

SECTION 07 24 00

AXIS Total Envelope Series 1100 Panelized EIFS Wall System

PART 1 – GENERAL

1.1 SYSTEM DESCRIPTION

AXIS Total Envelope®, 1100 EIFS Wall System is a member of the AXIS Total Envelope®, Series 1000 EIFS Wall Systems.

AXIS Total Envelope®, Series 1000 EIFS Wall Systems, are panelized external insulation and finish systems (EIFS), intended to provide complete, insulated building exterior wall and cladding assemblies. The AXIS Total Envelope®, Series 1000 EIFS Wall Systems are assembled and installed by AXIS Total Envelope® certified companies, bound by strict QA/QC processes in both the manufacturing and installation of the systems.

The AXIS Total Envelope®, Series 1000 EIFS Wall Systems are wall systems incorporating an exterior insulation and finish system (EIFS) for use in above grade applications. The AXIS Total Envelope®, Series 1000 EIFS Wall Systems incorporate structural framing with water resistant sheathing. An air and water-resistive barrier (AWRB) provides the concealed drainage plane and the air barrier system for the wall assemblies.

The AXIS Total Envelope®, Series 1000 EIFS Wall Systems can either be load bearing on the building foundation or supported on the floor systems of the building. In a foundation load bearing configuration, panels can be installed without intermediate support, to a height determined by the structural design. In all cases the structural framing of the panels is designed for the load requirements of each specific application.

Device boxes for electrical outlets and fixtures are factory installed and fully integrated into the drainage plane of the panels. Likewise, vent boxes for mechanical systems are factory installed.

Based on the client's preferences, windows can be factory or site installed. The AXIS Total Envelope® certified company will coordinate the factory installation of windows into the Series 1000 EIFS Wall Systems if specified by the owner. Site installation of windows is beyond the scope of AXIS Total Envelope®'s offering; however, AXIS Total Envelope® does provide details regarding the proper integration of the windows and doors into the Series 1000 EIFS Wall Systems.

AXIS Total Envelope® provides specific details for robust terminations of Series 1000 EIFS Wall Systems such as at grade, at balconies and at the interface with other wall assemblies.

The design of AXIS Total Envelope®, Series 1000 EIFS Wall Systems panels includes various options for the integration of firestopping details into the construction of the wall panels, for both the vertical and horizontal requirements of interior party walls and floor slab edge conditions.

The installation of the AXIS Total Envelope®, Series 1000 EIFS Wall Systems includes double wythe caulked joints at panel joints, penetrations and terminations, with the exception of caulking requirements for site installed windows and doors, which is the responsibility of the window supplier/installer.

AXIS Total Envelope®, Series 1000 EIFS Wall Systems panels may be manufactured based on site measurements undertaken by the AXIS Total Envelope® certified company, or to guaranteed dimensions provided by the owner. Where dimensions are provided by the owner, the owner takes full responsibility for the cost of any site adjustments to panels that might be necessary due to variations in the as-built building structure.

The AXIS Total Envelope®, Series 1000 EIFS Wall Systems are based on EIFS products supplied by a single manufacturer, hence carry the backing of both AXIS Total Envelope® and the specific EIFS system manufacturer.

Water and Moisture Control

The AXIS Total Envelope®, Series 1000 EIFS Wall Systems are fully drained wall and cladding systems, incorporating a concealed drainage plane with weeping via a priority drainage system incorporated into the horizontal panel joints.

The configuration of the double wythe caulk joints provides for the continuity of the drainage plane between individual system panels. Membrane tie-ins at horizontal panel joints provide added protection against water ingress.

All penetrations are fully watertight at the plane of the drainage plane. Detailing of the system provides for the factory or site installation of windows with a positive water stop at the window sill and concealed, interior caulking, for the sill, jambs and head of the windows to the rough openings, for long term elimination of water ingress.

Structural Design

The AXIS Total Envelope®, Series 1000 EIFS Wall Systems panels are engineered and certified, from a structural perspective, for each specific project. The panels generally incorporate 152 mm steel track and stud framing with steel, flat stock bracing for racking

strength. The size, spacing and gauge of individual components is determined by the anticipated design loads.

Generally the panel structures are design based on a deflection criteria of $L/240$, although more stringent criteria can be specified, at the option of the Owner.

