SECTION 07 24 00 – exterior insulation and finish system (eifs)

1. General
   1. SUMMARY
      1. This Section includes requirements for supply and installation of water managed, polymer based exterior insulation and finish system onto an insulated wall system where EIFS does not form the primary thermal insulation for the building.
      2. Related Requirements:
         1. Section 04 20 00 – Unit Masonry.
         2. Section 05 40 00 – Cold-Formed Metal Framing.
         3. Section 05 50 00 – Metal Fabrications.
         4. Section 06 10 00 – Rough Carpentry.
         5. Section 07 21 00 – Thermal Insulation.
         6. Section 07 42 16 – Preformed Aluminum Panels.
         7. Section 07 46 19 – Steel Siding.
         8. Section 07 51 00 – Built-up Bituminous Roofing.
         9. Section 07 92 00 – Joint Sealants.
         10. Section 08 11 13 – Steel Doors and Frames.
         11. Section 08 36 13 – Sectional Doors.
         12. Section 08 41 13 – Aluminum Framed Entrances and Storefronts.
         13. Section 08 44 13 – Glazed Aluminum Curtain Walls.
         14. Section 09 29 00 – Gypsum Board.
         15. Section 09 90 00 – Painting.
         16. Section 11 13 00 – Loading Dock Equipment.
   2. reference standards
      1. Underwriter Lavatories of Canada (ULC):
         1. CAN/ULC-S101-07 Standard Methods of Fire Endurance Test.
         2. CAN/ULC-S114 Standard Method of Test for Determination of Non-combustibility in Building Materials.
         3. CAN/ULC-S134 Fire Test for Exterior Wall Assemblies.
         4. CAN/ULC-S102 Surface Burning Characteristics of Building Materials and Assemblies.
         5. CAN/ULC-S716.1 Standard for Exterior Insulation and Finish Systems (Materials and Systems).
         6. ULC BXUVC.W456 Fire Resistance Ratings.
         7. ULC - FWFOC.Guide Info - Exterior Wall Insulation and Finish System.
      2. American Society for Testing and Materials (ASTM):
         1. ASTM C 150/C 150M-12 Standard Specification for Portland Cement.
         2. ASTM C 297C 297M-04(2010) Standard Test Method for Flatwise Tensile Strength of Sandwich Constructions.
         3. ASTM C 1177/C 1177M-08 Standard Specification for Glass Mat Gypsum Substrate for Use as Sheathing.
         4. ASTM C 1396/C 1396M-11 Standard Specification for Gypsum Board.
         5. ASTM D 2247-11 (Federal Test Standard 141A Method 6201) Standard Practice for Testing Water Resistance of Coatings in 100% Relative Humidity.
         6. ASTM E 96/E 96M-10 Standard Test Methods for Water Vapor Transmission of Materials.
         7. ASTM E 119-12 Standard Method for Fire Tests of Building Construction and Materials.
         8. ASTM E 2098-00(2006) Test Method for Determining the Tensile Breaking Strength of Glass Fiber Reinforcing Mesh for use in Class PB Exterior Insulation and Finish Systems (EIFS), after Exposure to Sodium Hydroxide Solution.
         9. ASTM E 2134-01(2006) Test Method for Evaluating the Tensile-Adhesion Performance of Exterior Insulation and Finish Systems (EIFS).
         10. ASTM E 2430-05 Standard Specification for Expanded Polystyrene (EPS) Thermal Insulation Boards for use in Exterior Insulation and Finish System (EIFS).
         11. ASTM E 2485-06 (formerly EIMA Std. 101.01) Standard Test Method for Freeze-Thaw Resistance of Exterior Insulation and Finish Systems (EIFS) and Water-Resistive Barrier Coatings.
         12. ASTM E 2486-06 (formerly EIMA Std. 101.86) Standard Test Method for Impact Resistance of Class PB and PI Exterior Insulation and Finish Systems (EIFS).
      3. National Fire Protection Association (NFPA):
         1. NFPA 268 Standard Test Method for Determining Ignitibility 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.
      4. American National Standards Institute (ANSI):
         1. ANSI FM 4880 Evaluating Insulated Wall or Wall and Roof/Ceiling Assemblies; Plastic Interior Finish Materials; Plastic Exterior Building Panels; Wall/Ceiling Coating Systems; Interior or Exterior Finish Systems.
   3. design criteria
      1. Trowel applied acrylic modified cement stucco finish over a rigid insulation board backing, and over exterior sheathing board.

