

SECTION 01 83 16 - EXTERIOR ENCLOSURE PERFORMANCE REQUIREMENTS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. General exterior enclosure performance requirements.
 - a. General coordination and sequencing requirements for building enclosure and weatherproofing the building exterior.
 - b. Compatibility.
2. Verification and inspection of air barrier and exterior enclosure.
3. Integrated exterior mockup.

B. This Section applies to all exterior enclosure Work including but not limited to the following:

1. Section 03 30 00 "Cast-in-Place Concrete."
2. Section 06 16 00 "Sheathing."
3. Section 07 11 13 "Bituminous Dampproofing."
4. Section 07 05 43 "Cladding Support Systems."
5. Section 07 19 00 "Water Repellents."
6. Section 07 21 00 "Thermal Insulation."
7. Section 07 27 00 "Air Barrier."
8. Section 07 42 13.23 "Metal Composite Material Wall Panels."
9. Section 07 54 23 "TPO Roofing."
10. Section 07 62 00 "Sheet Metal Flashing and Trim."
11. Section 07 92 00 "Joint Sealants."
12. Section 08 11 13 "Hollow Metal Doors and Frames."
13. Section 08 36 13 "Sectional Doors."
14. Section 08 41 13 "Aluminum-Framed Entrances and Storefronts."
15. Section 08 44 13 "Glazed Aluminum Curtain Walls."
16. Section 08 71 00 "Door Hardware" for weatherstripping for exterior doors not supplied in other Door Sections.
17. Section 08 80 00 "Glazing."

C. Related Requirements:

1. Section 01 40 00 "Quality Requirements" for specialist and quality control requirements; for general mockup requirements.

1.2 REFERENCES

- A. OEESC: Oregon Energy Efficiency Specialty Code.
- B. Standard 90.1: ASHRAE 90.1-2022 as adopted by OEESC.

1.3 COORDINATION ADMINISTRATIVE REQUIREMENTS

- A. Coordinate and sequence work to comply with requirements of this Section and all other related enclosure Sections, including but not limited to waterproofing, air barriers, roofing, sealing of penetrations and openings in enclosure systems and enclosure openings to limit passage of air and moisture, and to drain and exclude water from cavities to the exterior of the building envelope.
- B. Coordinate inspection, testing and verification, and commissioning activities with Owner's Envelope Testing and Inspectors and Project commissioning activities applicable to the exterior envelope.
 - 1. Coordinate sequence of construction work activities to accommodate tests and inspections.
- C. Schedule work in a manner to avoid the need ~~to~~for alterations to Drawings or installation standards, to existing Work placed, to comply with requirements of building enclosure Sections.
- D. Submittal Procedure: Describe procedures for ensuring compliance with requirements through review and management of submittal process. Indicate qualifications of personnel responsible for submittal review.
- E. Enclosure Testing and Inspection Subschedule: Coordinate sequencing and scheduling of required submittals and inspections, and prepare a subschedule to Construction Schedule. Base subschedule on preliminary construction schedule. Secure time commitments for performing testing and inspection activities from separate entities responsible for construction work.
 - 1. Include a comprehensive schedule of enclosure Work requiring testing or inspection, including the following:
 - a. Contractor-performed tests and inspections, including subcontractor-performed tests and inspections. Include required tests and inspections and Contractor-elected tests and inspections.
 - b. Owner's testing and inspections.
 - c. Manufacturer's representative tests and inspections.
- F. Continuous Inspection of Workmanship Plan: 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 the Work into compliance with standards of workmanship established by Contract requirements and approved mockups.
- G. Monitoring and Documentation: Maintain testing and inspection reports, including log of approved and rejected results. Include Work Architect 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.

1.4 ACTION SUBMITTALS

- A. Enclosure Testing and Inspection Subschedule.
- B. Continuous Inspection of Workmanship Plan.

1.5 PREINSTALLATION MEETINGS

- A. Preinstallation Conferences, Individual Scopes: See individual Sections for specific conferences.

- B. Preinstallation Conference, Envelope: Conduct conference at site.
 - 1. Attendees:
- C. Preliminary Envelope Conference: Before starting exterior enclosure construction, conduct conference at Project site.
 - 1. Meet with Owner, Architect, testing and inspecting agency representative, all enclosure systems installers, product manufacturer's representative, and installers whose work interfaces with or affects enclosure, including installers of accessories and equipment.
 - 2. Review submittal requirements, RFI and other administrative requirements.
 - 3. Review methods and procedures related to general installation, including manufacturer's written instructions affecting others' work.
 - 4. Review and finalize construction schedule, and verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.
 - 5. Review cleaning procedures and delivery of work to next installer.
 - 6. Review general requirements, special details, and condition of other construction that affects each system.
 - 7. Review repair procedures.
 - 8. Review notification procedures.
 - 9. Review governing regulations and requirements for insurance and certificates if applicable.
 - 10. Review temporary protection requirements during and after installation.
 - 11. Review observation and repair procedures after installation.
- D. Preinstallation Envelope Conferences: Conduct conference at Project site.
 - 1. Meet with Owner, Architect, testing and inspecting agency representative, system installers, system manufacturer's representative, and installers whose work interfaces with or affects work, including installers of accessories and equipment.
 - 2. Review methods and procedures related to installation, including manufacturer's written instructions.
 - 3. Review and finalize construction schedule, and verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.
 - 4. Examine substrate conditions and finishes for compliance with requirements, including tolerances, plumb and flatness, anchoring and fastening.
 - 5. Review Work, special details, interfaces, transitions, and penetrations, and condition of other construction that affects Work.
 - 6. Review governing regulations and requirements for insurance and certificates if applicable.
 - 7. Review temporary protection requirements for system during and after installation.
 - 8. Review observation and repair procedures after installation.