Additional bracing is provided to deal with specific loads and stresses that can be anticipated in the shipping, handling and erection of the panels.

Panel anchoring is engineered and certified for each individual project.

Fire Ratings

AXIS Total Envelope®, Series 1000 EIFS Wall Systems rely on the certification of the EIFS as carried by the EIFS manufacturer. This includes compliance with Canadian standards including thermal barrier and fire performance requirements of CAN/ULC-S124 and CAN/ULC-S134.

The basic components of a AXIS Total Envelope®, Series 1000 EIFS Wall System are illustrated in Figure 1, with general details of the moisture management and firestopping components illustrated in Figure 2.

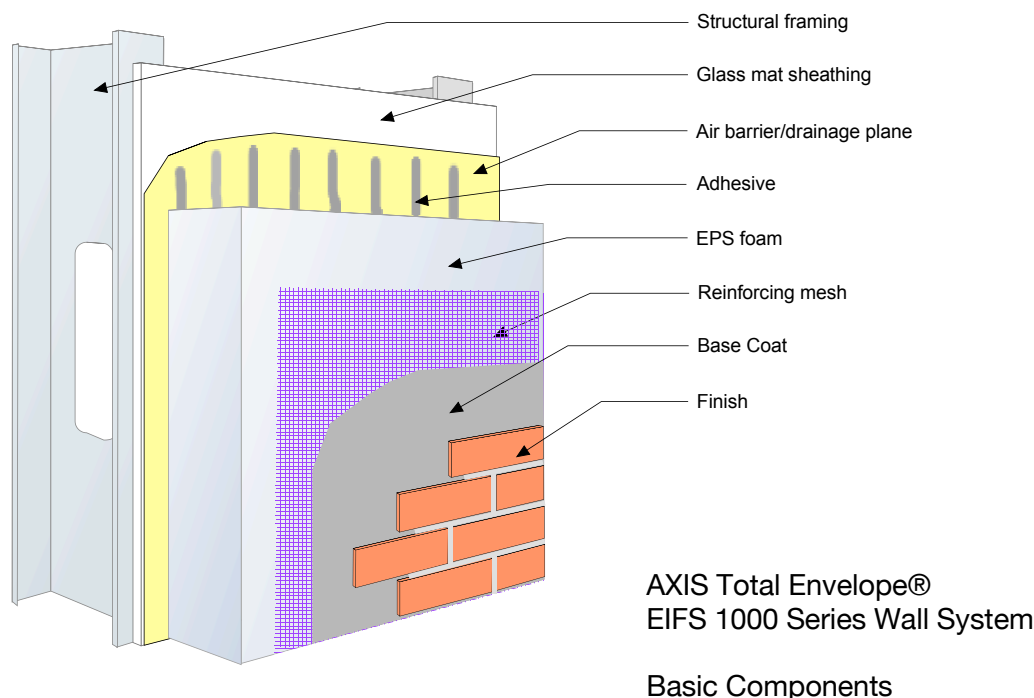


FIGURE 1

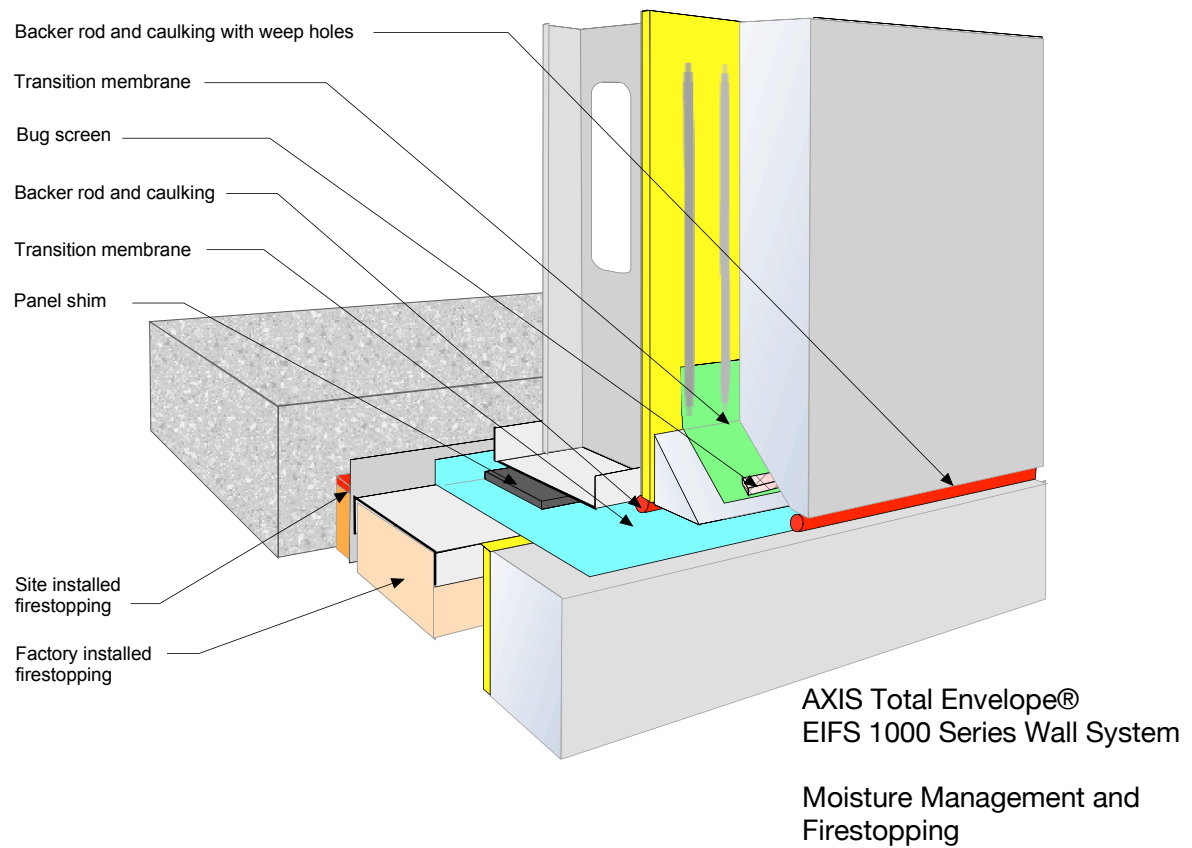


FIGURE 2

AXIS Total Envelope® 1100 EIFS Wall System

The AXIS Total Envelope®, 1100 EIFS Wall System is the AXIS Total Envelope®, Series 1000 EIFS Series Wall System based specifically on the StoTherm ci and the StoTherm ci mineral systems with all components supplied by Sto Canada. Continuous exterior insulation is either expanded polystyrene foam boards (EPS) in the StoTherm ci system or mineral wool in the StoTherm ci mineral system. With the StoTherm ci system insulation is applied with vertical ribbons of adhesive to form the concealed drainage cavity in the assembly. With the StoTherm ci mineral system the insulation is mechanically fastened with the insulation being free draining.

The insulation is fully backrapped and covered with a reinforced base coat, which serves as a base for various available finishes. Available finishes include traditional acrylic stucco renderings, as well as, StoCast finishes that simulate the look of wood, brick and stone, among a range of other options.

All caulking is undertaken using caulking compatible with the StoTherm ci systems as approved by Sto Canada.

Certifications

StoTherm ci has been evaluated under Canadian standards including thermal barrier and fire performance requirements of CAN/ULC-S124 and CAN/ULC-S134. As such, the AXIS Total Envelope®, Series 1100 EIFS Wall System meets these requirements.

StoTherm ci has been evaluated by the Canadian Construction Materials Centre (CCCMC) under listing with respect to the requirements of the National Building Code of Canada for energy efficiency, fire safety, and moisture protection. The AXIS Total Envelope®, Series 1100 EIFS Wall System meets or exceeds all of the requirements of the evaluated StoTherm ci system.

