SECTION 07 24 23 – direct applied stucco finish system (eifs)

1. General
   1. SUMMARY
      1. This Section includes requirements for supply and installation of a direct-applied stucco finishing system, consisting of the following components:
         1. Acrylic Base Coat.
         2. Mesh.
         3. Acrylic Finish Coat.
         4. Accessories.
         5. Stucco Refinishing Coating.
      2. Related Requirements:
         1. Section 06 10 00 – Rough Carpentry.
         2. Section 07 21 00 – Thermal Insulation.
         3. Section 07 27 26 – Liquid Applied Air Barrier Membrane.
         4. Section 07 46 19 – Steel Siding.
         5. Section 07 92 00 – Joint Sealants.
         6. Section 08 11 13 – Steel Doors and Frames.
         7. Section 08 36 13 – Sectional Doors.
         8. Section 08 41 13 – Aluminum Framed Entrances and Storefronts.
         9. Section 08 51 13 – Aluminum Windows.
         10. Section 09 29 00 – Gypsum Board.
   2. reference standards
      1. American Society for Testing and Materials (ASTM):
         1. ASTM A 641/A 641M-09a, Standard Specification for Zinc-Coated (Galvanized) Carbon Steel Wire.
         2. ASTM A 653/A 653M-11, Standard Specification for Steel Sheet, Zinc Coated (Galvanized) or Zinc Iron Alloy Coated (Galvannealed) by the Hot-Dip Process.
         3. ASTM B 69-11, Standard Specification for Rolled Zinc.
         4. ASTM C 144-11, Standard Specification for Aggregate for Masonry Mortar.
         5. ASTM C 297C 297M-04(2010) Standard Test Method for Flatwise Tensile Strength of Sandwich Constructions.
         6. ASTM C 847-12, Standard Specification for Metal Lath.
         7. ASTM C 897-05(2009), Standard Specification for Aggregate for Job-Mixed Portland Cement-Based Plasters.
         8. ASTM C 926-12a, Standard Specification for Application of Portland Cement-Based Plaster.
         9. ASTM C 1063-12c, Standard Specification for Installation of Lathing and Furring to Receive Interior and Exterior Portland Cement Based Plaster.
         10. ASTM D 1784-11, Standard Specification for Rigid Poly (Vinyl Chloride) (PVC) Compounds and Chlorinated Poly (Vinyl Chloride) (CPVC) Compounds.
         11. ASTM D 5034-09(2013, Standard Test Method for Breaking Strength and Elongation of Textile Fabrics (Grab Test).
         12. ASTM E 96/E 96M-10 Standard Test Methods for Water Vapor Transmission of Materials.
         13. ASTM E 2178-11, Standard Test Method for Air Permeance of Building Materials.
         14. ASTM E 2357-11, Standard Test Method for Determining Air Leakage of Air Barrier Assemblies.
      2. Underwriter Lavatories of Canada (ULC):
         1. CAN/ULC-S102-10, Surface Burning Characteristics of Building Materials and Assemblies.
         2. CAN/ULC-S114-05, Standard Method of Test for Determination of Non-combustibility in Building Materials.
         3. CAN/ULC-S134-92, Fire Test for Exterior Wall Assemblies.
         4. CAN/ULC-S701-11, Standard for Thermal Insulation, Polystyrene Boards and Pipe Covering.
         5. CAN/ULC-S702-09, Amendment 1, Standard for Mineral Fibre Thermal Insulation for Buildings.
         6. CAN/ULC-S716.1-12, Standard for Exterior Insulation and Finish Systems - Materials and Systems.
         7. CAN/ULC-S716.2-12, Standard for Exterior Insulation and Finish Systems - Installation of EIFS Components & Water Resistive Barrier.
         8. CAN/ULC-S716.3-12, Standard for Exterior Insulation and Finish Systems - Design Application.
      3. Northwest Wall and Ceiling Bureau (NWCB):
         1. Stucco Resource Guide, 2002.
      4. Portland Cement Association (PCA):
         1. Portland Cement Plaster/Stucco Manual, 2003.
   3. administrative requirements
      1. Coordination: Coordinate the Work of this Section with the installation of substrate; Sequence work so that installation of Portland cement stucco coincides with installation of substrate materials without causing delay to the Work.
      2. Pre-Installation Conference: Conduct on site pre-installation conference in accordance with Section 01 31 19 – Project Meetings before installing Portland cement stucco, attended by Contractor, Consultant, Owner, Subcontractor, and system manufacturer's representative to:
      3. Review methods and procedures related to installation, including manufacturer's written instructions.
      4. Examine substrate conditions for compliance with manufacturers installation requirements.
      5. Review temporary protection measures required during and after installation.
   4. SUBMITTALS
      1. Provide requested information in accordance with Section 01 33 00 – Submittal Procedures.
      2. Action Submittals: Provide the following submittals before starting any work of this Section:
         1. Product Data: Submit manufacturers product data for each type of product specified.
         2. Shop Drawings: Submit shop drawings showing complete details of all conditions, construction, and interfacing with work of other Sections.
         3. Samples for Initial Selection: Submit one (1) sample panel, 150 mm x 150 mm (6" x 6") for each colour and texture, for review by the Consultant.
         4. Samples for Verification: Submit two (2) samples 300 mm x 300 mm (12" x 12") for verification for each colour and texture of stucco finish specified in this Section prior to ordering samples from film manufacturer.
   5. CLOSEOUT SUBMITTALS
      1. Operation and Maintenance Data: Submit manufacturer's written instructions for cleaning solutions, materials, and procedures, include name of original installer and contact information in accordance with Section 01 77 19 – Closeout Requirements.
      2. Provide specific warning of any maintenance practice or materials that may damage or disfigure the finished Work.
   6. performance requirements
      1. Design Criteria:
         1. Structural (wind and axial loads):
            1. Design for maximum allowable deflection, normal to the plane of the wall of L/360
            2. Design for wind load in conformance with code requirements.
            3. Limit insulation board thickness to maximum 38 mm (1-1/2").
            4. Minimum required metal stud gage: 18 gage.
            5. Maximum stud spacing: 406 mm (16") on center.
         2. Moisture Control:
            1. Prevent the accumulation of water into or behind the stucco, either by condensation or leakage into the wall construction, in the design and detailing of the wall assembly:

Provide corrosion resistant flashing to protect exposed elements and to direct water to the exterior, including, above window and door heads, beneath window and door sills, at floor lines, at roof/wall intersections, decks, abutments of lower walls with higher walls, above projecting features, and at the base of the wall.

Air Leakage Prevention: Prevent excess air leakage in the design and detailing of the wall assembly. Provide continuity between air barrier components in the wall assembly.

Vapor Diffusion and Condensation: Perform a dew point analysis of the wall assembly to determine the potential for accumulation of moisture in the wall assembly as a result of water vapor diffusion and condensation. Adjust wall assembly components accordingly to minimize the risk of condensation. Avoid the use of vapor retarders on the interior side of the wall in warm, humid climates.

At expansion joints, back joints with barrier membrane.

Seal stucco terminations and accessory butt joints with appropriate sealant.

* + - 1. Grade Condition:
         1. Do not specify stucco for use below grade or on surfaces subject to continuous or intermittent water immersion or hydrostatic pressure. Provide minimum 100 mm (4") clearance above earth grade, minimum 51 mm (2") clearance above finished grade (pavers/sidewalk). Provide increased clearance in freeze/thaw climate zones.
      2. Joints and Accessories:
         1. Provide two-piece expansion joints in the stucco system where building movement is anticipated:

At joints in the substrate or supporting construction.

Where the system is to be installed over dissimilar construction or substrates.

At changes in building height.

At floor lines.

At columns and cantilevered areas.

