

StoPanel Precast ci

Fabricated Wall Panel Assemblies

Section 07 4263.36

Abstract:

The StoPanel Precast ci is a finished, pre-fabricated, drainable, structural, exterior wall panel with integral StoGuard air and moisture barrier, ci (continuous insulation) and precast veneer.

StoGuard®, the air and moisture barrier in the StoPanel Precast ci panel, consists of two components—joint treatment and waterproof coating. StoGuard functions as an air and moisture barrier over glass mat faced gypsum sheathing.

StoGuard provides secondary protection to wall panels against moisture damage during the construction process and in the event of a breach in the wall cladding while in service. It is not intended to correct faulty workmanship such as the absence or improper integration of flashing in the construction, nor is it intended to correct other defective components of construction such as windows that leak into the wall assembly. Flashing should always be integrated with the cladding to direct water to the exterior, not into the wall assembly, particularly at potential leak sources such as windows.

As a component of an air barrier system StoGuard minimizes the risk of condensation within the building envelope by resisting mass transfer of warm moisture laden air through the wall assembly where it can condense on a cold surface. A complete air barrier system consists of individual air barrier components and the connections between them. The air barrier components must be continuous to become an effective air barrier system. The design/construction professional must take material compatibility and construction sequencing into account when designing an "air tight" assembly to ensure continuity and long term durability. The effects of air tightness on mechanical ventilation should also be included in the overall project evaluation.

An air barrier should not be confused with a vapor retarder which may also be used in the wall assembly to retard water vapor diffusion and reduce the risk of condensation. Generally a vapor retarder is placed on the warm side of the insulation. Specifically, it is placed on the interior side in cold climates. A vapor retarder may not be necessary depending on the wall components and the range of temperature/humidity conditions inside and outside. A vapor retarder should not be used on the inside of walls in warm humid climates. A dewpoint analysis should be performed to determine whether a vapor barrier should be installed.

StoPanel Precast ci wall panels are produced and installed by Sto Panel Technology Affiliates and are generally available with insulating values that conform to applicable energy codes, and a variety of precast veneers.

Sto Panel Technology's exclusive 5 year limited warranty can only be obtained through Sto Panel Technology Affiliates for projects fabricated and installed by a Sto Panel Technology Affiliate.

*Text between ** ** requires editing. Delete ** after editing.*

SECTION 07 4263.36 – StoPanel PRECAST ci

PART 1 - GENERAL

1.1 SUMMARY

- A. Sto Panel Technology Affiliate shall provide finished, pre-fabricated, drainable, structural, exterior wall panels with integral StoGuard air and moisture barrier and ci (continuous insulation) for exterior above grade walls.

Add/delete depending on project requirements.

Edit "xx xxxxx" to appropriate section numbers

- B. Related Requirements:
1. Section xx xxxxx: Cold Formed Metal Framing (used for other work)
 2. Section xx xxxxx: Sheathing (used for other work)
 3. Section xx xxxxx: Insulation (used for other work)
 4. Section xx xxxxx: Sheet Metal Flashing and Trim
 5. Section xx xxxxx: Sealants and Caulking
 6. Section xx xxxxx: Exterior Entrance Doors
 7. Section xx xxxxx: Exterior Windows

Retain the following article, "Referenced Standards," at the Specifier's option

1.2 REFERENCED STANDARDS

- A. American Society for Testing and Materials (ASTM) Standards
1. A36 Standard Specification for Carbon Structural Steel
 2. A108 Standard Specification for Steel Bar, Carbon and Alloy, Cold-Finished.
 3. A283 Standard Specification for Low and Intermediate Tensile Strength Carbon Steel Plates, Shapes and Bars.
 4. A496 Standard Specification for Steel Wire, Deformed, For Concrete Reinforcement.
 5. A500 Standard Specification for Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes.
 6. A572 Standard Specification for High-Strength Low-Alloy Columbium-Vanadium Structural Steel.
 7. A780 Standard Practice for Repair of Damaged and Uncoated Areas of Hot-Dip Galvanized Coatings.
 8. A1003 Standard Specification for Steel Sheet, Carbon, Metallic- and Nonmetallic-Coated for Cold-Formed Framing Members.
 9. C150 Specification for Portland Cement.
 10. C578 Specification for Preformed, Cellular Polystyrene Thermal Insulation
 11. C847 Specification for Metal Lath.
 12. C920 Standard Specification for Elastomeric Joint Sealants