1.2 RELATED SECTIONS

Section 03 30 00 – Cast in Place Concrete

Section 05 12 23 – Structural Steel for Buildings

Section 05 21 00 – Steel Joist Framing

Section 05 40 00 – Cold-Formed Metal Framing

Section 05 41 00 – Structural Metal Stud Framing

Section 06 16 43 – Gypsum Sheathing Section

Section 07 26 00 – Vapor Retarders
Section 07 27 00 – Air Barriers
Section 07 46 00 – Rainscreen Cladding
Section 07 62 00 – Sheet Metal Flashing and Trim
Section 07 81 00 – Applied Fire Protection
Section 07 81 23 – Intumescent Fire Protection
Section 07 84 00 – Firestopping
Section 07 92 00 – Joint Sealants
Section 08 44 00 – Window Wall Systems
Section 08 80 00 – Glazing

1.3 REFERENCES

Ontario Building Code (OBC) – Latest edition
National Building Code of Canada
National Fire Code of Canada
OBC SB-10 – Energy Efficiency Energy Efficiency Supplement
National Energy Code of Canada for Buildings 2025
CAN/CSA-A82.27-M – Gypsum Board
CAN/CSA-A440.4:19 – Window, Door and Skylight Installation
CAN/CSA S136 – Cold-Formed Steel Structural Members
CAN/ULC S101-14 – Standard Method of Fire Endurance Tests of Building Construction and Materials
CAN/ULC S102-10 – Standard Method of Test for Surface Burning Characteristics of Building Materials and Assemblies
CAN/ULC S115-11 – Standard Method of Tests of Firestop Systems
CAN/ULC-S124 – Standard Method of Test for the Evaluation of Thermal Barriers for Foamed Plastics
CAN/ULC-S134-13 – Standard Method of Fire Test of Exterior Wall Assemblies

CAN/ULC S135-04 – Standard Method of Test for Determination of Degrees of Combustibility of Building Materials Using an Oxygen Consumption Calorimeter (Cone Calorimeter)

CAN/ULC-S701-11 – Thermal Insulation, Polystyrene, Boards and Pipe Covering, Type 1 or Type 2

CAN/ULC S701.1-17 – Standard for Thermal Insulation, Polystyrene Boards

CAN/ULC-S702-14 – Standard for Mineral Fibre Thermal Insulation for Buildings

CAN/ULC S716 – Installation of EIFS

CAN/ULC-S716.1-12 – Exterior Insulation and Finish Systems (EIFS) – Materials and Systems

CAN/ULC-S716.2-12 – Standard for Exterior Insulation and Finish Systems (EIFS) – Installation of EIFS Components and Water Resistive Barriers

CAN/ULC-S716.3-12 Second Edition – Standard for Exterior Insulation and Finish Systems (EIFS) - Design Application

CCMC-TG-072413.01-20B – CCMC Technical Guide for Exterior Insulation Finish Systems

CAN/CGSB-19.13-M87 – Sealing Compound, One Component, Elastomeric, Chemical Curing

Canadian Sheet Steel Building Institute (CSSBI) 61-21 – Product Certification Standard – Cold Formed Steel Framing Members

CSA S478-19 Durability of Buildings

ASTM A653M -20 – Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process

ASTM C612-14 – Standard Specification for Mineral Fibre Block and Board Thermal Insulation

ASTM C719-22 – Standard Test Method for Adhesion and Cohesion of Elastomeric Joint Sealants Under Cyclic Movement (Hockman Cycle)

ASTM C920-18 – Standard Specification for Elastomeric Joint Sealants

ASTM C1002-07 – Standard Specification for Steel Self Piercing Tapping Screws for the Application of Gypsum Panel Product and Metal Plaster Bases to Wood Studs or Steel Studs

ASTM C1241 – Standard Test Method For Volume Shrinkage Of Latex Sealants During Cure

ASTM E330 – Structural Performance

ASTM E331 – Water Penetration

ASTM E1399M – Standard Test Method For Cyclic Movement And Measuring The Minimum And Maximum Joint Widths Of Architectural Joint Systems

ASTM E2307-15b – Standard Test Method for Determining Fire Resistance of Perimeter Fire Barriers Using Intermediate-Scale, Multi-story Test Apparatus

ASTM E2486M-22 – Standard Test Method for Impact Resistance of Class PB and PI Exterior Insulation and Finish Systems (EIFS)

ASTM C1177M – Glass Mat Gypsum Substrate for Use as Sheathing

ASTM C1396M – Gypsum Board

ASTM C1658-18 – Standard Specification for Glass Mat Gypsum Panels

ASTM E96M-16 – Water Vapor Transmission of Materials

1.4 ADMINISTRATIVE REQUIREMENTS

Coordinate work with structural steel/concrete building structural work, including site measurements as required by the contract.

