qualifications: A firm or individual experienced in installing, erecting, 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.
- C. 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.
- D. 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.
- 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 are similar to those indicated for this Project in material, design, and extent.
- F. Specialists: Certain sections of the Specifications require that specific construction activities shall be performed by entities who are recognized experts in those operations. Specialists shall satisfy qualification requirements indicated and shall be engaged for the activities indicated.
1. Requirement for specialists shall not supersede building codes and regulations governing the Work.
- G. Testing Agency Qualifications: An NRTL, an NVLAP, or an independent agency with the experience and capability to conduct testing and inspecting indicated, as documented according to ASTM E 548; and with additional qualifications specified in individual Sections; and where required by authorities having jurisdiction, that is acceptable to authorities.
1. NRTL: A nationally recognized testing laboratory according to 29 CFR 1910.7.
 2. NVLAP: A testing agency accredited according to NIST's National Voluntary Laboratory Accreditation Program.

- H. **Factory-Authorized Service Representative Qualifications:** An authorized representative of manufacturer who is trained and approved by manufacturer to inspect installation of manufacturer's products that are similar in material, design, and extent to those indicated for this Project.
- I. **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 in location and of size indicated or, if not indicated, as directed by Architect.
 - 2. Notify Architect seven days in advance of dates and times when mockups will be constructed.
 - 3. Demonstrate the proposed range of aesthetic effects and workmanship.
 - 4. Obtain Architect's approval of mockups before starting work, fabrication, or construction.
 - a. Allow seven days for initial review and each re-review of each mockup.
 - 5. Maintain mockups during construction in an undisturbed condition as a standard for judging the completed Work.
 - 6. Demolish and remove mockups when directed, unless otherwise indicated.

1.6 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 inspecting 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. **Tests and inspections not explicitly assigned to Owner are Contractor's responsibility.** 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.
 - 1. Where services are indicated as Contractor's responsibility, engage a qualified testing agency to perform these quality-control services.
 - a. Contractor shall not employ same entity engaged by Owner, unless agreed to in writing by Owner.
 - 2. Notify testing agencies at least 24 hours in advance of time when Work that requires testing or inspecting 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 inspecting requested by Contractor and not required by the Contract Documents are Contractor's responsibility.
- C. 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 Division 01 Section "Submittal Procedures."
- D. 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.
- E. Testing Agency Responsibilities: Cooperate with Architect and Contractor in performance of duties. Provide qualified personnel to perform required tests and inspections.
1. Notify Architect and Contractor promptly of irregularities or deficiencies observed in the Work during performance of its services.
 2. Determine the location from which test samples will be taken and in which in-situ tests are conducted.
 3. Conduct and interpret tests and inspections and state in each report whether tested and inspected work complies with or deviates from requirements.
 4. Submit a certified written report, in duplicate, of each test, inspection, and similar quality-control service through Contractor.
 5. Do not release, revoke, alter, or increase the Contract Document requirements or approve or accept any portion of the Work.
 6. Do not perform any duties of Contractor.
- F. Associated Services: Cooperate with agencies 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 inspecting. Assist agency in obtaining samples.
 4. Facilities for storage and field curing of test samples.
 5. Delivery of samples to testing agencies.
 6. Preliminary design mix proposed for use for material mixes that require control by testing agency.
 7. Security and protection for samples and for testing and inspecting equipment at Project site.
- G. Coordination: Coordinate sequence of activities to accommodate required quality-assurance and -control services with a minimum of delay and to avoid necessity of removing and replacing construction to accommodate testing and inspecting.
1. Schedule times for tests, inspections, obtaining samples, and similar activities.

1.7 SPECIAL TESTS AND INSPECTIONS

- A. Special Tests and Inspections: Owner will engage a qualified special inspector to conduct special tests and inspections required by authorities having jurisdiction as the responsibility of Owner. See State Form CO-6b 2006 VUSBC Special Inspections – State Owned Buildings.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 TEST AND INSPECTION LOG

- A. 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 modifications as they occur. Provide access to test and inspection log for Architect's reference during normal working hours.

3.2 REPAIR AND PROTECTION

- A. General: On completion of testing, inspecting, 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. Restore patched areas and extend restoration into adjoining areas with durable seams that are as invisible as possible.
 - 2. Comply with the Contract Document requirements for Division 01 Section "Cutting and Patching."
- 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 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. This Section includes requirements for temporary utilities, support facilities, and security and protection facilities.
- B. Related Sections include the following:
 - 1. Division 01 Section "Summary" for limitations on utility interruptions and other work restrictions.
 - 2. Division 01 Section "Execution" for progress cleaning requirements.
 - 3. Divisions 02 through 49 Sections for temporary heat, ventilation, and humidity requirements for products in those Sections.

1.3 DEFINITIONS

- A. Permanent Enclosure: As determined by Architect, permanent or temporary roofing is complete, insulated, and weathertight; exterior walls are insulated and weathertight; and all openings are closed with permanent construction or substantial temporary closures.

1.4 USE CHARGES

- A. General: Cost or use charges for temporary facilities shall be included in the Contract Sum. Allow other entities to use temporary services and facilities without cost, including, but not limited to, Architect, testing agencies, and authorities having jurisdiction.
- B. Water Service: Pay water service use charges for water used by all entities for construction operations.
- C. Electric Power Service: Pay electric power service use charges for electricity used by all entities for construction operations.

1.5 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.

1.6 PROJECT CONDITIONS

- A. Temporary Use of Permanent Facilities: Installer of each permanent service shall 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. Lumber and Plywood: Comply with requirements in Division 06 Section "Rough Carpentry."
- B. Gypsum Board: Minimum 1/2 inch thick by 48 inches wide by maximum available lengths; regular-type panels with tapered edges. Comply with ASTM C 36/C 36M.
- C. Insulation: Unfaced mineral-fiber blanket, manufactured from glass, slag wool, or rock wool; with maximum flame-spread and smoke-developed indexes of 25 and 50, respectively.
- D. Paint: Comply with requirements in Division 09 painting Sections.

2.2 TEMPORARY FACILITIES

- A. Field Offices, General: Prefabricated or mobile units with serviceable finishes, temperature controls, and foundations adequate for normal loading.
- B. Common-Use Field Office: Of sufficient size to accommodate needs of construction personnel. Keep office clean and orderly. Furnish and equip offices as follows:
 - 1. Furniture required for Project-site documents including file cabinets, plan tables, plan racks, and bookcases.
 - 2. Conference room of sufficient size to accommodate meetings of 10 individuals. Provide electrical power service and 120-V ac duplex receptacles, with not less than 1 receptacle on each wall. Furnish room with conference table, chairs, and 4-foot- square tack board.
 - 3. Drinking water and private toilet.
 - 4. Heating and cooling equipment necessary to maintain a uniform indoor temperature of 68 to 72 deg F.
 - 5. Lighting fixtures capable of maintaining average illumination of 20 fc at desk height.

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: 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 Units: Listed and labeled for type of fuel being consumed, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.

PART 3 - EXECUTION

3.1 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.
- 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.

3.2 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: Install water service and distribution piping in sizes and pressures adequate for construction.
- C. Sanitary Facilities: Provide temporary toilets and drinking water for use of construction personnel. Comply with authorities having jurisdiction for type, number, location, operation, and maintenance of fixtures and facilities.
- D. Heating: Provide temporary heating 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.
- E. Ventilation and Humidity Control: Provide temporary ventilation required by construction activities for curing or drying of completed installations or for protecting installed construction from adverse effects of high humidity. Select equipment that will not have a harmful effect on completed installations or elements being installed. Coordinate ventilation requirements to produce ambient condition required and minimize energy consumption.
- F. Electric Power Service: Provide electric power service and distribution system of sufficient size, capacity, and power characteristics required for construction operations.
 - 1. Install electric power service overhead, unless otherwise indicated.
 - 2. Connect temporary service to Owner's existing power source, as directed by Owner.

- G. 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.
- H. Telephone Service: Provide temporary telephone service in common-use facilities for use by all construction personnel. Install one telephone line(s) for each field office.
 - 1. At each telephone, post a list of important telephone numbers.
 - a. Police and fire departments.
 - b. Ambulance service.
 - c. Contractor's home office.
 - d. Architect's office.
 - e. Engineers' offices.
 - f. Owner's office.
 - g. Principal subcontractors' field and home offices.
 - 2. Provide superintendent with cellular telephone or portable two-way radio for use when away from field office.

3.3 SUPPORT FACILITIES INSTALLATION

- A. General: Comply with the following:
 - 1. Maintain support facilities until near Substantial Completion. 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: Provide temporary parking areas for construction personnel.
- D. 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 nor endanger permanent Work or temporary facilities.
 - 2. Remove snow and ice as required to minimize accumulations.
- E. Waste Disposal Facilities: Comply with requirements specified in Division 01 Section "Construction Waste Management and Disposal."
- F. 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.

- G. Temporary Stairs: Until permanent stairs are available, provide temporary stairs where ladders are not adequate.
- H. Temporary Use of Permanent Stairs: Cover finished, permanent stairs with protective covering of plywood or similar material so finishes will be undamaged at time of acceptance.

3.4 SECURITY AND PROTECTION FACILITIES INSTALLATION

- A. Environmental Protection: Provide protection, operate temporary facilities, and conduct construction in ways and by methods that 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 Division 01 Section "Summary."
- B. Temporary Erosion and Sedimentation Control: Provide measures to prevent soil erosion and discharge of soil-bearing water runoff and airborne dust to adjacent properties and walkways, according to requirements of authorities having jurisdiction.
 - 1. Inspect, repair, and maintain erosion- and sedimentation-control measures during construction until permanent vegetation has been established.
- C. Stormwater Control: Comply with authorities having jurisdiction. Provide barriers in and around excavations and subgrade construction to prevent flooding by runoff of stormwater from heavy rains.
- D. Pest Control: Engage pest-control service to recommend practices to minimize attraction and harboring of rodents, roaches, and other pests and to perform extermination and control procedures at regular intervals so Project will be free of pests and their residues at Substantial Completion. Obtain extended warranty for Owner. Perform control operations lawfully, using environmentally safe materials.
- E. Barricades, Warning Signs, and Lights: Comply with requirements of authorities having jurisdiction for erecting structurally adequate barricades, including warning signs and lighting.
- F. 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 not complete, insulate temporary enclosures.
- 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.
 - 1. Prohibit smoking in hazardous fire-exposure areas.
 - 2. Supervise welding operations, combustion-type temporary heating units, and similar sources of fire ignition according to 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.

3.5 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. Remove temporary paving not intended for or acceptable for integration into permanent paving. Where area is intended for landscape development, remove soil and aggregate fill that do not comply with requirements for fill or subsoil. Remove materials contaminated with road oil, asphalt and other petrochemical compounds, and other substances that might impair growth of plant materials or lawns. Repair or replace street paving, curbs, and sidewalks at temporary entrances, as required by authorities having jurisdiction.
 3. At Substantial Completion, clean and renovate permanent facilities used during construction period. Comply with final cleaning requirements specified in Division 01 Section "Closeout Procedures."

END OF SECTION 015000

SECTION 016000 - PRODUCT REQUIREMENTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. This Section includes administrative and procedural requirements for selection of products for use in Project; product delivery, storage, and handling; manufacturers' standard warranties on products; special warranties; product substitutions; and comparable products.
- B. Related Sections include the following:
 - 1. Division 01 Section "References" for applicable industry standards for products specified.
 - 2. Division 01 Section "Closeout Procedures" for submitting warranties for Contract closeout.
 - 3. Divisions 02 through 49 Sections for specific requirements for warranties on products and installations specified to be warranted.

1.3 DEFINITIONS

- A. Products: Items purchased for incorporating into the Work, whether purchased for Project or taken from previously purchased stock. The term "product" includes the terms "material," "equipment," "system," and terms of similar intent.
 - 1. Named Products: Items identified by manufacturer's product name, including make or model number or other designation shown or listed in manufacturer's published product literature, which is current as of date of the Contract Documents.
 - 2. New Products: Items that have not previously been incorporated into another project or facility, except that products consisting of recycled-content materials are allowed, unless explicitly stated otherwise. Products salvaged or recycled from other projects are not considered new products.
 - 3. Comparable Product: Product that is demonstrated and approved through submittal process, or where indicated as a product substitution, to have the indicated qualities related to type, function, dimension, in-service performance, physical properties, appearance, and other characteristics that equal or exceed those of specified product.
- B. Substitutions: Changes in products, materials, equipment, and methods of construction from those required by the Contract Documents and proposed by Contractor.
- C. Basis-of-Design Product Specification: Where a specific manufacturer's product is named and accompanied by the words "basis of design," including make or model number or other designation, to establish the significant qualities related to type, function, dimension, in-service

performance, physical properties, appearance, and other characteristics for purposes of evaluating comparable products of other named manufacturers.

1.4 SUBMITTALS

A. Substitution Requests: Submit three copies of each request for consideration. Identify product or fabrication or installation method to be replaced. Include Specification Section number and title and Drawing numbers and titles.

1. Substitution Request Form: Use CSI Form 13.1A.
2. Documentation: Show compliance with requirements for substitutions and the following, as applicable:
 - a. Statement indicating why specified material or product cannot be provided.
 - b. Coordination information, including a list of changes or modifications needed to other parts of the Work and to construction performed by Owner and separate contractors, that will be necessary to accommodate proposed substitution.
 - c. Detailed comparison of significant qualities of proposed substitution with those of the Work specified. Significant qualities may include attributes such as performance, weight, size, durability, visual effect, and specific features and requirements indicated.
 - d. Product Data, including drawings and descriptions of products and fabrication and installation procedures.
 - e. Samples, where applicable or requested.
 - f. List of similar installations for completed projects with project names and addresses and names and addresses of architects and owners.
 - g. Material test reports from a qualified testing agency indicating and interpreting test results for compliance with requirements indicated.
 - h. Research/evaluation reports evidencing compliance with building code in effect for Project, from a model code organization acceptable to authorities having jurisdiction.
 - i. Detailed comparison of Contractor's Construction Schedule using proposed substitution with products specified for the Work, including effect on the overall Contract Time. If specified product or method of construction cannot be provided within the Contract Time, include letter from manufacturer, on manufacturer's letterhead, stating lack of availability or delays in delivery.
 - j. Cost information, including a proposal of change, if any, in the Contract Sum.
 - k. Contractor's certification that proposed substitution complies with requirements in the Contract Documents and is appropriate for applications indicated.
 - l. Contractor's waiver of rights to additional payment or time that may subsequently become necessary because of failure of proposed substitution to produce indicated results.
3. Architect's Action: If necessary, Architect will request additional information or documentation for evaluation within 7 days of receipt of a request for substitution. Architect will notify Contractor of acceptance or rejection of proposed substitution within 14 days of receipt of request, or 7 days of receipt of additional information or documentation, whichever is later.
 - a. Form of Acceptance: Change Order.

- b. Use product specified if Architect cannot make a decision on use of a proposed substitution within time allocated.
- B. Comparable Product Requests: Submit three copies of each request for consideration. Identify product or fabrication or installation method to be replaced. Include Specification Section number and title and Drawing numbers and titles.
 - 1. Architect's Action: If necessary, Architect will request additional information or documentation for evaluation within one week of receipt of a comparable product request. Architect will notify Contractor of approval or rejection of proposed comparable product request within 14 days of receipt of request, or 7 days of receipt of additional information or documentation, whichever is later.
 - a. Form of Approval: As specified in Division 01 Section "Submittal Procedures."
 - b. Use product specified if Architect cannot make a decision on use of a comparable product request within time allocated.
- C. Basis-of-Design Product Specification Submittal: Comply with requirements in Division 01 Section "Submittal Procedures." Show compliance with requirements.

1.5 QUALITY ASSURANCE

- A. Compatibility of Options: If Contractor is given option of selecting between two or more products for use on Project, product selected shall be compatible with products previously selected, even if previously selected products were also options.
 - 1. Each contractor is responsible for providing products and construction methods compatible with products and construction methods of other contractors.
 - 2. If a dispute arises between contractors over concurrently selectable but incompatible products, Architect will determine which products shall be used.

1.6 PRODUCT DELIVERY, STORAGE, AND HANDLING

- A. Deliver, store, and handle products using means and methods that will prevent damage, deterioration, and loss, including theft. Comply with manufacturer's written instructions.
- B. Delivery and Handling:
 - 1. Schedule delivery to minimize long-term storage at Project site and to prevent overcrowding of construction spaces.
 - 2. Coordinate delivery with installation time to ensure minimum holding time for items that are flammable, hazardous, easily damaged, or sensitive to deterioration, theft, and other losses.
 - 3. Deliver products to Project site in an undamaged condition in manufacturer's original sealed container or other packaging system, complete with labels and instructions for handling, storing, unpacking, protecting, and installing.
 - 4. Inspect products on delivery to ensure compliance with the Contract Documents and to ensure that products are undamaged and properly protected.

C. Storage:

1. Store products to allow for inspection and measurement of quantity or counting of units.
2. Store materials in a manner that will not endanger Project structure.
3. Store products that are subject to damage by the elements, under cover in a weathertight enclosure above ground, with ventilation adequate to prevent condensation.
4. Store cementitious products and materials on elevated platforms.
5. Store foam plastic from exposure to sunlight, except to extent necessary for period of installation and concealment.
6. Comply with product manufacturer's written instructions for temperature, humidity, ventilation, and weather-protection requirements for storage.
7. Protect stored products from damage and liquids from freezing.
8. Provide a secure location and enclosure at Project site for storage of materials and equipment by Owner's construction forces. Coordinate location with Owner.

1.7 PRODUCT WARRANTIES

A. Warranties specified in other Sections shall be in addition to, and run concurrent with, other warranties required by the Contract Documents. Manufacturer's disclaimers and limitations on product warranties do not relieve Contractor of obligations under requirements of the Contract Documents.

1. Manufacturer's Warranty: Preprinted written warranty published by individual manufacturer for a particular product and specifically endorsed by manufacturer to Owner.
2. Special Warranty: Written warranty required by or incorporated into the Contract Documents, either to extend time limit provided by manufacturer's warranty or to provide more rights for Owner.

B. Special Warranties: Prepare a written document that contains appropriate terms and identification, ready for execution. Submit a draft for approval before final execution.

1. Manufacturer's Standard Form: Modified to include Project-specific information and properly executed.
2. Specified Form: When specified forms are included with the Specifications, prepare a written document using appropriate form properly executed.
3. Refer to Divisions 02 through 49 Sections for specific content requirements and particular requirements for submitting special warranties.

C. Submittal Time: Comply with requirements in Division 01 Section "Closeout Procedures."

PART 2 - PRODUCTS

2.1 PRODUCT SELECTION PROCEDURES

A. General Product Requirements: Provide products that comply with the Contract Documents, that are undamaged and, unless otherwise indicated, that are new at time of installation.

1. Provide products complete with accessories, trim, finish, fasteners, and other items needed for a complete installation and indicated use and effect.
2. Standard Products: If available, and unless custom products or nonstandard options are specified, provide standard products of types that have been produced and used successfully in similar situations on other projects.
3. Owner reserves the right to limit selection to products with warranties not in conflict with requirements of the Contract Documents.
4. Where products are accompanied by the term "as selected," Architect will make selection.
5. Where products are accompanied by the term "match sample," sample to be matched is Architect's.
6. Descriptive, performance, and reference standard requirements in the Specifications establish "salient characteristics" of products.
7. Or Equal: Where products are specified by name and accompanied by the term "or equal" or "or approved equal" or "or approved," comply with provisions in Part 2 "Comparable Products" Article to obtain approval for use of an unnamed product.

B. Product Selection Procedures:

1. Product: Where Specifications name a single product and manufacturer, provide the named product that complies with requirements.
2. Manufacturer/Source: Where Specifications name a single manufacturer or source, provide a product by the named manufacturer or source that complies with requirements.
3. Products: Where Specifications include a list of names of both products and manufacturers, provide one of the products listed that complies with requirements.
4. Manufacturers: Where Specifications include a list of manufacturers' names, provide a product by one of the manufacturers listed that complies with requirements.
5. Available Products: Where Specifications include a list of names of both products and manufacturers, provide one of the products listed, or an unnamed product, that complies with requirements. Comply with provisions in Part 2 "Comparable Products" Article for consideration of an unnamed product.
6. Available Manufacturers: Where Specifications include a list of manufacturers, provide a product by one of the manufacturers listed, or an unnamed manufacturer, that complies with requirements. Comply with provisions in Part 2 "Comparable Products" Article for consideration of an unnamed product.
7. Product Options: Where Specifications indicate that sizes, profiles, and dimensional requirements on Drawings are based on a specific product or system, provide the specified product or system. Comply with provisions in Part 2 "Product Substitutions" Article for consideration of an unnamed product or system.
8. Basis-of-Design Product: Where Specifications name a product and include a list of manufacturers, provide the specified product or a comparable product by one of the other named manufacturers. Drawings and Specifications indicate sizes, profiles, dimensions, and other characteristics that are based on the product named. Comply with provisions in Part 2 "Comparable Products" Article for consideration of an unnamed product by the other named manufacturers.
9. Visual Matching Specification: Where Specifications require matching an established Sample, select a product that complies with requirements and matches Architect's sample. Architect's decision will be final on whether a proposed product matches.

- a. If no product available within specified category matches and complies with other specified requirements, comply with provisions in Part 2 "Product Substitutions" Article for proposal of product.
- 10. Visual Selection Specification: Where Specifications include the phrase "as selected from manufacturer's colors, patterns, textures" or a similar phrase, select a product that complies with other specified requirements.
 - a. Standard Range: Where Specifications include the phrase "standard range of colors, patterns, textures" or similar phrase, Architect will select color, pattern, density, or texture from manufacturer's product line that does not include premium items.
 - b. Full Range: Where Specifications include the phrase "full range of colors, patterns, textures" or similar phrase, Architect will select color, pattern, density, or texture from manufacturer's product line that includes both standard and premium items.

2.2 PRODUCT SUBSTITUTIONS

- A. Timing: Architect will consider requests for substitution if received within 60 days after commencement of the Work. Requests received after that time may be considered or rejected at discretion of Architect.
- B. 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.

2.3 COMPARABLE PRODUCTS

- A. Conditions: Architect will consider Contractor's request for comparable product 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. Evidence that the proposed product does not require extensive revisions to the Contract Documents, that it is consistent with the Contract Documents and will produce the indicated results, and that it is compatible with other portions of the Work.
 2. Detailed comparison of significant qualities of proposed product with those named in the Specifications. Significant qualities include attributes such as performance, weight, size, durability, visual effect, and specific features and requirements indicated.
 3. Evidence that proposed product provides specified warranty.
 4. List of similar installations for completed projects with project names and addresses and names and addresses of architects and owners, if requested.
 5. Samples, if requested.

PART 3 - EXECUTION (Not Used)

END OF SECTION 016000

SECTION 017300 - EXECUTION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 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 and surveying.
 - 3. Installation of the Work.
 - 4. Cutting and patching.
 - 5. Coordination of Owner-installed products.
 - 6. Progress cleaning.
 - 7. Starting and adjusting.
 - 8. Protection of installed construction.
 - 9. Correction of the Work.
- B. Related Requirements:
 - 1. Division 01 Section "Summary" for limits on use of Project site.
 - 2. Division 01 Section "Submittal Procedures" for submitting surveys.
 - 3. Division 07 Section "Penetration Firestopping" for patching penetrations in fire-rated construction.

1.3 DEFINITIONS

- A. Cutting: Removal of in-place construction necessary to permit installation or performance of other work.
- B. Patching: Fitting and repair work required to restore construction to original conditions after installation of other work.

1.4 QUALITY ASSURANCE

- A. Land Surveyor Qualifications: A professional land surveyor who is legally qualified to practice in jurisdiction where Project is located and who is experienced in providing land-surveying services of the kind indicated.

- 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, 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.
 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.
 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.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. General: Comply with requirements specified in other Sections.
- 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.

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, and other construction affecting the Work.
1. Before construction, verify the location and invert elevation at points of connection of sanitary sewer, storm sewer, 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. 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.
- B. Space Requirements: Verify space requirements and dimensions of items shown diagrammatically on Drawings.
- C. Review of Contract Documents and Field Conditions: Immediately on discovery of the need for clarification of the Contract Documents caused by differing field conditions outside the control of Contractor, submit a request for information to Architect according to requirements in Division 01 Section "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. If discrepancies are discovered, notify Architect promptly.
- B. General: Engage a land surveyor to lay out the Work using 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.
- 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 FIELD ENGINEERING

- A. Reference Points: Locate existing permanent benchmarks, control points, and similar reference points before beginning the Work. Preserve and protect permanent benchmarks and control points during construction operations.
 - 1. Do not change or relocate existing benchmarks or control points without prior written approval of Architect. Report lost or destroyed permanent benchmarks or control points promptly. Report the need to relocate permanent benchmarks or control points to Architect before proceeding.
 - 2. Replace lost or destroyed permanent benchmarks and control points promptly. Base replacements on the original survey control points.
- B. Benchmarks: Establish and maintain a minimum of two permanent benchmarks on Project site, referenced to data established by survey control points. Comply with authorities having jurisdiction for type and size of benchmark.
 - 1. Record benchmark locations, with horizontal and vertical data, on Project Record Documents.
 - 2. Where the actual location or elevation of layout points cannot be marked, provide temporary reference points sufficient to locate the Work.
 - 3. Remove temporary reference points when no longer needed. Restore marked construction to its original condition.

3.5 INSTALLATION

- A. General: 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.
- 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 the best possible results. 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.
- 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: Do not use tools or equipment that produce harmful 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 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.
 - 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. Fit exposed connections together to form hairline joints.
- J. Hazardous Materials: Use products, cleaners, and installation materials that are not considered hazardous.

3.6 CUTTING AND PATCHING

- A. Cutting and Patching, 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. Temporary Support: Provide temporary support of work to be cut.
- C. 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.
- D. 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 and Masonry: Cut using a cutting machine, such as an abrasive saw or a diamond-core drill.
 4. Excavating and Backfilling: Comply with requirements in applicable Division 31 Sections where required by cutting and patching operations.
 5. Proceed with patching after construction operations requiring cutting are complete.
- E. 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. 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 minimize 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.
- F. Cleaning: Clean areas and spaces where cutting and patching are performed. Remove paint, mortar, oils, putty, and similar materials from adjacent finished surfaces.

3.7 OWNER-INSTALLED PRODUCTS

- A. Site Access: Provide access to Project site for Owner's construction personnel.
- B. Coordination: Coordinate construction and operations of the Work with work performed by Owner's construction personnel.
1. Construction Schedule: Inform Owner of Contractor's preferred construction schedule for Owner's portion of the Work. Adjust construction schedule based on a mutually agreeable timetable. Notify Owner if changes to schedule are required due to differences in actual construction progress.
 2. Preinstallation Conferences: Include Owner's construction personnel at preinstallation conferences covering portions of the Work that are to receive Owner's work. Attend preinstallation conferences conducted by Owner's construction personnel if portions of the Work depend on Owner's construction.

3.8 PROGRESS CLEANING

- A. General: 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, according to 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 according to 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 in Finished Areas: 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 Division 01 Section "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 assure that no part of the construction, completed or in progress, is subject to harmful, dangerous, damaging, or otherwise deleterious exposure during the construction period.

3.9 STARTING AND ADJUSTING

- A. Coordinate startup and adjusting of equipment and operating components with requirements in Division 01 Section "General Commissioning Requirements."
- B. Start equipment and operating components to confirm proper operation. Remove malfunctioning units, replace with new units, and retest.
- C. Adjust equipment for proper operation. Adjust operating components for proper operation without binding.
- D. Test each piece of equipment to verify proper operation. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.
- E. Manufacturer's Field Service: Comply with qualification requirements in Division 01 Section "Quality Requirements."

3.10 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. Comply with manufacturer's written instructions for temperature and relative humidity.

END OF SECTION 017300

SECTION 017700 - CLOSEOUT PROCEDURES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. This Section includes administrative and procedural requirements for contract closeout, including, but not limited to, the following:
 - 1. Inspection procedures.
 - 2. Warranties.
 - 3. Final cleaning.
- B. Related Sections include the following:
 - 1. Division 01 Section "Payment Procedures" for requirements for Applications for Payment for Substantial and Final Completion.
 - 2. Division 01 Section "Execution" for progress cleaning of Project site.
 - 3. Division 01 Section "Project Record Documents" for submitting Record Drawings and Record Specifications.
 - 4. Division 01 Section "Operation and Maintenance Data" for operation and maintenance manual requirements.
 - 5. Division 01 Section "Demonstration and Training" for requirements for instructing Owner's personnel.
 - 6. Divisions 02 through 49 Sections for specific closeout and special cleaning requirements for the Work in those Sections.

1.3 SUBSTANTIAL COMPLETION

- A. Preliminary Procedures: Before requesting inspection for determining date of Substantial Completion, complete the following. List items below that are incomplete in request.
 - 1. Submit specific warranties, workmanship bonds, maintenance service agreements, final certifications, and similar documents.
 - 2. Obtain and submit releases permitting Owner unrestricted use of the Work and access to services and utilities. Include occupancy permits, operating certificates, and similar releases.
 - 3. Prepare and submit Project Record Documents, operation and maintenance manuals, and similar final record information.
 - 4. Deliver tools, spare parts, extra materials, and similar items to location designated by Owner. Label with manufacturer's name and model number where applicable.
 - 5. Make final changeover of permanent locks and deliver keys to Owner.

6. Complete startup testing of systems.
7. Submit test/adjust/balance records.
8. Terminate and remove temporary facilities from Project site, along with mockups, construction tools, and similar elements.
9. Submit changeover information related to Owner's occupancy, use, operation, and maintenance.
10. Complete final cleaning requirements, including touchup painting.
11. Touch up and otherwise repair and restore marred exposed finishes to eliminate visual defects.

B. Inspection: Submit a written request for inspection for Substantial Completion. On receipt of request, 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. Reinspection: Request reinspection when the Work identified in previous inspections as incomplete is completed or corrected.
2. Results of completed inspection will form the basis of requirements for Final Completion.

1.4 FINAL COMPLETION

A. Preliminary Procedures: Before requesting final inspection for determining date of Final Completion, complete the following:

1. Submit a final Application for Payment according to Division 01 Section "Payment Procedures."
2. Submit pest-control final inspection report and warranty.
3. Instruct Owner's personnel in operation, adjustment, and maintenance of products, equipment, and systems.

B. Inspection: Submit a written request for final inspection for acceptance. 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. Reinspection: Request reinspection when the Work identified in previous inspections as incomplete is completed or corrected.

1.5 WARRANTIES GENERAL

A. Submittal Time: Submit written warranties on request of Architect for designated portions of the work. All warranty periods shall commence from the time of substantial completion is designated by the Architect and Owner.

B. Organize warranty documents into an orderly sequence based on the table of contents of the Project Manual.

1. Bind warranties and bonds in heavy-duty, 3-ring, vinyl-covered, loose-leaf binders, thickness as necessary to accommodate contents, and sized to receive 8-1/2-by-11-inch paper.
2. Provide heavy paper dividers with plastic-covered tabs for each separate warranty. Mark tab to identify the product or installation. Provide a typed description of the product or installation, including the name of the product and the name, address, and telephone number of Installer.
3. Identify each binder on the front and spine with the typed or printed title "WARRANTIES," Project name, and name of Contractor.

C. Provide additional copies of each warranty to include in operation and maintenance manuals.

1.6 ROOFING WARRANTY

A. Roofing Guarantee (General): Unless otherwise noted, provide the following for all new roofing systems:

1. Provide the following roofing contractors guarantee on the General Contractor Guarantee:

The roofing contractor shall guarantee its materials and workmanship associated with the roofing, flashings, and sheet metal work incidental to the work required under the roofing subcontract, against defect due to faulty materials or workmanship for a period of two (2) years from the date of substantial completion. It is understood and agreed by all parties hereto that the responsibility of the roofing contractor under this guarantee form or any contract document shall be limited to the limited guarantee herein expressed by said roofing contractor.

2. Provide the following Owners Agreement on the General Contractor Guarantee:

The undersigned named Owner agrees, from the date of acceptance of the project, to maintain the roof in accordance with the manufacturers written requirements and agrees to avoid damage to the roof surface by any parties under his control working or walking on the roof. The Owner recognizes his responsibility to inspect the roof semi-annually.

3. The General Contractor shall furnish as a minimum, a manufacturers standard 10-year warranty / guarantee in which he agrees to maintain the entire roof system(s) in a completely watertight condition at no cost to the Owner for two (2) years from date of final acceptance; except the water tightness guarantee shall not be enforced when the Contractor can prove water damage was caused by the Owner.
4. Authorized agents of the General Contractor, Roofing Contractor, and Owner shall execute the guarantee form.

PART 2 - PRODUCTS

2.1 MATERIALS

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

PART 3 - EXECUTION

3.1 FINAL CLEANING

- A. General: Provide final cleaning. Conduct cleaning and waste-removal operations to comply with local laws and ordinances and Federal and local environmental and antipollution regulations.
- B. Cleaning: Employ experienced workers or professional cleaners for final cleaning. Clean each surface or unit to condition expected in an average commercial building cleaning and maintenance program. Comply with manufacturer's written instructions.
 - 1. Complete the following cleaning operations before requesting inspection for certification of Substantial Completion for entire Project or for a portion of Project:
 - a. Clean Project site, yard, and grounds, in areas disturbed by construction activities, including landscape development areas, of rubbish, waste material, litter, and other foreign substances.
 - b. Sweep paved areas broom clean. Remove petrochemical spills, stains, and other foreign deposits.
 - c. Rake grounds that are neither planted nor paved to a smooth, even-textured surface.
 - d. Remove tools, construction equipment, machinery, and surplus material from Project site.
 - e. Remove snow and ice to provide safe access to building.
 - f. 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.
 - g. Remove debris and surface dust from limited access spaces, including roofs, plenums, shafts, trenches, manholes, and similar spaces.
 - h. Sweep concrete floors broom clean in unoccupied spaces.
 - i. Vacuum carpet and similar soft surfaces, removing debris and excess nap; shampoo if visible soil or stains remain.
 - j. Clean transparent materials, including mirrors and glass in doors and windows. Remove glazing compounds and other noticeable, vision-obscuring materials. Replace chipped or broken glass and other damaged transparent materials. Polish mirrors and glass, taking care not to scratch surfaces.
 - k. Remove labels that are not permanent.

- l. Touch up and otherwise repair and restore marred, exposed finishes and surfaces. Replace finishes and surfaces that cannot be satisfactorily repaired or restored or that already show evidence of repair or restoration.
 - 1) Do not paint over "UL" and similar labels, including mechanical and electrical nameplates.
 - m. Wipe surfaces of mechanical and electrical equipment, elevator equipment, and similar equipment. Remove excess lubrication, paint and mortar droppings, and other foreign substances.
 - n. Replace parts subject to unusual operating conditions.
 - o. Clean plumbing fixtures to a sanitary condition, free of stains, including stains resulting from water exposure.
 - p. Replace disposable air filters and clean permanent air filters. Clean exposed surfaces of diffusers, registers, and grills.
 - q. Clean ducts, blowers, and coils if units were operated without filters during construction.
 - r. Clean light fixtures, lamps, globes, and reflectors to function with full efficiency. Replace burned-out bulbs, and those noticeably dimmed by hours of use, and defective and noisy starters in fluorescent and mercury vapor fixtures to comply with requirements for new fixtures.
 - s. Leave Project clean and ready for occupancy.
- C. Pest Control: Engage an experienced, licensed exterminator to make a final inspection and rid Project of rodents, insects, and other pests. Prepare a report.
- D. Comply with safety standards for cleaning. Do not burn waste materials. Do not bury debris or excess materials on Owner's property. Do not discharge volatile, harmful, or dangerous materials into drainage systems. Remove waste materials from Project site and dispose of lawfully.

END OF SECTION 017700

SECTION 017823 - OPERATION AND MAINTENANCE DATA

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. This Section includes administrative and procedural requirements for preparing operation and maintenance manuals, including the following:
 - 1. Operation manuals for systems, subsystems, and equipment.
 - 2. Maintenance manuals for the care and maintenance of products, materials, finishes and systems and equipment.
- B. Related Sections include the following:
 - 1. Division 01 Section "Submittal Procedures" for submitting copies of submittals for operation and maintenance manuals.
 - 2. Division 01 Section "Closeout Procedures" for submitting operation and maintenance manuals.
 - 3. Division 01 Section "Project Record Documents" for preparing Record Drawings for operation and maintenance manuals.
 - 4. Divisions 02 through 49 Sections for specific operation and maintenance manual requirements for the Work in those Sections.

1.3 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.

1.4 SUBMITTALS

- A. Final Submittal: Submit one copy of each manual in final form at least 14 days before final inspection. Architect will return copy with comments within 14 days after final inspection.
 - 1. Correct or modify each manual to comply with Architect's comments. Submit 3 copies of each corrected manual within 14 days of receipt of Architect's comments.

1.5 COORDINATION

- A. Where operation and maintenance documentation includes information on installations by more than one factory-authorized service representative, assemble and coordinate information furnished by representatives and prepare manuals.

PART 2 - PRODUCTS

2.1 MANUALS, GENERAL

- A. Organization: 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 shall contain the following materials, in the order listed:
 - 1. Title page.
 - 2. Table of contents.
 - 3. Manual contents.
- B. Title Page: Enclose title page in transparent plastic sleeve. 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, address, and telephone number of Contractor.
 - 6. Name and address of Architect.
 - 7. 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.
 - 1. Binders: Heavy-duty, 3-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. Indicate volume number for multiple-volume sets.
2. Dividers: Heavy-paper dividers with plastic-covered tabs for each section. 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 diskettes for computerized electronic equipment.
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.

2.2 OPERATION MANUALS

- A. 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.
 2. Performance and design criteria if Contractor is 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.
- B. Descriptions: Include the following:
 1. Product name and model number.
 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.

- C. 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.
- D. Systems and Equipment Controls: Describe the sequence of operation, and diagram controls as installed.
- E. Piped Systems: Diagram piping as installed, and identify color-coding where required for identification.

2.3 PRODUCT MAINTENANCE MANUAL

- A. 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.
- B. 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.
- C. 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.
- D. 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.
- E. Repair Materials and Sources: Include lists of materials and local sources of materials and related services.

- F. 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.

2.4 SYSTEMS AND EQUIPMENT MAINTENANCE MANUAL

- A. 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 warranty and bond information, as described below.
- B. 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.
- C. Manufacturers' Maintenance Documentation: Manufacturers' maintenance documentation including the following information for each component part or piece of equipment:
 - 1. Standard printed maintenance instructions and bulletins.
 - 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.
- D. 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 videotape, if available.
- E. 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.
- F. 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.

- G. Maintenance Service Contracts: Include copies of maintenance agreements with name and telephone number of service agent.
- H. 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 3 - EXECUTION

3.1 MANUAL PREPARATION

- 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. Operation and Maintenance Manuals: Assemble a complete set of operation and maintenance data indicating operation and maintenance of each system, subsystem, and piece of equipment not part of a system.
 - 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.
- C. Manufacturers' Data: Where manuals contain manufacturers' standard printed data, 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.
 - 1. 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.
- D. 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 operation and maintenance manuals.
 - 2. Comply with requirements of newly prepared Record Drawings in Division 01 Section "Project Record Documents."
- E. Comply with Division 01 Section "Closeout Procedures" for schedule for submitting operation and maintenance documentation.

END OF SECTION 017823

SECTION 017839 - PROJECT RECORD DOCUMENTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. This Section includes administrative and procedural requirements for Project Record Documents, including the following:
 - 1. Record Drawings.
 - 2. Record Specifications.
- B. Related Sections include the following:
 - 1. Division 01 Section "Closeout Procedures" for general closeout procedures.
 - 2. Division 01 Section "Operation and Maintenance Data" for operation and maintenance manual requirements.
 - 3. Divisions 02 through 49 Sections for specific requirements for Project Record Documents of the Work in those Sections.

1.3 SUBMITTALS

- A. Record Drawings: Comply with the following:
 - 1. Number of Copies: Submit one set of marked-up Record Prints.
- B. Record Specifications: Submit one of Project's Specifications, including addenda and contract modifications.

PART 2 - PRODUCTS

2.1 RECORD DRAWINGS

- A. Record Prints: Maintain one set of blue- or black-line white prints of the Contract Drawings in the Job Superintendents trailer (not to be removed from the trailer).
 - 1. Preparation: Mark Record Prints to show the actual installation where installation varies from that shown originally. Require individual or entity who obtained record data, whether individual or entity is Installer, subcontractor, or similar entity, to prepare the marked-up Record Prints.

- a. Give particular attention to information on concealed elements that would be difficult to identify or measure and record later.
 - b. Accurately record information in an understandable drawing technique.
 - c. Record data as soon as possible after obtaining it. Record and check the markup before enclosing concealed installations.
 - d. Architect, Owner, and Contractor shall review as-built drawings at job progress meetings to determine that they are up to date. Issuance of the agreed Contractor's monthly progress payment shall not be executed until as-built drawings are updated monthly.
2. Content: Types of items requiring marking include, but are not limited to, the following:
- a. Dimensional changes to Drawings.
 - b. Revisions to details shown on Drawings.
 - c. Depths of foundations below first floor.
 - d. Locations and depths of underground utilities.
 - e. Revisions to routing of piping and conduits.
 - f. Revisions to electrical circuitry.
 - g. Actual equipment locations.
 - h. Duct size and routing.
 - i. Locations of concealed internal utilities.
 - j. Changes made by Change Order.
 - k. Changes made following Architect's written orders.
 - l. Changes made by RFI.
 - m. Details not on the original Contract Drawings.
 - n. Field records for variable and concealed conditions.
3. Mark the Contract Drawings completely and accurately.
4. Mark record sets with erasable, red-colored pencil. Use other colors to distinguish between changes for different categories of the Work at same location.
5. Mark important additional information that was either shown schematically or omitted from original Drawings.
6. Note Construction Change Directive numbers, additive bid item numbers, Change Order numbers, and similar identification, where applicable.
- B. Format: Identify and date each Record Drawing; include the designation "PROJECT RECORD DRAWING" in a prominent location.
1. Record Prints: Organize Record Prints into manageable sets. Bind each set with durable paper cover sheets. Include identification on cover sheets.
2. Identification: As follows:
- a. Project name.
 - b. Date.
 - c. Designation "PROJECT RECORD DRAWINGS."
 - d. Name of Architect.
 - e. Name of Contractor.

