

SECTION 019115
BUILDING EXTERIOR ENVELOPE COMMISSIONING

PART 1 GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.
- B. Owner's Project Requirements and Basis of Design documentation are included for information only.
- C. Division 01 section "General Commissioning Requirements" for general requirements for commissioning including definition, commissioning team membership and responsibilities.
- D. Division 03 through 9 sections for building exterior enclosure commissioning requirements specific to the work of each section.

1.2 SUMMARY

- A. This section includes exterior enclosure commissioning procedures, including substructure, superstructure, exterior enclosure, and roofing construction that protects conditioned and semi-conditioned interior spaces from unconditioned spaces and the exterior environment.
- B. The materials, components, systems, and assemblies that comprise the above and below-grade building exterior enclosure will be evaluated and tested as outlined in this Section, as well as in accordance with each of the technical Sections associated with the design and construction of the building exterior enclosure. The purpose of Building Exterior Enclosure Commissioning is to provide a process for independent, third-party verification that the installed performance of the building exterior enclosure meets or exceeds the minimum performance requirements set forth by the contract documents for this project.

1.3 DEFINITIONS

- A. Refer to Division 01 Section "General Commissioning Requirements" for definitions.

1.4 SUBMITTALS

- A. The Contractor is to provide the following submittals to the Commissioning Authority in addition to submitting them to the Architect-of-Record. These submittals are in addition to those specified in Division 1 "General Commissioning Requirements."

1. Coordination Drawings: Provide cross references on any and all shop drawings indicating that drawings have been checked and cross-referenced by the Contractor to ensure that adjacent elements (i.e. wall elements and fenestration elements) and the dimensions and construction tolerances indicated will allow all work at interfaces to be constructible
2. Preconstruction Test Reports: all preconstruction air and water leakage performance test results, including all failed tests, recording the noted deficiency and the required repair, and provide a copy of all remediation processes and QC/QA processes that will be put in place to address the deficiency on future work product
3. Field Quality Control Reports: provide a copy of the test reports for all field water and air penetration and other appropriate building exterior enclosure tests completed by Owner's testing agency
4. Special Inspections Reports for all special inspections indicated by the Architect/Engineer-of-Record in the specifications.

1.5 PERFORMANCE REQUIREMENTS

- A. Construction will comply with all performance requirements set forth in the individual specifications for enclosure components. Where multiple systems from separate specification sections comprise a single system, such as the air barrier, the moisture barrier, and the thermal barrier, the Contractor shall ensure coordination among the various trades in order to provide continuity across the entirety of the enclosure.
- B. Preconstruction Testing of Mockups: See requirements in the individual specification sections in Divisions 2 through 9.

1.6 QUALITY ASSURANCE

- A. Quality Assurance and Control: Specific commissioning quality assurance and control requirements for individual construction activities are specified in the individual specification sections in Divisions 2 through 9. Specified commissioning tests, inspections, and related actions do not limit Contractor's other quality assurance and control procedures that facilitate compliance with the Contract Document requirements.

PART 2 PRODUCTS (Not Used)

PART 3 EXECUTION

3.1 CONTRACTOR'S RESPONSIBILITIES

- A. Attend Commissioning meetings.
- B. Provide schedule of field quality control tests and inspections required by the Contract Documents to Commissioning Authority.
 - a. Update schedule, as it pertains to the Building Exterior Enclosure, weekly throughout the construction period.
- C. Cooperate with the Commissioning Authority personnel, provide access to work, and provide an adequate schedule for the work for commissioning tasks.
- D. Furnish copies of all shop drawings, manufacturer's literature, installation instructions, maintenance information, schedules, warranties or other information as requested.
- E. Provide qualified personnel for assistance to complete the commissioning tests, including air and water leakage testing for elements of the building exterior enclosure.
- F. Submit a copy of the General Contractor's project and site-specific Quality Assurance program to be implemented for construction for review by the Architect of Record, the Owner, Owner representatives and the Commissioning Authority, prior to beginning of construction.
- G. Participate and ensure all subcontractors utilized for work on this contract participate in meetings prior to beginning construction with the various members of the design and construction teams, including, but not limited to, the Owner, Owner's representatives, Architect of Record, Commissioning Authority, Mechanical Engineer, suppliers, and manufacturer technical representatives. The subcontractors that must attend this meeting include all subcontractors that will be involved in the construction of the building exterior enclosure, including, but not limited to, the roofing, cladding, air barrier system, glazing systems, and exterior sheathing contractors. This meeting will be to discuss construction sequencing and the coordination of trades and the General Contractor's project and site-specific Quality Assurance program to be implemented that will be completed during construction of the building exterior enclosure.
- H. Facilitate all field installation and performance testing by Owner's testing agency of building exterior enclosure materials or systems, as required in the individual specification sections in Divisions 2 through 9.
- I. The Contractor is to complete and participate in the construction of on-site performance mock-ups to verify constructability, including elements of the building exterior enclosure, as identified in individual sections of the specifications in Divisions 2 through 9, including but not limited to wall-to-window interfaces, roof-to-wall

interfaces, sill conditions, and material transitions, and provide personnel to be present and have a representative present from each trade and/or subcontractor associated with installing the system during air and water leakage performance testing on the mock-up, as indicated within the individual sections within Divisions 2 through 9. Personnel from each trade that will be completing the work in the field are to be utilized to construct each required mock-up. Provide a written protocol, timeline for repair of any deficiencies noted during the performance testing and/or a written report from the third party agency performing the tests indicating what repairs were required. If a systemic problem is identified during testing, provide repair and remediation protocol for any systemic failures identified by the Commissioning Authority. Include a timeline for repair of all affected elements. Repaired elements shall not be covered up without review by the Commissioning Authority.