Attend meetings with the project architect, building envelope consultant, mechanical and electrical designers and Owner, as required to fully define the wall system requirements from a design and performance perspective. Coordinate all wall system terminations and penetrations with appropriate project team members.

1.5 DESIGN REQUIREMENTS

Wall System Structural Design

Design to the requirements of the Ontario Building Code for the specific project conditions.

Ensure panel tolerances and attachment design account for all anticipated differential movement, including slab-edge deflection from live and dead loads, frame shortening, thermal loads and seismic loads.

EIFS

Design EIFS components of the wall assembly in conformance with the requirements and guidelines as detailed in CAN/ULC-S716.1-12, CAN/ULC-S716.2-12 and CAN/ULC-S716.3-12.

Design EIFS panel installations with specific attention to integration with adjoining construction.

Select materials meeting the flame spread and smoke developed requirements as test in conformance with CAN/ULC-S102. Demonstrate wall system meets the requirements for use in non-combustible construction when tested in conformance with CAN/ULC-S134.

Thermal Performance

Wall system thermal performance to meet or exceed design requirements as set out in the energy modelling for the building and as determined by the applicable Codes, Standards and project requirements.

Envelope Air and Water Penetration Performance

Water Penetration Resistance - Wall system shall demonstrate no water penetration when subjected to 75 minutes of water spray at 300 Pa and measured in accordance with ASTM E331.

Air Barrier Performance (materials) - Air leakage less than $0.02 \text{ L}/(\text{s} \cdot \text{m}^2)$ at a pressure differential of 75 Pa when measured in accordance with ASTM E2178.

Air Barrier Performance (wall assembly) - Air leakage less than $0.02 \text{ L}/(\text{s} \cdot \text{m}^2)$ at a pressure differential of 75 Pa when measured in accordance with ASTM E2178.

Vapour Diffusion Control

Determine the requirements and placement of the vapour retarder in the wall assembly based on the placement and type of insulation being incorporated into the wall assembly. Undertake dew point calculations as necessary.

Vapour Permanence. - Where a vapour permeable membrane is required, vapour permeance shall be greater than $600 \text{ ng}/(\text{Pa} \cdot \text{s} \cdot \text{m}^2)$ when measured in accordance with ASTM E96M, Method B.

Vapour Impermeable, - Where a vapour impermeable membrane is required, vapour permeance shall be less than $60 \text{ ng}/(\text{Pa} \cdot \text{s} \cdot \text{m}^2)$ when measured in accordance with ASTM E96, Method A.

Caulking Design

Caulking joints - Provide a minimum 12 mm clearance for all panel to panel and perimeter sealant joints. Provide a minimum clearance of 12 mm at heads, jams and sills of all doors and windows, or as specified by the window/door manufacturer.

Ensure wall system design is such that caulking is only to the base coat of the EIFS.

Grade Clearance

Grade Condition - Provide minimum 200 mm clearance above grade or as required by Code, whichever is greater. At balcony surfaces provide a minimum of 50 mm clearance to balcony surfaces. At balconies, and at grade areas where there is a reasonable exception of abuse, use high impact mesh in reinforcing the base coat of the EIFS to minimum height of 450 mm.

1.6 SUBMITTALS

Product Data:

EIFS manufacturer's product data, clearly showing compliance with applicable Code and Standards requirements.

EIFS manufacturer's recommended design details for all panel system components.

Manufacturers' installation instructions for all panel system components.

Building Code Compliance Data:

Structural design sealed by a Professional Engineer licensed in the Province of Ontario.

Confirmation of panel assembly compliance with the requirements of CAN/CSA S102, CAN/ULC-S124 and CAN/CSA S134 certified by an Architect or Professional Engineer licensed in the Province of Ontario.

Shop Drawings:

Panel layout, dimensions, lifting points, and attachment details.

Interface details of the wall panel system with all adjoining construction, clearly and accurately depicting the detailing of the adjoining construction.

Three dimensional details, where required, to fully depict transition conditions, such as a balcony corners and corners of panel penetrations.

Manufacturer and Installer Qualifications

Confirmation of conformance with manufacturer and installer minimum qualifications.

Samples

Provide sample of the complete wall assembly including drainage plane and weeping details.