2.2 RECORD SPECIFICATIONS

- A. Preparation: Mark Specifications to indicate the actual product installation where installation varies from that indicated in Specifications, addenda, and contract modifications.
 - 1. Give particular attention to information on concealed products and installations that cannot be readily identified and recorded later.
 - 2. Mark copy with the proprietary name and model number of products, materials, and equipment furnished, including substitutions and product options selected.
 - 3. Record the name of manufacturer, supplier, Installer, and other information necessary to provide a record of selections made.
 - 4. For each principal product, indicate whether Record Product Data has been submitted in operation and maintenance manuals instead of submitted as Record Product Data.
 - 5. Note related Change Orders and Record Drawings where applicable.

2.3 MISCELLANEOUS RECORD SUBMITTALS

- A. Assemble miscellaneous records required by other Specification Sections for miscellaneous record keeping and submittal in connection with actual performance of the Work. Bind or file miscellaneous records and identify each, ready for continued use and reference.

PART 3 - EXECUTION

3.1 RECORDING AND MAINTENANCE

- A. Maintenance of Record Documents: Store Record Documents in the field office apart from the Contract Documents used for construction. Do not use Project Record Documents for construction purposes. Maintain Record Documents in good order and in a clean, dry, legible condition, protected from deterioration and loss. Provide access to Project Record Documents for Architect's reference during normal working hours. Do not remove from field office.
- B. **Architect, Owner, and Contractor shall review as-built drawings at job progress meetings to determine that they are up to date. Issuance of the agreed Contractor's monthly progress payment shall not be executed until as-built drawings are updated monthly.**

END OF SECTION 017839

SECTION 017900 - DEMONSTRATION AND TRAINING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. This Section includes administrative and procedural requirements for instructing Owner's personnel, including the following:
 - 1. Demonstration of operation of systems, subsystems, and equipment.
 - 2. Training in operation and maintenance of systems, subsystems, and equipment.
- B. Related Sections include the following:
 - 1. Divisions 02 through 49 Sections for specific requirements for demonstration and training for products in those Sections.

1.3 QUALITY ASSURANCE

- A. Instructor Qualifications: A factory-authorized service representative, complying with requirements in Division 01 Section "Quality Requirements," experienced in operation and maintenance procedures and training.

1.4 COORDINATION

- A. Coordinate instruction schedule with Owner's operations. Adjust schedule as required to minimize disrupting Owner's operations.
- B. Coordinate instructors, including providing notification of dates, times, length of instruction time, and course content.
- C. Coordinate content of training modules with content of approved operation, and maintenance manuals. Do not submit instruction program until operation and maintenance data has been reviewed and approved by Architect.

PART 2 - PRODUCTS

2.1 INSTRUCTION PROGRAM

- A. Program Structure: Develop an instruction program that includes individual training modules for each system and equipment not part of a system, as required by individual Specification Sections, and as follows:
1. Fire-protection systems, including fire alarm, fire pumps, and fire-extinguishing systems.
 2. Conveying systems, including elevators.
 3. Medical equipment, including medical gas equipment and piping.
 4. Laboratory equipment, including laboratory air and vacuum equipment and piping.
 5. Heat generation, including boilers, pumps, and water distribution piping.
 6. Refrigeration systems, including condensers, pumps, and distribution piping.
 7. HVAC systems, including air-handling equipment, air distribution systems, and [terminal equipment and devices.
 8. HVAC instrumentation and controls.
 9. Electrical service and distribution, including transformers, switchboards, panelboards, and motor controls.
 10. Lighting equipment and controls.
- B. Training Modules: Develop a learning objective and teaching outline for each module. Include a description of specific skills and knowledge that participant is expected to master. For each module, include instruction for the following:
1. Basis of System Design, Operational Requirements, and Criteria: Include the following:
 - a. System, subsystem, and equipment descriptions.
 - b. Operating standards.
 - c. Regulatory requirements.
 - d. Equipment function.
 - e. Operating characteristics.
 - f. Limiting conditions.
 - g. Performance curves.
 2. Documentation: Review the following items in detail:
 - a. Emergency manuals.
 - b. Operations manuals.
 - c. Maintenance manuals.
 - d. Project Record Documents.
 - e. Identification systems.
 - f. Warranties and bonds.
 - g. Maintenance service agreements and similar continuing commitments.
 3. Operations: Include the following, as applicable:
 - a. Startup procedures.
 - b. Equipment or system break-in procedures.
 - c. Routine and normal operating instructions.

- d. Regulation and control procedures.
 - e. Control sequences.
 - f. Safety procedures.
 - g. Instructions on stopping.
 - h. Normal shutdown instructions.
 - i. Operating procedures for emergencies.
 - j. Operating procedures for system, subsystem, or equipment failure.
 - k. Seasonal and weekend operating instructions.
 - l. Required sequences for electric or electronic systems.
 - m. Special operating instructions and procedures.
4. Adjustments: Include the following:
- a. Alignments.
 - b. Checking adjustments.
 - c. Noise and vibration adjustments.
 - d. Economy and efficiency adjustments.
5. Troubleshooting: Include the following:
- a. Diagnostic instructions.
 - b. Test and inspection procedures.
6. Maintenance: Include the following:
- a. Inspection procedures.
 - b. Types of cleaning agents to be used and methods of cleaning.
 - c. List of cleaning agents and methods of cleaning detrimental to product.
 - d. Procedures for routine cleaning
 - e. Procedures for preventive maintenance.
 - f. Procedures for routine maintenance.
 - g. Instruction on use of special tools.
7. Repairs: Include the following:
- a. Diagnosis instructions.
 - b. Repair instructions.
 - c. Disassembly; component removal, repair, and replacement; and reassembly instructions.
 - d. Instructions for identifying parts and components.
 - e. Review of spare parts needed for operation and maintenance.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Assemble educational materials necessary for instruction, including documentation and training module.

- B. Set up instructional equipment at instruction location.

3.2 INSTRUCTION

- A. Engage qualified instructors to instruct Owner's personnel to adjust, operate, and maintain systems, subsystems, and equipment not part of a system.
 - 1. Owner will furnish Contractor with names and positions of participants.
- B. Scheduling: Provide instruction at mutually agreed on times. **For equipment that requires seasonal operation, provide similar instruction at start of each season.**
 - 1. Schedule training with Owner with at least seven days' advance notice.
- C. Cleanup: Collect used and leftover educational materials and give to Owner. Remove instructional equipment. Restore systems and equipment to condition existing before initial training use.

END OF SECTION 017900

SECTION 024119 - SELECTIVE DEMOLITION

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. Demolition and removal of selected portions of building or structure.

1.3 DEFINITIONS

- A. Remove: Detach items from existing construction and dispose of them off-site unless indicated to be salvaged or reinstalled.
- B. Remove and Salvage: Detach items from existing construction, in a manner to prevent damage, and deliver to Owner ready for reuse.
- C. Remove and Reinstall: Detach items from existing construction, in a manner to prevent damage, prepare for reuse, and reinstall where indicated.
- D. Existing to Remain: Leave existing items that are not to be removed and that are not otherwise indicated to be salvaged or reinstalled.
- E. Dismantle: To remove by disassembling or detaching an item from a surface, using gentle methods and equipment to prevent damage to the item and surfaces; disposing of items unless indicated to be salvaged or reinstalled.

1.4 MATERIALS OWNERSHIP

- A. Unless otherwise indicated, demolition waste becomes property of Contractor.

1.5 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 materials, 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.

1.6 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For refrigerant recovery technician.
- B. Engineering Survey: Submit engineering survey of condition of building.
- C. Proposed Protection Measures: Submit report, including Drawings, that indicates the measures proposed for protecting individuals and property, for environmental protection, dust control and, for noise control. Indicate proposed locations and construction of barriers.
- D. 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. 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.
- E. Predemolition Photographs or Video: Show existing conditions of adjoining construction, including finish surfaces, that might be misconstrued as damage caused by demolition operations. Comply with Section 013233 "Photographic Documentation." Submit before Work begins.
- F. Statement of Refrigerant Recovery (if needed): Signed by refrigerant recovery technician responsible for recovering refrigerant, stating that all refrigerant that was present was recovered and that recovery was performed according to EPA regulations. Include name and address of technician and date refrigerant was recovered.
- G. Warranties: Documentation indicating that existing warranties are still in effect after completion of selective demolition.

1.7 CLOSEOUT SUBMITTALS

- A. Inventory: Submit a list of items that have been removed and salvaged.

1.8 QUALITY ASSURANCE

- A. Refrigerant Recovery Technician Qualifications (if needed): Certified by an EPA-approved certification program.

1.9 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:
- C. Notify Architect of discrepancies between existing conditions and Drawings before proceeding with selective demolition.
- D. Hazardous Materials: It is not expected that hazardous materials will be encountered in the Work.
- E. Storage or sale of removed items or materials on-site is not permitted.
- F. Utility Service: Maintain existing utilities indicated to remain in service and protect them against damage during selective demolition operations.
 - 1. Maintain fire-protection facilities in service during selective demolition operations.

1.10 WARRANTY

- A. Existing Warranties: Remove, replace, patch, and repair materials and surfaces cut or damaged during selective demolition, by methods and with materials and using approved contractors so as not to void existing warranties. Notify warrantor before proceeding. Existing warranties include the following:
- B. Notify warrantor on completion of selective demolition, and obtain documentation verifying that existing system has been inspected and warranty remains in effect. Submit documentation at Project closeout.

1.11 COORDINATION

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

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 ASSE 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. Perform an engineering survey of condition of building to determine whether removing any element might result in structural deficiency or unplanned collapse of any portion of structure or adjacent structures during selective building demolition operations.
 - 1. Perform surveys as the Work progresses to detect hazards resulting from selective demolition activities.
- D. Steel Tendons: Locate tensioned steel tendons and include recommendations for de-tensioning.
- E. Verify that hazardous materials have been remediated before proceeding with building demolition operations.
- F. Survey of Existing Conditions: Record existing conditions by use of measured drawings, preconstruction photographs or video.
 - 1. Comply with requirements specified in Section 013233 "Photographic Documentation."
 - 2. Inventory and record the condition of items to be removed and salvaged. Provide photographs or video of conditions that might be misconstrued as damage caused by salvage operations.
 - 3. Before selective demolition or removal of existing building elements that will be reproduced or duplicated in final Work, make permanent record of measurements, materials, and construction details required to make exact reproduction.

3.2 PREPARATION

- A. Refrigerant (if needed): Before starting demolition, remove refrigerant from mechanical equipment according to 40 CFR 82 and regulations of authorities having jurisdiction.

3.3 UTILITY SERVICES AND MECHANICAL/ELECTRICAL SYSTEMS

- A. Existing Services/Systems to Remain: Maintain services/systems indicated to remain and protect them against damage.
- B. Existing Services/Systems to Be Removed, Relocated, or Abandoned: Locate, identify, disconnect, and seal or cap off utility services and mechanical/electrical systems serving areas to be selectively demolished.
 - 1. Arrange to shut off utilities with utility companies.

2. If services/systems are required to be removed, relocated, or abandoned, provide temporary services/systems that bypass area of selective demolition and that maintain continuity of services/systems to other parts of building.
3. Disconnect, demolish, and remove fire-suppression systems, plumbing, and HVAC 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. Piping to Be Abandoned in Place: Drain piping and cap or plug piping with same or compatible piping material and leave in place.
 - c. Equipment to Be Removed: Disconnect and cap services and remove equipment.
 - d. Equipment to Be Removed and Reinstalled: Disconnect and cap services and remove, clean, and store equipment; when appropriate, reinstall, reconnect, and make equipment operational.
 - e. Equipment to Be Removed and Salvaged: Disconnect and cap services and remove equipment and deliver to Owner.
 - f. Ducts to Be Removed: Remove portion of ducts indicated to be removed and plug remaining ducts with same or compatible ductwork material.
 - g. Ducts to Be Abandoned in Place: Cap or plug ducts with same or compatible ductwork material and leave in place.

3.4 PROTECTION

- A. 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. Provide temporary weather protection, during interval between selective demolition of existing construction on exterior surfaces and new construction, to prevent water leakage and damage to structure and interior areas.
 3. Protect walls, ceilings, floors, and other existing finish work that are to remain or that are exposed during selective demolition operations.
 4. Cover and protect furniture, furnishings, and equipment that have not been removed.
 5. Comply with requirements for temporary enclosures, dust control, heating, and cooling specified in Section 015000 "Temporary Facilities and Controls."
- B. 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.
- C. Remove temporary barricades and protections where hazards no longer exist.

3.5 SELECTIVE DEMOLITION, GENERAL

- A. General: Demolish and remove existing construction only to the extent required by new construction and as indicated. Use methods required to complete the Work within limitations of governing regulations and as follows:
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 2 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.
 10. Dispose of demolished items and materials promptly.
- 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.
- C. Removed and Reinstalled Items:
1. Clean and repair items to functional condition adequate for intended reuse.
 2. Pack or crate items after cleaning and repairing. Identify contents of containers.
 3. Protect items from damage during transport and storage.
 4. Reinstall items in locations indicated. Comply with installation requirements for new materials and equipment. Provide connections, supports, and miscellaneous materials necessary to make item functional for use indicated.
- D. 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 during selective demolition and cleaned and reinstalled in their original locations after selective demolition operations are complete.

3.6 SELECTIVE DEMOLITION PROCEDURES FOR SPECIFIC MATERIALS

- A. Concrete: 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. Masonry: Demolish in small sections. Cut masonry at junctures with construction to remain, using power-driven saw, and then remove masonry between saw cuts.
- C. Concrete Slabs-on-Grade: Saw-cut perimeter of area to be demolished, and then break up and remove.
- D. Resilient Floor Coverings: Remove floor coverings and adhesive according to recommendations in RFCI's "Recommended Work Practices for the Removal of Resilient Floor Coverings."
- E. Roofing, regarding the one roof cut on this project: Remove no more existing roofing than what can be covered in one day by new roofing and so that building interior remains watertight and weathertight. See Section for new roofing requirements.
 - 1. Remove existing roof membrane, flashings, copings, and roof accessories.
 - 2. Remove existing roofing system down to substrate.

3.7 DISPOSAL OF DEMOLISHED MATERIALS

- A. Remove demolition waste materials from Project site and dispose of them in an EPA-approved construction and demolition waste landfill acceptable to authorities having jurisdiction.
 - 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. Comply with requirements specified in Section 017419 "Construction Waste Management and Disposal."
- B. Burning: Do not burn demolished materials.

3.8 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 064113 - WOOD-VENEER-FACED ARCHITECTURAL CABINETS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Wood-veneer-faced architectural cabinets.
2. Wood furring, blocking, shims, and hanging strips for installing architectural cabinets that are not concealed within other construction.
3. Shop finishing of architectural cabinets.

1.2 PREINSTALLATION MEETINGS

- ##### A. Preinstallation Conference: Conduct conference at Project site.

1.3 ACTION SUBMITTALS

- ##### A. Product Data: For each type of product.

- ##### B. Shop Drawings: For architectural cabinets.

1. Include plans, elevations, sections, and attachment details.

- ##### C. Samples: For each exposed product and for each color and finish specified.

PART 2 - PRODUCTS

2.1 CABINETS, GENERAL

- ##### A. Quality Standard: Unless otherwise indicated, comply with the Architectural Woodwork Standards for grades of architectural cabinets indicated for construction, finishes, installation, and other requirements.

2.2 WOOD CABINETS FOR TRANSPARENT FINISH

- ##### A. Architectural Woodwork Standards Grade: Premium.

- ##### B. Type of Construction: match existing.

1. Reveal Dimension: 1/2 inch
2. Species: Figured Cherry, match existing.

3. Cut: match existing
 4. Grain Direction: match existing
 5. Matching of Veneer Leaves: book match.
- C. Drawer Construction: Fabricate with exposed fronts fastened to subfront with mounting screws from interior of body.
1. Join subfronts, backs, and sides with glued rabbeted joints supplemented by mechanical fasteners or glued dovetail joints.

2.3 WOOD MATERIALS

- A. Wood Products: Provide materials that comply with requirements of referenced quality standard for each type of architectural cabinet and quality grade specified unless otherwise indicated.
1. Do not use plain-sawn softwood lumber with exposed, flat surfaces more than 3 inches wide.
 2. Wood Moisture Content: 5-10 percent.

2.4 CABINET HARDWARE AND ACCESSORIES

- A. General: Provide cabinet hardware and accessory materials associated with architectural cabinets except for casework, match existing hardware.
- B. Shelf Rests: BHMA A156.9, B04013; metal
- C. Grommets for Cable Passage: 1-1/4-inch OD, molded-plastic grommets and matching plastic caps with slot for wire passage.
1. Color: Black.
- D. Exposed Hardware Finishes: Match existing
- E. For concealed hardware,: Match existing

2.5 MISCELLANEOUS MATERIALS

- A. Furring, Blocking, Shims, and Hanging Strips: Softwood or hardwood lumber, kiln-dried to less than 15 percent moisture content.
- B. Anchors: Select material, type, size, and finish required for each substrate for secure anchorage. Provide metal expansion sleeves or expansion bolts for post-installed anchors. Use nonferrous-metal or hot-dip galvanized anchors and inserts at inside face of exterior walls and at floors.

2.6 FABRICATION

- A. Complete fabrication, including assembly and hardware application, to maximum extent possible before shipment to Project site. Disassemble components only as necessary for

shipment and installation. Where necessary for fitting at site, provide ample allowance for scribing, trimming, and fitting.

- B. Shop-cut openings to maximum extent possible to receive hardware, appliances, electrical work, and similar items. Locate openings accurately and use templates or roughing-in diagrams to produce accurately sized and shaped openings. Sand edges of cutouts to remove splinters and burrs.

2.7 SHOP FINISHING

- A. General: Finish architectural cabinets at manufacturer's shop as specified in this Section. Defer only final touchup, cleaning, and polishing until after installation.
- B. Preparation for Finishing: Comply with referenced quality standard for sanding, filling countersunk fasteners, sealing concealed surfaces, and similar preparations for finishing architectural cabinets, as applicable to each unit of work.
 - 1. Backpriming: Apply one coat of sealer or primer, compatible with finish coats, to concealed surfaces of cabinets.
- C. Transparent Finish:
 - 1. Architectural Woodwork Standards Grade: Premium.
 - 2. Finish: System – match existing
 - 3. Staining: Match existing, provide sample for approval.
 - 4. Sheen: Match existing

2.8 INSTALLATION

- A. Before installation, condition cabinets to humidity conditions in installation areas for not less than 72 hours.
- B. Architectural Woodwork Standards Grade: Install cabinets to comply with quality standard grade of item to be installed.
- C. Anchor cabinets to anchors or blocking built in or directly attached to substrates. Secure with countersunk, concealed fasteners and blind nailing. Use fine finishing nails or finishing screws for exposed fastening, countersunk and filled flush with cabinet surface.
 - 1. For shop-finished items, use filler matching finish of items being installed.
- D. Install cabinets level, plumb, and true in line to a tolerance of 1/8 inch in 96 inches using concealed shims.
 - 1. Scribe and cut cabinets to fit adjoining work, refinish cut surfaces, and repair damaged finish at cuts.
 - 2. Install cabinets without distortion so doors and drawers fit openings and are accurately aligned. Adjust hardware to center doors and drawers in openings and to provide

unencumbered operation. Complete installation of hardware and accessory items as indicated.

3. Maintain veneer sequence matching of cabinets with transparent finish.

E. Shop Finishes: Touch up finishing after installation of architectural cabinets. Fill nail holes with matching filler.

2.9 FIELD QUALITY CONTROL

A. Inspections: Provide inspection of installed Work through AWI's Quality Certification Program certifying that woodwork, including installation, complies with requirements of the Architectural Woodwork Standards for the specified grade.

END OF SECTION 064113

SECTION 064216 - FLUSH WOOD PANELING

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. Flush wood paneling.
 - 2. Wood furring, blocking, shims, and hanging strips for installing flush wood paneling that is not concealed within other construction.
 - 3. Shop finishing of flush wood paneling.

1.3 COORDINATION

- A. Coordinate sizes and locations of framing, blocking, furring, reinforcements, and other related units of Work specified in other Sections to ensure that paneling can be installed as indicated.

1.4 PREINSTALLATION MEETINGS

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

1.5 ACTION SUBMITTALS

- A. Product Data: For each type of product.
- B. Shop Drawings: For flush wood paneling.
 - 1. Include plans, elevations, sections, and attachment details.
 - 2. Show details full size.
 - 3. Show locations and sizes of furring and blocking, including concealed blocking specified in other Sections.
 - 4. For paneling produced from premanufactured sets, show finished panel sizes, set numbers, sequence numbers within sets, and method of cutting panels to produce indicated sizes.
 - 5. For paneling veneered in fabrication shop, show veneer leaves with dimensions, grain direction, exposed face, and identification numbers indicating the flitch and sequence within the flitch for each leaf.

- C. Samples: For each exposed product and for each color and finish specified, in manufacturer's or fabricator's standard size.
- D. Samples for Verification: For the following:
 - 1. Lumber for Transparent Finish: Submit full size panel for approval. Stain and prepare as finished product. Can be used in field if approved.

1.6 QUALITY ASSURANCE

- A. Fabricator Qualifications: Shop that employs skilled workers who custom-fabricate products similar to those required for this Project and whose products have a record of successful in-service performance.
- B. Mockups: Build mockups to verify selections made under Sample submittals, to demonstrate aesthetic effects, and to set quality standards for materials and execution.
 - 1. Build mockups of typical paneling as shown on Drawings
 - 2. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Do not deliver paneling until painting and similar operations that might damage paneling have been completed in installation areas. Store paneling in installation areas or in areas where environmental conditions comply with requirements specified in "Field Conditions" Article.

1.8 FIELD CONDITIONS

- A. Environmental Limitations: Do not deliver or install paneling until building is enclosed, wet-work is complete, and HVAC system is operating and will maintain temperature between **60 and 90 deg F** and relative humidity between 25 and 55 percent during the remainder of the construction period.
- B. Field Measurements: Where paneling is indicated to fit to other construction, verify dimensions of other construction by field measurements before fabrication and indicate measurements on Shop Drawings. Coordinate fabrication schedule with construction progress to avoid delaying the Work.
 - 1. Locate concealed framing, blocking, and reinforcements that support paneling by field measurements before being enclosed/concealed by construction and indicate measurements on Shop Drawings.
- C. Established Dimensions: Where paneling is indicated to fit to other construction, establish dimensions for areas where woodwork is to fit. Provide allowance for trimming at site, and coordinate construction to ensure that actual dimensions correspond to established dimensions.

PART 2 - PRODUCTS

2.1 PANELING FABRICATORS

- A. Source Limitations: Engage a qualified woodworking firm to assume undivided responsibility for production of paneling and wood-veneer-faced architectural cabinets.

2.2 PANELING, GENERAL

- A. Quality Standard: Unless otherwise indicated, comply with the "Architectural Woodwork Standards" for grades of flush wood paneling (wood-veneer wall surfacing) indicated for construction, finishes, installation, and other requirements.

2.3 FLUSH WOOD PANELING (WOOD-VENEER WALL SURFACING)

- A. Grade: Premium.
- B. Wood Species and Cut: Match existing Figured Cherry
- C. Veneer Matching Method:
 - 1. Adjacent Veneer Leaves: match existing layout.
 - 2. Within Panel Face: match existing layout
 - 3. Adjacent Veneer Leaves and within Panel Face: Slip, center-balance, or book match.
- D. Vertical Panel-Matching Method: match existing vertical panel layout.
- E. Exposed Panel Edges: match existing, coordinate with reveals.
- F. Panel Reveals: Stainless-steel channels sized to match existing.
- G. Fire-Retardant-Treated Paneling: Panels shall consist of wood-veneer and fire-retardant particleboard or fire-retardant, medium-density fiberboard (MDF). Panels shall have a flame-spread index of [25] [75] or less and a smoke-developed index of 450 or less per ASTM E84, and be listed and labeled by a testing and inspecting agency acceptable to authorities having jurisdiction.
- H. Assemble panels by gluing and concealed fastening.

2.4 MATERIALS

- A. Materials, General: Provide materials that comply with requirements of referenced quality standard for each quality grade specified unless otherwise indicated.
- B. Wood Moisture Content: 5 to 10 percent.

2.5 INSTALLATION MATERIALS

- A. Furring, Blocking, Shims, and Hanging Strips: Softwood or hardwood lumber, kiln-dried to less than 15 percent moisture content.
- B. Anchors: Select material, type, size, and finish required for each substrate for secure anchorage. Provide metal expansion sleeves or expansion bolts for post-installed anchors. Use nonferrous-metal or hot-dip galvanized anchors and inserts at inside face of exterior walls.

2.6 FABRICATION

- A. Arrange paneling in shop or other suitable space in proposed sequence for examination by Architect. Mark units with temporary sequence numbers to indicate position in proposed layout.
 - 1. Lay out one elevation at a time if approved by Architect.
 - 2. Notify Architect seven days in advance of the date and time when layout will be available for viewing.
 - 3. Provide lighting of similar type and level as that of final installation for viewing layout unless otherwise approved by Architect.
 - 4. Rearrange paneling as directed by Architect until layout is approved.
 - 5. Do not trim end units and other nonmodular-size units to less than modular size until after Architect's approval of layout. Indicate trimming by masking edges of units with nonmarking material.
 - 6. Obtain Architect's approval of layout before start of assembly. Mark units and Shop Drawings with assembly sequence numbers based on approved layout.
- B. Complete fabrication, including assembly, to maximum extent possible, before shipment to Project site. Disassemble components only as necessary for shipment and installation. Where necessary for fitting at site, provide ample allowance for scribing, trimming, and fitting.
 - 1. Notify Architect seven days in advance of the dates and times paneling fabrication will be complete.
- C. There should be no openings for electrical or fire alarm systems.

2.7 SHOP FINISHING

- A. General: Finish paneling at fabrication shop as specified in this Section. Defer only final touchup, cleaning, and polishing until after installation.
- B. Shop Priming: Shop apply the prime coat including backpriming, if any, for transparent-finished paneling specified to be field finished. See Section 099300 "Staining and Transparent Finishing" for material and application requirements.
- C. Preparation for Finishing: Comply with referenced quality standard for sanding, filling countersunk fasteners, sealing concealed surfaces, and similar preparations for finishing paneling, as applicable to each unit of work.

1. Backpriming: Apply two coats of sealer or primer, compatible with finish coats, to concealed surfaces of paneling.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Before installation, condition paneling to humidity conditions in installation areas.
- B. Before installing paneling, examine shop-fabricated work for completion and complete work as required, including removal of packing and backpriming.

3.2 INSTALLATION

- A. Grade: Install paneling to comply with quality standard grade of paneling to be installed.
- B. Install paneling level, plumb, true in line, and without distortion. Shim as required with concealed shims. Install level and plumb to a tolerance of 1/8 inch in 96 inches. Install with no more than 1/16 inch in 96-inch vertical cup or bow and 1/8 inch in 96-inch horizontal variation from a true plane.
 1. For flush paneling with revealed joints, install with variations in reveal width, alignment of top and bottom edges, and flushness between adjacent panels not exceeding 1/32 inch.
- C. Anchor paneling to supporting substrate with concealed panel-hanger clips
- D. Complete finishing work specified in this Section to extent not completed at shop or before installation of paneling. Fill nail holes with matching filler where exposed.
 1. Apply specified finish coats, including stains and paste fillers if any, to exposed surfaces where only sealer/prime coats are shop applied.
- E. See Section 099300 "Staining and Transparent Finishing" for final finishing of installed paneling.

3.3 ADJUSTING AND CLEANING

- A. Repair damaged and defective paneling, where possible, to eliminate defects. Where not possible to repair, replace paneling. Adjust for uniform appearance.
- B. Clean paneling on exposed surfaces. Touch up shop-applied finishes to restore damaged or soiled areas.

END OF SECTION 064216

SECTION 092216 - NON-STRUCTURAL METAL FRAMING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Non-load-bearing steel framing systems for interior partitions.

1.2 ACTION SUBMITTALS

A. Product Data: For each type of product.

1.3 INFORMATIONAL SUBMITTALS

- A. Product Certificates: For each type of code-compliance certification for studs and tracks.
- B. Evaluation reports for embossed, high-strength steel studs and tracks

1.4 QUALITY ASSURANCE

- A. Code-Compliance Certification of Studs and Tracks: Provide documentation that framing members are certified according to the product-certification program of the Certified Steel Stud Association.

PART 2 - PRODUCTS

2.1 FRAMING SYSTEMS

A. Framing Members, General: Comply with ASTM C754 for conditions indicated.

1. Steel Sheet Components: Comply with ASTM C645 requirements for steel unless otherwise indicated.
2. Protective Coating: ASTM A653/A653M, G40, hot-dip galvanized unless otherwise indicated.

B. Studs and Tracks: ASTM C645. Use either conventional steel studs and tracks or embossed, high-strength steel studs and tracks.

1. Minimum Base-Steel Thickness: As required by performance requirements for horizontal deflection
2. Depth: As indicated on Drawings

C. Slip-Type Head Joints: Where indicated, provide one of the following:

1. Single Long-Leg Track System: ASTM C645 top track with 2-inch- deep flanges in thickness not less than indicated for studs, installed with studs friction fit into top track and with continuous bridging located within 12 inches of the top of studs to provide lateral bracing.
 2. Double-Track System: ASTM C645 top outer tracks, inside track with 2-inch deep flanges in thickness not less than indicated for studs and fastened to studs, and outer track sized to friction-fit over inner track.
 3. Deflection Track: Steel sheet top track manufactured to prevent cracking of finishes applied to interior partition framing resulting from deflection of structure above; in thickness not less than indicated for studs and in width to accommodate depth of studs.
- D. Flat Strap and Backing Plate: Steel sheet for blocking and bracing in length and width indicated.
1. Minimum Base-Steel Thickness: 0.0179 inch

2.2 AUXILIARY MATERIALS

- A. General: Provide auxiliary materials that comply with referenced installation standards.
1. Fasteners for Steel Framing: Of type, material, size, corrosion resistance, holding power, and other properties required to fasten steel members to substrates.
- B. Isolation Strip at Exterior Walls: Provide one of the following:
1. Asphalt-Saturated Organic Felt: ASTM D226/D226M, Type I (No. 15 asphalt felt), nonperforated.
 2. Foam Gasket: Adhesive-backed, closed-cell vinyl foam strips that allow fastener penetration without foam displacement, 1/8 inch thick, in width to suit steel stud size.

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

- A. Installation Standard: ASTM C754.
1. Gypsum Board Assemblies: Also comply with requirements in ASTM C840 that apply to framing installation.
- B. Install framing and accessories plumb, square, and true to line, with connections securely fastened.
- C. Install bracing at terminations in assemblies.
- D. Do not bridge building control and expansion joints with non-load-bearing steel framing members. Frame both sides of joints independently.

3.2 INSTALLING FRAMED ASSEMBLIES

- A. Install framing system components according to spacings indicated, but not greater than spacings required by referenced installation standards for assembly types.

- B. Where studs are installed directly against exterior masonry walls or dissimilar metals at exterior walls, install isolation strip between studs and exterior wall.
- C. Install studs so flanges within framing system point in same direction.
- D. Install tracks at floors and overhead supports. Extend framing full height to structural supports or substrates above suspended ceilings except where partitions are indicated to terminate at suspended ceilings. Continue framing around ducts that penetrate partitions above ceiling.
 - 1. Slip-Type Head Joints: Where framing extends to overhead structural supports, install to produce joints at tops of framing systems that prevent axial loading of finished assemblies.
 - 2. Door Openings: Screw vertical studs at jambs to jamb anchor clips on door frames; install track section (for cripple studs) at head and secure to jamb studs.
 - a. Install two studs at each jamb unless otherwise indicated.
 - b. Install cripple studs at head adjacent to each jamb stud, with a minimum 1/2-inch clearance from jamb stud to allow for installation of control joint in finished assembly.
 - c. Extend jamb studs through suspended ceilings and attach to underside of overhead structure.
 - 3. Other Framed Openings: Frame openings other than door openings the same as required for door openings unless otherwise indicated. Install framing below sills of openings to match framing required above door heads.
- E. Installation Tolerance: Install each framing member so fastening surfaces vary not more than 1/8 inch from the plane formed by faces of adjacent framing.

END OF SECTION 092216

SECTION 092900 - GYPSUM BOARD

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Interior gypsum board.

1.2 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Samples: For each texture finish indicated on same backing indicated for Work.

PART 2 - PRODUCTS

2.1 GYPSUM BOARD, GENERAL

- ##### A. Size: Provide maximum lengths and widths available that will minimize joints in each area and that correspond with support system indicated.

2.2 INTERIOR GYPSUM BOARD

A. Gypsum Board, Type X: ASTM C1396/C1396M.

1. Thickness: 5/8 inch.
2. Long Edges: Tapered

2.3 TRIM ACCESSORIES

A. Interior Trim: ASTM C1047.

1. Material: Galvanized or aluminum-coated steel sheet, rolled zinc, plastic, or paper-faced galvanized-steel sheet
2. Shapes:
 - a. Cornerbead.
 - b. LC-Bead: J-shaped; exposed long flange receives joint compound.
 - c. L-Bead: L-shaped; exposed long flange receives joint compound.
 - d. U-Bead: J-shaped; exposed short flange does not receive joint compound.

2.4 JOINT TREATMENT MATERIALS

- A. General: Comply with ASTM C475/C475M.
- B. Joint Tape:
 - 1. Interior Gypsum Board: Paper.
- C. Joint Compound for Interior Gypsum Board: For each coat, use formulation that is compatible with other compounds applied on previous or for successive coats.
 - 1. Prefilling: At open joints, and damaged surface areas, use setting-type taping compound.
 - 2. Embedding and First Coat: For embedding tape and first coat on joints, fasteners, and trim flanges, use setting-type taping or drying-type, all-purpose compound.
 - a. Use setting-type compound for installing paper-faced metal trim accessories.
 - 3. Fill Coat: For second coat, use setting-type, sandable topping or drying-type, all-purpose compound.
 - 4. Finish Coat: For third coat, use setting-type, sandable topping or drying-type, all-purpose compound.
 - 5. Skim Coat: For final coat of Level 5 finish, use setting-type, sandable topping compound or drying-type, all-purpose compound.

2.5 AUXILIARY MATERIALS

- A. General: Provide auxiliary materials that comply with referenced installation standards and manufacturer's written instructions.
- B. Steel Drill Screws: ASTM C1002 unless otherwise indicated.
 - 1. Use screws complying with ASTM C954 for fastening panels to steel members from 0.033 to 0.112 inch thick.
 - 2. For fastening cementitious backer units, use screws of type and size recommended by panel manufacturer.

PART 3 - EXECUTION

3.1 APPLYING AND FINISHING PANELS

- A. Examine panels before installation. Reject panels that are wet, moisture damaged, and mold damaged.
- B. Comply with ASTM C840.
- C. Isolate perimeter of gypsum board applied to non-load-bearing partitions at structural abutments. Provide 1/4- to 1/2-inch wide spaces at these locations and trim edges with edge trim where edges of panels are exposed. Seal joints between edges and abutting structural surfaces with acoustical sealant.

- D. For trim with back flanges intended for fasteners, attach to framing with same fasteners used for panels. Otherwise, attach trim according to manufacturer's written instructions.
- E. Prefill open joints and damaged surface areas.
- F. Apply joint tape over gypsum board joints, except for trim products specifically indicated as not intended to receive tape.
- G. Gypsum Board Finish Levels: Finish panels to levels indicated below and according to ASTM C840:
 - 1. Level 4:
 - a. Primer and its application to surfaces are specified in Section 099123 "Interior Painting."

3.2 APPLYING TEXTURE FINISHES

- A. Surface Preparation and Primer: Prepare and apply primer to gypsum panels and other surfaces receiving texture finishes. Apply primer to surfaces that are clean, dry, and smooth.
- B. Texture Finish Application: Mix and apply finish using powered spray equipment, to produce a uniform texture matching approved mockup and free of starved spots or other evidence of thin application or of application patterns.

3.3 PROTECTION

- A. Protect installed products from damage from weather, condensation, direct sunlight, construction, and other causes during remainder of the construction period.
- B. Remove and replace panels that are wet, moisture damaged, and mold damaged.

END OF SECTION 092900

SECTION 095113 - ACOUSTICAL PANEL CEILINGS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section includes acoustical panels and exposed suspension systems for interior ceilings.

1.3 PREINSTALLATION MEETINGS

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

1.4 ACTION SUBMITTALS

- A. Product Data: For each type of product.
- B. Samples: For each exposed product and for each color and texture specified, 6 inches in size.

1.5 INFORMATIONAL SUBMITTALS

- A. Coordination Drawings: Reflected ceiling plans, drawn to scale, on which the following items are shown and coordinated with each other, using input from installers of the items involved:
 - 1. Ceiling suspension-system members.
 - 2. Structural members to which suspension systems will be attached.
 - 3. Method of attaching hangers to building structure.
 - a. Furnish layouts for cast-in-place anchors, clips, and other ceiling attachment devices whose installation is specified in other Sections.
 - 4. Carrying channels or other supplemental support for hanger-wire attachment where conditions do not permit installation of hanger wires at required spacing.
 - 5. Size and location of initial access modules for acoustical panels.
 - 6. Items penetrating finished ceiling and ceiling-mounted items including the following:
 - a. Lighting fixtures.
 - b. Diffusers.
 - c. Grilles.
 - d. Speakers.
 - e. Sprinklers.

f. Perimeter moldings.

- B. Qualification Data: For testing agency.
- C. Product Test Reports: For each acoustical panel ceiling, for tests performed by manufacturer and witnessed by a qualified testing agency.
- D. Evaluation Reports: For each acoustical panel ceiling suspension system and anchor and fastener type, from ICC-ES.
- E. Field quality-control reports.

1.6 CLOSEOUT SUBMITTALS

- A. Maintenance Data: For finishes to include in maintenance manuals.

1.7 MAINTENANCE MATERIAL SUBMITTALS

- A. Furnish extra materials, from the same product run, that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
 - 1. Acoustical Ceiling Units: Full-size panels equal to 2 percent of quantity installed.
 - 2. Suspension-System Components: Quantity of each exposed component equal to 2 percent of quantity installed.

1.8 QUALITY ASSURANCE

- A. Mockups: Build mockups to verify selections made under Sample submittals, to demonstrate aesthetic effects, and to set quality standards for materials and execution.
 - 1. Build mockup of typical ceiling area as shown on Drawings.
 - 2. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Architect specifically approves such deviations in writing.
 - 3. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.9 DELIVERY, STORAGE, AND HANDLING

- A. Deliver acoustical panels, suspension-system components, and accessories to Project site and store them in a fully enclosed, conditioned space where they will be protected against damage from moisture, humidity, temperature extremes, direct sunlight, surface contamination, and other causes.
- B. Before installing acoustical panels, permit them to reach room temperature and a stabilized moisture content.

1.10 FIELD CONDITIONS

- A. Environmental Limitations: Do not install acoustical panel ceilings until spaces are enclosed and weathertight, wet-work in spaces is complete and dry, work above ceilings is complete, and ambient temperature and humidity conditions are maintained at the levels indicated for Project when occupied for its intended use.
 - 1. Pressurized Plenums: Operate ventilation system for not less than 48 hours before beginning acoustical panel ceiling installation.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Source Limitations: Obtain each type of acoustical ceiling panel and its supporting suspension system from single source from single manufacturer.

2.2 PERFORMANCE REQUIREMENTS

- A. Seismic Performance: Suspended ceilings shall withstand the effects of earthquake motions determined according to ASCE/SEI 7.

2.3 ACOUSTICAL PANELS

- A. Acoustical Panel Basis of Design:
 - 1. Manufacturer: Armstrong Industries
 - 2. Style: High CAC Lyra
 - 3. Edge: Tegular
 - 4. Size: 30" x 60" x 9/16" thick, unless otherwise noted
 - 5. Color: White
 - 6. CAC: 44
 - 7. NRC: 0.95

2.4 METAL SUSPENSION SYSTEM

- A. Metal Suspension-System basis of design:
 - 1. Manufacturer: Armstrong Industries
 - 2. Prelude 9/16" Bolt Slot 1/8" Reveal
 - 3. Color: White

2.5 ACCESSORIES

- A. Attachment Devices: Size for five times the design load indicated in ASTM C635/C635M, Table 1, "Direct Hung," unless otherwise indicated. Comply with seismic design requirements.

1. Anchors in Concrete: Anchors of type and material indicated below, with holes or loops for attaching hangers of type indicated and with capability to sustain, without failure, a load equal to 5 times that imposed by ceiling construction, as determined by testing according to ASTM E488/E488M or ASTM E1512 as applicable, conducted by a qualified testing and inspecting agency.
 - a. Type: Postinstalled expansion anchors.
 - b. Corrosion Protection: Carbon-steel components zinc plated according to ASTM B633, Class SC 1 (mild) service condition.
 - c. Corrosion Protection: Stainless-steel components complying with ASTM F593 and ASTM F594, Group 1 Alloy 304 or 316.
 - d. Corrosion Protection: Components fabricated from nickel-copper-alloy rods complying with ASTM B164 for UNS No. N04400 alloy.
2. Power-Actuated Fasteners in Concrete: Fastener system of type suitable for application indicated, fabricated from corrosion-resistant materials, with clips or other accessory devices for attaching hangers of type indicated and with capability to sustain, without failure, a load equal to 10 times that imposed by ceiling construction, as determined by testing according to ASTM E1190, conducted by a qualified testing and inspecting agency.

B. Wire Hangers, Braces, and Ties: Provide wires as follows:

1. Stainless-Steel Wire: ASTM A580/A580M, Type 304, nonmagnetic.
2. Size: Wire diameter sufficient for its stress at three times hanger design load (ASTM C635/C635M, Table 1, "Direct Hung") will be less than yield stress of wire, but not less than 0.106-inch diameter wire.

C. Hanger Rods: Mild steel, zinc coated or protected with rust-inhibitive paint.

D. Flat Hangers: Mild steel, zinc coated or protected with rust-inhibitive paint.

E. Angle Hangers: Angles with legs not less than 7/8 inch wide; formed with 0.04-inch- thick, galvanized-steel sheet complying with ASTM A653/A653M, G90 (Z275) coating designation; with bolted connections and 5/16-inch- diameter bolts.

F. Hold-Down Clips: Manufacturer's standard hold-down.

G. Impact Clips: Manufacturer's standard impact-clip system designed to absorb impact forces against acoustical panels.

H. Seismic Clips: Manufacturer's standard seismic clips designed to secure acoustical panels in place during a seismic event.

