

## **StoPanel Classic NExT ci**

### Fabricated Wall Panel Assemblies

#### **Section 07 4263.23**

*Abstract:*

*The StoPanel Classic NExT ci is a finished, pre-fabricated, drainable, structural, exterior wall panel with integral StoGuard air and moisture barrier, ci (continuous insulation) and finish coats.*

*StoGuard®, the air and moisture barrier in the StoPanel Classic NExT ci system, 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 Classic NExT 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 finish coats.*

*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 4263.23 – StoPanel CLASSIC NExT 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. A36-12 Standard Specification for Carbon Structural Steel.
  2. A108-2013 Standard Specification for Steel Bar, Carbon and Alloy, Cold-Finished.
  3. A283-13 Standard Specification for Low and Intermediate Tensile Strength Carbon Steel Plates, Shapes and Bars.
  4. A496-07 Standard Specification for Steel Wire, Deformed, For Concrete Reinforcement.
  5. A500-13 Standard Specification for Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes.
  6. A572-13a Standard Specification for High-Strength Low-Alloy Columbium-Vanadium Structural Steel.
  7. A780-09 Standard Practice for Repair of Damaged and Uncoated Areas of Hot-Dip Galvanized Coatings.
  8. A1003-13b Standard Specification for Steel Sheet, Carbon, Metallic- and Nonmetallic-Coated for Cold-Formed Framing Members.
  9. B117-11 Test Method for Salt Spray (Fog) Testing.
  10. C150-12 Standard Specification for Portland Cement.

11. C578-13 Specification for Preformed, Cellular Polystyrene Thermal Insulation.
  12. C920-11 Standard Specification for Elastomeric Joint Sealants.
  13. C954-11 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. C1177-13 Specification for Glass Mat Gypsum for Use as Sheathing.
  15. C1382-11 Test Method for Determining Tensile Adhesion Properties of Sealants When Used in Exterior Insulation and Finish Systems (EIFS) Joints.
  16. D968-05(2010) Test Method for Abrasion Resistance of Organic Coatings by Falling Abrasive.
  17. D2247-11 Practice for Testing Water Resistance of Coatings in 100% Relative Humidity.
  18. D3273-12 Test for Resistance to Growth of Mold on the Surface of Interior Coatings in an Environmental Chamber.
  19. E84-2013a Test Method for Surface Burning Characteristics of Building Materials.
  20. E119-12a Method for Fire Tests of Building Construction and Materials.
  21. E283-04(2012) Test Method for Determining the Rate of Air Leakage through Exterior Windows, Curtain Walls, and Doors under Specified Pressure Differences across the Specimen.
  22. E330-02(2010) Test Method for Structural Performance of Windows, Curtain Walls, and Doors by Uniform Static Air Pressure Difference.
  23. E331-00(2009) Test Method for Water Penetration of Exterior Windows, Curtain Walls, and Doors by Uniform Static Air Pressure Difference.
  24. E2098-13 Test Method for Determining Tensile Breaking Strength of Glass Fiber Reinforcing Mesh for Use in Class PB Exterior Insulation and Finish System after Exposure to a Sodium Hydroxide Solution.
  25. E2134-14 Test Method for Evaluating the Tensile-Adhesion Performance of an Exterior Insulation and Finish System (EIFS).
  26. E2273 Drainage Efficiency of EIFS
  27. E2430-13 Specification for Expanded Polystyrene (EPS) Thermal Insulation Boards for use in Exterior Insulation and Finish Systems (EIFS).
  28. E2485-13 Standard Test Method for Freeze/Thaw Resistance of Exterior Insulation and Finish Systems (EIFS) and Water Resistive Barrier Coatings.
  29. E2486-13 Standard Test Method for Impact Resistance of Class PB and PI Exterior insulation and Finish Systems (EIFS).
  30. G153-13 Recommended Practice for Operating Light-and Water-Exposure Apparatus (Carbon-Arc Type) for Exposure of Nonmetallic Materials.
  31. G154-12a Recommended Practice for Operating Light-and Water-Exposure Apparatus (Fluorescent UV-Condensation Type) for Exposure of Nonmetallic Materials.
- 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 ES – AC 235, Acceptance Criteria for EIFS Clad Drainage Wall Assemblies
  2. ICC ESR – 1720, Evaluation Report for StoTherm Classic, Essence, Premier.
  3. ICC ESR- 1233, Evaluation Report for StoGuard
- E. National Fire Protection Association (NFPA) Standards
1. NFPA 268-2012, Standard Test Method for Determining Ignitability of Exterior Wall Assemblies Using a Radiant Heat Energy Source
  2. NFPA 285-2012, 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 Society of Heating, Refrigerating and Air-Conditioning Engineers, Inc., ASHRAE 90.1-2013, Energy Standard for Buildings except Low-Rise Residential Buildings.
  2. ICC ESR- 1233, Evaluation Report for StoGuard
  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. General Contractor 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. General Contractor 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. 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 finish-coat color and texture indicated.
    - b. Samples for verification: \*\* 24-inch- (600-mm-) \*\* square panels for each type of finish-coat color and texture indicated, prepared using same tools and techniques intended for actual work including \*\* custom trim, each profile, \*\* and \*\* an aesthetic reveal.