SPEC NOTE: Delete the following paragraph if the building is above three storeys in height and has greater then 10% unprotected openings. (This paragraph is for bldg below three storeys and using combustible system)

* + 1. The System has undergone CAN/ULC-S101 Standard Methods of Evaluation for Fire Performance. The system shall be considered a combustible exterior wall assembly permitted for use in noncombustible construction, as it is defined in the National Building Code of Canada, Part 3, Section 3.1.5. A noncombustible protective coating shall protect a combustible insulation, permitting the system to remaining in place for at least 15 minutes.

SPEC NOTE: Delete the following paragraph if building is below there storeys in height. (This paragraph is for bldg more than three storeys and using non-combustible system)

* + 1. The System has undergone CAN/ULC-S114 testing and is considered a non-combustible exterior wall assembly, utilizing both non-combustible insulation and non-combustible protective coating.
    2. Integral decorative colours and finish texture to Consultant's selection as specified herein.
    3. Materials of this Section to provide continuity of thermal barrier at building enclosure elements in conjunction with substrates and decorative "stucco" finish in colours as selected.
    4. Conform to ASTM E 330-02(2010); wind load performance for L/240 deflection criteria.
    5. System shall be designed to drain to the exterior any moisture that penetrates the exterior surface (rain-screen system).
  1. SUBMITTALS
     1. Provide submittals specified and as required to assess conformance with the Contract Documents.
     2. Submit shop drawings showing complete details of all conditions, construction, and interfacing with work of other Sections.
     3. Provide product data on system materials, product characteristics, performance criteria, limitations.
     4. Samples: Submit three 610 mm x 610 mm (24" x 24") size sample panels of the insulation and finishing system, mounted on exterior sheathing board, illustrating colour and texture range for each selection. Submit three 305 mm (12") long samples of trim accessories such as corner beads, control joints, etc.
     5. Maintain an approved sample at the job site.
     6. Manufacturer's Installation Instructions: Indicate preparation required, installation techniques, jointing requirements with references to this application.
     7. Safety Data Sheets: Submit WHMIS safety data sheets for inclusion with project record documents. Keep one copy of WHMIS safety data sheets on site for reference by workers.
     8. Submit manufacturer's written certification for acceptability of the installation.
  2. QUALITY ASSURANCE
     1. Contractor executing the work of this Section shall have a minimum of five (5) years continuous Canadian experience in successful application of materials of type specified. Submit proof of experience upon Consultant's request. Contractor to be an approved applicator of material manufacturers.
     2. Contractor shall be experienced and competent in the placement of exterior insulation system, shall understand and respect industry standards governing detailing and protection of work being installed and be knowledgeable in the proper installation of the manufacturer's system.
     3. Contractor, for Work of this Section, shall have attended a system specific 'Contractor Listing Session' presented by the manufacturer and possess a current 'Listing Certificate' for same. A copy of a valid Listing Certificate shall accompany tender submission.
     4. Manufacturer shall be a member of the EIFS Council of Canada.
     5. Conform to applicable National Building Code requirements and pertinent Local building requirements for use of insulated stucco finishes as applicable.
     6. Arrange for a Manufacturer's Representative to:
        1. Visit the site and discuss any special requirements, procedures, and unique conditions, prior to commencement of work.
        2. Inspect substrate surfaces and recommend solutions to accommodate adverse conditions.
        3. Periodically visit and inspect the installation and report unsatisfactory conditions to the Contractor.
        4. Attend final inspection and to submit written certification that the products, systems, and assemblies have been installed in accordance with the manufacturer's requirements.
  3. DELIVERY, STORAGE AND HANDLING
     1. Co-ordinate deliveries with construction schedule and arrange for proper storage areas.
     2. Deliver materials to the site in their original unopened packages, clearly marked with the manufacturer's name, brand name, and description of contents. Inspect materials for damage, particularly freezing. Inform manufacturer of any discrepancies. Materials unsatisfactory to the fabrication to be removed from site.
     3. Store materials in accordance with manufacturer's recommendations for storage and handling. And generally, as follows, store materials in a cool, dry location, out of sunlight protected from weather and other damage and at temperatures above 4 deg C.
  4. project conditions
     1. Do not install coating system when ambient temperature is below 5 deg C.
     2. Maintain this temperature during and for at least 24 hours after application.
     3. Protect the coating system and adjacent materials during installation while curing and/or unattended from weather and other damage.
  5. MAINTENANCE DATA
     1. Maintenance Materials: Supply one (1) can of finish coat for each colour texture selected, one (1) can of adhesive and 20 sq.ft. of reinforcing mesh.
  6. WARRANTY
     1. Warrant work of this Section against defects in materials and labour from the manufacturer and workmanship from the authorized applicator in accordance with the General Conditions for a period of five (5) years and agree to promptly make good defects which become evident during warranty period without cost to the Owner.
     2. Defects shall include but not be limited to, delamination, cracking, crazing and discolouration of finish.