13. C954 Standard Specification for Steel Drill Screws for the Application of Gypsum Panel Products or Metal Plaster Bases to Steel Studs from 0.033 In. (0.84 mm) to 0.112 in. (2.84 mm) in Thickness.
 14. C955 Standard Specification for Load-Bearing (Transverse and Axial) Steel Studs, Runners (Tracks), and Bracing or Bridging for Screw Application of Gypsum Panel Products and Metal Plaster Bases.
 15. C1002 Standard Specification for Steel Self-Piercing Tapping Screws for Application of Gypsum Panel Products or Metal Plaster Bases to Wood Studs or Steel Studs.
 16. C1177 Specification for Glass Mat Gypsum for Use as Sheathing.
 17. C1513 Standard Specification for Steel Tapping Screws for Cold-Formed Steel Framing Connectors.
 18. D226 Specification for Asphalt-saturated Organic Felt Used in Roofing and Waterproofing.
 19. E84 Test Method for Surface Burning Characteristics of Building Materials.
 20. E96 Test Methods for Water Vapor Transmission of Materials.
 21. E119 Method for Fire Tests of Building Construction and Materials.
 22. E283 Test Method for Determining the Rate of Air Leakage through Exterior Windows, Curtain Walls, and Doors under Specified Pressure Differences across the Specimen.
 23. E330 Test Method for Structural Performance of Windows, Curtain Walls, and Doors by Uniform Static Air Pressure Difference.
 24. E331 Test Method for Water Penetration of Exterior Windows, Curtain Walls, and Doors by Uniform Static Air Pressure Difference.
 25. E1233 Standard Test Method for Structural Performance of Exterior Windows, Curtain Walls and Doors by Cyclic Static Air Pressure Difference.
 26. E2178 Standard Specification for Asphalt Glass Felt Used in Roofing and Waterproofing.
- B. American Iron & Steel Institute (AISI)
1. AISI 1018, Steel, Cold Drawn, High Temperature, Stress Relieved, 16-22 mm (0.625-0.875 in) Round.
 2. AISI 1019, Steel, Cold Drawn.
 3. AISI 1020, Carbon Steel.
 4. AISI S100, North American Specification for the Design of Cold-Formed Steel Structural Members and AISI S100-12.
 5. AISI S200, North American Standard for Cold-Formed Steel Framing – General Provisions, 2012 Edition
 6. AISI S211, North American Standard for Cold-Formed Steel Framing - Wall Stud Design, 2007 Edition With Supplement 1 (Reaffirmed 2012).
- C. American Welding Society (AWS)
1. D1.1/D1.1M, Structural Welding Code – Steel.
 2. D1.3/1.3M, Structural Welding Code – Sheet Steel.
- D. Building Code Standards
1. ICC ESR-1233, Evaluation Report for StoGuard Air and Moisture Barrier.
 2. ICC ESR 2142, Styrofoam Brand Insulation Boards and Dow Fan-Fold Products.
- E. National Fire Protection Association (NFPA) Standards

1. NFPA 268, Standard Test Method for Determining Ignitability of Exterior Wall Assemblies Using a Radiant Heat Energy Source
 2. NFPA 285, Standard Method of Test for the Evaluation of Flammability Characteristics of Exterior Non-Load-Bearing Wall Assemblies containing Combustible Components Using the Intermediate-Scale, Multistory Test Apparatus
- F. Other Reference Documents
1. American Concrete Institute, ACI 530-05/530.1-05, "Building Code Requirements and Specifications for Masonry Structures"
 2. American Society of Heating, Refrigerating and Air-Conditioning Engineers, Inc., ASHRAE 90.1 -2010, Energy Standard for Buildings Except Low-Rise Residential Buildings.
 3. Occupational Safety and Health Administration (OSHA), 29 CFR 1926.

1.3 ADMINISTRATIVE REQUIREMENTS

- A. Coordination: Allow time in the project schedule for coordination with related sections through the general contractor.
- B. Pre-Installation Conference: Prior to mobilizing installation forces onto the jobsite, participate in a Pre-Installation Conference with the General Contractor to review the following:
1. G.C. and Sto Panel Technology Affiliate Field Operations contact info.
 2. Safety Plans and Procedures
 - a. Potential jobsite hazards.
 3. Schedules
 - a. Time frames for Layout/Hardware Install, Erecting, and Final Tune-up.
 - b. Operating hours and constraints.
 4. Access requirements for materials, equipment, processes, and personnel.
 5. Equipment (Cranes, Trucks, Welding machines, etc.).
 6. Jobsite areas strictly reserved for panel storage, staging, and erecting operations.
 7. G. C. and preceding trade work requirements
 - a. Complete and stable structure and panel attachment surfaces.
 - b. Benchmarks and Control Lines as required.
 - c. Site conditions compliant with all safety requirements.
 - d. Clear access to all areas of work.
 - e. Do not allow the storage of materials or installation of work of other trades in areas where the panel installation process (including welding and torch burning) may damage such materials or work, or may present a fire or other hazard.
 8. Special or unique conditions or issues.

