

SECTION 000110 – TABLE OF CONTENTS

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SECTION 011000 - SUMMARY

SECTION 012000 – ADMINISTRATIVE REQUIREMENTS FOR DESIGN-BUILD

SECTION 012100 - ALLOWANCES

SECTION 012500 - SUBSTITUTION PROCEDURES

SECTION 012600 - CONTRACT MODIFICATION PROCEDURES

SECTION 012900 - PAYMENT PROCEDURES

SECTION 013100 - PROJECT MANAGEMENT AND COORDINATION

SECTION 013200 - CONSTRUCTION PROGRESS DOCUMENTATION

SECTION 013216 – PROJECT SCHEDULES

SECTION 013233 - PHOTOGRAPHIC DOCUMENTATION

SECTION 013300 - SUBMITTAL PROCEDURES

SECTION 013591 - HISTORIC TREATMENT PROCEDURES

SECTION 014000 - QUALITY REQUIREMENTS

SECTION 014200 - REFERENCES

SECTION 015000 - TEMPORARY UTILITIES AND FACILITIES

SECTION 016000 - PRODUCT REQUIREMENTS

SECTION 017300 – CONSTRUCTION EXECUTION

SECTION 017419 - CONSTRUCTION WASTE MANAGEMENT AND DISPOSAL

SECTION 017700 - CLOSEOUT PROCEDURES

SECTION 017823 - OPERATION AND MAINTENANCE DATA

SECTION 017839 - PROJECT RECORD DOCUMENTS

SECTION 017900 - DEMONSTRATION AND TRAINING

SECTION 018113.15 - SUSTAINABLE DESIGN REQUIREMENTS - LEED v4 BD+C

SECTION 019113 - GENERAL COMMISSIONING REQUIREMENTS

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, and provisions of Request for Proposal (RFP) apply to this Section.

1.2 SUMMARY

- A. Design-Builder shall coordinate “Work by Owner” with other elements of the construction project including:
 - 1. Project information.
 - 2. Work covered by the Performance Requirements.
 - 3. Work by Owner.
 - 4. Work under separate contracts.
 - 5. Owner-furnished products.
 - 6. Access to site.
 - 7. Coordination with occupants.
 - 8. Work restrictions.
 - 9. Specification and Drawing conventions.
 - 10. Miscellaneous provisions.
- B. The Design-Build work includes developing construction documents and constructing the Project as envisioned in the RFP, which includes but is not limited to:
 - 1. Performance Requirements
- C. General Description of Work: The Project shall include the design and preparation of construction documents, complete construction, testing, and commissioning, for Recorder of Deeds Modernization as outlined in the RFP, located at 515 D St NW, Washington, DC 20001:
 - 1. Background: The historic Recorder of Deeds (“RoD”) building is the newest addition to the Owner’s facilities portfolio. In 2019, the D.C. Courts executed an agreement Attachment J## Occupancy Agreement between DC Courts and DGS, dated 9/23/2019 with the District of Columbia for use of the RoD building for 99 years with the intent of modernizing the building to create an “Access to Justice Center” with the following benefits:
 - The D.C. Courts’ anticipated space need will be fulfilled through 2030 without dependency on high-cost leased space, as all D.C. Courts’ components requiring functional adjacency to the courthouses will be consolidated into the D.C. Courts’ Judiciary Square portfolio of government-owned facilities.

- Adjacency to the courthouse will allow the Courts to provide greater “access to justice for all” in the community by co-locating the Courts and community partners who deliver vital services in one easily accessible location.
- Restoration and modernization of the historic Recorder of Deeds Building will not only preserve a building that is an important part of our nation’s African American history, but it will also lower the number of excess and underutilized properties in the District of Columbia’s real property portfolio by bringing a vacant, deteriorating building back into active use.

In return, the District of Columbia (referred to as DGS) will occupy at least five thousand (5,000) useable square feet of space in the building, per the Agreement.

2. It is a requirement that the Design-Builder must provide and be responsible for all components not supplied by Owner; the Design-Builder is to be the single point of accountability and the responsible party for functioning of the entire building system.
3. Services shall include, but are not limited to the following:
 - a. Development of Construction Documents to meet all the applicable building codes and District of Columbia city ordinances.
 - b. Coordination with end users of space as outlined in Specification 012000 Administrative Requirements for Design-Build.
 - c. Acquiring all necessary Permits and Inspections required for construction and occupancy.
 - d. Construction of complete scope of project as awarded and amended.
 - e. Testing and abatement of hazardous materials if encountered.
 - f. Commissioning as required and incorporation of Court’s Commissioning Authority comments and plan in design documents. Design Builder shall contact and initiate coordination of Design with the Courts Commissioning Agent upon receipt of Design Notice to Proceed.
 - g. All required indoor air quality testing.
 - h. Validation of Program Design as set forth in RFP.
4. Design, coordinate, furnish, install, and test as necessary the following:
 - a. Fire Alarm equipment and any necessary building automation.
 - b. Power and data connections to Owner provided furniture.
 - c. All infrastructure and wiring for low voltage requirements. Contractor must coordinate with all Courts IT staff for telephones, equipment, wireless and networking infrastructure, cabling and switches.
 - d. All infrastructure and wiring for audio visual requirements. Contractor must coordinate with Court’s AV staff.
 - e. All infrastructure for security. Contractor must coordinate any electrical infrastructure requirements including proximity card door lock release entry system and any video surveillance / closed circuit camera systems necessary.
 - f. Required locations for AV/IT/Security closets for equipment. All cooling for IT closets must be coordinated and installed.
 - g. All hardware necessary per Basis of Design or approved equal and coordination with Courts Facilities staff.
 - h. All infrastructure for printers and copiers and any other equipment in the design
 - i. All lighting and finishes in accordance with Basis of Design or approved equal.
 - j. All signage.

- k. Coordination with Courts to identify a date for moving Court staff after substantial completion and before final completion. The move of staff, staff furniture, and equipment will be done by Courts.

D. Related Requirements:

1. Section 011500 "Design Submissions and Reviews" for requirements of the Design-Builder during the design phase
2. Section 015000 "Temporary Facilities and Controls" for limitations and procedures governing temporary use of Owner's facilities.
3. Section 019113 "General Commissioning Requirements" for procedures governing commissioning.

1.3 PROJECT INFORMATION

A. Project Identification: Recorder of Deeds Modernization Project

B. Owner: District of Columbia Courts

Capital Projects & Facilities Management Division
700 6th Street NW, Twelfth Floor
Washington, DC 20001

C. Project Design-Builder: TBD

D. Consultants: Project Design-Builder has retained the following design professionals who have prepared designated portions of the Contract Documents:

1. Architect: TBD
2. Mechanical, Electrical, Plumbing: TBD
3. Structural: TBD
4. Audio Visual & Acoustical Consultant: TBD
5. Fire and Life Safety Consultant: TBD
6. Civil: TBD
7. Landscaping Consultant: TBD
8. Telecommunications: TBD
9. Vertical Transportation Consultant: TBD

E. Owner Consultants: Owner has retained the following design professionals who will work for the Owner during the project. Owner will designate authority to these consultants, and others, as needed to progress the Work

1. Security: TBD
2. Code Inspection Agent: TBD
3. Commissioning Agent: Setty & Associates International, PLLC
4. IT Group:
5. Construction Manager: TBD

F. Web-Based Project Software: PMIS Software administered by Owner will be used for the purpose of managing communication and documents during the design and construction stages.

Procure provides for an online central collaboration hub for access to real time project information and will be the primary method for construction data dissemination. The Design-Builder shall be responsible for utilizing the PMIS system for:

1. All Submittals, Requests for Information (RFIs), Meeting Minutes, Daily Reports, Punch Lists, Observation Reports, Design Drawings, Specifications, Project Photographs, Procurement Log, and other items as outlined in other sections of the specification and the RFP.

1.4 WORK COVERED BY CONTRACT DOCUMENTS

A. Type of Contract:

1. Project will be constructed under a single Design-Build contract with scopes that define the base plus options as defined in the RFP.

B. The Work of the Project is defined by the Design-Build RFP and Performance Requirements.

1.5 WORK BY OWNER OR UNDER SEPARATE CONTRACTS

A. General: Cooperate fully with Owner so work may be carried out smoothly, without interfering with or delaying work under this Contract or work by Owner. Coordinate the Work of this Contract with work performed by Owner.

B. Subsequent Work: Owner will perform the following additional work at site after Substantial Completion. Completion of that work will depend on successful completion of preparatory Work under this Contract.

1. Signage (All life safety signage required for occupancy is to be by the Design-Builder, coordinated with Owner's signage vendor)
2. Furniture Installation (DB to coordinate electrical requirements of new furniture)
3. Security [TBD]

1.6 PURCHASE CONTRACTS

A. General: Owner has negotiated Purchase contracts with suppliers of material and equipment to be incorporated into the Work. Owner will assign these Purchase contracts to Design-Builder. Include costs for purchasing, receiving, handling, storage if required, and installation of material and equipment in the Contract Sum unless otherwise indicated.

1. Design-Builder's responsibilities are same as if Design-Builder had negotiated Purchase contracts, including responsibility to renegotiate purchase and to execute final purchasing agreements.

1.7 OWNER-FURNISHED PRODUCTS

- A. Owner will furnish products indicated. The Work includes receiving, unloading, handling, storing, protecting, and installing Owner-furnished products and making building services connections. Items like existing equipment relocated by Owner and installed by Design-Builder.
- B. Owner-Furnished Products:
 - 1. Refer to Concept Design Drawings – Sheet G11.

1.8 ACCESS TO SITE

- A. General: Design-Builder shall have use of Project site for construction operations as indicated on Drawings by the Contract limits and as indicated by requirements of this Section.
- B. Use of Site: Limit use of Project site to areas within the Contract limits indicated.
 - 1. Limits: Confine construction operations to areas indicated in the Contract Documents.
 - 2. Driveways, Walkways and Entrances: Use of these areas is available to the Contractor pending approval and permitting by the District of Columbia, Department of Transportation (DDOT). Any damage to existing conditions through the use of these areas will be repaired to equal or better condition and in accordance with District standards.
- C. Condition of Existing Building: Maintain all portions of existing building affected by construction operations in a weathertight condition throughout construction period. Repair damage caused by construction operations.
- D. Condition of Existing Grounds: Maintain portions of existing grounds, landscaping, and hardscaping affected by construction operations throughout construction period that are not identified for demolition or replacement in the RFP. Repair of any damage caused by construction operations will be at the sole risk of the Contractor.
 - 1. Damage to existing grounds caused by construction activities shall be anticipated and will be included in construction costs. Unanticipated damage will be repaired to a level of finish acceptable to the Owner at no additional cost to the owner.

1.9 WORK RESTRICTIONS

- A. General: Comply with restrictions on construction operations within the District of Columbia.
 - 1. Comply with limitations on use of public streets and with other requirements of authorities having jurisdiction.
 - 2. For Owner specific restrictions related to the execution of the Work refer to the Request for Proposal.
- B. Restricted Substances: Use of tobacco products and other controlled substances within the existing or new building and on Project site is not permitted. No smoking is permitted within 25 feet of an entrance, operable window, or any out-side air intakes.

- C. Employee Identification: Owner will provide identification badges for Design-Builder personnel working on Project site and require personnel to use identification badges at all times.
- D. Employee Screening: Comply with Owner's requirements for drug and background screening of Design-Builder personnel working on Project site.
 - 1. Maintain list of approved screened personnel with Owner's representative.
 - 2. After installation of data or telecommunications equipment, additional security requirements will be implemented in accordance with Security Regulations.

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. 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 Design-Builder 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. Refer to Request for Proposals for additional requirements.
- 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.
 - 2. Abbreviations: Materials and products are identified by abbreviations published as part of the U.S. National CAD Standard and scheduled on Drawings.
 - 3. Keynoting: Materials and products are identified by reference keynotes referencing Specification Section numbers found in this Project Manual.

1.11 MISCELLANEOUS PROVISIONS

- A. Building Security
 - 1. Construction Security Requirements: After award of the Contract, all Design-Builder employees shall be required to furnish information to allow for background checks. All information on the completed forms must be typed and all signatures must be original. Comply with security regulations as imposed by the occupying agency and submit the following forms:
 - a. Use form Security Clearance Form and Criminal History Request, to be provided by Owner.

2. Secure Access: Notify the Owner and Construction not less than three (3) days prior to performing work in a security area.
 - a. Use form Secure Access Request Form, to be provided by Owner.
3. A Court Security Officer escort is required for entry and exit into secured areas even when security access has been approved.

B. General Security Regulations

1. Non-publicity: It is a specific condition of this Contract that the Design-Builder, or any sub of the Design-Builder performing work on this project, shall not use or allow to be used any aspect of this project for publicity or advertising brochures without express written permission by the Courts.
2. Agency Security Regulations: All persons employed within the boundaries of the property or restricted-access areas therein, and all persons permitted to enter such property and areas shall comply with the security regulations that have been established for this Contract.
3. The Design-Builder agrees on behalf of themselves and all subs of the Design-Builder that the following security regulations will be observed by Design-Builder and subs of the Design-Builder personnel on the property. The Design-Builder shall make it a specific provision of their subcontracts that these regulations be accepted.
4. At the commencement of the work under this Contract, the following security facilities and procedures will apply:
 - a. The Design-Builder shall provide information about all Design-Builder and subs of the Design-Builder personnel and others who require continuing access to the site, before access is required and when access ceases.
 - b. In order to permit the Owner to supply badges for on-site personnel, the Design-Builder shall cause each individual to complete a personnel identification form. These forms will be provided by the Owner to the Design-Builder at the pre-construction conference. Processing of the forms will be performed by the Owner at Owner expense.
 - c. The permanent badge furnished by the Owner to each Design-Builder employee or other person granted access to the site will serve to authorize the wearer to enter and leave the security area. The badge must be worn so as to be clearly visible at all times when on the work site.
 - d. The badge will be retained by the individual if they require continued admittance to the site, but the Design-Builder will arrange for its immediate return to the Owner when such need ceases.
 - e. In the case of any questions as to the eligibility of an individual to obtain a badge, notify the Owner, who will obtain a determination whether the individual can obtain a badge.

- f. Personnel may be subject to inspection of their personal effects when entering and leaving the facility. In addition, unscheduled inspections of personnel may be made while on site.
 - g. If any work is canceled, notify Owner or their designated representative.
 - h. The Owner reserves the right to close down the job site and order Design-Builder personnel off the premises in the event of a national emergency or a shut-down, for as long as security problems persist. The Design-Builder may only return to the site with verbal approval from the Owner or their authorized representative.
 - i. The Owner reserves the right to exclude or remove from the site or building any employee of the Design-Builder or a sub of the Design-Builder whom the Owner deems incompetent, careless, insubordinate or otherwise objectionable, or whose continued employment on the work is deemed by the Owner to be contrary to the public interests. The Owner further reserves the right to complete processing of the security documentation for personnel assigned to work within restricted access areas prior to access to such areas by the personnel.
- 5. Cameras are not permitted without written permission from the Owner. If approved, permission will be granted in writing and will provide additional guidelines.
 - a. Use Camera Letter Request Form to be provided by Owner.
- 6. No employment interviews shall be conducted within the secured area. The Design-Builder and subs of the Design-Builders will be required to maintain a field office, outside the limits established by the security area, for all public contacts. Applicants for employment and other persons not entitled to access to the secured area shall be required to contact the Design-Builder or subs of the Design-Builder at these offices.

1.12 ATTACHMENT FORMS

- . The following forms will be made available on PMIS from the Owner.

- 0. Security Clearance Form and Criminal History Request.
- 1. Secure Access Request Form.
- 2. Request for Access to Electrical Closet with Instructions.
- 3. Request for Access Telecommunications Closet with Instructions
- 4. Camera Letter Request Form

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION 011000

SECTION 012000 – ADMINISTRATIVE REQUIREMENTS FOR DESIGN-BUILD

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 and Request for Proposal (RFP), apply to this Section.

1.2 SUMMARY

- A. Section includes Design Requirements after the Notice to Proceed (NTP) for the Work of this Project.
- B. Related Requirements include, but are not limited to, the following:
 - 1. Section 013216 “Construction Project Schedule”
 - 2. Section 017839 “Project Record Documents.”
 - 3. Section 017300 “Execution” for Construction Management plan requirements.

1.3 DEFINITIONS

- A. Owner’s Project Requirements: Owner’s Project Requirements are developed by or for the Owner to describe the Owner’s program requirements and objectives for the Project, including use, space, price, time, site, and expandability requirements, as well as submittal requirements, design criteria and specifications, and other requirements governing Design-Builder’s (D-B) performance of the Work.
- B. Owner’s Team(s): Owner’s Team(s) consists of the following and may be amended from time to time. Authority to act on behalf of the Owner can be given by the Owner at their discretion.
 - 1. Commissioning Authority
 - 2. Program Management Team
 - 3. Construction Management Team
 - 4. Information Technology and Audio/Visual representatives
 - 5. Quality Assurance Team
 - 6. Furniture representative
 - 7. Communications representative
 - 8. Security representative
 - 9. Other personnel as identified by Owner or requested by D-B
- C. Bridging Architect: Owner’s design professional responsible for Bridging Contract Documents.
- D. Early Works Packages: Construction activities that can be clearly defined and separated from the remainder of the construction work and commence prior to completion of overall design.
- E. SUBMITTALS

- F. Project Design Submission Schedule as specified in this section.
- G. Early Work Report: Indicate status and compliance with specified requirements.
- H. Qualification Data for Designers of Record: Indicate compliance with requirements specified in this Section.
- I. Design Submittal packages (Base Design):
 - 1. Design Quality Control Plan
 - 2. Concept Design & Cost Estimate (35%)
 - 3. Preliminary Design & Cost Estimate (65%)
 - 4. Final Design & Cost Estimate (95%)
 - 5. Issued for Construction (100%)
- J. Design Submittal packages (Contract Option 1)
 - 1. DID1
 - 2. DID2
- K. Design Submittal packages (Contract Option 2)
 - 1. Concept Design & Cost Estimate (35%)
 - 2. Preliminary Design & Cost Estimate (65%)
 - 3. Final Design & Cost Estimate (95%)
 - 4. Issued for Construction (100%)

1.4 WORK PRIOR TO COMPLETION OF OVERALL DESIGN

- A. Early Work Packages
 - 1. The Design-Builder (D-B) may elect to proceed with early work construction of parts of the Work that are approved prior to completion of the overall design. The D-B may elect to divide the Work into design packages specifically related to major disciplines or construction types.
 - 2. If electing early work arrangements, the Design Builder shall provide an Early Work Report that indicates the following:
 - a. How the design will be divided to advance early work elements.
 - b. Describe the elements of the Early Work
 - c. Schedule of early work projects, including start and completion date and critical items of coordination between projects. Early Work Schedule shall be incorporated in Construction Project Schedule.
 - d. Description of the methods to ensure coordination and quality control of the various parts.
 - 3. Designs for Early Work Packages: D-B shall provide a design package and specifications for the Early Work for review by Owner. After acceptance D-B may order material and shall integrate the accepted equipment/materials into the design. Final Design must follow the design dictated by of Early Work Packages.
 - 4. Complete scope of work to be completed as part of early-work package.
- B. Early Work Packages Submissions
 - 1. 50% Early Work Package Construction Documents and Cost Estimate.

2. 100% Early Work Package Construction Documents and Cost Estimate.
- C. Early Work Construction Release: The Design-Builder shall proceed with the construction work only after the Owner has reviewed and provided written acceptance of the Issued for Construction - 100% (IFC-100%) design submission for each Early Work package.
 1. D-B may proceed with the construction work included in an individual early work design package after Owner has accepted the Issued for Construction (IFC) design submission for that package. D-B may, with Owner approval, request to start construction work prior to acceptance of the IFC drawings at their risk.
- D. Owner is responsible for all work performed on the Project or at the Site by Other Government Contractors (OGC) under Owner's control. Owner shall contractually require its OGCs to cooperate with and coordinate their activities so as not to interfere with D-B in order to enable D-B to timely complete the Work consistent with the Contract. Likewise, D-B shall coordinate their activities with all Project stakeholders and OGCs as necessary for the duration of the Project to successfully complete the Project.

1.5 DESIGN BUILDER (D-B) RESPONSIBILITIES

- A. The Design-Builder (D-B) shall develop Construction Design-Build Documents, including Concept Drawings and Specifications and any associated amendments, into complete Contract Document Sets, and construct the Work, as described herein and in the Request for Proposal.
- B. D-B has reviewed and understands the design intent and plans provided by the owner for the space and assumes full responsibility for the end product and has included all design and construction work necessary to complete the design and work. D-B will not be paid any additional funds for work that should have reasonably been inferred utilizing the site conditions report and design criteria as outlined in the RFP and elsewhere in the contract documents.
- C. Within fourteen (14) days after the NTP is issued, and prior to Initial Design Meeting, D-B shall provide for approval, a complete Design Submission Schedule with all design milestone submissions and review times indicated in calendar days. After Owner approval, D-B shall integrate the Design Submission Schedule into the Project Schedule. The Design Submission Schedule shall be developed in accordance with Section 013216 Construction Project Schedule and show the sequence of events involved in performing the Project design tasks to deliver the Project within the period of performance. The schedule shall be updated in accordance with Section 013216; however, D-B shall provide Owner a minimum advance notice of fourteen (14) calendar days of any submission date changes.
- D. The D-B shall be responsible for the professional quality, technical accuracy and the coordination for all design drawings and specifications furnished by the D-B under this contract. The D-B shall, without additional compensation, correct or revise any errors or deficiencies in D-B's designs, drawings, and specifications.
- E. It is the sole responsibility of the D-B to exhaust all efforts including sufficient professional and qualified resources to deliver to the Owner the complete Project on time and according to the requirements and standards described herein. The D-B is fully responsible for the completeness of the design.

- F. Existing Conditions and Site Survey Report: Within twenty-one (21) days of NTP issuance, or as specified in RFP, D-B shall conduct its own survey of the site/building and existing conditions where Work will occur, to include at a minimum, all key building systems affected by the Work. The intent is for D-B to verify existing site conditions prior to beginning any design work. The D-B shall complete the report within thirty **[30]** days from the date of the survey. Owner shall review and provide comments to D-B. D-B shall respond and revise report for record.
1. Five (5) working days prior to the Initial Design Meeting, D-B shall submit the report of the Existing Conditions and Site Survey identifying any discrepancies among the Owner's Project Requirements and D-B's findings, or existing site conditions or deficiencies not identified in the Owner's Project Requirements. Failure to identify deficiencies indicates D-B's concurrence that building systems and existing site conditions are as indicated in the Owner's Project Requirements.
- G. Designers of Record: The Contractor shall provide Designer(s) of Record (DOR) that are responsible for each discipline of the final Construction Documents and for construction quality assurance. The DOR shall be a registered architect/engineer (A/E) with proven experience in design, installation, and commissioning as a Designer or A/E of Record (DOR). All design disciplines shall be accounted for by registered DORs. One DOR may be responsible for more than one discipline.
1. DOR must be licensed and registered architects and engineers in their respective fields and have considerable influence over the development of the design.
 2. Acceptance and signature by the DOR and/or designated representatives shall be on all design submissions, construction documents, specifications and shop drawings before construction can begin on those work packages.
 3. The DOR and those identified by the DOR with signature authority must be licensed in the District of Columbia.
- H. Designers of Record's Responsibilities: The DOR shall:
1. Be responsible for ensuring integrity of their design and design integration in all submittals and extensions to design developed by others, such as the contractor, subcontractors or suppliers.
 2. Be responsible for the integration and approval of the complete design package, and be involved at every step of the design, construction, and commissioning process.
 3. DOR's quality assurance representative to accept and sign-off on all design submissions, construction documents, specifications, and shop drawings.
 4. Provide Final Submission Drawings, Specifications, and other submittals as indicated in these Design-Build Request for Proposal (RFP) and as required by the referenced manuals.
 5. DOR's quality assurance representative to review and approve all design/construction documents, including but not limited to, all design submissions, shop drawings, engineered sketches, etc. DORs shall review and approve all submittals and extensions of design, and DORs shall stamp, sign, and date all Final Design Submittals under their responsible discipline.
 6. Design project to qualify for LEED Silver Certification. D-B shall provide LEED checklist to identify achievable credit points. Point credits shall be verified by design and construction records, and product material cutsheets.
 7. Stamp, sign, and date each Final Submission Drawing, the Specification Cover Seal and Signature Page, and other design deliverables under their responsible discipline.
 8. Assume accountability of the design commensurate with application of the seal and signature.
 9. Provide written responses to Owner's design comments.

10. Identify deliverables that are not ready for release for construction as "NOT FOR CONSTRUCTION."
11. Ensure implementation of the Contract Document requirements through construction completion.
12. Ensure compliance with Contract Document to include all sources referenced therein.
13. Ensure compliance with applicable codes and standards.
14. Advise the Owner in writing of ALL changes to the Contract Documents.
15. Prepare and maintain changes, amendments, and revisions to the Contract Documents during Construction and maintain current records in PMIS.
16. Field verify and document existing conditions as required for preparation of the Construction Documents.
17. Document as-built conditions with D-B Record Drawings as required for preparation of post-construction As-Built Documents.

I. Design-Builder's Construction Team Role During Design

1. The D-B construction key personnel shall be actively involved during the design process to effectively integrate the design and construction requirements of this contract. In addition to the typical required construction activities, the D-B construction management involvement includes, but is not limited to:
 - a. Integrating the design schedule into the Project Schedule to maximize the effectiveness of early work on approved design and construction (within the limits allowed in the contract).
 - b. Ensuring constructability and economy of the design.
 - c. Integrating the shop drawing and installation drawing process into the design.
 - d. Executing the material and equipment acquisition programs to meet critical schedules.
 - e. Effectively interfacing the construction quality control program with the design quality control program.
 - f. Maintaining and providing the design team with accurate, up to date redline and as-built documentation.
 - g. The D-B Contractor shall require and manage the active involvement of key subcontractors in the above activities.

- J. D-B Contractor shall furnish the Owner a "needs" list for design related items every two (2) weeks. This list shall include information or action needed from the Owner or Owner's Other Government Contractors (OGCs) for the D-B to advance the design in a timely manner. Each list shall include a sequence number, description of information requested or action item, name of the individual, division, or vendor responsible for providing the information or completing the action item, and comments/remarks. Once an item is added to the list, it shall remain on the list until resolution.

1.6 CONFERENCES/MEETINGS

A. Post Award Conference

1. General: Conduct a Post Award Conference with the Owner and the Owner's staff, at the project site, or site designated by owner within 7 days after Notice to Proceed. The purpose is to integrate D-B and all client representatives into the project team.
2. Attendees
 - a. Design Builder
 - b. Major Designers of Record

- c. Major sub-contractor representatives
 - d. Owner and their representatives
- 3. Agenda
 - a. Introduce D-B's personnel.
 - b. Discuss roles and responsibilities.
 - c. Discuss contract administration requirements.
 - d. Discuss expected project progress processes.
 - e. Coordinate subsequent meetings for quality control.
- B. Interim Design Conferences: The D-B may request interim design conferences or over-the-shoulder reviews with the Owner and the Owner's staff to ensure continued Owner concurrence with the design work. Provide the Owner at least five (5) working days' notice prior to the requested conferences. Indicate requested disciplines to attend.
- C. Deliverable Design Conference Meeting: D-B shall conduct a Design Conference for each design submittal with the Owner to ensure continued Owner concurrence with the design work. The agenda shall be limited to only Owner comments that D-B does not concur with or requires further clarification. D-B shall indicate disciplines to attend and provide documents, presentations, and any other material necessary to conduct a page turning review of the Contract Documents. These meetings shall be scheduled so as not to impede the progress of design.
- D. 50% Submission Conference for each Early Work Package: Within five (5) working days after the 50% Submission for each Early Work Package conduct a 50% Submission Design Review Conference with Owner to ensure continued Owner concurrence with design work. 50% Design Submission must be accepted by Owner prior to D-B developing the next submission. D-B shall provide all applicable Designers of Record, as well as appropriate subcontractors, along with documents, presentations, and any other material necessary to conduct a page turning review of the Contract Documents.
- E. 100% Submission Conference for each Early Work Package: Within five (5) working days after the 100% Submission for each Early Work Package conduct a 100% Submission Design Review Conference with Owner to ensure continued Owner concurrence with design work. D-B shall provide all applicable Designers of Record, as well as appropriate subcontractors, along with documents, presentations, and any other material necessary to conduct a page turning review of the Contract Documents.

PART 2 - PRODUCTS

2.1 DESIGN DOCUMENT/DATA STANDARDS

- A. Delivery of electronic documents for each Design Submission shall be per Section 017839 – Project Record Documents. Electronic copies of each submission shall be provided and distributed via PMIS.

2.2 ELECTRONIC DATA

- A. Contract Documents, including drawings, specifications, and three-dimensional modeling (such as Building Information Models) and other Work Product (collectively “Electronic Data”) is preferred and may be transmitted among Owner, D-B and others in electronic media.

2.3 GENERAL DOCUMENTATION REQUIREMENTS

- A. Design Build (D-B) Contractor originated design documents shall represent a project design that complies with the Contract Documents.
- B. Design Submissions will be reviewed for compliance with Contract requirements but not for design validity.
- C. Any portions of the overall design submitted must be sufficient in detail to permit professional evaluation as to the extent that the elements to be constructed meet the Contract requirements.
- D. Drawing and Specification Submittals
 - 1. Drawings and Specifications shall be in searchable, bookmarked PDF format. Final submissions shall include native program drawing and word documents.
 - 2. Specifications shall be bound sets of 8 ½” x 11”, CSI MasterFormat documents covering all items of construction for the package represented. Products sections of specifications shall describe salient characteristics of all material specified, simple product name and model numbers are not acceptable. Basis of Design products must be provided with equivalent manufacturer alternates. Electronic Specifications shall be combined into one document, bookmarked and searchable.
- E. Electronic copies of each submission shall be submitted by D-B via PMIS and distributed by Owner after its initial review for compliance with Design Quality Control Plan and contract requirements related to submission.
- F. Design Submission Document Printed Quantities
 - 1. The following quantities of paper documents shall be submitted for each design submission and at Final Design Submission.
 - a. Full sized complete set - three (3)
 - b. Half sized complete set – nine (9)
 - c. Specifications/Project Manual – two (2)
- G. Design Submission Quality Control
 - 1. With each submission, the D-B Contractor shall submit in writing to the Owner that the Submission is complete and that a QC review was performed in compliance with the accepted Design Quality Control Plan and contract requirements related to submission.
 - 2. Each design submission shall be complete for acceptance and reviewed by Owner’s QA Team prior to Owner distribution to reviewers, to include all documents required as part of the submission and confirm that the D-B has conducted Quality Control reviews.

2.4 DESIGN SUBMITTAL REVIEW TIME

- A. The D-B shall, in the Design Submission Schedule, indicate Owner submittal review periods as identified in the RFP. For scheduling purposes, the D-B shall comply with Section 013216 – Project Schedules and add additional time to the identified minimum review time periods to allow for the following scheduling conditions:
 - 1. Period of review for a resubmittal is the same as the initial submittal. Review time for resubmittals caused by non-conformance do not result in a change in contract duration or cost.
 - 2. Submittal reviews may include Other Government Contractors (OGCs), which the Courts will facilitate. Every effort will be made by the design builder to allow for schedule float to be associated with these reviews.
 - 3. Any other OGCs, such as DDOT, utilities, CFA, SHPO, NCPC etc, that are necessary for the execution of the work will be the sole responsibility of the D-B to coordinate reviews for permits or acceptances. Any delay due to these acceptances will not be considered for contract extension.

PART 3 - EXECUTION

3.1 DESIGN DEVELOPMENT PROCESS

- A. The D-B's design development process shall provide a problem-solving approach that is inclusive of all parties. The review of specific design submissions will involve the D-B, major subcontractors, Owner's Team and the end user, as available; the goal is to provide an environment in which all participants partake freely in the design process through program validation, design development sessions, and design document reviews. The D-B and major subcontractors shall provide input on constructability throughout the design process to mitigate delays during construction and proactively resolve constructability issues.

3.2 DESIGN DOCUMENT REVIEW AND ACCEPTANCE

- A. The design review process is the critical step to ensuring compliance with contract requirements, proper system interface, and constructability and operability of the facility. Design Reviews shall be conducted for all design submissions, as indicated in the D-B's Design Submission Schedule. D-B shall insure that all design packages have been through their QC program and signed-off by the DOR prior to submission to Owner for review. Design submissions calculations, and specifications will be distributed for review and comment by the Owner. Final acceptance of design packages will be by the Owner.
- B. Upon receipt of each design submittal, the Owner shall do a cursory check of quality and quantity. If a design submittal is lacking, it will be returned for correction and resubmission. The review time will begin when the corrected submittal is received. If an otherwise satisfactory design submittal is over one (1) day late in accordance with the latest Design Submission Schedule, the Owner review period may be extended up to seven (7) days.
- C. After satisfactory submittal receipt, the Owner will be allowed fourteen (14) days to review and comment on each submission, prior to and including the concept (35%), preliminary (65%) design submittal; and twenty-one (21) days to review and comment on the final (95%) design submittal.

In addition, should contract Option 1 be exercised, DID1 and DID2, will also require the same review periods. Should Option 2 be exercised and Concept (35%), preliminary (65%) and final (95%) will also require the same review periods. For each design review submission, Owner comments will be documented via PMIS.

- D. The Owner review is to verify conformance with the contract requirements, not design validity. The D-B shall be fully responsible for the design. Any portions of the overall design submitted must be sufficient in detail to permit professional evaluation as to the extent that the elements to be constructed meet the contract requirements. The Owner's review and acceptance of design submissions, meeting minutes, and the Construction Documents is for the purpose of mutually establishing a conformed set of Contract Documents compatible with the requirements of the Work.
- E. During the design review process, comments will be made on the design submittals that will change the drawings and specifications. The Owner will pay no additional compensation to the D-B for the incorporation of comments.
- F. The D-B shall establish procedures to ensure that comments on design deliverables are addressed and resolved prior to the next submission. In the event comments are not resolved prior to the next submission D-B shall provide basis for deferment. All comments must be resolved prior to the Final Design (95%) submission, or it may be rejected as unacceptable.
- G. The D-B shall respond to all comments in PMIS at least fourteen (14) days in advance of the next scheduled submittal. The response shall identify action taken with citation of location within the relevant document. Generalized statements of intention such as "will comply" or "will revise the specification" are not acceptable.
- H. If the D-B disagrees technically with any comment and does not intend to comply with the comment, the D-B must clearly outline, with succinct justification, the reason(s) why, within five (5) days after close of the review period, in order for the comment to be resolved. If the D-B believes the action required by any comment exceeds the requirements of this Contract, the D-B shall "flag" the comment within PMIS as being outside design scope. Further, the D-B shall notify Owner in writing immediately.
- I. D-B shall hold review meetings for each design submittal. The D-B shall bring the personnel who developed the design submittal to the review meeting. Design review meetings shall be held the week after the Owner completes the review of each submittal.
- J. D-B shall evaluate the impact of design decisions on project cost and project schedule and conduct "value engineering" during the design process. Any changes that effect the contract performance requirements and NTE Project Cost must be approved by the Owner.
- K. Neither the Owner's review nor acceptance of any design submissions, meeting minutes, and Construction Documents shall be deemed to transfer any design liability from the D-B to the Owner. Acceptance by the Owner of any design documents or other submittals prepared by D-B shall not relieve D-B of its sole responsibility to ensure that the D-B's design satisfies all contract requirements.
- L. Proceeding beyond a design submission when the Owner has not provided acceptance is at the sole risk of the Design-Build Contractor.

3.3 DESIGN QUALITY CONTROL PLAN

- A. Within fourteen (14) days after NTP is issued, D-B shall provide and maintain a Design Quality Control Plan as a comprehensive quality control program that will ensure that all services required by this design-build contract are performed and provided in a manner that meets professional architectural and engineering quality and practice standards for similar projects located in surrounding area of the Project. All design deliverables must be reviewed by qualified, competent, and independent reviewers and shall be detailed in the Design Quality Control Plan. D-B shall correct errors and deficiencies identified in the design documents during the quality control review prior to submitting them to Owner for review.
- B. The Design Quality Control Manager has the responsibility to implement the Design Quality Control Plan and to ensure that all documents on the project have been coordinated. This individual must be a person who has verifiable engineering or architectural design experience and is a registered professional engineer or architect in the jurisdiction where the Work is being performed.
- C. Acceptance of the Design Quality Control Plan by Owner is required prior to the start of design. Acceptance is conditional and will be predicated on satisfactory implementation throughout the design phase. The Owner reserves the right to require the D-B to make changes in D-B's Design Quality Control Plan and operations including removal of personnel, as necessary, to obtain the quality specified.
- D. Include a discipline-specific checklist to be used during the design and quality control of each submission. Submit these completed checklists at each design submission as part of the project documentation.

3.4 INITIAL DESIGN SUBMITTAL REGISTER

- A. D-B shall provide an Initial Submittal Register identifying anticipated design-data submittals, denoting submission type (and applicable codes), approving authorities, etc. The Initial Submittal Register shall be submitted within fourteen (14) days of NTP and shall be updated by the D-B and submitted at all contract meetings.
- B. At a minimum, D-B shall provide design submittals for each design stage completion (for each discipline) shown in the matrix below. Submittals for individual project features shown in the matrix may be combined in submittal packages as necessary and specified herein to allow for early work packages to begin.

	Base Design Submission			Contract Option 1 Submission		Contract Option 2 Submission		
Discipline	Concept Design (35%)	Preliminary Design (65%)	Final Design (95%) & (100%/ IFC)	DID 1	DID 2	Concept Design (35%)	Preliminary Design (65%)	Final Design (95%) & (100%/ IFC)

Cover Sheet	X	X	X	X	X	X	X	X
Demolition	X	X	X	X	X	X	X	X
Construction (Partition)	X	X	X	X	X	X	X	X
Furniture (Generic)	X	X	X	X	X	X	X	X
Finish	X	X	X	X	X	X	X	X
Electrical	X	X	X	X	X	X	X	X
Reflected Ceiling	X	X	X		X	X	X	X
Int. Elevations	X	X	X		X	X	X	X
Int. Sections	X	X	X		X	X	X	X
Partition (Wall)	X	X	X		X	X	X	X
D/F/H Sched	X	X	X		X	X	X	X
Civil/Site/Utilities	X	X	X				X	X
Foundations	X	X	X				X	X
Structural	X	X	X				X	X
Architectural	X	X	X				X	X
Mechanical	X	X	X				X	X

3.5 DESIGN INTENT DOCUMENT DELIVERABLES

A. Design Intent Document (DID) Requirements

1. DID Overview: D-B shall develop the DIDs to illustrate the design concept prior to the development of Construction Documents (CDs). The DID development process shall be based on a “problem solving” approach with the goal of verifying and incorporating all end user requirements into a drawing for each end user to sign-off on at the final DID meeting. The final DID will serve as the end user’s understanding of the space they will occupy upon delivery.

B. DID Format: DID packages shall only include drawing sheets required for the end user to sign off on design.

1. D-B shall produce separate DID packages for five (5) end user groups utilizing the Owner’s Project Requirements provided for each group.

C. DID Level 1 (DID 1) Submission: The D-B shall submit one (1) DID 1 package per End User. Each package shall include the following:

1. Drawing sheets as indicated below.
2. Initial Basis of Design (BOD): The basis of design is the documentation that supports the primary thought processes and assumptions behind design selections and decisions that are made to meet the design intent. The D-B shall break out Initial BOD by discipline to

- describe the systems, components, conditions, and methods chosen to meet the design intent.
3. Program Verification Report.
 4. Initial Submittal Register.
 5. Design Submission Schedule.
- D. DID Level 2 (DID2) Submission: Following the Internal DID Review, D-B team shall submit the DID 2 to the End users and Owner for a ten (10) day review period. The D-B shall submit one (1) DID 2 package per End User. Each package shall include the following and shall be developed for sign-off at the Sign-Off Meeting. The D-B shall use the DID 2 signed by each End User to develop the Concept Design (35%) submission:
0. All DID1 End User and Owner comments and red-lines
 1. Drawing sheets
 2. Existing Furniture Assessment Report (revised), may be incorporated into drawings.
 3. Existing Equipment Assessment Report (revised), may be incorporated into drawings.
 4. Initial Basis of Design (BOD) (revised)
 5. Program Verification Report (revised)
 6. Initial Submittal Register
 7. Design Submission Schedule
 8. Parametric Cost Estimate (to include breakout of early-work packages)
 9. Design Needs List update.
 10. Early-work package list

3.6 DESIGN INTENT DRAWING ONE (DID 1) MEETING

- A. End User Kick-Off Meeting & Minutes
1. After the Initial Design Meeting, the D-B shall conduct one (1) End User Kick-Off Meeting per End User. The Owner shall facilitate the meeting and the D-B shall lead the meeting with a suggested itinerary provided by the Owner. D-B participants shall include the D-B Project Manager (PM) and key A/E team members (including the DOR), and other key personnel as required to develop the DID 1.
 2. The D-B shall assume a one (1) working day duration for each End User meeting and this shall be reflected in D-B's Design Submission Schedule. The D-B shall come to the meeting prepared having incorporated all information provided from the Owner's Project Requirements, gathered and verified prior to the meeting, and discussed at the Initial Design meeting into a test-fit sketch or draft DID. The D-B shall bring at least one (1) full sized test-fit sketch or draft DID for mark up during the meeting. During this meeting, the End Users will be educated on the process of design and their input related to the submissions included in the Design Submission Schedule and the Initial Submittal Register. During the meeting, the D-B will verify or gather additional End User requirements as necessary to develop the DID 1 submission. The D-B shall incorporate all information received and red-line markups made at the End User Kick-Off meeting into the DID 1 submission.
 3. Both the D-B and Owner will capture meeting minutes. At the conclusion of this meeting, the D-B shall compile official meeting minutes and scanned redline mark-ups for approval by Owner prior to distribution to End Users for record.
- B. Internal DID 1 Review Meeting
1. Fourteen (14) days following the End User Kick-Off meeting, the D-B shall meet informally with Owner for an internal review of the DID 1. D-B shall come prepared with

a preliminary DID 1 incorporating comments and information gathered at the End User Kick-Off Meeting and the Program Verification Report. At this meeting, Owner's Representative(s) will provide comments for D-B's incorporation into the DID 2 for submission. Following this meeting, the D-B shall incorporate Owner's Representative(s) comments and generate the DID 2 submission.

3.7 DESIGN INTENT DRAWING TWO (DID 2) MEETING

- A. Sign-Off Meeting & Minutes: Following a ten (10) day review period of the DID 2 submission, D-B shall conduct one (1) End User Sign-Off Meeting per End User. All in attendance for sign-off shall include the D-B team, End User Rep, Owner, Fire Protection Rep, Facilities Rep, Security Rep, IT/AV/Comm Rep, Furniture Rep(s), Signage Rep. The Owner shall facilitate the meeting and the D-B shall lead the meeting with a suggested itinerary provided by the Owner. D-B participants shall include the D-B Project Manager (PM) and key A/E team members (including the DOR), and other key personnel as required to ensure all representatives sign-off on the DID 2 at the conclusion of the meeting.
 - 1. The D-B shall assume a one (1) working day duration for each Sign-Off meeting, which should be reflected in D-B's Design Submission Schedule. The D-B shall bring at least one (1) full sized DID 2 for mark up and sign-off at the conclusion of the meeting. During the meeting, the D-B shall ensure all requirements have been captured as necessary to proceed to the Concept Design (35%) submission. The D-B shall incorporate red-line markups made at the Sign-Off meeting into the Concept Design (35%) submission.
 - 2. Both the D-B and Owner will capture meeting minutes. At the conclusion of this meeting, D-B shall compile official meeting minutes and scanned redline mark-ups for approval by Owner prior to distribution to End Users for record.

3.8 CONCEPT DESIGN (35%) SUBMISSION

- A. Per the Design Submission Schedule, D-B shall submit the Concept Design (35%) in accordance with this specification section. Owner's review of the 35% submittal is primarily to ensure that the DOR understands all project requirements, that the design criteria are being correctly interpreted, and that contract documents and design analysis are proceeding according to the Design Submission Schedule. Review of the 35% submittal is also the Owner's opportunity to make corrections to the design development documents and incorporate project criteria changes at a point where changes will incur the least cost and have the least impact to the overall Project Schedule.
- B. As part of the submission, D-B shall prepare a memorandum identifying key construction concerns related to the Project. Such memorandum shall:
 - 1. Assess the constructability issues related to the Project, including site logistics.
 - 2. Identify any items where the design is predicated on a single manufacturer and, if so, identify at least two (2) comparable products.
 - 3. Identify any long-lead delivery items that could adversely affect the schedule contemplated in this RFP. To the extent any such long-lead items are identified, the memorandum shall make recommendations for addressing such items.
- C. The 35% design submittal shall contain, at a minimum, the following:
 - 1. An updated parametric cost estimate (to include breakout of early-work packages).
 - 2. Any changes necessary to comply with the DID 2 review comments.

3. Identification of any deviations from the DID 2 submission with rationale, cost and schedule implications associated with deviation.
4. Developed site plans, floor plans, elevations, building sections, and wall sections
5. BOD narrative and analysis including code analysis by all disciplines (civil, architectural, structural mechanical, plumbing, power and lighting, communications, fire detection/protection, life safety etc.)
6. Single line schematic drawings for mechanical, electrical, communications, etc.
7. Comprehensive Interior Design (CID) plans
8. Color boards
9. Preliminary furniture footprints
10. Environmental permitting and Sustainable development requirements
11. A listing of the proposed specifications for the project
12. Value engineering considerations
13. Check status of any required waivers or exemptions
14. Design Needs List.
15. Electronic version of submission (in native file format)
16. Constructability/Sole Source/Long-Lead Time Memorandum
17. Early work package list

3.9 PRELIMINARY DESIGN (65%) SUBMISSION

- A. Per the Design Submission Schedule, D-B shall submit the Preliminary Design (65%) in accordance with this specification section. At this stage, Owner has made all basic design decisions and design development is in full progress. Owner's review of the 65% submittal is primarily to ensure that the contract documents and design analysis are proceeding in a timely manner and within the NTE Project cost.
- B. The 65% design submittal shall contain, at a minimum, the following:
 1. An updated detailed cost estimate (to include breakout of early-work packages)
 2. Any in-scope changes necessary to comply with the 35% review comments
 3. Owner changes resulting from 35% review
 4. Identification of any out-of-scope deviations from the 35% submission with rationale, cost and schedule implications associated with deviation
 5. Permits list/regulatory agency approval
 6. Complete floor plans with details
 7. Comprehensive Interior Design (CID) plans/FF&E
 8. Structural Interior Design (SID) plans
 9. Complete elevations
 10. Complete building sections
 11. Structural, mechanical, plumbing, communication, and electrical plans per below
 12. Furniture footprints
 13. Color boards and materials
 14. Site and landscaping plans (if required)
 15. Specifications in rough draft
 16. All the analyses and discussions that were part of the 35% submittal
 17. Updated design analysis
 18. Calculations
 19. Check status of any required waivers or exemptions
 20. Design Submission Schedule/Project Schedule
 21. Design Needs List

22. Electronic version of submission (in native file format)
23. Updated Constructability/Sole Source/Long-Lead Time Memorandum
24. Clash Detection Report
25. Early-work package list
26. Equipment layouts with necessary clearances and utility support should also be shown at this stage of design. Construction specifications for renovation projects should include testing for lead based paint (LBP) and asbestos-containing material (ACM).

C. Architectural (65%) Submission

1. All references used in the design shall be listed, including Owner design documents and industry standards.
2. A design narrative shall provide a summary of rooms and functional spaces, their names, numbers, and area in square feet, adjacencies, and circulation. A statement of interior and exterior design concepts and the rationale behind major design decisions shall be provided.
3. A building code and life safety analysis shall be included.
4. Drawings shall include North arrows, graphic scales, dimensions, and appropriate legends.
5. Drawings shall include at a minimum, demolition plans, floor plans, reflected ceiling plans, building elevations, building sections, wall sections and details, interior elevations, door schedule, partition types and details, finish schedule and details, window details, and other detail plans as required.
6. Plans shall indicate space/room names and numbers, dimensions, column lines, and detail references. Toilets and other specialized areas shall be drawn to 1/4" scale, dimensioned, and shall show interior features. Special interior design features such as fascia, soffits, lighting troughs, etc. shall be indicated with interior elevations.
7. Building and wall sections shall indicate locations or conditions to be further detailed.
8. A finish schedule shall be provided indicating materials, finishes, textures, patterns, and colors.
9. All required equipment shall be shown on the drawings, including an equipment list.
10. Any special graphics or informational displays to be provided shall be listed.
11. Schedules shall be provided for doors and windows. These schedules shall indicate sizes, types, and details for all items shown on the floor plans. A wall/partition schedule of types, construction, fire ratings, etc. shall be provided and keyed to the plans.
12. Hardware sets shall be indicated using BHMA designations. Security locking systems shall also be indicated.
13. Fire protection plans and analysis shall be provided. Exit capacities, travel paths and distances, fire extinguisher locations, etc. shall be indicated on the plans.
14. Composite floor plans and elevations shall be provided to show all prewired workstations and typical elevations of each type of workstation.
15. Draft specifications based on the appropriate guide specifications shall be provided for all aspects of the project.

D. Mechanical - Heating Ventilating, and Air Conditioning (HVAC) (65%) Submission

1. All references used in the design shall be listed, including Owner design documents and industry standards.
2. Preliminary design analysis, including psychrometric analysis, shall be provided.
3. Preliminary temperature control drawings and sequence of operation shall be provided.
4. Preliminary equipment sizing, drawings, selections and schedules for major items, including equipment, ductwork, and piping plans and details shall be provided.
5. HVAC system drawings shall be included in the 65% design submittal.
6. Separate drawings for HVAC piping and plumbing piping shall be provided.
7. Draft specifications

- E. Mechanical – Plumbing (65%) Submission
1. All references used in the design shall be listed, including Owner design documents and industry standards.
 2. Justification and brief description of the types of new and existing plumbing fixtures, piping materials and equipment proposed for use shall be provided.
 3. Detailed calculations for systems such as sizing of waste and water piping; water heaters and pumps.
 4. Locations and general arrangement of plumbing fixtures and major equipment shall be indicated.
 5. Plans and isometric riser diagrams of all areas including hot water, cold water, waste and vent piping. Piping layouts and risers should also include natural gas, and radon piping as required.
 6. Equipment and fixture schedules with descriptions, capacities, locations, connection sizes and other information as required.
 7. Draft Specifications
- F. Mechanical – Fire Protection (65%) Submission
1. All references used in the design shall be listed, including Owner design documents and industry standards.
 2. Building shall be classified in accordance with fire zone, building floor areas, and height and number of stories.
 3. A description of required fire protection including extinguishing equipment, detection equipment, alarm equipment and water supply shall be provided. Alarm and detection equipment shall interface to requirements of Electronic Systems.
 4. Hydraulic calculations based on water flow test shall be prepared for each sprinkler system to ensure that flow and pressure requirements can be met with current water supply and tied into existing building system. Sprinkler systems shall be provided with all designs unless otherwise noted.
 5. A plan shall be prepared for each floor of each building that presents a compendium of the total fire protection features being incorporated into the design. The following types of information shall be provided:
 6. The location and rating of any fire-resistive construction such as occupancy separations, area separations, exterior walls, shaft enclosures, corridors, stair enclosures, exit passageways, etc.
 7. The location and coverage of any fire detection systems. The location and coverage of any fire suppression systems (sprinkler risers, standpipes, etc.).
 8. The location of any other major fire protection equipment.
 9. Any hazardous areas and their classification.
 10. A schedule describing the system with the following information: fire hazard and occupancy classifications, building construction type, GPM/ square foot sprinkler density, area of operation and other criteria as required.
 11. Draft Specifications
- G. Electrical – Interior Electrical System (65%) Submission
1. All references used in the design shall be listed, including Owner design documents and industry standards.
 2. A narrative, indicate electrical characteristics (phase, voltage, and number of wires) for the electrical system shall be provided, including a justification for new equipment, use of existing equipment, and integration of new equipment into the existing system. A life cycle analysis shall be provided for 208Y/120 Volt systems 300 kVA and above.

3. A description of the lighting system(s) to be used for all areas shall be provided, including referencing calculations.
4. A tabulation showing the following shall be provided:
5. Room name and number.
6. Lighting intensity for each room. (State the basis for selection such as I.E.S., etc.).
7. The type of fixture (identified by manufacturers catalog cuts).
8. The type of wiring system to be used, such as insulated conductors installed in rigid or intermediate metal conduit, insulated conductors installed in electrical metallic tubing, nonmetallic sheathed cables, etc. In general, THHN or THWN insulation shall be used unless otherwise noted. All circuits shall be minimum 20 amps unless otherwise noted or required.
9. A paragraph describing any special design items such as handicapped and seismic design requirements, power filters, emergency power system, UPS, etc.
10. Any hazardous classified locations by class, division, and group as defined by the National Electrical Code. The types of equipment to be used in these areas. State the reasons for the area(s) being hazardous classified locations shall be indicated.
11. Lightning protection system to be installed/modified, including the type of grounding system.
12. The basic characteristics of panelboards, switchgear, switchboards, motor control centers, transfer switches, UPS, and other major pieces of electrical equipment being provided/modified/replaced. Short circuit and voltage drop calculations showing these values at all equipment with protective devices included shall be provided. Equipment interrupting ratings and short circuit withstand ratings based on these calculations shall be indicated.
13. The electrical metering equipment to be provided/modified/replaced.
14. The power riser or one-line diagram shall be complete except for finalization of conduit and wire sizes.
15. Panelboards, switchboards, switchgear, motor control centers, and all other utilization equipment shall be located on the floor plans. Schedules for applicable equipment shall be provided and shall include all pertinent information to fully describe the equipment. Elevations for free standing equipment shall be provided.
16. Details of the layouts for electrical closets and rooms shall be shown.
17. Receptacles and lighting layouts, including complete wiring, shall be shown for typical rooms. Typical rooms are those which appear more than one time or rooms of different sizes but the same function.
18. Areas where nonlinear loads will be encountered shall be identified.
19. A completed fixture schedule shall be included on the drawings.
20. Draft Specifications

H. Electrical – Electronic Systems (65%) Submission

1. All references used in the design shall be listed, including Owner design documents and industry standards.
2. A narrative shall be provided describing all electronic systems in the project, including systems for fire detection and suppression control, public address, telephone, television, special grounding, cathodic protection, intrusion detection, card access, and central security control and monitoring.
3. The design analysis shall include all calculations required to support design decisions and estimates. The analysis shall include specific criteria furnished, conference minutes and cost analyses of all systems considered.