1. Products
   1. APPROVED PRODUCTS AND MANUFACTURERS
      1. Basis-of-Design Products: Products named in this Section were used as the basis-of-design for the project; additional manufacturers offering similar products may be incorporated into the work of this Section provided they meet the performance requirements established by the named products.
      2. Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include but are not limited to, the following:
         1. Outsulation PD (NC) System by Dryvit Systems Canada Ltd.
         2. Senerflex GDC by Senergy, Inc.
         3. Durex Insulite EXT Select ADH, Drained Type by Durabond Products Ltd.
         4. PUCCS EIFS by DuROCK Alfacing International Ltd.
         5. Akrilon Pro-RS by Akrilon.

SPEC NOTE: Use the following if the non-combustible system was selected above. Delete if not required.

* + 1. Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include but are not limited to, the following:
       1. Exsulation S5000 System by Dryvit Systems Canada Ltd.
  1. PERFORMANCE REQUIREMENTS
     1. System Performance:

SPEC NOTE: Use paragraph 1 for combustible wall, or use paragraph 2 for non-combustible wall. Delete the paragraph which is not required.

* + 1. Combustibility: Provide combustible wall system meeting requirements of National Building Code 2010, having maximum insulation thickness of 127 mm (5") when used in non combustible construction.
    2. Noncombustibility: Provide non-combustible wall system using materials meeting requirements of CAN/ULC S114 for system used within limiting distance of adjacent structures and for buildings greater than three (3) storeys high.
    3. Bond Integrity: Provide a complete and functioning EIFS free from bond failure within components or between system and supporting wall construction, resulting from exposure to wind loads, weather, or other in-service conditions.
    4. Weathering Tightness: Provide a complete and functioning EIFS resistant to water penetration from exterior into components and assemblies behind or through EIFS into interior of building that results in deterioration of thermal insulating effectiveness or other degradation of EIFS and back up assemblies including but not limited to, substrates, supporting wall construction, and interior finishes.
    5. Physical Performance: Provide an adhered wall system that provides a decorative finish system to the building; that is resistant to abrasion, freeze thaw, water penetration, positive and negative wind loads in accordance with ASTM E 2134; provides impact resistance in accordance with ASTM E 2486; and is capable of draining accumulated water from within the wall system using insulation having geometrically defined voids or a drainage board.
  1. materials
     1. Substrate: Gypsum based sheathing panel or glass faced gypsum sheathing as specified in Section 09 29 00 – Gypsum Board.
     2. Joint Tape: Manufacturer's standard self adhesive open weave mesh joint reinforcement tape for application over substrate board joints before application of water resistive air barrier material.
     3. Primer: Manufacturer's recommended primer compatible with substrate materials and water resistive air barrier materials.
     4. Water Resistive Air Barrier: Manufacturers standard roller applied air barrier system designed specifically for insulated wall assemblies having an interior vapour retarder not forming a part of wall system specified in this Section.
     5. Transition Membranes: Manufacturers standard composite self adhering membrane comprised of rubberized asphalt, SBS modified bitumen or fleece faced membrane backed with high density polyethylene film compatible with adjacent materials and assemblies and materials specified in this Section including primer and sealant compatible with transition membranes.
     6. Adhesive: Manufacturer's standard polymer modified cementitious adhesive system forming a part of water drainage and venting component of EIFS coating.