#### **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. EPS board manufacturer's certificate of compliance with ASTM E2430.
  4. 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: Manufacturer'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: 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 Quality 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 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 accordance with ASTM E283, E330 and E331, respectively, through an independent laboratory.
  - 3. Mock-up shall comply with Design Team requirements.
  - 4. Acceptable 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©).

- 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 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](http://www.stopanel.com)**.

## 2.2 PERFORMANCE REQUIREMENTS

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

Table 1—EIFS System Durability

TEST	METHOD	CRITERIA	RESULTS
10. 1. Accelerated Weathering	ASTM G153 (Formerly ASTM G 23)	No deleterious effects* at 2000 hours when viewed under 5x magnification	2000
2. Accelerated Weathering	ASTM G154 (Formerly ASTM G 53)	No deleterious effects* at 2000 hours when viewed under 5x magnification	Pass @ 4000 hours
3. Freeze/Thaw Resistance	ASTM E2485	No deleterious effects* at 10 cycles when viewed under 5x magnification	Pass @ 90 cycles
4. Water Penetration	ASTM E331 (modified per ICC-ES AC 219)	No water penetration beyond the plane of the base coat/EPS board interface after 15 minutes at 6.24 psf (299 Pa) or 20% of design wind pressure, whichever is greater	Pass at 12.0 psf (575 Pa) after 30 minutes
5. Tensile Adhesion	ASTM E2134	No failure in the adhesive, base coat, or finish coat. Minimum 15 psi (34 kPa) tensile strength before/after accelerated weathering and freeze/thaw exposure	Pass
6. Water Resistance	ASTM D2247	No deleterious effects* at 14 day exposure	Pass @ 28 days
7. Salt Spray	ASTM B117	No deleterious effects* at 300 hours	Pass @ 500 hours
8. Abrasion Resistance	ASTM D968	No cracking or loss of film integrity at 528 quarts (500 L) of sand	Pass @ 1057 quarts (1000 L)*
9. Mildew Resistance	ASTM D3273	No growth at 28 days	Pass at 42 days



10. Impact Resistance	ASTM E2486	Level 1: 25-49 in-lbs (2.83-5.54J)	Pass with one layer Sto Mesh
		Level 2: 50-89 in-lbs (5.65-10.1J)	Pass with two layers Sto Mesh
		Level 3: 90-150 in-lbs (10.2-17J)	Pass with one layer Sto Intermediate Mesh
		Level 4: >150 in-lbs (>17J)	Pass with one layer Sto Armor Mat and one layer Sto Mesh
11. Drainage Efficiency	ASTM E2273	>90%	99.0%

\*No deleterious effects: no cracking, checking, crazing, erosion, rusting, blistering, peeling or delamination

Table 2—EIFS Fire Performance

TEST	METHOD	CRITERIA	RESULT
1. Fire Endurance	ASTM E 119	Maintain fire resistance of existing rated assembly	Pass*
2. Intermediate Scale Multi-Story Fire Test	NFPA 285 (UBC Standard 26-9)	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 12 inches of EPS insulation *
3. Radiant Heat Ignition	NFPA 268	No ignition @ 20 minutes	Pass with 12 inches of EPS insulation
4. Surface Burning (individual components)	ASTM E84	Insulation board and reinforced coating system shall each have a flame spread of 25 or less, and smoke developed of 450 or less	Flame: 0 Smoke Developed: 5

Note: \* indicates results based on extrapolation of data from series testing. ASTM E119 testing performed on assembly with 4 inch thick (102 mm) EPS.