1.4 ACTION SUBMITTALS

- A. Sto Panel Technology Affiliate shall submit the following:
1. Component manufacturer's product data.
 2. Prepare and submit shop drawings for each panel and for project specific details.
 - a. Detail configurations of panelized units.

- b. Indicate locations, plans, elevations, dimensions, shapes, and cross sections of each unit.
 - c. Indicate joints, reveals, drips, chamfers, and extent and location of each surface finish.
 - d. Indicate details at building corners.
 - e. Indicate type, size, and length of welded connections by AWS standard symbols. Detail loose and in-panel hardware and connections.
 - f. Indicate locations and details of anchorage devices to be embedded in or attached to structure or other construction.
 - g. Include plans and elevations showing unit location and sequence of erection for special conditions.
 - h. Indicate location of each panelized unit by same identification mark placed on panel.
 - i. Indicate relationship of panelized units to adjacent materials.
3. Samples for approval:
- a. Samples for initial selection:
 - 1) For each type of veneer color and texture indicated.
 - 2) Include samples of exposed accessories involving color selection.
 - b. Samples for verification: ** 24-inch- (600-mm-) ** square panels for each type of veneer color and texture indicated, prepared using same tools and techniques intended for actual work including custom shapes, profiles, unit orientations and positions, and any aesthetic accents.
 - 1) Include ** exposed trim and accessory ** samples to verify color selected.

1.5 INFORMATIONAL SUBMITTALS

- A. Sto Panel Technology Affiliate shall submit the following.
1. Component manufacturer's code compliance report.
 2. Affiliate's Sto Panel Technology affiliate certificate.
 3. Calculations: Provide structural calculations prepared in compliance with these specifications. Where these specifications and code differ, more severe requirements shall govern. Test reports are not an acceptable substitute for calculations. Calculations shall include the following information:
 - a. Analysis for all applicable loads on framing members and attachment hardware.
 - b. Seal and signature on calculations of professional structural engineer currently registered in State in which the project is located.

1.6 CLOSEOUT SUBMITTALS

- A. Maintenance Data: Sto Panel Technology's recommendations for cleaning and repairing damage to system.
- B. Component manufacturer's standard warranty.

1.7 QUALITY ASSURANCE

- A. Fabricator and Installer Qualifications
1. StoPanel fabricator/installer shall be an Affiliate in good standing with Sto Panel Technology.

2. Sto Panel Technology Affiliate shall fabricate and install the StoPanel panels in accordance with Sto Panel Technology Fabrication and Installation Quality Standards.
- B. Quality-Control Standard
 1. For manufacturing procedures and testing requirements, quality-control recommendations, and dimensional tolerances for types of units required, comply with Sto Panel Technology Fabrication and Installation Standards.
 - C. Inspections
 1. Provide independent third party inspection of completed StoPanel panel installation, where required by code or contract documents.
 2. Conduct inspections in accordance with code requirements and contract documents.
 - D. Mock-up Testing (when required by contract)
 1. Construct full-scale mock-up of typical wall panel assembly with specified tools and materials incorporating windows, doors and other penetrations, as depicted in contract documents.
 2. Test air and water infiltration and structural performance in accord with ASTM E283, ASTM E331 and ASTM E330, respectively, through an independent laboratory.
 3. Mock-up shall comply with Design Team requirements.
 4. Accepted mock-up may remain as part of project.

1.8 DELIVERY, STORAGE, AND HANDLING

- A. Deliver panels to site reserved and secured trailer staging area in sequence of erection and according to scheduled dates.
- B. If panels are stored on site, provide protection of panels from weather and damage.

1.9 FIELD/SITE CONDITIONS

- A. General Contractor shall provide restricted, level and stabilized staging and truck/crane operating area for the exclusive use of the panel installation operation, in accordance with OSHA standards for Steel Erection. (See 29 CFR 1926, Subpart R—Steel Erection, Section 1926.752(c)).
- B. All project general conditions safety measures (perimeter fall protection, stairs, hole covers, rebar capping, site grading, etc.) shall be coordinated by the General Contractor and installed and maintained by others prior to the panel installation forces mobilizing on site. All such measures shall allow for the required access of panel installation forces and processes and shall be configured such that panel installation can proceed and be completed without the modification or removal of such measures. All such measures shall be removed and/or modified by others at the direction of the General Contractor after the completion of panel installation and the General Contractor has determined that they are no longer needed.
- C. General Contractor shall provide all project general conditions items and services (water, power, general lighting, sanitary facilities, dumpster, restricted jobsite, etc.).