2.6 METAL EDGE MOLDINGS AND TRIM

1. Manufacturer: Armstrong Industries
2. Axiom Classic Trim
3. Color: White
4. Size: 8"

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, including structural framing to which acoustical panel ceilings attach or abut, with Installer present, for compliance with requirements specified in this and other Sections that affect ceiling installation and anchorage and with requirements for installation tolerances and other conditions affecting performance of acoustical panel ceilings.
- B. Examine acoustical panels before installation. Reject acoustical panels that are wet, moisture damaged, or mold damaged.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Measure each ceiling area and establish layout of acoustical panels to balance border widths at opposite edges of each ceiling. Avoid using less-than-half-width panels at borders unless otherwise indicated, and comply with layout shown on reflected ceiling plans.
- B. Layout openings for penetrations centered on the penetrating items.

3.3 INSTALLATION

- A. Install acoustical panel ceilings according to ASTM C636/C636M and manufacturer's written instructions.
- B. Suspend ceiling hangers from building's structural members and as follows:
 - 1. Install hangers plumb and free from contact with insulation or other objects within ceiling plenum that are not part of supporting structure or of ceiling suspension system.
 - 2. Where width of ducts and other construction within ceiling plenum produces hanger spacings that interfere with location of hangers at spacings required to support standard suspension-system members, install supplemental suspension members and hangers in form of trapezes or equivalent devices.
 - 3. Secure wire hangers to ceiling-suspension members and to supports above with a minimum of three tight turns. Connect hangers directly to structure or to inserts, eye screws, or other devices that are secure and appropriate for substrate and that will not deteriorate or otherwise fail due to age, corrosion, or elevated temperatures.
 - 4. Secure flat, angle, channel, and rod hangers to structure, including intermediate framing members, by attaching to inserts, eye screws, or other devices that are secure and appropriate for both the structure to which hangers are attached and the type of hanger involved. Install hangers in a manner that will not cause them to deteriorate or fail due to age, corrosion, or elevated temperatures.
 - 5. Do not support ceilings directly from permanent metal forms or floor deck. Fasten hangers to cast-in-place hanger inserts, postinstalled mechanical or adhesive anchors, or power-actuated fasteners that extend through forms into concrete.

6. When steel framing does not permit installation of hanger wires at spacing required, install carrying channels or other supplemental support for attachment of hanger wires.
 7. Do not attach hangers to steel deck tabs.
 8. Do not attach hangers to steel roof deck. Attach hangers to structural members.
 9. Space hangers not more than 48 inches o.c. along each member supported directly from hangers unless otherwise indicated; provide hangers not more than 8 inches from ends of each member.
 10. Size supplemental suspension members and hangers to support ceiling loads within performance limits established by referenced standards.
- C. Secure bracing wires to ceiling suspension members and to supports with a minimum of four tight turns. Suspend bracing from building's structural members as required for hangers, without attaching to permanent metal forms, steel deck, or steel deck tabs. Fasten bracing wires into concrete with cast-in-place or postinstalled anchors.
- D. Install edge moldings and trim of type indicated at perimeter of acoustical ceiling area and where necessary to conceal edges of acoustical panels.
1. Apply acoustical sealant in a continuous ribbon concealed on back of vertical legs of moldings before they are installed.
 2. Screw attach moldings to substrate at intervals not more than 16 inches o.c. and not more than 3 inches from ends. Miter corners accurately and connect securely.
 3. Do not use exposed fasteners, including pop rivets, on moldings and trim.
- E. Install suspension-system runners so they are square and securely interlocked with one another. Remove and replace dented, bent, or kinked members.
- F. Install acoustical panels with undamaged edges and fit accurately into suspension-system runners and edge moldings. Scribe and cut panels at borders and penetrations to provide precise fit.
1. Arrange directionally patterned acoustical panels as follows:
 - a. As indicated on reflected ceiling plans.

3.4 ERECTION TOLERANCES

- A. Suspended Ceilings: Install main and cross runners level to a tolerance of 1/8 inch in 12 feet, non-cumulative.
- B. Moldings and Trim: Install moldings and trim to substrate and level with ceiling suspension system to a tolerance of 1/8 inch in 12 feet, non-cumulative.

3.5 CLEANING

- A. Clean exposed surfaces of acoustical panel ceilings, including trim, edge moldings, and suspension-system members. Comply with manufacturer's written instructions for cleaning and touchup of minor finish damage.

- B. Remove and replace ceiling components that cannot be successfully cleaned and repaired to permanently eliminate evidence of damage.

END OF SECTION 095113

SECTION 096513 - RESILIENT BASE AND ACCESSORIES

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. Thermoplastic-rubber base.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product.
- B. Samples for Verification: For each type of product indicated and for each color, texture, and pattern required in manufacturer's standard-size Samples, but not less than 12 inches long.
- C. Product Schedule: For resilient base and accessory products.

1.4 MAINTENANCE MATERIAL SUBMITTALS

- A. Furnish extra materials, from the same product run, that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
 - 1. Furnish not less than 10 linear feet for every 500 linear feet or fraction thereof, of each type, color, pattern, and size of resilient product installed.

1.5 QUALITY ASSURANCE

- A. Mockups: Build mockups to verify selections made under Sample submittals, to demonstrate aesthetic effects, and to set quality standards for materials and execution.
 - 1. Coordinate mockups in this Section with mockups specified in other Sections.
 - 2. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Architect specifically approves such deviations in writing.
 - 3. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Store resilient products and installation materials in dry spaces protected from the weather, with ambient temperatures maintained within range recommended by manufacturer, but not less than 50 deg F or more than 90 deg F.

1.7 FIELD CONDITIONS

- A. Maintain ambient temperatures within range recommended by manufacturer, but not less than 70 deg F or more than 95 deg F, in spaces to receive resilient products during the following periods:
 - 1. 48 hours before installation.
 - 2. During installation.
 - 3. 48 hours after installation.
- B. After installation and until Substantial Completion, maintain ambient temperatures within range recommended by manufacturer, but not less than 55 deg F or more than 95 deg F.
- C. Install resilient products after other finishing operations, including painting, have been completed.

PART 2 - PRODUCTS

2.1 THERMOSET-RUBBER BASE

- A. Product Standard: ASTM F1861, Type TS (rubber, vulcanized thermoset), Group I (solid, homogeneous).
 - 1. Style and Location: Johnsonite Millwork: Monument
- B. Thickness: .25
- C. Height: 4 inches.
- D. Lengths: coils in manufacturer's standard length.
- E. Outside Corners: Job formed or preformed
- F. Inside Corners: Job formed or preformed.
- G. Colors: TB1 Peppercorn

2.2 INSTALLATION MATERIALS

- A. Adhesives: Water-resistant type recommended by resilient-product manufacturer for resilient products and substrate conditions indicated.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, with Installer present, for compliance with requirements for maximum moisture content and other conditions affecting performance of the Work.
 - 1. Verify that finishes of substrates comply with tolerances and other requirements specified in other Sections and that substrates are free of cracks, ridges, depressions, scale, and foreign deposits that might interfere with adhesion of resilient products.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.
 - 1. Installation of resilient products indicates acceptance of surfaces and conditions.

3.2 PREPARATION

- A. Prepare substrates according to manufacturer's written instructions to ensure adhesion of resilient products.
- B. Fill cracks, holes, and depressions in substrates with trowelable leveling and patching compound; remove bumps and ridges to produce a uniform and smooth substrate.
- C. Do not install resilient products until materials are the same temperature as space where they are to be installed.
 - 1. At least 48 hours in advance of installation, move resilient products and installation materials into spaces where they will be installed.
- D. Immediately before installation, sweep and vacuum clean substrates to be covered by resilient products.

3.3 RESILIENT BASE INSTALLATION

- A. Comply with manufacturer's written instructions for installing resilient base.
- B. Apply resilient base to walls, columns, pilasters, casework and cabinets in toe spaces, and other permanent fixtures in rooms and areas where base is required.
- C. Install resilient base in lengths as long as practical without gaps at seams and with tops of adjacent pieces aligned.
- D. Tightly adhere resilient base to substrate throughout length of each piece, with base in continuous contact with horizontal and vertical substrates.
- E. Do not stretch resilient base during installation.

- F. On masonry surfaces or other similar irregular substrates, fill voids along top edge of resilient base with manufacturer's recommended adhesive filler material.
- G. Preformed Corners: Install preformed corners before installing straight pieces.
- H. Job-Formed Corners:
 - 1. Outside Corners: Use straight pieces of maximum lengths possible and form with returns not less than 3 inches in length.
 - a. Form without producing discoloration (whitening) at bends.
 - 2. Inside Corners: Use straight pieces of maximum lengths possible and form with returns not less than 3 inches in length.
 - a. Miter corners to minimize open joints.

3.4 CLEANING AND PROTECTION

- A. Comply with manufacturer's written instructions for cleaning and protecting resilient products.
- B. Perform the following operations immediately after completing resilient-product installation:
 - 1. Remove adhesive and other blemishes from surfaces.
- C. Protect resilient products from mars, marks, indentations, and other damage from construction operations and placement of equipment and fixtures during remainder of construction period.

END OF SECTION 096513

SECTION 096519 - RESILIENT TILE FLOORING

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. Solid vinyl floor tile.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product.
- B. Shop Drawings: For each type of resilient floor tile.
 - 1. Include floor tile layouts, edges, columns, doorways, enclosing partitions, built-in furniture, cabinets, and cutouts.
 - 2. Show details of special patterns.
- C. Samples for Verification: Full-size units of each color and pattern of floor tile required.

1.4 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For Installer.

1.5 CLOSEOUT SUBMITTALS

- A. Maintenance Data: For each type of floor tile to include in maintenance manuals.

1.6 MAINTENANCE MATERIAL SUBMITTALS

- A. Furnish extra materials, from the same product run, that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
 - 1. Floor Tile: Furnish one box for every 50 boxes or fraction thereof, of each type, color, and pattern of floor tile installed.

1.7 QUALITY ASSURANCE

- A. Installer Qualifications: An entity that employs installers and supervisors who are competent in techniques required by manufacturer for floor tile installation and seaming method indicated.
 - 1. Engage an installer who employs workers for this Project who are trained or certified by floor tile manufacturer for installation techniques required.
- B. Mockups: Build mockups to verify selections made under Sample submittals, to demonstrate aesthetic effects, and to set quality standards for materials and execution.
 - 1. Coordinate mockups in this Section with mockups specified in other Sections.
 - a. Size: Minimum 100 sq. ft. for each type, color, and pattern
 - 2. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Architect specifically approves such deviations in writing.
 - 3. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.8 DELIVERY, STORAGE, AND HANDLING

- A. Store floor tile and installation materials in dry spaces protected from the weather, with ambient temperatures maintained within range recommended by manufacturer, but not less than 50 deg F or more than 90 deg F. Store floor tiles on flat surfaces.

1.9 FIELD CONDITIONS

- A. Maintain ambient temperatures within range recommended by manufacturer, but not less than 70 deg F or more than 95 deg F, in spaces to receive floor tile during the following periods:
 - 1. 48 hours before installation.
 - 2. During installation.
 - 3. 48 hours after installation.
- B. After installation and until Substantial Completion, maintain ambient temperatures within range recommended by manufacturer, but not less than 55 deg F or more than 95 deg F.
- C. Close spaces to traffic during floor tile installation.
- D. Close spaces to traffic for 48 hours after floor tile installation.
- E. Install floor tile after other finishing operations, including painting, have been completed.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Fire-Test-Response Characteristics: For resilient floor tile, as determined by testing identical products according to ASTM E648 or NFPA 253 by a qualified testing agency.
 - 1. Critical Radiant Flux Classification: Class I, not less than 0.45 W/sq. cm.

2.2 SOLID VINYL FLOOR TILE

- A. Basis of Design:
 - 1. Manufacturer: Shaw Contract
 - 2. Style: unite
 - 3. Pattern: Cove
 - 4. Color: Pour
 - 5. Size: 9x48

2.3 INSTALLATION MATERIALS

- A. Trowelable Leveling and Patching Compounds: Latex-modified, portland-cement-based or blended hydraulic-cement-based formulation provided or approved by floor tile manufacturer for applications indicated.
- B. Adhesives: Water-resistant type recommended by floor tile and adhesive manufacturers to suit floor tile and substrate conditions indicated.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, with Installer present, for compliance with requirements for maximum moisture content and other conditions affecting performance of the Work.
 - 1. Verify that finishes of substrates comply with tolerances and other requirements specified in other Sections and that substrates are free of cracks, ridges, depressions, scale, and foreign deposits that might interfere with adhesion of floor tile.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Prepare substrates according to floor tile manufacturer's written instructions to ensure adhesion of resilient products.
- B. Concrete Substrates: Prepare according to ASTM F710.

1. Verify that substrates are dry and free of curing compounds, sealers, and hardeners.
2. Remove substrate coatings and other substances that are incompatible with adhesives and that contain soap, wax, oil, or silicone, using mechanical methods recommended by floor tile manufacturer. Do not use solvents.
3. Alkalinity and Adhesion Testing: Perform tests recommended by floor tile manufacturer. Proceed with installation only after substrate alkalinity falls within range on pH scale recommended by manufacturer in writing, but not less than 5 or more than 9 pH.
4. Moisture Testing: Perform tests so that each test area does not exceed 200 sq. ft., and perform no fewer than three tests in each installation area and with test areas evenly spaced in installation areas.
 - a. Anhydrous Calcium Chloride Test: ASTM F1869. Proceed with installation only after substrates have maximum moisture-vapor-emission rate of 3 lb of water/1000 sq. ft. in 24 hours.
 - b. Relative Humidity Test: Using in-situ probes, ASTM F2170. Proceed with installation only after substrates have a maximum 75 percent relative humidity level measurement.
- C. Fill cracks, holes, and depressions in substrates with trowelable leveling and patching compound; remove bumps and ridges to produce a uniform and smooth substrate.
- D. Do not install floor tiles until materials are the same temperature as space where they are to be installed.
 1. At least 48 hours in advance of installation, move resilient floor tile and installation materials into spaces where they will be installed.
- E. Immediately before installation, sweep and vacuum clean substrates to be covered by resilient floor tile.

3.3 FLOOR TILE INSTALLATION

- A. Comply with manufacturer's written instructions for installing floor tile.
- B. Lay out floor tiles from center marks established with principal walls, discounting minor offsets, so tiles at opposite edges of room are of equal width. Adjust as necessary to avoid using cut widths that equal less than one-half tile at perimeter.
 1. Lay tiles as noted on drawings.
- C. Match floor tiles for color and pattern by selecting tiles from cartons in the same sequence as manufactured and packaged, if so numbered. Discard broken, cracked, chipped, or deformed tiles.
 1. Lay tiles as shown on drawings
- D. Scribe, cut, and fit floor tiles to butt neatly and tightly to vertical surfaces and permanent fixtures including built-in furniture, cabinets, pipes, outlets, and door frames.

- E. Extend floor tiles into toe spaces, door reveals, closets, and similar openings. Extend floor tiles to center of door openings.
- F. Maintain reference markers, holes, and openings that are in place or marked for future cutting by repeating on floor tiles as marked on substrates. Use chalk or other nonpermanent marking device.
- G. Install floor tiles on covers for telephone and electrical ducts, building expansion-joint covers, and similar items in installation areas. Maintain overall continuity of color and pattern between pieces of tile installed on covers and adjoining tiles. Tightly adhere tile edges to substrates that abut covers and to cover perimeters.
- H. Adhere floor tiles to substrates using a full spread of adhesive applied to substrate to produce a completed installation without open cracks, voids, raising and puckering at joints, telegraphing of adhesive spreader marks, and other surface imperfections.

3.4 CLEANING AND PROTECTION

- A. Comply with manufacturer's written instructions for cleaning and protecting floor tile.
- B. Perform the following operations immediately after completing floor tile installation:
 - 1. Remove adhesive and other blemishes from surfaces.
 - 2. Sweep and vacuum surfaces thoroughly.
 - 3. Damp-mop surfaces to remove marks and soil.
- C. Protect floor tile from mars, marks, indentations, and other damage from construction operations and placement of equipment and fixtures during remainder of construction period.
- D. Cover floor tile until Substantial Completion.

END OF SECTION 096519

SECTION 096813 - TILE CARPETING

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 modular carpet tile.

1.3 PREINSTALLATION MEETINGS

- A. Preinstallation Conference: Conduct conference at Project site
 - 1. Review methods and procedures related to carpet tile installation including, but not limited to, the following:
 - a. Review delivery, storage, and handling procedures.
 - b. Review ambient conditions and ventilation procedures.
 - c. Review subfloor preparation procedures.
 - d. Review pattern & electrical box locations.

1.4 ACTION SUBMITTALS

- A. Product Data: For each type of product.
 - 1. Include manufacturer's written data on physical characteristics, durability, and fade resistance.
 - 2. Include installation recommendations for each type of substrate.
- B. Shop Drawings: Show the following:
 - 1. Columns, doorways, enclosing walls or partitions, built-in cabinets, and locations where cutouts are required in carpet tiles.
 - 2. Carpet tile type, color, and dye lot.
 - 3. Type of subfloor.
 - 4. Type of installation.
 - 5. Pattern of installation.
 - 6. Pattern type, location, and direction.
 - 7. Pile direction.
 - 8. Type, color, and location of insets and borders.
 - 9. Type, color, and location of edge, transition, and other accessory strips.
 - 10. Transition details to other flooring materials.

- C. Samples: For each of the following products and for each color and texture required. Label each Sample with manufacturer's name, material description, color, pattern, and designation indicated on Drawings and in schedules.
 - 1. Carpet Tile: Full-size Sample.
 - 2. Exposed Edge, Transition, and Other Accessory Stripping: 12-inch long Samples.
- D. Product Schedule: For carpet tile. Use same designations indicated on Drawings.

1.5 CLOSEOUT SUBMITTALS

- A. Maintenance Data: For carpet tiles to include in maintenance manuals. Include the following:
 - 1. Methods for maintaining carpet tile, including cleaning and stain-removal products and procedures and manufacturer's recommended maintenance schedule.
 - 2. Precautions for cleaning materials and methods that could be detrimental to carpet tile.

1.6 MAINTENANCE MATERIAL SUBMITTALS

- A. Furnish extra materials, from the same product run, that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
 - 1. Carpet Tile: Full-size units equal to 5% percent of amount installed for each color indicated, but not less than 10 sq. yd.

1.7 QUALITY ASSURANCE

- A. Mockups: Build mockups to verify selections made under Sample submittals and to demonstrate aesthetic effects and set quality standards for fabrication and installation.
 - 1. Build mockups at locations and in sizes shown on Drawings.
 - 2. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.8 DELIVERY, STORAGE, AND HANDLING

- A. Comply with CRI 104.

1.9 FIELD CONDITIONS

- A. Comply with CRI 104 for temperature, humidity, and ventilation limitations.
- B. Environmental Limitations: Do not deliver or install carpet tiles until spaces are enclosed and weathertight, wet work in spaces is complete and dry, and ambient temperature and humidity conditions are maintained at occupancy levels during the remainder of the construction period.

- C. Do not install carpet tiles over concrete slabs until slabs have cured and are sufficiently dry to bond with adhesive and concrete slabs have pH range recommended by carpet tile manufacturer.
- D. Where demountable partitions or other items are indicated for installation on top of carpet tiles, install carpet tiles before installing these items.

1.10 WARRANTY

- A. Special Warranty for Carpet Tiles: Manufacturer agrees to repair or replace components of carpet tile installation that fail in materials or workmanship within specified warranty period.
 - 1. Warranty does not include deterioration or failure of carpet tile due to unusual traffic, failure of substrate, vandalism, or abuse.
 - 2. Failures include, but are not limited to, more than 10 percent edge raveling, snags, runs, dimensional stability, excess static discharge, loss of tuft bind strength, loss of face fiber, and delamination.
 - 3. Warranty Period: 10 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 CARPET TILE

- A. Products: Shaw Contract: Color At Work: Patterns: Achromatic, Duotone, Value, and Saturate. See colors and patterns indicated on drawings.
- B. Call sales representative: Paula Wade 1.540.525.4900 for pricing take offs & shop drawing information. Her email address is: paula.wade@shawinc.com
- C. Size: 9x36 & 18 x 36; see drawings.

2.2 INSTALLATION ACCESSORIES

- A. Trowelable Leveling and Patching Compounds: Latex-modified, hydraulic-cement-based formulation provided or recommended by carpet tile manufacturer.
- B. Adhesives: Water-resistant, mildew-resistant, nonstaining, pressure-sensitive type to suit products and subfloor conditions indicated, that complies with flammability requirements for installed carpet tile and is recommended by carpet tile manufacturer for releasable installation.
 - 1. Adhesives shall have a VOC content of 50 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for maximum moisture content, alkalinity range, installation tolerances, and other conditions affecting carpet tile performance. Examine carpet tile for type, color, pattern, and potential defects.
- B. Concrete Subfloors: Verify that concrete slabs comply with ASTM F 710 and the following:
 - 1. Slab substrates are dry and free of curing compounds, sealers, hardeners, and other materials that may interfere with adhesive bond. Determine adhesion and dryness characteristics by performing bond and moisture tests recommended by carpet tile manufacturer.
 - 2. Subfloors are free of cracks, ridges, depressions, scale, and foreign deposits.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. General: Comply with CRI 104, Section 6.2, "Site Conditions; Floor Preparation," and with carpet tile manufacturer's written installation instructions for preparing substrates indicated to receive carpet tile installation.
- B. Use trowelable leveling and patching compounds, according to manufacturer's written instructions, to fill cracks, holes, depressions, and protrusions in substrates. Fill or level cracks, holes and depressions 1/8 inch wide or wider and protrusions more than 1/32 inch unless more stringent requirements are required by manufacturer's written instructions.
- C. Remove coatings, including curing compounds, and other substances that are incompatible with adhesives and that contain soap, wax, oil, or silicone, without using solvents. Use mechanical methods recommended in writing by carpet tile manufacturer.
- D. Clean metal substrates of grease, oil, soil and rust, and prime if directed by adhesive manufacturer. Rough sand painted metal surfaces and remove loose paint. Sand aluminum surfaces, to remove metal oxides, immediately before applying adhesive.
- E. Broom and vacuum clean substrates to be covered immediately before installing carpet tile.

3.3 INSTALLATION

- A. General: Comply with CRI 104, Section 14, "Carpet Modules," and with carpet tile manufacturer's written installation instructions.
- B. Installation Method: Glue down; install every tile with full-spread, releasable, pressure-sensitive adhesive

- C. Maintain dye lot integrity. Do not mix dye lots in same area.
- D. Cut and fit carpet tile to butt tightly to vertical surfaces, permanent fixtures, and built-in furniture including cabinets, pipes, outlets, edgings, thresholds, and nosings. Bind or seal cut edges as recommended by carpet tile manufacturer.
- E. Extend carpet tile into toe spaces, door reveals, closets, open-bottomed obstructions, removable flanges, alcoves, and similar openings.
- F. Maintain reference markers, holes, and openings that are in place or marked for future cutting by repeating on finish flooring as marked on subfloor. Use nonpermanent, nonstaining marking device.
- G. Install pattern parallel to walls and borders.
- H. Stagger joints of carpet tiles so carpet tile grid is offset from access flooring panel grid. Do not fill seams of access flooring panels with carpet adhesive; keep seams free of adhesive.

3.4 CLEANING AND PROTECTION

- A. Perform the following operations immediately after installing carpet tile:
 - 1. Remove excess adhesive, seam sealer, and other surface blemishes using cleaner recommended by carpet tile manufacturer.
 - 2. Remove yarns that protrude from carpet tile surface.
 - 3. Vacuum carpet tile using commercial machine with face-beater element.
- B. Protect installed carpet tile to comply with CRI 104, Section 16, "Protecting Indoor Installations."
- C. Protect carpet tile against damage from construction operations and placement of equipment and fixtures during the remainder of construction period. Use protection methods indicated or recommended in writing by carpet tile manufacturer.

END OF SECTION 096813

SECTION 097713 - STRETCHED-FABRIC WALL SYSTEMS

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 site-upholstered wall systems.

1.3 DEFINITIONS

- A. NRC: Noise Reduction Coefficient.
- B. SAA: Sound Absorption Average.

1.4 PREINSTALLATION MEETINGS

- A. Preinstallation Conference: Conduct conference at Project Site

1.5 ACTION SUBMITTALS

- A. Product Data: For each type of product.
 - 1. Include fabric facing, frame edge and trim, core material, and mounting indicated.
- B. Shop Drawings: For each stretched-fabric system.
 - 1. Include plans, elevations, sections, and installation and system details.
 - 2. Include details at head, base, joints, and corners; and details at ceiling, floor base, and wall intersections. Indicate frame-edge profile and core materials.
 - 3. Include details at cutouts and penetrations for other work.
 - 4. Include direction of fabric weave and pattern matching.
 - 5. Show sewn-seam locations, types, and methods.
- C. Samples for Initial Selection: For each type of fabric facing.
 - 1. Include Samples of accessories involving color or finish selection.
- D. Samples for Verification: For the following products:

1. Fabric: Full-width by approximately 36-inch long Sample, but not smaller than required to show complete pattern repeat, from dye lot to be used for the Work, and with specified treatments applied. Mark top and face of fabric.
2. Frame System: 12-inch square Sample(s) showing each edge profile and corner.
3. Core Material: 12-inch square Sample at corner.
4. Assembled System: Approximately 36 by 36 inches, including joints in mockup.

1.6 INFORMATIONAL SUBMITTALS

- A. Coordination Drawings: Elevations and other details, drawn to scale, on which the following items are shown and coordinated with each other, using input from installers of the items involved: THERE SHOULD BE NO PENETRATIONS WITHIN ACOUSTICAL PANELS. COORDINATE WITH TRADES.
- B. Qualification Data: For Installer.
- C. Product Certificates: For each type of stretched-fabric system.
- D. Sample Warranty: For special warranty.

1.7 CLOSEOUT SUBMITTALS

- A. Maintenance Data: For stretched-fabric systems to include in maintenance manuals. Include fabric manufacturer's written cleaning, stain-removal, restretching, and reupholstering instructions.

1.8 MAINTENANCE MATERIAL SUBMITTALS

- A. Furnish extra materials, from the same product run, that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
 1. Fabric: For each fabric, color, and pattern installed, furnish length equal to 10 percent of amount installed, but no fewer than 10 sq. yd., full width of bolt.
 2. Framing and Related Installation Items: Furnish manufacturer's full-length units equal to 5 percent of amount installed, but no fewer than 5 units, including unopened adhesives.

1.9 QUALITY ASSURANCE

- A. Installer Qualifications: An authorized representative who is trained and approved by manufacturer.
- B. Mockups: Build mockups to verify selections made under Sample submittals, to demonstrate aesthetic effects, and to set quality standards for materials, fabrication, and installation.
 1. Build mockup of typical wall area as shown on Drawings

2. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Architect specifically approves such deviations in writing.
3. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.10 DELIVERY, STORAGE, AND HANDLING

- A. Comply with fabric and stretched-fabric system manufacturers' written instructions for minimum and maximum temperature and humidity requirements for shipment, storage, and handling.
- B. Deliver materials in unopened bundles and store in a temperature-controlled dry place with adequate air circulation.

1.11 FIELD CONDITIONS

- A. Environmental Limitations: Do not install stretched-fabric systems until spaces are enclosed and weathertight, wet-work in spaces is complete and dry, work at and above ceilings is complete, and ambient temperature and humidity conditions are maintained at the levels indicated for Project when occupied for its intended use.
- B. Lighting: Do not install stretched-fabric systems until a permanent level of lighting is provided on surfaces to receive stretched-fabric systems.
- C. Air-Quality Limitations: Protect stretched-fabric systems from exposure to airborne odors such as tobacco smoke, and install systems under conditions free from odor contamination of ambient air.

1.12 WARRANTY

- A. Special Warranty: Manufacturer and Installer agree to repair or replace components of stretched-fabric systems that fail in performance, materials, or workmanship within specified warranty period.
 1. Failures include, but are not limited to, the following:
 - a. Acoustical performance.
 - b. Fabric sagging, distorting, or releasing from panel edge.
 - c. Warping of core.
 2. Warranty Period: five years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. 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:
1. Accutrack Systems.
 2. Acoustical Solutions, Inc.
 3. Architectural Fabric Systems, Inc.
 4. DFB Sales, Inc.
 5. Fabricmate Systems, Inc.
 6. Fabric Wallmount Systems, Inc.
 7. FabriTrak Systems, Inc.
 8. Golterman & Sabo.
 9. Novawall Systems, Inc.
 10. Snap-Tex International LLC.
 11. SoftWalls, Inc.
 12. Wall Technology, Inc.; an Owens Corning company.
 13. Whisper Walls.

2.2 PERFORMANCE REQUIREMENTS

- A. Fire-Test-Response Characteristics: Stretched-fabric wall systems shall comply with "Surface-Burning Characteristics" or "Fire Growth Contribution" Subparagraph below, or both, as determined by testing identical products by UL or another testing and inspecting agency acceptable to authorities having jurisdiction:
1. Surface-Burning Characteristics: Comply with ASTM E84 or UL 723; testing by a qualified testing agency on systems prepared according to ASTM E2573. Identify products with appropriate markings of applicable testing agency.
 - a. Flame-Spread Index: 25 or less.
 - b. Smoke-Developed Index: 450 or less.
 2. Fire Growth Contribution: Comply with acceptance criteria of local code and authorities having jurisdiction when tested according to NFPA 286.

2.3 STRETCHED-FABRIC WALL SYSTEMS

- A. Stretched-Fabric Wall System: Manufacturer's standard system consisting of facing material stretched tightly over a frame and core material and secured in the frame.
1. Core: Manufacturer's standard
 - a. Core-Face Layer: Manufacturer's standard tackable, impact-resistant, high-density board
 - b. Nominal Core Thickness: ¾"
 2. Core Overlay: Polyester batting

3. Frame Edge: Chamfered (beveled) profile.
4. Reveals between Panels: as indicated on Drawings.
5. Facing Material: As indicated on drawings. Varies between rooms
6. Acoustical Performance: Sound absorption NRC of .80 according to ASTM C423 for Type A mounting according to ASTM E795.
7. Nominal Overall System Thickness: 1"

2.4 MATERIALS

- A. Core Materials:[Manufacturer's standard.]
 1. Glass-Fiber Board: ASTM C 612, Type standard with manufacturer; nominal density of 6 to 7 lb/cu. ft. , unfaced, and dimensionally stable, molded rigid board; and with maximum flame-spread and smoke-developed indexes of 25 and 50, respectively.
 2. Tackable, Impact-Resistant, High-Density Board for Face Layer: 1/8-inch- thick layer of compressed molded glass-fiber board with a nominal density of 16 to 18 lb/cu. ft. laminated to face of core.
 3. Core Overlay: Flame-retardant, compressible, fiberfill, polyester batting.
 4. Impact-Resistant, Acoustically Transparent, Copolymer Sheet for Face Layer: 1/16- to 1/8-inch thick layer of perforated, noncombustible, copolymer sheet laminated to face of core.
 - a. Fire-retardant treated by pressure process with a flame-spread index of 25 or less when tested according to ASTM E84 or UL 723, and with no evidence of significant progressive combustion when the test is extended an additional 20 minutes, and with the flame front not extending more than 10.5 feet beyond the centerline of the burners at any time during the test.
 - 1) Treated material shall have a moisture content of 28 percent or less when tested according to ASTM D3201/D3201M at 92 percent relative humidity.
 - 2) Kiln-dry material after treatment to 7 to 13 percent or less for lumber and 15 percent or less for plywood.
- B. Frame Construction: Manufacturer's standard, continuous, extruded plastic frame (track).
- C. Facing Material: Fabric from same dye lot; color and pattern as indicated on Drawings
 1. Manufacturer: varies. See finish list for each room
 2. Product Line/Pattern: See finish list for each room
 3. Style Number: See finish list for each room
 4. Color: See finish list for each room
 5. Width: minimum 54"
 6. Applied Treatments: manufacturer's standard
- D. Lining Material Fabric as indicated by manufacturer

2.5 INSTALLATION MATERIALS

- A. Installation Products: Concealed on back of system, recommended by stretched-fabric system manufacturer to support weight of system, fabric tension, and as follows:

1. Fasteners: Manufacturer's standard

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine fabric, materials, substrates, areas, and conditions, with Installer present, for compliance with requirements, installation tolerances, and other conditions affecting performance of stretched-fabric systems.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Measure each area and establish layout of panels and joints of uniform size with balanced borders at opposite edges within a given area.
- B. Before installation, allow fabric to adjust and become stable in spaces where it will be installed according to stretched-fabric system manufacturer's written instructions. Acclimatize fabric for minimum of 24 hours at ambient temperature and humidity conditions indicated for spaces when occupied for their intended use.

3.3 INSTALLATION

- A. Install stretched-fabric systems according to system manufacturer's written instructions.
 1. Provide continuous perimeter frames of each profile indicated, designed to be inconspicuous when covered by fabric facing, with smooth edges, and with surface finish that will not telegraph through fabric facing.
 2. Install framing around penetrations.
 3. Tightly fit framing to adjacent construction and securely attach to substrate.
 4. Install core material with full coverage, flush with face of stretched-fabric system frame.
 5. Attach frame and core to substrate with adhesive or fasteners or both to support system and prevent deformation of components.
 6. Install stretched-fabric systems level and plumb unless otherwise indicated, true in plane, and with fabric square to the grain.
 7. Install jointed panels with butt joints and reveals as indicated.
- B. Fabric Installation: Apply fabric monolithically in continuous run over area, without joints or reveals, except where panel joints or midspan frames are indicated.
 1. Fabric Direction: manufacturer standard
 2. Fabric Sequence: Maintain sequence of fabric drops; match and level fabric pattern and grain.
 3. Fabric Alignment: Install fabric with patterns or directional weaves so pattern or weave aligns with adjacent panels
 4. Fabric Seams: Sewn seams are not permitted.

5. Core Overlay: Evenly stretch over core face and edges; free from puckers, ripples, wrinkles, and sags.
6. Stretch and secure fabric to frame edges and so frame and frame attachment method are concealed by fabric unless otherwise indicated.
7. Stretch fabric tightly and square without puckers, ripples, or distortions. Acclimatize and restretch if recommended by stretched-fabric system manufacturer. Repair distortions, wrinkles, and sagging.
8. Trim Strip: Back-wrap trim strip fabric from the fabric-insertion point over the exposed part of the frame edge where indicated, resulting in a contrasting fabric along the edge.

3.4 INSTALLATION TOLERANCES

- A. Edge Straightness: Plus or minus 1/16 inch in 48 inches.
- B. Variation from Level and Plumb: Plus or minus 1/16 inch in 48 inches, noncumulative.
- C. Variation of Joint Width: Not more than 1/16 inch in 48 inches from reveal line, noncumulative.

3.5 CLEANING

- A. Clip loose threads; remove pills and extraneous materials.
- B. Clean panels on completion of installation to remove dust and other foreign materials according to manufacturer's written instructions.

END OF SECTION 097713

SECTION 099123 - INTERIOR PAINTING

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 surface preparation and the application of paint systems on the following interior substrates:
 - 1. Steel and iron.
 - 2. Galvanized metal.
 - 3. Gypsum board.
 - 4. Cotton or canvas insulation covering.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product. Include preparation requirements and application instructions.
 - 1. Include Printout of current "MPI Approved Products List" for each product category specified, with the proposed product highlighted.
 - 2. Indicate VOC content.
- B. Samples for Verification: For each type of paint system and in each color and gloss of topcoat.
 - 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.
- C. Product List: Cross-reference to paint system and locations of application areas. Use same designations indicated on Drawings and in schedules. Include color designations.

1.4 MAINTENANCE MATERIAL SUBMITTALS

- A. Furnish extra materials, from the same product run, that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
 - 1. Paint: 5 percent, but not less than 1 gal. of each material and color applied.

1.5 QUALITY ASSURANCE

- A. Mockups: Apply mockups of each paint system indicated and each color and finish selected to verify preliminary selections made under Sample submittals and to demonstrate aesthetic effects and 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 Architect specifically approves such deviations in writing.
 - 4. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.6 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.

1.7 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 less than 5 deg F above the dew point; or to damp or wet surfaces.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Products: Subject to compliance with requirements, provide product listed in the Interior Painting Schedule for the paint category indicated.

2.2 PAINT, GENERAL

A. Material Compatibility:

1. Materials for use within each paint system shall 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, products shall be recommended in writing by topcoat manufacturers for use in paint system and on substrate indicated.

B. Colors: As selected by Architect from manufacturer's full range

1. 25% percent of surface area will be painted with deep tones.

2.3 SOURCE QUALITY CONTROL

A. Testing of Paint Materials: Owner reserves the right to invoke the following procedure:

1. Owner will engage the services of a qualified testing agency to sample paint materials. Contractor will be notified in advance and may be present when samples are taken. If paint materials have already been delivered to Project site, samples may be taken at Project site. Samples will be identified, sealed, and certified by testing agency.
2. Testing agency will perform tests for compliance with product requirements.
3. Owner may direct Contractor to stop applying paints if test results show materials being used do not comply with product requirements. Contractor shall remove noncomplying paint materials from Project site, pay for testing, and repaint surfaces painted with rejected materials. Contractor will be required to remove rejected materials from previously painted surfaces if, on repainting with complying materials, the two paints are incompatible.

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. Gypsum Board: 12 percent.
- C. Gypsum Board Substrates: Verify that finishing compound is sanded smooth.
- D. Verify suitability of substrates, including surface conditions and compatibility, with existing finishes and primers.
- E. 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 and recommendations in "MPI Architectural Painting Specification Manual" 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. Steel Substrates: Remove rust, loose mill scale, and shop primer, if any. 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.
- E. 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.
- F. Galvanized-Metal Substrates: Remove grease and oil residue from galvanized sheet metal by mechanical methods to produce clean, lightly etched surfaces that promote adhesion of subsequently applied paints.
- G. Cotton or Canvas Insulation Covering Substrates: Remove dust, dirt, and other foreign material that might impair bond of paints to substrates.

3.3 APPLICATION

- A. Apply paints according to manufacturer's written instructions and to recommendations in "MPI Manual."
 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. Do not paint over labels of independent testing agencies or equipment name, identification, performance rating, or nomenclature plates.
 5. Primers specified in painting schedules may be omitted on items that are factory primed or factory finished if acceptable to topcoat 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 in equipment rooms:
 - a. Uninsulated metal piping.
 - b. Uninsulated plastic piping.
 - c. Pipe hangers and supports.
 - d. Metal conduit.
 - e. Plastic conduit.
 - f. Tanks that do not have factory-applied final finishes.
 - g. Duct, equipment, and pipe insulation having cotton or canvas insulation covering or other paintable jacket material.
 - h. Steel structure & decking
 2. Paint the following work where exposed 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.
 - i. Steel structure and decking
 3. 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. Contractor shall 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, Contractor shall pay for testing and apply additional coats as needed to provide dry film thickness that complies with paint manufacturer's written recommendations.

3.5 CLEANING AND PROTECTION

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

- A. Products noted are local paint products. Submit equals if needed.
- B. Steel Substrates:
 - 1. Alkyd System:
 - a. Prime Coat: Primer, alkyd, quick dry, for metal.
 - 1) PPG Architectural: Protective and Marine Coatings; Multiprime 4160 / Devguard 4160
 - 2) Sherwin Williams – Protective & Marine Kem Bond HS Universal Alkyd Primer
 - b. Prime Coat: Shop primer specified in Section where substrate is specified.
 - c. Intermediate Coat: Alkyd, interior, matching topcoat.
 - d. Topcoat: Alkyd, interior, flat.
 - 1) PPG Architectural: HPC Industrial Alkyd 4306/Devguard 4306
 - 2) Sherwin Williams - Pro Mar 200

C. Galvanized-Metal Substrates:

1. Latex System

- a. Prime Coat: Primer, galvanized, water based
 - 1) PPG Architectural Pitt Tech Plus 4020 PF/ Devflex 4020PF
 - 2) Sherwin Williams Pro Industrial Pro-Cryl Universal Primer
- b. Intermediate Coat: Latex, interior, matching topcoat.
- c. Topcoat:
 - 1) PPG Architectural Speedhide High Solids Interior Enamel Eggshell Latex

2. Alkyd Dry-Fall over Water Based Primer System

- a. Prime Coat: Primer, quick dry, for shop application
 - 1) PPG Architectural Pitt Tech Plus 4020 PF/ Devflex 4020PF
 - 2) Sherwin Williams Pro Industrial Pro-Cryl Universal Primer
- b. Topcoat: Dry fall, alkyd, flat:
 - 1) PPG Architectural: Speedhide Interior Alkyd Dry Fog Flat
 - 2) Sherwin Williams: Protective and Marine Dry Fall Flat

D. Gypsum Board Substrates:

1. Over Latex Sealer System :

- a. Prime Coat: Primer sealer, latex, interior.
 - 1) PPG Architectural: Speedhide Interior Latex Primer
 - 2) Sherwin Williams: ProMar200 Zero Interior Latex Primer
- b. Intermediate Coat: Latex, interior, matching topcoat.
- c. Topcoat: Latex, interior, flat
 - 1) PPG Architectural: Manor Hall Interior Paint, Primer/Stain Repellant
 - 2) Sherwin Williams: ProMar200 HP Zero VOC

END OF SECTION 099123

SECTION 099300 - STAINING AND TRANSPARENT FINISHING

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 surface preparation and application of wood stains and transparent finishes on the following substrates:
 - 1. Interior Substrates:
 - a. Dressed lumber (finish carpentry or woodwork).
 - b. Wood-based panel products.

1.3 DEFINITIONS

- A. MPI Gloss Level 1: Not more than 5 units at 60 degrees and 10 units at 85 degrees, according to ASTM D523.
- B. MPI Gloss Level 4: 20 to 35 units at 60 degrees and not less than 35 units at 85 degrees, according to ASTM D523.
- C. MPI Gloss Level 5: 35 to 70 units at 60 degrees, according to ASTM D523.
- D. MPI Gloss Level 6: 70 to 85 units at 60 degrees, according to ASTM D523.
- E. MPI Gloss Level 7: More than 85 units at 60 degrees, according to ASTM D523.

1.4 ACTION SUBMITTALS

- A. Product Data: For each type of product. Include preparation requirements and application instructions.
 - 1. Include printout of current "MPI Approved Products List" for each product category specified, with the proposed product highlighted.
 - 2. Indicate VOC content.
- B. Samples for Initial Selection: For each type of product.
- C. Samples for Verification: For each type of finish system and in each color and gloss of finish required.

1. Submit Samples on representative samples of actual wood substrates, 8 inches x 48" long wood sample
 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.
- D. Product List: Cross-reference to finish system and locations of application areas. Use same designations indicated on Drawings and in schedules. Include color designations.