Table 3—EIFS Component Performance

TEST	METHOD	CRITERIA	RESULT
1. Alkali Resistance of Reinforcing Mesh	ASTM E2098	Greater than 120 pli (21 dN/cm) retained tensile strength	Pass

- B. Energy Standards Compliance: Wall panel system shall comply with the material 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: Unless more stringent requirements are indicated, comply with AISI S100, AISI S200 and AISI S211.
- C. Incorporate provisions within the structural calculations for the StoPanel 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/240. Adjust allowable deflection requirement for more stringent deflection requirements where required by code or specific finish requirements.
  - 2. Provide for wind load resistance in conformance with code requirements and as agreed to with the Project Design Team.
- E. Moisture Control:
  - 1. Fabricate panels to restrict air leakage of the panel assembly to limits required by applicable ASHRAE 90.1 standard and to restrict water leakage as required by ICC ES AC 235.

2. Fabricate panels with Sto Wedge drainage feature at bottom in accordance with applicable Sto details.
- F. Impact resistance: Provide panels with impact resistance as determined by the Design Team and as indicated on design drawings.
1. Standard impact resistance: (Default U.N.O.): One layer of nominal 4.5 oz/yd<sup>2</sup> (153 gm/m<sup>2</sup>).
  2. Medium impact resistance: One layer of nominal 11.0 oz/yd<sup>2</sup> (373gm/m<sup>2</sup>) reinforcing mesh (where indicated).
  3. Ultra-high impact resistance: One layer of nominal 4.5 oz/yd<sup>2</sup> (153 gm/m<sup>2</sup>) reinforcing mesh and one layer of nominal 15 oz/yd<sup>2</sup> (509 gm/m<sup>2</sup>) reinforcing mesh (where indicated).
- G. 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 C920
    - b. Maintain air barrier continuity across the joint.
    - c. Use double seals or other approved redundant joint sealant configuration.
    - d. Use sealant/primer combinations compatible with the materials on both sides of the sealant joints.
    - e. Specify compatible backer rod and sealant that has been evaluated in accordance with ASTM C1382, and that meets minimum 50% elongation after conditioning.
- H. 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 EIFS veneer a minimum of 2 inches (51 mm) above paved surfaces. Keep EIFS veneer a minimum of 8 inches (203 mm) or greater (as required or recommended by roofing manufacturer) above roofing surfaces.
- I. Trim, Projecting Architectural Features and Reveals
1. Trim and projecting architectural features shall have a minimum 1:2 [27°] slope along their top surface. Horizontal reveals shall have a minimum 1:2 [27°] slope along their bottom surface. Increase slope for northern climates to prevent accumulation of ice/snow and water on surface. Where trim/feature or bottom surface of reveal projects more than 2 inches (51 mm) from the face of the panel wall plane, protect the top surface with Sto Flexyl waterproof base coat.
  2. Where panel finish system occurs on weather exposed projecting ledges, sills, and other projecting features, support by framing or other structural support and protect with metal coping or flashing.
- J. Fire Protection:

1. Limit foam plastic insulation to 12 inches (305 mm) maximum thickness for Types I, II, III, and IV construction.
2. Limit foam insulation to 4 inches (102 mm) maximum thickness in fire-resistance rated wall construction.
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. 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.)*

- E. 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/A496M or ASTM A706/A706M.
  7. Welding Electrodes: Comply with AWS standards.

- F. Red Oxide Primer: Red oxide primer meeting requirements of SSPC-Paint No. 15, Type I.
- G. 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 accordance 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 Fiberglass-Faced Gypsum 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 accordance 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. \*\*
- 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. /yd<sup>2</sup> (143 g/m<sup>2</sup>).
    - 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. /yd<sup>2</sup> (143 g/m<sup>2</sup>).
    - b. Sto Gold Coat® with StoGuard Fabric and StoGuard RediCorners
    - c. StoGuard® RapidSeal™
  - 3. Air and Moisture Barrier Coating: Sto Gold Coat® - Ready mixed waterproof coating for wall sheathing.

## 2.7 ADHESIVE

- A. Acceptable Cementitious Adhesive (select one):

1. Sto Primer/Adhesive: Acrylic based base coat mixed with Portland cement for use over glass mat gypsum sheathing protected with StoGuard air and moisture barrier.
2. Sto Primer/Adhesive-B: Factory blended polymer modified cement-based adhesive for use over glass mat gypsum sheathing protected with with StoGuard air and moisture barrier.
3. Sto TurboStick: Liquid polyurethane foam adhesive for use as infill between weep tubes.