1.10 WARRANTY

- A. Sto Panel Technology Affiliate shall provide standard warranty from fabricator. Warranty shall begin on date of substantial Completion.
- B. Sto Panel Technology Affiliate’s warranty shall not cover leakage due to infiltration of water or air through windows, doors or other penetrating elements installed by others.
- C. Sto Panel Technology Affiliate’s warranty shall not cover leakage of water or air due to failure of joint sealers not installed as part of the work of this section.
- D. Provide Sto Panel Technology limited 5-year warranty. Warranty shall begin on date of substantial Completion.

PART 2 - PRODUCTS

2.1 PANEL MANUFACTURERS

- A. Finished wall panel system shall be fabricated by a Sto Panel Technology Affiliate.
- B. Air/moisture barrier and ci components shall be manufactured or recognized for use in the wall panel assembly by Sto Corp.
- C. Acceptable Fabricators: Subject to compliance with requirements of Sto Panel Technology. For a list of acceptable fabricators **visit www.stopanel.com**.

2.2 PERFORMANCE CRITERIA

- A. Sto Panel Technology Affiliate shall fabricate the StoPanel panels using materials shown to meet or exceed the following performance requirements

Table 1—Air and Moisture Barrier Performance

TEST	METHOD	CRITERIA	RESULT
1. Water Penetration Resistance	AATCC 127 (Water Column)	Resist 21.6 in (55 cm) water for 5 hours before and after aging	Pass
2. Water Penetration Resistance after Cyclic Wind Loading	ASTM E1233 / ASTM E331	No water at exterior plane of sheathing after 10 cycles @ 80% design load and 75 minutes water spray at 6.24 psf (299 Pa) differential	No water penetration
3. Water Resistance Testing	ASTM D2247	Absence of deleterious effects after 14 day exposure	No deleterious effects
4. Water Vapor Transmission	ASTM E96 Method B (Water Method)	Measure	Sto Gold Fill®: 7.10 perms [408 ng/(Pa·s·m ²)] Sto Gold Coat®: > 10 perms [574 ng/(Pa·s·m ²)]

5. Air Leakage	ASTM E2178	≤ 0.004 cfm/ft ² at 1.57 psf (0.02 L/s•m ² at 75 Pa)	Pass
6. Structural Integrity	ASTM E330	2-inches (51 mm) H ₂ O pressure (positive & negative) for 1 hour.	Pass
7. Tensile Adhesion	ASTM C297	>15 psi (103 kPa)	Gypsum (ASTM C 1177): > 30 psi (207 kPa)

*Note: Sto Gold Fill testing with Sto Detail Mesh reinforcement

Table 2—Fire Performance

TEST	METHOD	CRITERIA	RESULT
1. Surface Burning	ASTM E84	Flame Spread 0 – 25 for NFPA Class A, UBC Class I	Flame Spread: 5 Smoke Density: 10
2. Fire Endurance	ASTM E 119	Maintain fire resistance of existing rated assembly	Pass*
3. Intermediate Scale Multi-Story Fire Test	NFPA 285	1. Resistance to vertical spread of flame within the core of the panel from one story to the next 2. Resistance to flame propagation over the exterior surface 3. Resistance to vertical spread of flame over the interior surface from one story to the next 4. Resistance to significant lateral spread of flame from the compartment of fire origin to adjacent spaces	Pass with 2 inches of XPS insulation
4. Radiant Heat Ignition	NFPA 268	No ignition @ 20 minutes	Pass with 2 inches of XPS insulation

Note: * indicates results based on extrapolation of data from testing.

- B. Energy Standards Compliance: Wall panel system shall comply with the requirements of ASHRAE 90.1 – 2010 and 2013 for:
 1. Section 5: Building Envelope Continuous Insulation (ci) over Metal Frame Walls - All Climate Zones (with sufficient ci thickness)
 2. Section 5: Continuous Air Barrier

2.3 DESIGN CRITERIA

- A. Sto Panel Technology Affiliate shall engage a qualified professional structural engineer, licensed in the state in which the project is located, to provide structural calculations:
 1. Acknowledging the applicable Code design parameter values,