1.5 MAINTENANCE MATERIAL SUBMITTALS

- A. Furnish extra materials, from the same product run, that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
1. Stains and Transparent Finishes: 5 percent, but not less than 1 gal. of each material and color applied.

1.6 QUALITY ASSURANCE

- A. Mockups: Apply mockups of each finish system indicated and each color selected to verify preliminary 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 type of finish system and substrate.
 - 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 stain color selections will be based on mockups.
 - a. If preliminary stain color selections are not approved, apply additional mockups of additional stain colors selected by Architect at no added cost to Owner.

1.7 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.

1.8 FIELD CONDITIONS

- A. Apply finishes only when temperature of surfaces to be finished and ambient air temperatures are between 50 and 95 deg F.

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

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Products: Subject to compliance with requirements to match existing color and finish sheen.

2.2 MATERIALS, GENERAL

- A. MPI Standards: Products shall comply with MPI standards indicated and shall be listed in its "MPI Approved Products List."
- B. Material Compatibility:
 - 1. Materials for use within each paint system shall 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, products shall be recommended in writing by manufacturers of topcoat for use in paint system and on substrate indicated.
- C. Stain Colors: match existing cabinet and wall panel stain

2.3 SOURCE QUALITY CONTROL

- A. Testing of Materials: Owner reserves the right to invoke the following procedure:
 - 1. Owner will engage the services of a qualified testing agency to sample wood finishing materials. Contractor will be notified in advance and may be present when samples are taken. If materials have already been delivered to Project site, samples may be taken at Project site. Samples will be identified, sealed, and certified by testing agency.
 - 2. Testing agency will perform tests for compliance with product requirements.
 - 3. Owner may direct Contractor to stop applying wood finishes if test results show materials being used do not comply with product requirements. Contractor shall remove noncomplying materials from Project site, pay for testing, and refinish surfaces finished with rejected materials. Contractor will be required to remove rejected materials from previously finished surfaces before refinishing with complying materials if the two finishes are incompatible or produce results that, in the opinion of the Architect, are aesthetically unacceptable.

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 Interior Wood Substrates: 10 percent, when measured with an electronic moisture meter.
- C. Verify suitability of substrates, including surface conditions and compatibility with existing finishes and primers.
- D. Proceed with finish application only after unsatisfactory conditions have been corrected.
 - 1. Beginning finish application constitutes Contractor's acceptance of substrates and conditions.

3.2 PREPARATION

- A. Comply with manufacturer's written instructions and recommendations in "MPI Architectural Painting Specification Manual" applicable to substrates indicated.
- B. Remove hardware, covers, plates, and similar items already in place that are removable. If removal is impractical or impossible because of size or weight of item, provide surface-applied protection before surface preparation and finishing.
 - 1. After completing finishing operations, use workers skilled in the trades involved to reinstall items that were removed. Remove surface-applied protection if any.
- C. Clean and prepare surfaces to be finished according to manufacturer's written instructions for each substrate condition and as specified.
 - 1. Remove dust, dirt, oil, and grease by washing with a detergent solution; rinse thoroughly with clean water and allow to dry. Remove grade stamps and pencil marks by sanding lightly. Remove loose wood fibers by brushing.
 - 2. Remove mildew by scrubbing with a commercial wash formulated for mildew removal and as recommended by stain manufacturer.
- D. Interior Wood Substrates:
 - 1. Apply wood filler paste to open-grain woods, as defined in "MPI Architectural Painting Specification Manual," to produce smooth, glasslike finish.
 - 2. Sand surfaces exposed to view and dust off.
 - 3. After priming, fill holes and imperfections in the finish surfaces with putty or plastic wood filler. Sand smooth when dry.

3.3 APPLICATION

- A. Apply finishes according to manufacturer's written instructions and recommendations in "MPI Architectural Painting Specification Manual."
 - 1. Use applicators and techniques suited for finish and substrate indicated.
 - 2. Finish surfaces behind movable equipment and furniture same as similar exposed surfaces.
 - 3. Do not apply finishes over labels of independent testing agencies or equipment name, identification, performance rating, or nomenclature plates.
- B. Apply finishes to produce surface films without cloudiness, holidays, lap marks, brush marks, runs, ropiness, or other surface imperfections.

3.4 CLEANING AND PROTECTION

- A. At end of each workday, remove rubbish, empty cans, rags, and other discarded materials from Project site.
- B. After completing finish application, clean spattered surfaces. Remove spattered materials by washing, scraping, or other methods. Do not scratch or damage adjacent finished surfaces.
- C. Protect work of other trades against damage from finish application. Correct damage 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 finished wood surfaces.

END OF SECTION 099300

SECTION 102226 – OPERABLE PARTITIONS

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 includes the following:

- 1. Manually operated, individual panel operable partitions.

- B. Related Sections include the following:

- 1. Division 3 Sections for concrete tolerances required.
 - 2. Division 5 Sections for primary structural support, including pre-punching of support members by structural steel supplier per operable partition supplier's template.
 - 3. Division 6 Sections for wood framing and supports, and all blocking at head and jambs as required.
 - 4. Division 9 Sections for wall and ceiling framing at head and jambs.

1.3 QUALITY ASSURANCE

- A. Installer Qualifications: An experienced installer who is certified in writing by the operable partition manufacturer, as qualified to install the manufacturer's partition systems for work similar in material, design, and extent to that indicated for this Project.
- B. Acoustical Performance: Test operable partitions in an independent acoustical laboratory in accordance with ASTM E90 test procedure to attain no less than the STC rating specified. Provide a complete and unedited written test report by the testing laboratory upon request.
- C. Preparation of the opening shall conform to the criteria set forth per ASTM E557 "Standard Practice for Architectural Application and Installation of Operable Partitions."

1.4 SUBMITTALS

- A. Product Data: Material descriptions, construction details, finishes, installation details, and operating instructions for each type of operable partition, component, and accessory specified.
- B. Shop Drawings: Show location and extent of operable partitions. Include plans, sections, details, attachments to other construction, and accessories. Indicate dimensions, weights, conditions at openings, and at storage areas, and required installation, storage, and operating clearances. Indicate location and installation requirements for hardware and track, including floor tolerances required and direction of travel. Indicate blocking to be provided by others.

- C. Setting Drawings: Show imbedded items and cutouts required in other work, including support beam punching template.
- D. Samples: Color samples demonstrating full range of finishes available by architect.
Verification samples will be available in same thickness and material indicated for the work.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Clearly mark packages and panels with numbering systems used on Shop Drawings. Do not use permanent markings on panels.
- B. Protect panels during delivery, storage, and handling to comply with manufacturer's direction and as required to prevent damage.

1.6 WARRANTY

- A. Provide written warranty by manufacturer of operable partitions agreeing to repair or replace any components with manufacturing defects.
- B. Partition Warranty period: Three (3) years from date of shipment.
- C. Suspension System Warranty:
 - 1. Twenty (20) years from date of shipment.

PART 2 - PRODUCTS

2.1 MANUFACTURERS, PRODUCTS, AND OPERATIONS

- A. Manufacturers: Subject to compliance with requirements, provide products by the following:
 - 1. Modernfold, Inc.
- B. Products: Subject to compliance with the requirements, provide the following product:
 - 1. Acousti-Seal Encore - Single Panel: Manually operated individual panel operable partition.

2.2 OPERATION

- A. Acousti-Seal Encore - Single Panel: Series of individual flat panels, manually operated, top supported with operable floor seals and automatic top seals.
- E. Final Closure:
 - 1. Horizontally expanding panel edge with removable crank

2.3 PANEL CONSTRUCTION

A. Nominal 4.25-inch (108mm) thick panels in manufacturer's standard 51-inch (1295mm) widths. All panel horizontal and vertical framing members fabricated from minimum 16-gage formed steel with overlapped and welded corners for rigidity. Top channel is reinforced to support suspension system components. Frame is designed so that full vertical edges of panels are of formed steel and provide concealed protection of the edges of the panel skin.

B. Panel skin shall be:

1. Roll-formed steel wrapping around panel edge. Panel skins shall be lock formed and welded directly to the frame for unitized construction. Acoustical ratings of panels with this construction minimum:

a. 52 STC

C. Hinges for Closure Panels, Pass Doors, and Pocket Doors shall be:

1. Full leaf butt hinges, attached directly to the panel frame with welded hinge anchor plates within panel to further support hinge mounting to frame. Lifetime warranty on hinges. Hinges mounted into panel edge or vertical astragal are not acceptable.

D. Panel Trim: No vertical trim required or allowed on edges of panels; minimal groove appearance at all panel joints.

E. Panel Weights:

1. 52 STC - 8.2 lbs./square foot

2.4 PANEL FINISH

A. Panel finish shall be factory applied, Class "A" rated material. Finish shall be:

1. Lower Half – (up to 9'-0") Reinforced impact resistant vinyl with woven backing weighing not less than 30.oz
2. Upper Half - Reinforced vinyl with woven backing weighing not less than 21.oz

B. Panel Trim: Exposed panel trim of one consistent color:

1. Vinyl covered fastener at seam of the 2 vinyl finishes.
 - a. no exposed screws
2. Standard Trim finish
 - a. Color - To Be Advised

2.5 SOUND SEALS

- A. Vertical Interlocking Sound Seals between panels: Aluminum astragals, with tongue and groove configuration in each panel edge. Rigid plastic astragals are not acceptable.
- B. Horizontal Top Seals shall be Modernfold SureSet™ automatic operable top seals, manually operated top seals not required or permitted.
- C. Horizontal bottom floor seals shall be Modernfold Sureset™ bottom seal:
 - 1. Modernfold SA2 Bottom Seal. Automatic operable seals providing nominal 2" (51mm) operating clearance with an operating range of + 0.50" (13mm) to -1.50" (38mm) which automatically drop as panels are positioned without the need for tools or cranks. Extended seal shall exert nominal 120 pounds (265 kg) downward force to the floor throughout operating range.

2.6 SUSPENSION SYSTEM

A. #14 Suspension System

- 1. Suspension Tracks: Minimum 7-gauge, 0.18-inch (4.57mm) roll formed steel. Static loading of track with brackets at 48-inch (1220mm) centers shall show no failure of track or brackets at 5,000 pounds (2550kg) point loading at mid-span. Track shall be supported by adjustable steel hanger brackets connected to structural support pairs of 0.50-inch (13mm) diameter threaded rods. Brackets must support the load bearing surface of the track.
 - a. Exposed track soffit: Steel, removable for service and maintenance, attached to track bracket without exposed fasteners, and pre-painted off-white.

2.7 OPTIONS

A. Available accessories/options:

B. Single Pass Doors:

- 1. Matching pass door same thickness and appearance as the panels. ADA compliant pass door to be trimless and equipped with friction latch and flush pulls for panic operation. No threshold will be permitted.
- 2. Recessed Self-Illuminated exit signs
 - 1. Pocket Doors: Acousti-Seal Pocket Doors by Modernfold, Inc., with same construction, finish, and appearance as the adjacent panels.
 - a. Pocket Door configuration shall be manually operated: Type IV bi-fold door hinged to a jamb on one side as required.

PART 3: EXECUTION

3.1 INSTALLATION

- A. General: Comply with ASTM E557, operable partition manufacturer's written installation instructions, Drawings and approved Shop Drawings.
- B. Install operable partitions and accessories after other finishing operations, including painting have been completed.
- C. Match operable partitions by installing panels from marked packages in numbered sequence indicated on Shop Drawings.
- D. Broken, cracked, chipped, deformed or unmatched panels are not acceptable.

3.2 CLEANING AND PROTECTION

- A. Clean partition surfaces upon completing installation of operable partitions to remove dust, dirt, adhesives, and other foreign materials according to manufacturer's written instructions.
- B. Provide final protection and maintain conditions in a manner acceptable to the manufacturer and installer that insure operable partitions are without damage or deterioration at time of Substantial Completion.

3.3 ADJUSTING

- A. Adjust operable partitions to operate smoothly, easily, and quietly, free from binding, warp, excessive deflection, distortion, nonalignment, misplacement, disruption, or malfunction, throughout entire operational range. Lubricate hardware and other moving parts.

3.4 EXAMINATION

- A. Examine flooring, structural support, and opening, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of operable partitions. Proceed with installation only after unsatisfactory conditions have been corrected.

3.5 DEMONSTRATION

- A. Demonstrate proper operation and maintenance procedures to Owner's representative.
- B. Provide Operation and Maintenance Manual to Owner's representative.

SECTION 123640 - STONE COUNTERTOPS

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 granite countertops.

1.3 ACTION SUBMITTALS

- A. Shop Drawings:
 - 1. Include plans, sections, details, and attachments to other work.
 - 2. Show locations and details of joints.
 - 3. Show direction of veining, grain, or other directional pattern.
- B. Samples for Verification: For each stone type indicated, in sets of Samples not less than 12 inches square.
 - 1. Include two or more Samples in each set and show the full range of variations in appearance characteristics expected in the completed Work.

1.4 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For fabricator.
- B. Material Test Reports:
 - 1. Stone Test Reports: For each stone variety proposed for use on Project, by a qualified testing agency, indicating compliance with required physical properties, according to referenced ASTM standards. Base reports on testing done within previous three years.
 - 2. Sealant Compatibility and Adhesion Test Report: From sealant manufacturer indicating that sealants will not stain or damage stone.

1.5 CLOSEOUT SUBMITTALS

- A. Maintenance Data: For stone countertops to include in maintenance manuals. Include product data for stone-care products used or recommended by Installer, and names, addresses, and telephone numbers of local sources for products.

1.6 QUALITY ASSURANCE

- A. Fabricator Qualifications: Shop that employs skilled workers who custom-fabricate stone countertops similar to that required for this Project, and whose products have a record of successful in-service performance.
- B. Installer Qualifications: Fabricator of stone countertops.
- C. Mockups: Build mockups to demonstrate aesthetic effects and to set quality standards for fabrication and execution.
 - 1. Build mockup of typical countertop as shown on Drawings.
 - 2. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Store and handle stone and related materials to prevent deterioration or damage due to moisture, temperature changes, contaminants, corrosion, breaking, chipping, and other causes.
 - 1. Lift stone with wide-belt slings; do not use wire rope or ropes that might cause staining. Move stone, if required, using dollies with cushioned wood supports.
 - 2. Store stone on wood A-frames or pallets with nonstaining, waterproof covers. Arrange to distribute weight evenly and to prevent damage to stone. Ventilate under covers to prevent condensation.

1.8 FIELD CONDITIONS

- A. Field Measurements: Verify dimensions of construction to receive stone countertops by field measurements before fabrication and indicate measurements on Shop Drawings.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Source Limitations for Stone: Obtain each variety of stone, regardless of finish, from a single quarry, whether specified in this Section or in another Specification Section, with resources to provide materials of consistent quality in appearance and physical properties.

2.2 GRANITE

- A. Material Standard: Comply with ASTM C615/C615M.
- B. Description: Uniform, fine-grained. Match existing slab type.
- C. Cut stone from contiguous, matched slabs in which natural markings occur.

- D. Finish: Polished
- E. Match Architect's samples for color, finish, and other stone characteristics relating to aesthetic effects.

2.3 ADHESIVES, GROUT, SEALANTS, AND STONE ACCESSORIES

- A. General: Use only adhesives formulated for stone and ceramic tile and that are recommended by their manufacturer for the application indicated.
- B. Water-Cleanable Epoxy Adhesive: ANSI A118.3.
- C. Water-Cleanable Epoxy Grout: ANSI A118.3, chemical-resistant, water-cleanable, tile-setting and -grouting epoxy.
- D. Stone Adhesive: Two-part epoxy adhesive, formulated specifically for bonding stone to stone, with an initial set time of not more than two hours at 70 deg F.
 - 1. Color: match stone
- E. Sealant for Countertops: Manufacturer's standard sealant that complies with applicable requirements in Section 079200 "Joint Sealants" and that will not stain the stone it is applied to.
 - 1. Mildew-Resistant Joint Sealant: Single component, nonsag, mildew resistant, acid curing, silicone
 - 2. Joint Sealant: Single component, nonsag, neutral curing, silicone; Class 25
 - 3. Color: clear
- F. Stone Joint Splines: Stainless-steel or brass washers approximately 1 inch (25 mm) in diameter and of thickness to fit snugly in saw-cut kerf in edge of stone units.
- G. Plywood Subtops: Exterior softwood plywood complying with DOC PS 1, Grade C-C Plugged, touch sanded.
- H. Stone Cleaner: Specifically formulated for stone types, finishes, and applications indicated, as recommended by stone producer and, if a sealer is specified, by sealer manufacturer. Do not use cleaning compounds containing acids, caustics, harsh fillers, or abrasives.
- I. Stone Sealer: Colorless, stain-resistant sealer that does not affect color or physical properties of stone surfaces, as recommended by stone producer for application indicated.

2.4 STONE FABRICATION, GENERAL

- A. Select stone for intended use to prevent fabricated units from containing cracks, seams, and starts that may impair structural integrity, function, or appearance.
 - 1. Repairs that are characteristic of the varieties specified are acceptable provided they do not impair structural integrity or function and are not aesthetically displeasing, as judged by Architect.

- B. Grade and mark stone for final locations to produce assembled countertop units with an overall uniform appearance.
- C. Fabricate stone countertops in sizes and shapes required to comply with requirements indicated.
 - 1. Clean sawed backs of stones to remove rust stains and iron particles.
 - 2. Dress joints straight and at right angle to face unless otherwise indicated.
 - 3. Cut and drill sinkages and holes in stone for anchors, supports, and attachments.
 - 4. Provide openings, reveals, and similar features as needed to accommodate adjacent work.
 - 5. Fabricate molded edges with machines having abrasive shaping wheels made to reverse contour of edge profile to produce uniform shape throughout entire length of edge and with precisely formed arris slightly eased to prevent snapping, and matched at joints between units. Form corners of molded edges as indicated with outside corners slightly eased unless otherwise indicated.
 - 6. Finish exposed faces of stone to comply with requirements indicated for finish of each stone type required and to match approved Samples and mockups. Provide matching finish on exposed edges of countertops, splashes, and cutouts.
- D. Carefully inspect finished stone units at fabrication plant for compliance with requirements for appearance, material, and fabrication. Replace defective units.

2.5 STONE COUNTERTOPS

- A. General: Comply with recommendations in MIA's "Dimension Stone - Design Manual VII."
- B. Nominal Thickness: Provide thickness indicated, but not less than 3/4 inch. Gage backs to provide units of identical thickness.
- C. Edge Detail: Straight, slightly eased at top to receive wood nosing.
- D. Splashes: Provide 3/4-inch thick unless otherwise indicated.
 - 1. Height: 4 inches.
 - 2. Top-Edge Detail: Straight, slightly eased at corner.
- E. Joints: Fabricate countertops without joints.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates to receive stone countertops and conditions under which stone countertops will be installed, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of stone countertops.
- B. Prepare written report, endorsed by Installer, listing conditions detrimental to performance of stone countertops.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Advise installers of other work about specific requirements for placement of inserts and similar items to be used by stone countertop Installer for anchoring stone countertops. Furnish installers of other work with Drawings or templates showing locations of these items.
- B. Before installing stone countertops, clean dirty or stained stone surfaces by removing soil, stains, and foreign materials. Use only mild cleaning compounds that contain no caustic or harsh materials or abrasives and rinse with clear water. Allow stone to dry before installing.

3.3 CONSTRUCTION TOLERANCES

- A. Variation from Level: Do not exceed 1/8 inch in 96 inches maximum.

3.4 INSTALLATION OF COUNTERTOPS

- A. Install countertops by adhering to supports with water-cleanable epoxy adhesive.
- B. Do not cut stone in field unless otherwise indicated. If stone countertops or splashes require additional fabrication not specified to be performed at Project site, return to fabrication shop for adjustment.
- C. Do necessary field cutting as stone is set. Use power saws with diamond blades to cut stone. Cut lines straight, true, and at right angles to finished surfaces unless beveling is required for clearance. Ease edges slightly to prevent snipping.
- D. Install backsplashes and end splashes by adhering to countertops with stone adhesive. Mask areas of countertops and splashes adjacent to joints to prevent adhesive smears.

3.5 ADJUSTING AND CLEANING

- A. In-Progress Cleaning: Clean countertops as work progresses. Remove adhesive, grout, mortar, and sealant smears immediately.
- B. Remove and replace stone countertops of the following description:
 - 1. Broken, chipped, stained, or otherwise damaged stone. Stone may be repaired if methods and results are approved by Architect.
 - 2. Defective countertops.
 - 3. Defective joints, including misaligned joints.
 - 4. Interior stone countertops and joints not matching approved Samples and mockups.
 - 5. Interior stone countertops not complying with other requirements indicated.
- C. Replace in a manner that results in stone countertops matching approved Samples and mockups, complying with other requirements, and showing no evidence of replacement.
- D. Clean stone countertops no fewer than six days after completion of sealant installation, using clean water and soft rags. Do not use wire brushes, acid-type cleaning agents, cleaning compounds with caustic or harsh fillers, or other materials or methods that may damage stone.

- E. Sealer Application: Apply stone sealer to comply with stone producer's and sealer manufacturer's written instructions.

END OF SECTION 123640

SECTION 260100 - BASIC ELECTRICAL REQUIREMENTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this and the other sections of Division 26.
- B. All sections of Division 26 are interrelated. Where materials are required to complete work associated with equipment in a specific section, but the materials are not specified within that specific section, the requirements for those materials shall be as specified elsewhere in Division 26.

1.2 SUMMARY

- A. This Section includes general administrative and procedural requirements for electrical installations. The following administrative and procedural requirements are included in this Section to expand the requirements specified in Division 01:
 - 1. Submittals.
 - 2. Coordination drawings.
 - 3. Record documents.
 - 4. Maintenance manuals.
 - 5. Rough-ins.
 - 6. Electrical installations.
 - 7. Cutting and patching.
 - 8. Inspections
- B. Related Sections: The following sections contain requirements that relate to this section:
 - 1. Division 26 Section "Basic Electrical Materials and Methods," for materials and methods common to the remainder of Division 26.

1.3 SUBMITTALS

- A. General: Follow the procedures specified in Division 01 Section "Submittal Procedures".
- B. Specific Requirements to Electrical Product Data and Shop Drawing Submittals:
 - 1. Submit newly prepared information, drawn to scale where applicable. Do not reproduce Contract Documents or use Contract Document images in the preparation of submittals.
 - 2. Any deviations from Contract Documents shall be clearly noted and highlighted, encircled, or otherwise visually identified.
 - 3. Product Data and Shop Drawings are separate items and shall be submitted with separate submittal numbers. Where both Product Data and Shop Drawings are required by the same specification section (i.e. Fire alarm) both items shall be submitted for review at the same time. Product Data and Shop Drawings will be reviewed separately by Engineer, but Engineer reserves the right to withhold review until both items have been received.

4. Submittal Documents Quality: Facsimile documents are prohibited. Submittals containing sheets copied from facsimile documents will be automatically Rejected and returned to Contractor without review. Also submittals containing poor quality copies will be automatically Rejected and returned to Contractor without review.
 5. Submittal Document Binding: Use report covers with 3-hole, dual-prong tang fasteners or slide fasteners. Velo- and comb bound documents are also acceptable. Use of 3-ring binders is prohibited and will be automatically Rejected and returned to Contractor without review.
- C. Additional copies may be required by individual sections of these Specifications.
- D. Substitution of Equivalent Products: Where individual sections require submittal for substitution of manufacturers and products equivalent to those listed under Manufacturers paragraph, submittals shall be in accordance with that section. Engineer has final authority on equivalence and acceptance.
1. Submittal of Substitution Request Forms are permitted by Prime Bidders only. Substitution Request Forms submitted by a vendor, distributor, or sub-contractor will not be accepted or reviewed.

1.4 RECORD DOCUMENTS

- A. Prepare record documents in accordance with the requirements in Division 01 Section "Closeout Procedures." In addition to the requirements specified in Division 01, indicate installed conditions for:
1. Major raceway systems, size and location, for both exterior and interior; locations of control devices; distribution and branch electrical circuitry; and fuse and circuit breaker size and arrangements.
 2. Equipment locations (exposed and concealed), dimensioned from prominent building lines.
 3. Approved substitutions, Contract Modifications, and actual equipment and materials installed.

1.5 OPERATION & MAINTENANCE MANUALS

- A. Prepare maintenance manuals in accordance with Division 01 Section "Closeout Procedures" In addition to the requirements specified in Division 01, include the following information for equipment items:
1. Product data for all equipment installed during construction. Product data shall be manufacturer literature, cut-sheets, and/or catalogs and shall clearly depict manufacturer and model number along with standard features and optional features where applicable.
 2. Where available for installed equipment, Contractor shall include manufacturer's published Installation and/or Owner's manuals.
 3. Description of function, normal operating characteristics and limitations, performance curves, engineering data and tests, and complete nomenclature and commercial numbers of replacement parts.
 4. Programming report/summary for all systems with conditional logic programming (i.e. fire alarm, lighting control system, and PLCs)
 5. Maintenance procedures for routine preventative maintenance and troubleshooting; disassembly, repair, and reassembly; aligning and adjusting instructions.

6. Warranty Information: Copies of documentation for all additional and secondary warranties shall be included.

1.6 DELIVERY, STORAGE, AND HANDLING

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

PART 2 - PRODUCTS (Not Applicable)

PART 3 - EXECUTION

3.1 ROUGH-IN

- A. Verify final locations for rough-ins with field measurements and with the requirements of the actual equipment to be connected.
- B. Refer to equipment specifications in Divisions 26 for rough-in requirements.

3.2 ELECTRICAL INSTALLATIONS

- A. General: Sequence, coordinate, and integrate the various elements of electrical systems, materials, and equipment. Comply with the following requirements:
 1. Coordinate electrical systems, equipment, and materials installation with other building components.
 2. Verify all dimensions by field measurements.
 3. Arrange for chases, slots, and openings in other building components during progress of construction, to allow for electrical installations.
 4. Coordinate the installation of required supporting devices and sleeves to be set in poured-in-place concrete and other structural components, as they are constructed.
 5. Sequence, coordinate, and integrate installations of electrical materials and equipment for efficient flow of the Work. Give particular attention to large equipment requiring positioning prior to closing in the building.
 6. Where mounting heights are not detailed or dimensioned, install systems, materials, and equipment to provide the maximum headroom possible.
 7. Coordinate connection of electrical systems with exterior underground utilities and services. Comply with requirements of governing regulations, franchised service companies, and controlling agencies. Provide required connection for each service.
 8. Install systems, materials, and equipment to conform with approved submittal data, including coordination drawings, to greatest extent possible. Conform to arrangements indicated by the Contract Documents, recognizing that portions of the Work are shown only in diagrammatic form. Where coordination requirements conflict with individual system requirements, refer conflict to the Architect.
 9. Install systems, materials, and equipment level and plumb, parallel and perpendicular to other building systems and components, where installed exposed in finished spaces.

10. Install electrical equipment to facilitate servicing, maintenance, and repair or replacement of equipment components. As much as practical, connect equipment for ease of disconnecting, with minimum of interference with other installations.
 11. Install access panel or doors where units are concealed behind finished surfaces.
 12. Install systems, materials, and equipment giving right-of-way priority to systems required to be installed at a specified slope.
- B. Basis of Design: Where specific systems and products are shown or specified with a Basis of Design, the supporting work and appurtenances are shown and specified uniquely for the Basis of Design. Where systems and products other than the Basis of Design are installed, Contractor shall adjust circuiting, raceway infrastructure, cable type, wire size, supporting means, backbox type, and any other appurtenance as required for a complete, fully functional and operational system or product.

3.3 CUTTING AND PATCHING

- A. General: Perform cutting and patching in accordance with the following requirements:
1. Perform cutting, fitting, and patching of electrical equipment and materials required to:
 - a. Remove and replace defective Work.
 - b. Remove and replace Work not conforming to requirements of the Contract Documents.
 - c. Upon written instructions from the Engineer, uncover and restore Work to provide for Engineer observation of concealed Work.
 2. Cut, remove, and legally dispose of selected electrical equipment, components, and materials as indicated, including but not limited to removal of electrical items indicated to be removed and items made obsolete by the new Work.
 3. Protect the structure, furnishings, finishes, and adjacent materials not indicated or scheduled to be removed.
 4. Protection of Installed Work: During cutting and patching operations, protect adjacent installations. Provide and maintain temporary partitions or dust barriers adequate to prevent the spread of dust and dirt to adjacent areas.
 5. Patch existing finished surfaces and building components using new materials matching existing materials and experienced Installers. Installers' qualifications refer to the materials and methods required for the surface and building components being patched.

3.4 TESTING

- A. Coordinate with the Owner any testing specified to be conducted after final acceptance.

3.5 INSPECTIONS

- A. Authority Having Jurisdiction: Notify and schedule all inspections, with a minimum of 10 days notice in writing prior, to the Authority Having Jurisdiction.

END OF SECTION 260100

SECTION 260500 - BASIC ELECTRICAL MATERIALS AND METHODS

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. Electrical Equipment Installation.
 - 2. Sleeves and sleeve seals for raceway and cable.
 - 3. Firestopping.
 - 4. Concrete equipment bases.
 - 5. Cutting and patching for electrical construction.
 - 6. Touchup painting.

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.
- C. Electrical equipment shall be new and manufactured within the last 12 months unless otherwise noted and approved by the engineer.

1.4 COORDINATION

- A. Coordinate chases, slots, inserts, sleeves, and openings with general construction work and arrange in building structure during progress of construction to facilitate the electrical installations that follow.
 - 1. Set inserts and sleeves in poured-in-place concrete, masonry work, and other structural components as they are constructed.
- B. Sequence, coordinate, and integrate installing electrical materials and equipment for efficient flow of the Work. Coordinate installing large equipment requiring positioning before closing in rooms.
- C. Coordinate electrical service connections to components furnished by utility companies.

1. Coordinate installation and connection of exterior underground and overhead utilities and services, including provision for electricity-metering components.
 2. Comply with requirements of authorities having jurisdiction and of utility company providing electrical power and other services.
- D. Coordinate location of access panels and doors for electrical items that are concealed by finished surfaces.

PART 2 - PRODUCTS

2.1 SLEEVES FOR RACEWAYS AND CABLES

- A. Steel Pipe Sleeves: ASTM A 53/A 53M, Type E, Grade B, Schedule 40, galvanized steel, plain ends.
- B. Sleeves for Rectangular Openings: Galvanized sheet steel.
1. Minimum Metal Thickness:
 - a. For sleeve cross-section rectangle perimeter less than 50 inches (1270 mm) and no side more than 16 inches (400 mm), thickness shall be 0.052 inch (1.3 mm).
 - b. For sleeve cross-section rectangle perimeter equal to, or more than, 50 inches (1270 mm) and 1 or more sides equal to, or more than, 16 inches (400 mm), thickness shall be 0.138 inch (3.5 mm).

2.2 CONCRETE BASES

- A. Concrete Forms and Reinforcement Materials: As specified in Division 03 Section "Cast-in-Place Concrete."
- B. Concrete: 3000-psi (20.7-MPa), 28-day compressive strength as specified in Division 03 Section "Cast-in-Place Concrete."

2.3 TOUCHUP PAINT

- A. For Equipment: Equipment manufacturer's paint selected to match installed equipment finish.
- B. Galvanized Surfaces: Zinc-rich paint recommended by item manufacturer.

PART 3 - EXECUTION

3.1 ELECTRICAL EQUIPMENT INSTALLATION

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

- B. Materials and Components: Install level, plumb, and parallel and perpendicular to other building systems and components, unless otherwise indicated.
- C. Equipment: Install to facilitate service, maintenance, and repair or replacement of components. Connect for ease of disconnecting, with minimum interference with other installations. Provide any additional supporting means not provided by manufacturer to install equipment.
- D. Right of Way: Give to raceways and piping systems installed at a required slope.

3.2 SLEEVE INSTALLATION FOR ELECTRICAL PENETRATIONS

- A. Electrical penetrations occur when raceways, cables, wireways, cable trays, or busways penetrate concrete slabs, concrete or masonry walls, or fire-rated floor and wall assemblies.
- 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. Use pipe sleeves unless penetration arrangement requires rectangular sleeved opening.
- D. 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.
- E. Sleeves for power raceway and cables: Steel, cut sleeves to length for mounting flush with both surfaces of walls.
- F. Sleeves for telecommunication cables: Rigid galvanized steel conduit, extend sleeves 2" on each side of wall. Provide plastic bushing on each end.
- G. Extend sleeves installed in floors **2 inches (50 mm)** above finished floor level.
- H. Size pipe sleeves to provide **1/4-inch (6.4-mm)** annular clear space between sleeve and raceway or cable, unless indicated otherwise.
- I. Seal space outside of sleeves with grout for penetrations of concrete and masonry
 - 1. Promptly pack grout solidly between sleeve and wall so no voids remain. Tool exposed surfaces smooth; protect grout while curing.
- J. Interior Penetrations of Non-Fire-Rated Walls and Floors: Seal annular space between sleeve and raceway or cable, using joint sealant appropriate for size, depth, and location of joint. Comply with requirements in Division 07 Section "Joint Sealants."
- K. Fire-Rated-Assembly Penetrations: Maintain indicated fire rating of walls, partitions, ceilings, and floors at raceway and cable penetrations. Install sleeves and seal raceway and cable penetration sleeves with firestop materials. Comply with requirements in Division 07 Section "Penetration Firestopping."
- L. Roof-Penetration Sleeves: Seal penetration of individual raceways and cables with flexible boot-type flashing units applied in coordination with roofing work.

- M. Aboveground, Exterior-Wall Penetrations: Seal penetrations using steel pipe sleeves and mechanical sleeve seals. Select sleeve size to allow for 1-inch (25-mm) annular clear space between pipe and sleeve for installing mechanical sleeve seals.
- N. Underground, Exterior-Wall Penetrations: Install cast-iron pipe sleeves. Size sleeves to allow for 1-inch (25-mm) annular clear space between raceway or cable and sleeve for installing mechanical sleeve seals.

3.3 SLEEVE-SEAL INSTALLATION

- A. Install to seal exterior wall penetrations.
- B. Use type and number of sealing elements recommended by manufacturer for raceway or cable material and size. Position raceway or cable in center of sleeve. Assemble mechanical sleeve seals and install in annular space between raceway or cable and sleeve. Tighten bolts against pressure plates that cause sealing elements to expand and make watertight seal.

3.4 FIRESTOPPING

- A. Apply firestopping to cable and raceway penetrations of fire-rated floor and wall assemblies to achieve fire-resistance rating of the assembly. Firestopping materials and installation requirements are specified in Division 07 Section "Penetration Firestopping."

3.5 CONCRETE BASES

- A. Construct concrete bases of dimensions indicated, but not less than 4 inches (100 mm) larger, in both directions, than supported unit. Follow supported equipment manufacturer's anchorage recommendations and setting templates for anchor-bolt and tie locations, unless otherwise indicated. Use 3000-psi (20.7-MPa), 28-day compressive-strength concrete and reinforcement as specified in Division 03 Section "Cast-in-Place Concrete."

3.6 CUTTING AND PATCHING

- A. Cut, channel, chase, and drill floors, walls, partitions, ceilings, and other surfaces required to permit electrical installations. Perform cutting by skilled mechanics of trades involved.
- B. Repair and refinish disturbed finish materials and other surfaces to match adjacent undisturbed surfaces. Install new fireproofing where existing firestopping has been disturbed. Repair and refinish materials and other surfaces by skilled mechanics of trades involved.

3.7 REFINISHING AND TOUCHUP PAINTING

- A. Refinish and touch up paint. Paint materials and application requirements are specified in Division 09 Section "Interior Painting" and Division 09 Section "Exterior Painting"
 - 1. Clean damaged and disturbed areas and apply primer, intermediate, and finish coats to suit the degree of damage at each location.

2. Follow paint manufacturer's written instructions for surface preparation and for timing and application of successive coats.
3. Repair damage to galvanized finishes with zinc-rich paint recommended by manufacturer.
4. Repair damage to PVC or paint finishes with matching touchup coating recommended by manufacturer.

3.8 CLEANING AND PROTECTION

- A. On completion of installation, including outlets, fittings, and devices, inspect exposed finish. Remove burrs, dirt, paint spots, and construction debris.
- B. Protect equipment and installations and maintain conditions to ensure that coatings, finishes, and cabinets are without damage or deterioration at time of Substantial Completion.

END OF SECTION 260510

SECTION 260519 - CONDUCTORS AND CABLES

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. Building wires and cables rated 600 V and less.
 - 2. Connectors, splices, and terminations rated 600 V and less.

1.3 SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Field quality-control test reports: Submit all cable tests reports to Engineer ten days prior to Final Inspection.

1.4 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. 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. American Insulated Wire Corp.; a Leviton Company.
 - 2. General Cable Corporation.
 - 3. Southwire Company.
- B. Conductors: Comply with NEMA WC 70.

- C. Conductor Insulation: Comply with NEMA WC 70 for Types THHN-THWN and XHHW.

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. Thomas & Betts Corporation.
 - 2. Ideal Industries, Inc.
 - 3. 3M; Electrical Products Division.
 - 4. Tyco Electronics Corp.
- B. Description: UL listed, factory-fabricated connectors and splices of size, ampacity rating, material, type, and class for application and service indicated. Splices in solid conductors shall be made using Ideal Wirenuts, 3M Scotchlocks, or T&B Marrette pressure type wire connectors. Permanent crimp connectors are not acceptable.

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 for No. 10 AWG and smaller; stranded for No. 8 AWG and larger.
- C. Minimum Size: No. 12 AWG for power and lighting circuits.

3.2 CONDUCTOR INSULATION AND MULTICONDUCTOR CABLE APPLICATIONS AND WIRING METHODS

- A. Service Entrance: Type THHN-THWN or XHHW, single conductors in raceway.
- B. Exposed Feeders: Type THHN-THWN or XHHW, single conductors in raceway.
- C. Feeders Concealed in Ceilings, Walls, Partitions, and Crawlspace: Type THHN-THWN or XHHW, single conductors in raceway.
- D. Feeders Concealed in Concrete, below Slabs-on-Grade, and Underground: Type THHN-THWN or XHHW, single conductors in raceway.
- E. Exposed Branch Circuits, Including in Crawlspace: Type THHN-THWN or XHHW, single conductors in raceway.
- F. Branch Circuits Concealed in Ceilings, Walls, and Partitions: Type THHN-THWN or XHHW, single conductors in raceway.
 - 1. Concealed Lighting Branch Circuits: Type MC cable, #12 AWG, copper conductor, 90°C insulation. May be used for connecting light fixtures together. Maximum length is 15'.

All home runs to first light fixture and switch legs shall be in conduit. Do not use for receptacle or other power circuits.

2. Concealed Receptacle Branch Circuits: Type MC cable, #12 AWG, copper conductor, 90°C insulation. May be used for connecting general purpose receptacles within a single room where concealed in gypsum board walls. All home runs to first junction box or receptacle within room shall be in conduit. Do not use in masonry wall construction or for dedicated receptacles or other power circuits.
- G. Branch Circuits Concealed in Concrete, below Slabs-on-Grade, and Underground: Type THHN-THWN or XHHW, single conductors in raceway.
- H. Cord Drops and Portable Appliance Connections: Type SO, hard service cord with stainless-steel, wire-mesh, strain relief device at terminations to suit application.
- I. Fire Alarm Circuits: See Section "Fire Alarm", in raceway.
- J. Class 1 Control Circuits: Type THHN-THWN or XHHW, in raceway.
- K. Class 2 Control Circuits: Type THHN-THWN or XHHW, single conductors 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. Voltage Drop: Conductor size shall be increased to account for voltage drop as follows:
 1. Where the conductor length from the panel to the first outlet on a 277V circuit exceeds 125 feet, the branch circuit conductors from the panel to the first outlet shall not be smaller than #10 AWG.
 2. Where the conductor length from the panel to the first outlet on a 120V circuit exceeds 50 feet, the branch circuit conductors from the panel to the first outlet shall not be smaller than #10 AWG. Increase an additional wire size for every additional 50' to first outlet.
 3. Proportionally increase size of equipment ground conductors wherever ungrounded conductor sizes are increased for voltage drop.
- F. Dedicated Neutrals: Provide dedicated neutral for all single-pole branch circuits, unless otherwise noted on plans. All neutrals shall be uniquely identified at splices or taps to correspond with their ungrounded circuit conductors.
- G. Support cables according to Division 26 Section "Hangers and Supports for Electrical Systems."

- H. Identify and color-code conductors and cables according to Division 26 Section "Identification for Electrical Systems."

3.4 CONNECTIONS

- A. Keep conductor splices to a minimum. No feeders shall be spliced. No splicing shall be made except within outlet or junction boxes, troughs, or gutters.
- B. Make splices and taps that are compatible with conductor material and that possess equivalent or better mechanical strength and insulation ratings than unspliced conductors.
 - 1. Splices shall be made using with pre-insulated spring/coil connectors (wire nuts), insulated barrel mechanical lugs, or box mounted insulated terminal strips.
 - 2. Push-in type, permanent crimp-on type, and split-bolt type are prohibited.
 - 3. Use oxide inhibitor in each splice and tap conductor for aluminum conductors.
- C. Wiring at Outlets: Install conductor at each outlet, with at least 12 inches of slack.

3.5 FIELD QUALITY CONTROL

- A. Perform tests and inspections and prepare test reports.
- B. Testing Technician
 - 1. The testing technicians shall be trained in all the methods of correctly and safely conducting the required test. The technician shall have regular experience conducting the required tests and they must have the knowledge to determine the serviceability of a specific piece of equipment.
- C. Tests and Inspections: After installing conductors and cables and before electrical circuitry has been energized, test conductors for compliance with following requirements.
 - 1. Physical Inspection and Testing
 - a. Verify cable ratings and data correspond to drawings and specifications.
 - b. Verify electrical connections are made to provide the electrical system described in the drawings and specifications.
 - c. Confirm bolted electrical connections are low impedance using one of the following means:
 - 1) Measure the resistance with a low-resistance ohmmeter. Bolted electrical connection resistances shall be compared to resistances measured on similar connections. Any similar resistance values that deviate more than 50 percent should be investigated.
 - 2) Inspect the bolted connection and verify that it is at the manufacturer's rated torque using a calibrated torque wrench.
 - d. A thermographic test of the service entrance conductors and distribution feeders. Conductor connection points shall be visible during the test. All equipment should

be energized and loaded during test. Thermographic images of any connections that fail the test must be submitted with a description of the failure including the probable cause of the failure. A thermographic test shall be performed, but not limited to, the following areas.

1) Service entrance conductors and feeders rated for 1000A or more.