4. Design of the fire alarm and detection system shall include layout drawings for all devices and a riser diagram showing the control panel, annunciator panel, zones, radio transmitter and interfaces with other systems (HVAC, sprinkler, foam, hood dry chemical, etc.).
5. All components of the Fire Suppression (FS) System shall be specified in the specifications. The system operation and interaction with other systems, such as the fire alarm system, will be clearly described. A riser diagram shall be included in the drawings to show principal components and interconnections with other systems. FS system components shall be indicated on drawing legends. All components shown on floor plans shall be designated as FS system components (as opposed to Fire Alarm components). The location of FS control panels, HVAC control devices, sensors, and 120V power panel connections shall be shown on the floor plans. The numbers and sizes of conductors and conduits for detector circuits shall not be shown since this varies among suppliers. Zoning of areas shall be indicated by numbers (1, 2, 3), and detectors sub-zoned for cross zoning shall be indicated by letter designations (A, B, C). Ceiling mounted detectors shall be differentiated from underfloor detectors by distinct symbols indicating the subzone of each.
6. Location of telephone and other communications outlets shall be shown on the plans. Legends and symbol definitions indicating height above finished floor shall be provided. Telephone conduit system riser diagrams, including conduit sizes, shall be shown. Conduit runs between backboard and outlets shall not be shown on the floor plans. Underground telephone distribution conduit shall be shown on either the electrical or electronic site plan.
7. The grounding system specifications and drawings shall clearly reflect all design requirements. The specifications shall require field tests during Construction to be witnessed by the Owner, for determining the effectiveness of the grounding system. Drawings showing existing construction shall be provided. D-B shall provide verification of the validity of any existing drawings and/or any other data furnished by Owner.
8. The extent of any exterior work, such as telephone lines, television (TV) distribution cables, communication antenna and disks, or duct banks, etc., outside of five (5) feet from the building line shall be described.
9. The name of the licensed corrosion engineer or National Association of Corrosion Engineers (NACE) specialist to be utilized for the design shall be provided. The following shall be provided for cathodic protection systems:
 10. Define areas of structures or components in soil or water to be protected.
 11. Comparison of systems and equipment, including cost estimates for all alternatives, and the type of system recommended.
 12. Calculations for all systems considered, including related information and descriptions.
 13. Cathodic protection design, including comprehensive specifications and drawings meeting the protection criteria. The design plans and specifications shall show the extent of the facilities to be protected, location and type of anodes, location of test points, and details for sectionalizing an underground piping system. The design shall be sufficient for purchasing equipment and building the system without design changes.
14. Exterior work shall be shown on the electrical site plan.
15. Existing and new communications service lines, both overhead and underground, shall be properly identified.
16. Removals and relocations shall be shown if applicable.
17. A descriptive narrative of all electronic systems required for project shall be provided. Any hazardous areas as defined in the National Electric Code shall be identified, and the type of equipment proposed for use in such areas indicated. The location of all electronic system panels, etc., shall be shown on the floor plans. The proposed riser diagrams for all systems shall be provided, and sizes of all conduits, wires, cables, panels, etc. shall be indicated. A complete symbol legend shall be provided for all devices or equipment shown on the plans.

Work requiring removals or demolition and how it is to be performed shall be described using drawings and/or narrative as necessary.

18. Draft Specifications

3.10 PRELIMINARY DESIGN (65%) COST ESTIMATE

- A. Concurrent with the delivery of the 65% design submission, D-B shall submit a detailed Cost Estimate of the 65% design and a statement that the design delivered can be constructed within the NTE Project Cost. The purpose of the Cost Estimate is to (1) ensure that the design progresses according to the NTE Project Cost, (2) aid the Owner in understanding the costs associated with key elements of the Project to better prioritize and manage the use of the funding allocated to this Project.
- B. Prior to the 95% submission, D-B shall perform BIM modeling clash detection to identify any conflicts in advance of preparing the Final Design (95%) submission and provide a report of findings to Owner. A summary of all findings shall be presented to the Owner for review prior to completing the 95% Submission. Should conflicts occur that require coordination outside of the D-B team, then D-B shall coordinate with Owner to schedule coordination meetings required to resolve conflicts. D-B shall lead the clash detection process, including scheduling, leading and documenting all required meetings, and shall facilitate the resolution of all identified conflicts.

3.11 FINAL DESIGN (95%) SUBMISSION

- A. Per the Design Submission Schedule, D-B shall submit the Final Design (95%). D-B shall prepare the submission with the intent to negotiate a Lump Sum or Fixed Price for the Construction of the Project.
- B. Owner's review of the 95% submittal is primarily to ensure that the contract documents and design analysis are proceeding in a timely manner and within the NTE Project cost. The 95% design submittal shall contain, at a minimum, the following:
 1. An updated detailed cost estimate (to include breakout of early-work packages)
 2. Any changes necessary to comply with the 65% review comments
 3. Identification of any out-of-scope deviations from the 65% submission with rationale, cost and schedule implications associated with deviation
 4. Comprehensive Interior Design (CID) plans/FF&E
 5. Structural Interior Design Plans (SID) plans
 6. Complete specifications
 7. Final design analysis
 8. Finish documentation Color boards
 9. Check status of any required waivers or exemptions
 10. Drawings, specifications, and cost estimate in compliance with concerns identified during technical and constructability review.
 11. Calculations
 12. Design Submission Schedule/Project Schedule
 13. Initial Submittal Schedule for Construction
 14. Design Needs List
 15. Permit list/regulatory agency approval
 16. Electronic version of submission (in native file format)
 17. Updated Constructability/Sole Source/Long-Lead Time Memorandum

- 18. Early-work package list

3.12 FINAL DESIGN (95%) COST ESTIMATE

- A. Concurrently with the delivery of the 95% design submission, D-B shall submit an updated detailed Cost Estimate of the 95% design and a statement that the design delivered can be constructed within the Owner's budgeted amount or NTE Project Cost. The purpose of the Cost Estimate is to (1) ensure that the design has been completed according to the NTE Project Cost and (2) to negotiate a Lump Sum or Fixed Price for the Construction Phase of the Project.

3.13 ISSUED FOR CONSTRUCTION (IFC) (100%) SUBMISSION

- A. Per the Design Submission Schedule, D-B shall submit the Corrected Final Design (100%) or Issued for Construction (IFC) in accordance with this section. D-B shall prepare the submission with the intent to submit for permitting either as an accepted early-work package in the Pre-Construction Phase or during Construction of the Project.
- B. The 100% design submittal shall contain, at a minimum, the following:
 - 1. Complete detailed cost estimate (to include breakout of early-work packages)
 - 2. Any changes necessary to comply with the 95% review comments
 - 3. Identification of any out-of-scope deviations from the 95% submission with rationale, cost and schedule implications associated with deviation
 - 4. Permits list
 - 5. Comprehensive Interior Design (CID) plans/FF&E
 - 6. Structural Interior Design Plans (SID) plans
 - 7. Any corrections to the final design analysis
 - 8. Finish Documentation Color boards
 - 9. Complete FF&E list
 - 10. Complete specifications
 - 11. Complete Calculations
 - 12. Design Submission Schedule/Project Schedule
 - 13. Design Needs List per Section
 - 14. Permit list
 - 15. Electronic version of submission (in native file format)
 - 16. Updated Constructability/Sole Source/Long-Lead Time Memorandum
 - 17. Early-work package list
- C. IFC (100%) Documents shall contain the DOR's professional stamp and signature.
- D. D-B shall provide an updated, cumulative submittal register with each design package that identifies the design and construction submittals required by that design package and previous submittals.
- E. Written Owner Acceptance: The Owner will review the Backcheck Submission and the 100% review comments to determine if all comments have been addressed and resolved to the Owner's satisfaction. Thereafter, the Owner will provide written acceptance indicating the design package may be released for construction. The approval shall be limited to the Work within the Post-100% Submission and does not authorize construction of unaccepted Work. Unaccepted Work, provided

by the D-B Contractor shall be done at the D-B Contractor's risk and is subject to modifications or removal for non-compliance with the intent of the Work of this Project.

3.14 CONTRACTOR'S RESOLUTION OF COMMENTS

- A. Provide written responses to all submitted comments by the Owner for resolution. Resubmittal of a previously unacceptable design submittal must be a complete package that includes all the required and corrected components of that design submittal. The D-B shall, without additional compensation, correct or revise any errors or deficiencies in D-B's designs, drawings, and specifications. When D-B is required to resubmit the design package due to nonconformance to the contract shall not result a delay in the contract.

3.15 DESIGN CHANGE AND VARIATIONS

- A. A design change is when the design is revised from what was reviewed by the Owner during any phase of the design process prior to Owner acceptance of the Final Design. A Variation is any portion of the design that differs from the requirements of the solicitation, accepted proposal, or final design after Owner acceptance of the Final Design. Design changes and variations require Owner acceptance and only variations that are advantageous to the Owner will be considered. Refer to Section 013300, Submittal Procedures for further explanation and requirements of design change and variation.
- B. The D-B Contractor must immediately notify the Owner of all potential design changes and variations via a Notice of Design Change (NDC) to the Owner. Design changes or variations that the D-B Contractor asserts will require a contract modification to adjust the cost/price or schedule are not allowed to be incorporated in the design during any phase of the design process without prior documented approval from the Owner. Contractors will not receive compensation for any unauthorized design changes or variations which have been included in the Owner accepted Final Design. Include the following information in the design change and variation RFIs:
 - 1. Indicate the RFP parts, sections, and paragraphs affected by this design change or variation,
 - 2. The scope of work of the design change or variation,
 - 3. The reason for the proposed change,
 - 4. Explanations of how the variation is advantageous to the Owner.
 - 5. Indicate which upcoming design submittal will be affected by the subject design change,
 - 6. Explanation of contract cost/price and schedule impacts or provide an affirmative statement indicating that the design change or variation will not have an impact on the contract cost/price or schedule.
 - 7. Coordination measures proposed to incorporate the design change or variation into the construction.
 - 8. Submit a cost proposal prepared using the for all design changes and variations that have cost or schedule impacts. Submit a proposal that provides cost breakdown of each system or subsystem that is applicable to the design change or variation.

3.16 DESIGN SUPPORT DURING CONSTRUCTION

- A. The D-B with their core DOR team shall provide construction administration services to include on-site verification of construction. Onsite verification shall occur on a weekly basis, at a

minimum. Should the team notice any issues with the execution of the design per the accepted drawings, the D-B shall immediately submit an RFI to the Owner describing the issue and providing viable solutions. The solution shall be verified and coordinated with the DOR and shall include a sketch and a narrative, at a minimum. If a different or new product is required, a product specification shall be included with the RFI.

3.17 OWNER REVIEW OR APPROVAL

- A. Owner review or acceptance of any portion of the proposal or final design does not relieve the D-B Contractor from responsibility for errors or omissions with respect thereto.

END OF SECTION 012000

SECTION 012100 - ALLOWANCES

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, provisions of Request for Proposal (RFP) apply to this Section.

1.2 SUMMARY

- A. Section includes administrative and procedural requirements governing allowances.
- B. Types of allowances include the following:
 - 1. Lump-sum allowances.
 - 2. Unit-cost allowances.
 - 3. Quantity allowances.
 - 4. Contingency allowances.
 - 5. Testing and inspecting allowances.
- C. Related Requirements:
 - 1. Section 012600 - Contract Modification Procedures, for requirements of providing pricing backup for utilization of Allowances.
 - 2. Section 012900 "Payment Procedures" for how Allowances are represented on Schedule of Values and payment applications.

1.3 DEFINITIONS

- A. Allowance is a quantity of work or dollar amount established in lieu of additional requirements, used to defer selection of actual materials and equipment to a later date when direction will be provided to Design-Builder. If necessary, additional requirements will be issued by Change Order.

1.4 SELECTION AND PURCHASE

- A. At the earliest practical date after award of the Contract, advise Owner of the date when final selection, or purchase and delivery, of each product or system described by an allowance must be completed by the Owner to avoid delaying the Work.
- B. At Owner's request, obtain proposals for each allowance for use in making final selections. Include recommendations that are relevant to performing the Work.

- C. Purchase products and systems defined within the contract documents from the designated supplier.

1.5 ACTION SUBMITTALS

- A. Submit proposals for purchase of products or systems included in allowances as outlines in Specification 012600 – Contract Modification Procedures.

1.6 INFORMATIONAL SUBMITTALS

- A. Submit invoices or delivery slips to show actual quantities of materials delivered to the site for use in fulfillment of each allowance.
- B. Submit time sheets and other documentation to show labor time and cost for installation of allowance items that include installation as part of the allowance.
- C. Coordinate and process submittals for allowance items in same manner as for other portions of the Work.

1.7 LUMP-SUM ALLOWANCES

- A. Allowance shall include cost to Design-Builder of specific products and materials ordered by the Owner under an allowance and shall include taxes, freight, and delivery to Project site.
- B. Unless otherwise indicated, Design-Builder's costs for receiving and handling at Project site, labor, installation, overhead and profit, and similar costs related to products and materials ordered by the Owner under allowance shall be included as part of the Contract Sum and not part of the allowance.
- C. Unused Materials: Return unused materials purchased under an allowance to manufacturer or supplier for credit to the Owner, after installation has been completed and accepted.
 - 1. If requested by the Owner, retain and prepare unused material for storage by the Owner. Deliver unused material to the Owner's storage space as directed.

1.8 UNIT-COST ALLOWANCES

- A. Allowance shall include cost to Design-Builder of specific products and materials ordered by Owner under allowance and shall include taxes, freight, and delivery to Project site.
- B. Unless otherwise indicated, Design-Builder's costs for receiving and handling at Project site, labor, installation, overhead and profit, and similar costs related to products and materials ordered by Owner under unit-cost allowance shall be included as part of the Contract Sum and not part of the allowance.
- C. Unused Materials: Return unused materials purchased under this allowance type to manufacturer or supplier for credit to Owner, after installation has been completed and accepted.

1. If requested by Owner, retain and prepare unused material for storage by Owner. Deliver unused material to Owner's storage space as directed.

1.9 QUANTITY ALLOWANCES

- A. Allowance shall include cost to Design-Builder of specific products and materials ordered by Owner under allowance and shall include taxes, freight, and delivery to Project site.
- B. Unless otherwise indicated, Design-Builder's costs for receiving and handling at Project site, labor, installation, overhead and profit, and similar costs related to products and materials ordered by Owner under allowance shall be included as part of the Contract Sum and not part of the allowance.
- C. Unused Material: Return unused materials purchased under an allowance to manufacture or supplier for credit to Owner, after installation has been completed and accepted.
 1. If requested by Owner, retain and prepare unused material for storage by Owner. Deliver unused material to Owner's storage space as directed.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine products covered by an allowance promptly on delivery for damage or defects. Return damaged or defective products to manufacturer for replacement.

3.2 PREPARATION

- A. Coordinate materials and their installation for each allowance with related materials and installations to ensure that each allowance item is completely integrated and interfaced with related work.

END OF SECTION 012100

SECTION 012500 - SUBSTITUTION PROCEDURES

PART 1 - GENERAL

1.0 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections and Request for Proposal (RFP), apply to this Section.

1.1 SUMMARY

- A. Section includes administrative and procedural requirements for substitutions.
- B. Related Requirements:
 - 1. Section 012100 - Allowances for products selected under an allowance.
 - 2. Section 012600 - Contract Modification Procedures for requirements of contract modifications as it relates to substitution requests.
 - 3. Section 01300 - Submittal Procedures for requirements for submittals.
 - 4. Section 016000 - Product Requirements for requirements for submitting comparable product submittals for products by listed manufacturers.

1.2 DEFINITIONS

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

1.3 ACTION SUBMITTALS

- A. Substitution Requests: Submit each substitution request for consideration in PMIS under specification section 012500. 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: Substitution request shall be submitted through owners PMIS system following requirements of section 013300- Submittal Procedures.

2. Documentation: Show compliance with requirements for substitutions and the following, as applicable:
 - a. Statement indicating why specified product or fabrication, or installation method cannot be provided, if applicable.
 - b. Coordination of information, including a list of changes or revisions needed to other parts of the Work and to construction performed by Owner and separate contractors that will be necessary to accommodate proposed substitution.
 - c. Detailed comparison of significant qualities of proposed substitutions with those of the Work specified. Include annotated copy of applicable Specification Section. Significant qualities may include attributes, such as performance, weight, size, durability, visual effect, sustainable design characteristics, warranties, and specific features and requirements indicated. Indicate deviations, if any, from the Work specified.
 - d. Product Data, including drawings and descriptions of products and fabrication and installation procedures.
 - e. Samples, where applicable or requested.
 - f. Certificates and qualification data, where applicable or requested.
 - g. List of similar installations for completed projects, with project names and addresses as well as names and addresses of architects and owners.
 - h. Material test reports from a qualified testing agency, indicating and interpreting test results for compliance with requirements indicated.
 - i. Research reports evidencing compliance with building code in effect for Project.
 - j. Detailed comparison of Design-Builder's construction schedule using proposed substitutions with products specified for the Work, including effect on the overall Contract Time. If specified product or method of construction cannot be provided within the Contract Time, include letter from manufacturer, on manufacturer's letterhead, stating date of receipt of purchase order, lack of availability, or delays in delivery.
 - k. Cost information, including a proposal of change, if any, in the Contract Sum.
 - l. Design-Builder's certification that proposed substitution complies with requirements in the Contract Documents, except as indicated in substitution request, is compatible with related materials and is appropriate for applications indicated.
 - m. Design-Builder's waiver of rights to additional payment or time that may subsequently become necessary because of failure of proposed substitution to produce indicated results.
 - n. Statement from Design-Builder's Architect of acceptability of substitution and conformance with the requirements of the construction documents.
3. Owner's Action: If necessary, Owner will request additional information or documentation for evaluation within seven (7) calendar days of receipt of a request for substitution. Owner will notify Design-Builder of acceptance or rejection of proposed substitution within fourteen (14) calendar days of receipt of request, or seven (7) calendar days of receipt of additional information or documentation, whichever is later.
 - a. Forms of Acceptance: Approved / Approved as noted submittal and/or Letter directive for items that are a change in contract value or time as outlined in section 012600.

1.4 QUALITY ASSURANCE

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

1.5 PROCEDURES

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

1.6 SUBSTITUTIONS

Substitutions for Cause: Submit requests for substitution immediately on discovery of need for change, but not later than fourteen (14) calendar days prior to time required for preparation and review of related submittals. Substitutions for cause shall not impact the project schedule unless there is a change in procurement duration, such changes requiring a request for additional contract time shall follow specification 012600. The Owner has fourteen (14) calendar days to review and comment on the Contractor substitution requests.

- 0. Conditions: Owner will consider Design-Builder's request for substitution when the following conditions are satisfied. If the following conditions are not satisfied Owner 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 Design-Builder's construction schedule.
 - d. Requested substitution has received necessary review and approvals of the Design-Builder's Architect.
 - e. Requested substitution has received necessary approvals of authorities having jurisdiction and will comply with all codes
 - f. Requested substitution is compatible with other portions of the Work.
 - g. Requested substitution has been coordinated with other portions of the Work.
 - h. Requested substitution provides specified warranty.
 - i. 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.

1.7 DESIGN-BUILDER REPRESENTATION:

- A. A request for substitution constitutes a representation by the Design-Builder that the Design-Builder has:
 - 1. Investigated the proposed product or material and has determined that it is fully equivalent, or superior, in all respects, to the specified product or material.

2. Warrants that the proposed substitution is fully equivalent to the specified material with regard to the project's ability to achieve the design intent.
3. Will provide the same warranties or bonds for the substitution in the work and will make such other changes in the work as may be required, by incorporation of the substitution, to make the work complete in all respects.
4. Will coordinate the installation of an accepted substitution in the work and make such other changes in the work as may be required to make the work complete in all respects.
5. Will waive all claims for additional costs, payments, and time, under its responsibility, which may subsequently become apparent.

PART 2 - PRODUCTS (NOT USED)

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 and Request for Proposal (RFP), apply to this Section.

1.2 SUMMARY

- A. Section includes administrative and procedural requirements for handling and processing Contract modifications.
- B. Related Requirements:
 - 1. Section 012500 - Substitution Procedures for administrative procedures for handling requests for substitutions made after the Contract award.
 - 2. Section 012100 - Allowances
 - 3. Section 013216 - Construction Project Schedules for administrative procedures for handling project scheduling as it relates to Change Modifications after Contract Award.

1.3 CHANGES IN THE WORK

- A. The Owner, without invalidating the Contract, may require a change for any reason whatsoever and shall provide details of request. All such work shall be executed under the terms of the original Contract.
- B. One or more changes to the work within the general scope of this Contract may be ordered by the Owner in the form of a Letter Directive, that shall be signed by the Construction Administrator for the project.
- C. Design-Builder may request changes in the Work but shall not act on those changes until approved in writing by the Courts. Any change made without the Courts' written authorization shall be the sole responsibility of the Design-Builder.
- D. The Design-Builder shall continue its performance hereunder regardless of the existence of any claims submitted.
- E. The Contract language contained within this Specification Section shall supplement and take precedence over all other change order pricing contract provisions provided by the Owner. It is understood that these contract provisions shall govern the pricing and administration of all change order proposals to be submitted by the Design-Builder, Prime Contractors, Trade Contractors, Subcontractors (Subcontractor), and all other lower tier Contractors (Sub-Subcontractors) working on the project. In the event of a conflict between the language in this Section and other contract documents used for the project, this section shall govern.

- F. Design-Builder agrees this specification section will be acknowledged by all agreements it enters into with any entity or individual in relation to this Project. It is understood that these change order pricing provisions apply to all types of contracts and/or subcontracts.

1.4 PROPOSALS AND REQUESTS

- A. Work Change Proposal Requests issued by the Owner are not instructions to either stop work in progress or to execute the proposed change.
- B. Design-Builder's proposals for changes in the contract amount or time shall be submitted within fourteen (14) calendar days, when not otherwise specified, after receipt of Work Change Proposal Request from the Owner.
- C. In the event of a change resulting from latent or changed condition requiring modifications to the Contract, Design-Builder shall initiate a claim by submitting a request for change within fifteen (15) calendar days of discovery of event, or first appearance of the circumstances that constitute the change. Said change order request shall set forth in detail all known facts and circumstances that support the claim, and actual damage or injuries suffered.
- D. Design-Builder's failure to submit a claim as outlined in these provisions shall constitute a complete waiver by the Design-Builder of any claim for additional compensation or extension of time. This written notice requirement may not be waived by verbal representations or the acts of representatives of the Owner.

1.5 PRICING CHANGE ORDERS

- A. The Design-Builder shall proceed with any extra work or changes which alter the Contract by adding to, or deducting from the Contract Sum or Contract Time in strict accordance with the Contract and the following terms:
 - 1. Change Order shall mean a written order to the Design-Builder executed by the Owner, directing a change in the Work and may include a change in the Contract Price or the time for Design-Builder's performance, or any combination thereof.
 - 2. Any change in Contract Price or Contract time resulting from a Change Order shall be determined as follows: By mutual agreement between Owner and the Design-Builder evidenced by (a) the change in the Contract Price or time being set forth in a Contract Modification in accordance with this Section, and (b) the execution of a Contract Modification.
 - 3. Whenever change order proposals to adjust the contract price become necessary, the Owner will have the right to select the method of pricing to be used by the Design-Builder in accordance with the provisions of this section. The options will be (1) lump sum change order proposal, (2) unit price change order proposal, or (3) time and material changes
 - a. **Lump Sum Change Order Proposals** – Design-Builder shall submit properly itemized Lump Sum Change Order Proposal covering the additional work and/ or the work to be deleted. This proposal shall be itemized for various components of the work and segregated by labor, material, and equipment in a detailed format satisfactory to Owner. Owner requires itemized change orders on all change order

proposals from the Design-Builder, subcontractors, and sub-subcontractors regardless of tier.

- b. **Labor:** Estimated labor costs to be included for self-performed work shall be based on the actual cost per hour paid by the Design-Builder or any contractor for those workers or crews of workers who the Design-Builder or any contractor reasonably anticipates will perform the change order work. Labor hours shall be limited to workers directly involved in the work. No supervision above the level of a working foreman shall be included. Supervision above working foreman (i.e., general foreman, superintendent, project manager, etc.) is considered to be included in the agreed upon markup percentages as outlined in section. Costs include payments, assessments, or benefits required by lawful labor union collective bargaining agreements, compensation insurance payments, contributions made to the State pursuant to the Unemployment Insurance Code, and for taxes paid to the federal government required by the Social Security Act.
 - c. **Material:** Estimated material change order costs shall reflect the Design-Builder, or any contractors anticipated net actual cost for the purchase, or the material needed for the change order work. Estimated material costs shall reflect cost reduction available to the Design-Builder or any contractor due to trade discounts, free material credits, and / or volume rebates. Price quotations from material suppliers must be itemized by each specific item to be purchased. "Lot pricing" quotations will not be considered sufficient substantiating detail.
 - d. **Equipment:** Allowable change order estimated costs may include appropriate rental of major equipment specifically needed to perform change order work (defined as tools and equipment with an individual purchase cost of more than \$1000). For Design-Builder or any contractor owned equipment, the "bare" equipment rental rate allowed for pricing change order proposal shall be 75% of the monthly rate listed in the most current publication of the AED Green Book. Fuel utilized for equipment shall be considered as a separate direct cost associated with the change order work.
- 4. Unit Price Change Order Proposals – As an alternative to Lump Sum Change Order Proposals, the Owner may choose the option to use Contract Unit Prices as were presented by the Design-Builder as part of their contract price for construction. The Design-Builder will submit a written unit price proposal itemizing the quantities of each item of work for which there is an applicable Contract Unit Price. Unit prices will be considered to cover all direct and indirect costs of furnishing an installing the item including the subcontractor's markup.
 - 5. Time and Material with Not to Exceed – As an alternative to either Lump Sum Change Order Proposals or Unit Price Change Order Proposals, the Owner may elect to have any extra work performed on Time and Material basis. In this instance, the Design-Builder will track direct labor, material, and equipment costs relative to the work on a daily basis verified by the delegate of the Owner. Upon completion of the work, the change shall be compiled as outlined in previous sections including the tickets as verification of labor, material, and equipment utilized and shall be marked utilizing the following mark-up percentages.
 - 6. Maximum Markup Percentage on Self-Performed Work: With respect to pricing change orders, the maximum markup percentage to be paid to any contractor (regardless of tier) on self-performed work shall be a single percentage not to exceed the following sliding scale of percentages, of the net direct cost of (1) direct labor costs applicable to the change

order or extra work, (2) the net cost of material and installed equipment incorporated into the change or extra work, and (3) net rental cost of major equipment and related fuel costs necessary to complete the change in the work.

- a. 15% on the first \$100,000 of the change order direct cost of self-performed work,
 - b. 10% on the portion of the change order direct cost of self-performed work greater than \$100,000.
7. Maximum Markup Percentages Allowable on work Performed by Lower Tier Contractors: With respect to pricing the change order proposal involving work performed by lower tier contractors, the allowable markup percentage shall be:
 - a. 10% on the first \$100,000 of the change order work performed by all subcontractors combined for any particular change order proposal.
 - b. 5% on any amount greater than \$100,000 of approved change order work performed by all subcontractors combined for any particular change order proposal.
8. NO ADJUSTMENTS TO FEE: Design-Builder shall not be entitled to any additional fees or general conditions unless
 - a. the Owner makes additions to the scope provided for in this Agreement that cause the budget/cost, either individually or in the aggregate, to increase by more than ten percent (10%) or
 - b. The Owner decides to exercise options which require the Design-Builder's services for the Project to extend beyond the Substantial Completion date.

In the event that the above allows for additional general conditions or fee, the total markup percentage shall follow the maximum markup allowed on work performed by lower tier contractors.
9. As a further clarification, the agreed upon markup percentage is intended to cover the profit/fee and all indirect costs associated with the change order work. Items intended to be covered by the Markup Percentage include, but are not limited to: home office expense, branch office and field office overhead expense of any kind, project management, superintendents, general foreman, estimating, engineering, coordination, expediting, purchasing, detailing, legal, accounting, data processing, or any administrative expenses, shop drawings, permits, comprehensive general liability insurance, auto insurance, and umbrella insurance, pick-up truck costs. The cost of the use of small tools and consumables also considered covered by the markup percentages.
10. The credit to be allowed by the Design-Builder to the Owner for a deletion or change which results in a net decrease in the Contract Sum shall be the total actual costs (as set forth above in section 1.5) saved. The Design-Builder shall provide a six percent (6%) markup on all deductive change orders to account for Design-Builder's overhead, bonds, and insurance on deducted work.
11. The application of the markup percentages referenced in the preceding paragraphs will apply to both additive and deductive change orders. In those instances where a change involves both additive and deductive work, the additions and deductions will be netted, and the markup percentage adjustments will be applied to the net additive or deductive amount as outlined above.

12. Sales and use tax (if applicable) shall not be subject to any Markup Percentage. Any sales or use tax properly payable by the Design-Builder or any contractor shall be added after computing the change order amount before tax.
13. In no event will any amounts for “contingency” be allowed to be added as a separate line item in change order estimates.

B. ARCHITECT/ENGINEER CHANGES: For any work performed by the Architect/ Engineer on a change order, the Architect / Engineer shall receive payment for estimated labor costs of principals and employees to provide services as they relate to the change order.

1. The Architect/Engineer hourly rates shall be based upon the Labor Rates worksheet provided as part of the solicitation response.
2. The Architect/Engineer shall be paid only the actual and reasonable costs for reimbursables incurred on the change order work as approved in writing by the Courts prior to the Architect/Engineer incurring those costs. No markups are allowed on these costs.

1.6 CLAIMS FOR DELAY/REQUESTS FOR TIME

- A. For any changes in schedule for the change order, Design-Builder shall follow steps as outlined for Time Impact Analysis (TIA) as outlined in specification section 013216 – Project Schedules.

1.7 LETTER DIRECTIVES WITH NTP

- A. The Owner may issue a Letter Directive with an NTP instructing the Design-Builder to provide pricing associated with a change in the Work, for subsequent inclusion in a Change Order. Letter Directives with NTP shall be issued as an alternative to an executed Change Modification
- B. The Design-Builder is obligated to proceed with the Work for a Letter Directive with NTP, even though there has not been an agreement reached with the Owner as to an adjustment to the Contract Price or Time, and even if there is dispute as to same. Letter Directives with NTP are issued to the Design-Builder when the changes need to be expedited or the Design Builder fails to agree on the terms offered by the Owner.
- C. Letter Directives with NTP are clear direction from the Owner to perform the change work.

1.8 CONSTRUCTION CHANGE DIRECTIVE

- A. On Owner’s approval of a Change Order Proposal, a Change Modification will be issued for signatures of Owner and Design-Builder on form provided by Owner.
- B. The execution of a Contract Modification by the Design-Builder shall constitute conclusive evidence of the Design-Builder’s agreement to the ordered changes in the Work and the change in the Contract Price and time for performance by the Design-Builder. By executing the change order, the Design-Builder waives and forever releases any claim against the Owner for additional time or compensation for issues or matters relating to or arising out of or resulting from the Work included within or affected by the executed Change Modification.

- C. The Design-Builder shall notify and obtain the consent and approval of the Design-Builder's surety with reference to all Change Modifications and provide such consent in the form of fully executed Performance Bond Rider and Payment Bond Rider as is applicable to the contract.

1.9 MATERIAL ESCALATION

- A. Materials prices for original contract Work will be considered fixed for the duration of the contract. No material price escalations will be considered unless the original contract duration has been exceeded.

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 and Request for Proposal (RFP), apply to this Section.

1.2 SUMMARY

- A. Section includes administrative and procedural requirements necessary to prepare and process Applications for Payment.
- B. Related Requirements:
 - 1. Section 012100 "Allowances" for procedural requirements governing the handling and processing of allowances.
 - 2. Section 012600 "Contract Modification Procedures" for administrative procedures for handling changes to the Contract.
 - 3. Section 013216 "Construction Project Schedule" for requirements of the cost loaded construction schedule
 - 4. construction schedule
 - 5. Section 013200 "Construction Progress Documentation" for administrative requirements governing the preparation and submittal of the Design-Builder's construction schedule.
 - 6. Section 013300 "Submittal Procedures" for administrative requirements governing the preparation and submittal of the submittal schedule.

1.3 DEFINITIONS

- A. Schedule of Values: A statement furnished by Design-Builder allocating portions of the Contract Sum to various portions of the Work and used in conjunction with cost loaded schedule as the basis for reviewing Design-Builder's Applications for Payment.

1.4 SCHEDULE OF VALUES

- A. Coordination: Coordinate preparation of the schedule of values based upon Design-Builder's cost loaded construction schedule as approved by Owner.
 - 1. Coordinate line items in the schedule of values with items required to be indicated as separate activities in Design-Builder's construction schedule.
 - a. Application for Payment forms
 - b. Submittal schedule

- c. Items required to be indicated as separate activities in Design-Builder's construction schedule.
 2. Submit the schedule of values to Owner, and Owner's CM at earliest possible date, but no later than 14 calendar days before the date scheduled for submittal of initial Applications for Payment.
- B. Format and Content: Use Project Manual table of contents as a guide to establish line items for the schedule of values. Provide at least one-line item for each Specification Section.
 1. 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. Design-Builder's name and address.
 - e. Date of submittal.
 2. Arrange schedule of values consistent with format of AIA Document G703 or modified DC Court version.
 3. Arrange the schedule of values in tabular form, with separate columns to indicate the following for each item listed:
 - a. Related Specification Section or Division.
 - b. Description of the Work.
 - c. Name of subcontractor.
 - d. Name of manufacturer or fabricator.
 - e. Name of supplier.
 - f. Change Orders (numbers) that affect value.
 - g. Dollar value of the following, as a percentage of the Contract Sum to nearest one-hundredth percent, adjusted to total 100 percent. Round dollar amounts to whole dollars, with total equal to Contract Sum.
 - 1) Labor.
 - 2) Materials.
 - 3) Equipment.
 4. Provide a breakdown of the Contract Sum in enough detail to facilitate continued evaluation of Applications for Payment and progress reports.
 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.
 6. Allowances: Provide a separate line item in the schedule of values for each allowance. Show line-item value of unit-cost allowances, as a product of the unit cost, multiplied by measured quantity. Use information indicated in the Contract Documents to determine quantities.

7. Purchase Contracts: Provide a separate line item in the schedule of values for each purchase contract. Show line-item value of purchase contract. Indicate Owner payments or deposits, if any, and balance to be paid by Design-Builder.
8. Closeout Costs. Include separate line items under Design-Builder and principal subcontracts for Project closeout requirements in an amount totaling 5% [five percent] of the Contract Sum and subcontract amount.
9. Schedule of Values Revisions: Revise the schedule of values when Change Orders or Construction Change Directives result in a change in the Contract Sum. Include at least one separate line item for each Change Order and Construction Change Directive, on the G703 form.

1.5 APPLICATIONS FOR PAYMENT

- A. Each Application for Payment following the initial Application for Payment shall be consistent with previous applications and payments as certified by CM and paid for by Owner.
- B. Payment Application Times: The date for each progress payment is indicated in the Agreement between Owner and Design-Builder. The period of construction work covered by each Application for Payment is the period indicated in the Agreement.
- C. Applications for payment shall be submitted as outlined in RFP Section G utilizing the Courts Invoice Processing Platform (IPP)
- D. Payment Application Times: Design-Builder on the fifth day of each month after commencement of performance, but no more frequently than once monthly, may submit an application for Payment for the period ending the last day of the previous month or other pay period as mutually defined and agreed to by the Design-Builder and Owner.
 1. Submit draft/pencil copy of Application for Payment no later than fourteen (14) days prior to submission date for review by Owner and QA/QC Manager.
- E. Application for Payment Forms: Coordinate with Owner for payment forms.
- F. Application Preparation: Complete every entry on form. Notarize and execute by a person authorized to sign legal documents on behalf of Design-Builder. Owner will return incomplete applications without action.
 1. Entries shall match data on the schedule of values and Design-Builder's construction schedule. Design-Builder shall provide updated schedules with data date though application submission date.
 2. Include amounts for work completed following previous Application for Payment, whether or not payment has been received. Include only amounts for work completed at time of Application for Payment.
 3. Include amounts of executed Change Modifications issued before last day of construction period covered by application.
 4. Indicate separate amounts for work being carried out under Owner-requested project acceleration.

- G. **Stored Materials:** Design-Builder may include in application for payment amounts applied for materials or equipment purchased or fabricated and stored, but not yet installed under the following conditions:
1. Provide certificate of insurance, against loss, damage (from whatever source), or disappearance, including loss or theft prior to incorporation into the Work. Design-Builder releases Owner from any responsibility for stored materials and assumes all liability for and risk of loss or damage, by whatever means, including Owner's alleged negligence, regardless of whether the Owner has paid for said stored materials. Provide evidence of transfer of title to Owner (free of liens or encumbrances of any kind) and provide consent of surety to payment for stored materials.
 2. Provide an applicable purchase order listing the materials in detail and identifying the contract documents, by name, with verification that the total value of the purchase order amount reconciles with the corresponding application for payment stored materials line-item value; do not include overhead and profit on stored materials.
 3. Provide photographic evidence of procured materials or equipment stored either on site or off site (in a facility that shall meet the Owner's approval in accordance with manufacturer's recommendations).
 4. Owner's payment for any stored material pursuant to the contract documents shall in no way relieve the Design-Builder of the responsibility for providing and installing such material in accordance with the requirements of the contract documents.
 5. Provide summary documentation for stored materials indicating the following:
 - a. Value of materials previously stored and remaining stored as of date of previous Applications for Payment.
 - b. Value of previously stored materials put in place after date of previous Application for Payment and on or before date of current Application for Payment.
 - c. Value of materials stored since date of previous Application for Payment and remaining stored as of date of current Application for Payment.
- H. **Transmittal:** Submit on PMIS and one hard copy, signed and notarized original copies of each Application for Payment to Owner by a method ensuring receipt within 24 hours. One copy shall include waivers of lien and similar attachments if required.
1. Transmit each copy with a transmittal form listing attachments and recording appropriate information about application.
- I. **Waivers of Mechanic's Lien:** With each Application for Payment, submit waivers of mechanic's lien from entities lawfully entitled to file a mechanic's lien arising out of the Contract and related to the Work covered by the payment to include subcontractors, sub-subcontractors, and suppliers for construction period covered by the previous application.
1. Submit partial waivers on each item for amount requested in previous application, after deduction for retainage, on each item.
 2. When an application shows completion of an item, submit conditional final or full waivers.
 3. Owner reserves the right to designate which entities involved in the Work must submit waivers.

4. Submit final Application for Payment with or preceded by conditional final waivers from every entity involved with performance of the Work covered by the application who is lawfully entitled to a lien.
 5. Waiver Forms: Submit executed waivers of lien on forms acceptable to Owner.
- J. 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. Design-Builder's cost loaded construction schedule (accepted by Owner).
 4. Combined Design-Builder's construction schedule (preliminary if not final) incorporating Work of multiple contracts, with indication of acceptance of schedule by each Design-Builder.
 5. Products list (preliminary if not final).
 6. Sustainable design action plans, including preliminary project materials cost data.
 7. Schedule of unit prices.
 8. Submittal schedule (preliminary if not final).
 9. List of Design-Builder's staff assignments.
 10. List of Design-Builder's principal consultants.
 11. Copies of building permits.
 12. Copies of authorizations and licenses from authorities having jurisdiction for performance of the Work.
 13. Initial progress report.
 14. Report of preconstruction conference.
 15. Certificates of insurance and insurance policies.
 16. Performance and payment bonds.
 17. Data needed to acquire Owner's insurance.
- K. Application for Payment at Substantial Completion: After Owner issues the Certificate of Substantial Completion, submit an Application for Payment showing 100 percent completion for portion of the Work claimed as substantially complete.
1. Include documentation supporting claim that the Work is substantially complete and a statement showing an accounting of changes to the Contract Sum.
 2. This application shall reflect Certificate(s) of Substantial Completion issued previously for Owner occupancy of designated portions of the Work.
- L. Final Payment Application: Within 30 days after completing Project closeout requirements, submit final Application for Payment with releases and supporting documentation not previously submitted and accepted, including, but not limited, to the following:
1. Evidence of completion of Project closeout requirements.
 2. Insurance certificates for products and completed operations where required and proof that taxes, fees, and similar obligations were paid.
 3. Updated final statement, accounting for final changes to the Contract Sum.
 4. Attachment J.8 Release of Claims form.
 5. Evidence that claims have been settled.
 6. Final meter readings for utilities, a measured record of stored fuel, and similar data as of date of Substantial Completion or when Owner took possession of and assumed responsibility for corresponding elements of the Work.

7. 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 and Request for Proposal (RFP) apply to this Section.

1.2 SUMMARY

- A. Section includes administrative provisions for coordinating construction operations on Project including, but not limited to, the following:
 - 1. General coordination procedures.
 - 2. Coordination drawings.
 - 3. Requests for Information.
 - 4. Digital project management procedures.
 - 5. Project meetings.
- B. Each contractor shall participate in coordination requirements. Certain areas of responsibility are assigned to a specific contractor.
- C. Related Requirements:
 - 1. Section 013200 "Construction Progress Documentation" for documenting the progress of construction during performance of the Work.
 - 2. Section 013216 "Construction Progress Schedule" for preparing and submitting Contractor's construction schedule.
 - 3. Section 017300 "Execution" for procedures for coordinating general installation and field-engineering services, including establishment of benchmarks and control points.
 - 4. Section 017700 "Closeout Procedures" for coordinating closeout of the Contract.
 - 5. Section 019113 "General Commissioning Requirements" for coordinating the Work with Owner's Commissioning Authority.

1.3 DEFINITIONS

- A. BIM: Building Information Modeling.

1.4 INFORMATIONAL SUBMITTALS

- A. Subcontract List: Prepare a written summary identifying individuals or firms proposed for each portion of the Work, including those who are to furnish products or equipment fabricated to a special design. Include the following information in tabular form:

1. Name, address, telephone number, and email address of entity performing subcontract or supplying products.
 2. Number and title of related Specification Section(s) covered by subcontract.
 3. Drawing number and detail references, as appropriate, covered by subcontract.
- B. Key Personnel Names: Within fifteen (15) calendar days of Design NTP, submit key personnel assignments in accordance with the solicitation response organizational chart, including superintendent and other personnel in attendance at Project site. Identify individuals and their duties and responsibilities. Provide names, email addresses, and telephone numbers of key personnel and individuals assigned as alternates in the absence of individuals assigned to Project.
1. Design-Builder shall input all key personnel information on Owner's PMIS system and coordinate with Owner to ensure continuity.
- C. Design-Builder shall provide a detailed 3-week look-ahead construction schedule in a format acceptable to Owner. This look ahead shall be updated once a week by the close of business on the last day of the previous week's work. The schedule shall include the following:
1. Location utilizing WBS code location from Design-Builders construction schedule.
 2. Description of work for each trade.
 3. Number of persons who will be on site for each location and trade.
 4. Specific impacts required, such as equipment or utility shutdowns.
 5. Hours of operation.
 6. Ensure that line items tie back to Design-Builders construction schedule utilizing activity IDs to ensure continuity between activities on the look ahead schedules and the contract schedule.

1.5 COORDINATION PROCEDURES

- A. Coordination: Coordinate construction operations included in different Sections of the Specifications to ensure efficient and orderly installation of each part of the Work. Coordinate construction operations included in different Sections that depend on each other for proper installation, connection, and operation.
1. Schedule construction operations in sequence required to obtain the best results where installation of one part of the Work depends on installation of other components, before or after its own installation.
 2. Coordinate installation of different components to ensure maximum performance and accessibility for required maintenance, service, and repair.
 3. Make adequate provisions to accommodate items scheduled for later installation.
- B. 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.
1. Prepare similar memoranda for Owner and separate contractors if coordination of their Work is required.

2. Design-Builder understands that Owner may, through Other Government Contractors (OGCs) perform some of the Work on the project. Design-Builder shall be fully responsible for coordination with OGCs to ensure they are scheduled for their installations to not impede progress of the construction schedule. All necessary coordination meetings requiring attendance by OGCs shall be coordinated with the Owner
- C. Administrative Procedures: Coordinate scheduling and timing of required administrative procedures with other construction activities and scheduled activities of other contractors 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 Design-Builder's construction schedule.
 2. Preparation of the schedule of values.
 3. Installation and removal of temporary facilities and controls.
 4. Delivery and processing of submittals.
 5. Progress meetings.
 6. Preinstallation conferences.
 7. Project closeout activities.
 8. Startup and adjustment of systems.
- D. Conservation: Coordinate construction activities to ensure that operations are carried out with consideration given to conservation of energy, water, and materials. Coordinate use of temporary utilities to minimize waste.
1. Salvage materials and equipment involved in performance of, but not actually incorporated into, the Work. Refer to other Sections for disposition of salvaged materials that are designated as Owner's property.

1.6 COORDINATION DRAWINGS

- A. Coordination Drawings, General: Prepare coordination drawings according to requirements in individual Sections, and additionally where installation is not completely indicated on Shop Drawings, where limited space availability necessitates coordination, or if coordination is required to facilitate integration of products and materials fabricated or installed by more than one entity. Any work that proceeds without proper coordination drawings is at the sole risk of the contractor. Conduct regular coordination drawing meetings to review the drawings and process for developing and submitting the drawings, prior to the start of any work.
1. Coordination drawings must be submitted to the Owner and reviewed prior to the start of any new Work. No payment applications will be processed for Work that was conducted without accepted coordination drawings. Acceptance of coordination drawings does not alleviate the D-B Contractor of compliance with the Contract Documents.
 2. Content: Project-specific information, drawn accurately to a minimum ¼ inch scale plan, elevation and section drawings, to indicate and resolve conflicts. Utilize BIM clash detection to the greatest extent possible. Drawings submitted shall be CAD electronic files preferably utilizing latest release of AutoCAD or REVIT showing: partitions, fire/smoke rated barriers, ceiling heights, structural framing locations and elevations, column lines, and other related work. After Subcontractor's written approval of coordination drawings, Design-Builder shall determine method used to resolve

interferences not previously identified. Design-Builder shall give written approval of changes to coordination drawings prior to start of work. Maintain one working copy of current approved Coordination Drawings at project site. The Design-Builder's resolution to coordination issues of various subcontractor's should not directly impact the intent of architectural elements of the project such as ceilings, walls, and chases. Do not base coordination drawings on standard printed data. Include the following information, as applicable:

- a. Use applicable Drawings as a basis for preparation of coordination drawings. Prepare sections, elevations, and details as needed to describe relationship of various systems and components.
- b. Coordinate the addition of trade-specific information to coordination drawings by multiple contractors in a sequence that best provides for coordination of the information and resolution of conflicts between installed components before submitting for review.
- c. Indicate functional and spatial relationships of components of architectural, structural, civil, mechanical, fire protection, and electrical systems.
- d. Indicate space requirements for routine maintenance and for anticipated replacement of components during the life of the installation.
- e. Show location and size of access doors required for access to concealed dampers, valves, and other controls.
- f. Indicate required installation sequences.
- g. Indicate dimensions shown on Drawings. Specifically note dimensions that appear to be in conflict with submitted equipment and minimum clearance requirements. Provide alternative sketches indicating proposed resolution of such conflicts. Minor dimension changes and difficult installations will not be considered changes to the Contract.

B. Coordination Drawing Organization: Organize coordination drawings as follows:

1. Floor Plans and Reflected Ceiling Plans: Show architectural and structural elements, and mechanical, plumbing, fire-protection, fire-alarm, and electrical Work. Show locations of visible ceiling-mounted devices relative to acoustical ceiling grid. Supplement plan drawings with section drawings where required to adequately represent the Work.
2. Plenum Space: Indicate sub-framing for support of ceiling, raised access floor, and wall systems, mechanical and electrical equipment, and related Work. Locate components within plenums to accommodate layout of light fixtures and other components indicated on Drawings. Indicate areas of conflict between light fixtures and other components.
3. Mechanical Rooms: Provide coordination drawings for mechanical rooms showing plans and elevations of mechanical, plumbing, fire-protection, fire-alarm, and electrical equipment.
4. Structural Penetrations: Indicate penetrations and openings required for all disciplines.
5. Slab Edge and Embedded Items: Indicate slab edge locations and sizes and locations of embedded items for metal fabrications, sleeves, anchor bolts, bearing plates, angles, door floor closers, slab depressions for floor finishes, curbs and housekeeping pads, and similar items.
6. Mechanical and Plumbing Work: Show the following:
 - a. Sizes and bottom elevations of ductwork, piping, and conduit runs, including insulation, bracing, flanges, and support systems.

- b. Dimensions of major components, such as dampers, valves, diffusers, access doors, cleanouts and electrical distribution equipment.
 - c. Fire-rated enclosures around ductwork.
 - 7. Electrical Work: Show the following:
 - a. Runs of vertical and horizontal conduit **1-1/4 inches (32 mm)** in diameter and larger.
 - b. Light fixture, exit light, emergency battery pack, smoke detector, and other fire-alarm locations.
 - c. Panel board, switch board, switchgear, transformer, busway, generator, and motor-control center locations.
 - d. Location of pull boxes and junction boxes, dimensioned from column center lines.
 - 8. Fire-Protection System: Show the following:
 - a. Locations of standpipes, mains piping, branch lines, pipe drops, and sprinkler heads.
 - 9. Review: The Owner will review coordination drawings to confirm that in general the Work is being coordinated, but not for the details of the coordination, which are Design-Builder's responsibility. If Owner determines that coordination drawings are not being prepared in sufficient scope or detail, or are otherwise deficient, Owner will so inform Design-Builder, who shall make suitable modifications and resubmit.
 - 10. Coordination Drawing Prints: Prepare coordination drawing prints according to requirements in Section 013300 "Submittal Procedures."
- C. Coordination Digital Data Files: Prepare coordination digital data files according to the following requirements:
- 1. File Preparation Format: Same digital data software program, version, and operating system as original Drawings.
 - 2. File Preparation Format: Latest version of AutoCAD or Revit at the time of NTP.
 - 3. File Submittal Format: Submit or post coordination drawing files using format same as file preparation format and PDF format.
 - 4. The Owner will furnish Design-Builder one set of digital data files of Drawings for use in preparing coordination digital data files.
 - a. The Owner makes no representations as to the accuracy or completeness of digital data files as they relate to Drawings.
 - b. Digital Data Software Program: Drawings are available in Revit.
 - c. Design-Builder shall execute a data licensing agreement in the form of an Agreement form acceptable to Owner and Design-Builder's Architect.

1.7 REQUEST FOR INFORMATION (RFI)

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

- B. General: Immediately on discovery of the need for additional information, clarification, or interpretation of the Contract Documents, Design-Builder shall prepare and submit an RFI in the form specified.
1. All RFI's are to be uploaded to the Owner's PMIS by the Design-Builder. Review and comment by the Design-Builder shall follow the project defined communication structure, as defined in other sections of the specifications.
 2. Design-Builder shall notify Owner in cases where Owner action is required. Owner shall be the final reviewer of an RFI after all other parties have responded.
 3. Owner shall have fourteen (14) calendar days for review of RFIs requiring their response.
 4. Design-Builder is fully responsible for construction schedule and understands that some RFIs will be critical to preservation of construction progress and milestones. Critical RFIs shall be elevated, and Design-Builder is responsible for expediting their review as quickly as possible.
 5. Do not issue RFI as request for substitution. CM will return such RFI with notification to submit proper "Request for Substitution" as per Section 012500 "Substitution Procedures."
- C. Content of the RFI: Include a detailed, legible description of item needing information or interpretation and the following:
1. Project name.
 2. Project number.
 3. Date.
 4. Name of Design-Builder.
 5. Name of Architect and Owner.
 6. RFI number, numbered sequentially.
 7. RFI subject.
 8. Specification Section number and title and related paragraphs, as appropriate.
 9. Drawing number and detail references, as appropriate.
 10. Field dimensions and conditions, as appropriate.
 11. If Design-Builder's suggested resolution. If Design-Builder's suggested resolution impacts the Contract Time or the Contract Sum, Design-Builder shall state impact in the RFI and elevate immediately to Owner for review.
 12. Design-Builder's signature.
 13. Attachments: Include sketches, descriptions, measurements, photos, Product Data, Shop Drawings, coordination drawings, and other information necessary to fully describe items needing interpretation. Attachments shall be electronic files in PDF format for approval and review by Owner as needed.
 - a. Include dimensions, thicknesses, structural grid references, and details of affected materials, assemblies, and attachments on attached sketches.
- D. RFI Forms: All RFI's shall be submitted through the Owner's PMIS system supplemented as needed with information from above if there are no fields for same.
- E. The Owner may review each RFI, determine action required, and respond as needed. When response or action is specifically needed, follow response guidelines provided above. RFI's received by the Owner after 1:00 p.m. will be considered as received the following working day.

1. Owner response on RFIs that may result in a change to the Contract Sum or Contract Time may be eligible for Design-Builder to submit change proposal in accordance with Specification Section 012600.
 - a. The Design-Builder shall consider an RFI response warranting a change to be the initiating event for the change.
 2. The following Design-Builder-generated RFIs will be returned without action:
 - a. Requests for approval of submittals.
 - b. Requests for approval of substitutions.
 - c. Requests for approval of Design-Builder's means and methods.
 - d. Requests for coordination information already indicated in the Contract Documents.
 - e. Requests for adjustments in the Contract Time or the Contract Sum.
 - f. Requests for interpretation of Owner's actions on submittals.
 - g. Incomplete RFIs or inaccurately prepared RFIs.
- F. Owner's action: Owner will review each RFI that is designated by Contractor for Owner's action. Allow fourteen (14) calendar days for response for each RFI. RFIs received from Contractor after 1:00 p.m. will be considered as received the following working day.
- G. Owner responses to RFIs that may result in a change to the Contract Time or the Contract Sum may be eligible for Design-Builder to submit Change Proposal according to Section 012600 "Contract Modification Procedures."
- a. If Design-Builder believes the RFI response warrants change in the Contract Time or the Contract Sum, notify the Owner in writing within five (5) calendar days of receipt of the RFI response.
- H. Review response and notify Owner within seven (7) calendar days if Design-Builder disagrees with response.
- I. RFIs will be returned without response for reasons including but not limited to requests for substitutions, money, time, forgiveness, direction, and means and methods. Requests for Information directly from Subcontractors will not be answered.
- 1.8 DIGITAL PROJECT MANAGEMENT PROCEDURES
- A. Bridging Architect's Data Files Not Available: Bridging Architect will not provide their BIM model digital data files for Design-Builder's use during construction.
- B. Use of Bridging Architect's Digital Data Files: Digital data files of Bridging Architect's CAD drawings will be provided by Bridging Architect for Design-Builder's use during construction.
1. Digital data files may be used by Design-Builder in preparing coordination drawings, Shop Drawings, and Project record Drawings.
 2. Bridging Architect makes no representations as to the accuracy or completeness of digital data files as they relate to Contract Drawings.
 3. Digital Drawing Software Program: Contract Drawings are available in AutoCAD (DWG) version 2016.
 4. Design-Builder shall execute a data licensing agreement.

- a. Subcontractors, and other parties granted access by Design-Builder to Bridging Architect's digital data files shall execute a data licensing agreement.
5. The following digital data files will be furnished for each appropriate discipline:
 - a. Floor plans.
 - b. Reflected ceiling plans.
- C. Web-Based Project Software: Use Owner's web-based Project software site for purposes of hosting and managing Project communication and documentation until Final Completion.
 1. Provide eight hours of software training for the Project Web site users.
 2. Design-Builder, subcontractors, and other parties granted access to the Project Web site shall execute the data licensing agreement implemented on the website.
- D. PDF Document Preparation: Where PDFs are required to be submitted to Owner, prepare as follows:
 1. Assemble complete submittal package into a single indexed file incorporating submittal requirements of a single Specification Section and transmittal form with searchable links enabling navigation to each item.
 2. Name file with submittal number or other unique identifier, including revision identifier.
 3. Certifications: Where digitally submitted certificates and certifications are required, provide a digital signature with digital certificate on where indicated.