2. Acknowledging the loading applied to the panels (including transferred window loads, etc.),
 3. Substantiating the detailed panel framing and connection hardware,
 4. Providing the loads transferred to the supporting building structure, for submission to the Design Team and the Project Engineer of Record.
- B. AISI Specifications and Standards: Comply with the 2007 edition of AISI S100, AISI S200 and AISI S211.
- C. Incorporate provisions within the structural calculations for the StoPanel Precast *ci* wall panel system to provide for expected movement of structural members, as determined by structural engineer of record, without damage or overstressing, sheathing failure, connection failure, undue strain on fasteners and anchors, or other detrimental effects. Incorporate provisions for panels to allow for movement of adjacent framing members outside the insulated building envelope, when subject to a maximum ambient temperature change of 120 deg F (67 deg C).
- D. Wind Load
1. Incorporate provisions within the structural calculations for the StoPanel wall panels for maximum allowable system deflection, normal to the plane of the wall, of L/360. Adjust allowable deflection requirement for more stringent deflection requirements where required by code or specific requirements.
 2. Provide for wind load resistance in conformance with code requirements and as agreed to with the Project Design Team.
- E. Moisture Control: Fabricate panels to restrict air infiltration into the panel assembly to limits determined by applicable ASHRAE 90.1 requirements.
- F. Joints:
1. Provide panels with allowance for minimum nominal 3/4 inch (19 mm) wide joints between panels and adjacent to other work.
 2. Provide panels with allowance for minimum nominal 3/4 inch (19 mm) wide perimeter sealant joints at penetrations through the pre-fabricated panel assembly (windows, doors, etc.).
 3. Panel Joint Filler (Provided by others): Unless otherwise noted by design team, provide joint design including sealants and backer rods specified in Joint Sealants section that comply with the following requirements:
 - a. One part low modulus silicone sealant conforming to ASTM C 920
 - b. Maintain air barrier continuity across the joint.
 - c. Use double seals or other approved redundant joint sealant configuration.
- G. Grade Condition: Panels shall not be installed below grade or where panel surfaces are subject to continuous or intermittent water immersion or hydrostatic pressure. Provide minimum 6 inch (152 mm) clearance above finished grade or as required by code. Keep precast veneer a minimum of 2 inches (51 mm) above paved surfaces. Keep precast veneer a minimum of 8 inches (203 mm) or greater (as required or recommended by roofing manufacturer) above roofing surfaces.
- H. Fire Protection:
1. Provide panel assembly that has been tested or evaluated to comply with acceptance criteria for NFPA 268 and NFPA 285 (refer to ICC-ESR 1233)

2. Where walls with a fire-resistance rating are required by code, panel sheathing and other assembly components shall be of type, thickness, and quantity as required by the tested assembly prescribed for the project.
3. Field application of additional fire resistant materials (such as interior gypsum wallboard) are typically required to be added to the installed panels (by others) to provide the finished fire-resistant and building code compliant assembly.

2.4 COLD-FORMED METAL FRAMING

- A. Manufacturer shall be a member in good standing with at least one of the following steel framing industry associations:
1. Certified Steel Stud Association (CSSA)
 2. Steel Framing Alliance (SFA)
 3. Steel Framing Industry Association (SFIA)
 4. Steel Stud Manufacturers Association (SSMA).

(Retain CP 90 for members subjected to high humidity and/or salt laden air.)

- B. Stud Type: Channel type, roll-formed from steel complying with ASTM C955, Metallic Coated, ** CP 60. ** CP 90. **
1. Material: Metallic coated steel meeting ASTM A1003-13b, Coating Designation ** G60: ** G90: **
 2. Grade: As required by structural performance requirements.

(Retain G90 if CP-90 specified in previous paragraph.)

- C. Studs and runners (track):
1. Stud sizes: As indicated on approved shop drawings.
 2. Stud gauge: Minimum 0.0428 inch (1.09 mm), except where stud manufacturer's product data requires heavier gauge for heights and conditions of use and as indicated on approved shop drawings and structural calculations.
 3. Runners: 1-1/4 inches (32 mm) deep by widths to receive studs, and as indicated on approved shop drawings and structural calculations.

- D. Z-furring and perimeter channel members:
1. Material: Grade 33ksi min. yield strength, G40.
 2. Gauge: Minimum 43 mils, 18 ga DW, 0.0451" Design Thickness, 0.0428" Min. Thickness
 3. Dimensions: 3/4" leg x 1-1/4" leg x depth to match ci thickness.

- E. Recycled Content of Steel Materials: Postconsumer recycled content plus one-half of preconsumer recycled content not less than 25 percent.

(Revise the following paragraph to suit Project. Add other materials as required.)

- F. Steel Connection Materials
1. Carbon-Steel Shapes and Plates: ASTM A36/A36M.
 2. Carbon-Steel-Headed Studs: ASTM A108, AISI 1018 through AISI 1020, cold finished, AWS D1.1/D1.1M, Type A or Type B, with arc shields.
 3. Carbon-Steel Plate: ASTM A283/A283M, Grade C.
 4. High-Strength, Low-Alloy Structural Steel: ASTM A572/A572M.