- e. Inspect cable connectors to verify they are correctly installed.
- f. Verify all cables are identified and arranged according to the drawings and specifications.
- g. Verify that all cable jackets and insulation are in good condition and did not sustain damage during installation.

2. Electrical Inspection and Testing

- a. For feeder current-carrying phase conductors and neutrals: test the insulation resistance with respect to ground for one minute. Cables rated for 300 volts shall be tested with 500 volts DC and cables rated for 600 volts shall be tested with 1000 volts DC. All insulation resistance data gathered shall comply with manufacturer's documentation; if documentation does not exist, comply with the values found in Table 100.1 in the ANSI/NETA ATS-2009.

D. Remove and replace malfunctioning units and retest as specified above.

E. 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.

END OF SECTION 260519

SECTION 260526 - GROUNDING AND BONDING

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 methods and materials for grounding systems and equipment.

1.3 SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Field quality-control test reports.

1.4 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.
 - 3. Bonding Cable: stranded conductor sized per NEC 250 requirements.
 - 4. Bonding Conductor: stranded conductor sized per NEC 250 requirements.
 - 5. Bonding Jumper: Copper tape, braided conductors, terminated with copper ferrules; sized per NEC 250 requirements.

- C. Grounding Bus: Rectangular bars of annealed copper, 1/4 by 2 inches (6 by 50 mm) in cross section, unless otherwise indicated; with insulators and stand-off brackets.

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.
- B. Bolted Connectors for Conductors and Pipes: Copper or copper alloy, bolted pressure-type, with at least two bolts.
 - 1. Pipe Connectors: Clamp type, sized for pipe.
- C. Welded Connectors: Exothermic-welding kits of types recommended by kit manufacturer for materials being joined and installation conditions.

2.3 GROUNDING ELECTRODES

- A. Ground Rods: Copper-clad steel; 3/4 inch by 10 feet (19 mm by 3 m) in diameter.

PART 3 - EXECUTION

3.1 APPLICATIONS

- A. Conductors: Install solid conductor for No. 8 AWG and smaller, and stranded conductors for No. 6 AWG and larger, unless otherwise indicated.
- B. Underground Grounding Conductors: Install bare copper conductor, No. 3/0 AWG minimum. Bury at least 24 inches (600 mm) below grade.
- C. Grounding Bus: Install in electrical and telecommunication equipment rooms, in rooms housing service equipment, and elsewhere as indicated. Install bus on insulated spacers 1 inch (25 mm), minimum, with stand-off bracket from wall 6 inches (150 mm) above finished floor, unless otherwise indicated.
- D. Conductor Terminations and Connections:
 - 1. Pipe and Equipment Grounding Conductor Terminations: Bolted connectors.
 - 2. Underground Connections: Welded connectors.
 - 3. Connections to Structural Steel: Welded connectors.

3.2 EQUIPMENT GROUNDING

- A. Install insulated equipment grounding conductors with all feeders and branch circuits. The raceway shall not be relied on for ground continuity.

- B. Signal and Communication Systems: For telephone, alarm, voice and data, and other communication systems, provide a No. 3/0 AWG minimum insulated grounding conductor (Telecommunications Bonding Backbone, TBB) in raceway from grounding electrode system to each service location, terminal cabinet, wiring closet, and central equipment location. Refer to Telecommunications Room Grounding Detail on plans for further requirements.
 - 1. MDF/Headend Room and IDF Rooms: Terminate Telecommunications Bonding Backbone on a grounding bus (Telecommunications Grounding Busbar, TGB). Refer to Telecommunications Room Grounding Detail on plans for requirements.
 - 2. Cabinets, Racks, and Ladder Tray: Extend minimum #10 grounding conductor from equipment to TGB.
 - 3. All telecommunication grounding shall be performed in compliance with TIA/EIA 607 Standard – Commercial Building Grounding (Earthing) and Bonding Requirements for Telecommunications.

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. Ground Rods: Drive rods until tops are 6 inches (50 mm) below finished floor or final grade, unless otherwise indicated.
 - 1. Interconnect ground rods with grounding electrode conductor below grade and as otherwise indicated. Make connections without exposing steel or damaging coating, if any.
- C. 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. Provide exothermic-welded connection to building structural steel.
 - 4. Use exothermic-welded connectors for outdoor locations, but if a disconnect-type connection is required, use a bolted clamp.
- D. Grounding Bushings and Jumpers: Boxes provided with concentric, eccentric or over-sized knockouts shall be provided with bonding bushings and jumpers lugged to box.
- E. Grounding and Bonding for Piping:
 - 1. Metal Water Service Pipe: Install insulated copper grounding conductors, in conduit, from building's main service equipment, or grounding bus, to main metal water service entrances to building. Connect grounding conductors to main metal water service pipes, using a bolted clamp connector or by bolting a lug-type connector to a pipe flange, using one of the lug bolts of the flange. Where a dielectric main water fitting is installed,

- connect grounding conductor on street side of fitting. Bond metal grounding conductor conduit or sleeve to conductor at each end.
2. Water Meter and Backflow Preventer Piping: Use braided-type bonding jumpers to electrically bypass water meters and backflow preventers where located inside the building. Connect to pipe with a bolted connector.
- F. Grounding for Steel Building Structure: Install a driven ground rod at base of each corner column and at intermediate exterior columns at distances not more than 60 feet (18 m) apart.

3.4 FIELD QUALITY CONTROL

- A. Perform the following tests and inspections and prepare test reports:
1. After installing grounding system but before permanent electrical circuits have been energized, test for compliance with requirements.
- B. Testing Technician
1. The testing technicians shall be trained in all the methods of correctly and safely conducting the required test. The technician shall have regular experience conducting the required tests and they must have the knowledge to determine the serviceability of a specific piece of equipment.
- C. Physical Inspection and Testing
1. Inspect grounding system to verify that it complies with the requirements in the drawings and specifications, as well as, NFPA 70 *National Electric Code Article 250*.
 2. Inspect the physical and mechanical condition and verify that it complies with manufacturer's standards. All portions of the grounding system shall be free of corrosion.
 3. Confirm bolted electrical connections are provided with low impedance using one of the following means:
 - a. Measure the resistance with a low-resistance ohmmeter. Bolted electrical connection resistances shall be compared to resistances measured on similar connections. Any similar resistance values that deviate more than 50 percent should be investigated.
 - b. Inspect the bolted connection and verify that it is at the manufacturer's rated torque using a calibrated torque wrench.
 4. Verify that adequate anchorage is in place for the grounding system.
- D. Electrical Inspection and Testing
1. Conduct tests for fall of potential as defined by ANSI/IEEE 81 on the grounding system.
 2. Determine the resistance to ground throughout grounding system including equipment frames, systems neutral, and equipment grounding bars. Measure ground resistance not less than two full days after last trace of precipitation and without soil being moistened by any means other than natural drainage or seepage and without chemical treatment or other artificial means of reducing natural ground resistance. Perform ground resistance in all of, but not limited to, the areas listed below:

- a. Main electrical distribution ground bar: 15 ohms
 - b. Main telecommunications ground bar: 15 ohms
 - c. Secondary telecommunications ground bars: 15 ohms
 - d. Lightning protection path to ground: 5 ohms.
- E. Excessive Ground Resistance: If resistance to ground exceeds specified values, notify Engineer promptly and include recommendations to reduce ground resistance.
 - 1. Retest required to show compliance with above value.
- F. Remove and replace malfunctioning units and retest as specified above.
- G. 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.

END OF SECTION 260526

SECTION 260529 - HANGERS AND SUPPORTS

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. Hangers and supports for electrical equipment and systems.
 - 2. Construction requirements for concrete bases.

1.3 DEFINITIONS

- A. EMT: Electrical metallic tubing.
- B. IMC: Intermediate metal conduit.
- C. RMC: Rigid metal conduit.

1.4 SUBMITTALS

- A. Product Data: For anchors, supports, and slotted channel/strut systems.

1.5 QUALITY ASSURANCE

- A. Comply with NFPA 70.

1.6 COORDINATION

- A. Coordinate size and location of concrete bases. Cast anchor-bolt inserts into bases. Concrete, reinforcement, and formwork requirements are specified in Division 03.
- B. Coordinate installation of roof curbs, equipment supports, and roof penetrations. These items are specified in Division 07 Section "Roof Accessories."

PART 2 - PRODUCTS

2.1 COATINGS

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

2.2 MANUFACTURED SUPPORTING DEVICES

- A. Raceway Supports: Clevis hangers, riser clamps, two-hole conduit straps, threaded C-clamps with retainers, ceiling trapeze hangers, wall brackets, and spring steel clamps as described in NECA 1 and NECA 101.
- B. Fasteners: Types, materials, and construction features as follows:
 - 1. Expansion Anchors: Carbon steel wedge or sleeve type for use in hardened portland cement concrete, steel, or wood, with tension, shear, and pullout capacities appropriate for supported loads and building materials where used.
 - 2. Powder-Driven Threaded Studs: Heat-treated steel for use in hardened portland cement concrete, steel, or wood, with tension, shear, and pullout capacities appropriate for supported loads and building materials where used.
 - 3. Toggle Bolts: All steel springhead type.
 - 4. Hanger Rods: Threaded steel.
- C. Conduit Sealing Bushings: Factory-fabricated watertight conduit sealing bushing assemblies suitable for sealing around conduit, or tubing passing through concrete floors and walls. Construct seals with steel sleeve, malleable iron body, neoprene sealing grommets or rings, metal pressure rings, pressure clamps, and cap screws.
- D. Cable Supports for Vertical Conduit: Factory-fabricated assembly consisting of threaded body and insulating wedging plug for non-armored electrical cables in riser conduits. Provide plugs with number and size of conductor gripping holes as required to suit individual risers. Construct body of malleable-iron casting with hot-dip galvanized finish.
- E. U-Channel Systems: Comply with MFMA-4, factory-fabricated components for field assembly; 16-gage steel channels, with 9/16-inch-diameter holes, at a minimum of 8 inches on center, in top surface. Provide fittings and accessories that mate and match with U-channel and are of the same manufacture.

2.3 FABRICATED SUPPORTING DEVICES

- A. General: Shop- or field-fabricated supports or manufactured supports assembled from U-channel components.
- B. Steel Brackets: Fabricated of angles, channels, and other standard structural shapes. Connect with welds and machine bolts to form rigid supports.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install supporting devices to fasten electrical components securely and permanently in accordance with NEC requirements.
- B. Coordinate with the building structural system and with other electrical installation.
- C. Raceway Supports: Comply with the NEC and the following requirements:
 - 1. Conform to manufacturer's recommendations for selection and installation of supports.
 - 2. Strength of each support shall be adequate to carry present and future load multiplied by a safety factor of at least four. Where this determination results in a safety allowance of less than 200 lbs, provide additional strength until there is a minimum of 200 lbs safety allowance in the strength of each support.
 - 3. Install individual and multiple (trapeze) raceway hangers and riser clamps as necessary to support raceways. Provide U-bolts, clamps, attachments, and other hardware necessary for hanger assembly and for securing hanger rods and conduits.
 - 4. Support parallel runs of horizontal raceways together on trapeze-type hangers.
 - 5. Support individual horizontal raceways by separate pipe hangers. Spring steel fasteners may be used in lieu of hangers only for 1-1/2-inch and smaller raceways serving lighting and receptacle branch circuits above suspended ceilings only. For hanger rods with spring steel fasteners, use 1/4-inch-diameter or larger threaded steel. Use spring steel fasteners that are specifically designed for supporting single conduits or tubing. Spring steel fasteners are not permitted for use where exposed.
 - 6. Support raceways installed on interior of exterior building walls a minimum of 1/4 inch from wall surface using "clamp-back" struts.
 - 7. Space supports for raceways in accordance with Table I of this section. Space supports for raceway types not covered by the above in accordance with NEC.
 - 8. Support exposed and concealed raceway within 1 foot of an unsupported box and access fittings. In horizontal runs, support at the box and access fittings may be omitted where box or access fittings are independently supported and raceway terminals are not made with chase nipples or threadless box connectors.
 - 9. In vertical runs, arrange support so the load produced by the weight of the raceway and the enclosed conductors is carried entirely by the conduit supports with no weight load on raceway terminals. Spring steel fasteners are not permitted for use in vertical runs. Support individual vertical runs using two-hole straps. Support parallel runs of vertical raceway together on channel using bolted clamps.
- D. Miscellaneous Supports: Support miscellaneous electrical components as required to produce the same structural safety factors as specified for raceway supports. Install metal channel racks for mounting cabinets, panelboards, disconnects, control enclosures, pull boxes, junction boxes, transformers, and other devices.
- E. Fixtures: Set level, plumb, and square with ceiling and walls, and secure according to manufacturer's written instructions and approved submittal materials.
- F. Support for Fixtures in or on Grid-Type Suspended Ceilings refer to "Lighting" section, if none, then as follows: Use grid for support.

1. Fixtures within Ceiling Grid: Where a recessed fluorescent, high intensity, or downlight fixture replaces a section or part of a ceiling tile, the fixture shall be supported at the two (2) opposite ends to the building steel/concrete frame or floor decking. Supports shall be provided with the same type of wire as used to support the lay-in ceiling track. Attach the luminaire to the main runners of the lay-in ceiling track at all four (4) corners using sheet metal screws. For fire rated suspended ceiling, luminaire shall be supported to the Building Structure as per the Ceiling Design Criteria, luminaire shall then be screwed to the main runners of the suspended ceiling track at all four (4) corners using sheet metal screws.
 2. Fixtures of Sizes Less Than Ceiling Grid: Arrange 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 between ceiling tees in addition to wires from building structure per above. Channel support shall be attached to ceiling grid using sheet metal screws.
- G. In open overhead spaces, cast boxes threaded to raceways need not be supported separately except where used for fixture support; support sheet metal boxes directly from the building structure or by bar hangers. Where bar hangers are used, attach the bar to raceways on opposite sides of the box and support the raceway with an approved type of fastener not more than 24 inches from the box.
- H. Fastening: Unless otherwise indicated, fasten electrical items and their supporting hardware securely to the building structure, including but not limited to conduits, raceways, cables, cable trays, busways, cabinets, panelboards, transformers, boxes, disconnect switches, and control components in accordance with the following:
1. Fasten by means of wood screws or screw-type nails on wood, toggle bolts on hollow masonry units, concrete inserts or expansion bolts on concrete or solid masonry, and machine screws, welded threaded studs, or spring-tension clamps on steel. Threaded studs driven by a powder charge and provided with lock washers and nuts may be used instead of expansion bolts and machine or wood screws. Do not weld conduit, pipe straps, or items other than threaded studs to steel structures. In partitions of light steel construction, use sheet metal screws.
 2. Holes cut to depth of more than 1-1/2 inches in reinforced concrete beams or to depth of more than 3/4 inch in concrete shall not cut the main reinforcing bars. Fill holes that are not used.
 3. Ensure that the load applied to any fastener does not exceed 25 percent of the proof test load. Use vibration- and shock- resistant fasteners for attachments to concrete slabs.

3.2 TABLE I: SPACING FOR RACEWAY SUPPORTS

HORIZONTAL RUNS

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

VERTICAL RUNS

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

NOTES:

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

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

END OF SECTION 260529

SECTION 260553 - IDENTIFICATION FOR ELECTRICAL SYSTEMS

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

1.3 SUBMITTALS

- A. Product Data: For each electrical identification product indicated.
- B. Identification Schedule: An index of nomenclature of all electrical equipment and system components used in identification signs and labels. Schedule shall depict preliminary printouts of proposed equipment labels for review prior to order.

1.4 QUALITY ASSURANCE

- A. Comply with ANSI C2.
- B. Comply with NFPA 70.
- C. Comply with ANSI A13.1 and NFPA 70 for color-coding.
- D. Comply with ANSI Z535.4 for safety signs and labels.
- E. Adhesive-attached labeling materials, including label stocks, laminating adhesives, and inks used by label printers, shall comply with UL 969.

PART 2 - PRODUCTS

2.1 RACEWAY AND CABLE LABELS

- A. Colored Adhesive Tape: Self-adhesive vinyl tape not less than 3 mils thick by 1 to 2 inches wide (0.08 mm thick by 25 to 51 mm wide).
- B. Underground-Line Warning Tape: Permanent, bright-colored, continuous-printed, vinyl tape.
 - 1. Not less than 6 inches wide by 4 mils thick (152 mm wide by 0.102 mm thick).

2. Compounded for permanent direct-burial service.
 3. Embedded continuous metallic strip or core.
 4. Printed legend indicating type of underground line.
- C. Tape Markers: Vinyl or vinyl-cloth, self-adhesive, wraparound type with preprinted numbers and letters.
- D. Plasticized Card-Stock Tags: Vinyl cloth with preprinted and field-printed legends. Orange background, unless otherwise indicated, with eyelet for fastener.

2.2 NAMEPLATES AND SIGNS

- A. Safety Signs: Comply with 29 CFR, Chapter XVII, Part 1910.145.
- B. Engraved Plastic Nameplates and Signs: Engraving stock, melamine plastic laminate, minimum 1/16 inch (1.6 mm) thick for signs up to 20 sq. in. (129 sq. cm) and 1/8 inch (3.2 mm) thick for larger sizes.
1. Punched or drilled for mechanical fasteners.
- C. Baked-Enamel Signs for Interior Use: Preprinted aluminum signs, punched or drilled for fasteners, with colors, legend, and size required for the application. 1/4-inch (6.4-mm) grommets in corners for mounting.
- D. Exterior, Metal-Backed, Butyrate Signs: Weather-resistant, nonfading, preprinted, cellulose-acetate butyrate signs with 0.0396-inch (1-mm) galvanized-steel backing; and with colors, legend, and size required for the application. 1/4-inch (6.4-mm) grommets in corners for mounting.
- E. Fasteners for Nameplates and Signs: Self-tapping, stainless-steel screws or No. 10/32, stainless-steel machine screws with nuts and flat and lock washers.

2.3 MISCELLANEOUS IDENTIFICATION PRODUCTS

- A. Cable Ties: Fungus-inert, self-extinguishing, one-piece, self-locking, Type 6/6 nylon cable ties.
1. Minimum Width: 3/16 inch (5 mm).
 2. Tensile Strength: 50 lb (22.3 kg) minimum.
 3. Temperature Range: Minus 40 to plus 185 deg F (Minus 40 to plus 85 deg C).
 4. Color: According to color-coding.
- B. Paint: Formulated for the type of surface and intended use.
1. Primer for Galvanized Metal: Single-component acrylic vehicle formulated for galvanized surfaces.
 2. Primer for Concrete Masonry Units: Heavy-duty-resin block filler.
 3. Primer for Concrete: Clear, alkali-resistant, binder-type sealer.
 4. Enamel: Silicone-alkyd or alkyd urethane as recommended by primer manufacturer.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Identification Materials and Devices: Install at locations for most convenient viewing without interference with operation and maintenance of equipment.
- B. Lettering, Colors, and Graphics: Coordinate names, abbreviations, colors, and other designations with corresponding designations in the Contract Documents or with those required by codes and standards. Use consistent designations throughout Project.
 - 1. General 277/480V and 120/208V Equipment: Black label with white core.
 - 2. Emergency Generation & Distribution Equipment: Orange label with white core.
 - 3. Stand-by Distribution Equipment: Green label with white core.
 - 4. Fire Alarm Equipment: Red label with white core.
 - 5. Voice, Data & Video Systems: Blue label with white core.
 - 6. Security Systems: Burgundy label with white core.
- C. Sequence of Work: If identification is applied to surfaces that require finish, install identification after completing finish work.
- D. Self-Adhesive Identification Products: Clean surfaces before applying.
- E. Install painted identification according to manufacturer's written instructions and as follows:
 - 1. Clean surfaces of dust, loose material, and oily films before painting.
 - 2. Prime surfaces using type of primer specified for surface.
 - 3. Apply one intermediate and one finish coat of enamel.
- F. Color Banding Raceways and Exposed Cables: Band exposed and accessible raceways of the systems listed below. Banding of colored conduit is not required.
 - 1. Bands: Pretensioned, wraparound plastic sleeves; colored adhesive tape; or a combination of both. Make each color band 2 inches (51 mm) wide, completely encircling conduit, and place adjacent bands of two-color markings in contact, side by side.
 - 2. Band Locations: At changes in direction, at penetrations of walls and floors, at 50-foot (15-m) maximum intervals in straight runs, and at 25-foot (7.6-m) maximum intervals in congested areas. Also provide color banding at outlet box stub-ups.
 - 3. Apply the following colors to the systems listed below:
 - a. Fire Alarm System: Red.
 - b. Telecom (Intercom, Data, Video) Systems: Blue.
 - c. Security (CCTV, Intrusion Detection) System: Black.
 - d. Emergency Systems: Orange.
 - e. Stand-by Systems: Green.
 - 4. Color code cover of raceway junction boxes following the colors listed above.
 - 5. Spare raceway for future use shall be identified as such and shall indicate where raceway originates and terminates on each end.
- G. Caution Labels for Indoor Boxes and Enclosures for Power and Lighting: Install pressure-sensitive, self-adhesive labels identifying system voltage with black letters on orange background. Install on exterior of door or cover.

- H. Circuit Identification Labels on Outlet Boxes, Junction Boxes and Pull Boxes: Install labels externally.
1. Outlet boxes (receptacles and switches) and exposed junction boxes: Pressure-sensitive, self-adhesive plastic label on faceplate. Use clear label with black letters.
 2. Concealed junction and pull boxes: Neat handwritten label using permanent black marker.
 3. Labeling Legend: Permanent, waterproof listing of panel and circuit number or equivalent.
 4. Future Use Circuits: Circuits for future use shall be identified as such and list panel and circuit number of source.
- I. Secondary Service, Feeder, and Branch-Circuit Conductors: Color-code throughout the secondary electrical system.
1. Color-code 208/120-V system as follows:
 - a. Phase A: Black.
 - b. Phase B: Red.
 - c. Phase C: Blue.
 - d. Neutral: White.
 - e. Ground: Green.
 2. Color-code 480/277-V system as follows:
 - a. Phase A: Brown.
 - b. Phase B: Orange.
 - c. Phase C: Yellow.
 - d. Neutral: Gray.
 - e. Ground: Green.
 3. Factory apply color the entire length of all conductors, except the following field-applied, color-coding methods may be used instead for service conductors:
 - a. Colored, pressure-sensitive plastic tape in half-lapped turns for a distance of 6 inches (150 mm) from terminal points and in boxes where splices or taps are made. Apply last two turns of tape with no tension to prevent possible unwinding. Use 1-inch- (25-mm-) wide tape in colors specified. Adjust tape bands to avoid obscuring cable identification markings.
 - b. Colored cable ties applied in groups of three ties of specified color to each wire at each terminal or splice point starting 3 inches (76 mm) from the terminal and spaced 3 inches (76 mm) apart. Apply with a special tool or pliers, tighten to a snug fit, and cut off excess length.
- J. Apply identification to conductors as follows:
1. Conductors to Be Extended in the Future: Indicate source and circuit numbers.
 2. Multiple Power or Lighting Circuits in the Same Enclosure: Identify each conductor with source, voltage, circuit number, and phase. Use color-coding to identify circuits' voltage and phase.
 3. Multiple Control and Communication Circuits in the Same Enclosure: Identify each conductor by its system and circuit designation. Use a consistent system of tags, color-coding, or cable marking tape.
- K. Apply warning, caution, and instruction signs as follows:
1. Warnings, Cautions, and Instructions: Install to ensure safe operation and maintenance of electrical systems and of items to which they connect. Install engraved plastic-laminated instruction signs with approved legend where instructions are needed for system or equipment operation. Install metal-backed butyrate signs for outdoor items.

2. Emergency Operation: Install engraved laminated signs with white legend on red background with minimum 3/8-inch- (9-mm-) high lettering for emergency instructions on power transfer, load shedding, and other emergency operations.
- L. Equipment Identification Labels: Engraved plastic laminate. Install on each unit of equipment, including central or master unit of each system. Locate label on exterior of any enclosure. This includes power, lighting, signal, and alarm systems, unless units are specified with their own self-explanatory identification. Unless otherwise indicated, provide three lines of text with 1/4-inch high lettering on 1-1/2-inch high label; where four lines of text are required, use labels 2 inches high. Use surface and core colors as listed in Part 2 above. Provide labels for all electrical equipment listed below. In general, all labels shall include riser diagram ID, amperage, voltage, number of phases/poles, and equipment served from (source). Provide additional information as listed below:
1. Switchboard: include bus amperage and mimic bus.
 2. Panelboards: MCB/MLO.
 3. Disconnect switches: equipment served by.
 - a. Provide label for all disconnects provide by Division 23, 24 or 26.
 4. Enclosed circuit breakers: equipment served by.
 - a. Provide label for all disconnects provide by Division 23, 24 or 26.
 5. Contactors & Relay Panels.
 6. Transformers: equipment served by.
 7. Generator Systems
 8. Transfer Switches: normal power source, emergency power source, and panelboard served by.
 9. Fire Alarm Control Panel and auxiliary power supplies and enclosures.
 10. Service Entrances: Provide placard at service entrance disconnects indicating maximum fault current and date of calculation per NEC Article 110.24. Maximum fault current shall be coordinated with utility and placard installed prior to energization

END OF SECTION 260553

SECTION 260961 – GREAT HALL LIGHTING

PART 1 - GENERAL

1.1 WORK INCLUDED

- A. Provide all labor, materials, equipment and services necessary to provide complete and operating stage power, lighting controls, and motorized rigging system as indicated on the drawings, and as specified herein.
- B. By preferred alternate, dimming and controls and motorized rigging manufacturer shall be Electronic Theatre Controls (ETC). It is recognized that ETC is the industry standard for such equipment, and being such, affords our students the best learning tools that are compatible with other existing equipment at nearby district, local, university, and professional theatres.
- C. Section Includes:
 - 1. Materials, components, modifications, assemblies, equipment and services as specified herein. These include, but are not limited to:
 - a. Verification of site dimensions and conditions.
 - b. Submittals as required by the Contract Documents.
 - c. Engineering of equipment and systems as required by the Contract Documents
 - d. Manufacture of equipment and systems as required by the Contract Documents
 - e. Scheduling, sequencing and coordination with other trades
 - f. Site supervision of equipment and systems installation specified herein and elsewhere in the Contract Documents
 - g. Testing and demonstration of equipment and systems as specified herein and elsewhere in the Contract Documents
- D. All materials shall be listed by an OSHA approved Nationally Recognized Testing Laboratory (NRTL).

1.2 RELATED SECTIONS:

- 1. Division 1 - General Requirements
- 2. Division 5 - Metals
- 3. Division 11 - Equipment
- 4. Division 26 – Electrical

1.3 REFERENCES

- A. National Electrical Code (NEC).
- B. United States Institute for Theatre Technology (USITT), latest edition.
- C. Underwriters Laboratory (UL), or other Nationally Recognized Testing Laboratory (NRTL).

1.4 SUBMITTALS

- A. Submit shop drawings, manufacturer's specifications, installation instructions, and catalog product data including operating and maintenance manuals complete with replacement parts data, before starting work.
- B. Provide a minimum of 5 sets of full system submittals. Submittals shall be 11" x17", at 1/8" scale, and shall include but not limited to:
 - 1. Catalog cuts for equipment items. These shall contain full information on dimensions, construction, applications, etc. to permit proper evaluation. In addition, they shall be properly identified as to their intended use. Any options or variations shall be clearly noted.
 - 2. Shop and installation drawings and schedules showing all information necessary to explain fully the design features, appearance, function, fabrication, installation, and use of system components in all phases of operation. They shall be approved by the A/E before fabrication, installation, or erection has begun. Any proposed deviations from the specifications shall be "starred" and noted in 3/8-inch high letters. Only deviations that are equal or upgrade the quality of the specified equipment will be considered.
 - 3. Full system riser diagram(s) illustrating interconnection of system components, how the system attaches to building structure, and any special installation considerations.
 - 4. Full set of equipment manufacturers printed technical data sheets.
 - 5. Additional information, including equipment demonstration, as required by the A/E to verify compliance with specifications.

1.5 DEFINITIONS

- A. The term "furnish" means to supply and deliver to the job site, ready for unloading, unpacking, assembly, installation, and similar operations.
- B. The term "install" is used to describe operations at the job site including the actual anchoring, applying, assembly, cleaning, curing, cutting, erection, finishing, patching, placing, protecting, pulling, terminating, unloading, unpacking, working to dimension, and similar operations that will render the systems complete and ready for the intended use.
- C. The term "provide" means to furnish and install.
- D. The term "primary components" refer to elements of the system which Control levels, such as dimmers, and control console.
- E. Dimmer Rack: A frame and chassis accommodating dimmer modules, load and line connections, and circuit protection.
- F. DMX Relay Panel: A switchable panel of DMX-Controlled Relay circuits.
- G. Plug-In Module: A modular unit which is installed in a standardized mounting location throughout the dimmer rack.
- H. Dimmer Module: A type of Plug-In Module containing one or more dimmers.

- I. Data Communications: Signals that provide control and feedback communications between devices in the system.
- J. Products utilizing the “DMX512” control protocol shall comply with the rules and recommendations of the following standard: Entertainment Services & Technology Association (ESTA), ANSI E1.11 – 2008, Entertainment Technology - USITT DMX512-A, Asynchronous Serial Digital Data Transmission Standard for Controlling Lighting Equipment and Accessories.
- K. Products utilizing the “ACN” control protocol shall comply with the rules and recommendations of the following standard: Entertainment Services & Technology Association (ESTA) ANSI E1.17 – 2006, Entertainment Technology - Architecture for Control Networks.
- L. Products utilizing the “RDM” control protocol shall comply with the rules and recommendations of the following standard: Entertainment Services & Technology Association (ESTA) ANSI E1.20 – 2006, Entertainment Technology - RDM - Remote Device Management over USITT DMX512 Networks.
- M. Products utilizing “Lightweight/Streaming ACN” control protocol shall comply with the rules and recommendations of the following standard: Entertainment Services & Technology Association (ESTA) ANSI E1.31 – 2009, Entertainment Technology – Lightweight streaming protocol for transport of DMX512 using ACN.
- N. Products utilizing a “0 – 10V” control protocol shall comply with the rules and recommendations of the following standard: Entertainment Services & Technology Association (ESTA)ANSI E1.3 - 2001 (R2006), Entertainment Technology - Lighting Control Systems - 0 to 10V Analog Control Specification.
- O. Products utilizing the DMX512 standard Entertainment Services & Technology Association (ESTA), ANSI E1.11 – 2008, Entertainment Technology - USITT DMX512-A, Asynchronous Serial Digital Data Transmission Standard for Controlling Lighting Equipment and Accessories shall comply with the rules and recommendations of the following standard: ANSI E1.27-1-2006, Entertainment Technology-Standard for Portable Control Cables for Use with USITT DMX512/1990 and E1.11 (DMX512-A)Products.
- P. Products utilizing the DMX512 standard Entertainment Services & Technology Association (ESTA), ANSI E1.11 – 2008, Entertainment Technology - USITT DMX512-A, Asynchronous Serial Digital Data Transmission Standard for Controlling Lighting Equipment and Accessories shall comply with the rules and recommendations of the following standard: ANSI E1.27-2 – 2009, Entertainment Technology - Recommended Practice for Permanently Installed Control Cables for Use with ANSI E1.11 (DMX512-A) and USITT DMX512/1990 Products
- Q. POE: Power Over Ethernet - an 802.3AF compliant scheme of powering devices on an Ethernet
- R. Control Console: A Performance Lighting Control Console is capable of controlling stage lighting, house lighting, and work lighting channels via ACN.

1.6 QUALITY ASSURANCE

- A. Regulatory Requirements: Control system components where applicable standards have been established shall be listed by an OSHA approved NRTL.

- B. Materials, equipment and appurtenances as well as workmanship provided under this section shall conform to the highest commercial standard and as specified and as indicated on drawings. Parts and components not specifically identified or indicated shall be made of materials most appropriate for their use or function and as such resistant to corrosion, thermal, and mechanical stresses encountered in the normal application and functioning of the luminaires.
- C. All cast parts, including die-cast members shall be of uniform quality, free from blow holes, pores, hard spots, shrinkage defects, cracks or other imperfections that affect strength and appearance, or are indicative of inferior metals or alloys. Exterior surfaces, which do not otherwise receive a finishing coating, shall be machined-sanded or similarly treated and shall be given a minimum of one coat of baked-on clear methacrylate lacquer unless a painted finish is specified.
- D. Installer Qualifications:
1. The installer of the system herein described shall be acknowledged in business as a Lighting Control Systems Integration Company, hereafter referred to as LCSI. This company shall employ full time Systems Integrators and Project Managers with experience in completing work of similar or greater size and scope. The LCSI shall be responsible for all documentation for equipment in this section, system record drawings, final testing of the system and training of DURHAM PUBLIC SCHOOLS designated personnel as required by this specification.
 2. The LCSI shall have experience in the operation and installation of similar equipment associated with the construction and/or renovation of facilities similar in scope to this project.
 3. The LCSI shall have been in business for a minimum of five (5) consecutive years, shall have no history of bankruptcy, and shall have no fewer than five (5) installations of similar size and scope which have been in service for no less than two (2) years.
 4. Where a manufacturer of a primary component offers factory training in the use of that component the LCSI is to have received that training.
 5. The LCSI shall be an authorized dealer for an adequate number of manufacturers of system products necessary to provide a complete working system meeting the intent of this specification. System products shall include but are not limited to the following:
 - a. Dimming Equipment.
 - b. Control Systems.
 - c. Lighting Fixtures.
 - d. Power Distribution Equipment.
 6. The LCSI shall maintain a permanent bonded warehouse and office space located within 250 miles of the project-site.
 7. The right is reserved to inspect previous equipment or systems as furnished or installed by this LCSI. In addition, the right is reserved to reject an LCSI who has failed in any respect to comply with the provisions of previous contracts.
 8. The LCSI shall have on staff at least two full-time manufacturer-certified field service technicians and have technical support and assistance accessible 24 hours a day, seven days a week.
 9. The LCSI shall have on staff at least two ETCP Certified technicians - one certified for entertainment electrical, the other for entertainment rigging. Alternatively, one technician
 10. Project Management:
 - a. The LCSI's shall designate a Project Manager which shall be the main contact between the Manufacturers and A/E from contract award until final sign off. The LCSI's Project Manager shall be the same person throughout the entire course of the project, unless otherwise approved by the A/E.

- b. The LCSI's Project Manager shall attend a Kick-Off Meeting at the project site office or a place to be designated. The objectives of the Kick-Off Meeting are:
 - 1) Introduce the Project Team Members.
 - 2) Review the Project Schedule.
 - 3) Review the Scope of Work and any additional materials and documents not in the Scope of Work.
 - 4) Layout the creative intent of the Project
- 11. No sub-contracting work is permissible, unless the Sub-Contractor is named and included as part of the bid. All terms and requirements herein apply to the Sub-Contractor. The right is reserved to reject the proposed Sub-Contractor based on the terms stated herein.
- 12. The Design Consultant shall be the final judge of suitability of experience.
- 13. Approved Lighting Control Systems Integration Companies shall be the following:

*Barbizon Lighting Co.
1016 McClelland Ct.
Charlotte, NC 28206
704-372-2122
Attn: Systems Manager, Jeff Montgomerie*

*Bandit Lites
5100 Reagan Dr. Suite 14
Charlotte, NC, 28206
980.999.6464
Attn: Andrew Fisher/Emily Eudy*

*Stage Sound
2240 Shenandoah Ave NW
Roanoke, VA 24017
540.342.2040
Attn:*

- 14. LCSI shall submit the following information at time of submittal:
 - a. A listing of 5 equivalent installations including:
 - 1) Name, address, and current telephone number of Owner.
 - 2) Name, address, and current telephone number of A/E or theater consultant associated with the installation.
 - 3) Scope of work of the installation including all sub-contractors and manufacturers.
 - 4) A brief written description of the LCSI's operation, including facilities, departments and key personnel.
 - 5) Biographical information of the Project Manager and integration team members who will be assigned to this project.
 - 6) A list of all sub-contractors who the LCSI proposes to use including their qualifications to perform the work.

1.7 RECORD DRAWINGS AND MANUALS

A. Record Drawings

1. Submit two complete sets of Record Drawings reflecting in detail, the actual finished installation of the complete Stage Control and Lighting Equipment system. The Record Drawing shall also include a Bill of Materials for future maintenance and repair of the system.
 - a. Each drawing shall be dated and stamped as a Record Drawing.
 - b. Prints shall be full sized, stapled into sets. They shall be fully legible.
 - c. Contractor shall provide revised Record Drawings to include any revisions or modifications performed during the 2-year warranty period. The Contractor shall provide revised "Record Drawings" during the warranty period for any system revision or modifications performed on the system. Any future revisions or modifications during the warranty period shall require that the Record Drawings be updated by the LCSi.
- B. Maintenance and Operations Manuals
 1. Manuals shall be bound in loose-leaf binders and labeled with tabbed dividers for easy reference.
 2. The Installer shall provide two sets of Instructions and Maintenance manuals to Durham Public Schools. The manuals shall consist of, but not be limited to:
 - a. System Description.
 - b. User Operating Instructions.
 - c. User Maintenance Instructions.
 - d. Catalogue Cut Sheets for all Stage Control and Lighting Equipment installed under the Work.
 - e. Spare Parts Listing
 - f. 11" x 17" reduced drawings of all system assembly drawings needed to perform system maintenance.

1.8 WARRANTY

- A. The Contractor shall provide a non-prorated two-year labor and material warranty for the complete system, effective from date of substantial completion. Within this warranty period, the LCSi shall be responsible for repair and replacement of system deficiencies.
- B. The Contractor shall offer an extended annual Maintenance and Service Contract after the end of the two year warranty period for DURHAM PUBLIC SCHOOLS consideration.

PART 2 - PERFORMANCE LIGHTING EQUIPMENT

2.1 LIGHTING CONTROL CONSOLE

- A. General
 1. The lighting control console shall be a microprocessor-based system specifically designed to provide complete control of stage, studio, and entertainment lighting systems. The console shall be the ColorSource 20 AV or ColorSource 40 AV as manufactured by Electronic Theatre Controls, Inc., or equal.
 2. The system shall provide control of up to 2,560 networked addresses or up to 1024 local DMX addresses on a maximum of forty (40) or eighty (80) control channels/devices.

Addresses may be distributed using DMX512-A (two ports) or via sACN or Art-Net Ethernet-based lighting protocols.

3. A maximum of 999 cues may be contained in non-volatile electronic memory.
4. Twenty (20) or forty (40) faders shall provide access to individual intensity channels, intensity for devices as well as playbacks.
5. Four (4) configurable faders shall provide functionality for controlling audio volume, output of bump buttons, output from the cue list, output from playbacks, or crossfade control.
6. The console shall have one (1) built-in 7" color multi-touch touchscreen. The touchscreen shall provide the primary interface for system configuration, programming show data and multi-parameter control.
7. Six (6) softkey buttons shall be provided, five (5) of which may be configured by the user.
8. Console shall be equipped with an on-board help system, with on-board tutorial videos.
9. Console shall not require the use of an external monitor for normal use. Optional displays shall be accessible via connection to an external HDMI™ compatible monitor.
10. Console software upgrades shall be made by the user via USB memory stick. Changing internal components shall not be required.
11. The console shall provide a USB port allowing show data to be saved for archival or transfer to other consoles or a personal computer.
12. The console shall be supplied with an onboard 32GB SSD.
13. Systems that do not provide the above capabilities shall not be acceptable.

B. Controls and Playback

1. Patching
 - a. The console shall provide patching facilities for dimmers and multi-parameter devices via a built in library of fixture definitions. The fixture library shall be updated via software based updates. It shall be possible to create custom fixture definitions using an offline application.
 - b. The console shall support patching, address setting, and mode changes using Remote Device Management (RDM) on local DMX/RDM ports and on Net3 DMX/RDM Gateway ports.
2. Channel or Playback Faders
 - a. Twenty (20) or forty (40) proportional, fully overlapping faders shall be provided with 45mm potentiometers and select/bump buttons.
 - b. The faders shall provide direct manual control of intensity for all channels. Channel levels may be changed at any time by using the individual channel faders. Buttons shall select associated channels for control.
 - c. Faders shall also control up to ten (10) pages of twenty (20) (or forty (40)) recordable memories or sequences. Memories shall record user-selected channel levels. Sequences shall record user-selected memories or channel levels.
 - 1) With color mixing systems, output of color from fixtures shall appear to be a combination of the active memories in a color space.
3. Programming Tools
 - a. The console shall provide a 7" color multi-touch touchscreen with six (6) softkeys, as well as touch-based controls. The LCD shall provide system configuration, programming show data and multi-parameter control.
 - b. Touch-based tools shall include:
 - 1) Forty (40) programmable color chips and color picker.
 - 2) Touch-based parameter controls.
 - 3) Virtual Level/Rate wheel.
 - 4) Virtual keypad for level entry.

- 5) Customizable channel display using Stage Map. It shall be possible to rearrange the graphical representations for control channels to closely mimic the positions of fixtures in the venue.
- 6) Effects (intensity, color, shape, and parameter)
 - a) It shall be possible to assign multiple effects to the same channel and parameters. The playback of those effects shall play levels back relative to the combination of the two effects.
- c. Fixture selection shall be made via:
 - 1) Auto fixture selection on fader moves.
 - 2) Pressing the selection button under channel faders.
 - 3) Touching the channel icon in the stage map display on the touch screen.
 - 4) Fixture Tags for Quick Selects
 - a) Selection of multiple fixture shall be possible through a special controls dock that groups channels together based on the channel tile positions within a pre-defined area in the topographical view for channels.
 - b) Selection shall be possible through the use of informational tags. Selecting a predefined tag selects all fixtures sharing that same tag. At least two tags may be assigned to any one channel.
 - c) There shall be at least 27 Quick Select groupings.
- d. Two independent channels shall be provided with on/off functionality. Independents shall be patched in a location separate from patch.
- e. Audio playback
 - 1) It shall be possible to import sound clips and files to be stored on the console's internal drive.
 - a) Sound files shall be played back from cues, playback faders as well as selecting the file and playing from the audio tab.
- f. Sound to Light
 - 1) The console shall have the ability to analyze sound wave and trigger playbacks 1 through 5 based on base through treble. Playback 6 shall act as a background state.
 - 2) Sound2Light shall apply to the current page of playbacks.
- g. Image playback
 - 1) It shall be possible to import image files to be stored on the console's internal drive.
 - a) Image files shall be played back from cues, playback faders as well as selecting the file and playing from the image tab.
- h. Video Toy interactive video effects generator
 - 1) Console shall have a series of predefined video effects that shall be triggered or manipulated through xy positioning of the user's fingers on the on-board multi-touch screen.
 - a) These effects shall be output via the HDMI port.
 - b) The video toy engine shall have the ability to be set to automatically trigger the effects based on a set of predefined parameters
- i. Amigo Browser based remote.
 - 1) Console shall provide a locally hosted web based control interface accessible by a web browser from a device connected to the same network as the console.
 - 2) Web based interface shall allow for color control, playback control, recording of playbacks and cues.