1.9 PROJECT MEETINGS

- A. General: Design Builder shall schedule and conduct meetings (Progress, Coordination, etc.) and conference at Project site or hosted online (At discretion of Owner). Coordinate all meetings with the Owner and relevant stakeholders for attendance.
 1. Attendees: Inform participants and others involved, and individuals whose presence is required, of date and time of each meeting. Notify Owner and other relevant stakeholders necessary for attendance of schedule meeting dates and times a minimum of 14 calendar days prior to meetings. In the instance of meetings that are regularly scheduled (i.e. Progress Meetings, Coordination Meetings, etc.) notification of the first meeting is necessary and then set schedule shall be followed unless modified by Design-Builder and approved or changed by Owner.
 2. Agenda: Prepare the meeting agenda. Distribute the agenda to all invited attendees.
 3. Minutes: Design-Builder shall be responsible for taking and distribution of Meeting Minutes for all meetings they are responsible for. Minutes shall be distributed no later than 24 hours after a meeting.
 4. After distribution of minutes, participants will have three (3) days to provide revisions back to the Design-Builder for incorporation into the final minutes. Final minutes shall be uploaded into the Owner's PMIS system and distributed to the team.
 5. There shall be no private meetings without appropriate attendees, and meeting minutes shall be distributed to all parties, to document the outcome of those meetings.
- B. Preconstruction Conference: Owner will schedule and conduct a preconstruction conference before starting construction, at a time convenient to Owner and Bridging Architect, but no later

than fifteen (15) calendar days after issuance of the Notice to Proceed for Construction as it relates to any Early Work Packages.

1. Attendees: Authorized representatives of Owner, Owner's Commissioning Authority, Owner's QA/QC Manager. Owner, Design-Builder and its superintendent; major subcontractors; suppliers; and other concerned parties shall attend the conference. Participants at the conference shall be familiar with Project and authorized to conclude matters relating to the Work.
 2. Agenda: Discuss items of significance that could affect progress, including the following:
 - a. Responsibilities and personnel assignments.
 - b. Tentative construction schedule.
 - c. Phasing.
 - d. Critical work sequencing and long lead items.
 - e. Designation of key personnel and their duties.
 - f. Lines of communications.
 - g. Use of PMIS.
 - h. Procedures for processing field decisions and Change Orders.
 - i. Procedures for RFIs.
 - j. Procedures for testing and inspecting.
 - 1) Schedule for all testing and inspections shall be part of the schedule process, per section 013200 "Construction Progress Documents."
 - k. Commissioning procedures.
 - l. Quality Assurance and Control Procedures (Owner's QA/QC Manager)
 - m. Procedures for processing Applications for Payment.
 - n. Distribution of the Contract Documents.
 - o. Submittal procedures.
 - p. Sustainable design requirements.
 - q. Preparation of Record Documents.
 - r. Use of the premises and existing building.
 - s. Work restrictions.
 - t. Working hours.
 - u. Owner's occupancy requirements.
 - v. Responsibility for temporary facilities and controls.
 - w. Procedures for moisture and mold control.
 - x. Procedures for disruptions and shutdowns.
 - y. Construction waste management and recycling.
 - z. Parking availability.
 - aa. Office, work, and storage areas.
 - bb. Equipment deliveries and priorities.
 - cc. First aid.
 - dd. Security.
 - ee. Progress cleaning.
 3. Minutes: Design-Build team will take and distribute meeting minutes.
- C. Sustainable Design Requirements Coordination Conference: Owner will schedule and conduct a sustainable design coordination conference before starting construction, at a time convenient to Owner, Bridging Architect, and Design-Builder

1. Attendees: Authorized representatives of Owner, Owner's Commissioning Authority, Bridging Architect, and their consultants; Design-Builder and its superintendent and sustainable design coordinator; major subcontractors; suppliers; and other concerned parties shall attend the conference. Participants at the conference shall be familiar with Project and authorized to conclude matters relating to the Work.
 2. Agenda: Discuss items of significance that could affect meeting sustainable design requirements, including the following:
 - a. Sustainable design Project checklist.
 - b. General requirements for sustainable design-related procurement and documentation.
 - c. Project closeout requirements and sustainable design certification procedures.
 - d. Role of sustainable design coordinator.
 - e. Construction waste management.
 - f. Construction operations and sustainable design requirements and restrictions.
 3. Minutes: Owner's Management Team for conducting meeting will record and distribute meeting minutes.
- D. Preinstallation Conferences: Design-Builder shall conduct a preinstallation conference at Project site before each construction activity when required by other sections and when required for coordination with other construction.
1. Attendees: Installer and representatives of manufacturers and fabricators involved in or affected by the installation and its coordination or integration with other materials and installations that have preceded or will follow, shall attend the meeting. Advise Owner, and Owner's Commissioning Authority and QA/QC Manager of scheduled meeting dates.
 2. Agenda: Review progress of other construction activities and preparations for the particular activity under consideration, including requirements for the following:
 - a. Contract Documents.
 - b. Options.
 - c. Related RFIs.
 - d. Related Change Orders.
 - e. Purchases.
 - f. Deliveries.
 - g. Submittals.
 - h. Sustainable design requirements.
 - i. Review of mockups.
 - j. Possible conflicts.
 - k. Compatibility requirements.
 - l. Time schedules.
 - m. Weather limitations.
 - n. Manufacturer's written instructions.
 - o. Warranty requirements.
 - p. Compatibility of materials.
 - q. Acceptability of substrates.
 - r. Temporary facilities and controls.
 - s. Space and access limitations.
 - t. Regulations of authorities having jurisdiction.
 - u. Testing and inspecting requirements.

- v. Installation procedures.
 - w. Coordination with other work.
 - x. Required performance results.
 - y. Protection of adjacent work.
 - z. Protection of construction and personnel.
 - 3. The D-B shall record significant conference discussions, agreements, and disagreements, including required corrective measures and actions.
 - 4. Reporting: The D-B shall take and distribute minutes of the meeting to each party present and to other parties requiring information.
 - 5. Do not proceed with installation if the conference cannot be successfully concluded. Initiate whatever actions are necessary to resolve impediments to performance of the Work and reconvene the conference at earliest feasible date.
- E. Project Closeout Conference: Owner will schedule and conduct a project closeout conference, at a time convenient to Owner, but no later than 90 days prior to the scheduled date of Substantial Completion.
- 1. Conduct the conference to review requirements and responsibilities related to Project closeout.
 - 2. Attendees: Authorized representatives of Owner, Owner's Commissioning Authority, Design-Builder, major subcontractors; suppliers; and other concerned parties shall attend the meeting. Participants at the meeting shall be familiar with Project and authorized to conclude matters relating to the Work.
 - 3. Agenda: Discuss items of significance that could affect or delay Project closeout, including the following:
 - a. Preparation of Record Documents.
 - b. Procedures required prior to inspection for Substantial Completion and for final inspection for acceptance.
 - c. Procedures for completing and archiving web-based Project software site data files.
 - d. Submittal of written warranties.
 - e. Requirements for completing sustainable design documentation.
 - f. Requirements for preparing operations and maintenance data.
 - g. Requirements for delivery of material samples, attic stock, and spare parts.
 - h. Requirements for demonstration and training.
 - i. Preparation of Design-Builder's punch list.
 - j. Procedures for processing Applications for Payment at Substantial Completion and for final payment.
 - k. Submittal procedures.
 - l. Coordination of separate contracts.
 - m. Owner's partial occupancy requirements.
 - n. Installation of Owner's furniture, fixtures, and equipment.
 - o. Responsibility for removing temporary facilities and controls.
 - 4. Minutes: Entity conducting meeting will record and distribute meeting minutes.
- F. Progress Meetings: Shall be conducted bi-weekly or as approved by Owner.
- 1. Coordinate dates of meetings with preparation of payment requests.

2. Attendees: In addition to representatives of Owner's Management Team, Owner's Commissioning Agent, Design-Builder and each contractor, subcontractor, supplier, and other entity concerned with current progress or involved in planning, coordination, or performance of future activities shall be represented at these meetings. All participants at the meeting shall be familiar with Project and authorized to conclude matters relating to the Work.
 3. Agenda: Review and correct or approve minutes of previous progress meeting. Review other items of significance that could affect progress. Include topics for discussion as appropriate to status of Project.
 - a. Design-Builder's Construction Schedule: Review progress since the last meeting. Determine whether each activity is on time, ahead of schedule, or behind schedule, in relation to Design-Builder's construction schedule. Determine how construction behind schedule will be expedited; secure commitments from parties involved to do so. Discuss whether schedule revisions are required to ensure that current and subsequent activities will be completed within the Contract Time.
 - 1) Review schedule for next period.
 - b. Review present and future needs of each entity present, including the following:
 - 1) Interface requirements.
 - 2) Sequence of operations.
 - 3) Resolution of BIM component conflicts.
 - 4) Status of submittals.
 - 5) Status of sustainable design documentation.
 - 6) Deliveries.
 - 7) Off-site fabrication.
 - 8) Access.
 - 9) Site use.
 - 10) Temporary facilities and controls.
 - 11) Progress cleaning.
 - 12) Quality and work standards.
 - 13) Status of correction of deficient items.
 - 14) Field observations.
 - 15) Status of RFIs.
 - 16) Status of Proposal Requests.
 - 17) Pending changes.
 - 18) Status of Change Orders.
 - 19) Pending claims and disputes.
 - 20) Documentation of information for payment requests.
 4. Minutes: The D-B team responsible for conducting the meeting will record and distribute the meeting minutes to each party present and to parties requiring information. Minutes to be distributed within 48 hours of the meeting.
- G. Coordination Meetings: Design-Builder shall conduct Project coordination meetings at weekly intervals or as needed for progress. Project coordination meetings are in addition to specific meetings held for other purposes, such as progress meetings and preinstallation conferences.

1. Attendees: In addition to representatives of Owner, Owner's Commissioning Authority, Design-Builder, subcontractors, suppliers, and other entity concerned with current progress or involved in planning, coordination, or performance of future activities shall be represented at these meetings. All participants at the meetings shall be familiar with Project and authorized to conclude matters relating to the Work.
2. Agenda: Review and correct or approve minutes of the previous coordination meeting. Review other items of significance that could affect progress. Include topics for discussion as appropriate to status of Project.
 - a. Combined Design-Builder's Construction Schedule: Review progress since the last coordination meeting. Determine whether each contract is on time, ahead of schedule, or behind schedule, in relation to combined Design-Builder's construction schedule. Determine how construction behind schedule will be expedited; secure commitments from parties involved to do so. Discuss whether schedule revisions are required to ensure that current and subsequent activities will be completed within the Contract Time.
 - b. Schedule Updating: Revise combined Design-Builder's construction schedule after each coordination meeting where revisions to the schedule have been made or recognized. Issue revised schedule concurrently with report of each meeting.
 - c. Review present and future needs of each contractor present, including the following:
 - 1) Interface requirements.
 - 2) Sequence of operations.
 - 3) Resolution of BIM component conflicts.
 - 4) Status of submittals.
 - 5) Deliveries.
 - 6) Off-site fabrication.
 - 7) Access.
 - 8) Site use.
 - 9) Temporary facilities and controls.
 - 10) Work hours.
 - 11) Hazards and risks.
 - 12) Progress cleaning.
 - 13) Quality and work standards.
 - 14) Status of RFIs.
 - 15) Proposal Requests.
 - 16) Change Orders.
 - 17) Pending changes.
3. Reporting: Record meeting results and distribute copies to everyone in attendance and to others affected by decisions or actions resulting from each meeting.

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, and provisions of the Request for Proposal (RFP) apply to this Section.

1.2 SUMMARY

- A. Section includes administrative and procedural requirements for documenting the progress of construction during performance of the Work, including the following:
 - 1. Daily construction reports.
 - 2. Procurement Log prepared with Court's standard practice document in Procure.
 - 3. Submittal log
 - 4. Site condition reports.
 - 5. Unusual event reports.
- B. Related Requirements:
 - 1. Section 011000 "Summary" for Construction Progress Documents kept in the Owner's project management database (PMIS).
 - 2. Section 013216 "Construction Project Schedule" for scheduling requirements.
 - 3. Section 013300 "Submittal Procedures" for submitting schedules and reports.
 - 4. Section 014000 "Quality Requirements" for submitting a schedule of tests and inspections.
 - 5. Section 013233 "Photographic Documentation" for Periodic Construction Photographs

1.3 INFORMATIONAL SUBMITTALS

- A. Format for Submittals: Submit required submittals in the following format:
 - 1. Native electronic copy of schedule file, where indicated.
 - 2. PDF file.
- B. Procurement log: Submit at bi-weekly intervals and with Payment Application.
- C. Submittal Log: Submit at bi-weekly intervals.
- D. Site Condition Reports: Submit at time of discovery of differing conditions.
- E. Unusual Event Reports: Submit at time of unusual event.

1.4 REPORTS

- A. Daily Construction Reports: Utilizing the Daily Report module in the Owner's PMIS system, report the following information concerning events at Project site:
1. List of subcontractors at Project site.
 2. List of separate contractors at Project site.
 3. Approximate count of personnel at Project site.
 4. Equipment at Project site.
 5. Material deliveries.
 6. High and low temperatures and general weather conditions, including presence of rain or snow.
 7. Testing and inspection.
 8. Accidents.
 9. Meetings and significant decisions.
 10. Unusual events.
 11. Stoppages, delays, shortages, and losses.
 12. Meter readings and similar recordings.
 13. Emergency procedures.
 14. Orders and requests of authorities having jurisdiction.
 15. Change Orders received and implemented.
 16. Construction Change Directives received and implemented.
 17. Services connected and disconnected.
 18. Equipment or system tests and startups.
 19. Partial completions and occupancies.
 20. Substantial Completions authorized.
- B. Procurement Log: Within (21) days of Construction NTP, provide a complete Procurement Log of all materials that are required to be procured including all D-B supplied and installed and all Owner Provided. At monthly intervals, update and submit a comprehensive list of materials delivered to and stored at Project site. List shall be cumulative, showing materials previously reported plus items recently delivered. Include with list a statement of progress on and delivery dates for materials or items of equipment fabricated or stored away from Project site. Indicate the following categories for stored materials: Procurement Log shall be held in Owners Procure system.
1. Material stored prior to previous report and remaining in storage.
 2. Material stored prior to previous report and since removed from storage and installed.
 3. Material stored following previous report and remaining in storage.
- C. Site Condition Reports: Immediately on discovery of a difference between site conditions and the Contract Documents, prepare and submit a detailed report. Submit with a Request for Information. Include a detailed description of the differing conditions, together with recommendations for changing the Contract Documents.
- D. Incident Reports: When an event of an unusual and significant nature occurs at Project site, whether or not related directly to the Work, prepare and submit a special report. List chain of events, persons participating, responses by Design-Builder's personnel, evaluation of results or effects, and similar pertinent information. Advise Owner in advance when these events are known or predictable.

1. Contact Owner's Facility Management Department and Owner immediately upon Unusual Event. Provide an initial action plan to mediate the Unusual Event

Submit Unusual Event Reports directly to Owner's Facility Management Department and Owner Design-Building shall submit initial findings and action plan immediately upon the discovery of the unusual event. Formal report shall be submitted within one day(s) of an occurrence.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION 013200

SECTION 013216 – PROJECT SCHEDULES

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 and Request for Proposal (RFP), apply to this Section.

1.2 SUMMARY

- A. Design-Builder Contractor (Contractor) shall develop and maintain project schedules, which shall be used by all involved parties to plan and execute all work required to complete the project. The project schedules will be used by the Owner to monitor the project, assess progress, and evaluate the effects of time-related issues on the project. The project schedule shall be prepared, maintained, and submitted in accordance with this provision, unless otherwise directed in writing by the Owner.
- B. The Contractor shall use a Critical Path Method ("CPM") Project Schedule to plan, coordinate, and perform the Work. The Contractor shall develop a detailed Network Plan demonstrating complete fulfillment of all work shown in the contract documents. Schedule activities shall accurately depict the Contractor means and methods to complete the entire scope of work including, but not limited to, activities of subcontractors, consultants, equipment vendors and suppliers, the Owner, and others, as required. The Contractor is required to follow the Network Plan in the execution of the work.
- C. Related Requirements:
 - 1. Section 011000 "Summary"
 - 2. Section 012900 "Payments Procedures" for application for Payment as it relates to scheduling.
 - 3. Section 013100 "Project Management and Coordination" for coordination as it relates to scheduling.
 - 4. Section 013300 "Submittal Procedures" for submitting schedules and reports.
 - 5. Section 014000 "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 Project. Activities included in a Project schedule consume time and resources. Each activity shall be limited to one trade unless the Owner specifically approves otherwise on an exception basis.
 - 1. Critical Activity: An activity on the critical path that must start and finish on the planned early start and finish times.

2. Predecessor Activity: An activity that precedes another activity in the network.
 3. Successor Activity: An activity that follows another activity in the network.
- B. Baseline Schedule: The original work plan approved by the Owner as the Project Schedule depicting the Contractor plan to prosecute the work.
- C. Constraint: A scheduling restriction imposed on the start date, finish date or float of an activity. No constraints will be allowed.
- D. Cost Loading: The allocation of the schedule of values for completing an activity as scheduled. The sum of costs for all activities must equal the total Contract Sum.
- E. Critical Path Method (CPM): A scheduling technique using activities, durations, and interrelationships/dependencies (logic), such that all activities are interrelated with logic ties from the beginning of the project to the completion of the project. There shall be no open-ended relationships in the schedule. All activities shall have at least one successor with a finish relationship (“finish to start” or “finish to finish”) except the last activity in the network.
- F. Critical Path: The Project critical path is defined as the longest, continuous path of interrelated activities depicting project work from Notice to Proceed (NTP) to project completion. All reports and graphics indicating the Critical Path shall depict the longest path of interrelated activities. Unless otherwise approved by the Owner, the Baseline Schedule Critical Path shall use all allotted Contract time. The Contractor may develop a schedule that forecasts an early finish, however, all time between the forecasted early finish of Substantial Completion and the contractual Substantial Completion date shall be shown as float.
- G. Current Schedule of Record: The current accepted Project schedule, recently updated or revised to reflect the actual progression of the work.
- H. Data Date: The date to which progress is updated. In most scheduling software, the data date represents the next day of work, and all progress is updated through the day prior to the data date.
- I. Float: The amount of time an activity can be delayed in a project network without causing delay to subsequent activities (free float) or the project completion date (total float).
1. Float time is not for the exclusive use or benefit of either Owner or Design-Builder, 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 Substantial Completion date.
- J. Float Suppression: The masking of available float through the use of constraints, unreasonable logical relationships or unreasonable durations. Float suppression techniques are not allowed.
- K. Fragnet: A subset group of interrelated activities representing only a portion of the CPM schedule.

- L. Resource Loading: The allocation of manpower and equipment necessary for completing an activity as scheduled.
- M. Network Plan: The Network Plan is the entire database of activities, logic, durations, and all items relating to any activity input into the scheduling software and is the complete representation of the Project Schedule prepared using the Critical Path Method and graphically shown in a time-scaled form. The network shows the sequence and interdependence of the activities, and planned and actual progress by activity, required for complete performance of the Work.
- N. Preliminary Schedule: The Preliminary Schedule is submitted within the time frame determined by the Owner. The Preliminary Schedule includes high level schedule information.
- O. Project Schedule: The Project Schedule includes the Preliminary Schedule, the approved Baseline Schedule (developed based on the Preliminary Schedule), and all subsequent Schedule Updates, Schedule Revisions, Recovery Schedules, and As-Built Schedule.
- P. Recovery Schedule: A schedule depicting the Contractor plan for recovery of time lost on the project.
- Q. Retained Logic: When you choose Retained Logic, the remaining duration of a progressed activity is not scheduled until the logical relationships of all predecessors are satisfied. When you choose Progress Override, network logic is ignored, and the activity can progress without delay.
- R. Schedule Revision: A schedule in which the plan for the work is revised. A Schedule Revision is required when the current schedule no longer represents the actual or planned prosecution of the Work.
- S. Schedule Update: A schedule in which only actual start dates, actual finish dates and duration percent completes are updated from the prior data date to the current data date. No Revisions will be permitted in a Schedule Update (i.e., added activities, deleted activities, logical relationships, etc.) unless the Owner specifically approves otherwise on an exception basis.
- T. Time Impact Analysis: A technique to demonstrate a revision or proposed revision against the current approved Project Schedule.
- U. Working Day: A Working Day is a calendar day scheduled for active prosecution of the Work. Contractual duration shall be calculated as calendar days.

1.4 INFORMATIONAL SUBMITTALS

- A. Format for Submittals: Submit required submittals in the following format:
 - 1. Native electronic copy of schedule file, where indicated, submitted through PMIS.
 - 2. PDF file. At a minimum, PDF schedule shall show the following for each activity Early Start, Early Finish, Actual Start, Actual Finish, % Complete, Remaining Duration, Predecessors, Successors, and Float.

- B. Preliminary Schedule: Initial schedule, of size required to display entire schedule for entire Design and Construction period.
 - 1. Submit a working digital copy of schedule, using software indicated, and labeled to comply with requirements for submittals.
- C. Baseline Schedule: Initial schedule, of size required to display entire schedule for entire design and construction period.
 - 1. Submit a working digital copy of schedule, using software indicated, and labeled to comply with requirements for submittals.
- D. Schedule Updates: Submit with Applications for Payment no later than the 5th of the following month to coincide with application for payment, see Section 012900. The Contractor's overall progress along with progress for discrete activities will be used to determine the amount to be approved for the monthly payment request.

1.5 QUALITY ASSURANCE

- A. Scheduler Qualifications: Engage an experienced specialist in CPM scheduling and reporting, with capability of producing CPM reports and diagrams within 24 hours of Owner's request. The Contractor's scheduler shall possess a minimum of 5 years' experience in CPM scheduling on projects of similar size, scope, and complexity as this Project. Contractor shall designate a Project Scheduler for the project and shall submit his/her qualifications for the Owner's Project Manager's written approval prior to submission of the Preliminary or Baseline Schedule.
 - 1. The Project Scheduler shall be primarily responsible for the development and maintenance of the project schedule and shall be present in all scheduling meetings and discussions on major issues concerning the project schedule.

1.6 COORDINATION

- A. Coordinate Contractor Project Schedule with the schedule of values, list of subcontracts, submittal schedule, progress reports, payment requests, and other required schedules and reports.
 - 1. Secure time commitments for performing critical elements of the Work from entities involved.
 - 2. Coordinate each activity in the network with other activities and schedule them in proper sequence.
- B. Construction Prescheduling Conference: Within ten (10) days following Construction NTP, conduct a prescheduling conference to discuss Contractor overall plan to accomplish the Work; the detail work plan for the initial one hundred and twenty (120) calendar days; and scheduling information, project specific requirements, and other key issues necessary for the preparation, maintenance and submittal of the project schedule. Conduct conference to comply with requirements in Section 013100 "Project Management and Coordination." Review methods and procedures related to the preliminary construction schedule and Design-Builder's Construction Schedule, including, but not limited to, the following:

1. Review software limitations and content and format for reports.
2. Verify availability of qualified personnel needed to develop and update schedule.
3. Discuss constraints, including phasing, work stages, area separations, interim milestones and partial Owner occupancy.
4. Review delivery dates for Owner-furnished products.
5. Review schedule for work of Owner's separate contracts.
6. Review submittal requirements and procedures.
7. Review time required for review of submittals and resubmittals.
8. Review requirements for tests and inspections by independent testing and inspecting agencies.
9. Review time required for Project closeout and Owner startup procedures, including commissioning activities.
10. Review and finalize list of construction activities to be included in schedule.
11. Review procedures for updating schedule.

1.7 PROJECT SCHEDULE, GENERAL

- A. Computer Scheduling Software: The Project Schedule shall be produced using widely used, commercially available computer software that is capable of generating and monitoring a CPM schedule and is capable of exporting readable output in PDF format. Prepare schedules using current version of a program that has been developed specifically to manage construction schedules.
 1. Use Primavera P6, version 8.2 or later.
- B. Time Frame: Extend Project Schedule from date established for the Notice to Proceed to date of Final Completion.
 1. Contract completion date shall not be changed by submission of a schedule that shows an early or late completion date, unless specifically authorized by Change Order.
- C. Activities: Comply with the following:
 1. Activity descriptions of the work shall include area designators sufficient to identify where the Work will occur. The work related to each Activity shall be limited to one work trade and one area. All activity descriptions shall be unique. No two activities can have the same description.
 2. Design and Permit Activities: Include design and permit activities with the necessary meetings, follow-up actions, and design submission dates. Include the design schedule to show the sequence of events involved in carrying out the design tasks within the specified contract period. Provided schedule at a detailed level sufficient to identify all major design tasks, including those that control the flow of work. Include review and correction periods associated with each item.
 3. Procurement Activities: Include procurement process activities for the long lead items and major items, requiring a cycle of more than forty (40) calendar days, as separate activities in schedule. Procurement cycle activities include, but are not limited to, submittals, approvals, purchasing, fabrication, and delivery.
 4. Submittal Review Time: Include review and resubmittal times indicated in Section 013300 "Submittal Procedures" in schedule. Coordinate submittal review times in Project Schedule with submittal schedule.

5. Startup and Testing Time: Include no fewer than fifteen (15) calendar days for startup and testing.
 6. Activity durations shall be in units of whole work days and scope of work shall be limited to one trade each. Limit duration of construction activities to twenty (20) calendar days.
 7. Include activities for third-party related responsibilities.
 8. Commissioning Time: Include no fewer than (15) calendar days for commissioning.
 9. Punch List and Final Completion: Include not more than ninety (90) calendar days for completion of punch list items and Final Completion.
 10. Contractor shall coordinate inclusion of other Owner's Contractors duration that will be employed by Owner during the execution of the Work. Include necessary duration of Owner's contractors within Construction Schedule and as outlined in Specification Section 013100.
 11. All activities shall at a minimum be coded by Area, Responsibility (trade/subcontractor), and Phase. Additional codes are allowed to sufficiently identify where work will occur. Codes shall be a maximum of six (6) characters and abbreviations shall be fully described in the Project Schedule. Include an activity code field Schedule of Values (SOV) for the coding of each schedule activity; this is for the tabulation and summarization of Contractor assigned cost-loading Schedule of Values for application of Progress Payment Request reporting. The Contractor self-performed work shall be clearly identifiable.
- D. Interrelationships (logic) and sequencing for ALL activities. Each activity shall have at least one successor (except for the last activity) relationship to form a logically connected Network Plan from NTP to the Contract Completion Date. For each activity, at least one successor must be a finish relationship (finish to start or finish to finish).
- E. Milestones: Contractual milestone events as defined in the Contract Documents including, but not limited to, phased work, work restrictions/access/shift work, and work being performed by separate contractors. The Contractor is prohibited from assigning milestones that are NOT consistent with key dates shown by Owner in the Contract Documents without specific Owner approval.
- F. Work Restrictions: Include work restrictions indicated in the Contract Documents and as follows in schedule and show how the sequence of the Work is affected.
1. Phasing: Arrange list of activities on schedule by phase.
 2. Work by Owner: Include a separate activity for each portion of the Work performed by Owner.
 3. Products Ordered in Advance: Include a separate activity for each product. Include delivery date indicated in Section 011000 "Summary." Delivery dates indicated stipulate the earliest possible delivery date.
 4. Owner-Furnished Products: Include a separate activity for each product. Include delivery date indicated in Section 011000 "Summary." Delivery dates indicated stipulate the earliest possible delivery date.
 5. Work Restrictions: Show the effect of the following items on the schedule:
 - a. Coordination with adjacent properties and existing construction.
 - b. Limitations of continued occupancies.
 - c. Uninterruptible services.
 - d. Partial occupancy before Substantial Completion.
 - e. Use-of-premises restrictions.
 - f. Seasonal variations.

- g. Environmental control.
 - 6. Work Phase: Indicate important stages of construction for each major portion of the Work, including, but not limited to, the following:
 - a. Subcontract awards for major trades.
 - b. Submittals.
 - c. Fabrication.
 - d. Deliveries.
 - e. Installation.
 - f. Tests and inspections.
 - g. Startup and placement into final use and operation.
 - h. Commissioning.
 - i. Close-out
- G. Schedule Composition
 - 1. Open Ended Logic
 - a. Only 2 open ended activities are allowed: the first activity "Construction NTP" shall have no predecessor logic, and the last activity "Final Completion" shall have no successor logic.
 - b. Dangling activities are defined as activities that either a) have only predecessors with finish-finish type relationships and/or b) have only successors with start-start type relationships. Dangling activities are effectively open ended and shall not be allowed.
 - 2. Leads, Lags, and Start to Finish Relationships
 - a. Lags shall be reasonable as determined by the Owner and not used in place of realistic original durations, shall not be in place to artificially absorb float, or to replace proper schedule logic.
 - b. Leads (negative lags) and Start to Finish (SF) relationships are prohibited.
- H. Recovery Schedule: When periodic update indicates the Work is thirty (30) or more calendar days behind the current approved schedule's defined milestones or final completion dates, submit a separate recovery schedule indicating means by which Contractor intends to regain compliance with the schedule. Indicate changes to working hours, working days, crew sizes, equipment required to achieve compliance, and date by which recovery will be accomplished.
- I. Distribution: Contractor shall distribute copies of approved schedules to Owner, Other Government Contractors specified by Owner, QA/QC Manager, testing and inspecting agencies, and other parties identified by either the Contractor or Owner with a need-to-know schedule responsibility.
 - 1. Post copy in Project meeting rooms and temporary field offices.
 - 2. When revisions are made, distribute updated schedules to the same parties and post them 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.

- J. Calendars: Establish a schedule calendar(s) as it relates to durations for activities (proposed number of working days per week, holidays to be observed, planned number of shifts per day, weather affected activities such as roofing or landscaping that normally cannot occur in the winter/fall months).
1. The following days are recognized as legal holidays and shall be indicated as non-working days on all construction calendars.
- a. New Year's Day
 - b. Martin Luther King, Jr. Birthday
 - c. Inauguration Day (when applicable)
 - d. President's Birthday
 - e. DC Emancipation Day
 - f. Memorial Day
 - g. Juneteenth
 - h. Independence Day
 - i. Labor Day
 - j. Indigenous People's Day
 - k. Veterans Day
 - l. Thanksgiving Day
 - m. Christmas Day
- K. Incorporate seasonal weather conditions in the project's geographic area into the project planning and include an average number of days lost to weather per month using the NOAA historical data five (5) year averages.

1.8 PRELIMINARY SCHEDULE

- A. Unless otherwise stated in the solicitation documents, within thirty (30) days of Contractor receipt of Design NTP, Contractor shall submit to the Owner, for its review and approval, a Preliminary Project Schedule. At its discretion, Contractor may submit in lieu of the Preliminary Schedule, a Baseline Schedule according to Section 1.9 below.
- B. Contractor shall provide Preliminary Construction Schedule within ten (10) calendar days of approval of 65% Design Deliverable as outlined in the contract documents. (No cost loading or resource loading shall be included in the Preliminary Schedule.). The Preliminary Construction Schedule will be used to monitor and assess progress of the Work until a Baseline Construction Schedule is approved by the Owner.
- C. Preliminary Schedule prepared and submitted in the form of a Baseline Schedule as defined herein, showing at a minimum:
- a. The detailed activities depicting the sequence and dates for any work planned during the first one-hundred and twenty (120) calendar days, including as applicable project milestones, review by the Owner, and other regulatory agencies; as well as environmental, permits, scope validation period, design, utility, and construction activities.
 - b. Activities, for major submittals and long lead items including activities representing: (1) Submittals, (2) Review & Approvals, (3) Fabrication, and (4)

Deliveries, design, construction, inspections, close-out, start-up, testing and balancing, commissioning and turnover, and work by separate contractors.

- c. Summary level activities depicting the sequence and general timing for work planned after the first one-hundred and twenty (120) calendar days. At Contractor discretion, detailed activities may be shown in lieu of summary level activities.
 - d. Quantities and dollar value of work associated with each activity for which Contractor expects to receive payment.
 - e. The project critical path (based on the longest path).
- 2. Preliminary Schedule Narrative: A Preliminary Schedule Narrative describing the Contractor overall plan to accomplish the entire scope of Work and the detailed plan for work planned during the initial one-hundred and twenty (120) calendar days. The narrative shall describe the sequence of work, means and methods, productivity, and other significant scheduling assumptions on which the Preliminary Schedule is based. The narrative shall also describe the project critical path (longest path), work planned during each construction season, and any known or foreseeable issues that may impact the schedule.
 - 3. The Preliminary Schedule shall indicate intended submittal dates and depict the review period as defined in the Contract for Owner review. Procurement/submittal activities shall be assigned codes that will allow these activities to be sorted and printed separately from the construction/close-out/commissioning work activities.
 - 4. The Preliminary Schedule shall have a Data Date no later than NTP, and no activities shall be progressed later than the data date.
 - 5. After no more than fourteen (14) calendar days the Contractor and Owner shall meet to discuss the results of the Owner's schedule review. To the extent that revisions are required, the Contractor shall resubmit the Preliminary Schedule to the Owner for approval within seven (7) calendar days of receipt of the Owner's comments.

1.9 BASELINE SCHEDULE

- A. Upon approval of the Preliminary Schedule (scope and logic), and approval of the Contractor 65% cost estimate, the Contractor shall cost load and resource load the schedule and submit it as the proposed Baseline Construction Schedule.
- B. The fully detailed, cost loaded Baseline Construction Schedule shall be submitted and approved within a time period determined by the Owner. The proposed Baseline Construction Schedule shall have a data date no later than the Construction NTP.
- C. Except for certain procurement activities (not including fabrication or delivery), each Activity representing a portion of the work shall be cost and manpower loaded, unless otherwise approved by the Owner.
 - 1. All activities shown in the Project Schedule shall be cost-loaded. The assigned dollar value (cost-loading) shall cumulatively equal the total Contract price. Mobilization costs, bond and insurance costs, general requirements, overhead and profit, etc., shall be

- individual activities. Activity costs shall be stated in at least the same level of detail as and shall correlate to the total contract price. To the extent that the Contractor anticipates requesting payments for stored materials, delivery activities shall be cost-loaded to reflect the cost of materials (excluding labor for installation) and shown separate from the related fabrication activity. Payment for stored materials is at the sole discretion of the Owner.
2. All field installation activities shown in the Project Schedule shall be resource loaded to depict the Contractor planned use of labor.
- D. The Owner will review the Baseline Schedule and provide comments to the Contractor within fifteen (15) calendar days of receipt of submittal and, if needed, will arrange for a Baseline Schedule Review Meeting with the Contractor for discussion of the schedule. The Baseline Schedule, when approved, shall become the basis for the next monthly Schedule Update and Schedule Revision submitted by the Design-Builder.
1. In the event that Owner provides comments, or the Baseline Schedule does NOT meet the requirements of this specification, the Contractor shall, within seven (7) calendar days, revise the Project Schedule to bring it into compliance with these requirements, and Contractor shall make a full Baseline Schedule submission for owner's review and approval.
 2. Upon approval of the Baseline Schedule by the owner, the cost-loaded values shown in the Baseline Schedule and progress of activities will be used as a basis for determining progress payments. Monthly progress payments shall be based upon information developed using the current monthly Schedule Update. The computer-generated cost report will be used by the Owner for verification of the Application for Payment submitted by the Design-Builder.
 3. Owner approval of the Baseline Project Schedule does not relieve the Contractor of responsibility whatsoever for the accuracy or feasibility of the Project Schedule, or of the Contractor ability to meet the Substantial Completion Date. Such acceptance does not create a warranty, expressed or implied, or acknowledge or admit the reasonableness of the activities, logic, phasing, durations, manpower, cost or equipment loading of the Contractor Project Schedule.
 4. If the Contractor fails to timely submit the Baseline Schedule, the owner shall withhold approval of progress payments until the Contractor submits the required Project Schedule. Additionally, the owner shall withhold 50% of the Contractor mobilization cost until the Baseline Schedule is approved.
 5. Payment for delivered materials and equipment will be subject to the guidelines as outlined in Specification 012900.
- E. The Baseline Schedule submission shall be comprised of the following, unless otherwise requested by Owner:
1. One (1) electronic copy of the entire Project Schedule shall be uploaded into PMIS and one copy electronic copy in native format (that is, the format of the scheduling software) The electronic copy shall be in a compressed format. The electronic filename shall have a unique identifier. The file naming structure shall be concise and accurately describe the file.
 2. Cost- and Resource-Loading of Baseline Schedule: Assign cost to construction activities on the Baseline schedule. Do not assign costs to submittal activities. Obtain Owner's approval prior to assigning costs to fabrication and delivery activities. Assign costs under main subcontracts for testing and commissioning activities, operation and maintenance

manuals, punch list activities, Project record documents, sustainable design documentation, and demonstration and training (if applicable), in the amount of 5 percent of the Contract Sum.

- a. Each activity cost shall reflect an appropriate value subject to approval by Owner.
 - b. Each activity cost shall not exceed \$100,000.
 - c. Total cost assigned to activities shall equal the total Contract Sum.
3. The Contractor shall prepare and submit cost loading graphic charts, (i.e., S-Curve and monthly histogram), and it shall be computer generated from the Contractor schedule data. The graphic shall show actual and forecasted monthly cash flow in a histogram format, and the actual and forecasted cost over the planned project execution period shown on a cumulative cost curve using actual dates, early dates, and late dates.
 4. The Contractor shall prepare and submit a manpower histogram depicting the monthly (or weekly if requested by the Owner) actual and forecasted manpower usage (in a histogram format) and the actual and forecasted cumulative manpower for the project execution period. The manpower-loading shall indicate the total number of workers, not total number of crews. The manpower charts shall be computer generated from the Contractor schedule data.
 5. The Contractor shall submit a Schedule Calculation Summary Report which includes listings of constraints, open-ends, out-of-sequence work, and scheduling statistics. This report is computer-generated when the Project Schedule is calculated.
 6. A narrative providing additional clarification/explanation of items such that Owner is informed of the approach used to plan and sequence the work, coordinate with other separate contractors to the extent applicable, and resource and cost load the Project Schedule.
 7. The Contractor shall provide (screen shots of) the schedule software settings used under each tab of User Preferences, Admin Preferences, and Schedule Options with the baseline schedule and each subsequent schedule submittal.

1.10 SCHEDULE UPDATES

- A. The Project Schedule shall be updated not less than monthly throughout the entire Project performance period until Project completion is achieved. Submit no later than the 5th working day following the end of the monthly update period. The monthly Progress reports shall be submitted in the format described herein shall include, at a minimum:
 1. For activities started and/or completed during the previous period: actual start and actual completion dates, number of work days.
 2. For activities begun but not yet completed: the actual start date, physical percentage complete to date, the remaining duration of the work, and the estimated completion date.
 3. For activities not yet started: estimated start dates, revised duration, and estimated completion dates, as necessary; if estimated start dates for activities vary from current schedule, explain variance and effects.
 4. For authorized Contract changes: revised activities, and durations where required.
 5. The monthly submittal to the Owner shall include the Contractor Schedule Narrative Report in detail, and shall follow the outline below:
 - a. Description of problem areas
 - b. Current and anticipated Contractor caused delays.

- 1) Cause of delay
 - 2) Corrective action and schedule adjustments to correct the delay so as to maintain affected original milestone completion dates.
 - 3) Impact of the delay on other activities, on milestones, and on completion dates.
- c. Current and anticipated non-Contractor caused delays:
- 1) Cause of delay
 - 2) Proposed plan of corrective action and schedule adjustments necessary to correct the delay and maintain affected milestone completion dates, to include anticipated costs and time for which the Contractor considers the Owner liable.
- d. Longest Path
- 1) Discussion of the longest path in the previous schedule at the beginning of the period.
 - 2) Discussion of progress achieved on the longest path.
 - 3) General description of the work on the forecasted longest path for the remainder of the project.
 - 4) Discussion of changes to the longest path since the prior month's approved schedule.
- e. Logic, lag, duration or constraint changes
- 1) Changes to relationship logic, lags, durations or constraints are not allowed unless specifically approved on a case-by-case basis by Owner. Proposed changes must be listed in tabular format with justifications.
 - 2) Added or deleted activities.
 - 3) Added or deleted activities are not allowed unless specifically approved on a case-by-case basis by Owner. Proposed changes must be listed in tabular format with justifications.
- f. Approved changes in construction sequence.
- g. Pending items and status thereof:
- 1) Permits.
 - 2) Potential Revisions.
 - 3) Change Orders.
 - 4) Time extensions.
 - 5) Other
- h. Contract completion date(s) status:
- 1) Ahead of schedule, and number of calendar days.
 - 2) Behind schedule, and number of working days.
 - 3) Revised Reports.
 - 4) Revised cost loading and cash flow information

6. No revisions or additions to the monthly Schedule Updates shall be made other than those reflecting the Owner's prior written approval (i.e., change orders, potential revisions, stop work orders, etc.).
7. The Contractor agrees that, whenever it becomes apparent from the monthly schedule update that any Contract completion date will not be met, at No Fault of the Owner, the Contractor will take any or all of the following actions with prior approval of the Owner and at no additional cost to the Owner:
 - a. Re-sequencing construction activities
 - b. Providing additional labor
 - c. Working additional shifts or otherwise accelerating the work to maintain the Contract stipulated completion dates.
8. Whenever it becomes apparent from the current monthly schedule update that any milestone date(s) and/or contract completion dates will not be met due to the Contractor slow progress on critical activities, items a, b and c above shall be incorporated in the Project Schedule all in accordance with section titled "Recovery Schedule." The revised schedule shall be submitted to the Owner for review and acceptance.
9. A schedule, which has not been accepted in accordance with all requirements set forth in the Contract, may not be used by the Contractor as a basis for notice of change/delay, requesting equitable adjustments, or partial progress payments.

1.11 DELAYS AND TIME EXTENSIONS

- A. The Owner is not bound by any Project Schedule until approved in writing by the Owner. In the event the Contractor proceeds with a schedule that is not approved by the Owner, and in the event of a delay claim, the Contractor shall have the burden of proving that the schedule used is reasonable, and based on its actions, throughout the project, the schedule would have been met.
- B. Whenever delays are experienced, the Contractor shall submit a written Time Impact Analysis to the Owner, illustrating the influence of each delay on the current Project Schedule completion date. Submit a time impact analysis based on industry standard AACE 52R-06 within fourteen (14) calendar days from the start of the delay event, for approval by the Owner. Utilize a copy of the last approved schedule prior to the first day of the impact or delay for the time impact analysis. If the Owner determines the time frame between the last approved schedule and the first day of impact is too great, prepare an interim updated schedule to perform the time impact analysis.
- C. Each Time Impact Analysis shall include a fragment network analysis (fragnet), demonstrating how the Contractor proposes to incorporate the delay into the Project Schedule. Additionally, the analysis shall demonstrate the time impact based on the date that the delay began, the status of construction at that point in time, and the event time computation of all affected activities. The event items used in the analysis shall be those included in the latest updated copy of the detailed progress schedule or as adjusted by mutual agreement. Contract time extensions will be granted only to the extent that time adjustments for the activity or activities affected exceed the total or remaining float along the path of activities.
- D. Each Time Impact Analysis shall be submitted as outlined in Specification 012600. In cases in which the Contractor does not submit a Time Impact Analysis for delay within the specified period of time, then it is mutually agreed that that particular delay has no time impact on the

Contract completion date and the Project's longest path and no time extension will be granted. Approval or rejection of each Time Impact Analysis by the Owner shall be made within fourteen (14) calendar days after receipt of each Time Impact Analysis unless subsequent meetings and negotiations are necessary. Upon mutual agreement by both parties, fragments illustrating the influence of Change Order and delays will be incorporated into the Project Schedule during the first update after agreement is reached.

E. Adjustments to Contract Time for Concurrent Delay:

1. The Contractor may make a claim for an extension of the Contract Time, subject to the following:
 - a. If an Excusable Delay and Compensable Delay occur concurrently, the maximum extension of the Contract Time shall be the number of days from the commencement of the first delay to the cessation of the delay which ends last.
 - b. If an Inexcusable Delay occurs concurrently with either an Excusable Delay and/or a Compensable Delay, the extension of the Contract Time shall be the number of days, if any, for which the Excusable Delay or the Compensable Delay extends beyond the concurrency with the Inexcusable Delay.

F. Delays due to Severe Weather

1. Definitions:
 - a. "Adverse weather" - atmospheric conditions at a definite time and place that are unfavorable to construction activities.
 - b. "Unusually severe weather" - weather that is more severe than the adverse weather anticipated for the season or location involved.
2. This provision specifies the procedure for determination of time extensions for unusually severe weather in accordance with the contract. In order for the Owner to award a time extension for unusually severe weather, the following conditions must be satisfied:
 - a. The weather experienced at the project site during the contract period must be found to be more severe than the adverse weather anticipated for the project location as defined by NOAA historical data five-year averages.
 - b. The unusually severe weather must cause a delay to the completion of the project. Project delay shall be demonstrated by a Time Impact Analysis.
 - c. The delay must be beyond the control of, and without the fault or negligence of, the Contractor.

1.12 SCHEDULE SOFTWARE SETTINGS AND RESTRICTIONS

- A. Activity Constraints: Date/time constraint(s), other than those required by the contract, are not allowed unless accepted by the Owner.
- B. Default Progress Data Disallowed: Actual Start and Actual Finish dates on the CPM schedule must match the dates on the Contractor Daily Reports.

- C. Software Settings: Handle schedule calculations and Out-of-Sequence progress (if applicable) through Retained Logic, not Progress Override. Show all activity durations and float values in days. Show activity progress using Remaining Duration. Set default activity type to "Task Dependent".
- D. At a minimum, include the following settings and parameters in Baseline Schedule preparation:
 - 1. General: Define or establish Calendars and Activity Codes at the "Project" level, not the "Global" level.
 - 2. Project Level, Dates Tab: Set "Must Finish By" date to "Contract Completion Date".
 - 3. Project Level, Defaults Tab:
 - a. Duration Type: Set to "Fixed Duration & Units".
 - b. Percent Complete Type: Set to "Physical".
 - c. Activity Type: Set to "Task Dependent".
 - 4. Project Level, Calculations Tab: Reset Remaining Duration and Units to Original: Must be Checked.
 - 5. Project Level, Settings Tab: Define Critical Activities: Check Longest Path.
 - 6. Activity Duration Types must be set to "Fixed Duration & Units".
 - 7. Percent Complete Types must be set to "Physical".
 - 8. Set Schedule Option for defining progressed activities to "Retained Logic."
 - 9. Activity Names must have the most defining and detailed description within the first 30 characters. All Activity Names must be unique.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION 013216

SECTION 013233 - PHOTOGRAPHIC 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 and Request for Proposal (RFP), apply to this Section.

1.2 SUMMARY

- A. Section includes administrative and procedural requirements for the following:
 - 1. Preconstruction photographs.
 - 2. Periodic construction photographs.
 - 3. Final completion construction photographs.
- B. Related Requirements:
 - 1. Section 017700 "Closeout Procedures" for submitting photographic documentation as Project Record Documents at Project closeout.
 - 2. Section 017900 "Demonstration and Training" for submitting video recordings of demonstration of equipment and training of Owner's personnel.
 - 3. Section 024116 "Structure Demolition" for photographic documentation before building demolition operations commence.

1.3 INFORMATIONAL SUBMITTALS

- A. Key Plan: Submit key plan of Project site and building with notation of vantage points marked for location and direction of each photograph and / or video recording. Plan shall be coordinated to provide best views of ongoing work. Coordinate number of locations and vantages with Owner. Plan shall indicate elevation or story of construction. Include same information as corresponding photographic documentation. Once plan is approved, plan shall be saved as a PDF in the Owner's PMIS system in the Photos section. Create a folder with the following naming convention: Key Plan_Project Name_Design-Builder Name. The Key Plan file shall be named as follows: Key Plan_Project Name_Design-Buidler Name_Date of Approval.
 - 1. Design-Builder understands that project conditions may warrant changes to the Key Plan as renovations continue or site variations dictate a change in location for photographs due to construction activities obstructing angles or views. Coordinate with Owner for updates to the Key Plan. Key Plan revisions shall be uploaded to the Key Plan folder created in PMIS utilizing the following naming convention: Key Plan_Revision #_Project Name_Design-Builder Name_Date of Approval.
- B. Key Plan Photos: All photographs relating to the Key Plan shall be uploaded to the Courts' PMIS site utilizing the Photos section of PMIS as follows:

1. Upload all image files to the PMIS system utilizing the Photos section. Photos shall be uploaded at the end of each week utilizing a folder designated by the weeks date in the following format: Project Name_Key Plan_YYYY.MM.DD (Revision # as required)
2. Identification: Provide the following information with each image description in file metadata tag that is uploaded to PMIS as above:
 - a. Name of Project.
 - b. Name of Design-Builder.
 - c. Date photograph was taken.
 - d. Unique sequential identifier keyed to accompanying key plan.

1.4 FORMATS AND MEDIA

- A. Digital Photographs: Provide color images in JPG format, produced by a digital camera with minimum sensor size of 12 megapixels, and at an image resolution of not less than 3200 by 2400 pixels, and with vibration-reduction technology. Use flash in low light levels or backlit conditions.
- B. Digital Images: Submit digital media as originally recorded in the digital camera, without alteration, manipulation, editing, or modifications using image-editing software.
- C. Metadata: Record accurate date and time and GPS location data from camera.
- D. File Names: Name media files with date Project area and sequential numbering suffix.

1.5 CONSTRUCTION PHOTOGRAPHS

- A. Usage Rights: All photographs of project site are considered property of the Owner and shall be furnished to Owner with full copyright usage rights.
- B. General: Take photographs with maximum depth of field and in focus.
 1. Maintain key plan with each set of construction photographs that identifies each photographic location.
- C. Preconstruction Photographs: Design-Builder shall document existing conditions by photographing the construction site and surrounding spaces. Refer to section 010000 as it relates to conditions of existing buildings and items to remain as they relate to the scope of work and impact of construction. These photographs shall be the responsibility of the Design-Builder and any irregular condition or issue with existing to remain conditions that would impact the work shall be identified and presented to Owner.
- D. This photographic documentation shall serve as the Design-Builders means by which to return temporary space designated for lay down, parking, or other activities relating to construction back to Owner and shall serve as proof of existing condition prior to impact due to construction. Periodic Construction Photographs: Design-Builder shall take no fewer than 20 periodic photographs of the project site as further means to show progress of work. These photographs are meant to be uploaded to the Courts' PMIS website in the Photos section of PMIS and shall be uploaded weekly. Design-Builder shall create a folder for each week with the following

naming convention: Project Name_Progress Photos_YYYY.MM.DD. Day shall be the Friday of the corresponding photos taken.

- E. Final Completion Construction Photographs: Take at least fifty (50) photographs, or as requested by the Owner, after date of Substantial Completion for submission as Project Record Documents. Owner will inform photographer of desired vantage points.
- F. Additional Photography: Owner may request photography in addition to periodic photographs specified. Additional photographs not included in the Contract Sum may be paid for by Change Order. Additional photographs may include:
 - 1. Three days' notice will be given, where feasible.
 - 2. In emergency situations, take additional photographs within 24 hours of request.
 - 3. Circumstances that could require additional photographs include, but are not limited to, the following:
 - a. Special events planned at Project site.
 - b. Immediate follow-up when on-site events result in construction damage or losses.
 - c. Photographs to be taken at fabrication locations away from Project site. These photographs are not subject to unit prices or unit-cost allowances.
 - d. Substantial Completion of a major phase or component of the Work.
 - e. Extra record photographs at time of final acceptance.
 - f. Owner's request for special publicity photographs.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION 013233

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 and provisions of the Request for Proposal (RFP), apply to this Section.

1.2 SUMMARY

A. Section Includes:

1. This Section includes certain administrative and procedural requirements for preparation of construction documents, shop drawings, coordination drawings, schedules, samples and certain other quality assurance submittals. This section also includes certain schedules and reports required for documenting the progress of construction during performance of the Work. The Design-Builder shall coordinate the timing for preparation and processing of schedules and reports with the performance of design and construction activities and maintain a consistent and logical correlation between updated schedules and reports.
2. Submittal schedule requirements.
3. Administrative and procedural requirements for submittals.

B. Related Requirements:

1. Section 011000 "Summary" for Construction Progress Documents kept in the Owner's project management database (PMIS).
2. Section 012900 "Payment Procedures" for submitting Applications for Payment and the schedule of values.
3. Section 013100 "Project Management and Coordination" for submitting coordination drawings and subcontract list and for requirements for web-based Project software.
4. Section 013200 "Construction Progress Documentation" for submitting schedules and reports, including Contractor's construction schedule.
5. Section 013233 "Photographic Documentation" for submitting preconstruction photographs, periodic construction photographs, and final completion construction photographs.
6. Section 017700 "Closeout Procedures" for submitting closeout submittals and maintenance material submittals.
7. Section 017823 "Operation and Maintenance Data" for submitting operation and maintenance manuals.
8. Section 017839 "Project Record Documents" for submitting record Drawings, record Specifications, and record Product Data.
9. Section 017900 "Demonstration and Training" for submitting video recordings of demonstration of equipment and training of Owner's personnel.

1.3 DEFINITIONS

- A. Action Submittals: Written and graphic information and physical samples that require Owner's responsive action. Action submittals are those submittals indicated in individual Specification Sections as "action submittals.

- B. Informational Submittals: Written and graphic information and physical samples that do not require Owner's responsive action. Submittals may be rejected for not complying with requirements. Informational submittals are those submittals indicated in individual Specification Sections as "informational submittals."
 - 1. Design data: Calculations, mix designs, analyses or other data pertaining to a part of work.
 - 2. Test Reports:
 - a. Report signed by authorized official of testing laboratory that a material, product or system identical to the material, product or system to be provided has been tested in accordance with specified requirements. (Testing must have been within three years of date of contract award for the project.)
 - b. Report which includes findings of a test required to be performed by the D-B on an actual portion of the work or prototype prepared for the project before shipment to job site.
 - c. Report which includes finding of a test made at the job site or on sample taken from the job site, on portion of work during or after installation.
 - d. Investigation reports.
 - e. Daily checklists.
 - f. Final acceptance test and operational test procedure.
 - 3. Certifications of compliance or conformance:
 - a. Statements signed by responsible officials of manufacturer of product, system or material attesting that product, system or material meets specification requirements. Must be dated after award of project contract and clearly name the project.
 - b. Document required of D-B, or of a supplier, installer or subcontractor through Contractor, the purpose of which is to further quality of orderly progression of a portion of the work by documenting procedures, acceptability of methods or personnel qualifications.
 - c. Confined space entry permits:
 - 4. Manufacturer's instructions:
 - a. Preprinted material describing installation of a product, system or material, including special notices and Material Safety Data sheets concerning impedances, hazards and safety precautions.
 - 5. Manufacturer's Field Reports:
 - a. Documentation of the testing and verification actions taken by manufacturer's representative to confirm compliance with manufacturer's standards or instructions.
 - b. Factory test reports.