5. Carbon-Steel Structural Tubing: ASTM A500/A500M, Grade B or Grade C.
 6. Deformed-Steel Wire or Bar Anchors: ASTM A496/A 496M or ASTM A706/A706M.
 7. Welding Electrodes: Comply with AWS standards.
- G. Red-Oxide Primer: Red-oxide primer meeting requirements of SSPC-Paint No. 15, Type I
- H. Cold Galvanizing Compound: Pre-mixed, zinc dust and organic binders formulated specifically for use on steel surfaces. Compounds shall have concentrations of zinc dust in the range of 65% to 69% or above 92% in the dried film in accord with ASTM A780.

2.5 SHEATHING

- A. Acceptable products:
1. CertainTeed Corp., GlasRoc Sheathing.
 2. G-P Gypsum Products, DensGlass Sheathing.
 3. National Gypsum, Gold Bond eXP Extended Exposure Sheathing.
 4. Temple-Inland GreenGlass Sheathing.
 5. USG Securock Sheathing
- B. Material:
1. Composition: Conforming to ASTM C1177; noncombustible water-resistant core, essentially gypsum, surfaced with glass mat partially or completely embedded in the core.
 2. Mold resistance: Resistant to mold growth when tested in accord with ASTM D3273.
 3. ** Type: Minimum 5/8" thickness for stud spacing of up to 2'-0" o.c. Face size shall be 4'-0" wide by 8'-0", 9'-0", 10'-0", or custom length, square ends and edges. **
** OR **
 4. ** Type: Type X Grade fire-rated board, minimum 5/8" thickness. Face size shall be 4'-0" wide by 8'-0", 9'-0", 10'-0", or custom length, square ends and edges. **
 5. Weight: Minimum 2300 lbs. /msf.
- C. Fasteners: Screws for application of fiberglass-faced gypsum sheathing to cold-formed metal framing shall be minimum 1-1/4 inch (31.8 mm) long, non-corrosive coated, self-drilling fasteners complying with ASTM C1002 and ASTM C954.

2.6 AIR AND MOISTURE BARRIER

- A. Acceptable Product: StoGuard®
1. Joint Treatment (Pick one):
 - a. Sto Gold Fill® with StoGuard Mesh Nominal 4.2 oz. /yd² (143 g/m²).
 - b. Sto Gold Coat® with StoGuard Fabric.
 - c. StoGuard RapidFill™.
 2. Rough Opening Protection (Pick one):
 - a. Sto Gold Fill® with StoGuard Mesh Nominal 4.2 oz. /yd² (143 g/m²).
 - b. Sto Gold Coat® with StoGuard Fabric
 - c. StoGuard® RapidSeal™

3. Air and Moisture Barrier Coating: Sto Gold Coat® - Ready mixed waterproof coating for wall sheathing.

2.7 INSULATION BOARD

- A. Acceptable product: Dow STYROFOAM™ Type IV XPS rigid insulation board in compliance with ASTM C 578. See ICC ESR 2142
- B. Characteristics:
 1. Type: Extruded, closed cell polystyrene boards meeting ASTM C578, Type IV.
 2. Thickness: ** 1". ** 1-1/2". ** 2". **
 3. Aged R value at 75 degrees F.: 5.0/in.

2.8 SLIP SHEET

- A. Building Felt complying with ASTM D226, Type I.

2.9 REINFORCED CAST BED

- A. Acceptable product: Sto Cast Bed reinforced with minimum 3.4 lb/yd² (1.8 kg/m²) self-furred galvanized diamond mesh metal lath.
- B. Characteristics: Proprietary, factory proportioned blend of cementitious materials reinforced with ASTM C 847 compliant metal lath.

2.10 FINISH COAT

(Select one finish coat.)

- A. Acceptable Finish Coat
 1. Stolit® Lotusan®: Specialty textured wall finish with graded marble aggregate and self-cleaning properties.
 2. Stolit®: Acrylic based textured wall finish with graded marble aggregate.
 3. Sto Essence DPR Finish: Acrylic based textured wall with finish with graded marble aggregate.

(Select finish coat with a light reflectance value of 20 or greater. The use of dark colors is not recommended with EIF Systems that incorporate expanded polystyrene [EPS]. EPS has a service temperature limitation of approximately 160° F [71°C]).