4. Playback Controls

- a. A cue list of up to 999 cues shall be provided. Cues may be made up of channel levels and parameter settings or contain a reference to a recorded memory. Cues shall be editable and shall be able to be individually deleted and inserted.
- b. Playback Toy for filtered and timed execution of playbacks.
- c. Multiple bump modes (Flash, Solo, SoloChange, Move/GO).
- d. Full history rubberbanding for playbacks.

C. Interface Options

- 1. The AV console shall provide connectors for the following:
 - a. 12V AC or DC input for external power supply.
 - b. DMX512-A/RDM output (two (2) 5-pin XLR connectors)
 - c. USB connection (two (2) type A connectors).
 - d. RJ45 Ethernet connection (sACN, ArtNet, OSC, Web Interface remote)
 - e. 3.5mm audio line in and line out connectors
 - f. HDMI port for console monitor or media playback
 - 1) HDMI connection may be used either for an external monitor to display live show data and onscreen data editing or as an output to a display device (projector, monitor, etc.) for show imagery (pictures, VideoToy).

D. Physical

- 1. All operator controls and console electronics shall be housed in a single desktop console.
- 2. Size and weight:
 - a. Twenty (20) fader console shall be equal to or less than 18.31" (465mm) wide 11" (279mm) deep 2.36" (60mm) high (including controls) and 6.9 lbs. (3.13 kg.)
 - b. Forty (40) fader console shall be equal to or less than 26.31" (668mm) wide 11" (279mm) deep 2.36" (60mm) high (including controls), and 9.55 lbs. (4.33kg).
- 3. Twenty (20) Fader console shall be able to be mounted into a 19" equipment rack with the use of additional mounting hardware.
- 4. Console power shall be 12V AC or DC via an external power unit. The power unit shall operate with 90-265VAC line voltage, 50 or 60Hz. Console shall be provided with a universal power supply.

2.2 ARCHITECTURAL LIGHTING PROCESSOR

- A. The Architectural Control Processor shall be the Unison Paradigm P-ACP Series Control Processor as manufactured by Electronic Theatre Controls, Inc., or equal.
- B. The Architectural Control Processor (ACP) assembly shall be designed for use in DRd Series Dimming Enclosures and ERn Series Control Enclosures.
- C. The processor shall utilize microprocessor based, solid state technology to provide multi-scene lighting and building control.
 - 1. ACP shall support functions such as station programming, macro sequencing, electronic lockout, room combine and astronomical time clock events. ACP station processor shall allow configuration of the control system via the menus. See software section for additional system details.
 - 2. When used in a dimming enclosure, the ACP shall allow access to dimming control menus including the status screen, dimming configuration screen, backup menu, test menu and configuration menu.

- D. One ACP shall be rated to drive 1024 channels of control, 1024 zones, 64 rooms, 512 presets, 62 button or button/fader stations and 6 Touchscreen Stations
- E. ACP module electronics shall be convection cooled.
- F. The ACP shall provide front-panel RJ45 jack, Secure Digital (SD) card slot, and Universal Serial Bus (USB) Port for configuration and data exchange.
- G. Architectural Lighting System configuration and program information shall be stored in flash memory, which does not require battery backup.
- H. The ACP shall be contained in a plug-in assembly and require no discrete wiring connections; all wiring shall be terminated into Dimming or Control Enclosure.
 - 1. The ACP shall support the following communications:
 - a. Echelon LinkPower
 - b. 10/100BaseTX, auto MDI/MDIX, 802.3af compliant Ethernet networking with TCP/IP, ESTA BSR E1.17 Advanced Control Networks (ACN) and ESTA BSR E1.31 (sACN) Protocols
 - c. EIA-232 serial protocol
 - d. ESTA DMX512A, configurable as input or output ports
 - e. Dry contact closure inputs
 - f. Dry contact closure outputs, rated at 1A@30VDC

2.3 ARCHITECTURAL LIGHTING BUTTON STATIONS

- A. The Lighting Control Stations shall be the Unison Heritage UH Series Control Stations as manufactured by Electronic Theatre Controls, Inc., or equal.
- B. Mechanical
 - 1. Unison Heritage Button and Button/Fader Stations shall operate using up to sixteen programmable faders and twelve programmable buttons.
 - 2. All button/fader stations shall be available with white, cream, ivory, gray or black faceplates, fader knobs, and buttons.
 - a. Manufacturer's standard colors shall conform to the RAL CLASSIC Standard.
 - 3. Stations shall have indicators lights at each button or fader.
 - a. Indicators shall be comprised of red, green and blue LED's
 - b. Indicator color and state (steady On, Blink, Off) shall be configured in software, and shall operate relative to the button or fader it is associated with.
 - 4. All faceplates shall be designed for flush or surface mounting.
 - 5. Station faceplates shall be constructed of ABS plastic and shall use no visible means of attachment.
 - 6. Station faceplates shall be indelibly marked for each button or fader function.
 - 7. The manufacturer shall supply back boxes for flush mounted half gang stations and for all surface mounted stations.
- C. Functional
 - 1. The Unison Paradigm Control System shall be designed to allow control of lighting and associated systems via Button, Button/Fader, and Interface or Astronomical time clock controls. System shall allow the programming of presets, sequences, macros and time clock events.

2. Station Button, Button/Fader, and Interface) control components shall be designed to operate standard default or custom system functions. Components shall operate default functions unless re-assigned via LightDesigner, the Windows-based configuration program.
3. Stations (Button and Button/Fader) shall allow programming of station and component electronic lockout levels via LightDesigner.

D. Electrical

1. Unison control station wiring shall be an Echelon® Link power network.
 - a. Link power shall utilize low-voltage Class II unshielded twisted pair, type TMB PCLP1PTP
 - b. Touchscreen and Interface stations shall also require (2) #16 AWG stranded wires for 24Vdc operating power. 24Vdc wiring shall be topology free.
 - c. Network wiring may be bus, loop, home run, star or any combination of these.
 - d. Network insulation displacement connectors shall be provided with all stations.

2.4 ARCHITECTURAL LIGHTING RESPONSIVE CONTROLS

A. Ceiling Mount Occupancy/ Vacancy Sensors

1. The Lighting Occupancy and Vacancy Sensors shall be the Unison Paradigm Responsive Controls Series as manufactured by Electronic Theatre Controls, Inc., or equal.
2. Mechanical
 - a. All sensors shall be constructed of ABS plastic and available in pure white or black
 - 1) Manufacturer's standard colors shall conform to the RAL CLASSIC Standard.
 - b. Sensors shall provide configuration buttons for:
 - 1) Linking of station to lighting control system
 - 2) Enabling walk-test mode
 - c. Sensors shall include customizable masks to block unwanted areas from view
 - 1) Masks shall be field installable without the need to unmount or disassemble the sensors
 - d. Sensors shall have no visible means of attachment
 - e. Sensors shall include an adjustable mounting base that supports the following mounting options:
 - 1) Mounting to any standard ceiling box
 - 2) Mounting to any standard junction box
 - 3) Mounting to single gang RACO box
 - 4) Mounting to drywall or soft ceiling tiles using an included wire form adapter
 - f. Sensors shall include necessary mounting screws and hardware
 - g. Sensors shall include all necessary mounting hardware, wiring connectors, and instructions.
 - h. Sensors shall utilize multi-segment lens with internal slots to reduce buildup of dust.
 - i. Sensors shall be available with three coverage options for:
 - 1) Large room: 1800 sq. ft. at 8' ceiling, 3000 sq. ft. at 12' ceiling
 - 2) Small room: 450 sq. ft. at 8' ceiling, 800 sq. ft. at 12' ceiling
 - 3) High Ceiling: 350 sq. ft. at 10' ceiling, 7000 sq. ft. at 40' ceiling
3. Electrical
 - a. Sensor wiring shall be low-voltage Class 2 wiring
 - b. Sensors shall use Unison LinkConnect control wiring
 - 1) Wiring shall be an Echelon® Link power network.

- 2) Link power shall utilize low-voltage Class II unshielded twisted pair, type TMB PCLP1PTP
 - 3) Network wiring may be bus, loop, home run, star or any combination of these.
 - 4) Network termination connectors shall be provided with all sensors
- c. Sensors shall be designed and tested to withstand discharges without impairment of performance when subjected to discharges of 15,000 volts per IEC 801-2.
- d. Sensors shall utilize LED illumination for status feedback of motion detection and for use during programming
- e. Sensors shall be UL and cUL LISTED and CE marked
- 4. Functional
 - a. The Control System shall support sensors for occupancy or vacancy detention
 - 1) A single sensor shall support occupancy or vacancy detection based on software configuration
 - b. Sensors shall meet ASHRE 90.1, CA Title 24 and NYC local law 48
 - c. Provide 360-degree coverage range and include configurable masking.
 - d. Sensors functions shall be programed using LightDesigner configuration software
 - 1) Shall support configurable time delay and sensitivity
 - 2) Shall support independent programming of any system function as occupied and unoccupied events
 - 3) Shall support overrides
 - e. Sensors shall support walk-thru mode for simple testing of coverage
 - 1) Illumination of sensor lens shall be used to indicate movement is detected, even with lens masks are installed.
 - 2) Activation shall not require special tools or software
 - 3) Provides 5 minute timeout to return to normal operation

2.5 ARCHITECTURAL LIGHTING TOUCHSCREEN STATIONS

- A. The Touchscreen Control Stations shall be the Unison Paradigm Touchscreen P-TS7 Series Control Stations as manufactured by ETC, Inc., or equal.
- B. General
 - 1. Touchscreen stations shall support default and fully graphical control pages.
 - 2. The Touchscreen station shall operate using graphic buttons, faders and other images on at least 30 separate programmable control pages.
 - 3. Touchscreen stations shall also allow programming of page pass-code, lock out and visibility levels.
- C. Mechanical
 - 1. Touchscreen stations shall consist of a seven inch, backlit liquid crystal display (LCD) with a minimum resolution of 800 by 400 pixels and 24-bit color depth with a capacitive touch interface.
 - 2. Touchscreen bezels shall be constructed of cast aluminum finished in a fine texture powder coat.
 - a. Touchscreen shall be available in five standard colors
 - 1) Cream (RAL 9001)
 - 2) Ivory (RAL 1015)
 - 3) Gray (RAL 7001)
 - 4) Black (RAL 9004)
 - 5) Signal White (RAL 9003)

- b. The bezel shall have no visible means of attachment.
 - c. The bezel shall allow the touchscreen to be installed and removed without the use of tools.
 - d. The bezel shall provide two working positions for the Touchscreen: service and normal operation.
- 3. Touchscreen shall offer optional hinged locking covers
 - a. Locking covers shall be made from cast aluminum and be painted to match standard touchscreen color options
 - b. Locking covers shall allow for viewing of system status on the touchscreen through a smoked Lexan window
- 4. The manufacturer shall provide back boxes for all LCD stations.
 - a. Flush back box for Touchscreens with or without locking covers shall be 7.94" wide x 5.33" high x 3.25" deep
 - b. Surface back box dimensions shall be 8.3" wide x 5.6" high x 2.75" deep
 - c. Surface back box for Touchscreens with locking cover dimensions shall be 10.0" wide x 6.7" high x 2.75" deep

2.6 DMX CONTROLLED MOTORIZED BREAKER PANEL

A. General

- 1. Intelligent breaker system shall be 120V Sensor IQ as manufactured by ETC, Inc., or equal
- 2. Breaker Panels shall be UL508, UL67, and UL924 Listed, and shall be so labeled when delivered
- 3. Breakers shall be UL489 listed and shall be labeled when delivered
- 4. Breaker Panels shall consist of a main enclosure with 12, 24, or 48 pole breaker subpanels, integral control electronics for low voltage terminations and provision for accessory cards
 - a. Up to two accessory cards shall be supported per breaker panel

B. Mechanical

- 1. The panel shall be constructed of 16-gauge galvanized steel. All panel components shall be properly treated or finished in fine-textured, scratch resistant paint
- 2. Breaker panels shall be capable of being mounted on the surface of a wall or recessed mounted
- 3. Breaker panels shall be available in 12, 24, and 48 pole configurations
 - a. 12 pole MLO (No provision for main Breaker)
 - 1) 31 inches high, 14.25" wide and 4" deep (with front panel attached)
 - b. 12 pole (with provision to add main breaker)
 - 1) 40.25 inches high, 14.25" wide and 4" deep (with front panel attached)
 - c. 24 pole (with provision to add main breaker)
 - 1) 50.25 inches high, 14.25" wide and 4" deep (with front panel attached)
 - d. 48 pole (with provision to add main breaker)
 - 1) 64 inches high, 20" wide and 5.25" deep (with front panel attached)
- 4. Choice of panel covers shall be available for surface or recess mount applications. This outer panel shall ship complete with a locking door to limit access to electronics and breakers
 - a. Optional center-pin reject security screws shall be available for all accessible screws
 - b. Optional recess mount doors shall extend 1" beyond all panel edges to hide wall cut-out

5. The unit shall provide interior cover over the control electronics and accessory cards to allow access only to class 2 wiring and prevent direct access to class 1 line voltage components
6. The panel shall support up to twelve, twenty-four, or 48 single pole branch circuits
 - a. Branch circuits shall range from 15A to 30A capable of holding full rated load for minimum of three hours continuously
 - b. Two and three-pole circuits shall be supported at decreased density where each pole constitutes one of the available single-pole circuits. Mixing of circuits in any combination shall be supported
7. Breakers shall provide manual switching control while power is unavailable to the panel such that critical lighting can be set to an on state, without the need for power to the panel
8. Breaker output lugs shall accept 10-14 AWG dual conductor wire
9. Breaker output lug shall support solid or stranded 6-14 AWG class B, C, or K copper wire
10. Control wiring for DMX, station bus, and Emergency input terminations shall land on a removable headers for contractor installation

C. User Interface

1. The user interface shall contain an LCD display with button pad to include 0-9 number entry, up, down back arrow navigation and enter
2. Test shortcut button shall be available for local activation of preset, sequence and set level overrides
3. The user interface shall have a power status LED indicator (Blue), a DMX status LED indicator (Green), a network status LED indicator (Green) and an LED indicator (red) for errors
4. Interface shall allow the backlight to timeout and shall provide user editable options to shut off backlight completely as well as adjust screen contrast
5. Ethernet interface shall default to automatic IP through link local and DHCP. Upon receiving IP address, the address of the Network Interface Card (NIC) shall display in the about menu. Static address and settings shall also be possible
6. The control interface shall support a USB memory stick interface for uploads of configurations and software updates
7. The user interface shall support power input from an external Uninterruptible Power Supply (UPS) supplying 800W-2400W AC power

D. Functional

1. Panel setup shall be user programmable. The control interface shall provide the following breaker setup features (per circuit):
 - a. Type (1 pole, 2 pole, or 3 pole)
 - b. Name
 - c. Circuit Number
 - d. DMX address
 - e. sACN address
 - f. Space Number
 - g. Circuit Modes
 - 1) Normal (priority and HTP based activation and dimming)
 - 2) Latch-lock
 - 3) Fluorescent
 - 4) DALI
 - h. On threshold level
 - i. Off threshold level
 - j. Include in UL924 emergency activation

- k. Allow Manual
- 2. Breaker panels shall support discrete addressing of each breaker. Panels that are restricted to use of start address with sequential addressing, and cannot assign each 0-10V output control to any internal circuit shall not be acceptable
- 3. The panel shall be capable of switching 6 poles on or off at once, or in a user-selectable delay per breaker using a period of 0.1 to 60 seconds, in 0.1 second increments
- 4. An Ethernet connection shall provide advanced control of relays over streaming ACN (sACN) and transmit status, control override, and measured energy usage per branch circuit via an internal Web UI or central monitoring interface
 - a. Control electronics shall report the following information per branch circuit.
 - 1) Breaker state (On/Off)
 - 2) Breaker state (Open/Closed)
 - 3) Current draw (In Amps)
 - 4) Voltage
 - 5) Energy usage
 - b. Panels that do not report this information shall not be acceptable.
- 5. Built-in Control shall include:
 - a. Ability to record up to 16 presets in each space from the control panel, connected control stations, or timed events
 - b. Presets shall be programmable by recording current levels (as set by DMX or connected control stations), by entering levels on the control panel directly, manually selecting breaker state on each breaker, or a combination of these methods. From the control panel, stations, or timed events it shall be possible to record values for up to 16 zones per space
 - c. Up to 8 spaces in a single rack for total of up to 16 spaces shall be supported per system or system subnet
 - d. Indication of an active preset shall be visible on the control panel display
 - e. One 16-step sequence per space for power up and power down routines
 - f. The panel shall have a UL924-listed contact input for use in Emergency Lighting systems. The panel shall respond to the contact input by setting included breakers to “on”, while setting non-emergency breakers “off”. Each breaker can be selected for activation upon contact input
 - g. Upon Data loss the system shall provide options to hold last look infinitely or hold for a configured time period set by the installing technician then fade/switch to the input of the next available priority
 - h. Control electronics shall respond directly to control stations for zone, preset, and sequence control. Systems that require secondary control systems for this functionality are not acceptable
 - i. After power loss, electronics shall be capable of holding the system in its previous state until new level data (DMX, architectural presets, sequences and zones, or local overrides) is received to make each breaker change state
- 6. The control of lighting and associated systems via timed and Astronomical clock controls
 - a. The breaker panel shall allow the activation of presets, sequence, and zone programming of up to 50 time clock events via a built in real and astronomical time clock
 - b. System time events shall be programmable via the control panel
 - 1) Time clock events shall be assigned to system day types. Standard day types include: everyday, weekday, weekend, Sunday, Monday, Tuesday, Wednesday, Thursday, Friday and Saturday
 - 2) Time clock events shall be activated based on sunrise, sunset, time of day or periodic event

- 3) System shall automatically compensate for regions using a fully configurable daylight saving time
 - 4) Presets shall be assigned to events at the time clock
 - c. The time clock shall support event override
 - 1) It shall be possible to override the timed event schedule from the face panel of the time clock
 - d. The time clock shall support timed event hold
 - 1) It shall be possible to hold a timed event from the face panel of the processor
 - 2) Timed event hold shall meet California Title 24 requirements
- 7. The panel shall receive ESTA DMX512-A control protocol. Addressing shall be set via the user interface button keypad with any circuit patched to any DMX control address
 - a. 2,500V of optical isolation shall be provided between the DMX512 inputs and the control electronics as well as between control and power components
 - b. The breakers shall respond to control changes (DMX or Stations) in less than 25 milliseconds. DMX512 update speed shall be 40Hz
 - c. Setting changes shall be able to be made across all, some, or just one selected breaker in a single action from the face panel
 - d. DMX data loss shall allow for levels/breakers to be held for ever or for a specified time before switching to a lower priority source
 - e. Initial Panel setup
 - 1) The breaker panel shall automatically detect the type of breaker or dimmer installed in each location without need for manual configuration of the physical arrangement
 - 2) Quick rack setup shall be available to apply address settings across all circuits for rack number, DMX Start Address, sACN universe, and sACN start address
 - 3) Emergency Setup Menu shall provide optional delays when emergency is activated or deactivated, and option to turn off non-emergency circuits shall be available. Record function shall allow circuits that are turned on to be added to the emergency setting

E. Electrical

- 1. Breaker Panels shall be available to support power input from:
 - a. 120/208V three phase 4-wire plus ground
 - b. 120/240V single phase 3-wire plus ground
- 2. Conduit Entry:
 - a. Feeders:
 - 1) Top or upper 6" of either side
 - 2) Bottom or lower 6" of either side
 - 3) Feeders shall enter through the top or bottom according to the orientation of the enclosure.
 - 4) Feeder entry shall be nearest to the location of the feeder lugs or main breaker.
 - b. Load:
 - 1) Load wiring shall enter through the top or bottom of the enclosure through the surface nearest to the breaker sub panel
 - 2) Load wiring may also enter through left and/or right side provided a low voltage chase is not required through the same area. If class 2 chase is required, a field installable barrier panel shall be provided upon request. The side of the panel where the barrier has been installed shall not permit load wiring
 - c. Low Voltage:

- 1) Top or upper 6" of either side
 - 2) Bottom or lower 6" of either side
 - 3) For low voltage conduit entry at the breaker end of the cabinet, conduits shall be located at the outer 3" of the top/bottom panel
3. Breaker
- a. Bus connection type: Stab on
 - b. 1, 2, or three poles
 - c. UL489 listed
 - d. 15 amp, 20 amp, or 30 amp
 - e. 22,000 SCCR; 65,000A series rated with main breaker
 - f. High inrush trip curve (matches all Sensor breakers)
 - g. Maintains trip curve through entire thermal range
 - h. Guaranteed not to trip at full load
 - i. Load lugs accept 6-14awg load wiring
 - j. Multi-conductor listed output terminal
 - k. Integral mechanically held air gap relay
 - l. Manual control of relay state using breaker handle w/o power
 - m. Integral current sensing
 - n. Integral position and trip sensing
 - o. Control and status provided by contact pads directly at bottom of the breaker case
 - p. No external wires or connections required for control or feedback
 - q. The breaker shall be capable of switching up to 30A
4. The breaker panel shall support a maximum feed size
- 1) 100 Amps at 12 circuits
 - 2) 200 Amps at 24 circuits
 - 3) 400 Amps at 48 circuits
 - b. Breaker panels shall support main circuit breaker options:
 - c. Main breaker options shall be optional and available for purchase upon request
 - d. Main breakers shall be field installable
 - e. Main breakers shall be available in up to 100 Amps for 12 circuit panels, up to 200 Amps for 24 circuit panels, and up to 400A for 48 circuit panels at 120V
 - f. Series SCCR ratings apply as follows with appropriate main breaker:
 - g. 22,000A or 64,000 at 120/208V
 - h. Main breakers shall allow the following range of wire sizes:
 - i. Up to 300kcmil at 100A and 200A
 - j. Up to 2x250kcmil at 400A
 - k. Main Lug input shall support up to 2x250kcmil
 - l. Breaker panel shall support a 500kcmil main lug option for 48-circuit panels
- F. Breaker remote switching ratings
- 1) Mechanical 1,000,000 cycles
 - 2) 24A Resistive 100,000 cycles
 - 3) 16A Ballast (HID) 75,000 cycles
 - 4) 15A Electronic (LED) 100,000 cycles
 - 5) 15A Tungsten 45,000 cycles
 - 6) 30FLA; 180 LRA Motor Load 50,000 cycles
 - 7) Tested duty cycle: 12 operations (6 cycles) per minute
 - 8) Decreasing duty cycle significantly increases switch life
 - 9) Isolation: 4000V RMS
 - 10) Current reporting accuracy: 5%
 - 11) Latching state mechanical relay

G. Breaker Panel Accessories

1. A low voltage 0-10V dimming option shall provide up to 24 0-10v control outputs that are linked to relay circuits within the panel. Each output shall support up to 400mA of current sink per output
2. A contact input option shall provide 24 dry contact inputs to be linked for direct or group relay control, to activate a preset, or to activate a sequence. Controller software shall allow for normally open maintained, normally closed maintained, or momentary toggle
3. A DALI control option shall provide 24 control loops of broadcast DALI control, with each loop controlling up to 64 DALI devices
4. A RideThru option shall provide short-term power backup of control electronics by automatically engaging when power is lost, and recharging when normal power is present
5. An Isolated Ground option shall provide each circuit in the panel with a ground terminal that is electrically isolated from the equipment ground
6. Main Breaker options shall be available as shown in Section E.4

H. Thermal

1. The panel shall be convection cooled. Panels that require the use of cooling fans shall not be acceptable
2. The panel shall operate safely in an environment having an ambient temperature between 32°F (0°C) and 104°F (40°C), and humidity between 5-95% (non-condensing)

2.7 EMERGENCY BYPASS DETECTION KIT

- A. The bypass detection kit shall be the Emergency Bypass Detection Kit as manufactured by Electronic Theatre Controls, Inc., or equal.
- B. The Enclosure shall be a surface mounted, constructed of 16-gauge formed steel panels removable front cover finished in fine textured, scratch-resistant, powder coat paint
- C. Accessories for installation, including tap kits and manual reset switch kits shall be available from a single manufacturer.
- D. Emergency Bypass Detection enclosures shall support 100 to 277 volt configurations
 1. EBDK enclosures shall be field configurable for single-phase, bi-phase, and three-phase operation without the need for additional components.
- E. The Emergency Bypass Detection Kit shall be completely pre-wired by the manufacturer. The contractor shall provide input feed and control wiring.
- F. All control wire connections shall be terminated via factory provided connectors.
- G. The Bypass Detection Kit shall be UL and cUL Section 924 Listed for interaction with similarly listed dimming and switching panels

2.8 DMX EMERGENCY BYPASS CONTROLLER

- A. Where required to trigger special-purpose lighting presets and bypass normal lighting controls during emergency or panic situations, the bypass means shall be the DMX Emergency Bypass Controller (DEBC) as manufactured by ETC, Inc., or equal
- B. Functional
 - 1. The DMX Emergency Bypass Controller shall be capable of overriding a single universe of ANSI E1.11–2008, USITT DMX512-A control signals from “Normal” to “Bypass” when a trigger signal is detected via a contact closure trigger input
 - a. The DMX Emergency Bypass Controller shall output to a single DMX output or up to six optically-isolated DMX outputs
 - b. The DMX Emergency Bypass Controller shall poll the bypass trigger input after a power loss and react upon start up
 - c. The default or recorded preset shall be recalled immediately on restart if the trigger is also applied at restart
 - d. Controllers that do not support E1.11–2008 compliant DMX communication shall not be acceptable
 - 2. The DMX Emergency Bypass Controller shall be capable of recording a single DMX preset (snapshot) of 512 channels for recall during “Bypass” mode
 - 3. The DMX Emergency Bypass Controller (DEBC) shall have internally accessible, labeled DIP switches for configuration of:
 - a. DMX Record Mode
 - 1) All 512 channels (default)
 - 2) Selected channels, snapshot
 - b. Contact input type
 - 1) Normally open (default)
 - 2) Normally closed
 - c. Wait Time for Restore incoming DMX (bypass trigger removed)
 - 1) 0 Seconds (default)
 - 2) 10 Second Wait
 - 3) 30 Second Wait
 - 4) 10 Minute Wait
 - 4. The DMX Emergency Bypass Controller shall support a single bypass input using two input modes:
 - a. Bypass triggering shall be supported via a maintained contact input configurable for normally open (N.O.) or normally closed (N.C.) operation
 - b. The contact input shall support +12VDC wet input to provide interface with fire alarm or secondary triggering systems. Bypass controllers that do not support a fire alarm input shall not be acceptable.
- C. Mechanical
 - 1. The DMX Emergency Bypass Controller (DEBC) enclosure shall be a surface mounted enclosure with a removable cover, constructed of 16-gauge, formed steel with a removable front cover
 - a. All components shall be properly treated and finished in fine textured, scratch-resistant, powder coat paint
 - b. DEBC enclosure shall have a minimum of four keyed mounting holes for wall attachment

- c. DEBC enclosure shall have a visible label stating the product name, manufacturer name, indicator functions, control functions, ratings and listings
- 2. The DMX Emergency Bypass Controller (DEBC) enclosure shall provide discrete high and low voltage wiring compartments with voltage barrier
- 3. The DMX Emergency Bypass Controller (DEBC) shall have a single bi-color LED indicator visible from the exterior of the enclosure
 - a. LED shall indicate Normal state with a “green” color light
 - 1) Normal state illuminates steady green when Power and DMX are present
 - 2) LED Off indicates Power or DMX are not present
 - b. LED shall indicate Bypass state with a “red” color light
 - 1) Bypass state includes bypass input contact trigger or ‘test’ active
- 4. The DMX Emergency Bypass Controller (DEBC) shall have a single test button accessible from the front of the enclosure without removing any panels
 - a. The test button shall immediately trigger bypass state for as long as it is held down, and release the bypass state immediately upon release of the button
 - 1) The test button shall be momentary only
 - 2) The test button shall be recessed to prevent accidental triggering
- 5. The DMX Emergency Bypass Controller (DEBC) shall have a single, internally accessible button for DMX Record (snapshot) with an indicator LED for record action
 - a. The record button shall be momentary only and held for at least 3 seconds before activation to prevent accidental recording
 - b. The LED indicator will flash rapidly when record function is active
 - c. The LED indicator will illuminate steady when record function is complete
- 6. The DMX Emergency Bypass Controller (DEBC) dimensions and weights shall not exceed:
 - a. 9” H x 11” W x 2” D,
 - b. 8lbs (single output); 14.5lbs (multi-output)

D. Electrical

- 1. The DMX Emergency Bypass Controller shall be completely internally pre-wired by the manufacturer
- 2. The contractor shall provide input feed and control wiring to the provided terminals
 - a. DMX Emergency Bypass Controllers (DEBC) shall support 100 to 277 volt input power, 50/60 Hz, 150mA maximum current
- 3. DEBC shall support labeled terminations for two 24 – 10 AWG solid or stranded power wires
- 4. DEBC shall support one Grounding Lug for 24-14 AWG solid or stranded ground wire
- 5. DEBC shall support labeled, socketed termination connections for DMX Input and DMX Output wiring
 - a. Terminations shall support Belden 9729 cable or equivalent
 - 1) DMX Termination kits for Belden 9729 shall be supplied with the controller
 - 2) Optional Termination kits for Belden 1583A (or equivalent Category 5 cable) shall be available from the manufacturer
- 6. DEBC shall support labeled, socketed termination for the bypass contact input
 - a. Termination shall support two, 30-12 AWG low-voltage wires
 - b. The bypass input shall support a maintained normally open (N.O.) or normally closed (N.C.) dry contact input
 - c. A +12VDC wet contact input shall also be available for interface to fire alarm systems.
 - d. DEBC shall support socketed DMX transceiver chips
 - 1) A spare DMX transceiver chip shall be supplied in a labeled, inactive socket

7. The DMX Emergency Bypass Controller (DEBC) shall internally switch from the normal DMX input (pass through) to the bypass DMX output using electromechanical relays when triggered
 - a. The DEBC shall have non-volatile memory for storage of a single recorded sequence of 512 channels
 - 1) The recorded sequence shall persist through power outages
 - 2) The default sequence shall have all 512 channels at “full” if no sequence is recorded
 - b. The DEBC shall have a DMX baud rate of “Slow” (20 packets per second) for increased compatibility during bypass DMX output
8. The DEBC shall be available in two versions capable of output to a single DMX line or up to six optically-isolated DMX lines
9. The DMX Emergency Bypass Controller shall be UL and cUL Section 924 LISTED for interaction with similarly listed products

E. Thermal

1. Ambient room temperature: 0-40°C / 32-104°F
2. Ambient humidity: 10-95% non-condensing

2.9 BRANCH CIRCUIT EMERGENCY LIGHTING TRANSFER SWITCH

A. General

1. The Branch Circuit Emergency Lighting Transfer Switch (BCELTS) shall be the SC1008 as manufactured by ETC, Inc., or equal
2. The BCELTS shall provide automatic transfer of a single branch circuit from normal to emergency power source, when normal power fails
3. The BCELTS shall transfer a lighting load branch circuit from a dimmer/ relay or secondary control output to a second power source in the event of a loss of power to the primary power source, a normal system failure, or activation of a fire alarm
4. The system shall be listed under ANSI / UL1008 Transfer Switch Equipment and comply with ANSI / NFPA 110 Standard for Emergency and Standby Power Systems, and ANSI / NFPA 70 (NEC), including Article 700, 701 and 702 safety standards. Emergency transfer systems that do not comply with the below stated NEC articles and sections shall not be permitted
 - a. Satisfies requirements of the National Electrical Code (NFPA 70):
 - 1) Article 700 – Emergency Systems
 - 2) Article 701 – Legally Required Standby Systems
 - 3) Article 702 – Optional Standby Systems
 - 4) Section 518.3(C) – Assembly Occupancies
 - 5) Section 520.7 – Theatres and Similar Locations
 - 6) Section 540.11(C) – Motion Picture Projection Rooms
5. The BCELTS shall transfer a single circuit at 120V or 277V up to 20 Amperes in capacity

B. Transfer Switch

1. The BCELTS shall be a UL1008 transfer switch listed for Emergency Systems (NEC Articles 700 and 701; UL CCN WPWR)
 - a. Transfer switches not listed under UL1008 shall not be acceptable
 - b. Transfer switches listed under UL1008 for Optional Standby (NEC Article 702; UL CCN WPXT) applications only shall not be acceptable

- c. Automatic Load Control Relays (ALCR) listed under UL924 shall not be acceptable
 - 2. The switch shall be positively latched and unaffected by voltage variations or momentary outages so that constant contact pressure is maintained and temperature rise at the contacts is minimized
 - 3. The switch shall be electrically interlocked to ensure only one position, either Normal or Emergency, is engaged at any time
 - 4. The switch shall be break-before-make to ensure that normal and emergency sources are never interconnected within the unit
 - 5. Built-in fuses shall provide 10,000 Ampere Short Circuit Current Rating (SCCR) on the connected emergency circuit
 - 6. Switch contacts shall withstand transfer without welding, with 180° phase displacement between normal and emergency power sources if both sources are energized
 - 7. Transfer switch contacts shall be rated for mixed loads, including electric discharge lamps and tungsten filament lamps
 - 8. Transfer switch shall be rated for a minimum of 6,000 cycles at full tungsten load
- C. Control Circuitry
- 1. The control circuitry shall direct the operation of the transfer switch
 - 2. A field-configurable normally closed (NC) or normally open (NO) dry contact closure input shall be provided
 - a. Up to (10) BCELTS devices may be connected to a single remote loop
 - 3. The BCELTS shall support transfer of a 0-10V or DALI controlled circuit
 - a. Upon activation of emergency transfer the BCELTS shall break the 0-10V or DALI control circuit, driving connected 0-10V circuits to full output and DALI circuits to their default level.
- D. Operation
- 1. Transfer to alternate emergency supply will occur when normal supply sense voltage drops below 80V when used at 120V or 277V
- E. Enclosure
- 1. The BCELTS shall be mounted in a NEMA 1 interior type enclosure finished in fine-textured epoxy paint
 - 2. The enclosure shall be 8.5"H x 10.5"W x 2.75"D
 - 3. The system shall be provided with an approved overlay mounted on the front of the enclosure, stating, "BRANCH CIRCUIT EMERGENCY LIGHTING TRANSFER SWITCH"
 - 4. The enclosure shall be provided with an approved label indicating that the system is UL1008 LISTED for Emergency Systems

2.10 LIGHTING NETWORK SPEC GENERAL

- A. General
- 1. The Electronic Theatre Controls Net3 network shall provide data distribution over TCP/IP Ethernet networks. Data shall be layer 3 routable. Systems using proprietary formats or formats other than 10/100/100Mbit wired Ethernet or non-layer 3 routable networks shall not be accepted.
 - 2. Connections shall be made between consoles, face panels, architectural processors, dimmers, Net3 Gateways, and computers over standard Ethernet distribution systems using

100BaseT, 100BaseFL, or greater wiring. All installations shall conform to established Ethernet wiring practice, and installation shall be performed by contractors qualified to do this type of work. All wiring shall be tested at Category 5e or higher for full bandwidth operation to the appropriate IEEE standard.

3. The Lighting Control system must be supplied by a single manufacturer and must have seamless integration over Ethernet between the Entertainment and Architectural lighting control.

B. Capacities

1. The network shall support DMX routing, patching, and prioritization for up to 63,399 universes (32,767,488 DMX addresses). Each address may be input or output from any port on any DMX gateway in the system. DMX input, routing and output shall be specifically supported on the system from multiple sources and locations up to the maximum number of gateways supported by the Ethernet topology.
2. The network shall support multiple network hosts including consoles, gateways, dimming racks, computers, file servers, printers, and architectural control processors with discrete command lines and control. The lighting network shall support multiple venues within a system and discrete systems on the same network.

C. System Configuration and Monitoring

1. Network device configuration shall be via Net3 Gateway Configuration Editor (GCE) software and/or ANSI E1.17 Architecture for Control Networks (ACN).
2. Patch addresses shall support viewing and manipulation via ANSI E1.17 ACN.
 - a. The system shall permit complete user flexibility allowing the system operator to patch each DMX input address to any ANSI E1.31 streaming ACN address, and DMX output to span streaming ACN universes.
 - b. The lighting system shall support assignment of DMX offsets, truncation of DMX universes, and provide choice of DMX port prioritization.
 - c. The lighting system shall support the DD start code extension to ANSI E1.31 which provides priority per address such that multiple control sources can share universes with discrete control per address.
 - d. Lighting systems that do not support the above mentioned address patching capabilities shall not be suitable.
3. The system shall allow assignable labels for all network devices to allow easy identification by system users.
4. Each network device shall have a discrete and unique IP address provided automatically by the software. The user may edit this IP address. Systems that do not support automated IP allocation with IP collision avoidance, and systems that do not allow complete reconfiguration of the above mentioned features over ANSI E1.17 ACN shall not be acceptable.
5. All configuration data for each network device shall be held at the device and system operation shall not require continuous on-line operation of the network configuration software.
6. Lighting console operators shall be able to backup the network configurations in the lighting control console. In the event of a network device failure, the operator shall be able to apply the configuration of the failed device to a replacement device of the same type without manually reentering settings. Systems that do not support configuration backup as described above shall not be accepted.
7. Architectural and Entertainment systems connected to the same network shall be capable of arbitrating control over E1.31 Streaming ACN (sACN) level data. The system shall be capable of alternating control of individual address data between architectural and

entertainment systems without intervention by the user. The user shall dictate the conditions under which system shall automatically take control. The network shall allow user override of the selected defaults. Systems which require direct user intervention to allocate control of dimmers between architectural and entertainment lighting systems shall not be accepted.

8. The Net3 network shall allow multiple DMX input sources to be prioritized on the same universe as network native sources using E1.31 Streaming ACN prioritization. Multiple DMX inputs may be assigned to the same streaming ACN address (this provides multi-source control for a particular address). Likewise, the system shall support E1.31 prioritization of multiple simultaneous network sources. Systems that cannot prioritize multiple DMX inputs and multiple native network sources on a network shall not be deemed suitable.
9. The lighting network shall allow each DMX input address to be assigned a priority on the network allowing each DMX control level coming into the system to participate in full arbitration. Addresses with the highest priority shall have control, with lower priority addresses being ignored. Addresses assigned the same numeric priority, between 1 and 200, shall respond in highest level takes precedence (HTP) manner. The network shall require a valid DMX signal present at the input to initiate prioritization. Systems that do not allow for prioritized HTP for DMX inputs to the network shall not be allowed.

D. Operational Features

1. Each DMX gateway shall control up to 512 DMX addresses per port, within the confines of up to 63,999 DMX universes (32,747,488 address). The specific DMX data input or output by the gateway shall be configurable by the user.
2. Duplicate outputs of DMX data (DMX splitter) and discrete outputs shall be fully supported.
3. Merging of multiple DMX input sources on a single gateway without gateway with DMX output on the same gateway shall be supported without connection to the network. The gateway shall support assignment of priority to each input source independently
4. File transmission, synchronization and access to software shall be supported.

2.11 DMX/RDM ETHERNET GATEWAY – FOUR PORT

A. General

1. The lighting control gateway shall be a microprocessor-based unit specifically designed to provide DMX-512 control of lighting systems and transport of RDM configuration and status messages. The gateway shall permit DMX-512 data to be encoded, routed over an Ethernet network and decoded back to DMX-512. The unit shall be a Response DMX/RDM 4-port Gateway as provided by ETC, Inc.
2. Gateways shall communicate over Ethernet directly with lighting control products and other Ethernet interfaces.
3. Connections shall be made between gateways, consoles, architectural systems, and PCs over standard Ethernet distribution systems using 10/100BaseT.
4. The gateway shall support multiple protocols including:
 - a. ANSI E1.17 Architecture for Control Networks (ACN)
 - b. ANSI E1.31 Streaming ACN (sACN)
 - c. ANSI E1.11 USITT DMX512-A
 - d. ANSI E1.20 Remote Device Management (RDM)
5. The gateway shall be tested to UL standards and labeled ETL Listed.