## 2.8 WEEP TUBES

- A. Medium Density Polyethylene:
1. 3/8" Diameter.
  2. Stainless Steel Bug Screen.
  3. Length – thickness of foam insulation minus ¼".

## 2.9 INSULATION BOARD

(Note: Minimum required thickness is 1 inch [25 mm] and maximum allowable thickness is 12 inches [305 mm] when installed in accordance with ICC ESR 1720. Insert thickness and R-value required for project.)

- A. Nominal 1.0 lb/ft<sup>3</sup> (16 kg/m<sup>3</sup>) Expanded Polystyrene (EPS) insulation board in compliance with ASTM E2430 and ASTM C578, Type I requirements.
1. Thickness: \*\* 1 inch (25 mm). \*\*
  2. R-value at 75 degrees F.: \*\* 3.6/in. \*\*

## 2.10 BASE COAT

*(Select one of the following base coats)*

- A. Cementitious Base Coats:
1. Sto Primer/Adhesive: Acrylic based base coat mixed with Portland cement.
  2. Sto Primer/Adhesive-B: Factory blended polymer modified Portland cement base coat
- B. Waterproof Base Coat: Sto Flexyl - two component fiber reinforced acrylic based waterproof base coat mixed with Portland cement (for use as a waterproof base coat for foundations, parapets, splash areas, trim and other projecting architectural features).

## 2.11 REINFORCING MESHES

- A. Standard Mesh: Sto Mesh - Nominal 4.5 oz./yd<sup>2</sup> (153 g/m<sup>2</sup>), symmetrical, interlaced open-weave glass fiber fabric made with alkaline resistant coating for compatibility with Sto materials which shall achieve Standard Impact Classification.
- B. Intermediate Mesh: Sto Mesh - Nominal 11.0 oz./yd<sup>2</sup> (373gm/m<sup>2</sup>) symmetrical, interlaced open-weave glass fiber fabric made with alkaline resistant coating for compatibility with Sto materials which shall achieve Intermediate Impact Classification.

- C. Ultra-High Impact Mesh: Sto Armor Mat - Nominal 15 oz./yd<sup>2</sup> (509 g/m<sup>2</sup>), ultra-high impact, double strand, interwoven, open-weave glass fiber fabric with alkaline resistant coating for compatibility with Sto materials installed to a height of 6'-0" above grade or as indicated on drawings. Mesh shall achieve Ultra-High Impact Classification when applied beneath Sto Mesh.
- D. Specialty Meshes: Sto Detail Mesh - Nominal 4.2 oz/yd<sup>2</sup> (143 g/m<sup>2</sup>), flexible, symmetrical, interlaced glass fiber fabric, with alkaline resistant coating for compatibility with Sto materials. Use for standard back wrapping, edge wrapping and aesthetic detailing. It may also be used for reinforcement of sheathing joints and protection of rough openings with Sto Gold Fill as part of the StoGuard air and moisture barrier.

## 2.12 PRIMERS

- A. Acceptable Products:
  - 1. Sto Primer Sand: Use for priming prepared concrete, EIFS base coat, or prior to application of Sto finishes and coatings.
  - 2. Sto Primer Creativ™: Acrylic based tinted, sanded primer for use with specific Sto finishes.

## 2.13 FINISH COAT

*(Select one finish coat.)*

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

## 2.14 JOINT SEALANTS

- A. Acceptable products:
  - 1. Sealant: Dow Corning Corp., 790.
  - 2. Primer: Dow Corning Corp., 1200 OS Primer or as recommended by Dow Corning Corp.
- B. Sealant:

1. Type: One-part, low modulus silicone rubber; meeting ASTM C920, Type S, Grade NS, Class 50, for use NT.
2. Colors: \*\* Custom \*\* Standard \*\* colors as selected by Architect.

## **2.15 MIXED INGREDIENTS**

- A. Water: Clean and potable.
- B. Portland cement: Type I, Type II, or Type I-II in conformance with ASTM C150.

## **2.16 MIXING**

- A. Mix components in accordance with Sto Panel Technology Fabrication and Installation Quality Standards.

## **2.17 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 accordance 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 Spandrel Panels: 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 4263.23**