- B. Finish color: ** As selected by Architect from manufacturer's standard selection. ** Custom color as selected by Architect. ** Match color indicated on drawings. **

(Retain the following joint sealant article if joints between panels are to be sealed by panel installer)

2.11 JOINT SEALANTS

- A. Acceptable products:
 1. Sealant: Dow Corning Corp., 790, 795

2. Primer: Dow Corning Corp., 1200 OS Primer or as recommended by Dow Corning Corp.
- B. Sealant type: One-part, low modulus silicone rubber; meeting ASTM C920, Type S, Grade NS, Class 50, for use NT.
1. Colors: ** Custom ** Standard ** colors as selected by Architect.

2.12 MIXED INGREDIENTS

- A. Water: Clean and potable.

2.13 MIXING

- A. Mix components in accordance with Sto Panel Technology Fabrication and Installation Quality Standards.
- B. Do not use anti-freeze compounds or other additives.

2.14 FABRICATION

- A. Fabricate all StoPanel panels and connection hardware in accordance with shop drawings and Sto Panel Technology Fabrication and Installation Quality Standards.
- B. Product Tolerances: Fabricate panelized units to shapes, lines, and dimensions indicated in accord with Sto Panel Technology Fabrication and Installation Quality Standards and the following dimensional tolerances:
1. Overall Height and Width of Units, Measured at the Face Exposed to View:
 - a. 10 feet (3 m) or under, plus or minus 1/8 inch (3 mm).
 - b. 10 to 20 feet (3 to 6 m), plus 1/8 inch (3 mm), minus 3/16 inch (5 mm).
 - c. 20 to 40 feet (6 to 12 m), plus or minus 1/4 inch (6 mm).
 - d. Each additional 10 feet (3 m), plus or minus 1/16 inch (1.5 mm).
 2. Total Thickness at Perimeter: Plus 1/4 inch (6 mm), minus 1/8 inch (3 mm).
 3. Variation from Square or Designated Skew (Difference in Length of the Two Diagonal Measurements): Plus or minus 1/8 inch/72 inches (3 mm/1830 mm) or 1/2 inch (13 mm) total, whichever is greater.
 4. Length and Width of Openings within One Unit: Plus or minus 1/4 inch (6 mm).
 5. Bowing: Plus or minus L/360, maximum 1 inch (25 mm).
 6. Local Smoothness: 1/4 inch/10 feet (6 mm/3 m).
 7. Warping: 1/16 inch/12 inches (1.5 mm/300 mm) of distance from nearest adjacent corner.
 8. Dimensions of In-Plane Architectural Features and Rustications: Plus or minus 1/8 inch (3 mm).
- C. Position Tolerances: Fabricate panelized units to shapes, lines, and dimensions indicated in accordance with Sto Panel Technology Fabrication and Installation Quality Standards and the following positional tolerances
1. Built-In Anchors: Plus or minus 1/2 inch (13 mm).
 2. Handling Devices: Plus or minus 3 inches (75 mm).
 3. Location of Aesthetic Joints: Plus or minus 1/8 inch (3 mm).
 4. Location of Opening within Panel: Plus or minus 1/4 inch (6 mm).
 5. Location of Finish Terminations on Panel: Plus or minus 1/4 inch (6 mm).

6. Location of Misc. Openings (Electrical Outlets, Hose Bibs): Plus or minus 1/2 inch (13 mm).
7. Location of Connection Plates: Plus or minus 1/4 inch (6 mm).

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Upon mobilization onto the project site, examine building supporting structural frame elements and adjacent conditions for compliance with requirements for proper panel installation, in accordance with approved panel shop drawings. Check bearing and adjacent surface locations and other conditions affecting installation of the panels.
- B. Do not proceed with wall panel installation until General Contractor confirms that the structure is structurally ready to receive loads from panel units and preceding trades' work is complete and corrected.
- C. Proceed with panel installation only after all unsatisfactory conditions have been corrected.

3.2 INSTALLATION

- A. Layout: Layout for installation of panels from control lines and bench marks provided by General Contractor.
 1. Install sufficient layout markings to install panels as per approved shop drawings and Sto Panel Technology Fabrication and Installation Quality Standards.
 2. Install clips, plates, and other accessories required for connecting wall panels to supporting structure.
 3. Re-check preceding trade work for compliance of proper and complete panel installation, as per approved shop drawings.
 4. Do not deviate from the approved panel shop drawing layout. Deviate only as directed by and agreed to with the General Contractor.
- B. Erection: Erect panels level, plumb, and square within specified allowable tolerances in accordance with approved shop drawings:
 1. Erect panels from trailers or staging stacks onto the building, in the agreed to sequence, to approximate line and grade as established in the layout phase.
 2. Maintain approximate horizontal and vertical joint alignment and approximate uniform joint width as erection proceeds.
 3. Install a sufficient number of permanent and/or temporary connections as required to maintain stability of the panels until panels are tuned-up and all permanent connections are completed.
 4. Install temporary shims and/or erecting aids as necessary as panels are being erected.
 5. Return reusable dunnage to fabrication plant on unloaded panel delivery trailers.
 6. Deposit trash and waste into dumpsters as provided by the General Contractor.
- C. Tune-up: Adjust and final connect wall panels in position by bolting, welding, or as otherwise indicated on shop drawings and in accordance with Sto Panel Technology Fabrication and Installation Quality Standards.