6. Operation and Maintenance Data: Data furnished by the manufacturer or the system provider to detail procedures for safe and efficient operations, maintenance and repair of equipment.
7. Closeout Submittals:
 - a. Documentation to record compliance with technical or administrative requirements or to establish an administrative mechanism.
 - b. Operation and Maintenance manuals submitted at various stages and progression of construction.
- C. Definition of Required Documents: For clarity purposes, shop drawings, coordination drawings and schedules are further categorized and defined as follows:
 0. Shop drawings include drawings and schedules prepared for specific parts of the project, with the exception of coordination drawings.
 1. Coordination drawings are specified in Section 013100 Project Management and Coordination.
 2. Product data includes manufacturer's standard catalogs, pamphlets and other printed materials, and includes, but is not limited to, the following:
 - a. Product specifications.
 - b. Installation instructions.
 - c. Color charts.
 - d. Catalog cuts.
 - e. Rough-in diagrams and templates.
 - f. Wiring diagrams.
 - g. Performance curves.
 - h. Operational range diagrams.
 - i. Mill reports.
 - j. Test and Start-up requirements.
 - k. Testing and balancing as required.
- D. Samples: Samples may, as accepted by the Owner, be of such scale as to allow a delivery for review as well as for field samples, benchmarks, and mock-ups of full-size physical examples erected onsite or elsewhere to establish a true-scale standard by which the corresponding work will be judged or used as a standard for compliance testing.
- E. Other Submittals: Other quality assurance submittals include materials specifically prepared for the project include but are not limited to the following:
 1. Design and construction documents
 2. Design data and calculations.
 3. Certifications of compliance or conformance.
 4. Manufacturer's instructions and field reports.
 5. Manufacturer's Start-up and Test Reports.
 6. Commissioning Construction Verification Checklists.

7. Commissioning Functional Performance Tests.
 8. Commissioning Integrated System Tests.
- F. Owner acceptance of submittals do not supersede the requirements of the contract documents and the Owner's acceptance of a submittal does not relieve the Design-Builder of its responsibility to perform all work in accordance with the requirements of the contract documents.

1.4 GENERAL SUBMITTAL REQUIREMENTS

- A. Submittals: All submittals shall be made to the Owner only after the review and acceptance by the Design-Builder's DOR. The Owner has fourteen (14) calendar days to review and comment on the Design-Builder's submittals.
- B. Construction Quality Control: The D-B Quality Control organization is responsible for reviewing and certifying that submittals comply with the contract requirements.
- C. The Owner's review of Submittals is informational in nature only and is meant as a verification of conformance to Owner's design and material standards and design criteria outlined for the project. Owner's acceptance of submittals does not relieve the Design-Builder's obligation to the contract drawings or Owner's standards. Owner's review of submittals shall not delay or be construed to delay the submittal process or work progression. Owner's review is not conducted for the purpose of determining the accuracy, completeness of design, and other details such as dimensions and quantities.
- D. Coordination: Coordinate preparation and processing of submittals with performance of construction activities and with the Submittal Schedule specified in Section 014000 Quality Requirements and elsewhere in the contract documents. Submittals shall be transmitted within thirty (30) calendar days after directive to approval with construction unless the acceptance Submittal Schedule specifically provides for a later submission. Transmit each submittal sufficiently in advance of the scheduled performance of related construction activities to avoid delaying the Work, allowing for the review times specified herein, in Section 014000 Quality Requirements, and elsewhere in the Contract documents.
1. Coordinate each submittal with other submittals and related activities that require sequential scheduling, to allow for testing, purchase, fabrication and product delivery in a timely manner.
 2. Schedule transmittal of different categories of submittals for the same element of Work and for different elements of related parts of the Work at the same time. Coordinate submittals to enable acceptances so as not to inhibit orderly progress of the Work.
 3. Post electronic submittals as PDF electronic files directly to the project PMIS.
 4. Allow sufficient time for submittal review, corrections following the initial review, and re-submittal review before activities scheduled after the submittal acceptance.
 5. Failure on the part of the Design-Builder to indicate acceptance on submittals by the Design Builder's DOR prior to submission to the Owner will result in the submittal(s) being returned. .
 6. Any resubmission required after Owner review shall be made within fourteen (14) calendar days after return of the submittal, unless specifically authorized otherwise by the Owner or stated explicitly within this specification.

7. Submittals which are determined to be incomplete or otherwise substandard will be returned to the Design-Builder with no further review. Delays due to incomplete or rejected submittals will not be excused and shall be remedied with no additional cost to the Owner.
8. Submittals which are determined to be partial submittals or submittals for which necessary correlated submissions have not been received will be returned to the Design-Builder with no further review. Delays due to incomplete or rejected submittals will not be excused and shall be remedied with no additional cost to the Owner.
9. Submittal review does not constitute acceptance of safety precautions, or construction means, methods, techniques, sequences or procedures.
10. Construction will not be allowed to proceed if submittals are not received in a timely manner and will not result in an extension to the Contract Project Completion Date.
11. Failure by the Design-Builder to provide the required submittals in a timely manner may result in progress payment Applications being returned to the Design-Builder until submittals are up to date.
12. Maintain an organized submittal register on PMIS. This will be an agenda item for the progress meetings.

1.5 SUBMITTAL SCHEDULE

- A. Initial Submittal Schedule: Submit within fourteen (14) calendar days after acceptance of the 65% Design Submission
- B. Final Submittal Schedule: Within fourteen (14) calendar days after acceptance of the Issued for Construction (100%) Documents, D-B shall submit, as an action submittal, a list of submittals, arranged in chronological order by dates required by construction schedule. Include time required for review, ordering, manufacturing, fabrication, and delivery when establishing dates. Include additional time required for making corrections or revisions to submittals noted by the Owner and additional time for handling and reviewing submittals required by those corrections.
 1. Coordinate submittal schedule with list of subcontracts, the schedule of values, and Design-Builder's construction schedule.
 2. Format: Arrange the following information in a tabular format:
 - a. Scheduled date for first submittal.
 - b. Specification Section number and title.
 - c. Submittal Category: Action; informational.
 - d. Name of subcontractor.
 - e. Description of the Work covered.
 - f. Scheduled date for Owner's final release or acceptance.
 - g. Scheduled dates for purchasing.
 - h. Scheduled date of fabrication.
 - i. Scheduled dates for installation.
 - j. Activity or event number.

1.6 SUBMITTAL FORMATS

- A. Submittal Information: Include the following information in each submittal:
 1. Project name.

2. Date.
3. Name of Owner.
4. Name of Design-Builder.
5. Name of firm or entity that prepared submittal.
6. Names of subcontractor, manufacturer, and supplier.
7. Unique submittal number, including revision identifier. Include Specification Section number with sequential alphanumeric identifier and alphanumeric suffix for resubmittals.
8. Category and type of submittal.
9. Submittal purpose and description.
10. Number and title of Specification Section, with paragraph number and generic name for each of multiple items.
11. Drawing number and detail references, as appropriate.
12. Indication of full or partial submittal. Partial submittals will not be reviewed.
13. Location(s) where product is to be installed, as appropriate.
14. Other necessary identification.
15. Remarks.
16. Signature of transmitter.

- B. Options: Identify options requiring selection by the Owner.
- C. Deviations and Additional Information: On each submittal, clearly indicate deviations from requirements in the Contract Documents, including minor variations and limitations; include relevant additional information and revisions, other than those requested by the Owner on previous submittals. Indicate by highlighting on each submittal or noting on attached separate sheet.
- D. Electronic PDF Submittals: Prepare submittals as a searchable PDF package, incorporating complete information into each PDF file. Name PDF file with submittal number.
- E. Submittals utilizing Web-Based Project Software: Prepare submittals as PDF files, or other format uploaded to PMIS.

1.7 SUBMITTAL PROCEDURES

1.1 D-B CONTRACTOR REVIEW

- . Action and Informational Submittals: Review each submittal and check for coordination with other Work of the Contract and for compliance with the Contract Documents. Note corrections and field dimensions. Mark up with review comments before submitting to D-B DOR.
- A. The D-B Contractor shall be responsible for quantities, weights, and dimensions to be confirmed and correlated at the site; for information that pertains solely to the fabrication processes and to the means, methods, techniques, sequences, and procedures of construction; and for coordination of the work of all trades.
- B. The D-B Contractor shall be responsible for the submittal to be in conformance with information given and the design concept expressed in the Contract Documents.
- C. The D-B Contractor with each submission shall provide specific written notice of any variation from the requirements of the Contract Documents by causing a specific notation to be made on the Submittal attachments or the Submittal-Transmittal.

- D. The D-B Contractor shall affix its own Submittal Review Stamp to all submittals and note with appropriate Review Code. D-B DOR will not review submittals that do not include a completed Contractor's Submittal Review stamp.

1.1 D-B DOR AND D-B CONTRACTOR ACTION

- . Action Submittals: D-B DOR's staff and consultants will review the submittal and mark the Submittal with an action code. The code meanings are described below.
- A. D-B DOR shall coordinate Owner reviews of submittals and include comments of Owner and corresponding Review Code.
- B. Additional codes may be provided within comments or as an electronic submittal review stamp and shall be used in help indicating return of partial submittals.
- C. The Final Review Code on the Submittal prevails and governs the action of the overall submittal.
- D. Review Code meanings are as follows:
 - 1. Action Codes Permitting Use:
 - a. When an action code permitting use is assigned to a submittal, it does not authorize work that does not comply with the requirements of the Contract Documents. Acceptance of the Work will depend on compliance.
 - b. Code AP - Approved: The Work covered by the submittal item may proceed, provided it complies with Contract Document requirements.
 - c. Code AN - Approved as Noted: The Work covered by the submittal item may proceed, provided it complies with the DOR's notations and Contract Document requirements.
 - d. Code AN-R - Approved as Noted - Resubmit: Do not deliver or install the related work until the resubmittal has received Code AP or AN. However, fabrication and other off-site work covered by the submittal item may proceed, at the Contractor's risk, provided it complies with the DOR's notations and Contract Document requirements.
 - 2. Action Code Prohibiting Use:
 - a. Action Code REJ - Not Approved: The Work covered by the submittal item, including purchasing, fabrication, delivery, and other activity, shall not proceed. Revise the submittal item or prepare a new item in accordance with the DOR's notations. Resubmit the corrected or new item without delay; do not permit submittal items marked "Not Approved" to be used. Work incorporating such items will be rejected.
 - 3. Action Code for Items Not Required:
 - a. Action Code X - Not Requested by Contract Documents: The submittal item is not called for by the Contract Documents and is being returned unreviewed by the DOR except to the extent necessary to determine its status.
- E. Informational Submittals: For D-B DOR's information only. D-B DOR and D-B Contractor will review each submittal and will not return it or will return it if it does not comply with requirements. D-B DOR and D-B Contractor will forward each submittal to the appropriate party.
 - 1. Action Code for Information Only:
 - a. Action Code INF - Information Only - Received: The submittal item is not called for a return with a reviewed action code by the Contract Documents and is being returned unreviewed by the DOR except to the extent necessary to determine its status.

- F. Partial submittals prepared for a portion of the Work will be reviewed when use of partial submittals has received prior approval from D-B DOR and D-B Contractor.
- G. Incomplete submittals are unacceptable, will be considered nonresponsive, and will be returned without review.
- H. D-B DOR and D-B Contractor will return without review or discard submittals received from sources other than the Contractor.
- I. Prepare and submit submittals required by individual Specification Sections. Types of submittals are indicated in individual Specification Sections.
 - 1. Web-Based Project Software: Prepare submittals in PDF form, and upload to web-based . Enter required data in web-based software site to fully identify submittal.
 - 2. Design-Builder shall establish submittal review workflow. Assign workflows to all submittals which include review by Owner.
- J. Coordination: Coordinate preparation and processing of submittals with performance of construction activities.
 - 1. Coordinate each submittal with fabrication, purchasing, testing, delivery, other submittals, and related activities that require sequential activity.
 - 2. Submit all submittal items required for each Specification Section concurrently. No partial submittals for portions of the Work shall be reviewed or accepted.
 - 3. Submit action submittals and informational submittals required by the same Specification Section as separate packages under separate transmittals.
 - 4. Coordinate transmittal of submittals for related parts of the Work specified in different Sections so processing will not be delayed because of need to review submittals concurrently for coordination.
 - a. Submittals shall be complete for each definable feature of work; submit components of definable feature interrelated as a system at the same time.
 - b. Acceptance of a separate material, product, or component does not imply acceptance of assembly in which item functions.
 - c. The Owner reserves the right to withhold action on a submittal requiring coordination with other submittals until related submittals are received.
 - d. The Owner will not review partial submittals.
- K. Processing Time: Allow time for submittal review, including time for resubmittals, as follows. Time for review shall commence upon Owner's receipt of submittal in PMIS. 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 fourteen (14) calendar days for initial review of each submittal. Allow additional time if coordination with subsequent submittals is required. The Owner will advise the Design-Builder 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. Resubmitted Review: Allow fourteen (14) calendar days for review of each resubmittal.
- L. Resubmittals: Make resubmittals in same form and number of copies as initial submittal.

1. Note date and content of previous submittal.
 2. Note date and content of revision in label or title block and clearly indicate extent of revision.
 3. Resubmit submittals until they are marked with an acceptance notation from Owner.
 4. Resubmittal number should be the original submittal number, with a revision number.
- M. Use for Construction: Use only final action submittals that are marked with acceptance notation from the D-B DOR.

1.2 SUBMITTAL REQUIREMENTS

- A. Product Data: Collect information into a single submittal for each element of construction and type of product or equipment.
1. If information must be specially prepared for submittal because standard published data are unsuitable for use, submit as Shop Drawings, not as Product Data.
 2. Mark each copy of each submittal to show which products and options are applicable.
 3. Include the following information, as applicable:
 - a. Manufacturer's catalog cuts.
 - b. Manufacturer's product specifications.
 - c. Standard color charts.
 - d. Statement of compliance with specified referenced standards.
 - e. Testing by recognized testing agency.
 - f. Application of testing agency labels and seals.
 - g. Notation of coordination requirements.
 - h. Availability and delivery time information.
 4. For equipment, include the following in addition to the above, as applicable:
 - a. Wiring diagrams that show factory-installed wiring.
 - b. Printed performance curves.
 - c. Operational range diagrams.
 - d. Clearances required to other construction, if not indicated on accompanying Shop Drawings.
 - e. Mock-ups
 - f. Equipment engineering requirements for connection to building systems.
 - g. Installation guidelines and details.
 - h. Where required site-specific installation drawings.
 5. Submit Product Data before Shop Drawings, and before or concurrent with Samples.
- B. Shop Drawings: Prepare Project-specific information, drawn accurately to scale. Do not base Shop Drawings on reproductions of the Contract Documents or standard printed data.
1. Preparation: Fully illustrate requirements in the Contract Documents. Include the following information, as applicable:
 - a. Identification of products.
 - b. Schedules.

- c. Compliance with specified standards.
 - d. Notation of coordination requirements.
 - e. Notation of dimensions established by field measurement.
 - f. Relationship and attachment to adjoining construction clearly indicated.
 - g. Seal and signature of professional engineer if specified.
- C. Samples: Submit Samples for review of kind, color, pattern, and texture for a check of these characteristics with other materials.
 - 1. Transmit Samples that contain multiple, related components such as accessories together in one submittal package.
 - 2. Identification: Permanently attach label on unexposed side of Samples that includes the following:
 - a. Project name and submittal number.
 - b. Generic description of Sample.
 - c. Product name and name of manufacturer.
 - d. Sample source.
 - e. Number and title of applicable Specification Section.
 - f. Specification paragraph number and generic name of each item.
 - 3. Web-Based Project Software: Prepare submittals in PDF form, and upload to web-based PMIS. Enter required data in web-based software site to fully identify submittal.
 - 4. Paper Transmittal: Include paper transmittal including complete submittal information indicated with sample.
 - 5. Disposition: Maintain sets of acceptance 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 not otherwise designated as Owner's property, are the property of Contractor.
 - 6. Samples for Initial Selection: Submit manufacturer's color charts consisting of units or sections of units showing the full range of colors, textures, and patterns available.
 - a. Number of Samples: Submit one (1) full set(s) of available choices where color, pattern, texture, or similar characteristics are required to be selected from manufacturer's product line. Owner will return submittal with options selected.
 - 7. Samples for Verification: Submit full-size units or Samples of size indicated, prepared from same material to be used for the Work, cured and finished in manner specified, and physically identical with material or product proposed for use, and that show full range of color and texture variations expected. Samples include, but are not limited to, the following: partial sections of manufactured or fabricated components; small cuts or containers of materials; complete units of repetitively used materials; swatches showing color, texture, and pattern; color range sets; and components used for independent testing and inspection.
 - a. Number of Samples: Submit two (2) sets of Samples. Owner will retain one (1) Sample set; remainder will be returned. Retain one returned Sample set as a project record Sample.

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

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

1.3 SUBSTITUTION REQUEST PROCEDURES

- A. Owner acceptance is required for any proposed deviation or substitution from the accepted design which still complies with the contract before the Design-Builder is authorized to proceed with material acquisition or installation. The Owner reserves the right to reject any deviation from the design which may impact furniture, furnishings, equipment selections or operations decisions that were made, based on the reviewed and concurred design. See Section 012500 Substitution Procedures.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION 013300

SECTION 013591 - HISTORIC TREATMENT PROCEDURES

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes general protection and treatment procedures for designated historic spaces, areas, rooms, and surfaces in Project.

1.2 DEFINITIONS

- A. Consolidate: To strengthen loose or deteriorated materials in place.
- B. Design Reference Sample: A sample that represents Owner's prebid selection of work to be matched; it may be existing work or work specially produced for Project.
- C. Dismantle: To disassemble or detach a historic item from a surface, or a nonhistoric item from a historic surface, using gentle methods and equipment to prevent damage to historic items and surfaces; disposing of items unless indicated to be salvaged or reinstalled.
- D. Historic: Spaces, areas, rooms, surfaces, materials, finishes, and overall appearance that are important to the successful preservation, restoration and reconstruction as determined by Design-Build Contractor. Designated historic spaces, areas, rooms, and surfaces are indicated on Bridging Concept Core & Shell Drawings and Core and Shell Basis of Design.
- E. Match: To blend with adjacent construction and manifest no apparent difference in material type, species, cut, form, detail, color, grain, texture, or finish; as approved by Owner.
- F. Refinish: To remove existing finishes to base material and apply new finish to match original, or as otherwise indicated.
- G. Reinstall: To protect removed or dismantled item, repair and clean it as indicated for reuse, and reinstall it in original position, or where indicated.
- H. Remove: To take down or detach a nonhistoric item located within a historic space, area, or room, using methods and equipment to prevent damage to historic items and surfaces; disposing of items unless indicated to be salvaged or reinstalled.
- I. Repair: To correct damage and defects, retaining existing materials, features, and finishes while employing as little new material as possible. This includes patching, piecing-in, splicing, consolidating, or otherwise reinforcing or upgrading materials.
- J. Replace: To remove, duplicate, and reinstall entire item with new material. The original item is the pattern for creating duplicates unless otherwise indicated.
- K. Replicate: To reproduce in exact detail, materials, and finish unless otherwise indicated.
- L. Reproduce: To fabricate a new item, accurate in detail to the original, and from either the same or a similar material as the original, unless otherwise indicated.
- M. Restore: To consolidate, replicate, reproduce, repair, and refinish as required to achieve the indicated results.
- N. Retain: To keep an element or detail secure and intact.
- O. Reversible: New construction work, treatments, or processes that can be removed or undone in the future without damaging historic materials unless otherwise indicated.
- P. Salvage: To protect removed or dismantled items and deliver them to Owner[**ready for reuse**].

- Q. Stabilize: To provide structural reinforcement of unsafe or deteriorated items while maintaining the essential form as it exists at present; also, to reestablish a weather-resistant enclosure.
- R. Strip: To remove existing finish down to base material unless otherwise indicated.

1.3 COORDINATION

- A. Historic Treatment Subschedule: A construction schedule coordinating the sequencing and scheduling of historic treatment work for entire Project, including each activity to be performed in historic spaces, areas, and rooms, and on historic surfaces; and based on Contractor's Construction Schedule. Secure time commitments for performing critical construction activities from separate entities responsible for historic treatment work.
 - 1. Schedule construction operations in sequence required to obtain best historic treatment results.
 - 2. Coordinate sequence of historic treatment work activities to accommodate the following:
 - a. Other known work in progress.
 - b. Tests and inspections.
 - 3. Detail sequence of historic treatment work, with start and end dates.
 - 4. Equipment Data: List gross loaded weight, axle-load distribution, and wheel-base dimension data for mobile and heavy equipment proposed for use. Do not use such equipment without certification from Contractor's professional engineer that the structure can support the imposed loadings without damage.

1.4 PROJECT MEETINGS FOR HISTORIC TREATMENT

- A. Preliminary Historic Treatment Conference: Before starting historic treatment work, Design-Build Contractor will conduct conference at Project site.
 - 1. Attendees: In addition to representatives of Owner, Construction Manager, Design-Build Contractor, testing service representative, historic treatment specialists, chemical-cleaner manufacturer(s), and installers whose work interfaces with or affects historic treatment shall be represented at the meeting.
 - 2. Agenda: Discuss items of significance that could affect progress of historic treatment work, including review of the following:
 - a. Historic Treatment Subschedule: Discuss and finalize; verify availability of materials, historic treatment specialists' personnel, equipment, and facilities needed to make progress and avoid delays.
 - b. Fire-prevention plan.
 - c. Governing regulations.
 - d. Areas where existing construction is to remain and the required protection.
 - e. Hauling routes.
 - f. Sequence of historic treatment work operations.
 - g. Storage, protection, and accounting for salvaged and specially fabricated items.
 - h. Existing conditions, staging, and structural loading limitations of areas where materials are stored.
 - i. Qualifications of personnel assigned to historic treatment work and assigned duties.
 - j. Requirements for extent and quality of work, tolerances, and required clearances.
 - k. Methods and procedures related to historic treatments, including product manufacturers' written instructions and precautions regarding historic treatment procedures and their effects on materials, components, and vegetation.
 - l. Embedded work such as flashings and lintels, special details, collection of wastes, protection of occupants and the public, and condition of other construction that affect the Work or will affect the work.

3. Reporting: Record conference results and distribute copies to everyone in attendance and to others affected by decisions or actions resulting from conference.
- B. Coordination Meetings: Conduct specifically for historic treatment work at bi-weekly intervals. Coordination meetings are in addition to specific meetings held for other purposes, such as progress meetings and preinstallation conferences.
 1. Attendees: In addition to representatives of Owner, **Construction Manager**, and Design-Build Contractor, each historic treatment specialist, supplier, installer, and other entity concerned with progress or involved in planning, coordination, or performance of historic treatment work activities shall be represented at these meetings. All participants at conference shall be familiar with Project and authorized to conclude matters relating to historic treatment work.
 2. Agenda: Review and correct or approve minutes of previous coordination meeting. Review other items of significance that could affect progress of historic treatment work. Include topics for discussion as appropriate to status of Project.
 - a. Historic Treatment Subschedule: Review progress since last coordination meeting. Determine whether each schedule item is on time, ahead of schedule, or behind schedule. Determine how construction behind schedule will be expedited with retention of quality; secure commitments from parties involved to do so. Discuss whether schedule revisions are required to ensure that current and subsequent activities are completed within the Contract Time.
 - b. Schedule Updating: Revise Contractor's Historic Treatment Subschedule after each coordination meeting where revisions to schedule have been made or recognized. Issue revised schedule concurrently with report of each meeting.
 - c. Review present and future needs of each entity present, including review items listed in the "Preliminary Historic Treatment Conference" Paragraph in this article and the following:
 - 1) Interface requirements of historic treatment work with other Project Work.
 - 2) Status of submittals for historic treatment work.
 - 3) Access to historic treatment work.
 - 4) Effectiveness of fire-prevention plan.
 - 5) Quality and work standards of historic treatment work.
 - 6) Change Orders for historic treatment work.
 3. Reporting: Record meeting results and distribute copies to everyone in attendance and to others affected by decisions or actions resulting from each meeting.

1.5 MATERIALS OWNERSHIP

- A. Historic items, relics, and similar objects including, but not limited to, cornerstones and their contents, commemorative plaques and tablets, antiques, and other items of interest or value to Owner that may be encountered or uncovered during the Work, regardless of whether they were previously documented, remain Owner's property.
 1. Dismantle and salvage each item or object and protect it from damage, then promptly deliver it to Owner where directed on site.
 2. Coordinate with Owner who will establish special procedures for dismantling and salvaging.

1.6 INFORMATIONAL SUBMITTALS

- A. Historic Treatment Subschedule:
 1. Submit historic treatment subschedule within 30 days of date established for commencement of historic treatment work.

- B. Preconstruction Documentation: Show preexisting conditions of adjoining construction and site improvements, including finish surfaces, that might be misconstrued as damage caused by Contractor's historic treatment operations.
- C. Historic Treatment Program: Submit 30 days before work begins.
- D. Fire-Prevention Plan: Submit 30 days before work begins.

1.7 QUALITY ASSURANCE

- A. Historic Treatment Specialist Qualifications: An experienced firm regularly engaged in historic treatments similar in nature, materials, design, and extent to the work as specified in each Section and that has completed a minimum of five recent projects with a record of successful in-service performance that demonstrates the firm's qualifications to perform this work.
 - 1. Field Supervisor Qualifications: Full-time supervisors experienced in historic treatment work similar in nature, material, design, and extent to that indicated for this Project. Supervisors shall be on site when historic treatment work begins and during its progress. Supervisors shall not be changed during Project except for causes beyond control of the specialist firm.
 - a. Provide new mockups of required work whenever a supervisor is replaced.
- B. Historic Treatment Program: Prepare a written plan for historic treatment for whole Project, including each phase or process and protection of surrounding materials during operations. Describe in detail the materials, methods, and equipment to be used for each phase of work. Show compliance with indicated methods and procedures specified in this and other Sections. Coordinate this whole-Project historic treatment program with specific requirements of programs required in other historic treatment Sections.
 - 1. Dust and Noise Control: Include locations of proposed temporary dust- and noise-control partitions and means of egress from occupied areas coordinated with continuing on-site operations and other known work in progress.
 - 2. Debris Hauling: Include plans clearly marked to show debris hauling routes, turning radii, and locations and details of temporary protective barriers.
- C. Fire-Prevention Plan: Prepare a written plan for preventing fires during the Work, including placement of fire extinguishers, fire blankets, rag buckets, and other fire-control devices during each phase or process. Coordinate plan with Owner's fire-protection equipment and requirements. Include fire-watch personnel's training, duties, and authority to enforce fire safety.
- D. Safety and Health Standard: ANSI/ASSP A10.6.

1.8 STORAGE AND HANDLING OF HISTORIC MATERIALS

- A. Identification: Photograph, tag, and catalog historic items to be salvaged or reinstalled.
 - 1. Identify each item with a nonpermanent location identification tag indicating item name or use, location, and location identification number to document its original location. Indicate original locations on plans, elevations, sections, or photographs by annotating the identifying tag.
 - a. For groups of material, such as brick, provide location identification tag for pallet or container. Do not tag individually.
- B. Salvaged Historic Materials:

1. Clean loose dirt and debris from salvaged historic items unless more extensive cleaning is indicated.
 2. Pack or crate items after cleaning; cushion against damage during handling. Label contents of containers.
 3. Store items in a secure area until delivery to Owner.
 4. Transport items to Owner's storage area designated by Owner.
 5. Protect items from damage during transport and storage.
- C. Historic Materials for Reinstallation:
1. Repair and clean historic items for reuse as indicated.
 2. Pack or crate items after cleaning and repairing; cushion against damage during handling. Label 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 unless otherwise indicated. Provide connections, supports, and miscellaneous materials to make items functional for use indicated.
- D. Existing Historic Materials to Remain: Protect construction indicated to remain against damage and soiling from construction work. Where permitted by Owner, items may be dismantled and taken to a suitable, protected storage location during construction work and reinstalled in their original locations after historic treatment and construction work in the vicinity is complete.
- E. Storage: Store historic items within a weathertight enclosure where they are protected from moisture, weather, condensation, and freezing temperatures.
1. Secure stored materials to protect from theft.
 2. Control humidity so that it does not exceed 85 percent. Maintain temperatures **5 deg F (3 deg C)** or more above the dew point.
- F. Storage Space:
1. Coordinate with Owner for off-site locations for storage and protection of historic material that cannot be stored and protected on-site, including security and climate control.
- 1.9 FIELD CONDITIONS
- A. Size Limitations in Historic Spaces: Materials, products, and equipment used for performing the Work and for transporting debris, materials, and products shall be of sizes that clear surfaces within historic spaces, areas, rooms, and openings, including temporary protection, by 12 inches or more.

PART 2 - PRODUCTS - (NOT USED)

PART 3 - EXECUTION

3.1 PROTECTION

- A. Protect persons, motor vehicles, surrounding surfaces of building, building site, plants, and surrounding buildings from harm resulting from historic treatment procedures.
1. Use only proven protection methods, appropriate to each area and surface being protected.
 2. Provide temporary barricades, barriers, and directional signage to exclude the public from areas where historic treatment work is being performed.
 3. Erect temporary barriers to form and maintain fire-egress routes.
 4. Erect temporary protective covers over walkways and at points of pedestrian and vehicular entrance and exit that must remain in service during historic treatment work.
 5. Contain dust and debris generated by historic treatment work, and prevent it from

- reaching the public or adjacent surfaces.
 - 6. Provide shoring, bracing, and supports as necessary. Do not overload structural elements.
 - 7. Protect floors and other surfaces along hauling routes from damage, wear, and staining.
 - B. Temporary Protection of Historic Materials:
 - 1. Protect existing historic materials with temporary protections and construction. Do not remove existing materials unless otherwise indicated.
 - 2. Do not attach temporary protection to historic surfaces except as indicated as part of the historic treatment program and approved by Owner.
 - C. Comply with each product manufacturer's written instructions for protections and precautions. Protect against adverse effects of products and procedures on people and adjacent materials, components, and vegetation.
 - D. Utility and Communications Services:
 - 1. Notify Owner, authorities having jurisdiction, and entities owning or controlling wires, conduits, pipes, and other services affected by historic treatment work before commencing operations.
 - 2. Disconnect and cap pipes and services as required by authorities having jurisdiction, as required for historic treatment work.
 - 3. Maintain existing services unless otherwise indicated; keep in service, and protect against damage during operations. Provide temporary services during interruptions to existing utilities.
 - E. Existing Drains: Prior to the start of work in an area, test drainage system to ensure that it is functioning properly. Notify Owner immediately of inadequate drainage or blockage. Do not begin work in an area until the drainage system is functioning properly.
 - 1. Prevent solids such as stone or mortar residue or other debris from entering the drainage system. Clean out drains and drain lines that become sluggish or blocked by sand or other materials resulting from historic treatment work.
 - 2. Protect drains from pollutants. Block drains or filter out sediments, allowing only clean water to pass.
- 3.2 PROTECTION FROM FIRE
- A. Follow fire-prevention plan and the following:
 - 1. Comply with NFPA 241 requirements unless otherwise indicated.
 - 2. Remove and keep area free of combustibles, including rubbish, paper, waste, and chemicals, unless necessary for the immediate work.
 - a. If combustible material cannot be removed, provide fire blankets to cover such materials.
 - 3. Prohibit smoking by all persons within Project work and staging areas.
 - B. Heat-Generating Equipment and Combustible Materials: Comply with the following procedures while performing work with heat-generating equipment or combustible materials, including welding, torch-cutting, soldering, brazing, removing paint with heat, or other operations where open flames or implements using high heat or combustible solvents and chemicals are anticipated:
 - 1. Obtain Owner's approval for operations involving use of open-flame or welding or other high-heat equipment. Notify Owner at least 72 hours before each occurrence, indicating location of such work.
 - 2. As far as practicable, restrict heat-generating equipment to shop areas or outside the building.
 - 3. Do not perform work with heat-generating equipment in or near rooms or in areas where flammable liquids or explosive vapors are present or thought to be present. Use a

- combustible gas indicator test to ensure that area is safe.
4. Use fireproof baffles to prevent flames, sparks, hot gases, or other high-temperature material from reaching surrounding combustible material.
 5. Prevent the spread of sparks and particles of hot metal through open windows, doors, holes, and cracks in floors, walls, ceilings, roofs, and other openings.
 6. Fire Watch: Before working with heat-generating equipment or combustible materials, station personnel to serve as a fire watch at each location where such work is performed. Fire-watch personnel shall have the authority to enforce fire safety. Station fire watch according to NFPA 51B, NFPA 241, and as follows:
 - a. Train each fire watch in proper operation of fire-control equipment and alarms.
 - b. Prohibit fire-watch personnel from other work that would distract from fire-watch duties.
 - c. Cease work with heat-generating equipment whenever fire-watch personnel are not present.
 - d. Have fire-watch personnel perform final fire-safety inspection each day beginning no sooner than 30 minutes after conclusion of work in each area to detect hidden or smoldering fires and to ensure that proper fire prevention is maintained.
 - e. Maintain fire-watch personnel at each area of Project site until two hours after conclusion of daily work.
- C. Fire-Control Devices: Provide and maintain fire extinguishers, fire blankets, and rag buckets for disposal of rags with combustible liquids. Maintain each as suitable for type of fire risk in each work area. Ensure that nearby personnel and fire-watch personnel are trained in fire-extinguisher and blanket use.
- D. Sprinklers: Where sprinkler protection exists and is functional, maintain it without interruption while operations are being performed. If operations are performed close to sprinklers, shield them temporarily with guards.
1. Remove temporary guards at the end of work shifts, whenever operations are paused, and when nearby work is complete.
- 3.3 PROTECTION DURING APPLICATION OF CHEMICALS
- A. Protect motor vehicles, surrounding surfaces of building being restored, building site, plants, and surrounding buildings from harm or spillage resulting from applications of chemicals and adhesives.
 - B. Cover adjacent surfaces with protective materials that are proven to resist chemicals selected for Project unless chemicals being used will not damage adjacent surfaces as indicated in historic treatment program. Use covering materials and masking agents that are waterproof and UV resistant and that will not stain or leave residue on surfaces to which they are applied. Apply protective materials according to manufacturer's written instructions. Do not apply liquid masking agents or adhesives to painted or porous surfaces. When no longer needed, promptly remove protective materials.
 - C. Do not apply chemicals during winds of sufficient force to spread them to unprotected surfaces.
 - D. Neutralize alkaline and acid wastes and legally dispose of off Owner's property.
 - E. Collect and dispose of runoff from chemical operations by legal means and in a manner that prevents soil contamination, soil erosion, undermining of paving and foundations, damage to landscaping, or water penetration into building interior.
- 3.4 GENERAL HISTORIC TREATMENT
- A. Have historic treatment work performed only by qualified historic treatment specialists.

- B. Ensure that supervisory personnel are present when historic treatment work begins and during its progress.
 - C. Record existing work before each procedure (preconstruction), and record progress during the work. Use digital preconstruction documentation photographs. Comply with requirements in Section 013233 "Photographic Documentation."
 - D. Perform daily inspections of Project site as the Work progresses to detect hazards resulting from historic treatment procedures.
 - E. Follow the procedures in subparagraphs below and procedures approved in historic treatment program unless otherwise indicated:
 - 1. Retain as much existing material as possible; repair and consolidate rather than replace.
 - 2. Use additional material or structure to reinforce, strengthen, prop, tie, and support existing material or structure.
 - 3. Use reversible processes wherever possible.
 - 4. Use historically accurate repair and replacement materials and techniques unless otherwise indicated.
 - 5. Record existing work before each procedure (preconstruction) and progress during the work with digital preconstruction documentation photographs. Comply with requirements in Section 013233 "Photographic Documentation."
 - F. Notify Owner of visible changes in the integrity of material or components whether from environmental causes including biological attack, UV degradation, freezing, or thawing or from structural defects including cracks, movement, or distortion.
 - 1. Do not proceed with the work in question until directed by Owner.
 - G. Where work requires existing features to be removed or dismantled and reinstalled, perform these operations without damage to the material itself, to adjacent materials, or to the substrate.
 - H. Identify new and replacement materials and features with permanent marks hidden in the completed Work to distinguish them from original materials. Record a legend of identification marks and the locations of the items on record Drawings.
- 3.5 HISTORIC TREATMENT SCHEDULE
- A. Spaces, areas, rooms, and surfaces requiring special care and treatment to ensure successful preservation, restoration, and reconstruction are indicated on Core and Shell Bridging Concept Drawings and Basis of Design.

END OF SECTION 013591

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 and Request for Proposal (RFP), apply to this Section.

1.2 SUMMARY

- A. Section includes administrative and procedural requirements for quality assurance and quality control.
- B. Testing and inspection services are required to verify compliance with requirements specified or indicated. These services do not relieve Design-Builder of responsibility for compliance with the Contract Document requirements.
 - 1. Specific quality assurance and quality control requirements for individual work results are specified in their respective Specification Sections. Requirements in individual Sections may also cover production of standard products.
 - 2. Specified tests, inspections, and related actions do not limit Design-Builder's other quality assurance and quality control procedures that facilitate compliance with the Contract Document requirements.
 - 3. Requirements for Design-Builder to provide quality assurance and quality control services required by the Contract Documents, Owner, Commissioning Authority, or authorities having jurisdiction are not limited by provisions of this Section.
 - 4. Specific test and inspection requirements are not specified in this Section.
- C. Related Requirements:
 - 1. Section 012100 "Allowances" for testing and inspection allowances.
 - 2. Section 013216 "Construction Project Schedule" for developing a schedule of required tests and inspections.
 - 3. Section 0191 13 "General Commissioning Requirements" for testing and documentation related to Commissioning activities.
 - 4. Section 012000 "Administrative Requirements for Design-Build" as it relates to Design Quality Control

1.3 DEFINITIONS

- A. Experienced: When used with an entity or individual, "experienced" unless otherwise further described means having successfully completed a minimum of five previous projects similar in nature, size, and extent to this Project; being familiar with special requirements indicated; and having complied with requirements of authorities having jurisdiction.

- B. Field Quality control Tests: Tests and inspections that are performed on-site for installation of the Work and for completed Work.
- C. Installer/Applicator/Erector: Design-Builder or another entity engaged by Design-Builder as an employee, Subcontractor, or Sub-subcontractor, to perform a particular construction operation, including installation, erection, application, assembly, and similar operations.
 - 1. Use of trade-specific terminology in referring to a trade or entity does not require that certain construction activities be performed by accredited or unionized individuals, or that requirements specified apply exclusively to specific trade(s).
- D. Mockups: Full-size physical assemblies that are constructed on-site either as freestanding temporary built elements or as part of permanent construction as approved by the Owner. Mockups are constructed to verify selections made under Sample submittals; to demonstrate aesthetic effects and qualities of materials and execution; to review coordination, testing, or operation; to show interface between dissimilar materials; and to demonstrate compliance with specified installation tolerances. Mockups are not Samples. Unless otherwise indicated, approved mockups establish the standard by which the Work will be judged. At a minimum provide mock-ups for historical material cleaning/restoration, and window restoration.
 - 1. Laboratory Mockups: Full-size physical assemblies constructed and tested at testing facility to verify performance characteristics.
 - 2. Integrated Exterior Mockups: Mockups of the exterior envelope constructed on-site as freestanding temporary built elements or as part of permanent construction, consisting of multiple products, assemblies, and subassemblies.
 - 3. Room Mockups: Mockups of typical interior spaces complete with wall, floor, and ceiling finishes; doors; windows; millwork; casework; specialties; furnishings and equipment; and lighting.
- E. Product Tests: Tests and inspections that are performed by a nationally recognized testing laboratory (NRTL) according to 29 CFR 1910.7, by a testing agency accredited according to NIST's National Voluntary Laboratory Accreditation Program (NVLAP), or by a testing agency qualified to conduct product testing and acceptable to authorities having jurisdiction, to establish product performance and compliance with specified requirements.
- F. Source Quality control Tests: Tests and inspections that are performed at the source; for example, plant, mill, factory, or shop.
- G. Testing Agency: An entity engaged to perform specific tests, inspections, or both. Testing laboratory shall mean the same as testing agency.
- H. 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.
- I. 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. Design-Builder's quality control services do not include contract administration activities performed by Owner.

1.4 CONFLICTING REQUIREMENTS

- A. Conflicting Standards and Other Requirements: If compliance with two or more standards or requirements are specified and the standards or requirements establish different or conflicting requirements for minimum quantities or quality levels, comply with the most stringent requirement. Refer conflicting requirements that are different, but apparently equal, to Owner for direction before proceeding.
- B. Minimum Quantity or Quality Levels: The quantity or quality level shown or specified shall be the minimum provided or performed. The actual installation may comply exactly with the minimum quantity or quality specified, or it may exceed the minimum within reasonable limits. To comply with these requirements, indicated numeric values are minimum or maximum, as appropriate, for the context of requirements. Refer uncertainties to Owner for a decision before proceeding.

1.5 ACTION SUBMITTALS

- A. Shop Drawings: For mockups.
 - 1. Include plans, sections, and elevations, indicating materials and size of mockup construction.
 - 2. Indicate manufacturer and model number of individual components.
 - 3. Provide axonometric drawings for conditions difficult to illustrate in two dimensions.
- B. Design Services Submittal: In addition to Shop Drawings, Product Data, and other required submittals, submit a statement signed and sealed by the responsible design professional, for each product and system designed or certified by a design professional, indicating that the products and systems are in compliance with best practices and performance and design criteria indicated in DC Courts Design and Materials Procedures and Best Practices. Include list of codes, loads, and other factors used in performing these services.

1.6 INFORMATIONAL SUBMITTALS

- A. Design-Builder's Quality control Plan: For review of installation and means for ensuring quality of activities and responsibilities.
 - 1. Plan shall indicate specific installations that will require intense scrutiny. Quality Plan shall outline approach to any and all systems requiring commissioning and their quality assurance and control guidelines for ensuring the successful completion of those activities.
 - 2. Plan shall outline necessary pre-work and start-up meetings as detailed in Specification Section 013100 "Project Management and Coordination" and the processes and procedures specific to those activities that the Design Builder will pursue to ensure quality installations.
- B. Qualification Data: For Design-Builder's quality control personnel.
- C. Design-Builder's Statement of Responsibility: When required by authorities having jurisdiction, submit copy of written statement of responsibility submitted to authorities having jurisdiction before starting work on the following systems:

1. Seismic-force-resisting system, designated seismic system, or component listed in the Statement of Special Inspections.
 2. Main wind-force-resisting system or a wind-resisting component listed in the Statement of Special Inspections.
- D. Testing Agency Qualifications: For testing agencies specified in "Quality Assurance" Article to demonstrate their capabilities and experience. Include proof of qualifications in the form of a recent report on the inspection of the testing agency by a recognized authority.
- E. Schedule of Tests and Inspections: Prepare in tabular form and include the following:
1. Specification Section number and title.
 2. Entity responsible for performing tests and inspections.
 3. Description of test and inspection.
 4. Identification of applicable standards.
 5. Identification of test and inspection methods.
 6. Number of tests and inspections required.
 7. Time schedule or time span for tests and inspections.
 8. Requirements for obtaining samples.
 9. Unique characteristics of each quality control service.
- F. Reports: Prepare and submit certified written reports and documents as specified.
- G. Permits, Licenses, and Certificates: For Owner's record, submit copies of permits, licenses, certifications, inspection reports, releases, jurisdictional settlements, notices, receipts for fee payments, judgments, correspondence, records, and similar documents established for compliance with standards and regulations bearing on performance of the Work.

1.7 DESIGN-BUILDER'S CONSTRUCTION QUALITY CONTROL PLAN

- A. Construction Quality Control Plan, General: Submit quality control plan within ten (10) calendar days of Construction NTP, and not less than five (5) calendar days prior to preconstruction conference. Submit in format acceptable to Owner. Identify personnel, procedures, controls, instructions, tests, records, and forms to be used to carry out Design-Builder's quality assurance and quality control responsibilities. Coordinate with Design-Builder's Construction Schedule.
- B. Quality Control Personnel Qualifications: Engage qualified personnel trained and experienced in managing and executing quality assurance and quality control procedures in accordance with the requirements of the solicitation.
1. Project Quality Control Manager shall be independent of Project Management and Project Supervision.
- C. Submittal Procedure: Describe procedures for ensuring compliance with requirements through review and management of submittal process. Indicate qualifications of personnel responsible for submittal review.
- D. Testing and Inspection: In quality control plan, include a comprehensive schedule of Work requiring testing or inspection, including the following:

1. Design-Builder-performed tests and inspections including Subcontractor-performed tests and inspections. Include required tests and inspections and Design-Builder-elected tests and inspections. Distinguish source quality control tests and inspections from field quality control tests and inspections. Ensure all tests within the Core & Shell Basis of Design are included.
 2. Special inspections required by authorities having jurisdiction and indicated on the Statement of Special Inspections.
 3. Owner-performed tests and inspections indicated in the Contract Documents, including tests and inspections indicated to be performed by the Commissioning Authority.
- E. Continuous Inspection of Workmanship: Describe process for continuous inspection during construction to identify and correct deficiencies in workmanship in addition to testing and inspection specified. Indicate types of corrective actions to be required to bring work into compliance with standards of workmanship established by Contract requirements and approved mockups.
- F. Monitoring and Documentation: Maintain testing and inspection reports including log of approved and rejected results. Include work Owner has indicated as nonconforming or defective. Indicate corrective actions taken to bring nonconforming work into compliance with requirements. Comply with requirements of authorities having jurisdiction.

1.8 REPORTS AND DOCUMENTS

- A. Test and Inspection Reports: Prepare and submit certified written reports specified in other Sections. Include the following:
1. Date of issue.
 2. Project title and number.
 3. Name, address, telephone number, and email address of testing agency.
 4. Dates and locations of samples and tests or inspections.
 5. Names of individuals making tests and inspections.
 6. Description of the Work and test and inspection method.
 7. Identification of product and Specification Section.
 8. Complete test or inspection data.
 9. Test and inspection results and an interpretation of test results.
 10. Record of temperature and weather conditions at time of sample taking and testing and inspection.
 11. Comments or professional opinion on whether tested or inspected Work complies with the Contract Document requirements.
 12. Name and signature of laboratory inspector.
 13. Recommendations on retesting and reinspecting.
- B. Manufacturer's Technical Representative's Field Reports: Prepare written information documenting manufacturer's technical representative's tests and inspections specified in other Sections. Include the following:
1. Name, address, telephone number, and email address of technical representative making report.
 2. Statement on condition of substrates and their acceptability for installation of product.
 3. Statement that products at Project site comply with requirements.

4. Summary of installation procedures being followed, whether they comply with requirements and, if not, what corrective action was taken.
 5. Results of operational and other tests and a statement of whether observed performance complies with requirements.
 6. Statement whether conditions, products, and installation will affect warranty.
 7. Other required items indicated in individual Specification Sections.
- C. Factory-Authorized Service Representative's Reports: Prepare written information documenting manufacturer's factory-authorized service representative's tests and inspections specified in other Sections. Include the following:
1. Name, address, telephone number, and email address of factory-authorized service representative making report.
 2. Statement that equipment complies with requirements.
 3. Results of operational and other tests and a statement of whether observed performance complies with requirements.
 4. Statement whether conditions, products, and installation will affect warranty.
 5. Other required items indicated in individual Specification Sections.

1.9 QUALITY ASSURANCE

- A. General: Qualifications paragraphs in this article establish the minimum qualification levels required; individual Specification Sections specify additional requirements.
1. Manufacturer Qualifications: A firm experienced in manufacturing products or systems similar to those indicated for this Project and with a record of successful in-service performance, as well as sufficient production capacity to produce required units. As applicable, procure products from manufacturers able to meet qualification requirements, warranty requirements, and technical or factory-authorized service representative requirements.
 2. 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.
 3. Installer Qualifications: A firm or individual experienced in installing, erecting, applying, or assembling work similar in material, design, and extent to that indicated for this Project, whose work has resulted in construction with a record of successful in-service performance.
 4. 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 in material, design, and extent to those indicated for this Project.
 5. Specialists: Certain Specification Sections 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.
 - a. Requirements of authorities having jurisdiction shall supersede requirements for specialists.

6. Testing Agency Qualifications: An NRTL, an NVLAP, or an independent agency with the experience and capability to conduct testing and inspection indicated, as documented according to ASTM E329; and with additional qualifications specified in individual Sections; and, where required by authorities having jurisdiction, that is acceptable to authorities.
 7. Manufacturer's Technical Representative Qualifications: An authorized representative of manufacturer who is trained and approved by manufacturer to observe and inspect installation of manufacturer's products that are similar in material, design, and extent to those indicated for this Project.
 8. 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.
- B. Preconstruction Testing: Where testing agency is indicated to perform preconstruction testing for compliance with specified requirements for performance and test methods, comply with the following:
1. Design-Builder responsibilities include the following:
 - a. Provide test specimens representative of proposed products and construction.
 - b. Submit specimens in a timely manner with sufficient time for testing and analyzing results to prevent delaying the Work.
 - c. Provide sizes and configurations of test assemblies, mockups, and laboratory mockups to adequately demonstrate capability of products to comply with performance requirements.
 - d. Build site-assembled test assemblies and mockups using installers who will perform same tasks for Project.
 - e. Build laboratory mockups at testing facility using personnel, products, and methods of construction indicated for the completed Work.
 - f. When testing is complete, remove test specimens and test assemblies, and mockups, and laboratory mockups; do not reuse products on Project.
 2. Testing Agency Responsibilities: Submit a certified written report of each test, inspection, and similar quality assurance service to Owner with copy to Design-Builder. Interpret tests and inspections and state in each report whether tested and inspected work complies with or deviates from the Contract Documents.
- C. Mockups: Before installing portions of the Work requiring mockups, build mockups for each form of construction and finish required to comply with the following requirements, using materials indicated for the completed Work:
1. Build mockups of size indicated.
 2. Build mockups in location indicated or, if not indicated, as directed by Owner.
 3. Notify Owner seven days in advance of dates and times when mockups will be constructed.
 4. Employ supervisory personnel who will oversee mockup construction. Employ workers that will be employed to perform same tasks during the construction at Project.
 5. Demonstrate the proposed range of aesthetic effects and workmanship.
 6. Obtain Owner's approval of mockups before starting corresponding work, fabrication, or construction.

- a. Allow seven days for initial review and each re-review of each mockup.
- 7. Maintain mockups during construction in an undisturbed condition as a standard for judging the completed Work.
- 8. Accepted mockups built in place may be incorporated into the final work product.
- 9. Demolish and remove mockups when directed.
- D. Integrated Exterior Mockups: Construct integrated exterior mockup according to approved Shop Drawings. Coordinate installation of exterior envelope materials and products for which mockups are required in individual Specification Sections, along with supporting materials. Comply with requirements in "Mockups" Paragraph.
- E. Room Mockups: Construct room mockups according to approved Shop Drawings or as indicated on Drawings incorporating required materials and assemblies, finished according to requirements. Provide required lighting and additional lighting where required to enable Owner to evaluate quality of the Work. Comply with requirements in "Mockups" Paragraph.

1.10 QUALITY CONTROL

- A. Owner Responsibilities: Where quality control services are indicated by the Owner as Owner's responsibilities, the Owner will engage a qualified testing agency to perform these services.
 - 1. Owner will furnish Design-Builder with names, addresses, and telephone numbers of testing agencies engaged and a description of types of testing and inspection they are engaged to perform.
 - 2. Costs for retesting and reinspecting construction that replaces or is necessitated by work that failed to comply with the Contract Documents will be charged to Design-Builder.
- B. Design-Builder Responsibilities: Tests and inspections not explicitly assigned to Owner are Design-Builder's responsibility. Perform additional quality control activities, whether specified or not, to verify and document that the Work complies with requirements.
 - 1. Unless otherwise indicated, provide quality control services specified and those required by authorities having jurisdiction. Perform quality control services required of Design-Builder by authorities having jurisdiction, whether specified or not.
 - 2. Engage a qualified testing agency to perform quality control services.
 - a. Design-Builder shall not employ same entity engaged by Owner, unless agreed to in writing by Owner.
 - 3. Notify testing agencies at least 48 hours in advance of time when Work that requires testing or inspection will be performed.
 - 4. Where quality control services are indicated as Design-Builder's responsibility, submit a certified written report, in duplicate, of each quality control service.
 - 5. Testing and inspection requested by Design-Builder and not required by the Contract Documents are Design-Builder's responsibility.
 - 6. Submit additional copies of each written report directly to authorities having jurisdiction when they so direct.

7. Coordination of testing and inspections, and re-inspections, performed by the Owner are the responsibility of the Design-Builder.
- C. Retesting/Reinspecting: Regardless of whether original tests or inspections were Design-Builder's responsibility, provide quality control services, including retesting and reinspecting, for construction that replaced Work that failed to comply with the Contract Documents.
- D. Testing Agency Responsibilities: Cooperate with Owner, Commissioning Authority, and Design-Builder in performance of duties. Provide qualified personnel to perform required tests and inspections.
1. Notify Owner, Commissioning Authority and Design-Builder promptly of irregularities or deficiencies observed in the Work during performance of its services.
 2. Determine the locations 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 Design-Builder.
 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 duties of Design-Builder.
- E. Manufacturer's Field Services: Where indicated, engage a factory-authorized service representative to inspect field-assembled components and equipment installation, including service connections. Report results in writing as specified in Section 013300 "Submittal Procedures."
- F. Manufacturer's Technical Services: Where indicated, engage a manufacturer's technical representative to observe and inspect the Work. Manufacturer's technical representative's services include participation in preinstallation conferences, examination of substrates and conditions, verification of materials, observation of Installer activities, inspection of completed portions of the Work, and submittal of written reports.
- G. Associated Design-Builder Services: Cooperate with agencies and representatives performing required tests, inspections, and similar quality control services, and provide reasonable auxiliary services as requested. Notify agency sufficiently in advance of operations to permit assignment of personnel. Provide the following:
1. Access to the Work.
 2. Incidental labor and facilities necessary to facilitate tests and inspections.
 3. Adequate quantities of representative samples of materials that require testing and inspection. Assist agency in obtaining samples.
 4. Facilities for storage and field curing of test samples.
 5. Preliminary design mix proposed for use for material mixes that require control by testing agency.
 6. Security and protection for samples and for testing and inspection equipment at Project site.

- H. Coordination: Coordinate sequence of activities to accommodate required quality assurance and quality control services with a minimum of delay and to avoid necessity of removing and replacing construction to accommodate testing and inspection.
 - 1. Schedule times for tests, inspections, obtaining samples, and similar activities.
- I. Schedule of Tests and Inspections: Prepare a schedule of tests, inspections, and similar quality control services required by the Contract Documents as a component of Design-Builder's quality control plan. Coordinate and submit concurrently with Design-Builder's Construction Schedule. Update as the Work progresses.
 - 1. Distribution: Distribute schedule to Owner, Commissioning Authority, testing agencies, and each party involved in performance of portions of the Work where tests and inspections are required.