SPEC NOTE: Use combustible insulation for building below three storeys in height.

* + 1. Combustible Insulation:
       1. Manufacturers approved expanded polystyrene board, manufactured in accordance with CAN/ULC S702, complete with geometrically defined voids on the backside of the board providing an air space of not less than 3/8" deep, to CAN/CGSB 51.20-M Type 1.
       2. The insulation shall be manufactured by a board supplier in standard sizes, complete with square cut edges, as approved and warranted by the EIFS manufacturer as part of the total system.
       3. Thickness and profiles as indicated on Drawings.

SPEC NOTE: Use non-combustible insulation for building above three storeys in height.

* + 1. Non-combustible Insulation and Drainage Board:
       1. Manufacturers approved non-combustible mineral fibre insulation manufactured in accordance with CAN/ULC S702 and tested in accordance with CAN/ULC S114.
       2. The insulation shall be manufactured by a board supplier in standard sizes, complete with square cut edges, as approved and warranted by the EIFS manufacturer as part of the total system. Insulation Thickness: As indicated on Drawings.
       3. Fasten mineral fibre insulation to 3/8" deep drainage board.
       4. Drainage Board: High-density polyethylene (HDPE), providing 3/8" (10 mm) deep dimple height. Basis of Design Material: Delta-Dry by Cosella-Dorken.
    2. Reinforcing Mesh:
       1. Standard Mesh: Minimum 4.5 oz./sq.yd., symmetrical, interlaced open-weave glass fibre, treated for compatibility with finish system materials.
       2. Corner Mesh: Treated, glass fibre mesh that must weigh a minimum of 9.5 oz/yd2 (320 kg/m2) and have a minimum tensile strength of 290 lbs/in (508 N/m) of width.
       3. Detail Mesh: Minimum 4.5 oz./sq.yd., symmetrical, flexible, interlaced open-weave glass fibre, treated for compatibility with finish system materials.
       4. Heavy-Duty Reinforcing Fabric: Treated, balanced, interlaced open weave, glass fibre type reinforcing fabric weighing minimum 21.0 oz./sq.yd., minimum tensile strength of 900 lb/in of width.
    3. Mechanical Fasteners: Galvanized drive-in plugs as supplied by Hilti Canada, or approved equal, if required to suit each condition and approved by EIFS manufacturer.
    4. Basecoat: Manufacturers standard non-combustible polymer modified cementitious basecoat.
    5. Finish Coat: Factory mixed, acrylic based finish coat containing integral colour and texture. Finished, texture, and colours as [selected by the Consultant from the manufacturer’s standard product line] [indicated on Drawings].
    6. Accessories: Metal trim, control joints and the like shall be preformed zinc strips if required to suit each condition.
    7. Trim Mouldings:
       1. Continuous, formed, expanded polystyrene insulation trim mouldings in profiles indicated on Drawings, with expanded polystyrene insulation conforming to ASTM C 578, Type 1, having continuous, reinforcing mesh reinforced base coat, ready for colour finish coating.
          1. Basis of Design Material: Precoated Trim Mouldings by Canamould Extrusions Inc., or approved equal by Driangle Inc.
       2. Provide adhesives, mechanical fasteners and other accessories as recommended by the trim mouldings manufacturer.