- J. The Contractor shall provide the following information to Commissioning Authority for inclusion in the Commissioning Plan:
- a. Submittals and other required documents and reports.
 - b. Identification of installed exterior enclosure components, assemblies, systems, and equipment, including design changes that occurred during the construction phase.
 - c. Certificate of completion, certifying that exterior enclosure assemblies, systems, equipment, and associated controls are complete and ready for testing.
 - d. Test and inspection reports and certificates.
 - e. Corrective action documents.

3.2 COMMISSIONING AUTHORITY'S RESPONSIBILITIES

- A. The Building Exterior Enclosure Commissioning process will be managed by the Commissioning Authority, retained by the Owner, and will include, by reference, all requirements set forth by the Architect-of-Record for pre-construction laboratory and field performance testing of the materials, components, systems and assemblies that comprise the building exterior enclosure. In that context, it should be understood by all parties to this project that:
1. Full and complete compliance with the building exterior enclosure performance requirements set forth by the Architect-of-Record in the Basis-of-Design (BOD) for this project will be required to achieve successful "commissioning" of the building exterior enclosure.
 2. The requirements of this Section shall in no way relieve the Owner, Contractor, Architect-of-Record and other parties to this project of their respective contractual obligations to the Owner for meeting the specified performance levels in the design and construction of this project.
 3. The "commissioning" requirements of the general contractor and sub-contractor or trade responsible for the final detailing and construction of the building exterior enclosure are included in Part 1 of each of the technical specification Sections as they relate to the design and construction of the building exterior enclosure for this project (Divisions 2 through 9).
- B. The Commissioning Authority will provide written summaries of selected inspections of the work in progress during the construction of the building exterior enclosure. These

reports will include, but may not be limited to, photographs, sketches and diagrams as required illustrating conditions observed in the field, especially deficiencies noted, together with proposed solutions for those conditions where appropriate for further review and acceptance by the Architect-of-Record for the project. Any changes to the contract documents arising out of the Building Exterior Enclosure Commissioning process must be submitted, reviewed, and accepted in writing by the Architect-of-Record and Owner. The Architect shall submit required details/schematics and material specifications to the Contractor for pricing prior to implementation of any changes on the project. The Contractor shall be responsible for coordinating and managing the commissioning responsibilities of each of the subcontractors responsible for the building exterior enclosure.

- C. The Commissioning Authority will:
1. Perform a focused review of the drawings and specification related to Building Exterior Enclosure during the Design Phase.
 2. Perform observation of initial and on-going installation of enclosure components.
 3. Compile test data, inspection reports, and certificates and include them in the commissioning report.
 4. Promptly notify Architect and Contractor of irregularities or deficiencies in work that are observed during performance of services.

3.3 VERIFICATION

- A. Field quality-control testing, as required in the individual enclosure specification section and as added by the Owner, will be used to help verify that building exterior enclosure systems, subsystems, and construction have been completed according to the Contract Documents.
- B. The Commissioning Authority will witness and document selected field quality-control tests and verify that the required field quality-control testing of the enclosure components and systems has been completed, that discrepancies have been corrected, and that the corrective work has been approved.
- C. If it is determined as a result from testing that a system is not constructed according to the Contract Documents, the Owner will decide whether modifications are required to bring the performance of the system to a level where the failure or deficiency is eliminated and shall be implemented or if the test results will be accepted as submitted. If corrective work is performed, the Owner will decide if tests shall be repeated and a revised report is to be submitted.
- D. Testing Reports: The Commissioning Authority shall provide reports including measured data, a description of the building exterior enclosure systems at the time of testing, diagnostics, and any recommendation for needed remediation.

- E. Deferred Testing: If tests cannot be completed because of a deficiency outside the scope of the Building Exterior Enclosure, the deficiency shall be documented by the Contractor and reported to Owner. Deficiencies shall be resolved and corrected by Contractor and tests rescheduled.

3.4 SYSTEMS TO BE COMMISSIONED

- A. The systems and elements to be commissioned include, but are not limited to:
 - 1. Below-grade construction, waterproofing, drainage
 - 2. Floors, slab-on-grade
 - 3. Plaza deck waterproofing.
 - 4. Fenestration systems including curtain walls, window walls, windows, storefronts and glazed openings
 - 5. Skylights /Sloped glazing
 - 6. Shading devices
 - 7. Exterior doors and louvers
 - 8. Exterior wall cladding systems (inclusive of masonry, stone, EIFS, concrete, precast concrete, metal, insulation, formed metal, rain screen systems, etc.) with associated sheathing, insulation, and support systems
 - 9. Air barriers, thermal barriers, vapor barriers and moisture barriers integral to the exterior envelope
 - 10. Flashings (end dams, drip edges, flexible flashing and metal flashings)
 - 11. Sealant joints, expansion joints and control joints related to the exterior envelope
 - 12. Roofing systems with associated flashing, trims, penetrations, curbs, etc.)
 - 13. Interface conditions between each of the above listed elements.
 - 14. Other special building exterior enclosure systems, equipment and controls

END OF SECTION