1. Adjust panel locations as necessary to maintain final panel positions within tolerances.
 2. Install balance of permanent connections.
 3. Remove temporary shims and/or erecting aids after panel connections are completed.
 4. Notify General Contractor of completed panel tune-up progress and request a review of tuned-up panels and release for follow-up trade work.
- D. Welding: Comply with applicable requirements in AWS D1.1/D1.1M and AWS D1.3/D1.3M for welding, welding electrodes, appearance, quality of welds, and methods used in correcting welding work.
- E. Tolerances: Install panels level, plumb, square, and in alignment without exceeding the erection tolerances of Sto Panel Technology Fabrication and Installation Quality Standards and the following:
1. Plan Location from Building Grid Datum: Plus or minus 1/2 inch (13 mm).
 2. Top Elevation from Nominal Top Elevation: As follows:
 - a. Exposed Individual Panel: Plus or minus 1/4 inch (6 mm).
 - b. Exposed Panel Relative to Adjacent Panel: 1/4 inch (6 mm).
 3. Maximum Plumb Variation over the Lesser of Height of Structure or 100 Feet (30 m): 1 inch (25 mm).
 4. Plumb in Any 10 Feet (3 m) of Element Height: 1/4 inch (6 mm).
 5. Maximum Jog in Alignment of Matching Edges: 1/4 inch (6 mm).
 6. Joint Width (Governs over Joint Taper): Plus or minus 1/4 inch (6 mm).
 7. Maximum Joint Taper: 3/8 inch (10 mm).
 8. Joint Taper in 10 Feet (3 m): 1/4 inch (6 mm).
 9. Maximum Jog in Alignment of Matching Faces: 1/4 inch (6 mm).
 10. Differential Bowing or Camber, as Erected, between Adjacent Members of Same Design: 1/4 inch (6 mm).
 11. Opening Height between Spandrels: Plus or minus 1/4 inch (6 mm).

3.3 ACCEPTANCE CRITERIA

- A. All StoPanel panels shall be fabricated and installed in accordance with these specifications and Sto Panel Technology Fabrication and Installation Quality Standards.
- B. All functional damages or deficiencies shall be promptly corrected. The Sto Panel Affiliate shall be reimbursed for all costs for repair of all damages to in-place panels not caused by the Affiliate.
- C. All aesthetic variations shall be evaluated in accordance with Sto Panel Technology Fabrication and Installation Quality Standards and the following:
1. Aesthetic quality shall not be evaluated in conditions of "Critical Lighting." Critical Lighting is defined as a condition where the angle of the light from the illumination source intersects with the plane of the finished surface at an angle of fifteen degrees or less. Critical Lighting from natural sunlight conditions are transient; care is advised when specifying artificial lighting that would create a Critical Lighting condition.
 2. Aesthetic quality shall be evaluated by unaided, normal eye sight at a threshold distance of twenty feet or more. Aesthetic imperfections not viewable at that

distance are deemed acceptable. By mutual agreement, the threshold distance may be reduced at entrances and aesthetic features normally viewable by the public at such closer distances and increased at locations not normally viewable by the public or otherwise obscured from view.

3. StoPanel finishes are generally hand-tool applied and by their nature have texturing variations within and among panels. The span of normal variations is not represented by small samples.
4. Aesthetic quality of repairs is limited by normal expectations of repairs performed in accordance with Sto Panel Technology Fabrication and Installation Quality Standards.

3.4 PROTECTION

- A. General Contractor shall coordinate follow-up trades and follow-up work to proceed in such a way to protect installed panels from water infiltration into or behind panels.

3.5 MAINTENANCE

- A. Building Owner shall over time clean and maintain panels and sealants for a fresh appearance and to prevent water entry into and behind panel system. Repair cracks, impact damage, spalls or delamination promptly.
- B. Building Owner shall maintain adjacent components of construction such as sealants, windows, doors, and flashing, to prevent water entry into the building or wall panel assembly.

END OF SECTION 07 4263.36