6. The gateway shall be RoHS Compliant (lead-free).
 7. The gateway shall be CE compliant.
 8. The gateway shall have a backlit graphic LCD display for identification (soft-labeling) and status reporting.
 - a. Labeling shall be user configurable using ANSI E1.17 Architecture for Control Network (ACN), or a purpose built software configuration tool.
 - b. The LCD display shall show DMX port configuration indication as well as indicate the presence of valid signal.
 - c. Gateways that do not indicate port configuration (input/output) and valid data shall not be acceptable.
 9. Each gateway shall have power and network activity LEDs on the front of the gateway
- B. DMX Ports
1. DMX Ports shall comply with the requirements of ANSI E1.11 USITT DMX512-A standards.
 2. Each DMX port shall be software-configurable for either input or output functionality.
 3. DMX input shall be optically-isolated from the gateway electronics.
 4. DMX output shall be earth-ground referenced.
 5. DMX Port shall be capable of withstanding fault voltages of up to 250vAC without damage.
 6. Each port shall incorporate one DMX512-A Connection
 - a. Gateways shall be available with the following connection options: 5-pin male XLR, 5-pin female XLR, Ethercon RJ-45, or terminal strip module for DMX wiring.
 7. Network gateways that do not indicate input/ output port configuration or presence of valid data shall not be accepted
- C. Processor
1. Each gateway shall have sufficient processing power to manage up to 63,999 universes (32,767,488 addresses).
 2. Maximum delay time from input to output shall not be greater than one packet time (approximately 22 mSec.).
 3. A minimum DMX update rate of 40Hz shall be sustained under all conditions unless specifically configured for a slower rate for the sake of compatibility with 3rd party DMX devices.
- D. Mechanical
1. The gateway shall be available in two versions
 - a. Rack-Mount/Portable
 - 1) The Gateway shall be fabricated of 16-gauge steel, finished in fine-texture, scratch-resistant, black powder coat (RAL 9004).
 - 2) Dimensions shall be 8.5" (22 cm) wide x 8.0" (20 cm) deep x 1.75" (5 cm) high.
 - 3) The weight of the gateway shall be 3.5 lbs. (1.6 kg) with four DMX modules. An individual module shall weight no more than .25 lbs. (.1 kg).
 - 4) The gateway shall support table top use
 - b. DIN Rail Mount
 - 1) The DIN Rail mounted gateway shall be included in an extruded aluminum enclosure.
 - 2) Two wiring connections shall be required for connection to the lighting system

- a) Ethernet connection that supports standard Cat5 patch cables
 - b) DMX input or output connection using is terminal strip style connector
 - 3) Dimensions shall not be more than 8.03" wide (204mm) x 4.13" (105mm) deep x 1.22" (31mm) high (not including mounting hardware)
 - 2. Optional accessories for rack-mount and pipe applications shall be available from the manufacturer. These accessories shall support installation by an end-user.
- E. Power
- 1. Power for the gateway shall be provided over the Category 5 (or better) cable, utilizing IEEE 802.3af compliant Power over Ethernet (PoE). Power consumption using shall not be greater than 5 watts.
 - 2. An optional low-voltage DC power input shall be available utilizing an isolated in-line power supply capable of an operating range of 8-28vDC. The Power supply shall be provided by the gateway manufacturer.
 - 3. The gateway electronics shall be electrically isolated from the power supplied over the Catagory5 (or better) cable.
- F. Configuration
- 1. Each gateway on the network shall be individually configurable using freely available software configuration tools. The primary configuration tool shall be Net3 Concert configuration software running on a network connected PC. The PC shall only be required for configuration, and shall not be required for normal operation of the system.
 - 2. Each DMX gateway shall control up to 512 DMX addresses, within the confines of 63,999 universes.
 - 3. The specific DMX data input or output by the gateway shall be freely configurable by the user.
 - 4. Duplicate outputs of DMX lines (DMX splitter) and discrete outputs shall be fully supported.
 - 5. Multiple DMX universes may be configured with any length up to 512 total addresses. Any range of DMX input addresses shall support selection and routing to the specified sACN output.
 - 6. Multiple sACN sources may be combined with a priority may be assigned to each source sending data to the gateway
 - 7. All relevant routing information shall be stored in non-volatile memory at each gateway. The system shall recover from a power outage without requiring the PC to be online. Gateways that do not support non-volatile storage of data routing shall not be accepted.
- G. Network
- 1. Communications physical layer shall comply with IEEE 802.3i for 10BASE-T, 802.3u for 100BASE-TX and 802.3af for Power over Ethernet specifications.
 - 2. All network cabling shall be Category 5 (or better), conforming to TIA-568A/B, and shall be installed by a qualified network installer.
 - 3. Data transport shall utilize the TCP/IP suite of protocols to transfer the DMX data.
 - 4. ANSI E1.17 Architecture for Control Networks (ACN) and streaming ACN (sACN) shall be supported. Gateways that do not support ANSI E1.17 shall not be acceptable.
 - 5. Switches shall comply with power-over-Ethernet IEEE802.3af, unless a separate in-line power supply is provided.
 - 6. Multiple DMX signal routing patches and multiple facilities shall be supported and limited only by the file storage capacity of the computer with ETC Gateway Configuration Editor (GCE) Software installed.

7. Each DMX gateway shall control up to 512 DMX addresses, per DMX port within the confines of up to 64,399 universes (32,767,488 addresses) using Streaming ACN (sACN).
 - a. Any range of DMX addresses may be selected for each universe.
 - b. Multiple sources shall be supported by prioritized Highest Takes Precedence (HTP with priority). Each source shall support assignment of priority to allow override of default HTP behavior.
 - c. Each DMX port shall support its own universe and start address.
8. Gateways shall have built in DMX merger capability on a universe or channel-by-channel basis.
9. Gateways shall support have built in priority on a per-universe or channel-by-channel basis. Gateways that do not support prioritized merging of multiple network sources at independent priorities shall not be accepted.

H. Environmental

1. The ambient operating temperature shall be 0° to 40°C (32° to 104°F).
2. The storage temperature shall be -40° to 70°C (-40° to 158°F).
3. The operating humidity shall be 5% - 95% non-condensing.

I. Accessories

1. Hanging bracket kit shall allow unit to be mounted in three orientations.
 - a. U-Bolt or C-Clamp mounting hardware shall be available
2. One E.I.A. rack space mounting bracket kit shall support either one or two complete units and allow for up to eight ports of DMX
3. Front Access Panel kit shall allow the connectors on the rear of the gateway to be accessed from the front of an equipment rack. Options for 5-pin XLR style connectors that support DMX input or output shall be available
4. A Universal Power Supply with international plug-set shall be available. Multiple power supplies shall be able to fit in a vertically stacked power strip.
5. ETC Net3 Concert Configuration and monitoring Software

J. System Requirements

1. Provide the quantity and type of gateways required, as scheduled. Gateways and software shall be as manufactured by ETC Inc. of Middleton, WI.
2. Provide Ethernet switches and power supplies as scheduled and as shown on drawings.
3. Systems that do not provide the above capabilities shall not be acceptable

2.12 COLOR MIXING OR WHITE-LIGHT LIGHT EMITTING DIODE PROFILE FIXTURE

A. General

1. The fixture shall be a color-mixing high-intensity LED illuminator with DMX control of intensity and color. The fixture shall be a ColorSource Spot, ColorSource Spot Deep Blue or ColorSource Spot Pearl as manufactured by Electronic Theatre Controls, Inc. or approved equal.
2. All LED fixtures shall be provided by a single manufacturer to ensure compatibility
3. The fixture shall be UL 1573 listed for stage and studio use
4. The fixture shall comply with the USITT DMX512-A standard
5. The fixture shall be provided with the minimum warranty of 5 years full fixture coverage and 10 years LED array coverage
6. ColorSource Spot and ColorSource Spot Deep Blue

- a. The fixture shall have a LM-84 report with a L70 rating of no less than 54,000 hours
 - 1) Substitutes must provide evidence of minimum L70 rating of no less than 54,000 hours
 - a) If no LM-84 report is available, an acceptable alternate is a LM-80 report on all emitters with a LM-79 report and an in situ temperature measurement test verifying the conditions of the fixture meet the conditions of the LM-80 report
 - b) All tests and reports must be completed by a Nationally Recognized Testing Laboratory
 - c) All tests must be conducted to IES standards
- 7. ColorSource Spot Pearl
 - a. The fixture shall have a LM-84 report with a L70 rating of no less than 36,000 hours
 - 1) Substitutes must provide evidence of minimum L70 rating of no less than 36,000 hours
 - a) If no LM-84 report is available, an acceptable alternate is a LM-80 report on all emitters with a LM-79 report and an in situ temperature measurement test verifying the conditions of the fixture meet the conditions of the LM-80 report
 - b) All tests and reports must be completed by a Nationally Recognized Testing Laboratory
 - c) All tests must be conducted to IES standards

B. Physical

- 1. The unit shall be constructed of rugged, die cast aluminum, free of burrs and pits.
- 2. The following shall be provided:
 - a. Lens secured with silicone shock mounts
 - b. Shutter assembly shall allow for $\pm 25^\circ$ rotation
 - c. 20 gauge stainless steel shutters
 - d. Interchangeable lens tubes for different field angles with Teflon guides for smooth tube movement
 - e. Sturdy integral die cast gel frame holders with two accessory slots, and a top-mounted, quick release gel frame retainer
 - f. Rugged steel yoke with two mounting positions allowing $300^\circ+$ rotation of the fixture within the yoke
 - g. Positive locking, hand operated yoke clutch
 - h. Slot with sliding cover for motorized pattern devices or optional iris
- 3. The housing shall have a rugged black powder coat finish
 - 1) White or silver/gray powder coat finishes shall be available as color options
 - 2) Other powder coat color options shall be available on request
- 4. Power supply, cooling and electronics shall be integral to each unit.
- 5. The unit shall ship with:
 - a. Theatrical-style hanging yoke as standard
 - b. 5' cable with Neutrik powerCON™ to choice of connector as standard
 - c. Gate diffuser
 - d. A-size pattern holder
- 6. Available options shall include but not be limited to:
 - a. Bare-end, Stage-Pin or Twist-lock type-equipped power leads
 - b. powerCON to powerCON cables for fixture power linking
 - c. Smooth Wash Diffuser for overlapping beams of light from multiple fixtures

C. Optical

1. The light beam should have a 2-to-1 center-to-edge drop-off ratio
2. The unit shall provide, but not be limited to:
 - a. Low gate and beam temperature
 - b. Sharp imaging through a three-plane shutter design
3. The unit shall provide, but not be limited to:
 - a. 5, 10, 14, 19, 26, 36, 50, 70 and 90 degree field angles
 - b. High-quality pattern imaging
 - c. Sharp shutter cuts without halation
 - d. Shutter warping and burnout in normal use shall be unacceptable
 - e. Adjustable hard and soft beam edges
4. 19, 26, 36, and 50 degree units shall have optional lens tubes available for precision, high-contrast imaging.
5. Shall work with S4 LED CYC and Fresnel adapters

D. Environmental and Agency Compliance

1. The fixture shall be ETL and cETL LISTED and/or CE rated, and shall be so labeled when delivered to the job site.
2. The fixture shall be ETL LISTED to the UL1573 standard for stage and studio use
3. The fixture shall be rated for IP-20 dry location use.

E. Thermal

1. Fixture shall be equipped with a cooling fan.
2. The fixture shall utilize advanced thermal management systems to maintain LED life to an average of 70% intensity after 54,000 hours of use for color mixing versions and 36,000 hours for Pearl
 - a. Thermal management shall include multiple temperature sensors within the housing to include:
 - 1) LED array circuit board temperatures
 - 2) Fixture ambient internal temperature
3. The fixture shall operate in an ambient temperature range of 0°C (32°F) minimum, to 40°C (104°F) maximum ambient temperature.

F. Electrical

1. The fixture shall be equipped with a 100V to 240V 50/60Hz internal power supply
2. The fixture shall support power in and thru operation
 - a. Power in shall be via Neutrik® powerCON™ input connector
 - b. Power thru shall be via Neutrik® powerCON™ output connector
 - c. Fixture power wiring and accessory power cables shall be rated to support linking of multiple fixtures up to the capacity of a 15A breaker
3. The fixture requires power from a non-dim source
4. Fixtures shall have droop compensation to prevent thermal shift of color or intensity
5. Power supply outputs shall have self-resetting current-limiting protection
6. Power supply shall have power factor correction

G. LED Emitters

1. The fixture shall contain a minimum of four different LED colors to provide color characteristics or two color temperature white LEDs for the Pearl products, as described in the Color Section below
2. All LEDs used in the fixture shall be high brightness and proven quality from established and reputable LED manufacturers.

- a. Fixture shall utilize Luxeon® Rebel™ LED emitters
 - 3. Manufacturer of LED emitters shall utilize an advanced production LED binning process to maintain color consistency.
 - 4. LED emitters should be rated for nominal 54,000-hour L70 rating for color mixing versions and 36,000-hour L70 rating for Pearl variant
 - 5. LED system shall comply with all relevant patents
- H. Calibration
- 1. Fixture shall be calibrated at factory for achieve consistent color and intensity output between fixtures built at different times and/or from different LED lots or bins
 - a. Calibration data shall be stored on the control card as a permanent part of on-board operating system
 - b. All arrays, including replacement arrays shall be calibrated to the same standard to insure consistency
 - c. Fixtures not offering LED calibration shall not be acceptable
- I. Color
- 1. The fixture shall utilize an minimum of 60 LED emitters
 - a. These emitters shall be made up of Red, Green, Blue and Lime for ColorSource
 - b. These emitters shall be made up of Red, Green, Indigo and Lime for ColorSource Deep Blue
 - c. These emitters shall be made up of 2700 K and 6500 K for ColorSource Pearl
- J. Dimming
- 1. The LED system shall use 15-bit nonlinear scaling techniques for high-resolution dimming.
 - 2. The fixture shall utilize an Incandescent dimming curve
 - 3. Dimming curve shall be optimized for smooth dimming over longer timed fades.
 - 4. The LED system shall be digitally driven using high-speed pulse width modulation (PWM)
 - 5. LED control shall be compatible with broadcast equipment in the following ways:
 - a. PWM control of LED levels shall be imperceptible to video cameras and related equipment
 - b. PWM shall be capable of being set via RDM to 25,000hz
- K. Control and User interface
- 1. The fixture shall be USITT DMX512-A compatible via In and Thru 5-pin XLR connectors or RJ45 connectors
 - 2. The fixture shall be compatible with the ANSI RDM E1.20 standard
 - a. All fixture functions shall accessible via RDM protocol for modification from suitably equipped control console
 - b. Temperature sensors within the luminaire shall be viewable in real time via RDM
 - c. Fixtures not offering RDM compatibility, feature set access or temperature monitoring via RDM shall not be compatible
 - 3. The fixture shall be equipped with a 7-segment display
 - 4. The fixture shall be equipped with a three-button user-interface
 - 5. A variable-rate strobe channel shall be provided
 - 6. The fixture shall offer stand-alone functionality eliminating the need for a console
 - a. Fixture shall ship with 12 preset colors or color temperatures accessible as a stand-alone feature
 - b. Fixture shall ship with 5 sequences accessible as a stand-alone feature
 - c. Each color and sequence can be modified by the end user via RDM

- d. Fixtures can be linked together with standard DMX cables and controlled from designated master fixture
 - 1) Up to 32 fixtures may be linked
- e. Fixtures in a stand-alone state shall restore to the settings present prior to power cycling, eliminating the need for reprogramming
- f. Fixtures without stand-alone operation features described above shall not be acceptable.

2.13 WHITE LIGHT EMITTING LED HOUSELIGHT (TYPE A)

A. General

- 1. The fixture shall be a white high-intensity LED illuminator with DMX control of intensity. The fixture shall be a Light Source RL Recessed as manufactured by The Light Source, Inc. or approved equal.

B. Electrical

- 1. The Light Source, Inc. RL Series fixture's LED driver has a universal input range of 100VAC to 277VAC 50/60HZ with no adjustments required, and a mean time between failures of 330,000 hours. The 150 Watt LED driver may be factory preset to 80, 100, 120, or 150 Watts output. The LED driver has active power factor correction with 99% PF at 120VAC, ATHD of 7%, and draws only .84 Amps. Inrush current is limited, allowing up to 12 of the 100 Watt LED fixtures to run on a single pole 20 Amp 120VAC circuit breaker. The LED fixture responds quickly, producing full light output in 2-3 seconds after power is applied. Relays are not required to turn The Light Source, Inc. RL series fixtures off between uses. The fixtures are fully rated for 24/7/365 operation. This enables the fixtures to instantly respond to DMX control signals without waiting for relays to sequence and fixture boot time. Standby wattage is less than 1 Watt with power on and DMX at level zero. The annual quiescent power draw is less than 9 KWH.

C. Connections

- 1. Power connections may be hardwired internally with a rigid conduit connection and the provided flip lever Wago connectors. DMX data connections may be hardwired with the provided IDC or screw terminal plugin connectors; or the optional external flush mounted Neutrik 5 pin XLR; or RJ-45 Ethercon connectors.

D. Control

- 1. The Light Source, Inc. RL Series fixtures are fully DMX dimmable with extremely smooth 24 bit dimming utilizing only single channel DMX dimming control. The dimmer microprocessor is able to use over 16 million steps from full intensity to off for incredibly smooth dimming. There is no flicker on video with either line scan or global camera shutters interacting with the 30khz output frequency. The DMX line is fully isolated to 2,500 Volts per microsecond. The Light Source proprietary Thermal Mass Equivalence may be enabled during installation by turning dip switch 1 to off. This setting allows the DMX control channel 512 to change the dimming performance to emulate a large or small incandescent lamp, or to change the dimming performance to an instant response. The fixture is also available in a non-dimming version.

E. Standard LED Module

- 1. Based on Cree's product testing, The Light Source, Inc.'s RL Series fixture's standard LED module offers over 100,000 hours of life operating from 100 to 150 input Watts. The

individual LEDs operate close to half of their maximum drive current even when the HL series fixture is driven at 150 Watts. The low drive current increases the LED brightness and life. Cree LEDs have a pleasing full spectrum light with all the visible colors represented in the fixture's spectral output. The 60 individual LEDs are carefully factory selected to maintain minimal color variance between LED modules. The white LEDs are available in color temperatures of: 2700K, 3000K, 3500K, 4000K, and 5000K. The standard LED module has a typical CRI of 82. The LED module is factory built on a copper PCB for maximum thermal and optical performance. Every LED module is tested by thermal imaging to verify all electrical and thermal bonding connections. LED color bins used in each LED module are recorded with the fixture serial number. No appreciable IR or UV is produced by the LED module. Extreme heat and cold ambient temperatures do not adversely affect the LED output. The LED module is replaceable utilizing normal hand tools.

F. Optical

1. Optical systems are available in 78, 65, 52, 44, 36, 30, 25, and 20 degree beam angles. Sixty tightly clustered Cree LEDs and a 6" tempered borosilicate Fresnel lens combine to provide a single source look that completely emulates an incandescent source. Efficient use of the lumens generated by the LED cluster is accomplished by directing the LED output to the task area. An additional condenser lens is utilized to maximize the lumen output on the 52 degree and tighter beam spreads..

G. Thermal

1. The maximum ambient operating temperature is 122 degrees Fahrenheit, (50 degrees C). With no fans or other devices to generate noise, the fixture is completely silent in operation. A huge, passive, convection-cooled, aluminum composite heat sink has plenty of space between fins to maximize the heat exchange and air flow. The short direct thermal path to the large convective surface area of the heat fins keeps the 60 Cree LEDs to a delta of 25 degrees C above the ambient temperature. The solid copper PCB is thermally bonded to the massive aluminum core with an 85 W/mK thermal interface material. This thermal junction actually improves over time and has 10 times the efficiency of the most commonly used thermal interface materials. The entire thermal system works together to keep the LED's operating temperature very low, producing significantly higher LED brightness and longer life.

H. Mounting

1. Recessed/ RL
 - a. The fixture requires a rough in hole of 11" Diameter

I. Finish

1. The extruded aluminum LED fixture comes in a standard black anodized finish. Optional anodized colors are also available. The accessory cylinders and square housings are available in standard black or white, and may be custom finished in any RAL powder coated color.

J. Listings

1. ETL listed in the USA and Canada.

K. Warranty

1. 10 year parts replacement on complete LED fixture and electronics. Simply ship the LED fixture to the factory prepaid. The LED fixture will be repaired or replaced at the factory's

discretion and returned freight prepaid. Fixture repair parts may also be sent for qualified repairs onsite. Damage from improper wiring, installation, and lightning are excluded from warranty repair.

PART 3 - PERFORMANCE RIGGING

3.1 GENERAL REQUIREMENTS

A. RELATED DOCUMENTS

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

B. GOVERNING CLAUSE

1. For the sake of brevity, these specifications shall omit phrases such as "Contractor shall furnish and install", "unless otherwise indicated or specified", etc., but these phrases are nevertheless implied. Mention of materials and operations requires the Contractor to furnish and install such materials and perform such operations completely to the satisfaction of the owner's representative.

C. SCOPE OF WORK

1. One company shall be responsible for the installation of all aspects of the stage rigging equipment. Work under this section shall include furnishing all labor, materials, tools, transportation services, supervision, etc., necessary to complete installation of the stage rigging equipment as well as any other items as herein listed, all as described in these specifications, as illustrated on the accompanying drawings; or as directed by the Owner's Representative. Work includes the following:
 - a. Motorized Rigging

D. SUBSTITUTIONS:

1. Specific items of equipment are specified by trade names. It has been determined by the systems designer that these are the particular items desired by the Owner and establish a standard of quality, equipment function and/or process. It is not the purpose or intent of these documents to eliminate competitive bids. In order to allow proper and fair comparison of pricing, contractors are required to submit their base bid price on the specified equipment. A contractor may submit an alternate bid based on equipment different from that specified only if that Contractor has received prior approval in writing from the Architect at least 10 days prior to bid. Accompanying each request shall be a letter specifically detailing each substitution including catalog data, specifications, operative samples, technical information, drawings, performance and test data, and complete descriptive and functional information to assist in a fair evaluation. Failure to submit any substitution for prior approval or not providing sufficient data for evaluation shall require the exact item specified to be furnished. Architect's approval of a substitution for bid purposes will not relieve the contractor from the responsibility of meeting all specification criteria. If an approval of a substitution is granted, the Contractor shall be fully responsible for any and all changes (wiring, power, distribution, support structure, etc.) such substitution shall require.

E. DEFECTIVE OR NON-APPROVED MATERIALS

1. Should any equipment be found defective, not meeting specifications, or that which has not been approved in writing by the Architect shall, upon discovery (including any time within the period of the guarantee), be replaced with the specified equipment or material at no additional cost.

F. GUARANTEE

1. The Contractor shall guarantee all of the work that is performed under this contract, including all materials, and workmanship, for a period of three (3) years from the date of full acceptance of the work in accordance with the following conditions.
2. Warranty shall be in effect on materials and equipment for three years from the date of system commissioning under the following conditions:
 - a. Maintaining the warranty in effect requires annual inspection of the system by a factory trained and certified contractor. Continuing annual inspection is strongly encouraged.
 - b. The three year warranty is contingent upon annual inspection at the end of the first and second years of service. The end user is responsible for making arrangements for each inspection with the contractor identified on the Motor Controller or a factory certified inspector/installer.
 - c. In the event annual inspection is not requested and performed at the end of the first or second year of service, the warranty shall become void at the end of that year of service.
 - d. Each warranty inspection report must be sent to the factory by the inspecting contractor within 10 days of completing the inspection.
3. Nothing in this guarantee shall cause repair or replacement by the Contractor where negligence, neglect or improper operation by the Owner has caused the failure of any equipment installed under this contract.

G. DISCREPANCIES

1. All equipment shall be sized to fit properly. The exact measurements are the responsibility of the Contractor. If there are discrepancies in the specifications, the Contractor shall ask for a clarification from the Architect. If no clarification is requested, the Architect's judgment shall rule.

H. SYSTEM INTEGRATOR

1. The Contractor may utilize a System Integrator to coordinate and assist in the installation of all aspects of the motorized rigging equipment as specified in this section. This shall include but not be limited to all motorized rigging and miscellaneous equipment. The following companies have prior approval as System Integrator:
2. In order to be considered as a System Integrator on this project, each Contractor requesting approval must submit to the Architect at least ten (10) days prior to the date of bid opening a letter expressing his intent to bid. This letter shall include a list of at least five (5) projects of similar size and scope completed by this firm within the last five (5) years. Inspection of one completed installation may be requested by the Architect/Engineer's Representative prior to consideration of request to bid. The System Integrator shall have been in business under the same name for five (5) full years preceding the date of this bid doing work similar to the type specified. ETCP certification in theatre rigging is required by the lead installer or project manager of the System Integrator to receive approval to bid. Verification of this certification must be provided to be considered for approval. The decision of the Architect as to the capability of the Bidder to successfully complete and maintain the system based on this pre-qualification information shall be final.

3. Pre-Bid request letter shall include a statement that all major items of equipment shall be bid and supplied as specified, or shall contain details of all proposed substitute equipment for review by the Architect/Engineer's Representative. Substitute equipment items to include specifications, parts numbers, and details of interconnection to proposed system. The decision of the Architect as to the acceptability of substitute equipment shall be final.
4. The System Integrator shall employ only fully trained stage riggers and mechanics, for the erection of the stage equipment. The stage riggers shall be completely familiar with the type of equipment to be installed. A competent job superintendent shall be on the job at all times when work is in progress. The job superintendent must be ETCP certified in theatre rigging. A copy of the certification must be furnished to the General Contractor prior to the start of the installation.

I. ACCEPTABLE EQUIPMENT MANUFACTURERS

1. For the purposes of establishing a standard of quality desired on this project, the rigging hardware products of Electronic Theatre Controls of Middleton, Wisconsin are specified.
2. All other companies must receive prior approval to bid this project. Please refer to the section regarding substitutions.

J. DOCUMENTATION

1. **SHOP DRAWINGS:** Shop drawings and equipment data sheets shall be submitted to the Architect under general provisions within 45 days after award of the contract. Failure to comply with this 45 day requirement shall be cause for disqualification of the selected Contractor and cancellation of contract without cost to the owner, on the basis that the selected Contractor does not have the ability or intention to comply with the specifications. Approval of submitted equipment shall be obtained prior to equipment purchase or fabrication. If shop drawings are rejected, correct and resubmit in the manner specified. All shop drawing information shall be submitted at the same time; no partial submittal shall be accepted. Drawings shall indicate complete details, dimensions, product types and locations of all equipment, clearances required, guides, cables, sets, Contractor fabricated equipment, and all other details required to completely describe the work to be performed. Submittals drawings shall be presented at a scale not less than 1/4" for equipment layouts and 1/2" = 1'-0" for equipment details, mounting and other details. Each sheet shall allow space for approval stamps and have the name of the project, the contractors and/or the supplier's name, address telephone number, and the date submitted. Submit the following items for Architect's approval, prior to fabrication:
 - a. Stage plan view
 - b. Stage side section view
 - c. Gridiron layout indicating all stage equipment
 - d. Electrical riser diagrams indicating the necessary power and control wiring for all rigging equipment and systems
 - e. Plan and elevation views indicating all power, motor and control hardware locations and layout
 - f. Provide full dimensions for panel layouts with finishes and materials for all custom panels
 - g. Details of installation and erection, including adjoining conditions and necessary clearances
 - h. Indication by arrow and boxed caption of each variation from contract drawing and specifications, except those indicated as acceptable in specifications or on drawings

2. **RECORD DRAWINGS AND DATA:** Submit in accordance with General Provisions. Within 30 days of final test and completion of the installation, submit the following to the Architect:
 - a. Three (3) complete sets of "as built and approved" drawings showing systems and elements as installed, including field modifications and adjustments
 - b. Three (3) sets of maintenance data including a list indicating replacement parts lists for all items of equipment, wiring diagrams, control diagrams, any and all keys for cabinets, racks, key operated switches etc. and complete operation manuals.
 - c. Three (3) Certificates of Guarantee
 3. **INSTRUCTION OF OWNER PERSONNEL:** This contractor or his representative, fully knowledgeable and qualified in systems operation, shall provide four (4) hours of instruction to the Owner-designated personnel on the use and operation of this System. Designated instruction times shall be arranged through the Architect.
 4. **PERMITS:** Obtain all permits necessary for the execution of any work pertaining to the installation, and conform in all trades with all applicable local codes and national codes. Obtain all permits necessary for operation of any equipment by the Owner.
- K. **CLEAN UP:** It shall be the responsibility of this Contractor to remove all debris from the building or site caused by his operations to a common trash point or receptacle on the job site, as determined by the GENERAL CONTRACTOR.

PART 4 - PERFORMANCE RIGGING EQUIPMENT

4.1 RIGGING CONTROLLER

A. GENERAL

1. The entire motor system shall be operated by a QuickTouch fixed speed controller. It shall be purpose-designed and fabricated to manage and operate motors specifically designed for overhead lifting. Each system shall incorporate mechanical, electrical and safety features that shall be inherent to this equipment and shall provide an engineered, efficient device to control the equipment. The mechanical, electrical and safety features of this control system shall establish the standard of quality, performance and safety by which motoring systems of other manufacture shall be evaluated.
2. The QuickTouch Control System shall consist of a surface, flush or rack mounted primary control panel and up to three remote E-stop stations.
3. The motoring system shall also include one QuickTouch Fixed Speed Remote control device with 30' of flexible cable that may be attached to the system at the QuickTouch control panel.
4. The controller shall include the following features:
 - a. Key operated power switch
 - b. LCD display for feedback/operating information
 - c. Key operated motor load profile training/enable switch
 - d. Latching motor selection buttons with rear illuminated naming tabs
 - e. Rear illuminated hold-to-operate (dead-man) up and down operation buttons
 - f. Dedicated E-stop button
 - g. Outlet for wired remote
 - h. Optional door
 - i. Optional rack mount kit

5. The control system shall only employ the QuickTouch controller, a power and control distribution infrastructure and the motors. A System that requires separate drive cabinets or motor-starters shall not be acceptable.

B. ENCLOSURE

1. The back box and face panel shall be fabricated from 16ga powder coated sheet steel specially formed to provide support for installation as well as support for all components installed within the housing.
2. The QuickTouch face panel shall be printed with complete labeling information to identify the function of each of the buttons in the control station.
3. The face panel shall identify the system as a QuickTouch controller for stage rigging.
4. The face panel shall be shades of grey. The ring surrounding the E-stop button shall be safety yellow and shall be rear illuminated
5. The steel panel to which all switches are mounted shall be removable via screws in the surface located underneath the face panel film.

C. LCD SCREEN

1. The liquid crystal display shall be purpose designed to communicate all information in human readable text.
2. The screen shall be rear illuminated and shall be dimmable.
3. During system start up the screen shall show the progress of the motors diagnostics self-tests. Upon completion of the startup sequence the screen shall indicate that the system is "OK" or shall provide specific information should a fault be detected. Fault conditions shall be reported in human readable text. Systems that report fault conditions in a series of blinking lights shall not be acceptable for this installation.
4. When a motor is selected the LCD screen shall readout the motor name or number, its current position above the floor, the amount of weight suspended from the batten, the preset position that is recorded, as well as a bar graph scale that shows the current position of the motor, top and bottom limits and the current weight suspended from the motor.

D. MOTOR SELECTION/OPERATION BUTTONS

1. There shall be rear illuminated motor selection buttons. Buttons shall remain illuminated until de-selected.
2. Up to four motors may be selected to move at one time. When the up or down button is pushed and held, each motor shall move to its next stop location. If the stop location is the adjustable preset, the motor can be made to continue to travel in the selected direction by releasing and re-pressing the up or down hold-to-operate button until the next stop for the motor(s) is reached.
3. A maximum of four motors may move at one time and only in one direction at a time.
4. Although four motors moving at one time is the factory default, it shall be possible to increase to eight or reduce to one the quantity of simultaneously moving motors.
5. As a backup, there shall be dedicated hardware to detect and disable the system when the user attempts to move more than the configured maximum quantity of motors.
6. All buttons shall fit neatly within each of the cover panel cutouts on the controller.

E. KEY SWITCHES

1. A key switch shall control power to the control system. The key must be in the lock and the key turned to the on position for the motoring system to operate.
2. A separate key is required to turn on the load profiling system. That key must be in the lock and turned to the "ON" position for load profiling to function.

3. When load profiling is turned on the motor shall know the amount of weight that is supposed to be supported by the batten at any location in the path of travel. Should the weight exceed or be reduced below the profiled weight by a preset value, the motor shall stop operation until the fault is cleared.
- F. SLACK LINE DETECTOR
1. The slack line detector is located in the Powerhead. When a slack line condition occurs, it shall cease motor movement and result in a fault message on the LCD screen on the controller. Movement in the upward direction shall be possible to clear the fault.
- G. E-STOP
1. The E-stop button on the QuickTouch controller shall be a mushroom button with a rear illuminated ring surrounding the button. During normal operation the E-stop button shall be in the out position. An E-stop can be activated via this button by firmly pressing the button in. The button shall latch and immediately cause a class zero stop of all motors in the system. The LCD screen shall report this as an E-stop fault. To continue system operation the E-stop button must be cleared by twisting the button to release the latch. Power to the control station must be cycled off/on to re-initiate the system. This action shall also initiate a self-test of the entire control system and contactors.
 2. The illuminated ring around each E-stop button shall be dimmable. The status of the lighted ring shall provide additional information about the state of the system as follows:
 - a. Ring at low intensity: no motor moving
 - b. Ring at high intensity: motor(s) moving
 - c. Ring blinking: system in E-stop condition
 3. Up to three remote E-stop stations may be connected to the system. Each additional E-stop station shall operate in the same way as the primary E-stop at the QuickTouch control panel.
- H. SYSTEM DIAGNOSTICS
1. Upon energization the control system shall perform an automatic series of diagnostic tests that assure that all system safety functions are working. Should an error in the safety functions be determined, the controller shall report back a fault condition in the LCD display window and shall identify the nature of the fault.
 2. Monthly, the system automatically shall perform an additional series of diagnostic tests to determine if there are any problems with any portion of the motor control system safety features. In the event of a problem, the controller shall report back a fault condition in the LCD display window and shall identify the nature of the fault.
 3. Eleven months after a system inspection has been performed, the system shall remind the user to schedule full system maintenance/inspection. The reminder shall remain in the system with a count-down calendar until it is turned off by the factory authorized and trained inspector.
 4. The installing contractor shall be able to leave contact information within the system. This information shall be displayed at power up and in the event of severe fault conditions.
- I. REMOTE CONTROL PENDANT
1. An optional remote control pendant with 30' long attached cable and plug shall be provided for the system. The remote control must be plugged to the QuickTouch control panel. When the remote control is plugged in the E-stop on the remote is active. Systems requiring "shunt plugs" to bypass an unplugged remote control connector shall not be acceptable.
 2. The remote control provides up/down control for those motors that have been preselected at the QuickTouch controller.

J. SYSTEM COMMISSIONING

1. It shall be possible to commission basic functionality of the system without a laptop computer or additional software.
2. A trained installer shall commission the full system via a laptop computer connected via the built-in USB port in the controller. USB connectivity shall not require special USB drivers.
3. Commissioning software shall feature an inspection report generator that allows a step by step inspection of the control system. Upon completion, the system shall generate an inspection report in PDF format.

4.2 HOISTS

A. GENERAL

1. Hoists shall be purpose-designed and fabricated for overhead lifting of theatre lights, equipment, curtains and scenic elements, whether used on stage, in the auditorium or other places of public assembly where people shall move beneath the suspended or moving load. The systems shall incorporate mechanical, electrical and safety features that shall be inherent to this equipment; they shall provide an engineered, efficient device for overhead lifting. The mechanical, electrical and safety features of this hoisting and control system shall establish the standard of quality, performance and safety by which hoisting systems of other manufacture shall be evaluated.
2. Each hoist shall be fully tested throughout its full travel distance with all its lift lines terminated to the hoist before the hoist is shipped from the manufacturer. Testing shall include:
 - a. Hoist operation
 - b. Hoist/motor speed
 - c. Lift line terminations
 - d. Braking and stopping
 - e. Over Load Function
 - f. Slack line detection
 - g. Position sensing
 - h. Hoist noise
3. Only hoists that successfully pass pre-shipment testing shall be sent to any job site. A record of testing and its results shall be available for review at the manufacturer's facility for at least one year after testing.
4. Anodization as required under this section shall be the manufacturer's standard finish and color except as noted.
5. All equipment items shall be new and conform to applicable provisions of Underwriters' Laboratories (UL), American Standards Association (ASA), American National Standards Institute (ANSI), National Fire Protection Association (NFPA) Life Safety Code 01, National Electric Code (NEC) and PLASA.
 - a. Where acceptable equipment items are specified by catalog number only, device shall meet all published manufacturer's specifications. Where quantities or sizes are not given, refer to drawings. Where two or more products are listed, contractor may use either, at his discretion. Equipment shall not be substituted without specific written approval by the Architect under the substitution paragraphs of these specifications.
 - b. All pipe battens, if required, shall be fabricated from 1.5" Schedule 40 aluminum pipe.
 - c. All turnbuckles and cable clips shall be drop forged.

- d. All turnbuckles and clips, tracks, chains and other items of incidental hardware shall be furnished plated or painted. Wire rope shall be galvanized. Fasteners, chain, and other miscellaneous hardware shall be either cadmium or zinc plated.
- e. All materials used in this project shall be new, unused and of the latest design. Refurbished materials are not permitted.
- f. In order to establish minimum standards of safety, a minimum factor of 8 shall be required for all equipment and hardware used on this project. In addition, the following factors shall be used:

Cables and fittings	10 Design Factor
Cable bending ratio.....	26 times diameter
Max. fleet angle	2 degrees
Steel	1/5 of yield
Bearings.....	Two times required load at full for 2000 hours

B. HOISTS

1. Hoists shall be purpose-designed and fabricated for overhead lifting of theatre lights, equipment, curtains and scenic elements, whether used on stage, in the auditorium or other places of public assembly where people shall move beneath the suspended or moving load. The systems shall incorporate mechanical, electrical and safety features that shall be inherent to this equipment; they shall provide an engineered, efficient device for overhead lifting. The mechanical, electrical and safety features of this hoisting and control system shall establish the standard of quality, performance and safety by which hoisting systems of other manufacture shall be evaluated.
2. Each dual 1/8" wire rope lift line sets shall adhere to a design factor of 8:1 with an ultimate combined strength of 4200 pounds. All load path components between the building structure and the batten shall exceed the breaking strength of the wire rope. The motor brake shall be rated at least at 125% of the motor torque.
3. Configured hoists components shall be capable of supporting a live load suspended from the batten as follows:
 - a. General purpose FlyPipe Drive Section 20 fpm 500 pound capacity in standard configuration. Motor sections measure 16" high x 16" w x 12" deep x 11' long and weigh 140 pounds.
 - b. General purpose FlyPipe End section shall measure 4.25" high x 3.25" w x 7'0" long and weigh 38 pounds.
 - c. General purpose FlyPipe Middle section shall measure 4.25" high x 3.25" w x 10'0" long and weigh 58 pounds.
4. The FlyPipe self-climbing hoist shall consist of the following major components: 1) Motor section 2) Middle section (if required) 3) End section 4) Dual Lift lines, 5) Beam Clamps and Pipe Batten (if required).
5. The hoist shall include the following features:
 - a. A Drive Section containing the following elements: the gear motor, motor brake, limit switches, remote operating electronics, slack line detector, position sensors, cable drum assembly, and wire rope.
 - b. The hoist shall incorporate a built-in slack line sensor.
 - c. The hoist shall include the emergency contactor built into the hoist.
6. The hoist shall be manufactured from UL Listed components and shall be UL Listed and tested as a complete system (not just UL listed parts).

C. DRIVE SECTION

1. The Drive Section shall be a fully enclosed, powder coated sheet metal housing that shall prevent contact with moving and electrical parts and shall provide protection against dirt, dust and debris.
 2. The following functions shall be available: operating switches, address setting knobs, limit switch override button, indicators for power, status and communication. Each of these functions shall be clearly labeled.
- D. GEAR MOTOR AND MOTOR BRAKE
1. The gear motor and motor brake shall be an integral unit from a single manufacturer. It shall operate on 208 Volt or 480 Volt 60 Hz, 3 phase current for fixed speed units and 480 Volt, 60 Hz, 3 phase current for variable speed hoists.
 2. The motor brake shall be integral to the gear motor and shall be capable of holding 125% of the motor full load torque.
 3. The motor brake shall be spring actuated to apply and hold braking force.
 4. The motor brake shall be magnetically released and held open upon actuation.
- E. Over Speed Load Arrest Brake
1. Fixed Speed Hoists
 - a. The over speed mechanism shall detect a runaway condition and trigger a load arresting device to stop the load.
 - b. Noise from the over speed brake shall not be audible at any time in the operational cycle.
 - c. Normal hoist operation shall not be limited by heat or noise caused by the load brake.
- F. WIRE ROPE DRUM
1. Each drum shall wrap up two, 1/8" diameter 7 x 19 galvanized aircraft (utility) wire rope lift lines up to 50' long in a compact manner on the cable drum. Each drive, mid, and end section shall contain one drum. The drum design shall prevent wire rope from tangling or crossing over itself.
- G. LIMIT SWITCH
1. A limit switch assembly shall be mounted within the Drive Section for hard "normal" and "ultimate" end of travel limits. Hard end of travel limits shall be set/adjusted at the time of installation aided by an indicator light visible on the bottom panel of the Drive Section cover. Any system that indicates that the limit has been set by audible or tactile means only shall not be acceptable.
- H. POSITION SENSOR
1. A position sensing system shall be built into the Drive Section to provide accurate position information. The system shall consist of encoder sensor that provides accurate position information for each batten at power-up of the system. Hoisting systems that require re-homing shall not be acceptable.
- I. SLACK LINE DETECTOR
1. The slack line detector shall be built into the Drive Section. When a slack line condition in excess of 15" develops in a lift line, the slack line detector shall remove power from the hoist. The hoist shall be allowed to move only in the upward direction to allow removal of the cause of the slack line fault.
- J. LOCAL USER INTERFACE

1. User interface located on the Drive Section shall include:
 - a. Hoist Up/Down Control
 - b. Limit Switch override buttons (tool accessible)
 - c. Address switches
 - d. Status LED's
- K. INFORMATION STORAGE WITHIN DRIVE SECTION
1. Record of severe fault conditions with date and time stamp
 - a. Record of E-stops, overloads, moves and power cycles
 - b. Record of travel distance since installation/inspection
- L. HELIX CABLE MANAGEMENT
1. The power and control, load circuits and data wiring shall be fed to the distribution trough by one or more UL Listed Helix cable management systems that are specifically designed to interface with traditional stage distribution raceways. The Helix device shall allow the feeder cable and data wiring for both motor and lighting distribution to coil and store along the top of the hoist.
 2. All cable shall be UL LISTED.
 3. It shall be possible to provide power for up to six 20 amp circuits plus ground and data via each Helix cable management system.
 4. These cable management systems shall interface with the circuit distribution device with standard mechanical and electrical hardware purpose designed for this assembly.
 5. Hoisting systems that do not fully integrate cable management in the hoisting system and controller shall not be acceptable for this installation.
- M. TRADITIONAL CABLE MANAGEMENT
1. Motor power can control, load circuits and data wiring shall be fed to a standard stage distribution by multi-conductor SO cable supported by cable cradles. The SO cable shall be held in place at the distro by means of a dedicated strain relief assembly.
- N. PIPE BATTEN
1. The pipe batten shall be 1½" schedule 40 grade A, seamless pipe fabricated in the largest possible lengths without splices. Battens of greater length shall be spliced by means of .120 x 1 9/16 dia. DOM tube 18" long with 9" of tube inserted into each half of the splice. The tight fitting splice tube shall be held in place by a pair of 3/8 x 2 ½" grade 5 hex bolts on each side of the joint. The bolts shall pass through the pipe at an angle of 90° to each other. There shall be two bolts on each side of the joint spaced 1" and 8" from the joint. Alternatively, one pair of bolts on one side of the joint may be replaced with either plug welds or tight fitting steel rivets. Pipes shall be straight and painted flat black.
 2. A safety-yellow batten cap shall be installed at each end of each pipe batten.
 3. The manufacturer shall provide up to four self-adhesive labels for each batten on which the rated batten load shall be written by the installer.
- O. POWER AND CONTROL DISTRIBUTION (PCD)
1. Each hoist shall receive power and control via a pair of 60'-0" long jumper cables extending from the Drive Section to the source outlets. Receptacles shall be installed in a sheet metal junction box or trough with outlets or terminals for wire termination. Proper strain relief shall be provided.
 2. Each Drive Section shall include a power cord hardwired to the hoist with bare end and a hard wired control cable with bare end. Inclusion of a 20 amp 3 phase breaker in the PCD is optional. The wiring and connectors shall be barriered between high and low voltage.