1. Execution
   1. examination
      1. Verify that substrate and adjacent materials are dry, sound and will not break or cause defects in finish system, upon application of new material.
   2. PREPARATION
      1. Adjacent materials shall be protected from damage during installation of insulation and finish system.
   3. APPLICATION
      1. Strictly adhere to manufacturer's specifications and recommendations in regard to installation of finishing system.
      2. Mix and apply air barrier membrane mixture in accordance with manufacturers written instructions. Using stainless steel trowel provide a uniform thickness of approximately 2.4 mm (3/32").
      3. Apply detail mesh to substrate at all locations where insulation terminates for back-wrapping purposes.

SPEC NOTE: Delete the following if a combustible system was selected above.

* + 1. Install drainage board in accordance with manufacturer's written instructions.
    2. Insulation:
       1. Install insulation, in accordance with manufacturer's written instructions or as otherwise specified herein.
       2. Minimum 10 mm (3/8") air space must be maintained behind insulation for drainage.
       3. Precut insulation board to fit around corners, obstructions and the like. Gaps in insulation are not to exceed 1/8".
       4. Insulation board shall be applied with long edge oriented horizontally.
       5. Apply adhesive to insulation board using the notched trowel method. Minimum 13 mm x 13 mm x 50 mm (1/2" x 1/2" x 2") trowel shall be used. Affix insulation board to substrate fully adhered.
       6. Provide insulation with joints offset in a running bond pattern, stagger and interlock joints at corners.
       7. Rasp entire surface of insulation smooth in a circular manner.
       8. Provide reveals cut into insulation, pattern as indicated.
    3. Reinforcing Mesh:
       1. Apply even coat of base coat over insulation board to receive reinforcing mesh. Work mesh into wet adhesive with trowel so as to fully embed mesh in adhesive. Mesh shall not be visible beneath the surface of the adhesive.
       2. Overlap mesh a minimum of 75 mm (3"), or as required by manufacturer, on all sides working from the centre to the edge while smoothing out wrinkles. Feather all seams and edges.
       3. At ground floors and high traffic areas, install one (1) layer of heavy-duty and one (1) layer of standard reinforcing fabric in base coat. Refer to Drawings for extent of heavy-duty reinforcing fabric required.
       4. Corners shall be reinforced by double wrapping reinforcing mesh or by installing corner mesh.
       5. Corners of openings shall be reinforced using 9-1/2" wide strip of Detail Mesh laid at a 45 deg angle.
    4. Apply intermediate coat in high exposure areas such as sloped surfaces, windowsills, etc., over basecoat, as per manufacturer's written instructions.
    5. Allow adhesive, basecoat, and intermediate coat to cure a minimum of twenty-four (24) hours each time it is applied before continuing work of this Section.
    6. Finish coat shall be applied continuously and in one operation to the entire wall surface, maintaining a wet edge. Protect finish coat from airborne contamination, weather, and other damage until cured.
    7. Apply two (2) coats of elastomeric exterior coating over finish coat, at sloped surfaces only, as per manufacturer's written instructions.
    8. Install all trim mouldings by adhesive and/or mechanical fastening methods in locations as indicated on Drawings.
  1. EXPANSION JOINTS / CONTROL JOINTS
     1. Provide joints in alignment with building expansion joints.
     2. Install joints at all locations where dissimilar substrates meet.
     3. Install joints at all locations of maximum stress (such as corners of openings), in the direction as shown on Drawings.
     4. Install joints horizontally and vertically so to divide the wall surface into panels of not more than 240 ft2. Neither dimension within the panel should be greater than 2.5 times the other.
     5. Unless otherwise noted, provide all joints 3/4" wide.
     6. All joints shall be caulked inside and outside and cavity to be drained. Co-ordinate with Section 07 92 00 – Joint Sealants.
  2. FIELD QUALITY CONTROL
     1. During the progress of the work of this Section, the exterior insulation and finish system manufacturer or his authorized representative is to inspect the installation and submit report to Consultant in writing.
  3. CLEANING AND PROTECTION
     1. Remove excess materials from the job site.
     2. Clean adjacent materials, surfaces and the work area of foreign materials resulting from Work of this Section.
     3. Do not permit finish surface to become soiled or damaged.

END OF SECTION