1.6 QUALITY ASSURANCE

- A. Sequencing: Installation sequence shown in the Drawings shall not be modified without request and approval by the Architect.
 - 1. Reverse lapping or reverse shingling of air barrier and roofing membrane with exposed leading edges are not permitted unless shown in Drawings.
 - a. Where sequence or Contractor's means and methods require an alternate installation sequence, submit for approval changes by Architect. Do not proceed without written approval.

2. Not all conditions are shown on Drawings. Where similar conditions exist, details provided shall apply.
 3. Do not proceed with installation where clarifications are required.
 4. Provide shop drawings under Sections of Work, where unique or field conditions require additional information on sequence, installation or executable standards.
- B. Compatibility: All products used shall be compatible with one another, with substrates over which materials are placed, and ~~those with~~ other materials ~~in which materials they are in contact with~~.
1. Confirm compatibility with each material used and with each material where changes in products occur.
 2. Submit compatibility confirmation under each appropriate Section.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Performance Requirements: Specified in individual Sections.

2.2 INTEGRATED EXTERIOR MOCKUPS

- A. General Requirements of Exterior Enclosure Mockups:
1. Build mockups to do the following:
 - a. Demonstrate aesthetic effects.
 - b. Demonstrate the qualities of products and workmanship.
 - c. Demonstrate acceptable coordination between components and systems.
 - d. Perform testing, such as window air- and water-leakage testing.
 2. Fabrication: Before fabricating or installing portions of the Work requiring mockups, build mockups for each form of construction and finish required. Use materials and installation methods as required for the Work.
 - a. Build mockups of size indicated.
 - b. Build mockups in location indicated or, if not indicated, as directed by Architect.
 - c. Employ supervisory personnel who will oversee mockup construction. Employ workers who will be employed to perform same tasks during the construction at Project.
 - d. Demonstrate the proposed range of aesthetic effects and workmanship.
 - e. Maintain mockups during construction in an undisturbed condition as a standard for judging the completed Work.
- B. Mockups: See individual Sections.
- C. Construct integrated exterior mockups of typical exterior enclosure components. Construct mockups to demonstrate constructability, coordination of trades, and sequencing of Work; and to ensure materials, components, subassemblies, assemblies, and interfaces integrate into a system complying with indicated performance and aesthetic requirements.
- D. Build integrated exterior mockups using installers and construction methods that will be used in completed construction.

- E. Use specified products that have been approved by Architect. Coordinate installation of materials and products specified in individual Specification Sections that include Work included in integrated exterior mockups.
- F. Photographic Documentation: Document construction of integrated exterior mockups with photographs showing installation and aesthetics. Provide photographs showing details of interface of different materials and assemblies.
 - 1. Document testing procedures, including water leakage and other deficiencies. Photograph modifications to component interfaces intended to correct deficiencies.
- G. Provide and document modifications to construction details and interfaces between components and systems required to properly sequence the Work, or to pass performance testing requirements. Obtain Architect's approval for modifications.
- H. Retain approved mockups constructed in place. Incorporate fully into the Work.
- I. Integrated Exterior Mockup:
 - 1. Provide sequential reviews for each phase of assembly from concrete footings and slab edges, framing, sheathing, air barriers, openings, cladding supports and insulation, associated sheet metal flashing and trim, cladding, and transition to roof, to not delay work.
 - 2. Coordinate with trades and Contractor's schedule to provide expedient installation of integrated mockup area, testing and reviews.
 - 3. Coordinate sequence of trades and review of mockup with other Sections and schedule with Architect, Owner and other parties with required attendance.
 - 4. Sequence and stage mockup reviews of Work, without causing delay.
 - 5. Provide multiple integrated mockups as required to show the installation, sequence and extents of the entire enclosure and all interfaces between Sections of Work of the enclosure.
 - 6. Build integrated mockups of typical exterior enclosure assemblies indicated on Drawings, minimum 150 sq. ft.
 - a. Incorporate backup wall construction, air barriers, cladding supports, external cladding, glazing systems, door frame and sill, insulation, and other penetrations, and flashing to demonstrate surface preparation joint treatment, application of air barriers, insulation, cladding supports, cladding and transitions and interfaces between different Work.
 - b. Include junction with roofing membrane, building corner condition, and foundation wall intersection.
 - 7. If Architect determines mockups do not comply with requirements, reconstruct mockups and apply air barrier until mockups are approved.
 - 8. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Architect specifically approves such deviations in writing.
 - 9. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

- A. Penetrations in Exterior Envelope, Continuous Air Barrier: Sealed at air barrier and at roof vapor retarder.

1. ~~Consider single~~Single-ply roofing membrane, self-adhering underlayments and vapor retarders ~~are shall be considered~~ air barriers of horizontal roof assemblies.

3.2 FIELD QUALITY CONTROL

- A. Testing and Inspection: Specified in other Sections and Division 01 Commissioning Sections.
- B. Testing of Integrated Exterior Mockups:
 1. See other Sections for required testing of mockups.
 - a. Section 08 41 13 "Aluminum-Framed Entrances and Storefronts" and Section 08 44 13 "Glazed Aluminum Curtain Walls."
- C. Field-Inspection, Continuous Air Barriers: See Section 07 27 00 "Air Barriers."
 1. See other Sections for field quality control requirements applicable to building envelopes.
- D. Prepare inspection reports.
- E. Repair or remove and replace components of enclosure system where inspections indicate that they do not comply with specified requirements.
- F. Materials installed out of compliance with Sections and with this Section are subject to removal and replacement at Contractor's expense.
- G. Additional testing and inspecting, at Contractor's expense, will be performed to determine if replaced or additional work complies with specified requirements.

END OF SECTION