1.11 SPECIAL TESTS AND INSPECTIONS

- A. Special Tests and Inspections: Design Builder will engage a qualified testing agency to conduct special tests and inspections required by Authorities Having Jurisdiction (AHJ) to be the responsibility of Owner, as indicated in individual Specification Sections, and as follows:
 - 1. Verifying that manufacturer maintains detailed fabrication and quality control procedures and reviewing the completeness and adequacy of those procedures to perform the Work.
 - 2. Notifying Owner and Design Builder promptly of irregularities and deficiencies observed in the Work during performance of its services.
 - a. These reports will be issued concurrently to the Design-Builder and the Design-Builder will pursue correction of these irregularities or deficiencies immediately and diligently to close open items. All coordination of corrections or reinspection's shall be coordinated through the Special Inspector by the Design-Builder to verify correction prior to an item being closed.
 - 3. Submitting a certified written report of each test, inspection, and similar quality control service to Owner with copy to Design Builder and to authorities having jurisdiction.
 - 4. Submitting a final report of special tests and inspections at Substantial Completion, which includes a list of unresolved deficiencies.
 - 5. Interpreting tests and inspections and stating in each report whether tested and inspected work complies with or deviates from the Contract Documents.
 - 6. Retesting and reinspecting corrected work.
 - 7. Design-Builder shall fully cooperate and coordinate with the Owner's Special Inspector as outlined above. This special inspector shall have no control over Design-Builder's means, methods, techniques, sequences, or procedures, but will report to Owner all deficiencies inherent in the work, whether they be related to quality, safety, time, or money.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION

3.1 ACCEPTABLE TESTING AGENCIES

- A. Design-Builder shall provide a list of firms to Owner for their acceptance, to perform designated tests and inspections as outlined in the contract documents. The list shall be comprehensive of all testing requirements administered by the Design-Builder along with reference to relevant specification sections that the tests are required by. This list shall be turned in [10 days] after issuance of NTP.

3.2 TEST AND INSPECTION LOG

- A. Test, Inspection, Quality Check Log: Prepare a record of tests and inspections. Include the following:
 - 1. Date of the projected and completed tests, inspections, and quality control checks were conducted.
 - 2. Description of the Work tested or inspected.
 - 3. Date test or inspection results were transmitted to Owner.
 - 4. Identification of testing agency or special inspector conducting test or inspection.
- B. Maintain log at Project site and upload all files to PMIS as an attachment to the Daily Reports. Post changes and revisions as they occur. Provide access to test and inspection log for Owner's reference during normal working hours.
 - 1. Submit log at Project closeout as part of Project Record Documents.

3.3 REPAIR AND PROTECTION

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

END OF SECTION 014000

SECTION 014200 - REFERENCES

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, and provisions of Request for Proposal (RFP) apply to this Section.

1.2 DEFINITIONS

- A. General: Basic Contract definitions are included in the Conditions of the Contract.
- B. Day(s): Unless otherwise indicated days shall mean "Calendar Days."
- C. "Approved": When used to convey Owner's action on Design Builder's submittals, applications, and requests, "approved" is limited to Owner's duties and responsibilities as stated in the Conditions of the Contract.
- D. "Directed": A command or instruction by Owner. Other terms including "requested," "authorized," "selected," "required," and "permitted" have the same meaning as "directed."
- E. "Indicated": Requirements expressed by graphic representations or in written form on Drawings, in Specifications, and in other Contract Documents. Other terms including "shown," "noted," "scheduled," and "specified" have the same meaning as "indicated."
- F. "Regulations": Laws, ordinances, statutes, and lawful orders issued by authorities having jurisdiction, and rules, conventions, and agreements within the construction industry that control performance of the Work.
- G. "Furnish": Supply and deliver to Project site, ready for unloading, unpacking, assembly, installation, and similar operations.
- H. "Install": Unload, temporarily store, unpack, assemble, erect, place, anchor, apply, work to dimension, finish, cure, protect, clean, and similar operations at Project site.
- I. "Provide": Furnish and install, complete and ready for the intended use.
- J. "Project Site": Space available for performing construction activities. The extent of Project site is shown on Drawings and may or may not be identical with the description of the land on which Project is to be built.

1.3 INDUSTRY STANDARDS

- A. Applicability of Standards: Unless the Contract Documents include more stringent requirements, applicable construction industry standards have the same force and effect as if

bound or copied directly into the Contract Documents to the extent referenced. Such standards are made a part of the Contract Documents by reference.

- B. Publication Dates: Comply with standards in effect as of date of the Contract Documents unless otherwise indicated.
- C. Copies of Standards: Each entity engaged in construction on Project should be familiar with industry standards applicable to its construction activity. Copies of applicable standards are not bound with the Contract Documents.
 - 1. Where copies of standards are needed to perform a required construction activity, obtain copies directly from publication source.

1.4 ABBREVIATIONS AND ACRONYMS

- A. Industry Organizations: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the entities in the following list. Abbreviations and acronyms not included in this list shall mean the recognized name of the entities indicated in Gale's "Encyclopedia of Associations: National Organizations of the U.S." or in Columbia Books' "National Trade & Professional Associations of the United States." The information in this list is subject to change and is believed to be accurate as of the date of the Contract Documents.

- 1. AABC - Associated Air Balance Council; .
- 2. AAMA - American Architectural Manufacturers Association; www.aamanet.org.
- 3. AASHTO - American Association of State Highway and Transportation Officials; www.transportation.org.
- 4. AATCC - American Association of Textile Chemists and Colorists; www.aatcc.org.
- 5. ABMA - American Boiler Manufacturers Association; www.abma.com.
- 6. ACI - American Concrete Institute; (Formerly: ACI International); www.concrete.org.
- 7. ACPA - American Concrete Pipe Association; www.concrete-pipe.org.
- 8. AEIC - Association of Edison Illuminating Companies, Inc. (The); www.aeic.org.
- 9. AF&PA - American Forest & Paper Association; www.afandpa.org.
- 10. AGA - American Gas Association; www.aga.org.
- 11. AHAM - Association of Home Appliance Manufacturers; www.aham.org.
- 12. AHRI - Air-Conditioning, Heating, and Refrigeration Institute (The); www.ahrinet.org.
- 13. AI - Asphalt Institute; www.asphaltinstitute.org.
- 14. AIA - American Institute of Architects (The); www.aia.org.
- 15. AISC - American Institute of Steel Construction; www.aisc.org.
- 16. AISI - American Iron and Steel Institute; www.steel.org.
- 17. AITC - American Institute of Timber Construction; www.aitc-glulam.org.
- 18. AMCA - Air Movement and Control Association International, Inc.; www.amca.org.
- 19. ANSI - American National Standards Institute; www.ansi.org.
- 20. APA - APA - The Engineered Wood Association; www.apawood.org.
- 21. APA - Architectural Precast Association; www.archprecast.org.
- 22. ARI - Air-Conditioning & Refrigeration Institute; (See AHRI).
- 23. ASCE - American Society of Civil Engineers; www.asce.org.
- 24. ASCE/SEI - American Society of Civil Engineers/Structural Engineering Institute; (See ASCE).

25. ASHRAE - American Society of Heating, Refrigerating and Air-Conditioning Engineers; www.ashrae.org.
26. ASME - ASME International; (American Society of Mechanical Engineers); www.asme.org.
27. ASSE - American Society of Safety Engineers (The); www.asse.org.
28. ASSE - American Society of Sanitary Engineering; www.asse-plumbing.org.
29. ASTM - ASTM International; www.astm.org.
30. ATIS - Alliance for Telecommunications Industry Solutions; www.atis.org.
31. AWI - Architectural Woodwork Institute; www.awinet.org.
32. AWMAC - Architectural Woodwork Manufacturers Association of Canada; www.awmac.com.
33. AWWA - American Water Works Association; www.awwa.org.
34. AWS - American Welding Society; www.aws.org.
35. AWWA - American Water Works Association; www.awwa.org.
36. BHMA - Builders Hardware Manufacturers Association; www.buildershardware.com.
37. BIA - Brick Industry Association (The); www.gobrick.com.
38. BICSI - BICSI, Inc.; www.bicsi.org.
39. BIFMA - BIFMA International; (Business and Institutional Furniture Manufacturer's Association); www.bifma.org.
40. CEA - Consumer Electronics Association; www.ce.org.
41. CFFA - Chemical Fabrics and Film Association, Inc.; www.chemicalfabricsandfilm.com.
42. CFSEI - Cold-Formed Steel Engineers Institute; www.cfsei.org.
43. CIMA - Cellulose Insulation Manufacturers Association; www.cellulose.org.
44. CISCA - Ceilings & Interior Systems Construction Association; www.cisca.org.
45. CISPI - Cast Iron Soil Pipe Institute; www.cispi.org.
46. CLFMI - Chain Link Fence Manufacturers Institute; www.chainlinkinfo.org.
47. CPA - Composite Panel Association; www.pbmdf.com.
48. CRI - Carpet and Rug Institute (The); www.carpet-rug.org.
49. CRRC - Cool Roof Rating Council; www.coolroofs.org.
50. CRSI - Concrete Reinforcing Steel Institute; www.crsi.org.
51. CSA - CSA Group; www.csagroup.com.
52. CSA - CSA International; www.csa-international.org.
53. CSI - Construction Specifications Institute (The); www.csinet.org.
54. CTI - Cooling Technology Institute; (Formerly: Cooling Tower Institute); www.cti.org.
55. CWC - Composite Wood Council; (See CPA).
56. DASMA - Door and Access Systems Manufacturers Association; www.dasma.com.
57. DHI - Door and Hardware Institute; www.dhi.org.
58. ECA - Electronic Components Association; (See ECIA).
59. ECAMA - Electronic Components Assemblies & Materials Association; (See ECIA).
60. ECIA - Electronic Components Industry Association; www.eciaonline.org.
61. EIA - Electronic Industries Alliance; (See TIA).
62. EIMA - EIFS Industry Members Association; www.eima.com.
63. EJMA - Expansion Joint Manufacturers Association, Inc.; www.ejma.org.
64. ESD - ESD Association; (Electrostatic Discharge Association); www.esda.org.
65. ESTA - Entertainment Services and Technology Association; (See PLASA).
66. ETL - Intertek (See Intertek); www.intertek.com.
67. EVO - Efficiency Valuation Organization; www.evo-world.org.
68. FCI - Fluid Controls Institute; www.fluidcontrolsintstitute.org.
69. FIBA - Federation Internationale de Basketball; (The International Basketball Federation); www.fiba.com.

70. FIVB - Federation International de Volleyball; (The International Volleyball Federation); www.fivb.org.
71. FM Approvals - FM Approvals LLC; www.fmglobal.com.
72. FM Global - FM Global; (Formerly: FMG - FM Global); www.fmglobal.com.
73. FSC - Forest Stewardship Council U.S.; www.fscus.org.
74. GA - Gypsum Association; www.gypsum.org.
75. GANA - Glass Association of North America; www.glasswebsite.com.
76. GS - Green Seal; www.greenseal.org.
77. HI - Hydraulic Institute; www.pumps.org.
78. HI/GAMA - Hydronics Institute/Gas Appliance Manufacturers Association; (See AHRI).
79. HMMA - Hollow Metal Manufacturers Association; (See NAAMM).
80. HPVA - Hardwood Plywood & Veneer Association; www.hpva.org.
81. IAPSC - International Association of Professional Security Consultants; www.iapsc.org.
82. IAS - International Accreditation Service; www.iasonline.org.
83. ICBO - International Conference of Building Officials; (See ICC).
84. ICC - International Code Council; www.iccsafe.org.
85. ICEA - Insulated Cable Engineers Association, Inc.; www.icea.net.
86. ICPA - International Cast Polymer Alliance; www.icpa-hq.org.
87. ICRI - International Concrete Repair Institute, Inc.; www.icri.org.
88. IEC - International Electrotechnical Commission; www.iec.ch.
89. IEEE - Institute of Electrical and Electronics Engineers, Inc. (The); www.ieee.org.
90. IES - Illuminating Engineering Society; (Formerly: Illuminating Engineering Society of North America); www.ies.org.
91. IESNA - Illuminating Engineering Society of North America; (See IES).
92. IEST - Institute of Environmental Sciences and Technology; www.iest.org.
93. IGMA - Insulating Glass Manufacturers Alliance; www.igmaonline.org.
94. IGSHPA - International Ground Source Heat Pump Association; www.igshpa.okstate.edu.
95. ILI - Indiana Limestone Institute of America, Inc.; www.iliai.com.
96. Intertek - Intertek Group; (Formerly: ETL SEMCO; Intertek Testing Service NA); www.intertek.com.
97. ISA - International Society of Automation (The); (Formerly: Instrumentation, Systems, and Automation Society); www.isa.org.
98. ISAS - Instrumentation, Systems, and Automation Society (The); (See ISA).
99. ISFA - International Surface Fabricators Association; (Formerly: International Solid Surface Fabricators Association); www.isfanow.org.
100. ISO - International Organization for Standardization; www.iso.org.
101. ISSFA - International Solid Surface Fabricators Association; (See ISFA).
102. ITU - International Telecommunication Union; www.itu.int/home.
103. KCMA - Kitchen Cabinet Manufacturers Association; www.kcma.org.
104. LMA - Laminating Materials Association; (See CPA).
105. LPI - Lightning Protection Institute; www.lightning.org.
106. MCA - Metal Construction Association; www.metalconstruction.org.
107. MFMA - Maple Flooring Manufacturers Association, Inc.; www.maplefloor.org.
108. MFMA - Metal Framing Manufacturers Association, Inc.; www.metalframingmfg.org.
109. MHIA - Material Handling Industry of America; www.mhia.org.
110. MIA - Marble Institute of America; www.marble-institute.com.
111. MMPA - Moulding & Millwork Producers Association; www.wmmpa.com.
112. MPI - Master Painters Institute; www.paintinfo.com.
113. MSS - Manufacturers Standardization Society of The Valve and Fittings Industry Inc.; www.mss-hq.org.

114. NAAMM - National Association of Architectural Metal Manufacturers; www.naamm.org.
115. NADCA - National Air Duct Cleaners Association; www.nadca.com.
116. NAIMA - North American Insulation Manufacturers Association; www.naima.org.
117. NBGQA - National Building Granite Quarries Association, Inc.; www.nbgqa.com.
118. NBI - New Buildings Institute; www.newbuildings.org.
119. NCMA - National Concrete Masonry Association; www.ncma.org.
120. NEBB - National Environmental Balancing Bureau; www.nebb.org.
121. NECA - National Electrical Contractors Association; www.necanet.org.
122. NeLMA - Northeastern Lumber Manufacturers Association; www.nelma.org.
123. NEMA - National Electrical Manufacturers Association; www.nema.org.
124. NETA - International Electrical Testing Association; www.netaworld.org.
125. NFPA - National Fire Protection Association; www.nfpa.org.
126. NFPA - NFPA International; (See NFPA).
127. NFRC - National Fenestration Rating Council; www.nfrc.org.
128. NHLA - National Hardwood Lumber Association; www.nhla.com.
129. NLGA - National Lumber Grades Authority; www.nlga.org.
130. NOFMA - National Oak Flooring Manufacturers Association; (See NWFA).
131. NOMMA - National Ornamental & Miscellaneous Metals Association; www.nomma.org.
132. NRCA - National Roofing Contractors Association; www.nrca.net.
133. NRMCA - National Ready Mixed Concrete Association; www.nrmca.org.
134. NSF - NSF International; www.nsf.org.
135. NSPE - National Society of Professional Engineers; www.nspe.org.
136. NSSGA - National Stone, Sand & Gravel Association; www.nssga.org.
137. NTMA - National Terrazzo & Mosaic Association, Inc. (The); www.ntma.com.
138. NWFA - National Wood Flooring Association; www.nwfa.org.
139. PDI - Plumbing & Drainage Institute; www.pdionline.org.
140. RCSC - Research Council on Structural Connections; www.boltcouncil.org.
141. RFCI - Resilient Floor Covering Institute; www.rfci.com.
142. RIS - Redwood Inspection Service; www.redwoodinspection.com.
143. SAE - SAE International; www.sae.org.
144. SCTE - Society of Cable Telecommunications Engineers; www.scte.org.
145. SDI - Steel Deck Institute; www.sdi.org.
146. SDI - Steel Door Institute; www.steeldoor.org.
147. SEFA - Scientific Equipment and Furniture Association (The); www.sefalabs.com.
148. SEI/ASCE - Structural Engineering Institute/American Society of Civil Engineers; (See ASCE).
149. SIA - Security Industry Association; www.siaonline.org.
150. SJI - Steel Joist Institute; www.steeljoist.org.
151. SMA - Screen Manufacturers Association; www.smainfo.org.
152. SMACNA - Sheet Metal and Air Conditioning Contractors' National Association; www.smacna.org.
153. SMPTE - Society of Motion Picture and Television Engineers; www.smpte.org.
154. SPFA - Spray Polyurethane Foam Alliance; www.sprayfoam.org.
155. SPIB - Southern Pine Inspection Bureau; www.spib.org.
156. SPRI - Single Ply Roofing Industry; www.spri.org.
157. SRCC - Solar Rating & Certification Corporation; www.solar-rating.org.
158. SSINA - Specialty Steel Industry of North America; www.ssina.com.
159. SSPC - SSPC: The Society for Protective Coatings; www.sspc.org.
160. TCNA - Tile Council of North America, Inc.; www.tileusa.com.
161. TEMA - Tubular Exchanger Manufacturers Association, Inc.; www.tema.org.

162. TIA - Telecommunications Industry Association (The); (Formerly: TIA/EIA - Telecommunications Industry Association/Electronic Industries Alliance); www.tiaonline.org.
 163. TIA/EIA - Telecommunications Industry Association/Electronic Industries Alliance; (See TIA).
 164. TMS - The Masonry Society; www.masonrysociety.org.
 165. TPI - Truss Plate Institute; www.tpinst.org.
 166. TPI - Turfgrass Producers International; www.turfgrasssod.org.
 167. TRI - Tile Roofing Institute; www.tilerroofing.org.
 168. UL - Underwriters Laboratories Inc.; www.ul.com.
 169. UNI - Uni-Bell PVC Pipe Association; www.uni-bell.org.
 170. USAV - USA Volleyball; www.usavolleyball.org. USGBC - U.S. Green Building Council; www.usgbc.org.
 171. WA - Wallcoverings Association; www.wallcoverings.org.
 172. WASTEC - Waste Equipment Technology Association; www.wastec.org.
 173. WCLIB - West Coast Lumber Inspection Bureau; www.wclib.org.
 174. WCMA - Window Covering Manufacturers Association; www.wcmanet.org.
 175. WDMA - Window & Door Manufacturers Association; www.wdma.com.
 176. WI - Woodwork Institute; www.wienet.org.
 177. WSRCA - Western States Roofing Contractors Association; www.wsrca.com.
 178. WWPA - Western Wood Products Association; www.wwpa.org.
- B. Code Agencies: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the entities in the following list. This information is believed to be accurate as of the date of the Contract Documents.
1. IAPMO - International Association of Plumbing and Mechanical Officials; www.iapmo.org.
 2. ICC - International Code Council; www.iccsafe.org.
 3. ICC-ES - ICC Evaluation Service, LLC; www.icc-es.org.
- C. Federal Government Agencies: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the entities in the following list. Information is subject to change and is up to date as of the date of the Contract Documents.
1. COE - Army Corps of Engineers; www.usace.army.mil.
 2. CFA – Commission on Fine Arts
 3. CPFMD – Capital Projects and Facilities Management Division
 4. CPSC – Consumer Product Safety Commission; www.cpsc.gov.
 5. DCC – District of Columbia Courts
 6. DCSC – District of Columbia Superior Court
 7. DCCOA – District of Columbia Court of Appeals
 8. DCSHPO – District of Columbia State Historic Preservation Office
 9. DCWASA – District of Columbia Water and Sewer Authority
 10. DGS – Department of General Services; <https://dgs.dc.gov/>
 11. DOB – Department of Buildings; <https://dob.dc.gov/>
 12. DOC - Department of Commerce; National Institute of Standards and Technology; www.nist.gov.
 13. DOD - Department of Defense; www.quicksearch.dla.mil.
 14. DOE - Department of Energy; www.energy.gov.
 15. DOJ – Department of Justice
 16. EPA - Environmental Protection Agency; www.epa.gov.
 17. FAA - Federal Aviation Administration; www.faa.gov.

18. FG - Federal Government Publications; www.gpo.gov/fdsys.
19. GSA - General Services Administration; www.gsa.gov.
20. HUD - Department of Housing and Urban Development; www.hud.gov.
21. LBL - Lawrence Berkeley National Laboratory; Environmental Energy Technologies Division; www.eetd.lbl.gov.
22. NCPC – National Capital Planning Commission
23. OSHA - Occupational Safety & Health Administration; www.osha.gov.
24. SD - Department of State; www.state.gov.
25. TRB - Transportation Research Board; National Cooperative Highway Research Program; The National Academies; www.trb.org.
26. USCAAF – United States Court of Appeals for the Armed Forces
27. USDA - Department of Agriculture; Agriculture Research Service; U.S. Salinity Laboratory; www.ars.usda.gov.
28. USDA - Department of Agriculture; Rural Utilities Service; www.usda.gov.
29. USDOJ - Department of Justice; Office of Justice Programs; National Institute of Justice; www.ojp.usdoj.gov.
30. USMS – United States Marshal Service
31. USP - U.S. Pharmacopeial Convention; www.usp.org.
32. USPS - United States Postal Service; www.usps.com.

D. Standards and Regulations: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the standards and regulations in the following list. This information is subject to change and is believed to be accurate as of the date of the Contract Documents.

1. CFR - Code of Federal Regulations; Available from Government Printing Office; www.gpo.gov/fdsys.
2. DOD - Department of Defense; Military Specifications and Standards; Available from DLA Document Services; www.quicksearch.dla.mil.
3. DSCC - Defense Supply Center Columbus; (See FS).
4. FED-STD - Federal Standard; (See FS).
5. FS - Federal Specification; Available from DLA Document Services; www.quicksearch.dla.mil.
 - a. Available from Defense Standardization Program; www.dsp.dla.mil.
 - b. Available from General Services Administration; www.gsa.gov.
 - c. Available from National Institute of Building Sciences/Whole Building Design Guide; www.wbdg.org.
6. MILSPEC - Military Specification and Standards; (See DOD).
7. USAB - United States Access Board; www.access-board.gov.
8. USATBCB - U.S. Architectural & Transportation Barriers Compliance Board; (See USAB).

E. State Government Agencies: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the entities in the following list. This information is subject to change and is believed to be accurate as of the date of the Contract Documents.

Recorder of Deeds Modernization

Section 014200

References

06/04/2024

Solicitation

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION 014200

SECTION 015000 - TEMPORARY UTILITIES AND FACILITIES

PART 1 - GENERAL

1.1 SUMMARY

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

1.2 UTILITY USE CHARGES

- A. General: Installation and removal of and use charges for temporary facilities shall be included in the Contract Sum unless otherwise indicated. Allow other entities engaged in the Project to use temporary services and facilities without cost, including, but not limited to, Owner's construction forces, occupants of Project, testing agencies, and authorities having jurisdiction.
- B. Sewer Service: Owner will pay sewer-service use charges for sewer usage by all entities for construction operations.
 - 1. Design-Builder to provide their own connections and extensions of service as required for construction operations.
- C. Water Service: Owner will pay water-service use charges for water used by all entities for construction operations.
- D. Electric Power Service: Owner will pay electric-power-service use charges for electricity used by all entities for construction operations.
- E. Water from Existing System: Water from Owner's existing water system is available for use without metering and without payment of use charges. Provide connections and extensions of services as required for construction operations. If water needed for construction is not available from Owner's facility, Design-Builder shall provide, at no addition cost.
- F. Electric Power Service from Existing System: Electric power from Owner's existing system is available for use without metering and without payment of use charges. Provide connections and extensions of services as required for construction operations.

1.3 INFORMATIONAL SUBMITTALS

- A. Site Utilization Plan: The Design Builder shall submit a complete site staging plan showing the layout of all required temporary construction facilities and controls, temporary utility lines and connections, staging areas, construction site entrances, vehicle circulation, traffic control plan,

and parking areas for construction personnel, including temporary ramp designs and product data for review and approval by the Owner.

1. Indicate specific location of the Design Builder's trailer, material storage and loading areas, security perimeter, locations of construction signage, locations of temporary toilets, and other temporary construction, emergency facilities and resources and any other construction facilities required.
 2. Ensure that Fire Hydrants/Hose Connections/Standpipes are not blocked if in staging or scaffold areas and place signs on fence if hydrant is located inside area.
 3. Address accessibility and alternate routes.
- B. Implementation and Termination Schedule: Within 15 calendar days of date established for commencement of the Work, submit schedule indicating implementation and termination dates of each temporary utility.
- C. Project Identification and Temporary Signs: Show fabrication and installation details, including plans, elevations, details, layouts, typestyles, graphic elements, and message content.
- D. Fire-Safety Program: Show compliance with requirements of NFPA 241 and authorities having jurisdiction. Indicate Design-Builder personnel responsible for management of fire-prevention program.

1.4 QUALITY ASSURANCE

- A. Regulations: Comply with industry standards and applicable laws and regulations of authorities having jurisdiction, including but not limited to:
1. Comply with the requirements of the Building Code listed on the Contract Documents and with regulations governing construction and local industry standards in the installation and maintenance of temporary services and facilities.
 2. NFPA Code 241, "Building Construction and Demolition Operations"
 3. ANSI A-10 Series standards for "Safety Requirements for Construction and Demolition."
 4. NECA National Joint Guideline NJC-6 "Temporary Job Utilities and Services."
 - a. Refer to "Guidelines for Bid Conditions for Temporary Job Utilities and Services", as prepared jointly by Associated General Contractors of America (AGC) and American Specialty Contractors, Inc. (ASC) for industry recommendations.
 - b. Trade Jurisdictions: The assigned responsibilities for the installation and operation of temporary utilities are not intended to interfere with the normal application of trade regulations and union jurisdictions applicable to the work.
 5. Electric Service: Comply with NECA, NEMA, and UL standards and regulations for temporary electric service. Install service to comply with NFPA 70.
 6. Accessible Temporary Egress: Comply with applicable provisions in the most current version of the ADA Accessibility Guidelines and ICC/ANSI A117.1.
- B. Tests and Inspections: Arrange for authorities having jurisdiction to test and inspect each temporary utility before use. Obtain required certifications and permits for temporary utilities and facilities as required.

1.5 CONDITIONS OF USE

- A. Temporary Use of Permanent Facilities: Engage Installer of each permanent service to assume responsibility for operation, maintenance, and protection of each permanent service during its use as a construction facility before Owner's acceptance, regardless of previously assigned responsibilities.
- A. Install, operate, maintain, and protect temporary utilities and facilities. Provide each temporary service and facility ready for use at each location when the service or facility is first needed to avoid delay in performance of the Work. Keep temporary services and facilities clean and neat in appearance. Operate in a safe and efficient manner. Do not allow hazardous, dangerous or unsanitary conditions or public nuisances to develop or persist on the site.
- B. Existing Equipment and Items: Cover or otherwise protect and provide security for existing equipment and other items that are to remain in place, to prevent soiling, damage and loss.
- C. Temporarily move equipment and other items that interfere with the performance of required Work. Upon completion of the Work, return the equipment and items to their original location and installation condition.
- D. Store equipment and other items that have been temporarily removed. Upon reinstallation, clean and if damaged, repair or replace equipment and items to match their condition prior to removal.
- E. Security and Protection: Maintain site security and protection facilities in a safe, lawful and publicly acceptable manner. Coordinate with US Marshal Services (USMS) and US Capitol Police (USCP) for necessary requirements.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Chain-Link Fencing: Minimum 2-inch, 0.148-inch thick, galvanized-steel, chain-link fabric fencing; minimum 6 feet high with galvanized-steel pipe posts; minimum 2-3/8-inch OD line posts and 2-7/8-inch OD corner and pull posts, with 1-5/8-inch OD top rails, with galvanized barbed-wire top strand.
- B. Portable Chain-Link Fencing: Minimum 2-inch, 0.148-inch thick, galvanized-steel, chain-link fabric fencing; minimum 6 feet high with galvanized-steel pipe posts; minimum 2-3/8-inch OD line posts and 2-7/8-inch OD corner and pull posts, with 1-5/8-inch OD top and bottom rails. Provide concrete bases for supporting posts.
- C. Fencing Windscreen Privacy Screen: Polyester fabric scrim with grommets for attachment to chain link fence, sized to height of fence, in color selected by Owner from manufacturer's standard colors.
- D. Gypsum wall board and framing: Fire resistive sheets and wood or metal studs for full height of partitions.
- E. Dust-Control Adhesive-Surface Walk-Off Mats: Provide mats minimum 36 by 60 inches.

- F. 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.

2.2 TEMPORARY FACILITIES

- A. Field Offices, General: There will be no separate area, outside of the limits of construction, for a construction field office and storage.
 - 1. Portable or mobile buildings with serviceable finishes, temperature control, and foundation adequate for normal loading
- B. Parking General: There will be no designated on-site parking provided for Design-Builder or subcontractor personnel.
- C. Sanitary Facilities: Include temporary toilets and wash facilities. Comply with regulations and health codes for the type, number, location, operation, and maintenance of fixtures and facilities. Install where facilities will best serve the Project's needs after coordinating locations with Owner.
 - 1. Existing Toilets: Use of the Owner's existing toilet facilities is not permitted unless coordinated and accepted by Owner.
- D. Covered Walkway: Erect a structural adequate protective covered walkway for passage of persons along pedestrian ways adjacent to the Work as may be required. Coordinate with Owner. Comply with regulations of authorities having jurisdiction.

2.3 EQUIPMENT

- A. Fire Extinguishers: Portable, UL rated; with class and extinguishing agent as required by locations and classes of fire exposures.
- B. HVAC Equipment: Unless Owner authorizes use of permanent HVAC system, provide vented, self-contained, liquid-propane-gas or fuel-oil heaters with individual space thermostatic control.
 - 1. Use of gasoline-burning space heaters, open-flame heaters, or salamander-type heating units is prohibited.
 - 2. Heating Units: Listed and labeled for type of fuel being consumed, by a qualified testing agency acceptable to authorities having jurisdiction and marked for intended location and application.
 - 3. Permanent HVAC System: If Owner authorizes use of permanent HVAC system for temporary use during construction, provide filter with MERV of 13 at each return-air grille in system and remove at end of construction and clean HVAC system.
- C. Air-Filtration Units: Primary and secondary HEPA-filter-equipped portable units with four-stage filtration. Provide single switch for emergency shutoff. Configure to run continuously.

PART 3 - EXECUTION

3.1 TEMPORARY FACILITIES, GENERAL

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

3.2 INSTALLATION, GENERAL

- A. Locate facilities where they will serve Project adequately and result in minimum interference with performance of the Work. Relocate and modify facilities as required by progress of the Work.
 - 1. Locate facilities to limit site disturbance.
- 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.

3.3 TEMPORARY UTILITY INSTALLATION

- A. General: Install temporary service or connect to existing service.
 - 1. Arrange with utility company, Owner, and existing users for time when service can be interrupted, if necessary, to make connections for temporary services.
- B. Sewers and Drainage: Provide temporary utilities to remove effluent lawfully.
 - 1. Connect temporary sewers to municipal system or private system indicated and as directed by authorities having jurisdiction.
- C. Water Service: Install water service and distribution piping in sizes and pressures adequate for construction.
- D. Water Service: Connect to Owner's existing water service facilities. Clean and maintain water service facilities in a condition acceptable to Owner. At Substantial Completion, restore these facilities to condition existing before initial use.
- E. Sanitary Facilities: Provide temporary toilets, wash facilities, and drinking water for use of construction personnel. Comply with requirements of authorities having jurisdiction for type, number, location, operation, and maintenance of fixtures and facilities.
- F. Temporary Heating and Cooling: Provide temporary heating and cooling required by construction activities for curing or drying of completed installations or for protecting installed

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

1. Provide temporary dehumidification systems when required to reduce ambient and substrate moisture levels to level required to allow installation or application of finishes and their proper curing or drying.
- G. Isolation of Work Areas in Occupied Facilities: Prevent dust, fumes, and odors from entering occupied areas.
1. Prior to commencing work, isolate the HVAC system in area where work is to be performed according to Design-Builder provided coordination drawings.
 - a. Disconnect supply and return ductwork in work area from HVAC systems servicing occupied areas.
 - b. Maintain negative air pressure within work area using HEPA-equipped air-filtration units, starting with commencement of temporary partition construction, and continuing until removal of temporary partitions is complete. Design-Builder provided exhaust fans and temporary ductwork may be required to maintain air circulation and negative pressure. Refer to Mechanical specifications for additional requirements.
 2. Maintain dust partitions during the Work. Use vacuum collection attachments on dust-producing equipment. Isolate limited work within occupied areas using portable dust-containment devices.
 3. Perform daily construction cleanup and final cleanup using approved, HEPA-filter-equipped vacuum equipment.
- H. Electric Power Service: Connect to Owner's existing electric power service. Maintain equipment in a condition acceptable to Owner.
- I. Electric Power Service: Provide electric power service and distribution system of sufficient size, capacity, and power characteristics required for construction operations.
1. Connect temporary service to Owner's existing power source, as directed by Owner.
- J. 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.
- K. Telephone Service: Provide temporary telephone service in common-use facilities for use by all construction personnel. Install WiFi cell phone access equipment.

3.4 SUPPORT FACILITIES INSTALLATION

- A. General: Comply with the following:

1. Maintain support facilities until Owner schedules Substantial Completion inspection. Remove before Substantial Completion. Personnel remaining after Substantial Completion will be permitted to use permanent facilities, under conditions acceptable to Owner.
- B. Temporary Roads and Paved Areas: Construct and maintain temporary roads and paved areas adequate for construction operations. Locate temporary roads and paved areas as indicated within construction limits indicated on Drawings.
 1. Provide dust-control treatment that is nonpolluting and non-tracking. Reapply treatment as required to minimize dust.
- C. Parking: Provide temporary parking areas for construction personnel.
 1. Parking is the responsibility of the Design Builder.
- D. Project Signs: Provide Project signs as indicated. Unauthorized signs are not permitted.
 1. Identification Signs: Provide Project identification signs as indicated on Drawings.
 2. Temporary Signs: Provide other signs as indicated and as required to inform public and individuals seeking entrance to Project.
- E. Waste Disposal Facilities: Comply with requirements specified in Section 017419 "Construction Waste Management and Disposal."
- F. Waste Disposal Facilities: Provide waste-collection containers in sizes adequate to handle waste from construction operations. Comply with requirements of authorities having jurisdiction.
 1. There is no permanent location for a dumpster. If the Design-Builder needs to use dumpsters, they must deliver it to the site at 6:00 PM and then remove the dumpster before 6:00 AM the next day unless coordinated and approved by Owner to remain for an extended time duration.
 2. Collect waste from construction areas daily. Comply with requirements of NFPA 241 for removal of combustible waste material and debris. Enforce requirements strictly. Handle dangerous or unsanitary waste materials separately from other waste by containerizing properly. Dispose of material in a lawful manner.
- G. 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.
- H. Existing Elevator Use: Use of Owner's existing elevators may be permitted, provided elevators are cleaned and maintained in a condition acceptable to Owner. At Substantial Completion, restore elevators to condition existing before initial use, including replacing worn cables, guide shoes, and similar items of limited life.
 1. The use of service elevator has to be shared with the operations of the Owner. Design-Builder shall schedule and coordinate use of the elevator on daily basis with the Owner.
 2. Do not load elevators beyond their rated weight capacity.
 3. Provide protective coverings, barriers, devices, signs, or other procedures to protect elevator car and entrance doors and frame. If, despite such protection, elevators become

damaged, engage elevator Installer to restore damaged work so no evidence remains of correction work. Return items that cannot be refinished in field to the shop, make required repairs and refinish entire unit, or provide new units as required.

4. Use of passengers' elevators for construction purpose is not permitted.

- I. Temporary Stairs: Until permanent stairs are available, provide temporary stairs where ladders are not adequate.
- J. Existing Stair Usage: Use of Owner's existing stairs will be permitted, provided stairs are cleaned and maintained in a condition acceptable to Owner. At Substantial Completion, restore stairs to condition existing before initial use.
 - 1. Provide protective coverings, barriers, devices, signs, or other procedures to protect stairs and to maintain means of egress. If stairs become damaged, restore damaged areas so no evidence remains of correction work.
- K. Temporary Use of Permanent Stairs: Use of new stairs for construction traffic will be permitted, provided stairs are protected and finishes restored to new condition at time of Substantial Completion.

3.5 SECURITY AND PROTECTION FACILITIES INSTALLATION

- A. Protection of Existing Facilities: Protect existing vegetation, equipment, structures, utilities, and other improvements at Project site and on adjacent properties, except those indicated to be removed or altered. Repair damage to existing facilities.
 - 1. Where access to adjacent properties is required in order to affect protection of existing facilities, obtain written permission from adjacent property owner to access property for that purpose.
- B. Temporary Erosion and Sedimentation Control: Comply with requirements shown on drawings.
- C. Stormwater Control: Comply with requirements shown on drawings for control of storm water. Provide barriers in and around excavations to prevent flooding by runoff of stormwater from heavy rains.
- D. Tree and Plant Protection: Comply with requirements shown on drawings.
- E. 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. Perform control operations lawfully, using materials approved by authorities having jurisdiction.
- F. Site Enclosure Fence: Before construction operations begin and prior to commencing work, furnish and install site enclosure fence in a manner that will prevent people from easily entering site except by entrance gates.
 - 1. Extent of Fence: As required to enclose entire Project site or portion determined sufficient to accommodate construction operations or as indicated on Drawings.

2. Maintain security by limiting number of keys and restricting distribution to authorized personnel. Furnish one set of keys to Owner.
- G. Security Enclosure and Lockup: Install temporary enclosure around partially completed areas of construction. Provide lockable entrances to prevent unauthorized entrance, vandalism, theft, and similar violations of security. Lock entrances at end of each workday.
- H. Barricades, Warning Signs, and Lights: Comply with requirements of authorities having jurisdiction for erecting structurally adequate barricades, including warning signs and lighting.
- I. Temporary Egress: Maintain temporary egress from existing occupied facilities as indicated and as required by authorities having jurisdiction.
- J. Covered Walkway: Erect protective, covered walkway for passage of individuals through or adjacent to Project site. Coordinate with entrance gates, other facilities, and obstructions. Comply with regulations of authorities having jurisdiction and requirements indicated on Drawings.
 1. Provide overhead decking, protective enclosure walls, handrails, barricades, warning signs, exit signs, lights, safe and well-drained walkways, and similar provisions for protection and safe passage.
 2. Paint and maintain appearance of walkway for duration of the Work.
 3. Submit plans for all temporary walkways for owner approval.
- K. Temporary Enclosures: Provide temporary enclosures for protection of construction, in progress and completed, from exposure, foul weather, other construction operations, and similar activities. Provide temporary weathertight enclosure for building exterior.
 1. Where heating or cooling is needed and permanent enclosure is incomplete, insulate temporary enclosures.
- L. Temporary Partitions: Provide floor-to-ceiling dustproof partitions to limit dust and dirt migration and to separate areas occupied by Owner and tenants from fumes and noise.
 1. Construct dustproof partitions with gypsum wallboard with joints taped on occupied side, and fire-retardant-treated plywood on construction operations side. This work must follow all code requirements. "Exit Access" must be maintained during construction and comply with jurisdictional requirements.
 2. Where allowed by owner, construct dustproof partitions with two layers of 10-mil polyethylene sheet on each side. Cover floor with two layers of 6-mil polyethylene sheet, extending sheets 18 inches up the sidewalls. Overlap and tape full length of joints. Cover floor with fire-retardant-treated plywood.
 - a. Construct vestibule and airlock at each entrance through temporary partition with not less than 48 inches between doors. Maintain water-dampened foot mats in vestibule.
 3. Where fire-resistance-rated temporary partitions are indicated or are required by authorities having jurisdiction, construct partitions according to the rated assemblies.
 4. Insulate partitions to control noise transmission to occupied areas.

5. Seal joints and perimeter. Equip partitions with gasketed dustproof doors and security locks where openings are required.
 6. Protect air-handling equipment.
 7. Provide walk-off mats at each entrance through temporary partition.
- M. Temporary Fire Protection: Install and maintain temporary fire-protection facilities of types needed to protect against reasonably predictable and controllable fire losses. Comply with NFPA 241; manage fire-prevention program.
1. Prohibit smoking in construction areas. Comply with additional limits on smoking specified in other Sections.
 2. Supervise welding operations, combustion-type temporary heating units, and similar sources of fire ignition 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.
 4. Provide temporary standpipes and hoses for fire protection. Hang hoses with a warning sign stating that hoses are for fire-protection purposes only and are not to be removed. Match hose size with outlet size and equip with suitable nozzles.
 5. Provide rated Fire Extinguishers of an appropriate size and locations.
 - a. The Design-Builder shall inspect and check each extinguisher at least once a week during the Contract period and shall affix a dated tag certifying adequacy of charge and workability of each extinguisher.
 - b. Comply with NFPA 10 and NFPA 241 for classification, extinguishing agent, and size required by location and class of fire exposure.
 - c. Where exposed electrical and/or telephone equipment occurs, fire extinguishers of dry chemical type for Class B and C fires shall be provided.

3.6 OPERATION, TERMINATION, AND REMOVAL

- A. Supervision: Enforce strict discipline in use of temporary facilities. To minimize waste and abuse, limit availability of temporary facilities to essential and intended uses.
- B. Maintenance: Maintain facilities in good operating condition until removal.
1. Maintain operation of temporary enclosures, heating, cooling, humidity control, ventilation, and similar facilities on a 24-hour basis where required to achieve indicated results and to avoid possibility of damage.
- C. Temporary Facility Changeover: Do not change over from using temporary security and protection facilities to permanent facilities until Substantial Completion.
- D. Termination and Removal: Remove each temporary facility when need for its service has ended, when it has been replaced by authorized use of a permanent facility, or no later than Substantial Completion. Complete or, if necessary, restore permanent construction that may have been delayed because of interference with temporary facility. Repair damaged Work, clean exposed surfaces, and replace construction that cannot be satisfactorily repaired.

1. Materials and facilities that constitute temporary facilities are property of Design-Builder. Owner reserves right to take possession of Project identification signs.
2. Remove temporary roads and paved areas not intended for or acceptable for integration into permanent construction. 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, repair, renovate, and clean permanent facilities used during construction period. Comply with final cleaning requirements specified in Section 017700 "Closeout Procedures."

END OF SECTION 015000

SECTION 016000 - PRODUCT REQUIREMENTS

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes administrative and procedural requirements for selection of products for use in Project; product delivery, storage, and handling; manufacturers' standard warranties on products; special warranties; and comparable products.
- B. Related Requirements:
 - 1. Section 012100 "Allowances" for products selected under an allowance.
 - 2. Section 012500 "Substitution Procedures" for requests for substitutions.
 - 3. Section 012900 "Payment Procedures" for application for payment requirements.
 - 4. Section 017700 "Closeout Procedures" for warranty submittals.
 - 5. Section 014200 "References" for applicable industry standards for products specified.

1.2 DEFINITIONS

- A. Products: Items obtained for incorporating into the Work, whether purchased for Project or taken from previously purchased stock. The term "product" includes the terms "material," "equipment," "system," and terms of similar intent.
 - 1. Named Products: Items identified by manufacturer's product name, including make or model number or other designation shown or listed in manufacturer's published product literature that is current as of date of the Contract Documents.
 - 2. New Products: Items that have not previously been incorporated into another project or facility. Products salvaged or recycled from other projects are not considered new products.
 - 3. Comparable Product: Product that is demonstrated and approved through submittal process to have the indicated qualities related to type, function, dimension, in-service performance, physical properties, appearance, and other characteristics that equal or exceed those of specified product.
- B. Basis-of-Design Product Specification: A specification in which a single manufacturer's product is named and accompanied by the words "basis-of-design product," including make or model number or other designation. In addition to the basis-of-design product description, product attributes and characteristics may be listed to establish the significant qualities related to type, function, in-service performance and physical properties, weight, dimension, durability, visual characteristics, and other special features and requirements for purposes of evaluating comparable products of additional manufacturers named in the specification. D-B shall specify products/systems/materials/equipment that meet (or exceed) the stated performance requirement, or performance of Basis of Design product, identified in the Bridging Concept Documents.
- C. Unless prohibited or provided for otherwise elsewhere in the Contract, where the accepted contract proposal named products, systems, materials or equipment by manufacturer, brand

name and/or by model number or other specific identification, and the D-B desires to substitute manufacturer or model after award, submit a requested substitution for Government concurrence. Include substantiation, identifying information and the DOR's approval, as meeting the contract requirements and that it is equal in function, performance, quality and salient features to that in the accepted contract proposal. If the Contract otherwise prohibits substitutions of equal named products, systems, materials or equipment by manufacturer, brand name and/or by model number or other specific identification, the request is considered a "variation" to the contract. All finish selections shall be Government/Owner Approved (GA).

- D. Subject to Compliance with Requirements: Where the phrase "Subject to compliance with requirements" introduces a product selection procedure in an individual Specification Section, provide products qualified under the specified product procedure. In the event that a named product or product by a named manufacturer does not meet the other requirements of the specifications, select another named product or product from another named manufacturer that does meet the requirements of the specifications. Submit a comparable product request, if applicable.

1.3 ACTION SUBMITTALS

- A. Comparable Product Request Submittal (Substitution): Comply with requirements in Section 012500 - Substitution Procedures.
- B. Product Specification Submittal: Comply with requirements in Section 013300- Submittal Procedures. Show compliance with requirements.

1.4 QUALITY ASSURANCE

- A. Compatibility of Options: If Design-Builder is given option of selecting between two or more products for use on Project, select product compatible with products previously selected, even if previously selected products were also options.
- B. Identification of Products: Except for required labels and operating data, do not attach or imprint manufacturer or product names or trademarks on exposed surfaces of products or equipment that will be exposed to view in occupied spaces or on the exterior.
1. Labels: Locate required product labels and stamps on a concealed surface, or, where required for observation following installation, on a visually accessible surface that is not conspicuous.
 2. Equipment Nameplates: Provide a permanent nameplate on each item of service-connected or power-operated equipment. Locate on a visually accessible but inconspicuous surface. Include information essential for operation, including the following:
 - a. Name of product and manufacturer.
 - b. Model and serial number.
 - c. Capacity.
 - d. Speed.
 - e. Ratings.

3. See individual identification sections in Divisions 21, 22, 23, and 26 for additional identification requirements.

1.5 PRODUCT DELIVERY, STORAGE, AND HANDLING

- A. Deliver, store, and handle products using means and methods that will prevent damage, deterioration, and loss, including theft and vandalism. Comply with manufacturer's written instructions.
- B. Delivery and Handling:
 1. Schedule delivery to minimize long-term storage at Project site and to prevent overcrowding of construction spaces.
 2. Coordinate delivery with installation time to ensure minimum holding time for items that are flammable, hazardous, easily damaged, or sensitive to deterioration, theft, and other losses.
 3. Deliver products to Project site in an undamaged condition in manufacturer's original sealed container or other packaging system, complete with labels and instructions for handling, storing, unpacking, protecting, and installing.
 4. Inspect products on delivery to determine compliance with the Contract Documents and to determine that products are undamaged and properly protected.
- C. Storage: For Application for Payment documentation requirements of stored materials see Section 012900 - Payment Procedures.
 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. Protect foam plastic from exposure to sunlight, except to extent necessary for period of installation and concealment.
 5. Comply with product manufacturer's written instructions for temperature, humidity, ventilation, and weather-protection requirements for storage.
 6. Protect stored products from damage and liquids from freezing.
 7. Provide a secure location and enclosure at Project site for storage of materials and equipment by Owner's construction forces. Coordinate location with Owner.

1.6 PRODUCT WARRANTIES

- A. Warranties shall commence upon Substantial Completion or at a date identified and agreed to by Owner for designated portions of the work. See Section 017700 - Closeout Procedures.
- B. 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 Design-Builder of obligations under requirements of the Contract Documents.
 1. Manufacturer's Warranty: Written warranty furnished by individual manufacturer for a particular product and specifically endorsed by manufacturer to Owner.

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

PART 2 - PRODUCTS

2.1 PRODUCT SELECTION PROCEDURES

- A. General Product Requirements: Provide products that comply with the Contract Documents, are undamaged and, unless otherwise indicated, are new at time of installation.
1. Provide products complete with accessories, trim, finish, fasteners, and other items needed for a complete installation and indicated use and effect.
 2. Standard Products: If available, and unless custom products or nonstandard options are specified, provide standard products of types that have been produced and used successfully in similar situations on other projects.
 3. Owner reserves the right to limit selection to products with warranties meeting requirements of the Contract Documents.
 4. Where products are accompanied by the term "as selected," Owner will make selection.
 5. Descriptive, performance, and reference standard requirements in the Specifications establish salient characteristics of products.
 6. Or Equal: For products specified by name and accompanied by the term "or equal," or "or approved equal," or "or approved," comply with requirements in "Comparable Products" Article to obtain approval for use of an unnamed product.
 - a. Submit additional documentation required in order to establish equivalency of proposed products. Evaluation of "or equal" product status is by Owner, whose determination is final.
- B. Product Selection Procedures:
1. Sole Product: Where Specifications name a single manufacturer and product, provide the named product that complies with requirements. Comparable products or substitutions for Design-Builder's convenience will not be considered.
 - a. Sole product may be indicated by the phrase: "Subject to compliance with requirements, provide the following..."

2. Sole Manufacturer/Source: Where Specifications name a single manufacturer or source, provide a product by the named manufacturer or source that complies with requirements. Comparable products or substitutions for Design-Builder's convenience will not be considered.
 - a. Sole manufacturer/source may be indicated by the phrase: "Subject to compliance with requirements, provide products by the following: ..."
3. Limited List of Products: Where Specifications include a list of names of both manufacturers and products, provide one of the products listed that complies with requirements. Comparable products or substitutions for Design-Builder's convenience will not be considered unless otherwise indicated.
 - a. Limited list of products may be indicated by the phrase: "Subject to compliance with requirements, provide one of the following: ..."
4. Non-Limited List of Products: Where Specifications include a list of names of both available manufacturers and products, provide one of the products listed, or an unnamed product, which complies with requirements.
 - a. Non-limited list of products is indicated by the phrase: "Subject to compliance with requirements, available products that may be incorporated in the Work include, but are not limited to, the following: ..."
5. Limited List of Manufacturers: Where Specifications include a list of manufacturers' names, provide a product by one of the manufacturers listed that complies with requirements. Comparable products or substitutions for Design-Builder's convenience **will not** be considered unless otherwise indicated.
 - a. Limited list of manufacturers is indicated by the phrase: "Subject to compliance with requirements, provide products by one of the following: ..."
6. Non-Limited List of Manufacturers: Where Specifications include a list of available manufacturers, provide a product by one of the manufacturers listed, or a product by an unnamed manufacturer, which complies with requirements.
 - a. Non-limited list of manufacturers is indicated by the phrase: "Subject to compliance with requirements, available manufacturers whose products may be incorporated in the Work include, but are not limited to, the following: ..."
7. Basis-of-Design Product: Where Specifications name a product, or refer to a product indicated on Drawings, and include a list of manufacturers, provide the specified or indicated product or a comparable product by one of the other named manufacturers. Drawings and Specifications indicate sizes, profiles, dimensions, and other characteristics that are based on the product named. Comply with requirements in "Comparable Products" Article for consideration of an unnamed product by one of the other named manufacturers.
 - a. For approval of products by unnamed manufacturers, comply with requirements in Section 012500 "Substitution Procedures" for substitutions for convenience.

- C. Visual Matching Specification: Where Specifications require "Owner's sample," provide a product that complies with requirements and matches Owner's sample. Owner's decision will be final on whether a proposed product matches.
 - 1. If no product available within specified category matches and complies with other specified requirements, comply with requirements in Section 012500 "Substitution Procedures" for proposal of product.
- D. Visual Selection Specification: Where Specifications include the phrase "as selected by Owner or Owner's Agent" from manufacturer's full range" or similar phrase, select a product that complies with requirements. Owner or Owner's Agent will select color, gloss, pattern, density, or texture from manufacturer's product line that includes both standard and premium items.

2.2 COMPARABLE PRODUCTS

- A. Consideration of Comparable Products: Owner will consider Design-Builder's request for comparable product (substitution) when applicable. Refer to Section 012500 Substitution Procedures.
- B. Submittal Requirements: Approval by the Owner of Design-Builder's request for use of comparable product is not intended to satisfy other submittal requirements. Comply with specified submittal requirements.

PART 3 - EXECUTION (NOT USED)

END OF SECTION 016000

SECTION 017300 – CONSTRUCTION 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, provisions of Request for Proposal (RFP) 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. Construction Management Plan
 - 4. Dust and HVAC Control
 - 5. Moisture and Mold Protection
 - 6. Installation of the Work.
 - 7. Cutting and patching.
 - 8. Coordination of Owner-installed products.
 - 9. Progress cleaning.
 - 10. Correction of the Work
 - 11. Starting and adjusting.
 - 12. Protection of installed and existing construction.
- B. Related Requirements:
 - 1. Section 011000 "Summary" for limits on use of Project site.
 - 2. Section 012900 "Payment Procedures" as referenced for the storage of materials to avoid damage from weather.
 - 3. Section 013100 "Project Management and Coordination" for general coordination provisions.
 - 4. Section 013300 "Submittal Procedures" for submitting surveys.
 - 5. Section 014000 "Quality Requirements" as it relates to the Quality Control Portion of the Construction Management Plan
 - 6. Section 015000 "Temporary Utilities and Facilities" for standards on temporary partitions and separation of work spaces
 - 7. Section 017419 "Construction Waste Management and Disposal" relating to coordination and removal of waste as outlined below.
 - 8. Section 017700 "Closeout Procedures" for submitting final property survey with Project Record Documents, recording of Owner-accepted deviations from indicated lines and levels, replacing defective work, and final cleaning.
 - 9. Section 024119 "Selective Demolition" for the disposition of waste resulting from demolition and for the disposition of hazardous waste.

1.3 DEFINITIONS

- A. Cutting: Removal of in-place construction necessary to permit installation or performance of subsequent work.
- B. Patching: Fitting and repair work required to restore construction to original conditions after installation of subsequent work.
- C. Construction Waste: Building and site improvement materials and other solid waste resulting from construction, demolition, remodeling, renovation, or repair operations. Construction waste including packaging.

1.4 PREINSTALLATION MEETINGS

- A. Cutting and Patching Conference: Conduct conference at Project site. See 013100 Project Management and Coordination for other Preinstallation Conference requirements.
 - 1. Require representatives of each entity directly concerned with cutting and patching to attend, including the following:
 - a. Owner.
 - b. Design-Builder's superintendent.
 - c. Trade supervisor responsible for cutting operations.
 - d. Trade supervisor(s) responsible for patching of each type of substrate.
 - e. Mechanical, electrical, and utilities subcontractors' supervisors, to the extent each trade is affecting by cutting and patching operations.
- B. Review areas of potential interference and conflict. Coordinate procedures and resolve potential conflicts before proceeding.

1.5 INFORMATIONAL SUBMITTALS

- A. Construction Management Plan: As part of each Design Deliverable Submission and Review, submit the Construction Management Plan which is to include the analysis of the work, constructability, and a detailed description of the tasks assigned to the Design-Builders staff performing the work. Final acceptance of the Construction Management plan will coincide with the 95% Design Deliverable, the requirements of the RFP, and final negotiation for Construction. The Construction Management Plan must address the following items:
 - 1. Noise Control
 - 2. Hours of Construction and Deliveries
 - 3. Site Utilization Plans (Showing Staging Plans, Construction Parking, Logistics, etc.)
 - 4. Traffic Control / Routing Plans
 - 5. Trash and Debris Removal Plans (In coordination with Specification 017419 Construction Waste Management and Disposal)
 - 6. Communication Procedures and Protocols (Including a list of contacts for the project. For relevant Owner's contacts, please coordinate with the Owner)
 - 7. Emergency Procedures and Protocols
 - 8. Quality Control Procedures (In coordination with Specification Section 014000 Quality Requirements)
 - 9. Project Signage (As outlined in Specification 015000 Temporary Utilities and Facilities) and as required for way finding during construction and as required by the AHJ and Owner.