Provide minimum 250 x 250 mm finish coat samples showing colour and texture.

Mock-Up:

Provide 2400 x 2400 mm mock-up demonstrating drainage paths, double wythe vertical and horizontal caulking joints, window tie-in details, and typical mechanical and electrical penetrations

1.7 QUALITY ASSURANCE

Panel manufacturer and installer shall be certified by AXIS Total Envelope and committed to the strict adherence to QA/QC processes in both the manufacturing and installation of the system as published by AXIS Total Envelope®.

Panel manufacturer and installer shall maintain a membership in good standing of the EIFS Council of Canada.

Panel fabrication shall take place in a temperature controlled environment, with temperatures within the range specified of the EIFS manufacturer for proper hydration and curing of all EIFS products.

Quality control records shall be produced and maintained for each individual panel as defined in the AXIS Total Envelope® QA/QC processes, including, as a minimum:

- The panel production number,
- date of manufacture,
- record of dimensions, including diagonals,
- structural inspection,
- air barrier inspection,
- base coat inspection and

- panel final inspection.

All QA/QC records of the panel manufacturing and installation process for each individual panel shall be submitted to, and maintained on, the AXIS Total Envelope® QA/QC digital platform.

1.8 DELIVERY, STORAGE, AND HANDLING

1. All materials and system components shall be stored in original packaging until used.
2. All materials are to be stored indoors, and protected from moisture and damage.
3. Finished panels may be stored outdoors only after complete hydration and curing of wall panel materials, typically not less than 48 hours after application of EIFS finish materials.
4. Protect finished panels from excessive exposure to water and any physical damage.
5. Handle panels using manufacturer-approved lifting devices.

1.9 WARRANTIES

1. Provide a comprehensive two year labour and materials warranty.
2. Provide a EIFS manufacturer materials warranty of 10 or 12 years, based on the manufacturer's standard provisions.
3. Offer, at the Owner's discretion and cost, an EIFS manufacturer comprehensive labour and materials warranty of a minimum of 10 years.

PART 2 – PRODUCTS

2.1 PANEL FRAMING

1. Cold-formed steel framing to CSA S136, gauge as required by structural calculations.
2. Galvanized coating to ASTM A653M, G90.

2.2 SHEATHING

1. Exterior gypsum sheathing conforming to ASTM C1177.

2. Fasten sheathing to the structural steel stud framework in accordance with the requirements of the structural design.

Acceptable Products:

Georgia-Pacific DensGlass Sheathing

Certainteed GlasRoc Sheathing

or approved alternate

2.3 AIR/WATER-RESISTIVE BARRIER (A/WRB)

1. Liquid-applied air barrier/drainage plane in conformance with the manufacturer's requirements. Reinforce all sheathing joints with mesh.
2. Conform to CAN/ULC-S716.1.

Acceptable Products:

Sto Gold Coat

StoGuard Mesh

2.4 INSULATION

1. Expanded polystyrene (EPS) to CAN/ULC 701.1-17
2. Mineral Fibre to CAN/ULC S702
3. Insulation thickness as required by building design parameters. Minimum 50 mm.
4. EPS boards adhered with ribbons of approved adhesive as per manufacturer's requirements.
5. Mineral fibre boards fastened with approved mechanical fasteners.

Acceptable Products (EPS System):

Sto EPS Insulation Board

Owens Corning Thermafiber Mineral Wool CI-C Mineral Wool Insulation

Sto TurboStick

Sto BTS Xtra

Sto Primer \Adhesive B

Acceptable Products (Mineral Wool System):

Owens Corning Thermafiber Mineral Wool CI-C Mineral Wool Insulation

Sto Thermo Dowel

2.5 BASE COAT AND REINFORCEMENT

1. Polymer-modified cementitious base coat.
2. Alkali-resistant fiberglass mesh:
3. Use high-impact grade mesh at ground level or high-traffic areas to 450 above surface.

Acceptable Products:

Sto Mesh

Sto Detail Mesh

Sto Armor Mat Mesh

Sto Armor Mat XX Mesh

Sto Intermediate Mesh

Sto BTS Plus

Sto BTS Plus Xtra

Sto Flexyl

2.6 FINISH

1. Primer as required.
2. Finish of type colour and texture as selected by Owner from the available range of Sto Canada options.