3. The power/distribution channel shall be UL LISTED for this application.

PART 5 - EQUIPMENT QUANTITIES

5.1 PERFORMANCE LIGHTING EQUIPMENT QUANTITIES

- A. (1) – “COLORSOURCE 20AV LIGHTING CONSOLE, complete with:
 1. (1) – 15’ CAT5E Cable
 2. (1) – Power Supply
 3. (1) – IEC power cables
- B. (16) – ETC “COLORSOURCE SPOT LED FIXTURE”, COMPLETE WITH THE FOLLOWING:
 1. (16) – 26° High Definition Lens Tubes
 2. (16) – C Clamps
 3. (16) – Safety Cables
 4. (16) – Soft Focus Diffusers
 5. (16) – 5’ Powercon to 2P&G Cables
 6. (16) – 5’ DMX 5-Pin XLR Cables
- C. (1) – ERN4 PARADIGM ENCLOSURE COMPLETE WITH:
 1. (1) – P-Architectural Control Processor
 2. (1) – P-Station Power Module
 3. (1) – P-TS7 Integrated 7” Touchscreen
 4. (1) – 5 Port POE Ethernet Switch
- D. (1) – PARADIGM CONTRL STATIONS AS FOLLOWS:
 1. (QTY. Per Drawings) – Heritage 5-Button Stations
 2. (QTY. Per Drawings) – OCC Sensors
- E. (1) – ETC DIN 28 ENCLOSURE COMPLETE WITH:
 1. (4) – TMB 4-Port DMX/RDM Opto-Splitter Din-Mount
 2. (1) – ETC 4-Port Response Gateway Din-Mount
 3. (1) – Din-Mount Low Voltage Power Supply
- F. (1) – ETC SENSOR IQ24 MOTORIZED BREAKER PANEL COMPLETE WITH:
 1. (24) – 1-Pole Motorized Breaker
 2. (1) – 0-10V Dimming Option Card
- G. (1) – ETC EMERGENCY DECTION BYPASS DECTETION KIT
- H. (1) – ETC DMX EMERGENCY BYPASS CONTROLLER
- I. (1) – ETC BCELTS
- J. POWER AND DATA DISTRIBUTION
 1. (QTY. Per Drawings) – Net Plug-In Stations
 2. (QTY. Per Drawings) – Colorsource Distro Strip

5.2 PERFORMANCE RIGGING QUANTITIES

- A. (2) – ETC FLY-PIPE COMPLETE WITH:
 - 1. (2) – ETC Colorsource Distro Strip Complete With:
 - a. 2 Circuits on 10 Stagepin Outlets
 - b. 10 DMX Outputs
 - 2. (2) – ETC PCD-F
- B. (1) – Quicktouch Preset Rigging Controller

PART 6 - EXECUTION

6.1 INSTALLATION

- A. It shall be the responsibility of the Electrical Contractor to receive and store the necessary materials and equipment from the Systems Integrator for installation of the dimmer system. It is the intent of these specifications and plans to include everything required for proper and complete installation and operation of the dimming system, even though every item may not be specifically mentioned. The contractor shall deliver on a timely basis to other trades any equipment that must be installed during construction.
- B. The electrical contractor shall be responsible for field measurements and coordinating physical size of all equipment with the architectural requirements of the spaces into which they are to be installed.
- C. The electrical contractor shall install all lighting control and dimming equipment in accordance with manufacturer's approved shop drawings.
- D. All branch load circuits shall be live tested before connecting the loads to the dimmer system load terminals.

6.2 MANUFACTURE'S SERVICES

- A. Upon completion of the installation, including testing of load circuits, the contractor shall notify the dimming system manufacturer that the system is available for formal checkout.
- B. Notification shall be provided in writing, two weeks prior to the time factory-trained personnel are needed on the job site.
- C. No power is to be applied to the dimming system unless specifically authorized by written instructions from the manufacturer.
- D. The purchaser shall be liable for any return visits by the factory engineer as a result of incomplete or incorrect wiring.
- E. Upon completion of the formal check-out, the factory engineer shall demonstrate operation and maintenance of the system to the owner's representatives. Training shall not exceed four working hours. Additional training shall be available upon request.

6.3 WARRANTY

- A. Manufacturer shall warrant products under normal use and service to be free from defects in materials and workmanship for a period of two years from date of delivery.
- B. Warranty shall cover repair or replacement of such parts determined defective upon inspection.
- C. Warranty does not cover any product or part of a product subject to accident, negligence, alteration, abuse or misuse. Warranty does not cover any accessories or parts not supplied by the manufacturer.
- D. Warranty shall not cover any labor expended or materials used to repair any equipment without manufacturer's prior written authorization.

END OF SECTION 260961

SECTION 262416 - PANELBOARDS

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. Distribution panelboards.
 - 2. Lighting and appliance branch-circuit panelboards.

1.3 DEFINITIONS

- A. SVR: Suppressed voltage rating.
- B. TVSS: Transient voltage surge suppressor.

1.4 SUBMITTALS

- A. Product Data: For each type of panelboard, switching and overcurrent protective device, transient voltage suppression device, accessory, and component indicated. Include dimensions and manufacturers' technical data on features, performance, electrical characteristics, ratings, and finishes.
- B. Shop Drawings: For each panelboard and related equipment.
 - 1. Include dimensioned plans, elevations, sections, and details. Show tabulations of installed devices, equipment features, and ratings.
 - 2. Detail enclosure types and details for types other than NEMA 250, Type 1.
 - 3. Detail bus configuration, current, and voltage ratings.
 - 4. Short-circuit current rating of panelboards and overcurrent protective devices.
 - 5. Detail features, characteristics, ratings, and factory settings of individual overcurrent protective devices and auxiliary components.
- C. Field Quality-Control Reports:
 - 1. Test procedures used.
 - 2. Test results that comply with requirements.
 - 3. Results of failed tests and corrective action taken to achieve test results that comply with requirements.

- D. Panelboard Schedules: For installation in panelboards. Room names and numbers shall match the final signage at the site. Submit final versions prior to installation in panelboard.
- E. Operation and Maintenance Data: For panelboards 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. Manufacturer's written instructions for testing and adjusting overcurrent protective devices.

1.5 QUALITY ASSURANCE

- A. Source Limitations: Obtain panelboards, overcurrent protective devices, components, and accessories from single source from single manufacturer.
- B. Product Selection for Restricted Space: Drawings indicate maximum dimensions for panelboards including clearances between panelboards and adjacent surfaces and other items. Comply with indicated maximum dimensions.
- 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.
- D. Comply with NEMA PB 1.
- E. Comply with NFPA 70.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Handle and prepare panelboards for installation according to NEMA PB 1.

1.7 PROJECT CONDITIONS

- A. Environmental Limitations:
 - 1. Do not deliver or install panelboards until spaces are enclosed and weathertight, wet work in spaces is complete and dry, work above panelboards is complete, and temporary HVAC system is operating and maintaining ambient temperature and humidity conditions at occupancy levels during the remainder of the construction period.

1.8 COORDINATION

- A. Coordinate layout and installation of panelboards and components with other construction that penetrates walls or is supported by them, including electrical and other types of equipment, raceways, piping, encumbrances to workspace clearance requirements, and adjacent surfaces. Maintain required workspace clearances and required clearances for equipment access doors and panels.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Available 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:
1. Eaton Electrical Inc.; Cutler-Hammer Business Unit.
 2. General Electric Company; GE Consumer & Industrial - Electrical Distribution.
 3. Siemens Energy & Automation, Inc.
 4. Square D; a brand of Schneider Electric.

2.2 GENERAL REQUIREMENTS FOR PANELBOARDS

- A. Enclosures: Flush- and surface-mounted cabinets as noted on schedules.
1. Rated for environmental conditions at installed location.
 - a. Indoor Dry and Clean Locations: NEMA 250, Type 1.
 - b. Outdoor Locations: NEMA 250, Type 4.
 - c. Kitchen Areas: NEMA 250, Type 4X stainless steel.
 - d. Other Wet or Damp Indoor Locations: NEMA 250, Type 4.
 2. Front Cover: For surface-mounted fronts, match box dimensions; for flush-mounted fronts, overlap box.
 - a. Flush Mounted Panelboards: Standard front cover. Secured to box with concealed trim clamps. Trim shall extend beyond box at least 1" in all dimensions.
 - b. Surface Mounted Panelboards: Entire front trim hinged to box. Continuous piano hinge. Provide standard door with front trim.
 3. Gutter Extension and Barrier: Same gage and finish as panelboard enclosure; integral with enclosure body. Arrange to isolate individual panel sections.
 4. Finishes:
 - a. Panels and Trim: Steel, factory finished immediately after cleaning and pretreating with manufacturer's standard two-coat, baked-on finish consisting of prime coat and thermosetting topcoat.
 - b. Back Boxes: Galvanized steel.
 5. Directory Card: Inside panelboard door, mounted in metal frame with transparent protective cover.
 6. Main Overcurrent Protective Devices: Molded-case circuit breakers.
 - a. Center Mounted Main: Branch mounted main breakers are not allowed.
 7. Branch Overcurrent Protective Devices: Molded-case circuit breakers.
 - a. Center mounted branch devices and sub-feed branch devices are not allowed.
- B. Incoming Mains Location: Top and bottom.

- C. Phase, Neutral, and Ground Buses: Hard-drawn copper, 98 percent conductivity
 - 1. Neutral Bus: Neutral bus rated 100 percent of phase bus.
 - 2. Equipment Ground Bus: Adequate for feeder and branch-circuit equipment grounding conductors; bonded to box. For branch circuit panelboards provide a minimum of 21 terminals.
- D. Main and Neutral Lugs: Mechanical type suitable for use with conductor material.
- E. Feed-through Lugs: Not acceptable.
- F. Future Devices: Mounting brackets, bus connections, filler plates, and necessary appurtenances required for future installation of devices. Future devices indicated as “SPACE” on drawings.
- G. Panelboard Short-Circuit Current Rating: Fully rated to interrupt symmetrical short-circuit current available at terminals. Series rating of equipment is not acceptable.

2.3 DISTRIBUTION PANELBOARDS

- A. Panelboards: NEMA PB 1, power and feeder distribution type.
- B. Doors: Secured with vault-type latch with tumbler lock; keyed alike.
 - 1. For doors more than 36 inches (914 mm) high, provide two latches, keyed alike.
- C. Mains: Circuit breaker.
- D. Branch Overcurrent Protective Devices for Circuit-Breaker Frame Sizes 125 A and Smaller: Bolt-on circuit breakers.
- E. Branch Overcurrent Protective Devices for Circuit-Breaker Frame Sizes Larger Than 125 A: Bolt-on circuit breakers; plug-in circuit breakers where individual positive-locking device requires mechanical release for removal.

2.4 LIGHTING AND APPLIANCE BRANCH-CIRCUIT PANELBOARDS

- A. Panelboards: NEMA PB 1, lighting and appliance branch-circuit type.
- B. Mains: Circuit breaker, unless otherwise noted on drawings.
- C. Branch Overcurrent Protective Devices: Bolt-on circuit breakers, replaceable without disturbing adjacent units.
- D. Doors: Concealed hinges; secured with flush latch with tumbler lock; keyed alike.

2.5 DISCONNECTING AND OVERCURRENT PROTECTIVE DEVICES

- A. Molded-Case Circuit Breaker (MCCB): Comply with UL 489, with full interrupting capacity to meet available fault currents.

1. Electronic Trip Circuit Breakers: Electronic trip circuit breakers with RMS sensing; field-replaceable rating plug or field-replicable electronic trip and individually field-adjustable long time, short time, and instantaneous trip pickup level settings. Trip unit shall also have adjustable long time and short time delay settings. Provide for circuit-breaker frame sizes 250A and larger.
 - a. Ground Fault Protection: Any 1000A-rated circuit breaker or larger, above 150V L-G, shall have ground fault pickup and time delay settings in addition to overcurrent trip settings indicated above.
2. Thermal-Magnetic Circuit Breakers: Inverse time-current element for low-level overloads, and instantaneous magnetic trip element for short circuits. Field adjustable instantaneous trip setting for circuit-breaker frame sizes 100 A to 225A.
3. Breakers Serving Elevator Controllers: Field adjustable instantaneous-trip setting for circuit-breaker.
4. GFCI Circuit Breakers: Single- and two-pole configurations with Class A ground-fault protection (6-mA trip).
5. Ground-Fault Equipment Protection (GFEP) Circuit Breakers: Class B ground-fault protection (30-mA trip).
6. Arc-Fault Circuit Interrupter (AFCI) Circuit Breakers: Comply with UL 1699; 120/240-V, single-pole configuration.
7. Molded-Case Circuit-Breaker (MCCB) Features:
 - a. Standard frame sizes, trip ratings, and number of poles.
 - b. Lugs: Mechanical style, suitable for number, size, trip ratings, and conductor materials.
8. Molded-Case Circuit-Breaker (MCCB) Accessories (where indicated):
 - a. Application Listing: Appropriate for application; Type SWD for switching fluorescent lighting loads; Type HID for feeding fluorescent and high-intensity discharge (HID) lighting circuits.
 - b. Ground-Fault Protection: Integrally mounted relay and trip unit with adjustable pickup and time-delay settings, push-to-test feature, and ground-fault indicator.
 - c. Shunt Trip: Trip coil energized from separate circuit, set to trip at [55] [75] percent of rated voltage. Match coil voltage to control power source.
 - d. Undervoltage Trip: Set to operate at 35 to 75 percent of rated voltage without intentional time delay.
 - e. Auxiliary Contacts: Two SPDT switches with "a" and "b" contacts; "a" contacts mimic circuit-breaker contacts and "b" contacts operate in reverse of circuit-breaker contacts.
 - f. Handle Clamp: Loose attachment, for holding circuit-breaker handle in on position.

2.6 INSTRUMENTATION

A. Instrument Transformers: IEEE C57.13, NEMA EI 21.1, and the following:

1. Potential Transformers: IEEE C57.13; 120 V, 60 Hz, single secondary; disconnecting type with integral fuse mountings. Burden and accuracy shall be consistent with connected metering and relay devices.

2. Current Transformers: IEEE C57.13; 5 A, 60 Hz, secondary; wound type; single secondary winding and secondary shorting device. Burden and accuracy shall be consistent with connected metering and relay devices.
 3. Control-Power Transformers: Dry type, mounted in separate compartments for units larger than 3 kVA.
 4. Current Transformers for Neutral and Ground-Fault Current Sensing: Connect secondary wiring to ground overcurrent relays, via shorting terminals, to provide selective tripping of main and tie circuit breaker. Coordinate with feeder circuit-breaker, ground-fault protection.
- B. Multifunction Digital-Metering Monitor: Microprocessor-based unit suitable for three- or four-wire systems and with the following features:
1. Switch-selectable digital display of the following values with maximum accuracy tolerances as indicated:
 - a. Phase Currents, Each Phase: Plus or minus 1 percent.
 - b. Phase-to-Phase Voltages, Three Phase: Plus or minus 1 percent.
 - c. Phase-to-Neutral Voltages, Three Phase: Plus or minus 1 percent.
 - d. Megawatts: Plus or minus 2 percent.
 - e. Megavars: Plus or minus 2 percent.
 - f. Power Factor: Plus or minus 2 percent.
 - g. Frequency: Plus or minus 0.5 percent.
 - h. Accumulated Energy, Megawatt Hours: Plus or minus 2 percent; accumulated values unaffected by power outages up to 72 hours.
 - i. Megawatt Demand: Plus or minus 2 percent; demand interval programmable from five to 60 minutes.
 - j. Contact devices to operate remote impulse-totalizing demand meter.
 2. Communications: Meter shall have a communications/network interface module, which enables the meter to communicate to the building automation system (BAS) via RS-485 Modbus protocol and a network management system via Owner's network infrastructure. The interface module shall include internal hardware and software to communicate (via SNMP and HTTP) to any I.P.-based Ethernet network through a RJ-45 connector. The module shall have redundant paths for communications that make it possible to connect to the BAS using Modbus while simultaneously communicating to through SNMP and HTTP. A terminal block shall be provided to connect to Modbus.
 3. Mounting: Display and control unit flush or semiflush mounted in instrument compartment door.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Receive, inspect, handle, and store panelboards according to NEMA PB 1.1.
- B. Examine panelboards before installation. Reject panelboards that are damaged or rusted or have been subjected to water saturation.

- C. Examine elements and surfaces to receive panelboards for compliance with installation tolerances and other conditions affecting performance of the Work.
- D. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

- A. Install panelboards and accessories according to NEMA PB 1.1.
- B. Temporary Lifting Provisions: Remove temporary lifting eyes, channels, and brackets and temporary blocking of moving parts from panelboards.
- C. Mount top of trim 90 inches (2286 mm) above finished floor unless otherwise indicated.
- D. Mount panelboard cabinet plumb and rigid without distortion of box. Mount recessed panelboards with fronts uniformly flush with wall finish and mating with back box.
- E. Install filler plates in unused spaces.
- F. Stub eight 3/4-inch empty conduits from panelboard into accessible ceiling space or space designated to be ceiling space in the future. Stub four 3/4-inch empty conduits into raised floor space or below slab not on grade.
- G. Arrange conductors in gutters into groups and bundle and wrap with wire ties.
- H. Comply with NECA 1.

3.3 IDENTIFICATION

- A. Identify field-installed conductors, interconnecting wiring, and components; provide warning signs complying with Division 26 Section "Identification for Electrical Systems."
- B. Create a directory to indicate installed circuit loads; incorporate Owner's final room designations. Obtain approval before installing. Use a computer or typewriter to create directory; handwritten directories are not acceptable.
- C. Panelboard Nameplates: Label each panelboard with a nameplate complying with requirements for identification specified in Division 26 Section "Identification for Electrical Systems."
- D. Device Nameplates: Label each branch circuit device in distribution panelboards with a nameplate complying with requirements for identification specified in Division 26 Section "Identification for Electrical Systems."

3.4 FIELD QUALITY CONTROL

- A. Tests and Inspections:
 - 1. Testing Technician

- a. The testing technicians shall be trained in all the methods of correctly and safely conducting the required test. The technician shall have regular experience conducting the required tests and they must have the knowledge to determine the serviceability of a specific piece of equipment.

2. Physical inspection and Testing

- a. Verify equipment rating correspond to drawings and specifications.
- b. Inspect the physical and mechanical condition and verify that it complies with manufacturer's standards.
- c. Verify equipment is properly secured and aligned with the required clearances as specified in the drawings and specifications. Assure that the equipment is properly grounded.
- d. Verify that all packing materials have been removed and the equipment has been cleaned.
- e. Confirm all breaker sizes, quantities, and configurations correspond to the drawings and specifications.
- f. Confirm bolted and mechanical lug electrical connections are low impedance using one of the following means:
 - 1) Measure the resistance with a low-resistance ohmmeter. Bolted electrical connection resistances shall be compared to resistances measured on similar connections. Any similar resistance values that deviate more than 50 percent should be investigated.
 - 2) Inspect the bolted connection and verify that it is at the manufacturer's rated torque using a calibrated torque wrench. If manufacturer's data is not available verify the torque meets the requirements of Table 100.12 in the ANSI/NETA ATS-2009.

3. Electrical Inspection and Testing

- a. Test each bus section for insulation resistance for one minute on phase to phase and phase to ground connections. Verify the test results comply with manufacturer's documentation or the requirements established in Table 100.1 of the ANSI/NETA ATS-2009.
- b. Verify all meters functionality and accuracy after testing and calibrating all inputs.
- c. Verify instrument transformers meet all the requirements of the drawings and specifications.
 - 1) Test transformer wiring integrity and proper transformer operation.
 - 2) Verify transformer output voltage is at the specified level.

4. Test Reports: Prepare a written report to record the following:

- a. Test procedures used.
- b. Test results that comply with requirements.
- c. Test results that do not comply with requirements and corrective action taken to achieve compliance with requirements.

B. Panelboards will be considered defective if they do not pass tests and inspections.

3.5 ADJUSTING

- A. Set field-adjustable circuit-breaker trip ranges. Unless otherwise noted, trip settings shall mimic trip characteristics for thermal magnetic circuit-breakers of similar trip rating.
- B. Load Balancing: After Substantial Completion, but not more than 60 days after Final Acceptance, measure load balancing and make circuit changes.
 - 1. Measure as directed during period of normal system loading.
 - 2. Perform load-balancing circuit changes outside normal occupancy/working schedule of the facility and at time directed. Avoid disrupting critical 24-hour services such as fax machines and on-line data processing, computing, transmitting, and receiving equipment.
 - 3. After circuit changes, recheck loads during normal load period. Record all load readings before and after changes and submit test records.
 - 4. Tolerance: Difference exceeding 20 percent between phase loads, within a panelboard, is not acceptable. Rebalance and recheck as necessary to meet this minimum requirement.

END OF SECTION 262416

SECTION 265100 - 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. Section Includes:
 - 1. Lighting fixtures, lamps, and ballasts.
 - 2. Emergency lighting units.
 - 3. Exit signs.
 - 4. Lighting fixture supports.
- B. Emergency Lighting Equipment, including supporting raceway, requires Seismic Controls. Equipment is required to be certified by the manufacturer. Engineer has delegated design of controls for mounting and supports to Contractor.
 - 1. Delegated Design: Design emergency lighting equipment supports, mounting, and associated raceway supports, including comprehensive engineering analysis by a qualified professional engineer, using performance requirements and design criteria indicated.
 - 2. Seismic Performance: Emergency lighting equipment shall withstand the effects of earthquake motions determined according to ASCE 7.
 - a. The term “withstand” means “the unit will remain in place without separation of any parts from the device when subjected to the seismic forces specified and the unit will be fully operational after the seismic event”.
 - 3. Structural Performance: Emergency lighting equipment supports, mounting, and associated raceway supports shall withstand the effects of gravity loads and the following loads and stresses within limits and under conditions indicated according to ASCE 7.
 - a. Seismic Loads: See Specification Section 260548.
- C. Related Sections:
 - 1. Division 26 Section "Lighting Control Devices" for occupancy sensors, contactors, and emergency lighting transfer devices.
 - 2. Division 26 Section "Classroom Dimming Control System" for modular classroom dimming systems.
 - 3. Division 26 Section "Relay Lighting Control System" for programmable relay control systems with low-voltage control wiring.
 - 4. Division 26 Section “Seismic Controls for Electrical Systems” for seismic restraint performance requirements including Site Classification and Seismic Use Group.

1.3 DEFINITIONS

- A. CRI: Color-rendering index.
- B. HID: High-intensity discharge.

1.4 SUBMITTALS

- A. Product Data:
 - 1. Fixture Schedule Matrix: At the front of the product data submittal provide a matrix that lists the fixture manufacturer and model number, ballast manufacturer and model number, lamp manufacturer and model number for each fixture type in schedule.
 - 2. Light Fixtures: For each type of lighting fixture in schedule, arranged in order of fixture designation. Provide manufacturer's published literature which includes data on features, accessories, and the following:
 - a. Dimensions of fixtures.
 - b. Manufacturer and type of ballasts.
 - c. Manufacturer and types of lamps.
 - d. For fixtures (non-exit) with LED light source submit the manufacturer's IESNA LM-79 Photometric Report and IESNA LM-80 Lumen Maintenance Report.
 - e. Method of emergency ballast installation (integral, external, or remote).
 - 3. Emergency Ballasts: For each type of emergency ballast installed in a scheduled lighting fixture, provide manufacturer's published literature containing lumen output, time duration, battery type, ballast dimensions, and mounting. Also provide wiring diagram.
- B. Shop Drawings:
 - 1. Site Lighting Illumination Plan: Provide computer generated isofootcandle plot diagrams for both initial and maintained footcandles on all horizontal patio, landing, walkway, roadway, and parking surfaces which show composite values of illuminance projected from the arrangement of all building mounted and non-building mounted light fixtures. Use manufacturer's published maintenance factors in calculating maintained footcandles. Calculation grid shall be 2' x 2' on pedestrian surfaces and 5' x 5' on vehicular surfaces. Also provide spill light isofootcandle plot diagrams for both horizontal and vertical maintained footcandles along property/LEED boundary and 10' beyond property/LEED boundary. Calculation grid shall be 10' on center along boundary. Plans depicting building mounted lighting and egress pedestrian surfaces shall be scaled no greater than 1"=10'. Plans depicting vehicular surfaces and property boundary shall be scaled no greater than 1"=30'.
- C. Warranty Information: Include in submittals warranty information for emergency exit signs, emergency lighting units, and emergency ballasts installed in schedule fixtures.
- D. Coordination Drawings: Reflected ceiling plans and sections drawn to scale and coordinating fixture installation with ceiling grid, ceiling-mounted items, and other components in the vicinity. Include work of all trades that is to be installed near lighting equipment.
- E. Test Reports: Report of operation test for emergency lighting units, emergency ballasts, and battery-powered exit signs. See Field Quality Control paragraph below. Submit copy to State Construction Office.

- F. Maintenance Data: For lighting fixtures to include in maintenance manuals specified in Division 1. Provide revised and updated Fixture Schedule Matrix. Include all warranty information and documentation with maintenance data.

1.5 QUALITY ASSURANCE

- A. Fixtures, Emergency Lighting Units, 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.
- C. NFPA 101 Compliance: Comply with visibility and luminance requirements for exit signs.

1.6 COORDINATION

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

1.7 WARRANTY

- A. Special Warranty for Electronic Ballasts: Written warranty, executed by manufacturer agreeing to replace fluorescent electronic ballasts that fails in materials or workmanship within 5 years from date of manufacturer, but not less than 4 years from date of Final Acceptance.
- B. Special Warranty for Emergency Exit Signs, Emergency Lighting Units, and Emergency Ballasts: Written warranty, executed by manufacturer agreeing to replace entire sign/unit/ballast that fails within 3 years from date of Final Acceptance. The batteries within sign/unit/ballast shall be covered for an additional 2 years by a pro-rated warranty.

1.8 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. Lamps: 10 for every 100 of each type and rating installed. Furnish at least two of each type.
 - 2. Ballasts: 1 for every 100 of each type and rating installed. Furnish at least two of each type. Includes emergency battery ballasts.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

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

1. It is the intent of the Light Fixture Schedule to denote the Basis of Design and quality standard of product desired and not to restrict bidders to a specific brand, make, manufacturer or specific name. The manufacturers and products listed in Schedule are used only to set forth and convey to bidders the general style, type, character, and quality of product desired. However, the use of products by a manufacturer not listed in Schedule is considered a substitution. Substitution of equivalent products will be acceptable according to the following paragraph.
- B. Substitution of Equivalent Products: Substitution of manufacturers and products equivalent to those listed in Light Fixture Schedule shall be submitted to the Engineer for approval more than 10 days prior to Bid Date. Submittal shall include all items listed in Article 1.4A and an IES photometric report file specific to the fixture configuration being submitted. Engineer has final authority on equivalence and acceptance.
- C. Substitution of Equivalent Products: Substitution of manufacturers and products equivalent to those listed in Light Fixture Schedule shall be submitted to the Engineer for approval through the product/shop drawing submittal review process.
- D. Equivalent fixtures, poles, ballasts, and other materials and equipment shall be products of manufacturers regularly engaged in the production of such products which are of equal material, design and workmanship. Products shall be a standard product offering as shown on manufacturer's published printed literature for appearance, mounting, light distribution and lamping (ballast and lens options are excluded from this requirement). Cut-sheets prepared for submittal are not considered published printed literature. Products shall have been in satisfactory commercial or industrial use for 2 years prior to bid opening. The 2-year period shall include applications of equipment and materials under similar circumstances and of similar size. The product shall have been on sale on the commercial market through advertisements, manufacturers' catalogs, or brochures during the 2-year period. Where two or more items of the same type or class of fixture are required, these items shall be products of a single manufacturer.

2.2 FIXTURES AND FIXTURE COMPONENTS, GENERAL

- A. Metal Parts: Free from burrs, sharp corners, and edges.
- B. Sheet Metal Components: Steel, unless otherwise indicated. Form and support to prevent warping and sagging.
- C. Doors, Frames, and Other Internal Access: Smooth operating, free from light leakage under operating conditions, and arranged to permit relamping without use of tools. Arrange doors, frames, lenses, diffusers, and other pieces to prevent accidental falling during relamping and when secured in operating position.
- D. Reflecting Surfaces: Minimum reflectance as follows, unless otherwise indicated:
 1. White Surfaces: 85 percent.
 2. Specular Surfaces: 83 percent.
 3. Diffusing Specular Surfaces: 75 percent.
 4. Laminated Silver Metallized Film: 90 percent.
- E. Lenses, Diffusers, Covers, and Globes: 100 percent virgin acrylic plastic or annealed crystal glass, unless otherwise indicated.

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

2.3 FLUORESCENT LAMP BALLASTS

- A. General Requirements: Unless otherwise indicated, features include the following:
1. Type: Electronic rapid-start. Comply with UL 953 and with ANSI C82.11.
 2. Designed for type and quantity of lamps indicated at full light output.
 3. Total Harmonic Distortion Rating: Less than 10 percent.
 4. Sound Rating: Class A.
 5. Protection: Class P Thermal Cutout
 6. Power Factor: 90 percent, minimum.
 7. Operating Frequency: 20 kHz or higher.
 8. Flicker: Less than 5 percent.
 9. Lamp Current Crest Factor: Less than 1.7.
 10. Shall meet or exceed requirements listed in ANSI C82.11
 11. Transient Protection: Comply with IEEE C62.41 for Category A1 locations.
 12. Normal Ambient Operating Temperature: 104 deg F (40 deg C).
 - a. Exterior Locations: Ballasts for exterior installed fixtures shall be rated for 0 deg F (minus 17 deg C) starting and operating temperature with indicated lamp types.
 13. Maximum Case Temperature: 77 deg F (25 deg C) above operating ambient
- B. Electronic Ballasts for Linear Lamps: Unless otherwise indicated, additional features include the following, besides those in "General Requirements" Paragraph above:
1. Ballast Factor: 0.87 through 0.89.
 2. Parallel Lamp Circuits: Multiple lamp ballasts connected to maintain full light output on surviving lamps if one or more lamps fail.
- C. Electronic Ballasts for Compact Lamps: Unless otherwise indicated, additional features include the following, besides those in "General Requirements" Paragraph above:
1. Ballast Factor: 0.95 or higher.
- D. Ballast Disconnect Device: All fixtures with double-ended fluorescent lamps, fixtures where the ballast is accessible without removing fixture, and other fixtures required by NEC 410.73(g) shall be provided with a plug-style disconnecting means within 12" and visual site of each ballast. Plug-style disconnecting means shall be factory installed by manufacturer and UL listed as an assembly.

2.4 FLUORESCENT DIMMING BALLASTS

- A. General Materials and Performance:
1. Programmed Rapid Start Type.
 2. Current crest factor (CCF) less than 1.7.
 3. Meet ANSI C82.11 High frequency ballast standard.
 4. Inaudible in a 27 dBA ambient.
 5. No visible change in light output with a variation of +/- 10 percent line voltage input.

6. Total Harmonic Distortion less than 10 percent and meet ANSI C82.11 maximum allowable THD requirements
7. Ballasts to track evenly across: Multiple lamp lengths and all light levels.
8. Designed and tested to withstand electrostatic discharges up to 15,000 V without impairment per IEC 801-2.
9. Ballast Disconnect Device: All fixtures with double-ended fluorescent lamps, fixtures where the ballast is accessible without removing fixture, and other fixtures required by NEC 410.73(g) shall be provided with a plug-style disconnecting means within 12" and visual site of each ballast. Plug-style disconnecting means shall be factory installed by manufacturer and UL listed as an assembly.

B. 10% General Purpose Dimming for Linear Fluorescent Lamps:

1. Electronic dimming ballast shall have a continuous flicker-free architectural dimming range of 100% -10% relative light output (RLO) for T5, T5HO, T8, and T12 linear fluorescent lamps.
2. Electronic dimming ballast shall not be damaged by miswires between any input power and control connections and any lamp leads to each other and/or ground.

C. 1% Architectural Dimming for Linear Fluorescent Lamps:

1. Electronic dimming ballast shall have a continuous flicker-free architectural dimming range of 100% -1% relative light output (RLO) for T5, T5HO, T8, and T12 linear fluorescent lamps.
2. Electronic dimming ballast shall not be damaged by miswires between any input power and control connections and any lamp leads to each other and/or ground.
3. See Fixture Schedule for fixtures requiring 1% Architectural Dimming ballasts.

D. 10% General Purpose Dimming for T4 Compact Fluorescent Lamps:

1. Electronic dimming ballast shall have a continuous flicker-free architectural dimming range of 100% - 1% relative light output (RLO) for T4 4-pin compact fluorescent lamps
2. Electronic dimming ballast shall not be damaged by miswires between any input power and control connections and any lamp leads to each other and/or ground.

E. 1% Architectural Dimming for T4 Compact Fluorescent Lamps:

1. Electronic dimming ballast shall have a continuous flicker-free architectural dimming range of 100% - 1% relative light output (RLO) for T4 4-pin compact fluorescent lamps
2. Electronic dimming ballast shall not be damaged by miswires between any input power and control connections and any lamp leads to each other and/or ground.
3. See Fixture Schedule for fixtures requiring 1% Architectural Dimming ballasts.

F. Fluorescent Ballast Energy Ratings: High Performance or Reduced Wattage type from the CEE qualified product list suitable for utility company rebates.

2.5 HIGH-INTENSITY-DISCHARGE LAMP BALLASTS

A. General: Comply with ANSI C82.4. Unless otherwise indicated, features include the following:

1. Type: Constant wattage autotransformer or regulating high-power-factor type, unless otherwise indicated.
 2. Operating Voltage: Match system voltage.
 3. Minimum Starting Temperature: Minus 22 deg F (Minus 30 deg C) for single lamp ballasts.
 4. Normal Ambient Operating Temperature: 104 deg F (40 deg C).
 5. Open-circuit operation that will not reduce average life.
- B. Encapsulation: Manufacturers' standard epoxy-encapsulated model designed to minimize audible fixture noise.

2.6 LED DRIVERS

- A. General:
1. Ten-year operational life while operating with a case temperature range of 0 degrees C to 62 degrees C and 90 percent non-condensing relative humidity.
 2. Electrolytic capacitors to operate at least 20 degrees C below the capacitor's maximum temperature rating when the driver is under fully-loaded conditions and case temperature is 62 degrees C.
 3. Designed and tested to withstand electrostatic discharges up to 15,000 V without impairment per IEC 801-2.
 4. Maximum inrush current of 2 amperes for 120V and 277 V drivers.
 5. Withstand up to a 4,000 volt surge without impairment of performance as defined by ANSI C62.41 Category A.
 6. Manufactured in a facility that employ ESD reduction practices in compliance with ANSI/ESD S20.20.
 7. Inaudible in a 27 dBA ambient environment.
 8. No visible change in light output with a variation of +/- 10 percent line voltage input.
 9. Total Harmonic Distortion less than 10 percent and meet ANSI C82.11 maximum allowable THD requirements
- B. Compatibility of driver and LED light engine must be tested and ensured by driver manufacturer.

2.7 FLUORESCENT EMERGENCY BALLASTS

- A. Integral Type: Self-contained, modular, battery-inverter unit factory mounted within, on, or remote from fixture body. Comply with UL 924
- 1.
 2. Output: Emergency ballast shall provide light output as listed in Light Fixture Schedule for a minimum of 90 minutes.
 3. Battery: Sealed, maintenance-free, high-temperature, nickel-cadmium type with minimum seven-year nominal life.
 - a. For Interior Locations: Temperature Operating Range: 0°C to 60°C.
 - b. For Exterior Locations: Temperature Operating Range to minimum -18°C/0°F.
 - c. Battery shall be field replaceable.
 4. Charger: Battery charger shall be fully automatic solid state type, full wave rectifying, with current limiting. Charger shall restore the battery to its full charge within 24 hours after a discharge of 90 minutes under full rated load.

5. Test Switch and Light-Emitting-Diode Indicator Light: Visible and accessible without opening fixture or entering ceiling space.
 - a. All 2x4 fluorescent fixtures with emergency ballast, test switch, and indicate light factory installed. Field mounting is not acceptable.
6. See Warranty requirements Part 1.

2.8 EMERGENCY EXIT SIGNS

- A. General Requirements: Comply with UL 924 and the following:
 1. Sign Colors and Lettering Size: Comply with authorities having jurisdiction.
 2. Lamps for AC Operation: Light-emitting diodes, 70,000 hours minimum rated lamp life. Maximum LED failure rate shall be 25% within a 7 year period.
 3. Emergency Operation: When normal voltage drops below 80% nominal, sign shall switch to operation from emergency battery.
 4. Testing Features: Exit sign shall be provided with a test switch to simulate the operation of the unit upon loss of normal power. Sign shall also be provided with pilot light indicating connection of normal power and a pilot indicating high rate charging status.
 5. Exit Signs shall be third party listed as emergency lighting equipment, and meet or exceed the following standards: NEC, NC Building Code, NC Energy Conservation Code, NFPA 101, and any applicable NEMA standards.
- B. Integral Emergency Battery: Battery shall be sealed, maintenance-free nickel-cadmium sized for a minimum of 90 minutes operating endurance. It shall also be a high temperature type with an operating range of 0°C to 60°C and contain a resealable pressure vent. Exterior signs shall be rated to a minimum temperature operating range of -18°C/0°F. Battery shall have normal life expectancy of 10 years. See Warranty requirements Part 1.
- C. Battery Charger: Battery charger shall be fully automatic solid state type, full wave rectifying, with current limiting. Charger shall restore the battery to its full charge within 24 hours after a discharge of 90 minutes under full rated load.

2.9 EMERGENCY LIGHTING UNIT

- A. General Requirements: Comply with UL 924 and the following:
 1. Description: Emergency lighting unit shall be a completely self-contained lighting unit designed to provide emergency illumination upon loss of normal power. Unit contains battery, automatic charger, transfer device, lamps, and testing features.
 2. Emergency Operation: When normal voltage drops below 80% nominal, unit shall activate to operate lamps from emergency battery. Lamps are off during normal operation.
 3. Testing Features: Units shall be provided with a test switch to simulate the operation of the unit upon loss of normal power. It shall also be provided with pilot light indicating connection of normal power and a pilot indicating high rate charging status.
 4. Emergency Lighting Units shall be third party listed as emergency lighting equipment.
- B. Emergency Battery: Battery shall be 12V sealed, maintenance-free nickel-cadmium sized for a minimum of 90 minutes operating endurance. It shall also be a high temperature type with an operating range of 0°C to 60°C and contain a resealable pressure vent. Exterior units shall be

rated to a minimum temperature operating range of -18°C/0°F. Battery shall have normal life expectancy of 10 years. See Warranty requirements Part 1.

- C. Battery Charger: Battery charger shall be fully automatic solid state type, full wave rectifying, with current limiting. Charger shall restore the battery to its full charge within 24 hours after a discharge of 90 minutes under full rated load.

2.10 LAMPS

- A. Fluorescent Color Temperature and Minimum Color-Rendering Index: 3500 K and 75 CRI, unless otherwise indicated.
 - 1. Non-compact Fluorescent Lamp Life: Rated average is 20,000 hours at 3 hours per start when used on rapid-start circuits.
- B. Metal-Halide Color Temperature and Minimum Color-Rendering Index: 3200 K and 70 CRI, unless otherwise indicated.
- C. Fluorescent Lamps Energy Ratings: High Performance or Reduced Wattage type from the CEE qualified product list suitable for utility company rebates.

2.11 FIXTURE SUPPORT COMPONENTS

- A. Comply with Division 26 Section "Hangers and Supports", for channel- and angle-iron supports and nonmetallic channel and angle supports.
- B. Refer to "Light Fixture Mounting Detail" on plans for individual fixture support.

2.12 FINISHES

- A. Fixtures: Manufacturers' standard, unless otherwise indicated.
 - 1. Paint Finish: Applied over corrosion-resistant treatment or primer, free of defects.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Fixtures: Set level, plumb, and square with ceiling and walls, and secure according to manufacturer's written instructions and approved submittal materials. Install lamps in each fixture.
- B. Support for Fixtures in or on Grid-Type Suspended Ceilings: Use grid for support.
 - 1. Fixtures within Ceiling Grid: Where a recessed fluorescent, high intensity, or downlight fixture replaces a section or part of a ceiling tile, the fixture shall be supported at the two (2) opposite ends to the building steel/concrete frame or floor decking. Supports shall be provided with the same type of wire as used to support the lay-in ceiling track. Attach the luminaire to the main runners of the lay-in ceiling track at all four (4) corners using sheet metal screws. For fire rated suspended ceiling, luminaire shall be supported to the

Building Structure as per the Ceiling Design Criteria, luminaire shall then be screwed to the man runners of the suspended ceiling track at all four (4) corners using sheet metal screws.

2. Fixtures of Sizes Less Than Ceiling Grid: Arrange 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 between ceiling tees in addition to wires from building structure per above. Channel support shall be attached to ceiling grid using sheet metal screws.

3.2 CONNECTIONS

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

3.3 FIELD QUALITY CONTROL

- A. Inspect each installed fixture for damage. Replace damaged fixtures and components.
- B. Provide instruments to make and record test results.
- C. Tests: As follows:
 1. Verify normal operation of each fixture after installation.
 2. Emergency Lighting: Interrupt electrical supply to demonstrate proper operation.
 - a. Contractor shall perform a test on each battery unit after it is permanently installed and charged for a minimum of 24 hours. Battery units shall be tested for 90 minutes and shall maintain not less than 60% of the initial emergency illumination or 87-1/2% of initial battery voltage for the duration of the test. Any unit which fails the test must be repaired or replaced, and tested again. Copy of testing report for each unit shall be sent to the Engineer.
 - b. All battery tests shall be complete a minimum of 10 days prior to final inspection.
 3. Verify operation of photoelectric controller and contactor.
 4. Verify normal transfer to battery source and retransfer to normal.
 5. Report results in writing.
- D. Malfunctioning Fixtures and Components: Replace or repair, then retest. Repeat procedure until units operate properly.
- E. Corrosive Fixtures: Replace during warranty period.

3.4 CLEANING AND ADJUSTING

- A. Clean fixtures internally and externally after installation. Use methods and materials recommended by manufacturer.
- B. Adjust aimable fixtures to provide required light intensities.

END OF SECTION 265100