10. Temporary Fire Protection Measures

- B. Dust and HVAC Control Plan: As part of the Design Deliverables Submittals, submit coordination drawings and narratives that indicates the dust and HVAC control measures proposed for use, proposed locations, and proposed time frame for their operation. These drawings should show all temporary partitions utilized to separate work areas from other areas where Owner's operations will remain. Final acceptance of the HVAC Control Plan will be provided ahead of 95% negotiations for Construction. The plans should include the following information:
1. HVAC System Isolation Schematic drawings
 - a. If Design-Builder is planning on utilizing existing HVAC systems that are to remain, provide a plan for isolation and protection of these existing systems from contamination during construction. Utilization of existing system can only be authorized by the Owner. Work areas must be completely isolated and air from work areas filtrated from cycling into occupied areas of the building. All filters used for this purpose shall be MERV 13 rated.
 - b. If approved by Owner, Design-Builder can utilize existing HVAC systems but accepts full responsibility for investigation of the integrity of the system and must provide a written assessment including Testing and Balancing of air handling system before construction as a baseline. Upon completion of the work DB shall provide written report including Testing and Balancing that confirms system performs to operable parameters within the tolerances established by the baseline. Any deficiencies shall be corrected by the Design-Builder at no additional cost to the Owner.
 2. Location of proposed air-filtration system discharge, interior and exterior. This must be done in coordination with other building systems to avoid contamination of outside air intakes. Cover and protect outside air intakes with MERV 13 filters. Cover interior return air ducts in construction area with MERV 13 Filters. Examine filters weekly and replace when dirty.
 3. All dust-control measures required during construction (For standards on temporary partitions and materials, refer to specification Section 015000)
- C. Moisture and Mold Protection Plan: As part of the Design Deliverables, submit Design-Builders procedures and control plans for protecting materials and construction from water absorption, water damage, and mold.
1. Describe delivery, handling, storage, installation, and protection provisions for materials subject to water absorption or water damage.
 - a. For storage and handling requirements, refer to Specification Section 016000. For payment of stored materials see Section 012900 Payment Procedures.
 2. Indicate procedures for discarding water-damaged materials, protocols for mitigating water intrusion into completed Work, and replacing water-damaged work. Any and all water damaged work shall be removed and replaced complete in place with new materials that match the damaged materials.
 3. Warranty: Existing material and assemblies warranties shall be maintained within the requirements of the warranties when affected by the work.
 4. Indicate sequencing of work that requires water, such as, but not limited to, sprayed fire-resistive materials, plastering, and terrazzo grinding, and describe plans for dealing with water from these operations. Show procedures for verifying that wet construction has dried sufficiently to permit installation of finish materials.
 5. Indicate methods to be used to avoid trapping water in finished work.

6. Exposed Construction Period: Before installation of water barriers, when materials are subject to wetting and exposure and to airborne mold spores, protect as suggested by manufacturer and as accepted by Owner.
 7. Protect porous material from water damage.
- D. Cutting and Patching Plan: Submit plan describing procedures at least ten 10 calendar days prior to the time cutting and patching will be performed. Prior to submitting cutting and patching, review extent of cutting and patching anticipated and examine procedures for ensuring satisfactory result from cutting and patching work. Include the following information:
1. Extent: Describe reason for and extent of each occurrence of cutting and patching.
 2. Changes to In-Place Construction: Describe anticipated results. Include changes to structural elements and operating components as well as changes in building appearance and other significant visual elements.
 3. Products: List products to be used for patching and firms or entities that will perform patching work.
 4. Dates: Indicate when cutting and patching will be performed.
 5. Utilities and Mechanical and Electrical Systems: List services and systems that cutting and patching procedures will disturb or affect. List services and systems that will be relocated and those that will be temporarily out of service. Indicate length of time permanent services and systems will be disrupted.
 - a. Include description of provisions for temporary services and systems during interruption of permanent services and systems.
- E. Landfill Receipts: Submit copy of receipts issued by a landfill facility, licensed to accept hazardous materials, for hazardous waste disposal.
- F. Fire protection/ fire watch Plan: Fire-Safety Program: Show compliance with requirements of NFPA 241 and Authorities Having Jurisdiction. (AHJ) Indicate Contractor personnel responsible for management of fire-prevention program. Submit Plan Prior to 95%
1. Coordination with fire Hot Work Permit: Contractors are expected to obtain a written permit prior to performing “Hot Work” (i.e. welding or cutting) or operating other flame-producing/spark producing devices, from the Owner. The Contractor and their subcontractors are solely responsible for strict adherence to the requirements outlined in the permit and for providing fire extinguisher for all types of Hot Work. Contractors are required to meet all criteria identified on the permit. Areas shall be surveyed prior to performing any hot work to ensure they are free of fire hazards. Provide at a minimum at least two 20 lb. ABC rated extinguishers for normal “Hot Work”. The extinguishers must be current inspection tagged and contain an approved safety pin and tamper resistant seal. All hot work activities must have a designated Fire watch whose sole activity is fire watch. The Fire Watch must be trained in accordance with NFPA 51B and remain on-site for a minimum of one hour after the completion of the task or as specified on the hot work permit.

1.6 QUALITY ASSURANCE

- A. Land Surveyor Qualifications: A professional land surveyor who is legally qualified to practice in the 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 Owner of locations and details of cutting and await directions from Owner 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 result in increased maintenance or decreased operational life or safety. Operational elements include the following:
 - a. Primary operational systems and equipment.
 - b. Fire separation assemblies.
 - c. Air or smoke barriers.
 - d. Fire-suppression systems.
 - e. Plumbing piping systems.
 - f. Mechanical systems piping and ducts.
 - g. Control systems.
 - h. Communication systems.
 - i. Fire-detection and -alarm systems.
 - j. Conveying systems.
 - k. Electrical wiring systems.
 - l. Operating systems of special construction.
 - 3. Other Construction Elements: Do not cut and patch other construction elements or components in a manner that could change their load-carrying capacity, that results in reducing their capacity to perform as intended, or that results in increased maintenance or decreased operational life or safety. Other construction elements include but are not limited to the following:
 - a. Water, moisture, or vapor barriers.
 - b. Membranes and flashings.
 - c. Exterior wall construction.
 - d. Sprayed fire-resistive material.
 - e. Equipment supports.
 - f. Piping, ductwork, vessels, and equipment.
 - g. Noise- and vibration-control elements and systems.
 - 4. Visual Elements: Do not cut and patch construction in a manner that results in visual evidence of cutting and patching. Do not cut and patch exposed construction in a manner that would, in Owner's opinion, reduce the building's aesthetic qualities. Remove and replace construction that has been cut and patched in a visually unsatisfactory manner.

- C. Manufacturer's Installation Instructions: Obtain and maintain on-site manufacturer's written recommendations and instructions for installation of products and equipment.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. General: Comply with requirements specified in other Sections.
 - 1. For projects requiring compliance with sustainable design and construction practices and procedures, use products for patching that comply with sustainable design requirements.
- B. In-Place Materials: Use materials for patching identical to in-place materials. For exposed surfaces, use materials that visually match in-place adjacent surfaces to the fullest extent possible.
 - 1. If identical materials are unavailable or cannot be used, use materials that, when installed, will provide a match acceptable to Owner for the visual and functional performance of in-place materials.
- C. Temporary Partitions: For materials to be utilized for temporary partitions, refer to Specification 015000 Temporary Utilities and Facilities.
 - 1. Design-Builder shall propose as part of their Construction Management Plan the materials utilized for temporary partitions, final acceptance shall be by the Owner and should be a function of the Design-Builders approach to the project.

PART 3 - EXECUTION

3.1 ACCESS TO AND USE OF FACILITY

- A. The Design-Builder shall use only such entrances to the work area as designated by the Owner and coordinated with the Owner.
- B. Only such portions of the premises as required for proper execution of the contract shall be occupied by the Design-Builder and construction staff.
- C. The Design-Builder shall not load or permit the loading of any part of any structure to such an extent as to endanger its safety.
- D. All work shall be carried on in an orderly manner and performed in such manner to cause minimum noises or disturbances as outlined and presented in the Construction Management Plan.
- E. Access to Building:
 - 1. Design-Builder will be given access to the portions of the building required to perform the work in accordance with the requirements established by the Owner. The Design-

Builder's access may be further limited by requirements to secure and sensitive areas or where work is specified to be performed only during certain specified periods.

2. Design-Builder shall make all necessary arrangements with the Owner for access to the building after regular working hours and/or for work on Saturday, Sunday, or Holidays.

3.2 EXAMINATION

- A. Existing Conditions: The existence and location of underground and other utilities and construction indicated as existing are not guaranteed. Before beginning sitework, investigate and verify the existence and location of underground utilities, mechanical and electrical systems, and other construction affecting the Work.
 1. Before construction, verify the location and invert elevation at points of connection of sanitary sewer, storm sewer, 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 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. Field Condition Report: Immediately upon discovery of a difference between field conditions and the Contract Documents, or conditions detrimental to the performance of the Work, prepare and submit a detailed written report. Include the following:
 1. Description of the Work.
 2. List of detrimental conditions, including substrates.
 3. List of unacceptable installation tolerances.
 4. Recommended corrections.
- D. Upon discovery of previously unknown condition outside the control of Design-Builder, that affects the Design and/or Cost of construction, submit notification to the Owner according to requirements in Section 013100 "Project Management and Coordination."
- E. Proceed with installation only after unsatisfactory conditions have been corrected. Proceeding with the Work indicates acceptance of surfaces and conditions.

3.3 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 with provisions of Request for Proposal (RFP).

3.4 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 the Owner in writing promptly.
- B. General: Engage a land surveyor or professional engineer 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 Owner when deviations from required lines and levels exceed allowable tolerances.
 - 7. Close site surveys with an error of closure equal to or less than the standard established by authorities having jurisdiction.
 - 8. Survey existing conditions at locations where physical connections are to be made between new and existing construction, such between floor elevations and at utility connections.
- 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 Owner.

3.5 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 Owner. 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.

3.6 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.
 4. Maintain minimum headroom clearance of 96 inches in occupied spaces and 90 inches in unoccupied spaces.
- 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: Where possible, select tools or equipment that minimize production of excessive noise levels.
- G. Templates: Obtain and distribute to the parties involved templates for work specified to be factory prepared and field installed. Check Shop Drawings of other portions of the Work to confirm that adequate provisions are made for locating and installing products to comply with indicated requirements.

- H. Attachment: Provide blocking and attachment plates and anchors and fasteners of adequate size and number to securely anchor each component in place, accurately located and aligned with other portions of the Work. Where size and type of attachments are not indicated, verify size and type required for load conditions.
 - 1. Mounting Heights: Where mounting heights are not indicated, mount components at heights directed by Owner.
 - 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.
 - 4. Coordinate with requirements of Owner/OGC supplied FFE, materials, furnishings, and components.
 - 5. Provide sufficient engineered support for concealed valves.
- 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. Repair or remove and replace damaged, defective, or nonconforming Work.
 - 1. Comply with Section 017700 "Closeout Procedures" for repairing or removing and replacing defective Work.

3.7 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. Existing Warranties: Remove, replace, patch, and repair materials and surfaces cut or damaged during installation or cutting and patching operations, by methods and with materials so as not to void existing warranties.
- C. Temporary Support: Provide temporary support of work to be cut.
- D. Protection: Protect in-place construction during cutting and patching to prevent damage. Provide protection from adverse weather conditions for portions of Project that might be exposed during cutting and patching operations.
- E. Adjacent Occupied Areas: Where interference with use of adjoining areas or interruption of free passage to adjoining areas is unavoidable, coordinate Work according to requirements in Section 011000 "Summary."
- F. Existing Utility Services and Mechanical/Electrical Systems: Where existing services/systems are required to be removed, relocated, or abandoned, bypass such services/systems before cutting to prevent interruption to occupied areas.

- G. Cutting: Cut in-place construction by sawing, drilling, breaking, chipping, grinding, and similar operations, including excavation, using methods least likely to damage elements retained or adjoining construction. If possible, review proposed procedures with original Installer; comply with original Installer's written recommendations.
1. In general, use hand or small power tools designed for sawing and grinding, not hammering and chopping. Cut holes and slots neatly to minimum size required, and with minimum disturbance of adjacent surfaces. Temporarily cover openings when not in use.
 2. Finished Surfaces: Cut or drill from the exposed or finished side into concealed surfaces.
 3. Concrete 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 Sections where required by cutting and patching operations.
 5. Mechanical and Electrical Services: Cut off pipe or conduit in walls or partitions to be removed. Cap, valve, or plug and seal remaining portion of pipe or conduit to prevent entrance of moisture or other foreign matter after cutting.
 6. Proceed with patching after construction operations requiring cutting are complete.
- H. Patching: Patch construction by filling, repairing, refinishing, closing up, and similar operations following performance of other work. Patch with durable seams that are as invisible as practicable. 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.
 3. Floors and Walls: Where walls or partitions that are removed extend one finished area into another, patch and repair floor and wall surfaces in the new space. Provide an even surface of uniform finish, color, texture, and appearance. Remove in-place floor and wall coverings and replace with new materials, if necessary, to achieve uniform color and appearance.
 - a. Where patching occurs in a painted surface, prepare substrate and apply primer and intermediate paint coats appropriate for substrate over the patch, and apply final paint coat over entire unbroken surface containing the patch. Provide additional coats until patch blends with adjacent surfaces.
 4. Ceilings: Patch, repair, or rehang in-place ceilings as necessary to provide an even-plane surface of uniform appearance.
 5. Exterior Building Enclosure: Patch components in a manner that restores enclosure to a weathertight condition and ensures thermal and moisture integrity of building enclosure.
- I. Cleaning: Clean areas and spaces where cutting and patching are performed. Remove paint, mortar, oils, putty, and similar materials from adjacent finished surfaces.

3.8 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 Design-Builder'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.

3.9 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 Design-Builder 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. Cutting and Patching: Clean areas and spaces where cutting and patching are performed. Completely remove paint, mortar, oils, putty, and similar materials prior to application of finish.
- H. Thoroughly clean piping, conduit, and similar features before applying paint or other finishing materials. Restore damaged pipe covering to its original condition,
- I. Any volatile materials shall be removed from site or stored in fire rated enclosures at the end of each workday.
- J. Waste Disposal: Do not bury or burn waste materials on-site. Do not wash waste materials down sewers or into waterways. Comply with waste disposal requirements in Section 015000 "Temporary Facilities and Controls and Section 017419 "Construction Waste Management and Disposal."
- K. 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.
- L. 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.
- M. Limiting Exposures: Supervise construction operations to ensure that no part of the construction completed or in progress, is subject to harmful, dangerous, damaging, or otherwise deleterious exposure during the construction period.

3.10 STARTING AND ADJUSTING

- A. Coordinate startup and adjusting of equipment and operating components with requirements in Section 019113 "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 Section 014000 "Quality Requirements."

3.11 PROTECTION OF INSTALLED CONSTRUCTION

- A. Provide final protection and maintain conditions that ensure installed Work is without damage or deterioration at time of Substantial Completion.

- B. Protection of Existing Facilities: Protect existing vegetation, equipment, structures, utilities, and other improvements at Project site and on adjacent properties, except those indicated to be removed or altered. Ensure that existing items remain undisturbed and unsoiled by construction and are maintained in the condition that existed at commencement of the Work. Repair any damage to existing facilities. See section 017700 Closeout Procedures for additional requirements.
 - 1. Temporarily move equipment and other items that interfere with the performance of required Work. Upon completion of the Work, return the equipment and items to their original location and installation condition.
 - 2. Store equipment and other items that have been temporarily removed at on site location determined by Owner. Upon reinstallation, clean and if damaged, repair or replace equipment and items to match their condition prior to removal.
- C. Comply with manufacturer's written instructions for temperature and relative humidity.

3.12 CORRECTION OF THE WORK

- A. Repair or remove and replace defective construction. Restore damaged substrates and finishes. Design Builder shall be aware that time is of the essence in regard to repairs and replacement of defective or damaged work.
 - 1. Repairing includes replacing defective parts, refinishing damaged surfaces, touching up with matching materials, and properly adjusting operating equipment.
 - 2. Refer to Section 014000 – Quality Requirements
- B. Restore permanent facilities used during construction to their specified condition.

END OF SECTION 017300

SECTION 017419 - CONSTRUCTION WASTE MANAGEMENT AND DISPOSAL

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, and provisions of Request for Proposal (RFP) apply to this Section.

1.2 SUMMARY

- A. Section includes administrative and procedural requirements for the following:
 - 1. Salvaging nonhazardous demolition and construction waste.
 - 2. Recycling nonhazardous demolition and construction waste.
 - 3. Disposing of nonhazardous demolition and construction waste.
- B. Related Requirements:
 - 1. Section 024119 "Selective Demolition" for disposal of waste.
 - 2. Section 013100 "Project Management and Coordination."
 - 3. Section 015000 "Temporary Facilities and Controls."

1.3 DEFINITIONS

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

1.4 MATERIALS OWNERSHIP

- A. Unless otherwise indicated, demolition and construction waste becomes property of Design-Builder.
- B. Historic items, relics, antiques, and similar objects including, but not limited to, cornerstones and their contents, commemorative plaques and tablets, and other items of interest or value to Owner that may be uncovered during demolition remain the property of Owner.
 - 1. Carefully salvage in a manner to prevent damage and promptly return to Owner.

1.5 ACTION SUBMITTALS

- A. Waste Management Plan: Submit draft plan within fourteen (14) calendar days of Notice to Proceed for construction and prior to any activities which generate waste. Update plan biweekly during construction until all activities are accounted.
 - 1. Design-Builder shall not proceed with the work on the Project site until Waste Management Plan is approved by Owner.

1.6 INFORMATIONAL SUBMITTALS

- A. Waste Reduction Progress Reports: Concurrent with each Application for Payment, submit report.
 - 1. Material category.
 - 2. Generation point of waste.
 - 3. Total quantity of waste in **tons**.
 - 4. Quantity of waste salvaged, both estimated and actual in **tons**.
 - 5. Quantity of waste recycled, both estimated and actual in **tons**.
 - 6. Total quantity of waste recovered (salvaged plus recycled) in **tons**.
 - 7. Total quantity of waste recovered (salvaged plus recycled) as a percentage of total waste.
- B. Waste Reduction Calculations: Before request for Substantial Completion, submit calculated end-of-Project rates for salvage, recycling, and disposal as a percentage of total waste generated by the Work.
- C. Recycling and Processing Facility Records: Indicate receipt and acceptance of recyclable waste by recycling and processing facilities licensed to accept them. Include manifests, weight tickets, receipts, and invoices.
- D. Landfill and Incinerator Disposal Records: Indicate receipt and acceptance of waste by landfills and incinerator facilities licensed to accept them. Include manifests, weight tickets, receipts, and invoices.
- E. Qualification Data: For waste management coordinator and refrigerant recovery technician.
- F. Statement of Refrigerant Recovery: 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. Refrigerant Recovery: Comply with requirements in Section 024119 "Selective Demolition" for refrigerant recovery submittals.

1.7 QUALITY ASSURANCE

- A. Waste Management Coordinator Qualifications: Experienced firm, or individual employed and assigned by Design-Builder, with a record of successful waste management coordination of projects with similar requirements. Superintendent may serve as Waste Management Coordinator.
- B. Refrigerant Recovery Technician Qualifications: Universal certified by EPA-approved certification program. Universal is for all types of equipment.
- C. Refrigerant Recovery Technician Qualifications: Comply with requirements in Section 024119 "Selective Demolition."
- D. Regulatory Requirements: Comply with transportation and disposal regulations of authorities having jurisdiction.
- E. Waste Management Conference(s): Conduct conference(s) at Project site to comply with requirements in Section 013100 "Project Management and Coordination." Review methods and procedures related to waste management including, but not limited to, the following:
 - 1. Review and discuss waste management plan including responsibilities of each contractor and waste management coordinator.
 - 2. Review requirements for documenting quantities of each type of waste and its disposition.
 - 3. Review and finalize procedures for materials separation and verify availability of containers and bins needed to avoid delays.
 - 4. Review procedures for periodic waste collection and transportation to recycling and disposal facilities.
 - 5. Review waste management requirements for each trade.

1.8 WASTE MANAGEMENT PLAN

- A. General: Develop a waste management plan according to requirements in this Section. Plan shall consist of waste identification, waste reduction work plan. Distinguish between demolition and construction waste. Indicate quantities by weight or volume but use same units of measure throughout waste management plan.
- B. Waste Identification: Indicate anticipated types and quantities of demolition site-clearing and construction waste generated by the Work. Include estimated quantities and assumptions for estimates.
- C. Waste Reduction Work Plan: List each type of waste and whether it will be salvaged, recycled, or disposed of in landfill or incinerator. Include points of waste generation, total quantity of each type of waste, quantity for each means of recovery, and handling and transportation procedures.
 - 1. Salvaged Materials for Reuse: For materials that will be salvaged and reused in this Project, describe methods for preparing salvaged materials before incorporation into the Work.

2. Recycled Materials: Include list of local receivers and processors and type of recycled materials each will accept. Include names, addresses, and telephone numbers.
3. Disposed Materials: Indicate how and where materials will be disposed of. Include name, address, and telephone number of each landfill and incinerator facility.
4. Handling and Transportation Procedures: Include method that will be used for separating recyclable waste including sizes of containers, container labeling, and designated location where materials separation will be performed.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION

3.1 PLAN IMPLEMENTATION

- A. General: Implement approved waste management plan. Provide handling, containers, storage, signage, transportation, and other items as required to implement waste management plan during the entire duration of the Contract.
 1. Comply with operation, termination, and removal requirements in Section 015000 "Temporary Facilities and Controls."
- B. Waste Management Coordinator: Engage a waste management coordinator to be responsible for implementing, monitoring, and reporting status of waste management work plan. Coordinator shall be present at Project site full time for duration of Project. Training: Train workers, subcontractors, and suppliers on proper waste management procedures, as appropriate for the Work.
 1. Distribute waste management plan to everyone concerned within three days of submittal return.
 2. Distribute waste management plan to entities when they first begin work on-site. Review plan procedures and locations established for salvage, recycling, and disposal.
- C. Site Access and Temporary Controls: Conduct waste management operations to ensure minimum interference with roads, streets, walks, walkways, and other adjacent occupied and used facilities.
 1. Designate and label specific areas on Project site necessary for separating materials that are to be salvaged and recycled.
 2. Comply with Section 015000 "Temporary Facilities and Controls" for controlling dust and dirt, environmental protection, and noise control.

3.2 SALVAGING DEMOLITION WASTE

- A. Comply with requirements in Section 024119 "Selective Demolition" for salvaging demolition waste.
- B. Salvaged Items for Reuse in the Work: Salvage items for reuse and handle as follows:
 1. Clean salvaged items.

2. Pack or crate items after cleaning. Identify contents of containers with label indicating elements, date of removal, quantity, and location where removed.
 3. Store items in a secure area until installation.
 4. Protect items from damage during transport and storage.
 5. Install salvaged items to comply with installation requirements for new materials and equipment. Provide connections, supports, and miscellaneous materials necessary to make items functional for use indicated.
- C. Salvaged Items for Sale and Donation: Not permitted on Project site.
- D. Salvaged Items for Owner's Use:
1. Clean salvaged items.
 2. Pack or crate items after cleaning. Identify contents of containers with label indicating elements, date of removal, quantity, and location where removed.
 3. Store items in a secure area until delivery to Owner.
 4. Transport items to Owner's storage area designated by Owner.
 5. Protect items from damage during transport and storage.
- E. Doors and Hardware: Brace open end of door frames. Except for removing door closers, leave door hardware attached to doors.
- F. Equipment: Drain tanks, piping, and fixtures. Seal openings with caps or plugs. Protect equipment from exposure to weather.
- G. Plumbing Fixtures: Separate by type and size.
- H. Lighting Fixtures: Separate lamps by type and protect from breakage.
- I. Electrical Devices: Separate switches, receptacles, switchgear, transformers, meters, panelboards, circuit breakers, and other devices by type.

3.3 RECYCLING DEMOLITION AND CONSTRUCTION WASTE, GENERAL

- A. General: Recycle paper and beverage containers used by on-site workers.
- B. Recycling Incentives: Revenues, savings, rebates, tax credits, and other incentives received for recycling waste materials shall be shared equally by Owner and Design-Builder.
- C. Preparation of Waste: Prepare and maintain recyclable waste materials according to recycling or reuse facility requirements. Maintain materials free of dirt, adhesives, solvents, petroleum contamination, and other substances deleterious to the recycling process.
- D. Procedures: Separate recyclable waste from other waste materials, trash, and debris. Separate recyclable waste by type at Project site to the maximum extent practical according to approved construction waste management plan. Due to limited space at site Contractor may use "co-mingled" method if acceptable to recycling facility which permits all recyclable waste to be placed in a single container that is separated later at the recycling facility.

1. Provide appropriately marked containers or bins for controlling recyclable waste until removed from Project site. Include list of acceptable and unacceptable materials at each container and bin.
 - a. Inspect containers and bins for contamination and remove contaminated materials if found.
2. Stockpile processed materials on-site without intermixing with other materials. Place, grade, and shape stockpiles to drain surface water. Cover to prevent windblown dust.
3. Stockpile materials away from construction area. Do not store within drip line of remaining trees.
4. Store components off the ground and protect from the weather.
5. Remove recyclable waste from Owner's property and transport to recycling receiver or processor as often as required to prevent overfilling bins.

3.4 RECYCLING DEMOLITION WASTE

- A. Masonry: Remove metal reinforcement, anchors, and ties from masonry and sort with other metals.
 1. Pulverize masonry to maximum 4-inch size.
 2. Clean and stack undamaged, whole masonry units on wood pallets.
- B. Wood Materials: Sort and stack members according to size, type, and length. Separate lumber, engineered wood products, panel products, and treated wood materials.
- C. Metals: Separate metals by type.
 1. Structural Steel: Stack members according to size, type of member, and length.
 2. Remove and dispose of bolts, nuts, washers, and other rough hardware.
- D. Gypsum Board: Stack large clean pieces on wood pallets or in container and store in a dry location. Remove edge trim and sort with other metals. Remove and dispose of fasteners.
- E. Acoustical Ceiling Panels and Tile: Stack large clean pieces on wood pallets and store in a dry location.
- F. Metal Suspension System: Separate metal members, including trim and other metals from acoustical panels and tile, and sort with other metals.
- G. Carpet and Pad: Roll large pieces tightly after removing debris, trash, adhesive, and tack strips.
 1. Store clean, dry carpet and pad in a closed container or trailer provided by carpet reclamation agency or carpet recycler.
- H. Carpet Tile: Remove debris, trash, and adhesive.
 1. Stack tile on pallet and store clean, dry carpet in a closed container or trailer provided by carpet reclamation agency or carpet recycler.

- I. Piping: Reduce piping to straight lengths and store by material and size. Separate supports, hangers, valves, sprinklers, and other components by material and size.
- J. Conduit: Reduce conduit to straight lengths and store by material and size.
- K. Lamps: Separate lamps by type and store according to requirements in 40 CFR 273.

3.5 RECYCLING CONSTRUCTION WASTE

- A. Packaging:
 - 1. Cardboard and Boxes: Break down packaging into flat sheets. Bundle and store in a dry location.
 - 2. Polystyrene Packaging: Separate and bag materials.
 - 3. Pallets: As much as possible, require deliveries using pallets to remove pallets from Project site. For pallets that remain on-site, break down pallets into component wood pieces and comply with requirements for recycling wood.
 - 4. Crates: Break down crates into component wood pieces and comply with requirements for recycling wood.
- B. Wood Materials:
 - 1. Clean Cut-Offs of Lumber: Grind or chip into small pieces.
 - 2. Clean Sawdust: Bag sawdust that does not contain painted or treated wood.
- C. Gypsum Board: Stack large clean pieces on wood pallets or in container and store in a dry location.
- D. Metals: Separate metal by type.
- E. Paint: Seal containers and store by type.

3.6 DISPOSAL OF WASTE

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

3.7 ATTACHMENTS

- A. PROCURE Form CWM-1 for construction waste identification.

END OF SECTION 017419

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, provisions of Request for Proposal (RFP) apply to this Section.

1.2 SUMMARY

- A. Section includes administrative and procedural requirements for contract closeout, including, but not limited to, the following:

1. Substantial Completion procedures.
2. Final completion procedures.
3. Submittal of Warranties.
4. Final cleaning.
5. Repair of the Work.

- B. Related Requirements:

1. Section 013233 "Photographic Documentation" for submitting final completion construction photographic documentation.
2. Section 017823 "Operation and Maintenance Data" for additional operation and maintenance manual requirements.
3. Section 017839 "Project Record Documents" for submitting Record Drawings, Record Specifications, and Record Product Data.
4. Section 017900 "Demonstration and Training" for requirements to train the Owner's maintenance personnel to adjust, operate, and maintain products, equipment, and systems.

1.3 DEFINITIONS

- F. Substantial Completion is defined as that state at which the project, or portion of the project identified in the construction contract, is determined by the Owner to be sufficiently complete and capable of being occupied and used by Owner for the intended purpose. Substantial Completion – The stage in the progress of the Work when the Work or designated portion thereof is sufficiently complete in accordance with the Contract Documents, Including work by Owner's Vendors, Owner's Self-Performed Work, and "Work by Others", to the point where the DC Courts can fully, safely, and securely occupy or utilize the Work or a portion thereof for its intended use.
- G. Final Acceptance or Final Completion: Owner and /or Owner's Agent acceptance of the Work as satisfactorily completed in accordance with Contract Documents. Unless otherwise specified in the contract, the Owner shall accept, as promptly as practicable after completion and

inspection, all work required by the contract. Acceptance shall be final and conclusive except for latent defects, fraud, gross mistakes amounting to fraud, or the Owner's rights under any warranty or guarantee. Design Builder duties and responsibility for safety and for protection of Work shall continue until such time as all the Work is completed and Final Acceptance of the Work achieved.

1.4 ACTION SUBMITTALS

- A. Product Data: For each type of cleaning agent. Refer to all other specification sections for product Record Submittal requirements.
- B. Design-Builder's List of Incomplete Items: Initial submittal at Substantial Completion.
- C. Certified List of Incomplete Items: Final submittal at final completion.

1.5 CLOSEOUT SUBMITTALS

- A. Certificates of Release: From authorities having jurisdiction.
- B. Certificates for Release of Liens.
- C. Certificate of Insurance: For continuing coverage.
- D. Field Report: For pest control inspection.
- E. Submit record documents, as specified in Section 017839 "Project Record Documents":
- F. Submit Operating and Maintenance Manuals: Organize and submit maintenance and operating data as specified in Section 01823 Operation and Maintenance Data. into suitable sets of manageable size.
- G. Closeout Submittal items specified in Section 019113 "General Commissioning Requirements," including commissioning issues reports.

1.6 MAINTENANCE MATERIAL SUBMITTALS

- A. Schedule of Maintenance Material Items: For extra stock maintenance material submittal items specified in other Sections.

1.7 SUBSTANTIAL COMPLETION PROCEDURES

- A. Preliminary Procedures: The following items shall be complete prior to requesting Substantial Completion walkthrough with Owner / Owner's Authority.
 - 1. Documentation: Provide supporting documentation for completion as indicated elsewhere in the Contract Documents and a statement showing an accounting of changes to the Contract Sum.
 - 2. Prepare a list of items to be completed See B below.

3. Advise Owner of pending insurance changeover requirements. Contractor is responsible for coordinating with Owner for these requirements to ensure coverage prior to Owner's occupancy.
4. Submit specific warranties, workmanship bonds, maintenance service agreements, final certifications, and similar documents. Warranties to be dated to start at the Substantial Completion Date.
5. 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.
6. Prepare and submit Project Record Documents, operation and maintenance manuals, final completion construction photographic documentation, and similar final record information.
7. Deliver tools, spare parts, extra materials, and similar items to location designated by Owner. Label with manufacturer's name and model number where applicable.
8. Complete startup and testing of systems and equipment.
9. Complete commissioning requirements for operations specified by the Commissioning Agent and at the Project Closeout Meeting. Obtain acknowledgement from Owner's Commissioning Authority that all contractual requirements for Commissioning have been met.
10. Documentation of service and maintenance performed on installed equipment prior to Substantial Completion.
11. Make final changeover of permanent locks and deliver keys to Owner. Advise Owner's personnel of changeover in security provisions. Coordinate with Court's Security to confirm key turnover process.
12. Participate with Owner in conducting inspection and walkthrough with local emergency responders.
13. Terminate and remove temporary facilities from Project site, along with mockups, construction tools, and similar elements.
14. Complete final cleaning requirements.
15. Touch up paint and otherwise repair and restore marred exposed finishes to eliminate visual defects.
16. Advise Owner of pending insurance changeover requirements.

B. List of Incomplete Item (Punch List)

1. Design-Builder's List of Incomplete Items: As part of the request for Substantial Completion, prepare and submit a list of items to be completed and corrected (to include the Design-Builder's punch list as a separate attachment), indicating the value of each item on the list and reasons why the Work is incomplete. (The Design-Builder's punch list shall include all other discipline's punch lists and be submitted prior to scheduling the Owners walk-through.). All incomplete items shall also have a scheduled completion date. Items on this list shall not be eligible for additional retainage reduction until their completion.
2. Organization of List: Include name and identification of each space and area affected by construction operations for incomplete items and items needing correction including, if necessary, areas disturbed by Design-Builder that are outside the limits of construction.
3. Organize list of spaces in sequential order, starting with exterior areas first and proceeding from lowest floor to highest floor.
4. Organize items applying to each space by major element, including categories for ceiling, individual walls, floors, equipment, and building systems.
5. Include the following information at the top of each page:
 - a. Project name.

- b. Date.
 - c. Name of Design-Builder and associated design and construction professionals
 - d. Page number.
 6. Submit list of incomplete items in the following formats:
 7. Electronic Punch List file.
 - a. Design-Builder shall upload the list to the Courts' PMIS. PMIS shall also be utilized for the Design-Builder's Punch List and shall utilize the feature for all updates and Owner's acceptance. This Punch List shall be separate and distinguished from Owner Pun List.
- C. Submittals Prior to Substantial Completion: Complete the following a minimum of ten (10) calendar days prior to requesting inspection for determining date of Substantial Completion. List items below that are incomplete at time of request.
 1. Certificates of Release: Obtain and submit releases from authorities having jurisdiction permitting Owner unrestricted use of the Work and access to services and utilities. Include occupancy permits, operating certificates, and similar releases.
 2. Submit closeout submittals specified in other Division 01 Sections, including project record documents, operation and maintenance manuals.
 3. Submit closeout submittals specified in individual Sections, including specific warranties, workmanship bonds, maintenance service agreements, final certifications, and similar documents.
 4. Submit maintenance material submittals specified in individual Sections, including tools, spare parts, extra materials, and similar items, and deliver to location designated by Owner. Label with manufacturer's name and model number.
 - a. Schedule of Maintenance Material Items: Prepare and submit schedule of maintenance material submittal items, including name and quantity of each item and name and number of related Specification Section. Obtain Owner's signature for receipt of submittals.
 5. Submit testing, adjusting, and balancing records.
 6. Submit sustainable design submittals not previously submitted.
 7. Submit changeover information related to Owner's occupancy, use, operation, and maintenance.
- D. Substantial Completion Inspection by Owner: When the Work or designated portion thereof is substantially complete, the Design-Builder shall prepare a written request for inspection by the Owner. Upon receipt of request, the Owner will either proceed with inspection within five (5) calendar days or notify the Design-Builder of unfulfilled requirements as outlined above. The Owner proceeding with the walkthrough does not relieve the Design-Builder of their obligations for submittals or duties required by the Contract Documents as it relates to Substantial Completion. Owner will prepare the Certificate of Substantial Completion upon acceptance.
 1. If the Owner and Design-Builder discover any item, whether or not included in the Design Builder's List, which is not sufficiently complete in accordance with the Contract Documents so that the Owner can utilize the Work or portion for its intended use, the Design-Builder shall complete or correct such item prior to execution of Substantial Completion and shall request an additional inspection by Owner once complete.

1.8 FINAL COMPLETION PROCEDURES

- A. Submittals Prior to Final Completion: Before requesting final inspection for determining final completion, complete the following:
 - 1. Submit a final Application for Payment according to Section 012900 "Payment Procedures."
 - 2. Certified List of Incomplete Items: Submit certified copy of Owner's Substantial Completion inspection list of items to be completed or corrected (punch list), endorsed and dated by Owner. Certified copy of the list shall state that each item has been completed or otherwise resolved for acceptance.
 - 3. Certificate of Insurance: Submit evidence of final, continuing insurance coverage complying with insurance requirements.
 - 4. Submit pest-control final inspection report.
 - 5. Submit final completion photographic documentation.
- B. Inspection: Submit a written request for final inspection to determine acceptance when the Work is completed and ready for final inspection. On receipt of request, Owner will either proceed with inspection or notify Design-Builder of unfulfilled requirements. Owner will prepare a final Certificate for Payment after inspection or will notify Design-Builder of construction that must be completed or corrected before certificate will be issued.
 - 1. Request reinspection when the Work identified in previous inspections as incomplete is completed or corrected.
- C. Asset Tagging: All building fixed assets including both existing and new assets shall be tagged in accordance with the District of Columbia Courts "Tagging Nomenclature Standard and Tagging Process", dated February 24, 2023. New assets that are either OF/CI or CF/CI are considered the responsibility of the Design-Build Contractor to meet compliance for asset tagging.

1.9 SUBMITTAL OF PROJECT WARRANTIES

- A. Time of Submittal: Submit written warranties on request of Owner for designated portions of the Work where warranties are indicated to commence on dates other than date of Substantial Completion, or when delay in submittal of warranties might limit Owner's rights under warranty.
- B. Partial Occupancy: Submit properly executed warranties within fifteen (15) calendar days of completion of designated portions of the Work that are completed and occupied or used by Owner during construction period by separate agreement with Design-Builder.
- C. Organize warranty documents into an orderly sequence based on the table of contents of Project Manual.
- D. Warranty Electronic File: Provide warranties and bonds in PDF format. Assemble complete warranty and bond submittal package into a single electronic PDF file with bookmarks enabling navigation to each item. Provide bookmarked table of contents at beginning of document.
 - 1. Submit to Owner by uploading to PMIS.

- E. Warranties in Paper Form:
1. Bind warranties and bonds in heavy-duty, three-ring, vinyl-covered, loose-leaf binders, thickness as necessary to accommodate contents, and sized to receive **8-1/2-by-11-inch** paper.
 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 Design-Builder.
- F. Provide additional copies of each warranty to include in operation and maintenance manuals.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Cleaning Agents: Use cleaning materials and agents recommended by manufacturer or fabricator of the surface to be cleaned. Do not use cleaning agents that are potentially hazardous to health or property or that might damage finished surfaces.
1. Use cleaning products that comply with Green Seal's GS-37, or if GS-37 is not applicable, use products that comply with the California Code of Regulations maximum allowable VOC levels.

PART 3 - EXECUTION

3.1 REPAIR OF THE WORK

- A. Complete repair and restoration operations before requesting inspection for determination of Substantial Completion.
- B. Repair, or remove and replace, defective construction. Repairing includes replacing defective parts, refinishing damaged surfaces, touching up with matching materials, and properly adjusting operating equipment. Where damaged or worn items cannot be repaired or restored, provide replacements. Remove and replace operating components that cannot be repaired. Restore damaged construction and permanent facilities used during construction to specified condition.
1. Remove and replace chipped, scratched, and broken glass, reflective surfaces, and other damaged transparent materials.
 2. Touch up and otherwise repair and restore marred or exposed finishes and surfaces. Replace finishes and surfaces that already show evidence of repair or restoration.
 - a. Do not paint over "UL" and other required labels and identification, including mechanical and electrical nameplates. Remove paint applied to required labels and identification.

3. Replace parts subject to operating conditions during construction that may impede operation or reduce longevity.
 4. Replace burned-out bulbs, bulbs noticeably dimmed by hours of use, and defective and noisy starters in fluorescent and mercury vapor fixtures to comply with requirements for new fixtures.
- C. Verify labels on fire rated doors have not been painted over. Remove paint if found.

3.2 FINAL CLEANING

- A. General: Perform final cleaning. Conduct cleaning and waste-removal operations to comply with local laws and ordinances and Federal and local environmental and antipollution regulations.
- B. Cleaning: Employ experienced workers or professional cleaners for final cleaning. Clean each surface or unit to condition expected in an average commercial building cleaning and maintenance program. Comply with manufacturer's written instructions.
1. Complete the following cleaning operations before requesting inspection for certification of Substantial Completion for entire Project or for a designated portion of Project:
 - a. Clean Project site, 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 not planted, mulched, or 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, equipment vaults, manholes, attics, and similar spaces.
 - h. Sweep concrete floors broom clean in unoccupied spaces.
 - i. Vacuum carpet and similar soft surfaces, removing debris and excess nap; clean according to manufacturer's recommendations 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. Polish mirrors and glass, taking care not to scratch surfaces.
 - k. Remove labels that are not permanent.
 - l. Wipe surfaces of mechanical and electrical equipment, elevator equipment, and similar equipment. Remove excess lubrication, paint and mortar droppings, and other foreign substances.
 - m. Clean plumbing fixtures to a sanitary condition, free of stains, including stains resulting from water exposure.

- n. Replace disposable air filters and clean permanent air filters. Clean exposed surfaces of diffusers, registers, and grills.
 - o. Clean ducts, blowers, and coils if units were operated without filters during construction or that display contamination with particulate matter on inspection.
 - 1) Clean HVAC system in compliance with NADCA ACR. and Section 230130.52 "Existing HVAC Air-Distribution System Cleaning." Provide written report on completion of cleaning.
 - p. Clean luminaires, lamps, globes, and reflectors to function with full efficiency.
 - q. Leave Project clean and ready for occupancy.
- C. Provide a second cleaning complying to above criteria after Substantial Completion is accepted. Coordinate acceptable schedule of cleaning with Owner.
- D. Pest Control: Comply with pest control requirements in Section 015000 "Temporary Utilities and Facilities." Prepare written report identifying types of pests controlled, chemicals and methods of application, and location of application. Include recommended schedule for maintenance applications and product safety sheets.
- E. Construction Waste Disposal: Comply with waste disposal requirements in Section 015000 "Temporary Utilities and Facilities." and Section 017419 "Construction Waste Management and Disposal."

END OF SECTION 017700

SECTION 017823 - OPERATION AND MAINTENANCE DATA

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes administrative and procedural requirements for preparing operation and maintenance manuals, including the following:
 - 1. Operation and maintenance documentation directory manuals.
 - 2. Emergency manuals.
 - 3. Systems and equipment operation manuals.
 - 4. Systems and equipment maintenance manuals.
 - 5. Product maintenance manuals.
- B. Related Requirements:
 - 1. Section 013300 "Submittal Procedures" for submitting copies of submittals for operation and maintenance manuals.
 - 2. Section 019113 "General Commissioning Requirements" for verification and compilation of data into operation and maintenance manuals.
 - 3. Section 017700 "Closeout Procedures" for submittal of project warranties.

1.2 DEFINITIONS

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

1.3 CLOSEOUT SUBMITTALS

- A. Submit operation and maintenance manuals indicated. Provide content for each manual as specified in individual Specification Sections, and as reviewed and approved at the time of Section submittals. Submit reviewed manual content formatted and organized as required by this Section.
 - 1. Owner, Design-Builder's Architect and Engineers, Commissioning Agent will comment on whether content of operation and maintenance submittals is acceptable.
 - 2. Where applicable, clarify and update reviewed manual content to correspond to revisions and field conditions.
- B. Format: Submit operation and maintenance manuals in the following format:
 - 1. Submit PDF electronic files. Assemble each manual into a composite and indexed file. Submit digital media on flash drives.. Enable reviewer comments on draft submittals.
 - 2. Provide at least one paper copies of each manual. Include a complete operation and maintenance directory. Enclose title pages and directories in clear plastic sleeves.

3. Provide a paper and electronic manual that contains a second copy of each warranty included in the O&M manuals.
- C. Initial Manual Submittal: Submit draft copy of each manual at least 30 days before commencing demonstration and training. Owner, Design-Builder's Architect, and Commissioning Authority or Agent will comment on whether general scope and content of manual are acceptable. Transmittal of Initial Manual for review may be done in PMIS.
- D. Final Manual Submittal: Submit each manual in final form prior to requesting inspection for Substantial Completion and at least 30 days before commencing demonstration and training. Owner, Design-Builder's Architect, and Commissioning Authority or Agent will return copy with comments.
 1. Correct or revise each manual to comply with Owner's, Design-Builder's Architect and Commissioning Authority's or Agent comments. Submit copies of each corrected manual within 15 days of receipt of Owner's, Design-Builder's Architect, and Commissioning Agent comments and prior to commencing demonstration and training.
- E. Comply with Section 017700 "Closeout Procedures" for schedule for submitting operation and maintenance documentation.

1.4 FORMAT OF OPERATION AND MAINTENANCE MANUALS

- A. Manuals, Electronic Files: Submit manuals in the form of a multiple file composite electronic PDF file for each manual type required.
 1. Electronic Files: Use electronic files prepared by manufacturer where available. Where scanning of paper documents is required, configure scanned file for minimum readable file size. Where available provide hyperlink to manufacturer's files.
 2. File Names and Bookmarks: Bookmark individual documents based on file names. Name document files to correspond to system, subsystem, and equipment names used in manual directory and table of contents. Group documents for each system and subsystem into individual composite bookmarked files, then create composite manual, so that resulting bookmarks reflect the system, subsystem, and equipment names in a readily navigated file tree. Configure electronic manual to display bookmark panel on opening file.
- B. Manuals, Paper Copy: Submit manuals in the form of hard-copy, bound and labeled volumes.
 1. Binders: Heavy-duty, three-ring, vinyl-covered, loose-leaf binders, in thickness necessary to accommodate contents, sized to hold 8-1/2-by-11-inch paper; with clear plastic sleeve on spine to hold label describing contents and with pockets inside covers to hold folded oversize sheets.
 - a. If two or more binders are necessary to accommodate data of a system, organize data in each binder into groupings by subsystem and related components. Cross-reference other binders if necessary to provide essential information for proper operation or maintenance of equipment or system.
 - b. Identify each binder on front and spine, with printed title "OPERATION AND MAINTENANCE MANUAL," Project title or name, and subject matter of

contents, and indicate Specification Section number on bottom of spine. Indicate volume number for multiple-volume sets.

2. Dividers: Heavy-paper dividers with plastic-covered tabs for each section of the manual. Mark each tab to indicate contents. Include typed list of products and major components of equipment included in the section on each divider, cross-referenced to Specification Section number and title of Project Manual.
3. Protective Plastic Sleeves: Transparent plastic sleeves designed to enclose diagnostic software storage media for computerized electronic equipment. Enclose title pages and directories in clear plastic sleeves.
4. Supplementary Text: Prepared on 8-1/2-by-11-inch white bond paper.
5. Drawings: Attach reinforced, punched binder tabs on drawings and bind with text.
 - a. If oversize drawings are necessary, fold drawings to same size as text pages and use as foldouts.
 - b. If drawings are too large to be used as foldouts, fold and place drawings in labeled envelopes and bind envelopes in rear of manual. At appropriate locations in manual, insert typewritten pages indicating drawing titles, descriptions of contents, and drawing locations.

- C. Maintenance and Operating Manuals: Organize maintenance and operating data into suitable sets of manageable size. Provide five (5) binders and five (5) USB flash drives with searchable PDF-A scans of O&M manuals. O&M data inserted onto USB flash drives in lieu of scanning shall be arranged in same format as in binders. Include the following types of information and/or as indicated in specification sections:

1. Emergency instruction.
2. Spare parts list.
3. Wiring diagrams.
4. Recommended "turn around" cycles.
5. Inspection procedures.
6. Shop Drawings and Product Data.
7. Fixture lamping schedule.

1.5 REQUIREMENTS FOR EMERGENCY, OPERATION, AND MAINTENANCE MANUALS

- A. Organization of Manuals: Unless otherwise indicated, organize each manual into a separate section for each system and subsystem, and a separate section for each piece of equipment not part of a system. Each manual shall contain the following materials, in the order listed:

1. Title page.
2. Table of contents.
3. Manual contents.

- B. Title Page: Include the following information:

1. Subject matter included in manual.
2. Name and address of Project.
3. Name and address of Owner.
4. Date of submittal.
5. Name and contact information for Design-Builder.

6. Name and contact information for Owner.
 7. Name and contact information for the Design-Builder's Architects.
 8. Name and contact information for the Design-Builder's Engineers.
 9. Name and contact information for Commissioning Agent.
 10. Names and contact information for major consultants to the Design-Builder that designed the systems contained in the manuals.
 11. Cross-reference to related systems in other operation and maintenance manuals.
- C. Table of Contents: List each product included in manual, identified by product name, indexed to the content of the volume, and cross-referenced to Specification Section number in Project Manual.
1. If operation or maintenance documentation requires more than one volume to accommodate data, include comprehensive table of contents for all volumes in each volume of the set.
- D. Manual Contents: Organize into sets of manageable size. Arrange contents alphabetically by system, subsystem, and equipment. If possible, assemble instructions for subsystems, equipment, and components of one system into a single binder.
- E. Identification: In the documentation directory and in each operation and maintenance manual, identify each system, subsystem, and piece of equipment with same designation used in the Contract Documents. If no designation exists, assign a designation according to ASHRAE Guideline 4, "Preparation of Operating and Maintenance Documentation for Building Systems."
- 1.6 OPERATION AND MAINTENANCE DOCUMENTATION DIRECTORY MANUAL
- A. Operation and Maintenance Documentation Directory: Prepare a separate manual that provides an organized reference to emergency, operation, and maintenance manuals. List items and their location to facilitate ready access to desired information. Include the following:
1. List of Systems and Subsystems: List systems alphabetically. Include references to operation and maintenance manuals that contain information about each system.
 2. List of Equipment: List equipment for each system, organized alphabetically by system. For pieces of equipment not part of system, list alphabetically in separate list.
 3. Tables of Contents: Include a table of contents for each emergency, operation, and maintenance manual.
- 1.7 EMERGENCY MANUALS
- A. Emergency Manual: Assemble a complete set of emergency information indicating procedures for use by emergency personnel and by Owner's operating personnel for types of emergencies indicated.
- B. Content: Organize manual into a separate section for each of the following:
1. Type of emergency.
 2. Emergency instructions.
 3. Emergency procedures.

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

1.8 SYSTEMS AND EQUIPMENT OPERATION MANUALS

- A. Systems and Equipment Operation Manual: Assemble a complete set of data indicating operation of each system, subsystem, and piece of equipment not part of a system. Include information required for daily operation and management, operating standards, and routine and special operating procedures.
 - 1. Engage a factory-authorized service representative to assemble and prepare information for each system, subsystem, and piece of equipment not part of a system.
 - 2. Prepare a separate manual for each system and subsystem, in the form of an instructional manual for use by Owner's operating personnel.
- B. Content: In addition to requirements in this Section, include operation data required in individual Specification Sections and the following information:
 - 1. System, subsystem, and equipment descriptions. Use designations for systems and equipment indicated on Contract Documents.
 - 2. Performance and design criteria if Design-Builder has delegated design responsibility.
 - 3. Operating standards.
 - 4. Operating procedures.
 - 5. Operating logs.
 - 6. Wiring diagrams.
 - 7. Control diagrams.
 - 8. Piped system diagrams.
 - 9. Precautions against improper use.
 - 10. License requirements including inspection and renewal dates.

- C. Descriptions: Include the following:
1. Product name and model number. Use designations for products indicated on Contract Documents.
 2. Manufacturer's name.
 3. Equipment identification with serial number of each component.
 4. Equipment function.
 5. Operating characteristics.
 6. Limiting conditions.
 7. Performance curves.
 8. Engineering data and tests.
 9. Complete nomenclature and number of replacement parts.
- D. Operating Procedures: Include the following, as applicable:
1. Startup procedures.
 2. Equipment or system break-in procedures.
 3. Routine and normal operating instructions.
 4. Regulation and control procedures.
 5. Instructions on stopping.
 6. Normal shutdown instructions.
 7. Seasonal and weekend operating instructions.
 8. Required sequences for electric or electronic systems.
 9. Special operating instructions and procedures.
- E. Systems and Equipment Controls: Describe the sequence of operation, and diagram controls as installed.
- F. Piped Systems: Diagram piping as installed and identify color coding where required for identification.

1.9 SYSTEMS AND EQUIPMENT MAINTENANCE MANUALS

- A. Systems and Equipment Maintenance Manuals: Assemble a complete set of data indicating maintenance of each system, subsystem, and piece of equipment not part of a system. Include manufacturers' maintenance documentation, preventive maintenance procedures and frequency, repair procedures, wiring and systems diagrams, lists of spare parts, and warranty information.
1. Engage a factory-authorized service representative to assemble and prepare information for each system, subsystem, and piece of equipment not part of a system.
 2. Prepare a separate manual for each system and subsystem, in the form of an instructional manual for use by Owner's operating personnel.
- B. Content: For each system, subsystem, and piece of equipment not part of a system, include source information, manufacturers' maintenance documentation, maintenance procedures, maintenance and service schedules, spare parts list and source information, maintenance service contracts, and warranties and bonds as described below.
- C. Source Information: List each system, subsystem, and piece of equipment included in manual, identified by product name and arranged to match manual's table of contents. For each product,

list name, address, and telephone number of Installer or supplier and maintenance service agent, and cross-reference Specification Section number and title in Project Manual and drawing or schedule designation or identifier where applicable.

- D. **Manufacturers' Maintenance Documentation:** Include the following information for each component part or piece of equipment:
 - 1. Standard maintenance instructions and bulletins; include only sheets pertinent to product or component installed. Mark each sheet to identify each product or component incorporated into the Work. If data include more than one item in a tabular format, identify each item using appropriate references from the Contract Documents. Identify data applicable to the Work and delete references to information not applicable.
 - a. Prepare supplementary text if manufacturers' standard printed data are not available and where the information is necessary for proper operation and maintenance of equipment or systems.
 - 2. Drawings, diagrams, and instructions required for maintenance, including disassembly and component removal, replacement, and assembly.
 - 3. Identification and nomenclature of parts and components.
 - 4. List of items recommended to be stocked as spare parts.
- E. **Maintenance Procedures:** Include the following information and items that detail essential maintenance procedures:
 - 1. Test and inspection instructions.
 - 2. Troubleshooting guide.
 - 3. Precautions against improper maintenance.
 - 4. Disassembly; component removal, repair, and replacement; and reassembly instructions.
 - 5. Aligning, adjusting, and checking instructions.
 - 6. Demonstration and training video recording, if available.
- F. **Maintenance and Service Schedules:** Include service and lubrication requirements, list of required lubricants for equipment, and separate schedules for preventive and routine maintenance and service with standard time allotment. Format data to integrate into the Courts CMMS system.
 - 1. Scheduled Maintenance and Service: Tabulate actions for daily, weekly, monthly, quarterly, semiannual, and annual frequencies.
 - 2. Maintenance and Service Record: Include manufacturers' forms for recording maintenance.
- G. **Spare Parts List and Source Information:** Include lists of replacement and repair parts, with parts identified and cross-referenced to manufacturers' maintenance documentation and local sources of maintenance materials and related services.
- H. **Maintenance Service Contracts:** Include copies of maintenance agreements with name and telephone number of service agent.
- I. **Warranties and Bonds:** Include copies of warranties and bonds and lists of circumstances and conditions that would affect validity of warranties or bonds.
 - 1. Include procedures to follow and required notifications for warranty claims.