Acceptable Products:

Sto Prime, Sto Prine Sand

Stolit Lotusan range of finishes

Stolit range of finishes

Sto Creavi range of finishes

StoTique

Sto Decocoat

Sto Limestin Finish

Sto GraniTex

2.7 PANEL ATTACHMENT HARDWARE

1. Engineered brackets, clips, and fasteners compatible with structural substrate conforming with the structural design.
2. Hot-dip galvanized to ASTM A653M, G90 or stainless steel.
3. Attachment system shall accommodate anticipated:
 - a. Vertical movement of slab edges, both static and live.
 - b. Wind loads.
 - c. Thermal expansion and contraction.
 - d. Seismic loads

2.8 ENVELOPE SEALANTS

1. High-performance silicone or polyurethane sealants as approved by Sto Canada.
2. Conform to ASTM C920-18.
3. Colour as selected by Owner.
4. Minimum ± 50 percent expansion and contraction capability when tested in accordance with ASTM C719.

Acceptable Products:

Dow Corning 795

Tremco Spectrem 3

Adfast Adseal DWS 4580

or approved alternate

2.9 FIRESTOP MINERAL WOOL

1. Mineral wool insulation, minimum density 64 kg/m³ (4.0 lbs/ft³).

Acceptable Products:

Rockwool Roxul Safe

or approved alternate

2.10 FIRESTOP SEALANTS

1. Sprayable acrylic latex sealant.

Acceptable Products:

Hilti CFS-SP WB

or approved alternate

2. Gun-grade, silicone based fire caulking

Acceptable Products:

Tremco TREMstop Fyre-Sil

Hilti CFS-S SIL GG

or approved alternate

3. Firestop acrylic sealant

Acceptable Products:

Hilti CP606

Tremco TREMstop Acrylic

or approved alternate

4. Self levelling, silicone based fire caulking

Acceptable Products:

Tremco TREMstop Fyre-Sil SL

Hilti CFS-S SIL SL

or approved alternate

PART 3 – EXECUTION

3.1 SITE EXAMINATION

1. Verify the building structural is plumb, and within tolerances for the installation of the EIFS panels.
2. Report deficiencies to Owner prior to proceeding with panel installations.

3.2 PANEL FABRICATION

1. Fabricate panels in accordance with approved shop drawings.
2. Fabricate panels in a temperature controlled environment, with temperatures within the range specified of the EIFS manufacturer for proper hydration and curing of all EIFS products.
3. Complete all fabrication in full conformance with the design requirements, keeping full QA/QC documentation available at all times for review by the Owner and AXIS Total Envelope®.
4. Fabricate panels on appropriate jigs as necessary to provide full access to all surfaces and to ensure the dimensional stability of the panels during fabrication.
5. Install lifting brackets as required for panel handling, as required to ensure panels are not adversely stressed or distorted during handling.

3.3 PANEL INSTALLATION

1. Install panels plumb, level, and true.
2. Maintain joint spacing as indicated in the design.
3. Stop panel installation if panel joint minimum clearance of 12 mm, or other specified tolerances, cannot be achieved. Determine cause of the discrepancy and effect corrections prior to proceeding.
4. Allow for building movement per requirements of the structural design.
5. Complete joints with backer rod and sealant on a double wythe configuration, as detailed in the system design. Ensure the rear caulking bead is precisely aligned as required by the design.
6. Ensure full continuity of air barrier and thermal insulation at transitions.
7. Complete firestopping of wall system to slab edges and rated partition walls as detailed in the drawings.

8. Coordinate with window and door installers to maintain air and water barrier continuity.
9. Provide flashing to direct water to the exterior, including, but not limited to, above window and door heads, beneath window and door sills, at parapets and interfaces with dissimilar construction.

3.4 FIELD QUALITY CONTROL

1. Inspect joints, sealants, and finish coat for uniformity.
2. Repair any damage to panels, as required. Do not undertake any repairs to EIFS components if temperatures are expected to be below 5 C within 24 hours of completion of the work.

3.5 CLEANING

1. At the end of each day, ensure all excess materials are stored or disposed of as appropriate.
2. Undertake a final cleaning of surfaces, as required to present a clean, uniform appearance to all panel surfaces.