- J. Drawings: Prepare drawings supplementing manufacturers' printed data to illustrate the relationship of component parts of equipment and systems and to illustrate control sequence and flow diagrams. Coordinate these drawings with information contained in record Drawings to ensure correct illustration of completed installation.

1. Do not use original project record documents as part of maintenance manuals.

1.10 PRODUCT MAINTENANCE MANUALS

- A. Product Maintenance Manual: Assemble a complete set of maintenance data indicating care and maintenance of each product, material, and finish incorporated into the Work.
- B. Content: Organize manual into a separate section for each product, material, and finish. Include source information, product information, maintenance procedures, repair materials and sources, and warranties and bonds, as described below.
- C. Source Information: List each product included in manual, identified by product name and arranged to match manual's table of contents. For each product, list name, address, and telephone number of Installer or supplier and maintenance service agent, and cross-reference Specification Section number and title in Project Manual and drawing or schedule designation or identifier where applicable.
- D. Product Information: Include the following, as applicable:
1. Product name and model number.
 2. Manufacturer's name.
 3. Color, pattern, and texture.
 4. Material and chemical composition.
 5. Reordering information for specially manufactured products.
- E. Maintenance Procedures: Include manufacturer's written recommendations and the following:
1. Inspection procedures.
 2. Types of cleaning agents to be used and methods of cleaning.
 3. List of cleaning agents and methods of cleaning detrimental to product.
 4. Schedule for routine cleaning and maintenance.
 5. Repair instructions.
- F. Repair Materials and Sources: Include lists of materials and local sources of materials and related services.
- G. Warranties and Bonds: Include copies of warranties and bonds and lists of circumstances and conditions that would affect validity of warranties or bonds.
1. Include procedures to follow and required notifications for warranty claims.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION 017823

SECTION 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 and Request for Proposal (RFP), apply to this Section.

1.2 SUMMARY

- A. Section includes administrative and procedural requirements for project record documents, including the following:
 - 1. Record Drawings.
 - 2. Record Specifications.
 - 3. Record Product Data.
 - 4. Miscellaneous record submittals.
- B. Related Requirements:
 - 1. Section 017300 "Execution" for final property survey.
 - 2. Section 017700 "Closeout Procedures" for general closeout procedures.
 - 3. Section 017823 "Operation and Maintenance Data" for operation and maintenance manual requirements.
 - 4. Divisions 02 through 32 Sections for specific requirements for project record documents of the Work in those Sections.

1.3 CLOSEOUT SUBMITTALS

- A. Record Drawings: Comply with the following:
 - 1. The Design Builder is required to ensure that as-built drawings are kept current on a daily basis and are marked to show deviations that have been made from the Contract drawings. Ensure that each deviation has been identified with the appropriate modifying information (e.g.: modification number, PC number, RFI number, etc.). The Design Builder's Superintendent and QC/QA Manager shall initial each deviation and each revision. Upon the completion of the work, the QC/QA Manager shall furnish a certificate addressed to the Owner attesting to the accuracy of the as-built drawings prior their submission.
 - 2. Number of Copies: Submit copies of record Drawings as follows:
 - a. Initial Submittal:
 - 1) Submit PDF electronic files of scanned record prints and one of file prints.

- 2) Owner, Design Build Contractor, and Design Builder's Architect will indicate whether general scope of changes, additional information recorded, and quality of drafting are acceptable.
- b. Final Submittal:
 - 1) Submit digital data record files in the most current version of Native BIM, Word, REVIT, AutoCAD, MICROSTATION and PDF's) and three set(s) of printed records documents.
 - a) Microsoft word
 - b) BIM
 - c) REVIT
 - d) AutoCAD
 - e) MicroStation
 - 2) Plot each drawing file, whether or not changes and additional information were recorded.
- B. Record Specifications: Submit one paper copy and legible annotated PDF electronic files of Project's Specifications, including addenda and contract modifications. Native and PDF shall be submitted in a searchable format.
- C. Record Product Data: Submit one paper copy and legible annotated PDF electronic files and directories of each submittal.
 1. Where record Product Data are required as part of operation and maintenance manuals, submit duplicate marked-up Product Data as a component of manual.
- D. Miscellaneous Record Submittals: See other Specification Sections for miscellaneous record-keeping requirements and submittals in connection with various construction activities. Submit two paper copy and annotated PDF electronic files and directories of each submittal.

1.4 RECORD DRAWINGS

- A. Record Prints: Maintain one set of marked-up paper copies of the Contract Drawings and Shop Drawings, incorporating new and revised drawings as modifications are issued. The Owner's representative will periodically review record drawings for compliance.
 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 provide information for preparation of corresponding 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 acceptable drawing technique.
 - c. Record data as soon as possible after obtaining it.
 - d. Record and check the markup before enclosing concealed installations.
 - e. Cross-reference record prints to corresponding photographic documentation.
 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.
 - 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 and Construction Change Directive.
 - k. Changes made following Owner's written orders.
 - l. Details not on the original Contract Drawings.
 - m. Field records for variable and concealed conditions.
 - n. Record information on the Work that is shown only schematically.
 3. Mark the Contract Drawings and Shop Drawings completely and accurately. Use personnel proficient at recording graphic information in production of marked-up record prints.
 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 Proposed Change Order numbers, alternate numbers, Change Order numbers, and similar identification, where applicable.
- B. Record Digital Data Files: Immediately before inspection for Certificate of Substantial Completion, review marked-up record prints with Owner, Design Builder, and Design-Builder's Architect and Engineers. When authorized, prepare a full set of corrected digital data files of the Contract Drawings, as follows:
1. Format: Same digital data software program, version, and operating system as the original Contract Drawings.
 2. Format: Native files (DWG), version operating in, Microsoft Windows operating system.
 3. Format: Annotated PDF electronic file with comment function enabled.
 4. Incorporate changes and additional information previously marked on record prints. Delete, redraw, and add details and notations where applicable.
 5. Refer instances of uncertainty to Owner for resolution.
 6. Design-Builder's Architect, and Engineers, will furnish Design-Builder with one set of digital data files of the Contract Drawings for use in recording information.
 - a. See Section 013100 "Project Management and Coordination" for requirements related to use of Design-Builder's Architect's digital data files.
 - b. Design-Builder's Architect and Engineers will provide data file layer information. Record markups in separate layers.
- C. 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. Format: Annotated PDF electronic file with comment function enabled.

3. Record Digital Data Files: Organize digital data information into separate electronic files that correspond to each sheet of the Contract Drawings. Name each file with the sheet identification. Include identification in each digital data file.
4. Identification: As follows:
 - a. Project name.
 - b. Date.
 - c. Designation "PROJECT RECORD DRAWINGS."
 - d. Name of Design-Builder's Architect and Engineers.
 - e. Name of Design-Builder

1.5 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, record Product Data, and record Drawings where applicable.
- B. Format: Submit record Specifications as annotated PDF electronic file and paper copy.

1.6 RECORD PRODUCT DATA

- A. Recording: Maintain one copy of each submittal during the construction period for project record document purposes. Post changes and revisions to project record documents as they occur; do not wait until end of Project.
- B. Preparation: Mark Product Data to indicate the actual product installation where installation varies from that indicated in Product Data submittal.
 1. Give particular attention to information on concealed products and installations that cannot be readily identified and recorded later.
 2. Include significant changes in the product delivered to Project site and changes in manufacturer's written instructions for installation.
 3. Note related Change Orders, record Specifications, and record Drawings where applicable.
- C. Format: Submit record Product Data as annotated PDF electronic file and searchable PDF electronic file(s) of marked-up paper copy of Product Data.
 1. Include record Product Data directory organized by Specification Section number and title, electronically linked to each item of record Product Data.

1.7 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.
- B. Format: Submit miscellaneous record submittals as searchable PDF electronic file(s) of marked-up miscellaneous record submittals.
 - 1. Include miscellaneous record submittals directory organized by Specification Section number and title, electronically linked to each item of miscellaneous record submittals.

1.8 MAINTENANCE OF RECORD DOCUMENTS

- 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 Owner, Design Builder, and Design-Builder's Architects' and Engineers' reference during normal working hours.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION 017839

SECTION 017900 - DEMONSTRATION AND TRAINING

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes administrative and procedural requirements for instructing Owner's personnel, including the following:
 - 1. Instruction and Training in operation and maintenance of systems, subsystems, and equipment.
 - 2. Demonstration of operation of systems, subsystems, and equipment.
 - 3. Demonstration and training video recordings.

1.2 INFORMATIONAL SUBMITTALS

- A. Instruction Program: Submit outline of instructional program for demonstration and training, including a list of training modules and a schedule of proposed dates, times, length of instruction time, and instructors' names for each training module. Include learning objective and outline for each training module.
 - 1. Indicate proposed training modules using manufacturer-produced demonstration and training video recordings for systems, equipment, and products in lieu of video recording of live instructional module.
- B. Qualification Data: For Facilitator or Instructor.
- C. Attendance Record: For each training module, submit list of participants and length of instruction time.
- D. Evaluations: For each participant and for each training module, submit results and documentation of performance-based test.

1.3 CLOSEOUT SUBMITTALS

- A. Demonstration and Training Video Recordings of demonstration and training: Submit via PMIS and two flash drive (USB drive) copies within seven days of end of each training module.
 - 1. Identification: On each copy, provide an applied label with the following information:
 - a. Name of Project.
 - b. Name and address of videographer.
 - c. Name of Design-Builder
 - d. Name of Design-Builder's Architect.
 - e. Date of video recording.

2. Transcript: Prepared and bound in format matching operation and maintenance manuals. Mark appropriate identification on front and spine of each binder. Include a cover sheet with same label information as the corresponding video recording. Include name of Project and date of video recording on each page. Include subtitles within the video.
3. Transcript: Prepared in PDF electronic format. Include a cover sheet with same label information as the corresponding video recording and a table of contents with links to corresponding training components. Include name of Project and date of video recording on each page.
4. At completion of training, submit complete training manual(s) for Owner's use prepared in same paper and PDF file format required for operation and maintenance manuals specified in Section 017823 "Operation and Maintenance Data."

1.4 QUALITY ASSURANCE

- A. Facilitator Qualifications: A firm or individual experienced in training or educating maintenance personnel in a training program similar in content and extent to that indicated for this Project, and whose work has resulted in training or education with a record of successful learning performance.
- B. Instructor Qualifications: A factory-authorized service representative, complying with requirements in Section 014000 "Quality Requirements," experienced in operation and maintenance procedures and training.
- C. Videographer Qualifications: A professional videographer who is experienced photographing demonstration and training events similar to those required.
- D. Pre-Instruction Conference: Conduct conference at Project site to comply with requirements in Section 013100 "Project Management and Coordination." Review methods and procedures related to demonstration and training including, but not limited to, the following:
 1. Inspect and discuss locations and other facilities required for instruction.
 2. Review and finalize instruction schedule and verify availability of educational materials, instructors' personnel, audiovisual equipment, and facilities needed to avoid delays.
 3. Review required content of instruction.
 4. For instruction that must occur outside, review weather and forecasted weather conditions and procedures to follow if conditions are unfavorable.

1.5 COORDINATION

- A. Coordinate instruction schedule with Owner's operations. Adjust schedule as required to minimize disrupting Owner's operations and to ensure availability of Owner's personnel. Include accommodation for off-hour training if required to minimize disruption of normal Court operations. Coordinate schedule with Commissioning Authority (CxA) for commissioned systems, refer to 019113 – General Commissioning Requirements for a list of commissioned systems.
- 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 emergency, operation, and maintenance manuals. Do not submit instruction program until operation and maintenance data have been reviewed and accepted. At least one (1) paper copy of the complete, approved operation and maintenance manuals, inclusive of emergency manuals, is to be available at the time and location of the training.

1.6 INSTRUCTION PROGRAM

- A. Program Structure: Develop an instruction program that includes individual training modules for each system and for equipment not part of a system, as required by individual Specification Sections. Submit manuals seven (7) calendar days before training.
- 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 as applicable to the system, equipment, or component:
 - 1. Basis of System Design, Operational Requirements, and Criteria: Include the following:
 - a. System, subsystem, and equipment descriptions.
 - b. Performance and design criteria if Design-Builder is delegated design responsibility.
 - c. Operating standards.
 - d. Regulatory requirements.
 - e. Equipment function.
 - f. Operating characteristics.
 - g. Limiting conditions.
 - h. Performance curves.
 - 2. Documentation: Review the following items in detail:
 - a. Emergency manuals.
 - b. Systems and equipment operation manuals.
 - c. Systems and equipment maintenance manuals.
 - d. Product maintenance manuals.
 - e. Project Record Documents.
 - f. Identification systems.
 - g. Warranties and bonds.
 - h. Maintenance service agreements and similar continuing commitments.
 - 3. Emergencies: Include the following, as applicable:
 - a. Instructions on meaning of warnings, trouble indications, and error messages.
 - b. Instructions on stopping.
 - c. Shutdown instructions for each type of emergency.
 - d. Operating instructions for conditions outside of normal operating limits.
 - e. Sequences for electric or electronic systems.
 - f. Special operating instructions and procedures.
 - 4. 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.
5. Adjustments: Include the following:
 - a. Alignments.
 - b. Checking adjustments.
 - c. Noise and vibration adjustments.
 - d. Economy and efficiency adjustments.
6. Troubleshooting: Include the following:
 - a. Diagnostic instructions.
 - b. Test and inspection procedures.
7. 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.
8. 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.

1.7 PREPARATION

- A. Assemble educational materials necessary for instruction, including documentation and training module. Assemble training modules into a training manual organized in coordination with requirements in Section 017823 "Operation and Maintenance Data."

- B. Set up instructional equipment at instruction location.
- C. The Design-Builder shall coordinate the agenda and training material for the training modules with the Owner, Design Architect, Engineer, Commissioning Agent, or other Owner consultants that provide the original design documents. The Design-Builder shall obtain from the Design A/E and Commissioning Agent their understanding of the design and operational intent of systems and equipment.

1.8 INSTRUCTION

- A. Facilitator: Engage a qualified facilitator to prepare instruction program and training modules, to coordinate instructors, and to coordinate between Design-Builder and Owner for number of participants, instruction times, and location.
- B. Engage qualified instructors to instruct Owner's personnel to adjust, operate, and maintain systems, subsystems, and equipment not part of a system.
 - 1. The Design-Builder will furnish an instructor to describe basis of system design, operational requirements, criteria, and regulatory requirements. The design intent shall be submitted to the design Architect, Engineer, Commissioning Agent, or any other of the Owners consultant that were involved with the original design, for their review and comment.
 - 2. Owner will furnish Design-Builder with names and positions of participants.
- C. 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 and Commissioning Authority with at least seven days' advance notice.
- D. Training Location and Reference Material: Conduct training on-site in the completed and fully operational facility using the actual equipment in-place. Conduct training using accepted operation and maintenance data submittals.
- E. Evaluation: At conclusion of each training module, assess and document each participant's mastery of module by use of a written and a demonstration performance-based test.
- F. 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.

1.9 TRAINING VIDEO RECORDINGS OF DEMONSTRATION AND TRAINING.

- A. General: Engage a qualified commercial videographer to record demonstration and training video recordings. Record each training module separately. Include classroom instructions and demonstrations, board diagrams, and other visual aids, but not student practice.
 - 1. At beginning of each training module, record each chart containing learning objective and lesson outline.

2. Obtain Owners signed acceptance of individual training programs.
- B. Digital Video Recordings: Provide high-resolution, digital video in MPEG format, produced by a digital camera with minimum sensor resolution of 12 megapixels and capable of recording in full HD mode with vibration reduction technology.
1. Submit video recordings on thumb drive (USB drive) and by uploading to PMIS software site.
 2. File Hierarchy: Organize folder structure and file locations according to Project Manual table of contents. Provide complete screen-based menu.
 3. File Names: Utilize file names based on name of equipment generally described in video segment, as identified in Project specifications.
 4. Design-Builder and Installer Contact File: Using appropriate software, create a file for inclusion on the equipment demonstration and training recording that describes the following for each Design-Builder involved on the Project, arranged according to Project Manual table of contents:
 - a. Name of Design-Builder/Installer.
 - b. Business address.
 - c. Business phone number.
 - d. Point of contact.
 - e. Email address.
 - f. Website information
- C. Recording: Mount camera on tripod before starting recording, unless otherwise necessary to adequately cover area of demonstration and training. Display continuous running time.
1. Film training session(s) in segments not to exceed 15 minutes.
 - a. Produce segments to present a single significant piece of equipment per segment.
 - b. Organize segments with multiple pieces of equipment to follow order of Project Manual table of contents.
 - c. Where a training session on a particular piece of equipment exceeds 15 minutes, stop filming and pause training session. Begin training session again upon commencement of new filming segment.
- D. Light Levels: Verify light levels are adequate to properly light equipment. Verify equipment markings are clearly visible prior to recording.
1. Furnish additional portable lighting as required.
- E. Narration: Describe scenes on video recording by audio narration by microphone while video recording is recorded. Include description of items being viewed.
- F. Preproduced Video Recordings: Provide video recordings used as a component of training modules in same format as recordings of live training.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION 017900

SECTION 018113.15 - SUSTAINABLE DESIGN REQUIREMENTS - LEED v4 BD+C

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes general requirements and procedures for compliance with certain prerequisites and credits needed for Project to obtain "LEED Version 4.0 for New Construction" (LEED v4.0 NC) Silver certification based on USGBC's LEED v4 BD+C.
 - 1. Specific requirements for LEED are also included in other Sections.
 - 2. Some LEED prerequisites and credits needed to obtain LEED certification depend on product selections and may not be specifically identified as LEED requirements. Compliance with requirements needed to obtain LEED prerequisites and credits may be used as one criterion to evaluate substitution requests and comparable product requests.
 - 3. A copy of the LEED Project checklist is attached at the end of this Section for information only.
 - a. Some LEED prerequisites and credits needed to obtain the indicated LEED certification depend on aspects of Project that are not part of the Work of the Contract.
 - 4. Definitions included in the "LEED Version 4.0 for Building Design and Construction" (LEED v4.0 BD+C) Reference Guide and online amendments apply to this Section.
- B. Related Requirements:
 - 1. Section 013233, "Photographic Documentation."
 - 2. Section 013300, "Submittal Procedures."
 - 3. Section 017419, "Construction Waste Management and Disposal."
 - 4. Section 017823, "Operation and Maintenance Data."
 - 5. Section 019113, "General Commissioning Requirements."
 - 6. Divisions 02 through 49 Sections for LEED requirements specific to the work of each of these Sections. Requirements may or may not include reference to LEED.

1.2 DEFINITIONS

- A. Bio-Based Materials: Materials that meet the Sustainable Agriculture Network's Sustainable Agriculture Standard. Bio-based raw materials shall be tested using ASTM D 6866 and be legally harvested, as defined by the exporting and receiving country.
- B. CDPH Standard Method v1.1: California Department of Public Health (CDPH) Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers, v. 1.1-2010, for the emissions testing and requirements of products and materials.
- C. Chain-of-Custody (COC): A procedure that tracks a product from the point of harvest or extraction to its end use, including all successive stage of processing, transformation, manufacturing, a distribution.
- D. Chain-of-Custody Certificates: Certificates signed by manufacturers and fabricators certifying that wood used to make products was obtained from forests certified by an FSC-accredited certification body to comply with FSC STD-01-001.
- E. Composite Wood and Agrifiber: Products made of wood particles and/or plant material pressed and bonded with adhesive or resin such as particleboard, medium density fiberboard (MDF), plywood, wheatboard, strawboard, panel substrates, and door cores.
- F. Corporate Sustainability Report: A third-party verified report that outlines the environmental impacts of extraction operations and activities associated with the manufacturer's product and

the product's supply chain.

- G. **Environmental Product Declaration (EPD):** An independently verified report based on life-cycle assessment studies that have been conducted according to a set of common rules for each product category and peer-reviewed.
 - 1. **Product-Specific Declaration:** A product with a publicly available, critically reviewed life-cycle assessment conforming to ISO 14044 that has at least a cradle to gate scope.
 - 2. **Industry-Wide (Generic) EPD:** Provide products with third-party certification (Type III), including external verification, in which the manufacturer is explicitly recognized as a participant by the program operator. EPD must conform to ISO 14025, 14040, 14044, and EN 15804 or ISO 21930 and have at least a cradle to gate scope.
 - 3. **Product-Specific Type III EPD:** A product with a third-party certification, including external verification, in which the manufacturer is explicitly recognized by the program operator. EPD must conform to ISO 14025, 14040, 14044, and EN 15804 or ISO 21930 and have at least a cradle to gate scope.
- H. **Extended Producer Responsibility (EPR):** Measures undertaken by the maker of a product to accept its own and sometimes other manufacturers' products as postconsumer waste at the end of the products' useful life.
- I. **Health Product Declaration Open Standard (HPD):** A standard format for reporting product content and associated health information for building products and materials.
- J. **Indoor Air Quality (IAQ) Management Plan:** Plan developed by the Contractor to provide a healthy indoor environment for workers and building occupants during construction. Plan must meet or exceed the recommendations of the Sheet Metal and Air Conditioning Contractors National Association (SMACNA) "IAQ Guidelines for Occupied Buildings Under Construction, 2nd edition, 2007, ANSI/SMACNA 008-2008, Chapter 3."
- K. **Leadership Extraction Practices:** Products that meet at least one of the responsible extraction criteria, which include: extended producer responsibility; bio-based materials; FSC wood products; materials reuse; recycled content; and other USGBC approved programs.
- L. **Material Cost:** The dollar value of materials being provided to the site, after Contractor mark-ups, including transportation costs, taxes, fees, and shop labor, but excluding field equipment and field labor costs.
- M. **Materials Reuse:** Reuse includes salvaged, refurbished, or reused products.
- N. **Multi-Attribute Optimization:** Third party certified products that demonstrate impact reduction below industry average in at least three of the following six categories: global warming potential; stratospheric ozone depletion; acidification; eutrophication; tropospheric ozone creation; nonrenewable resource depletion.
- O. **Recycled Content:** Recycled content is the sum of postconsumer recycled content plus one-half the preconsumer recycled content, based on cost.
 - 1. "Postconsumer" material is defined as waste material generated by households or by commercial, industrial, and institutional facilities in their role as end users of the product, which can no longer be used for its intended purpose.
 - 2. "Preconsumer" material is defined as material diverted from the waste stream during the manufacturing process. Excluded is reutilization of materials, such as rework, regrind, or scrap, generated in a process and capable of being reclaimed within the same process that generated it.
- P. **Regional Materials:** Materials that are extracted, harvested, recovered, and manufactured within a radius of 100 miles from the Project site.

- Q. Volatile Organic Compounds (VOC) Emissions Test: Refer to CDPH Standard Method v1.1 definition.

1.3 ADMINISTRATIVE REQUIREMENTS

- A. Work for this project includes completed building and application for LEED certification. Work is not complete until Owner has accepted USGBC's final review of LEED certification.
1. Provide documentation required by LEED and LEED review.
- B. Provide materials and procedures necessary to obtain LEED prerequisites and credits required in this Section. Other Sections may specify requirements that contribute to LEED prerequisites and credits. Refer to other sections for additional materials and procedures necessary to obtain LEED prerequisites and credits.
- C. Respond to questions and requests for additional information from Owner and the USGBC regarding LEED credits until the USGBC has made its determination on the project's LEED certification application.
- D. LEED Online Submittals: Upload LEED documentation submittal data directly to USGBC project "LEED Online" website. Complete online forms at least monthly and as necessary to document LEED credits for submittals required in this Section.
- E. LEED Conference: Schedule and conduct a conference at a time convenient to Owner within 30 days prior to commencement of the work. Advise Owner's Commissioning Authority, and Owner's Project Manager of scheduled meeting dates.
1. Attendees: Authorized representatives of Owner, Owner's Commissioning Authority, Owner's Project Manager, and their consultants; Contractor and its superintendent; major subcontractors; suppliers; and other concerned parties shall attend the conference. Participants at the conference shall be familiar with Project and authorized to conclude matters relating to the Work.
 2. Agenda: LEED goals for the project, Contractor's action plans, and discussion of targeted LEED Prerequisites and Credits.
 3. Minutes: Record and distribute minutes to attendees and other entities with responsibilities for obtaining LEED Credits.

1.4 ACTION SUBMITTALS

- A. General: Submit additional LEED submittals required by other Specification Sections.
1. Submit each LEED submittal simultaneously with applicable product submittal.
- B. LEED Documentation Submittals:
1. General, LEED v4/v4.1 Product Sustainable Attribute Form: Project submittals must be accompanied by a completed LEED v4/v4.1 Product Sustainable Attribute Form. Submittal packages must also include highlighted documentation supporting the sustainability claims made on the LEED v4/v4.1 Product Sustainable Attribute Form.
 - a. Provide location and distance from Project of material manufacturer and point of extraction, harvest, or recovery for each raw material.
 2. EAp3, Building-Level Energy Metering: Product data for meters, sensors, and data collection system used to provide continuous metering of building energy-consumption performance.
 3. MRp2/MRc5, Construction and Demolition Waste Management: Comply with submittal requirements of Section 017419 "Construction Waste Management and Disposal."
 4. MRc2, Building Product Disclosure and Optimization: Environmental Product Declarations complying with LEED requirements.
 5. MRc3, Building Product Disclosure and Optimization, Sourcing of Raw Materials: *Option 1*, Raw Material Source and Extraction Reporting.

- a. Corporate sustainability reports for products that comply with LEED requirements for raw material and source extraction reporting.
6. MRc3, Building Product Disclosure and Optimization, Sourcing of Raw Materials: *Option 2, Leadership Extraction Practices.*
 - a. Extended Producer Responsibility: Product data and certification letter from product manufacturers, indicating participation in an extended producer responsibility program and statement of costs.
 - b. Bio-Based Materials: Product data and certification for bio-based materials, indicating that they comply with requirements. Include statement of costs.
 - c. Certified Wood: Product data and chain-of-custody certificates for products containing certified wood. Include statement indicating cost for each certified wood product.
 - d. Materials Reuse: Receipts for salvaged and refurbished materials used for Project, indicating sources and costs.
 - e. Recycled Content: Product data and certification letter from product manufacturers, indicating percentages by weight of postconsumer and preconsumer recycled content for products having recycled content. Include statement of costs.
7. MRc4, Building Product Disclosure and Optimization, Material Ingredients: *Option 1, Material Ingredient Reporting.*
 - a. Material ingredient reports for products that comply with LEED requirements for material ingredient reporting, including but not limited to the following:
 - 1) Manufacturer Inventory.
 - 2) Health Product Declaration.
 - 3) Cradle to Cradle certifications.
 - 4) Declare product labels.
 - 5) ANSI/BIFMA e3 Furniture Sustainability Standard.
8. MRc4, Building Product Disclosure and Optimization, Material Ingredients: *Option 2, Material Ingredient Optimization.*
 - a. Documentation for products that comply with LEED requirements for material ingredient optimization, including but not limited to the following:
 - 1) GreenScreen Benchmarks.
 - 2) Cradle to Cradle certifications.
 - 3) REACH optimizations.
9. EQc3, Construction Indoor Air Quality Management:
 - a. Construction indoor-air-quality (IAQ) management plan. (See Paragraph 3.3.A)
 - b. Product data for temporary filtration media.
 - c. Product data for filtration media used during occupancy.
 - d. Construction Documentation: Six photographs at three different times during the construction period, along with a brief description of the SMACNA approach employed, documenting implementation of the IAQ management measures, such as protection of ducts and on-site stored or installed absorptive materials.
10. EQc2, Low-Emitting Materials: Product data, indicating VOC content and emissions testing documents showing compliance with requirements for low-emitting materials, for the following materials:
 - a. Paints and coatings.
 - b. Adhesives and sealants.
 - c. Flooring.
 - d. Products containing composite wood or agrifiber products or wood glues.
 - e. Ceilings, walls, thermal, and acoustic insulation.
 - f. Exterior applied materials.

g. Furniture.

1.5 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For LEED coordinator.
- B. Project Materials Cost Data: Provide statement indicating total cost and shop labor for materials used for Project. Costs exclude site labor, overhead, and profit. Include breakout of costs for the following categories of items:
 - 1. Wood construction materials.
 - 2. Furniture.
 - 3. Passive plumbing materials.
 - 4. Passive mechanical (HVAC) materials.
 - 5. Passive electrical materials.
 - 6. Earthwork and exterior improvements, hard costs.
- C. LEED Building Disclosure and Optimization (BPDO) Credit Action Plans: Provide preliminary submittals within 30 days of date established for the Notice to Proceed indicating how the following requirements will be met:
 - 1. General
 - a. The LEED-NC v4.1 credits can be used as the basis for all BPDO credits.
 - b. Use the LEED-NC v4.1 BPDO calculator to complete all BPDO Action Plans. A copy of the calculator is available at: <https://www.usgbc.org/resources/leed-v41-bpdo-calculator>.
 - c. These electronic forms shall be provided by the Owner at the beginning of the Construction Phase and reviewed in the Preconstruction Conference.
 - 2. MRc2 - Building Disclosure and Optimization - EPD; Option 1. List at least 10 different permanently installed products sourced from at least three different manufacturers that the Contractor intends to procure that meet the Life-Cycle Assessment or Environmental Product Declarations complying with the requirements listed in LEED v4.1 for Credit MRc2 Option 1
 - a. Refer to Paragraph 2.2 A. 3. for the 20 products selected by the Design-Build Contractor that comply with the LEED v4.1 for Credit MRc2 Option 1.
 - 3. MRc2 - Building Disclosure and Optimization - EPD; Option 2. List the products that the Contractor intends to procure representing at least 10% of the cost of the total value of permanently installed products in the project, or at least 5 permanently installed products sourced from at least three different manufacturers that meet the Life-Cycle Impact Reduction Action Plan requirements or the Life Cycle Impact Reductions in Embodied Carbon requirements listed in LEED v4.1 for Credit MRc2 Option 2.
 - a. Refer to Paragraph 2.2 B. 3. for the 5 products selected by the Design-Build Contractor that comply with the LEED v4.1 for Credit MRc2 Option 2. .
 - 4. MRc3 - Building Disclosure and Optimization - Sourcing of Raw Materials; *Option 1*. List the products that the Contractor intends to procure representing at least 15% of the cost of the total value of permanently installed products in the project, sourced from at least three different manufacturers that meet at least one of the responsible sourcing and extraction criteria listed in LEED v4.1 for Credit MRc3.
 - 5. MRc3 - Building Disclosure and Optimization - Sourcing of Raw Materials; *Option 2*. List the products that the Contractor intends to procure representing at least 30% of the cost of the total value of permanently installed products in the project, sourced from at least five different manufacturers that meet at least one of the responsible sourcing and extraction criteria listed in LEED v4.1 for Credit MRc3.
 - 6. MRc4 - Building Disclosure and Optimization - Materials Ingredients; Option 1. List at least 20 **[10]** different permanently installed products sourced from at least five **[three]**

different manufacturers that the Contractor intends to procure that use any of the programs listed in LEED v4.1 for Credit MRc4 Option 1 to demonstrate the chemical inventory of the product to at least 0.1% (1000 ppm)

- a. Refer to Paragraph 2.2 E. 3. for the 10 products selected by the Design-Build Contractor that comply with the LEED v4.1 for Credit MRc4 Option 1.
 7. MRc4 - Building Disclosure and Optimization - Materials Ingredients; Option 2. List the products that the Contractor intends to procure representing at least 10% of the cost of the total value of permanently installed products in the project, or at least 5 permanently installed products sourced from at least three different manufacturers for which the manufacturer documents material ingredient optimization using the paths listed in LEED v4.1 for Credit MRc4 Option 2.
 - a. Refer to Paragraph 2.2 F. 3. for the 10 products selected by the Design-Build Contractor that comply with the LEED v4.1 for Credit MRc4 Option 2.
 - D. LEED Credit Action Plan: Provide preliminary submittals within 7 days of date established for the Notice to Proceed indicating how the following requirements will be met:
 1. MRp2/MRc5, Waste management plan, complying with Section 017419 "Construction Waste Management and Disposal."
 2. EQc3 - Construction IAQ Management Plan:
 - a. Document all control measures to be used during construction to comply with the SMACNA IAQ Guidelines for Occupied Buildings under Construction, 2nd edition, 2007, ANSI/SMACNA 008-2008, Chapter 3.
 - b. Describe proposed measures to protect absorptive materials stored on-site and installed from moisture damage.
 - c. Describe methods to prohibit the use of tobacco products inside the building and within **25 feet (8 meters)** of the building entrance during construction.
 - E. LEED Progress Reports: Concurrent with each Application for Payment, submit reports comparing actual construction and purchasing activities with LEED action plans for the following:
 - F. MRp2/MRc5, Waste reduction progress reports complying with Section 017419 "Construction Waste Management and Disposal."
 - G. MRc2, Building product disclosure and optimization - environmental product declarations.
 - H. MRc3, Building product disclosure and optimization - sourcing of raw materials.
 - I. MRc4, Building product disclosure and optimization - material ingredients.
 - J. EQc2, Low emitting materials.
 1. Low Emitting Materials Tracking Sheet monitoring the project's progress towards targeted LEED Indoor Environmental Quality Credits. Tracking Sheet to be presented at construction meetings.
- 1.6 QUALITY ASSURANCE
- A. LEED Coordinator: Engage an experienced LEED-Accredited Professional to coordinate LEED requirements. LEED coordinator may also serve as waste management coordinator.
 - B. LEED Preconstruction Meeting: Design-Build Contractor to conduct meeting at project site as part of the Pre-Construction Conference to comply with requirements of this section.
 1. The General Contractor shall require all major subcontractors to attend meeting.
 2. Review methods and procedures related to managing the LEED construction process and to include, but are not limited to the following:
 - a. Understanding LEED process and terminology.

- b. Understanding contractor responsibilities and LEED submittal process.
- c. Maintaining proper meeting minutes, records, and tracking mechanisms related to LEED credit responsibilities.
- d. Understanding LEED certification process and filling out LEED Online submittal forms.

PART 2 - PRODUCTS

2.1 MATERIALS, GENERAL

- A. Provide products and procedures necessary to obtain LEED credits required in this Section. Although other Sections may specify some requirements that contribute to LEED credits, the Contractor shall determine additional materials and procedures necessary to obtain LEED credits indicated. Contractor to determine a combination of credit options best suited for achieving credits required.
 - 1. Exclusions: Special equipment, such as elevators, escalators, process equipment, and fire suppression systems, is excluded from the credit calculations. Also excluded are products purchased for temporary use on the project, like formwork for concrete.

2.2 BUILDING PRODUCT DISCLOSURE AND OPTIMIZATION

- A. MRc2, Building Product Disclosure and Optimization, Environmental Product Declarations (EPD):
Option 1.
 - 1. Provide at least 10 permanently installed products (sourced from at least 3 different manufacturers) which meet one of the disclosure criteria:
 - a. Product-Specific Declaration: Valued as one quarter (1/4) of a product.
 - b. Industry-Wide (Generic) EPD: Valued as one half (1/2) of a product.
 - c. Product-Specific Type III EPD: Valued as one whole product.
 - 2. Products sourced within 100 miles of the project site are valued at twice their contributing cost or number of products.
- B. MRc2, Building Product Disclosure and Optimization, Environmental Product Declarations (EPD):
Option 2.
 - 1. Provide products representing at least 10% of the cost of the total value of permanently installed products in the project, or at least 5 permanently installed products sourced from at least three different manufacturers that meet one of the disclosure criteria:
 - a. Life Cycle Impact Reduction Action Plan
 - b. Life Cycle Impact Reductions in Embodied Carbon
 - c. Products with environmental impact reductions demonstrated by third-party verified EPDs conforming to ISO 14025 and ISO 21930
 - 2. Products sourced within 100 miles of the project site are valued at twice their contributing cost or number of products.
- C. MRc3, Building Product Disclosure and Optimization, Sourcing of Raw Materials: *Option 1*, Responsible Sourcing of Raw Materials. Use products sourced from at least three different manufacturers that meet at least one of the responsible sourcing and extraction criteria below for at least 15%, by cost, of the total value of permanently installed building products in the project:
 - 1. Extended producer responsibility program.
 - 2. Bio-based materials.
 - 3. Certified Wood: Wood-based materials include, but are not limited to, the following materials when made from wood, engineered wood products, or wood-based panel products:

- a. Rough carpentry.
 - b. Miscellaneous carpentry.
 - c. Heavy timber construction.
 - d. Wood decking.
 - e. Metal-plate-connected wood trusses.
 - f. Structural glued-laminated timber.
 - g. Finish carpentry.
 - h. Architectural woodwork.
 - i. Wood paneling.
 - j. Wood veneer wall covering.
 - k. Wood flooring.
 - l. Wood lockers.
 - m. Wood cabinets.
 - n. Furniture.
 4. Recycled content.
 - a. Exceptions: Do not include furniture, fire protection, operational plumbing, operational mechanical, and operational electrical components, and specialty items, such as elevators and equipment, in the calculation.
 5. Products sourced within 100 miles of the project site are valued at twice their contributing cost.
- D. MRc3, Building Product Disclosure and Optimization, Sourcing of Raw Materials: *Option 2*, Responsible Sourcing of Raw Materials. Use products sourced from at least three different manufacturers that meet at least one of the responsible sourcing and extraction criteria listed in 2.2 C. above for at least 30%, by cost, of the total value of permanently installed building products in the project.
- E. MRc4, Building Product Disclosure and Optimization, Material Ingredients: *Option 1*, Material Ingredient Reporting.
1. Use at least 10 different permanently installed products from at least three different manufacturers that use any of the following programs to demonstrate the chemical inventory of the product to at least 0.1% (1000 ppm), which meet one of the following disclosure criteria:
 - a. Manufacturer Inventory.
 - b. Health Product Declarations (HPDs).
 - c. Cradle to Cradle (C2C) certifications.
 - d. Declare product labels.
 - e. Living Building Challenge
 - f. ANSI/BIFMA e3 Furniture Sustainability Standard.
 - g. Product Lens Certification
 - h. Facts - NSF/ANSI 336: Sustainability Assessment for Commercial Furnishings Fabric
 2. Products sourced within 100 miles of the project site are valued at twice their contributing cost or number of products.
- F. MRc4, Building Product Disclosure and Optimization, Material Ingredients: *Option 2*, Material Ingredient Optimization.
1. Use products representing at least 10% of the cost of the total value of permanently installed products in the project, or at least 10 permanently installed products sourced from at least three different manufacturers that document their material ingredient optimization using the paths below, which meet one of the following disclosure criteria:
 - a. Material Ingredient Screening and Optimization Action Plan
 - b. Advanced Inventory & Assessment

- c. Material Ingredient Optimization
- d. GreenScreen benchmarks.
- e. Declare Labels designated as Red List Free
- f. Cradle to Cradle version 3 or later certifications.
- g. REACH optimizations.
2. Products sourced within 100 miles of the project site are valued at twice their contributing cost or number of products.

2.3 LOW-EMITTING MATERIALS

- A. EQc2, Low-Emitting Materials, *General Emissions Requirements*: Products must demonstrate they have been tested and determined compliant in accordance with California Department of Public Health, (CDHP), Standard Method v1.1-2010, using the applicable exposure scenario. Manufacturer's documentation demonstrating compliance must state the range of total VOCs (tVOC) after 14 days measured as specified in the CDPH Standard Method v1.1 as follows:
 1. 0.5mg/m3 or less,
 2. between 0.5 and 5.0 mg/m3 or,
 3. 0.50 mg/m3 or more.
- B. EQc2, Low-Emitting Materials, *Paints and Coatings*: For field applications that are inside the weatherproofing system, use paints and coatings that comply with the limits for VOC content when calculated according to the California Air Resources Board (CARB) 2007, Suggested Control Measure (SCM) for Architectural Coatings, or the South Coast Air Quality Management District (SCAQMD) Rule 1113, effective June 3, 2011.

Product Type:	Allowable VOC Content (g/L):
Bond Breaker	350
Clear wood finishes - Varnish	275
Clear wood finishes - Sanding Sealer	275
Clear wood finishes - Lacquer	275
Colorant - Architectural Coatings, excluding IM coatings	50
Colorant - Solvent Based IM	600
Colorant - Waterborne IM	50
Concrete - Curing compounds	100
Concrete - Curing compounds for roadways & bridges	350
Concrete surface retarder	50
Driveway Sealer	50
Dry-fog coatings	50
Faux finishing coatings - Clear topcoat	100
Faux finishing coatings - Decorative Coatings	350
Faux finishing coatings - Glazes	350
Faux finishing coatings - Japan	350
Faux finishing coatings - Trowel applied coatings	50
Fire-proof coatings	150
Flats	50
Floor coatings	50
Form release compounds	100
Graphic arts (sign) coatings	150
Industrial maintenance coatings	100
Industrial maintenance coatings - High temperature IM coatings	420

Industrial maintenance coatings - Non-sacrificial anti-graffiti coatings	100
Industrial maintenance coatings - Zinc rich IM primers	100
Magnesite cement coatings	450
Mastic coatings	100
Metallic pigmented coatings	150
Multi-color coatings	250
Non-flat coatings	50
Pre-treatment wash primers	420
Primers, sealers and undercoaters	100
Reactive penetrating sealers	350
Recycled coatings	250
Roof coatings	50
Roof coatings, aluminum	100
Roof primers, bituminous	350
Rust preventative coatings	100
Stone consolidant	450
Sacrificial anti-graffiti coatings	50
Shellac- Clear	730
Shellac - Pigmented	550
Specialty primers	100
Stains	100
Stains, interior	250
Swimming pool coatings - repair	340
Swimming pool coatings - other	340
Traffic Coatings	100
Waterproofing sealers	100
Waterproofing concrete/masonry sealers	100
Wood preservatives	350
Low solids coatings	120

- C. EQc2, Low-Emitting Materials, *Paints and Coatings*: For field applications that are inside the weatherproofing system, 90 percent of paints and coatings shall comply with the requirements of the California Department of Public Health's "Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers."
- D. EQc2, Low-Emitting Materials, *Adhesives and Sealants*: For field applications that are inside the weatherproofing system, use adhesives and sealants that comply with the limits for VOC content when calculated according to South Coast Air Quality Management District (SCAQMD) Rule #1168, requirements in effect on July 1, 2005, and rule amendment date January 7, 2005:

Architectural Applications:	Allowable VOC Content (g/L):
Indoor carpet adhesives	50
Carpet pad adhesives	50
Outdoor carpet adhesives	150
Wood flooring adhesives	100
Rubber floor adhesives	60
Subfloor adhesives	50
Ceramic tile adhesives	65

VCT and asphalt tile adhesives	50
Dry wall and panel adhesives	50
Cove base adhesives	50
Multipurpose construction adhesives	70
Structural glazing adhesives	100
Single ply roof membrane adhesives	250
Specialty Applications:	
PVC welding	510
CPVC welding	490
ABS welding	325
Plastic cement welding	250
Adhesive primer for plastic	550
Computer diskette manufacturing	350
Contact adhesive	80
Special purpose contact adhesive	250
Tire retread	100
Adhesive primer for traffic marking tape	150
Structural wood member adhesive	140
Sheet applied rubber lining operations specialty	850
Top and Trim adhesive	250
Substrate Specific Applications:	
Metal to metal substrate specific adhesives	30
Plastic foam substrate specific adhesives	50
Porous material (except wood) substrate specific adhesives	50
Wood substrate specific adhesives	30
Fiberglass substrate specific adhesives	80
Sealants:	
Architectural sealant	250
Marine deck sealant	760
Nonmember roof sealant	300
Roadway sealant	250
Single-ply roof membrane sealant	450
Other sealant	420
Sealant Primers:	
Architectural non-porous sealant primer	250
Architectural porous sealant primer	775
Modified bituminous sealant primer	500
Marine deck sealant primer	760
Other sealant primer	750
Other	
Other adhesives, adhesive bonding primers, adhesive primers or any other primers	250

- Exception: The provisions of SCAQMD Rule 1168 do not apply to adhesives and sealants subject to state or federal consumer product VOC regulations.

- E. EQc2, Low-Emitting Materials, *Adhesives and Sealants*: For field applications that are inside the weatherproofing system, 90 percent of adhesives and sealants shall comply with the requirements of the California Department of Public Health's "Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers."
 - F. EQc2, Low-Emitting Materials, *Flooring*: Flooring shall comply with the requirements of the California Department of Public Health's "Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers."
 - G. EQc2, Low-Emitting Materials, *Composite Wood*: Composite wood, agrifiber products, and adhesives shall be made using ultra-low-emitting formaldehyde (ULEF) resins as defined in the California Air Resources Board's "Airborne Toxic Control Measure (ATCM) to Reduce Formaldehyde Emissions from Composite Wood Products" or shall be made with no added formaldehyde. Alternately, EN 717-1:2014 is acceptable as well.
 - H. EQc2, Low-Emitting Materials, *Ceilings, Walls, Thermal, and Acoustic Insulation*: Ceilings, walls, and thermal insulation shall comply with the requirements of the California Department of Public Health's "Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers."
 - I. EQc2, Low-Emitting Materials, *Exterior Applied Materials*: At least 90 percent of exterior applied materials, measured by volume, shall comply with the requirements of the California Department of Public Health's "Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers."
 - 1. The following materials are prohibited and do not count toward total percentage compliance:
 - a. Hot-mopped asphalt for roofing.
 - b. Coal tar sealants for parking lots and other paved surfaces.
 - J. EQc2, Low-Emitting Materials, *Furniture*: At least 90 percent of furniture, measured by cost, shall be tested in accordance with ANSI/BIFMA Standard Method M7.1-2011 (R-2016); comply with ANSI/BIFMA e3-2014 Furniture Sustainability Standard, Sections 7.6.1 (half credit) and/or 7.6.2 (full credit), using either the concentration modeling approach or the emissions factor approach; and model the test results using the open plan, private office, or seating scenario in ANSI/BIFMA M7.1, as appropriate.
 - K. Additional Low-Emitting Requirements:
 - 1. If the applicable regulation requires subtraction of exempt compounds, any content of intentionally added exempt compounds larger than 1% weight by mass (total exempt compounds) must be disclosed.
 - 2. If a product cannot reasonably be tested as specified above, testing of VOC content must comply with ASTM D2369-10; ISO 11890, part 1; ASTM D6886-03; or ISO 11890-2.
 - 3. Methylene chloride and perchloroethylene may not be intentionally added in paints, coatings, adhesives, or sealants.
- 2.4 INDOOR WATER USE REDUCTION
- A. WEp2, Indoor Water Use Reduction, Appliances: Provide ENERGY STAR or performance equivalent appliances.
 - B. WEp2/WEc2, Indoor Water Use Reduction, Plumbing Fixtures: Do not exceed water flow requirements indicated in Division 22 - PLUMBING.

PART 3 - EXECUTION

3.1 NONSMOKING BUILDING

- A. EQp2, Environmental Tobacco Smoke Control: Smoking is not permitted within the building or within **25 feet** of entrances, operable windows, or outdoor-air intakes.

3.2 CONSTRUCTION WASTE MANAGEMENT

- A. MRp2/MRc5, Construction and Demolition Waste Management: Comply with Section 017419 "Construction Waste Management and Disposal."

3.3 CONSTRUCTION INDOOR-AIR-QUALITY MANAGEMENT

- A. EQc3, Construction Indoor Air Quality Management Plan:
 - 1. Meet or exceed all applicable recommended control measures of the Sheet Metal and Air Conditioning National Contractors Association (SMACNA) IAQ Guidelines for Occupied Buildings under Construction, 2nd edition, 2007, ANSI/SMACNA 008-2008, Chapter 3.
 - a. If Owner authorizes use of permanent heating, cooling, and ventilating systems during construction period as specified in Division 01 Section "Temporary Utilities," install filter media having a MERV 8 according to ASHRAE 52.2-2007 at each return-air inlet for the air-handling system used during construction.
 - b. Replace all air filters immediately prior to occupancy.
 - 2. Protect absorptive materials stored on-site and installed from moisture damage.
 - 3. Prohibit the use of tobacco products inside the building and within **25 feet (8 meters)** of the building entrance during construction
- B. EQc4 - Indoor Air Quality Assessment
- C. Flush-Out:
 - 1. After construction ends, prior to occupancy and with all interior finishes installed, perform a building flush-out by supplying a total volume of **14,000 cu. ft. (4 300 000 L)** of outdoor air per **sq. ft. (sq. m)** of floor area while maintaining an internal temperature of at least **60 deg F (16 deg C)** and a relative humidity no higher than 60 percent.
 - 2. If occupancy is desired prior to flush-out completion, the space may be occupied following delivery of a minimum of **3500 cu. ft. (1 070 000 L)** of outdoor air per **sq. ft. (sq. m)** of floor area to the space. Once a space is occupied, it shall be ventilated at a minimum rate of **0.30 cfm per sq. ft. (1.52 L/s per sq. m)** of outside air or the design minimum outside-air rate, whichever is greater. During each day of the flush-out period, ventilation shall begin a minimum of three hours prior to occupancy and continue during occupancy. These conditions shall be maintained until a total of **14,000 cu. ft./sq. ft. (4 300 000 L/sq. m)** of outside air has been delivered to the space.
- D. Air-Quality Testing: Engage testing agency to perform the following:
 - 1. Conduct baseline IAQ testing, after construction ends and prior to occupancy, using testing protocols consistent with the EPA's "Compendium of Methods for the Determination of Air Pollutants in Indoor Air," and as additionally detailed in the USGBC's "LEED Reference Guide for Building Design and Construction."
 - 2. Demonstrate that the contaminant maximum concentrations listed below are not exceeded:
 - a. Formaldehyde: 27 ppb.
 - b. Particulates (PM10): 50 micrograms/cu. m.
 - c. Ozone: 0.075 ppm, according to ASTM D 5149.
 - d. Total Volatile Organic Compounds: 500 micrograms/cu. m.
 - e. 4-Phenylcyclohexene (4-PH): 6.5 micrograms/cu. m.

- f. Carbon Monoxide: 9 ppm and no greater than 2 ppm above outdoor levels.
 - g. Target Chemicals in California Department of Public Health "Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers," Table 4-1 (except formaldehyde): Allowable concentrations in California Department of Public Health "Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers," Table 4-1.
- 3. For each sampling point where the maximum concentration limits are exceeded, take corrective action until requirements have been met.
- 4. Air-sample testing shall be conducted as follows:
 - a. All measurements shall be conducted prior to occupancy but during normal occupied hours, and with building ventilation system starting at the normal daily start time and operated at the minimum outside-air flow rate for the occupied mode throughout the duration of the air testing.
 - b. Building shall have all interior finishes installed, including, but not limited to, millwork, doors, paint, carpet, and acoustic tiles. Nonfixed furnishings, such as workstations and partitions, are encouraged, but not required, to be in place for the testing.
 - c. Number of sampling locations varies depending on the size of building and number of ventilation systems. For each portion of building served by a separate ventilation system, the number of sampling points shall not be less than one per **5000 sq. ft. (465 sq. m).**
 - d. Air samples shall be collected between **3 and 6 feet (900 and 1800 mm)** from the floor to represent the breathing zone of occupants, and over a minimum four-hour period.

END OF SECTION **018113.15**

SECTION 019113 - GENERAL COMMISSIONING REQUIREMENTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions, other Division 01 Specification Sections, and provisions of Request for Proposal (RFP), apply to this Section.

1.2 SUMMARY

A. Section Includes:

1. General administration and procedural requirements for coordinating and scheduling commissioning of building systems, assemblies and equipment as specified for this project.
2. Commissioning meetings.
3. Commissioning reports.
4. Use of commissioning process test equipment, instrumentation, and tools.
5. Construction checklists, including, but not limited to, installation checks, startup, performance tests, and performance test demonstration.
6. Commissioning tests and commissioning test demonstration.
7. Adjusting, verifying, and documenting identified systems and assemblies.
8. Coordination with the Owner's Commissioning Authority.

B. Related Requirements:

1. Section 010000 "Summary" for Commissioning Authority responsibilities.
2. Section 013100 "Project Management and Coordination" for general requirements.
3. Section 013216 "Construction Project Schedule" for Commissioning Integration.
4. Section 013300 "Submittal Procedures" for submittal procedure requirements for commissioning process.
5. Section 017700 "Closeout Procedures" for Certificate of Construction-Phase Commissioning Process Completion submittal requirements.
6. Section 017823 "Operation and Maintenance Data" for preliminary operation and maintenance data submittal requirements.
7. Section 210800 "Commissioning of Fire Suppression" for technical commissioning requirements for fire suppression.
8. Section 220800 "Commissioning of Plumbing" for technical commissioning requirements for plumbing.
9. Section 230800 "Commissioning of HVAC" for technical commissioning requirements for HVAC.
10. Section 260800 "Commissioning of Electrical Systems" for technical commissioning requirements for electrical systems.

- A. American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE).
 1. ASHRAE 202-2013 Commissioning Process for Buildings and Systems.

1.4 DESCRIPTION:

- A. This section 019113 - GENERAL COMMISSIONING REQUIREMENTS shall form the basis of the construction phase commissioning process. The Commissioning Authority (CxA) shall add, modify, and refine the commissioning procedures, as approved by the Owner, to suit field conditions and actual manufacture's equipment, incorporate test data and procedure results, and provide detailed scheduling for all commissioning tasks.
- B. Various sections of the project specifications require equipment startup, testing, and adjusting services. The Design Builder shall coordinate the work required by individual specification sections with the commissioning services requirements specified herein.
- C. Where training is required and specified in other sections of these specifications, those services are intended to be provided in addition to the training and educational services specified in this section.
- D. Commissioning is a systematic process of verifying that the building systems perform interactively according to the construction documents and operational needs. The commissioning process shall encompass and coordinate the system documentation, equipment startup, control system calibration, testing and balancing, performance testing and training. Commissioning during the construction and post-occupancy phases is intended to achieve the objectives specified within the Construction Documents.
- E. The commissioning process does not take away from or reduce the responsibility of the Design-Builder to provide a finished and full functioning product. Commissioning does not take the place of or duplicate the Design Builder's quality control process.
- F. Whole Building Commissioning is a process that relies upon frequent and direct communications, as well as collaboration between all parties to the construction process. By its nature, a very high level of communication and cooperation between the Commissioning Authority and all other parties (Owner, Design-Builder, QA/QC Manager, Subcontractors, Vendors, Manufactures, testing agencies, code officials, etc.) is essential to the success of the Commissioning effort.
1. No communications from the Commissioning Authority shall be deemed to constitute direction that modifies the terms of any contract between the Owner and the Design-Builder.
 2. All parties to the Commissioning process shall be individually responsible for alerting the Owner of any issues that they deem to constitute a potential contract change prior to acting on that communication.
 3. In the event any Commissioning issues and suggestions are deemed by the Owner to require an official interpretation of Construction Documents or require a modification of the Contract Documents, the Owner will issue an official directive for this effort.

1.5 DEFINITIONS

- A. Acceptance Criteria: Threshold of acceptable work quality or performance specified for a commissioning activity, including, but not limited to, construction checklists, performance tests, performance test demonstrations, commissioning tests, and commissioning test demonstrations.
 - B. Basis-of-Design Document: A document prepared by Design-Builder's A/E that records concepts, calculations, decisions, and product selections used to comply with Owner's Project Requirements and to suit applicable regulatory requirements, standards, and guidelines. The document includes both narrative descriptions and lists of individual items that support the design intent and process.
 - C. Commissioning: A quality-focused process for verifying and documenting that the facility and all of its systems and assemblies are planned, designed, installed, and tested to comply with Owner's Project Requirements and construction documents prepared by the Design Builder with the input from Commissioning Authority. The commissioning process shall encompass and coordinate the traditionally separate functions of system documentation, equipment start-up, control system calibration, testing and balancing, performance testing and operator training. The requirements highlighted here are pertaining to the construction phase commissioning activities. The scope of the commissioning process is further defined in Section 010000 "Summary" and in other sections of the Contract Documents.
 - D. Commissioning Authority (CxA): An entity engaged by Owner, and identified in Section 010000 "Summary," to evaluate Commissioning-Process Work. The CxA facilitates and coordinates the commissioning activities in concert with the Owner, Design-Builder, and D-B A/E. The Commissioning Authority is responsible for directing the Commissioning Team in implementing the Commissioning Process.
 - E. Commissioning Plan: A document, prepared by CxA, that outlines the organization, schedule, allocation of resources, responsibilities, and documentation of commissioning requirements. The commissioning plan shall identify how commissioning responsibilities are distributed. The intent of this plan is to evoke questions, expose issues, and resolve them with input from the entire commissioning team early in construction.
 - F. Construction-Phase Commissioning-Process Completion: The stage of completion and acceptance of commissioning process when resolution of deficient conditions and issues discovered during commissioning process and retesting until acceptable results are obtained has been accomplished. Owner will establish, in writing, the date construction-phase commissioning-process completion is achieved. See Section 017700 - Closeout Procedures for Certificate of Construction-Phase Commissioning Process Completion submittal requirements.
- 1. Commissioning process is complete when the Work specified of this Section and related Sections has been completed and accepted, including, but not limited to, the following:
 - a. Completion of tests and acceptance of test results.
 - b. Resolution of issues, as verified by retests performed and documented with acceptance of retest results.
 - c. Comply with requirements in Section 017900 - Demonstration and Training.
 - d. Completion and acceptance of submittals and reports.

- f. Controls Contractor
 - g. Any other installing subcontractors or suppliers of equipment (particularly HVAC, piping, sheet metal, lighting controls, plumbing, and building enclosure)
- 4. Appointed team members shall have the authority to act on behalf of the entity they represent.

B. Members Appointed by Owner:

- 1. Commissioning Authority, plus consultants that the CxA may deem appropriate for a particular portion of the commissioning process.
- 2. Owner representative(s), facility operations and maintenance personnel, plus other employees, separate contractors, and consultants that Owner may deem appropriate for a particular portion of the commissioning process.
- 3. Owner to observe and assure compliance with the commissioning requirements.

1.8 INFORMATIONAL SUBMITTALS

A. Comply with requirements in Section 013300 - Submittal Procedures for submittal procedure general requirements for commissioning process.

B. Commissioning Plan:

- 1. The Design Builder shall provide all tests and data as defined in these specifications as well as within the "Commissioning Plan."
- 2. The Design Builder shall ensure that the commissioning responsibilities outlined in these specifications are included in all contracts and subcontracts and that subcontractors comply with the requirements of these specifications.
- 3. List of Design Builder-appointed commissioning team members to include specific personnel and subcontractors performing the various commissioning requirements.
- 4. Schedule of commissioning activities, integrated with the Construction Schedule. Comply with requirements in Section 013200 - Construction Progress Documentation for the Construction Schedule general requirements for commissioning process.
- 5. Design Builder personnel and subcontractor personnel participating in each test.
- 6. List of instrumentation required for each test to include identification of parties that will provide instrumentation for each test.

C. Commissioning Schedule:

- 1. Provide Owner with a two-week look-ahead schedules for Commissioning activities.

D. Commissioning Coordinator Letter of Authority:

- 1. Within 10 days after approval of Commissioning Coordinator qualifications, submit a letter of authority for Commissioning Coordinator, signed by a principal of the Design-Builder's firm. Letter shall authorize Commissioning Coordinator to do the following:
 - a. Make inspections required for commissioning process.
 - b. Coordinate, schedule, and manage commissioning process of Design Builder, subcontractors, and suppliers.
 - c. Obtain documentation required for commissioning process from Design Builder, subcontractors, and suppliers.
 - d. Report issues, delayed resolution of issues, schedule conflicts, and lack of cooperation or expertise on the part of members of the commissioning team.

- E. Commissioning Coordinator Qualification Data: For entity coordinating Design Builder's commissioning activities to demonstrate their capabilities and experience.
1. Experienced: When used with an entity or individual, "experienced" means having successfully completed a minimum of five previous projects similar in nature, size, and extent to this Project; being familiar with special requirements indicated; and having complied with requirements of authorities having jurisdiction.
- F. Commissioning Documentation: Provide the following information to the CxA:
1. Process and schedule for completing construction checklists, pre-functional and start-up for systems, assemblies, equipment and components to be commissioned.
 2. Completed construction checklists, pre-functional checklists and start-up forms.
 3. Certificate of readiness certifying that plumbing systems, subsystems, equipment and associated controls are ready for testing.
 4. Test and inspection reports and certificates.
 5. Corrective action documents.
 6. Testing, adjusting and balancing reports (preliminary and final copies).
 7. Data trend logs compiled in .XLS format.
- G. Equipment Shop Drawings and Submittals: The following information shall be submitted for systems to be commissioned, in electronic format, with the product shop drawings for review and approval by Owner and the CxA. This information will be used to confirm the product compliance with the contract documents and to establish commissioning requirements and procedures. This information is required to be submitted with product data information. The information shall be specific to each type of equipment herein this specification, being used on the project.
1. Manufacturer's detailed installation requirements and checklists including access and clearance dimensions.
 2. Manufacturer's detailed start-up requirements and checklists.
 3. Operation instructions.
 4. Manufacturer's recommended maintenance and troubleshooting procedures.
 5. Detailed product performance data for each piece of equipment including part load capacities, performance curves, electrical components and requirements, etc.
 6. Manufacturer's certified test reports on each piece of equipment.
 7. Logic flow diagrams for temperature control systems and sequences of operation.
 - a. Include applicable sections of the Sequence of Operation for related function groups.
 - b. Annotate function groups for clarity.
 - c. Indicate initial setpoints, reset schedules, etc.
 8. Calibration certificates for test instruments.
- H. List test instrumentation, equipment, and monitoring devices. Include the following information:
1. Make, model, serial number, and application for each instrument, equipment, and monitoring device.
 2. Brief description of intended use.
 3. Calibration record showing the following:
 - a. Calibration agency, including name and contact information.
 - b. Last date of calibration.
 - c. Range of values for which calibration is valid.
 - d. Certification of accuracy.

- e. Certification for calibration equipment traceable to NIST.
- f. Due date of the next calibration.

I. Test Reports:

1. Pre-Startup Report: Prior to startup of equipment or a system, submit signed, completed construction checklists.
2. Test Data Reports: At the end of each day in which tests are conducted, submit test data for tests performed.
3. Commissioning Issue Reports: Daily, at the end of each day in which tests are conducted, submit commissioning issue reports for tests for which acceptable results were not achieved.
4. Weekly Progress Report: Weekly, at the end of each week in which tests are conducted, submit a progress report.
5. Data Trend Logs: Submit data trend logs at the end of the trend log period.
6. System Alarm Logs: Daily, at the start of days following a day in which tests were performed, submit printout of log of alarms that occurred since the last log was printed.

J. Construction Checklists:

1. Material checks.
2. Installation checks.
3. Startup procedures, where required.

1.9 RESPONSIBILITIES

- A. The responsibilities of various parties in the commissioning process are provided in this Section. The responsibilities of the trade contractors are identified in each Division in addition to this section.

1. Division 21: Fire Suppression
2. Division 22: Plumbing.
3. Division 23: Mechanical.
4. Division 26: Electrical.
5. Division 27: Communications.
6. Division 28: Electronic Safety and Security.

B. All Parties:

1. Follow the Commissioning Plan.
2. Attend commissioning scoping meeting and additional meetings as requested by the CxA.

C. Design-Build Designer of Record (DOR or A/E):

1. Construction and Acceptance Phase
 - a. Provide support to the Commissioning Team who must provide a service as a part of the commissioning process. This shall include providing adequate space for equipment installation and maintenance.
 - b. Conduct periodic inspections of work in progress to ensure that all systems and equipment are installed according to specifications.
 - c. Copy the CxA on all relevant documentation and communication.
 - d. Attend the commissioning scoping meetings and selected commissioning team meetings as requested by the CxA.
 - e. Perform normal submittal review, and copy the CxA for construction observations, as-built drawing preparation, O&M manual preparation, etc.

- f. Provide design narrative documentation as requested by the CxA, including BOD and OPR.
 - g. Coordinate resolution of system deficiencies identified during commissioning, according to the contract documents.
 - h. Coordinate resolution of design deficiencies identified during the construction phase.
 - i. Prepare and submit final as-built design intent documentation for inclusion in the O&M manuals. Review and approve the O&M manuals.
 - 2. Warranty Period
 - a. Coordinate resolution of design non-conformance and design deficiencies identified during warranty-period commissioning.
- D. Mechanical, Electrical, and Plumbing Designers/Engineers (of the A/E)
 - 1. Construction and Acceptance Phase:
 - a. Provide documentation of initial design concepts, and Design Intent based on the Owner's program.
 - b. Provide mechanical system design parameters and obtain approval of Owner.
 - c. Prepare contract documents incorporating the commissioning specification requirements, and description of mechanical system.
 - d. Review TAB report and verification data sheets for system conformance to contract documents. Issue a report noting deficiencies requiring correction to the Commissioning Authority.
 - e. Review functional performance testing report for deficiencies in meeting the finalized design intent.
 - f. Review as-built records as required by contract documents and turn them over to the CxA for inclusion in the final project documentation.
 - g. Review and comment on the final commissioning report.
 - h. Perform normal submittal review, construction observation, as-built drawing preparation, etc., as contracted. One site observation should be completed just prior to system startup.
 - i. Provide any design narrative and sequences documentation requested by the CxA. The MEP Designers shall assist, along with the contractors, in clarifying the operation and control of commissioned equipment in areas where the specifications, control drawings or equipment documentation is not sufficient for writing detailed testing procedures.
 - j. Attend commissioning scoping meetings and other selected commissioning team meetings, as required or requested by CxA.
 - k. Participate in the resolution of system deficiencies identified during commissioning, according to the contract documents.
 - l. Prepare and submit the final as-built design intent and operating parameters documentation for inclusion in the O&M manuals. Review and approve the O&M manuals.
 - m. Sign-off on individual commissioning tests as completed and passing. Recommend completion of the commissioning process to the A/E.
 - n. Participate in Owner training and provide overview of systems and intended operation.
 - 2. Warranty Period

- a. Participate in the resolution of non-compliance, non-conformance and design deficiencies identified during commissioning during warranty-period commissioning.
- E. Commissioning Authority (CxA)
1. The primary role of the CxA is to develop and coordinate the execution of a testing plan, observe and document performance—that systems are functioning in accordance with the documented design intent and in accordance with the Contract Documents. The Contractors will provide all tools to start, check-out, and functionally test equipment and systems. The CxA is not responsible for design concept, design criteria, compliance with codes, design or general construction scheduling, cost estimating, or construction management. The CxA may assist with problem-solving non-conformance or deficiencies, but ultimately that responsibility resides with the D-B Contractor, subcontractors, and the A/E.
2. Construction and Acceptance Phase
- a. Coordinates and directs the commissioning activities in a logical, sequential and efficient manner using consistent protocols and forms, centralized documentation, clear and regular communications and consultations with all necessary parties, frequently updated timelines, schedules, and technical expertise.
- b. Coordinate the commissioning work with the PM, GC, and CA, who ensure that commissioning activities are being scheduled into the master schedule.
- c. Revise, as necessary, the Commissioning Plan - Construction Phase.
- d. Plan and conduct a commissioning scoping meeting and other commissioning meetings.
- e. Request and review additional information required to perform commissioning tasks, including O&M manuals, contractor startup and checkout procedures.
- f. Before startup, gather and review the current control sequences and interlocks and work with contractors and design engineers until sufficient clarity has been obtained, in writing, to be able to write detailed testing procedures.
- g. Review normal Contractor submittals applicable to systems being commissioned for compliance with commissioning needs, concurrent with the A/E reviews.
- h. Write and distribute pre-functional tests and checklists.
- i. Perform site visits to observe component and system installations. Attend selected planning and job-site meetings to obtain information on construction progress. Review construction meeting minutes for revisions/substitutions relating to the commissioning process. Assist in resolving any discrepancies.
- j. May witness the HVAC&R piping tests and flushing procedures, sufficient to be confident that proper procedures were followed. Notify Owner promptly of any deficiencies in results or procedures.
- k. May witness ductwork testing and cleaning procedures, sufficient to be confident that proper procedures were followed. Notify Owner promptly of any deficiencies in results or procedures.
- l. Approve pre-functional tests and checklist completion by reviewing pre-functional checklist reports and by selected site observations and spot checking.
- m. Verify systems startup by reviewing startup reports and by selected site observation.
- n. Review TAB execution plan.
- o. Verify air and water systems balancing by spot testing, by reviewing completed reports, and by selected site observation.
- p. Write the functional performance test procedures for equipment and systems with necessary assistance from installing contractors. Performance test procedures may

- include energy management control system trending, stand-alone data logger monitoring or manual functional testing. Submit to the Owner for review, and for approval if required. Provide to the D-B for review.
- q. Analyze any functional performance trend logs and monitoring data to verify performance or equipment and systems.
 - r. Coordinate, witness, and approve manual functional performance tests performed by installing contractors. Request retesting as necessary.
 - s. Maintain a master deficiency and resolution log and a separate testing record. Provide the Owner and D-B with written progress reports and test results with recommended actions.
 - t. Witness the training of the Owner's operating personnel.
 - u. Review of the O&M manuals.
 - v. Provide a final commissioning report (as described in this section).
3. Warranty Period
- a. Coordinate and witness required Function Performance Testing and deficiency corrections.
- F. Construction Administrator of Design Build Designer of Record (DOR or A/E)
- 1. Construction and Acceptance Phase
 - a. Facilitate the coordination of the commissioning work by the CxA for design related components and clarifications, as requested by the CxA.
 - b. Provide support to the Commissioning Team who must provide a service as a part of the commissioning process. This shall include providing adequate space for equipment and maintenance.
 - c. Review and approve the final Commissioning Plan - Construction Phase.
 - d. Attend a commissioning scoping meeting and other commissioning team meetings, as requested by the CxA.
 - e. Perform the normal review of Contractor submittals.
 - f. Furnish a copy of all construction documents, addenda, change orders and approved submittals and shop drawings related to commissioned equipment to the CxA.
 - g. When necessary, observe and witness pre-functional checklists, startup and functional testing of selected equipment.
 - h. Review commissioning progress and deficiency reports.
 - i. Coordinate the resolution of non-compliance and design deficiencies identified in all phases of commissioning.
 - 2. Warranty Period
 - a. Assist the CxA as necessary in the seasonal or deferred testing and deficiency corrections required by the specifications.
- G. Design-Build Contractor
- 1. Construction and Acceptance Phase
 - a. Include cost of commissioning requirements in the contract price. In each purchase order or subcontract written, include requirements for submittal data, O&M data, commissioning tasks and training.
 - b. Include commissioning requirements in the mechanical, electrical, plumbing, controls, TAB, and all other sub-contractor's contracts, to ensure full cooperation of all parties in the mechanical commissioning program.
 - c. Ensure acceptable representation, with the means and authority to prepare and coordinate execution of the commissioning program as described in the contract documents.

- d. Submit the following information for each Contractor and sub-discipline assigned as representatives to the commissioning team within two weeks of contract award.
 - 1) Company Name
 - 2) Name
 - 3) Years of Experience
 - 4) Phone Number
 - 5) Email address
 - e. Submit a complete list of project submittals required to the Owner by Division 01. The CxA will issue comments directly to the Design-Builder for incorporation into one set of review comments to be issued to the Design-Builder.
 - f. Submit to the CxA all Division 21, 22, 23, 26, 27, and 28 Quality Control Submittals in accordance with the requirements of individual sections.
 - g. Coordinate with CxA to incorporate all commissioning events in the Master Construction Schedule. The CM shall ensure that all testing requirements for the project are incorporated into the Master Schedule and are distributed to the Owner, CxA, A/E, and all other relevant parties.
 - h. Include the CxA on the construction meeting minutes distribution list.
 - i. Furnish a copy of all construction documents, addenda, change orders, test reports, and approved submittals and shop drawings related to commissioned equipment to the CxA.
 - j. Coordinate all construction meetings requested by the CxA, and ensure all Subcontractors and other applicable parties are in attendance.
 - k. Issue a statement that TAB work has been completed and submit the final TAB reports for review.
 - l. Ensure checklists are completed during construction.
 - m. Provide all manufacturer equipment startup sheets with submittals for each piece of equipment being commissioned.
 - n. Issue a statement that controls systems have been calibrated and point to point checks have been completed.
 - o. Design Builder to coordinate scheduling Commissioning activities.
 - p. Coordinate the remediation of deficiencies identified in verifications tests, start-ups, pre-functional checklists, punch lists, and other deficiencies noted during construction.
 - q. Facilitate the coordination of the commissioning work by the CxA, and with the Subs to ensure that commissioning activities are being scheduled and being completed based on the master schedule.
 - r. Coordinate as scheduled all subcontractors and startup testing.
 - s. Evaluate any performance deficiencies identified in the FPT report for non-conformance with contract documents.
 - t. Coordinate the preparation of O&M manuals with the installing contractors and Subs, according to the Contract Documents, including clarifying and updating the original sequences of operation to as-built conditions.
 - u. Arrange for facility operating and maintenance personnel to attend various field commissioning activities and field training sessions according to the Commissioning Plan - Construction Phase.
 - v. Provide final approval for the completion of the commissioning work.
2. Warranty Period
- a. Ensure that Subs execute seasonal or deferred functional performance testing, witnessed by the CxA, according to the specifications.

- ## 1.10 SYSTEMS TO BE COMMISSIONED

- | SPEC SECTION | EQUIPMENT TYPE | QUANTITY | % OF EQUIPMENT TESTED |
|-----------------------------------|--|-------------------------------------|--|
| RECORDER OF DEEDS BUILDING | | | |
| 235216 | New and Existing Boilers | 2 New | 100% |
| 236416 | Chillers | 2 New | 100% |
| 236500 | Cooling Towers | 2 New | 100% |
| 232100 | Hydronic Pumps | 6 new | 100% |
| 233600 | Variable Air Valves (VAV) | 36 New
71 ETR | 20% with 100% verified by trend data |
| 230900 | Direct Digital Control (DDC) Monitoring and Control System (BAS) | 1 system | 100% of new points verified |
| 235216 | New and Existing Boiler Commissioning/Start-up | 2 New
2 ETR (assumed, not shown) | 100% of new boilers, verification of ETR boiler operation only |
| 232100 | Heating system Commissioning (radiators/heating hot water systems) | 4 new, approximately 20 ETR | 20%, tested with associated VAV |

General Commissioning

Requirements

06/04/2024

Solicitation

Division 21	Fire Protection System (See Note 1)	1 system	Up to 3 witnessed tests with AHJ
262816	Electrical Breakers	Not counted	5%, verify labeling, ratings, and affected circuit
262913	Electrical Controllers	Not Counted	With associated equipment
262923	Variable Frequency Drives (VFD)	6 at pumps	With associated equipment
260923	Lighting Controllers	Not Counted	20%
283500	Refrigerant Detection System	1 system	100%
264113	Lightning Protection	1 system	Verify installation and witness testing by 3 rd party
260526	Grounding System	1 system	Verify installation and witness testing by 3 rd party
262413	Switchgear	1 New 1 ETR	Verify installation and witness testing by 3 rd party
263213	Generators	1 New	Verify installation and witness testing by 3 rd party, including NFPA 110 testing as specified.
TBD	Electrical metering system	1 system	100% of new system and points required
262923	Automatic Transfer Switches	5, including Fire Pump	100%, tested with Generator
Division 26.	Electrical connections as required for the equipment noted above	As required	With associated equipment
Note 1: Fire protection system (sprinkler system) commissioning shall consist of review of submittals, including shop drawings, observation of installation of materials, and one (1) witness of fire protection system testing performed for the authority having jurisdiction (AHJ). Since the AHJ has jurisdiction over placement of devices, and final acceptance of the system, Cx testing will defer to the requirements of that office.			

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1.11 CLOSEOUT SUBMITTALS

A. Commissioning Report:

1. At Construction-Phase Commissioning Completion, include the following:
 - a. Pre-startup reports.
 - b. Approved test procedures.
 - c. Test data forms, completed and signed.
 - d. Progress reports.
 - e. Commissioning issue report log.
 - f. Commissioning issue reports showing resolution of issues.
 - g. Correspondence or other documents related to resolution of issues.
 - h. Other reports required by commissioning process.
 - i. List unresolved issues and reasons they remain unresolved and should be exempted from the requirements for Construction-Phase Commissioning Completion.
 - j. Report shall include commissioning work of Design Builder.

B. Request for Certificate of Construction-Phase Commissioning Process Completion.

C. Operation and Maintenance Data: For proprietary test equipment, instrumentation, and tools to include in operation and maintenance manuals.

1.12 QUALITY ASSURANCE

A. Commissioning Coordinator Qualifications:

1. Documented experience commissioning systems of similar complexity to those contained in these documents on at least five projects of similar scope and complexity.
2. Certification of commissioning-process expertise. The following certifications are acceptable. Owner reserves the right to accept or reject certifications as evidence of qualification.
 - a. Certified Commissioning Authority, by AABC Commissioning Group (ACG).
 - b. Commissioning-Process Management Professional, by American Society of Heating, Refrigerating and Air-Conditioning Engineers.
 - c. Certified Commissioning Professional, by Building Commissioning Association.
 - d. Accredited Commissioning-Process Authority Professional, by University of Wisconsin.
 - e. Accredited Commissioning-Process Manager, by University of Wisconsin.
 - f. Accredited Green Commissioning-Process Provider, by University of Wisconsin.

B. Calibration Agency Qualifications: Certified by The American Association for Laboratory Accreditation that the calibration agency complies with minimum requirements of ISO/IEC 17025.

PART 2 - PRODUCTS

2.1 TEST EQUIPMENT, INSTRUMENTATION, AND TOOLS

- A. Test equipment and instrumentation required to perform the commissioning process shall remain the property of the Commissioning Authority unless otherwise indicated.
- B. Test equipment and instrumentation required to perform commissioning process shall comply with the following criteria:
 - 1. Be manufactured for the purpose of testing and measuring tests for which they are being used and have an accuracy to test and measure system performance within the tolerances required to determine acceptable performance.
 - 2. Calibrated and certified.
 - a. Calibration performed and documented by a qualified calibration agency according to national standards applicable to the tools and instrumentation being calibrated. Calibration shall be current according to national standards or within test equipment and instrumentation manufacturer's recommended intervals, whichever is more frequent, but not less than within six months of initial use on Project. Calibration tags shall be permanently affixed.
 - 1) Submit record of calibration dates and serial numbers for test equipment used for project.
 - b. Repair and recalibrate test equipment and instrumentation if dismantled, dropped, or damaged since last calibrated.
 - 3. Maintain test equipment and instrumentation.
 - 4. Use test equipment and instrumentation only for testing or monitoring Work for which they are designed.

2.2 PROPRIETARY EQUIPMENT, INSTRUMENTATION, AND TOOLS

- A. Proprietary equipment, instrumentation, and tools are those manufactured or prescribed by equipment manufacturer and required for work on its equipment as a condition of equipment warranty, or as otherwise required to test, service, repair, adjust, calibrate, or perform work on its equipment.
 - 1. Identify proprietary equipment, instrumentation, and tools required in the test equipment identification list submittal.
 - 2. Proprietary equipment, instrumentation, and tools shall become the property of Owner at Substantial Completion.

2.3 REPORT FORMAT AND ORGANIZATION

- A. General Format and Organization:
 - 1. Bind report in three-ring binders.

2. Label the front cover and spine of each binder with the report title, volume number, project name, Design Builder's name, and date of report.
3. Record report on compact disk.
4. Electronic Data: Portable document format (PDF); a single file with outline-organized bookmarks for major and minor tabs and tab contents itemized for specific reports.

B. Commissioning Report:

1. Include a table of contents and an index to each test.
2. Include major tabs for each Specification Section.
3. Include minor tabs for each test.
4. Within each minor tab, include the following:
 - a. Test specification.
 - b. Pre-startup reports.
 - c. Approved test procedures.
 - d. Test data forms, completed and signed.
 - e. Commissioning issue reports, showing resolution of issues, and documentation related to resolution of issues pertaining to a single test. Group data forms, commissioning issue reports showing resolution of issues, and documentation related to resolution of issues for each test repetition together within the minor tab, in reverse chronological order (most recent on top).

PART 3 - EXECUTION

3.1 PREPARATION

- A. Review preliminary construction checklists and preliminary test procedures and data forms.

3.2 CONSTRUCTION CHECKLISTS

- A. Construction checklists cannot modify or conflict with the Contract Documents.
- B. Create construction checklists based on actual systems and equipment to be included in Project.
- C. Material Checks: Design Builder shall compare specified characteristics and approved submittals with materials as received. Include factory tests and other evaluations, adjustments, and tests performed prior to shipment if applicable. CxA is to review results.
 - 1. Service connection requirements, including configuration, size, location, and other pertinent characteristics.
 - 2. Included optional features.
 - 3. Delivery Receipt Check: Inspect and record physical condition of materials and equipment on delivery to Project site, including agreement with approved submittals, cleanliness, and lack of damage.
 - 4. Installation Checks:
 - a. Location according to Drawings and approved Shop Drawings.
 - b. Configuration.
 - c. Compliance with manufacturers' written installation instructions.
 - d. Attachment to structure.

- e. Access clearance to allow for maintenance, service, repair, removal, and replacement without the need to disassemble or remove other equipment or building elements. Access coordinated with other building elements and equipment, including, but not limited to, ceiling and wall access panels, in a manner consistent with OSHA fall-protection regulations and safe work practices.
 - f. Utility connections are of the correct characteristics, as applicable.
 - g. Correct labeling and identification.
 - h. Startup Checks: Verify readiness of equipment to be energized. Include manufacturer's standard startup procedures and forms.
- D. Startup: CxA shall direct, witness and document initial operation of equipment to prove that it is installed properly and operates as intended according to manufacturer's standard startup procedures, at minimum.
- E. Performance Tests:
 - 1. Static Tests: As specified elsewhere, including, but not limited to, duct and pipe leakage tests, insulation-resistance tests, and water-penetration tests.
 - 2. Component Performance Tests: Tests evaluate the performance of an input or output of components under a full range of operating conditions.
 - 3. Equipment and Assembly Performance Tests: Test and evaluate performance of equipment and assemblies under a full range of operating conditions and loads.
 - 4. System Performance Tests: Test and evaluate performance of systems under a full range of operating conditions and loads.
 - 5. Intersystem Performance Tests: Test and evaluate the interface of different systems under a full range of operating conditions and loads.
- F. Deferred Construction Checklists: Obtain Owner approval of Design Builder's proposed deferral of construction checklists, including proposed schedule of completion of each deferred construction checklist, before submitting request for Certificate of Construction-Phase Commissioning Process Completion. When approved by Owner, deferred construction checklists may be completed after date of Construction-Phase Commissioning Completion. Include the following in a request for Certificate of Construction-Phase Commissioning Process Completion:
 - 1. Identify deferred construction checklists by number and title.
 - 2. Provide a target schedule for completion of deferred construction checklists.
 - 3. Written approval of proposed deferred construction checklists, including approved schedule of completion of each deferred construction checklist.
- G. Delayed Construction Checklists: Obtain Owner approval of Design Builder's proposed delayed construction checklists, including proposed schedule of completion of each delayed construction checklist, before submitting request for Certificate of Construction-Phase Commissioning Process Completion. When approved, delayed construction checklists may be completed after date of Construction-Phase Commissioning Completion. Include the following in a request for Certificate of Construction-Phase Commissioning Process Completion:
 - 1. Identify delayed construction checklist by construction checklist number and title.
 - 2. Provide a target schedule for completion of delayed construction checklists.
 - 3. Written approval of proposed delayed construction checklists, including approved schedule of completion of each delayed construction checklist.

- A. Schedule and coordinate commissioning process with the Construction Schedule.
- B. Perform activities identified in construction checklists, including tests, and document results of actions as construction proceeds.
- C. Perform test demonstrations for Owner's witness. Unless otherwise indicated, demonstrate tests for 100 percent of work to which the test applies. In some instances, demonstration of a random sample of other than 100 percent of the results of a test is specified.
 - 1. Where sampling is specified, the sampling plan and procedure for the test demonstration shall be determined using ASQ Z1.4.
 - 2. The "lot size" in ASQ Z1.4 is the sum of the number of items to which the test demonstration applies, as described in the scope subparagraph of each test.
 - 3. On determination of the sample size, the samples shall be selected randomly by Owner's witness at the time of the test demonstration.
 - 4. Include in the Commissioning Plan a detailed list of the test demonstrations with lot and sample quantities for each test.
- D. Report test data and commissioning issue resolutions.
- E. Schedule personnel to participate in and perform Commissioning-Process Work.
- F. Installing Design Builders' commissioning responsibilities include, but are not limited to, the following:
 - 1. Operating the equipment and systems they install during tests.
 - 2. In addition, installing Design Builders may be required to assist in tests of equipment and systems with which their work interfaces.

- A. Quality Control: Construction checklists, including tests, are quality control tools designed to improve the functional quality of Project. Test demonstrations evaluate the effectiveness of Design Builder's quality control process.
- B. Owner's witness will be present to witness commissioning work requiring the signature of an owner's witness, including, but not limited to, test demonstrations. Owner's project manager will coordinate attendance by Owner's witness with Design Builder's published Commissioning Schedule. Owner's witness will provide no labor or materials in the commissioning work. The only function of Owner's witness will be to observe and comment on the progress and results of commissioning process.
- C. Construction Checklists:
 - 1. Complete construction checklists as Work is completed.
 - 2. Distribute construction checklists to installing Design Builders before they start work.
 - 3. Installers:
 - a. Verify installation using approved construction checklists as Work proceeds.

- b. Complete and sign construction checklists weekly for work performed during the preceding week.
 4. Provide Commissioning Authority access to construction checklists.
- D. Installation Compliance Issues: Record as an installation compliance issue any Work that is found to be incomplete, inaccessible, at variance with the Contract Documents, nonfunctional, or that does not comply with construction checklists. Record installation compliance issues on the construction checklist at the time they are identified. Record corrective action and how future Work should be modified before signing off the construction checklist.
 1. Provide list of Compliance Issues within 5 working days of discovery. Maintain list with weekly updates until resolution. Coordinate or integrate compliance issues with final punch lists.
- E. Pre-Startup Audit: Prior to executing startup procedures, review completed installation checks to determine readiness for startup and operation. Report conditions, which, if left uncorrected, adversely impact the ability of systems or equipment to operate satisfactorily or to comply with acceptance criteria. Prepare pre-startup report for each system.
- F. Test Procedures and Test Data Forms:
 1. Test procedures shall define the step-by-step procedures to be used to execute tests and test demonstrations.
 2. Test procedures shall be specific to the make, model, and application of the equipment and systems being tested.
 3. Completed test data forms are the official records of the test results.
 4. Commissioning Authority will provide to Design-Builder preliminary test procedures and test data forms for performance tests and commissioning tests after approval of Product Data, Shop Drawings, and preliminary operation and maintenance manual.
 5. Review preliminary test procedures and test data forms and provide comments within 14 days of receipt from Commissioning Authority. Review shall address the following:
 - a. Equipment protection and warranty issues, including, but not limited to, manufacturers' installation and startup recommendations, and operation and maintenance instructions.
 - b. Applicability of the procedure to the specific software, equipment, and systems approved for installation.
 6. After Design Builder has reviewed and commented on the preliminary test procedures and test data forms, Commissioning Authority will revise and reissue the approved revised test procedures and test data forms marked "Approved for Testing."
 7. Use only approved test procedures and test data forms marked "Approved for Testing" to perform and document tests and test demonstrations.
- G. Performance of Tests:
 1. Provide signed letter of completion from Contractor stating that installations are complete and ready for functional testing from CxA.
 2. The sampling rate for tests is 100 percent. The sampling rate for test demonstrations is 100 percent unless otherwise indicated.

3. Perform and complete each step of the approved test procedures in the order listed.
4. Record data observed during performance of tests on approved data forms at the time of test performance and when the results are observed.
5. Record test results that are not within the range of acceptable results on commissioning issue report forms in addition to recording the results on approved test procedures and data forms according to the "Commissioning Compliance Issues" Paragraph in this Article.
6. On completion of a test, sign the completed test procedure and data form. Tests for which test procedures and data forms are incomplete, not signed, or which indicate performance that does not comply with acceptance criteria will be rejected. Tests for which test procedures and data forms are rejected shall be repeated and results resubmitted.

H. Performance of Test Demonstration:

1. Perform test demonstrations on a sample of tests after test data submittals are approved. The sampling rate for test demonstrations shall be 100 percent unless otherwise indicated in the individual test specification.
2. Notify Owner's at least five (5) days in advance of each test demonstration.
3. Perform and complete each step of the approved test procedures in the order listed.
4. Record data observed during performance of test demonstrations on approved data forms at the time of demonstration and when the results are observed.
5. Provide full access to Owner's witness to directly observe the performance of all aspects of system response during the test demonstration. On completion of a test demonstration, sign the completed data form and obtain signature of Owner's witness at the time of the test to authenticate the reported results.
6. Test demonstration data forms not signed by Design Builder and Owner's witness at the time of the completion of the procedure will be rejected. Test demonstrations for which data forms are rejected shall be repeated and results shall be resubmitted.
 - a. Exception for Failure of Owner's Witness to Attend: Failure of Owner's witness to be present for agreed-on schedule of test demonstration shall not delay Design Builder. If Owner's witness fails to attend a scheduled test, Design Builder shall proceed with the scheduled test. On completion, Design Builder shall sign the data form for Design Builder and for Owner's witness and shall note the absence of Owner's witness at the scheduled time and place.
7. False load test requirements are specified in related sections.
 - a. Where false load testing is specified, provide temporary equipment, power, controls, wiring, piping, valves, and other necessary equipment and connections required to apply the specified load to the system. False load system shall be capable of steady-state operation and modulation at the level of load specified. Equipment and systems permanently installed in this work shall not be used to create the false load without Commissioning Authority's written approval.

I. Deferred Tests:

1. Deferred Test List: Identify, in the request for Certificate of Construction-Phase Commissioning Process Completion, proposed deferred tests or other tests approved for deferral until specified seasonal or other conditions are available. When approved, deferred tests may be completed after the date of Construction-Phase Commissioning

Completion. Identify proposed deferred tests in the request for Certificate of Construction-Phase Commissioning Process Completion as follows:

- a. Identify deferred tests by number and title.
 - b. Provide a target schedule for completion of deferred tests.
2. Schedule and coordinate deferred tests. Schedule deferred tests when specified conditions are available. Notify Owner and Commissioning Authority at least three working days (minimum) in advance of tests.
 3. Where deferred tests are specified, coordinate participation of necessary personnel and of Owner's witness. Schedule deferred tests to minimize occupant and facility impact. Obtain Owner's approval of the proposed schedule.

J. Delayed Tests:

1. Delayed Test List: Identify, in the request for Certificate of Construction-Phase Commissioning Process Completion, proposed delayed tests. Obtain Owner approval of proposed delayed tests, including proposed schedule of completion of each delayed test, before submitting request for Certificate of Construction-Phase Commissioning Process Completion. Include the following in the request for Certificate of Construction-Phase Commissioning Process Completion:
 - a. Identify delayed tests by test number and title.
 - b. Written approval of proposed delayed tests, including approved schedule of completion of delayed tests.
2. Schedule and coordinate delayed tests. Schedule delayed tests when conditions that caused the delay have been rectified. Notify Owner and Commissioning Authority at least three working days (minimum) in advance of tests.
3. Where delayed tests are approved, coordinate participation of necessary personnel and of Owner, Commissioning Authority, and Owner's witness. Schedule delayed tests to minimize occupant and facility impact. Obtain Owner's approval of the proposed schedule.

K. Commissioning Compliance Issues:

1. Test results that are not within the range of acceptable results are commissioning compliance issues.
2. Track and report commissioning compliance issues until resolution and retesting are successfully completed.
3. If a test demonstration fails, determine the cause of failure. Direct timely resolution of issue and then repeat the demonstration. If a test demonstration must be repeated due to failure caused by Design Builder work or materials, reimburse Owner for billed costs for the participation in the repeated demonstration.
4. Test Results: If a test demonstration fails to meet the acceptance criteria, perform the following:
 - a. Complete a commissioning compliance issue report form promptly on discovery of test results that do not comply with acceptance criteria.
 - b. Submit commissioning compliance issue report form within 24 hours of the test.
 - c. Determine the cause of the failure.

- d. Establish responsibility for corrective action if the failure is due to conditions found to be Design Builder's responsibility.
5. Commissioning Compliance Issue Report: Provide a commissioning compliance issue report for each issue. Do not report multiple issues on the same commissioning compliance issue report.
 - a. Exception: If an entire class of devices is determined to exhibit the identical issue, they may be reported on a single commissioning compliance issue report. (For example, if all return-air damper actuators that are specified to fail to the open position are found to fail to the closed position, they may be reported on a single commissioning issue report. If a single commissioning issue report is used for multiple commissioning compliance issues, each device shall be identified in the report, and the total number of devices at issue shall be identified.
 - b. Complete and submit Part 1 of the commissioning compliance issue report immediately when the condition is observed.
 - c. Record the commissioning compliance issue report number and describe the deficient condition on the data form.
 - d. Resolve commissioning compliance issues promptly. Complete and submit Part 2 of the commissioning compliance issue report when issues are resolved.
6. Diagnose and correct failed test demonstrations as follows:
 - a. Perform diagnostic tests and activities required to determine the fundamental cause of issues observed.
 - b. Record each step of the diagnostic procedure prior to performing the procedure. Update written procedure as changes become necessary.
 - c. Record the results of each step of the diagnostic procedure.
 - d. Record the conclusion of the diagnostic procedure on the fundamental cause of the issue.
 - e. Determine and record corrective measures.
 - f. Include diagnosis of fundamental cause of issues in commissioning compliance issue report.
7. Retest:
 - a. Schedule and repeat the complete test procedure for each test demonstration for which acceptable results are not achieved. Obtain signature of Owner's witness on retest data forms. Repeat test demonstration until acceptable results are achieved. Except for issues that are determined to result from design errors or omissions, or other conditions beyond Design Builder's responsibility, compensate Owner for direct costs incurred as the result of repeated test demonstrations to achieve acceptable results.
 - b. For each repeated test demonstration, submit a new test data form, marked "Retest."
8. Do not correct commissioning compliance issues during test demonstrations.
 - a. Exceptions will be allowed if the cause of the issue is obvious, and resolution can be completed in less than ten minutes. If corrections are made under this exception, note the deficient conditions on the test data form and issue a commissioning compliance issue report. A new test data form marked "Retest," shall be initiated after the resolution has been completed.

A. Design Builder shall schedule Commissioning meetings. Commissioning Authority will conduct commissioning meetings. Comply with requirements in Section 013100 "Project Management and Coordination."

A. Sequencing of Commissioning Verification Activities: For a particular material, item of equipment, assembly, or system, perform the following in the order listed unless otherwise indicated:

- a. Material checks.
- b. Installation checks.
- c. Startup, as appropriate. Some startup may depend on component performance. Such startup may follow component performance tests on which the startup depends.
- d. Performance Tests:
 - 1) Static tests, as appropriate.
 - 2) Component performance tests. Some component performance tests may depend on completion of startup. Such component performance tests may follow startup.
 - 3) Equipment and assembly performance tests.
 - 4) System performance tests.
 - 5) Intersystem performance tests.

B. Before performing commissioning tests, verify that materials, equipment, assemblies, and systems are delivered, installed, started, and adjusted to perform according to construction checklists.

C. Verify readiness of materials, equipment, assemblies, and systems by performing tests prior to performing test demonstrations. Notify Owner and Commissioning Authority if acceptable results cannot be achieved due to conditions beyond Design Builder's control or responsibility.

D. Commence tests as soon as installation checks for materials, equipment, assemblies, or systems are satisfactorily completed. Tests of a particular system may proceed prior to completion of other systems, provided the incomplete work does not interfere with successful execution of test.

A. Commence commissioning process as early in the construction period as possible.

B. Commissioning Schedule: Integrate commissioning activities into Construction Schedule. See Section 013216 - Construction Project Schedule.

1. Include detailed commissioning activities in monthly updated Construction Schedule and short-interval schedule submittals.
2. Schedule the start date and duration for the following commissioning activities:
 - a. Submittals.
 - b. Preliminary operation and maintenance manual submittals.
 - c. Installation checks.
 - d. Startup, where required.
 - e. Performance tests.
 - f. Performance test demonstrations.
 - g. Commissioning tests.
 - h. Commissioning test demonstrations.
3. Schedule shall include a line item for each installation check, startup, and test activity specific to the equipment or systems involved.
4. Determine milestones and prerequisites for commissioning process. Show commissioning milestones, prerequisites, and dependencies in monthly updated critical-path-method construction schedule and short-interval schedule submittals.

C. Two-Week Look-Ahead Commissioning Schedule:

1. Two weeks prior to the beginning of tests, submit a detailed two-week look-ahead schedule. Thereafter, submit updated two-week look-ahead schedules weekly for the duration of commissioning process.
2. Two-week look-ahead schedules shall identify the date, time, beginning location, Design Builder personnel required, and anticipated duration for each startup or test activity.
3. Use two-week look-ahead schedules to notify and coordinate participation of Owner's witnesses.

D. Owner's Witness Coordination:

1. Coordinate Owner's witness participation.
2. Notify Owner and Commissioning Authority of commissioning schedule changes at least five (5) work days in advance for activities requiring the participation of Owner's witness.

3.8 PHASED COMMISSIONING

- A. The project may require startup and initial checkout to be executed in phases. The phasing shall be planned and scheduled in a coordination meeting of the Owner, Commissioning Authority, and the Design Builder. Results will be added to the master construction schedule and commissioning schedule.

3.9 FUNCTIONAL PERFORMANCE TESTING

- A. This sub-section applies to all commissioning functional testing for all divisions.
- B. The general list of equipment to be commissioned is found in Section 017500 and referenced Sections.
- C. The parties responsible to execute each test are listed with each test in other sections where test requirements are found.

- D. Objectives and Scope: The objective of functional performance testing is to demonstrate that each system is operating according to the documented Owner's Project Requirements and Contract Documents. Additionally, during the testing process, areas of deficient performance are identified and corrected, improving the operation and functioning of the systems. In general, each system should be operated through all modes of operation (seasonal, occupied, unoccupied, warm-up, cool-down, part- and full-load) where there is a specified system response. Verifying each sequence in the sequences of operation is required. Proper responses to such modes and conditions as power failure, freeze condition, low oil pressure, no flow, equipment failure, etc. shall also be tested. Specific modes required in this project are given in other sections where test requirements are found.
- E. Development of Test Procedures: Before test procedures are written, the CxA shall obtain all requested documentation and a current list of change orders affecting equipment or systems, including an updated points list, program code, control sequences and parameters. Using the testing parameters and requirements in other sections where test requirements are found, the CxA shall develop specific test procedures and forms to verify and document proper operation of each piece of equipment and system. Each subcontractor or vendor responsible to execute a test shall provide assistance to the CxA in developing the procedures review (answering questions about equipment, operation, sequences, etc.). Prior to execution, the CxA shall provide a copy of the test procedures to the Sub(s) who shall review the tests for feasibility, safety, equipment and warranty protection. The CxA may submit the tests to the A/E for review, if requested. The purpose of any given specific test is to verify and document compliance with the stated criteria of acceptance given on the test form.
- F. The test procedure forms developed by the CxA shall include (but not be limited to) the following information:
1. System and equipment or component name(s)
 2. Equipment location and ID number
 3. Unique test ID number, and reference to unique pre-functional checklist and start-up documentation ID numbers for the piece of equipment
 4. Date
 5. Project name
 6. Participating parties
 7. A copy of the specification section describing the test requirements
 8. A copy of the specific sequence of operations or other specified parameters being verified.
 9. Formulas used in any calculations.
 10. Required pre-test field measurements.
 11. Instructions for setting up the test.
 12. Special cautions, alarm limits, etc.
 13. Specific step-by-step procedures to execute the test, in a clear, sequential and repeatable format.
 14. Acceptance criteria of proper performance with a Yes/No check box to allow for clearly marking whether or not proper performance of each part of the test was achieved.
 15. A section for comments
 16. Signatures and date block for the CxA
- G. Test Methods
1. Functional performance testing and verification may be achieved by manual testing (persons manipulate the equipment and observe performance) or by monitoring the performance and analyzing the results using the control system's trend log capabilities or by stand-alone data loggers. Sections specific to the systems specify which methods shall be used for each test. The CxA may substitute specified methods or require an additional

method to be executed, other than what was specified, with no additional cost to the Owner. The CxA will determine which method is most appropriate for tests that do not have a method specified.

2. Simulated Conditions: Simulating conditions (not by an overwritten value) shall be allowed, though timing the testing to experience actual conditions is encouraged wherever practical.
3. Overwritten Values: Overwriting sensor values to simulate a condition, such as overwriting the outside air temperature reading in a control system to be something other than it really is, shall be allowed, but shall be used with caution and avoided when possible. Such testing methods often can only test a part of a system, as the interactions and responses of other systems will be erroneous or not applicable. Simulating a condition is preferable. e.g., for the above case, by heating the outside air sensor with a heat gun, rather than overwriting the value or by altering the appropriate set point to see the desired response. Before simulating conditions or overwriting values, sensors, transducers and devices shall have been calibrated.
4. Simulated Signals: Using a signal generator which creates a simulated signal to test and calibrate transducers and DDC constants is generally recommended instead of using the sensor to act as the signal generator via simulated conditions or overwritten values.
5. Altering Set points: Rather than overwriting sensor values, and when simulating conditions is difficult, altering set points to test a sequence is acceptable. For example, to see the AC compressor lockout work at an outside air temperature below 55°F, when the outside air temperature is above 55°F, temporarily change the lockout set point to be 2°F above the current outside air temperature.
6. Indirect Indicators: Relying on indirect indicators for responses or performance shall be allowed only after visually and directly verifying and documenting, over the range of the tested parameters, that the indirect readings through the control system represent actual conditions and responses. Much of this verification is completed during pre-functional testing.
7. Set-up: Each function and test shall be performed under conditions that simulate actual conditions as close as is practically possible. The Sub executing the test shall provide all necessary materials, system modifications, etc. to produce the necessary flows, pressures, temperatures, etc. necessary to execute the test according to the specified conditions. At completion of the test, the Sub shall return all affected building equipment and systems, due to these temporary modifications, to their pre-test condition.
8. Sampling: Multiple identical pieces of non-life-safety or otherwise non-critical equipment may be functionally tested using a sampling strategy. Significant application differences and significant sequence of operation differences in otherwise identical equipment invalidates their common identity. A small size or capacity difference, alone, does not constitute a difference. The specific recommended sampling rates are specified with each type of equipment. It is noted that no sampling by Subs is allowed in pre-functional checklist execution.
 - a. A common sampling strategy referenced in the Specifications as the “xx% Sampling—yy% Failure Rule” is defined by the following example.
 - 1) xx = the percent of the group of identical equipment to be included in each sample.
 - 2) yy = the percent of the sample that if failing, will require another sample to be tested.
 - b. The example below describes a 20% Sampling—10% Failure Rule.

- 1) Randomly test at least 20% (xx) of each group of identical equipment. In no case test less than three units in each group. This 20%, or three, constitute the “first sample.”
 - 2) If 10% (yy) of the units in the first sample fail the functional performance tests, test another 20% of the group (the second sample).
 - 3) If 10% of the units in the second sample fail, test all remaining units in the whole group.
 - 4) If at any point, frequent failures are occurring and testing is becoming more troubleshooting than verification, the CxA may stop the testing and require the responsible Sub to perform and document a checkout of the remaining units, prior to continuing with functionally testing the remaining units.
- H. Coordination and Scheduling: The Subs shall provide two (2) weeks notice to the CxA regarding their completion schedule for the pre-functional checklists and startup of all equipment and systems. The CxA will schedule functional tests through the Owner. The CxA shall direct, witness and document the functional testing of all equipment and systems. The Subs shall execute the tests.
- I. In general, functional testing is conducted after pre-functional testing and startup has been satisfactorily completed. The control system shall be sufficiently tested and approved by the CM or CM before it is used for TAB or to verify performance of other components or systems. The air balancing and water balancing is completed and debugged before functional testing of air-related or water-related equipment or systems. Testing proceeds from components to subsystems to systems. When the proper performance of all interacting individual systems has been achieved, the interface or coordinated responses between systems is checked.
- J. Test Equipment: Refer to Section 017500, Part 2 for test equipment requirements.
- K. Problem Solving: The CxA will recommend solutions to problems found, however the burden of responsibility to solve, correct and retest problems is with the D-B.
- 3.10 DEFERRED TESTING
- A. Unforeseen Deferred Tests: If any check or test cannot be completed due to the building structure, required occupancy condition or other deficiency, execution of checklists and functional testing may be delayed upon approval of the Owner. These tests will be conducted in the same manner as the seasonal tests as soon as possible. Services of necessary parties will be negotiated.
- 3.11 COMMISSIONING REPORTS
- A. Test Reports:
1. Pre-startup reports include observations of the conditions of installation, organized into the following sections:
 - a. Equipment Model Verification: Compare contract requirements, approved submittals, and provided equipment. Note inconsistencies.
 - b. Preinstallation Physical Condition Checks: Observe physical condition of equipment prior to installation. Note conditions including, but not limited to, physical damage, corrosion, water damage, or other contamination or dirt.
 - c. Preinstallation Component Verification Checks: Verify components supplied with the equipment, preinstalled or field installed, are correctly installed and functional. Verify external components required for proper operation of equipment correctly

- installed and functional. Note missing, improperly configured, improperly installed, or nonfunctional components.
 - d. Summary of Installation Compliance Issues and Corrective Actions: Identify installation compliance issues and the corrective actions for each. Verify that issues noted have been corrected.
 - e. Evaluation of System Readiness for Startup: For each item of equipment for each system for which startup is anticipated, document in summary form acceptable to Owner completion of equipment model verification, preinstallation physical condition checks, preinstallation component verification checks, and completion of corrective actions for installation compliance issues.
2. Test data reports include the following:
- a. "As-tested" system configuration. Complete record of conditions under which the test was performed, including, but not limited to, the status of equipment, systems, and assemblies; temporary adjustments and settings; and ambient conditions.
 - b. Data and observations, including, but not limited to, data trend logs, recorded during the tests.
 - c. Signatures of individuals performing and witnessing tests.
 - d. Data trend logs accumulated overnight from the previous day of testing.
3. Commissioning Compliance Issue Reports: Report as commissioning compliance issues results of tests and test demonstrations that do not comply with acceptance criteria. Report only one issue per commissioning compliance issue report. Use sequentially numbered facsimiles of commissioning compliance issue report form included in this Section, or other form approved by Owner. Distribute commissioning compliance issue reports to parties responsible for taking corrective action. Identify the following:
- a. Commissioning compliance issue report number. Assign unique, sequential numbers to individual commissioning compliance issue reports when they are created, to be used for tracking.
 - b. Action distribution list.
 - c. Report date.
 - d. Test number and description.
 - e. Equipment identification and location.
 - f. Briefly describe observations about the performance associated with failure to achieve acceptable results. Identify the cause of failure if apparent.
 - g. Diagnostic procedure or plan to determine the cause (include in initial submittal)
 - h. Diagnosis of fundamental cause of issues as specified below (include in resubmittal).
 - i. Fundamental cause of unacceptable performance as determined by diagnostic tests and activities.
 - j. When issues have been resolved, update and resubmit the commissioning issue report forms by completing Part 2. Identify resolution taken and the dates and initials of the persons making the entries.
 - k. Schedule for retesting.
4. Weekly progress reports include information for tests conducted since the preceding report and the following:
- a. Completed data forms.

- b. Equipment or system tested, including test number, system or equipment tag number and location, and notation about the apparent acceptability of results.
 - c. Activities scheduled but not conducted per schedule.
 - d. Commissioning compliance issue report log.
 - e. Schedule changes for remaining Commissioning-Process Work, if any.
- 5. Data trend logs shall be initiated and running prior to the time scheduled for the test demonstration.
 - a. Trend log data format shall be multiple data series graphs. Where multiple data series are trend logged concurrently, present the data on a common horizontal time axis. Individual data series may be presented on a segmented vertical axis to avoid interference of one data series with another, and to accommodate different axis scale values. Graphs shall be sufficiently clear to interpret data within the accuracy required by the acceptance criteria.
 - b. Attach to the data form printed trend log data collected during the test or test demonstration.
 - c. Record, print out, and attach to the data form operator activity during the time the trend log is running. During the time the trend log is running, operator intervention not directed by the test procedure invalidates the test results.
- 6. System Alarm Logs: Record and print out a log of alarms that occurred since the last log was printed. Evaluate alarms to determine if the previous day's work resulted in any conditions that are not considered "normal operation."
 - a. Conditions that are not considered "normal operation" shall be reported on a commissioning issue report attached to the alarm log. Resolve as necessary. The intent of this requirement is to discover control system points or sequences left in manual or disabled conditions, equipment left disconnected, set points left with abnormal values, or similar conditions that may have resulted from failure to fully restore systems to normal, automatic control after test completion.

3.12 CERTIFICATE OF CONSTRUCTION-PHASE COMMISSIONING PROCESS COMPLETION

- A. When Design-Builder considers that construction-phase commissioning process, or a portion thereof which Owner agrees to accept separately, is complete, D-B shall prepare and submit a comprehensive list of items to be completed or corrected to the Owner and CxA. Failure to include an item on such list does not alter Design-Builder's responsibility to compete commissioning process.
- B. On receipt of Design Builder's list, the CxA will make an inspection to determine whether the construction-phase commissioning process or designated portion thereof is complete. If the CxA's inspection discloses items which are not sufficiently complete as defined in "Construction-Phase Commissioning Process Completion", the D-B shall complete or correct such items on notification by the CxA. In such case, the D-B shall then submit a request for another inspection by the CxA to determine construction-phase commissioning process completion. Completion or correction must be complete before issuance of the Certificate of Construction-Phase Commissioning Process Completion.

- C. Design Builder shall promptly correct deficient conditions and issues discovered during commissioning process. Costs of correcting such deficient conditions and issues, including additional testing and inspections, the cost of uncovering and replacement, and compensation for the Owner's and Commissioning Authority's services and expenses made necessary thereby, shall be at Design-Builder's expense.
- D. When construction phase commissioning process or designated portion is complete, the Commissioning Authority will prepare a Certificate of Construction-Phase Commissioning Process Completion that shall establish the date of completion of construction-phase commissioning process. Certificate of Construction-Phase Commissioning Process Completion shall be submitted prior to requesting inspection for determining date of Substantial Completion.

END OF SECTION 019113