* + - * 1. Provide one piece expansion joints every 13 m2 (144 ft2). Cut and wire tie lath to the expansion joint accessory so lath is discontinuous at or beneath the accessory. Do not exceed length to width ratio of 2-1/2:1 in expansion joint layout and do not exceed more than 5.5 m (18') in any direction without an expansion joint. Where casing bead is used back-to-back as the expansion joint, back the joint with barrier membrane.
        2. Provide one piece expansion joints at through wall penetrations, for example, above and below doors or windows.
        3. Provide minimum 9 mm (3/8") wide joints where the system abuts windows, doors and other through wall penetrations.
        4. Provide appropriate accessories at stucco terminations and joints.
        5. Provide appropriate sealant at stucco terminations and at stucco accessory butt joints.
        6. Indicate location of joints, accessories, and accessory type on architectural drawings.
      1. Stucco Thickness:
         1. Stucco thickness shall not exceed 22 mm (7/8").
         2. Stucco shall be applied in 2 coats; base and finish coat, to achieve the prescribed thickness.
         3. Thickness shall be uniform throughout the wall area.
  1. QUALITY ASSURANCE
     1. Qualifications: Provide proof of qualifications when requested by Consultant:
        1. Manufacturer / Supplier: Obtain materials from one source with resources to provide products from the same production run for each contiguous area of consistent quality in appearance and physical properties.
        2. Installers: Execute Work of this Section using qualified personnel skilled in installation of work of this Section, having a minimum of three (3) years proven experience of installations similar in material, design, and extent to that indicated for this Project.
        3. Third Party Inspections:
           1. Conduct independent third-party inspections in accordance with code requirements and Contract Documents.
  2. DELIVERY, STORAGE AND HANDLING
     1. Delivery and Acceptance Requirements: Deliver and store packaged materials in their original containers with manufacturer's labels and seals intact.
     2. Store as recommended by manufacturer in a weatherproof enclosure and protect materials during handling and application to prevent damage.
        1. Protect insulation materials from prolonged UV exposure, keep away from sources of heat, sparks, flame, flammable or volatile materials. Store on a clean, flat surface, off the ground in a dry area.
        2. Protect coatings (pail products) from freezing and temperatures in excess of 32 deg C (90 deg F) and store away from direct sunlight.
        3. Protect Portland cement-based materials (bag products) from moisture and humidity. Store under cover off the ground, and in a dry location.
     3. Handle all products as directed on labeling.
  3. SITE CONDITIONS
     1. Ambient Conditions: Proceed with installation when ambient and substrate temperature conditions are within limits permitted by manufacturer and when substrates are free from dirt or wetness arising from frost, condensation, or other causes detrimental to adhesion.
        1. Temperature Range: Above 4 deg C (40 deg F) during application and for 24 hours after set of stucco.
        2. Provide supplementary heat for installation in temperatures less than 4 deg C (40 deg F) such that material temperatures are maintained as indicated above. Prevent concentration of heat on uncured stucco and vent fumes and other products of combustion to the outside to prevent contact with stucco.
        3. Prevent uneven or excessive evaporation of moisture from stucco during hot, dry or windy weather. For installation under any of these conditions provide special measures to properly moist cure the stucco. Do not install stucco if ambient temperatures are expected to rise above 38 deg C (100 deg F) within a 24 hour period.
        4. Provide protection of surrounding areas and adjacent surfaces from application of materials.
  4. 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.
     3. Warranty: Commencing on date of acceptance of Substantial Completion by Consultant.

1. Products
   1. manufacturer
      1. Basis-of-Design products are named in this Section; form the basis-of-design materials 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 and provided they submit requests a minimum of five (5) days in advance of Bid Closing.
      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. ADEX Systems.
         2. Dryvit.
         3. Durabond.
         4. Sto Corp.
   2. MATERIALS
      1. Air and Moisture Barrier: Fluid applied air barrier as indicated in Section 07 27 26 – Liquid Applied Air Barrier Membrane.
      2. Continuous Insulation:
         1. Manufacturers approved non-combustible mineral fibre insulation manufactured in accordance with CAN/ULC S702 and tested in accordance with CAN/ULC S114, as indicated in Section 07 21 56.
      3. Base Coat:
         1. Fibre-reinforced, 100% acrylic-based, asbestos-free product, suitable for levelling between 2.4mm and 6.4 mm (3/32" and 1/4") per coat.
         2. Basis of Design Material: NIVELEX by ADEX Systems Inc.
      4. Glass Fibre Mesh: Meeting ASTM D5034, and as follows:
         1. Starter Mesh: 150g/m2 (4.5 oz/yd2)
         2. Standard Mesh (Design): 150g/m2 (4.5 oz/yd2)
         3. Standard Mesh Plus: 190g/m2 (6 oz/yYd2)
         4. Intermediate Mesh: 375g/m2 (11 oz/yd2)
         5. Armour Mesh: 500g/m2 (15 oz/yd2)
         6. Corner Mesh: 305g/m2 (9 oz/yd2)
      5. Primer: Acrylic and silica mix.
         1. Basis of Design Material: PRIMEX by ADEX Systems Inc.
      6. Finish Coat:
         1. Ready mixed, 100% acrylic-based, ready-to-use, containing integral colour and texture; sourced from the same manufacturer as the base coat, mesh, and primer.
            1. Basis of Design Manufacturer: ADEX Systems Inc.
         2. Colour and Texture: As selected by the Consultant from the manufacturer's standard product line.
      7. Accessories:
         1. Mixing Water: Clean, potable, and free from deleterious materials.
         2. Sand: In compliance with ASTM C 897 or ASTM C 144.
         3. Cement: Lump-free, Type GU cement meeting CSA A3001 standards.
         4. Weep screed, casing bead, corner bead, corner lath, expansion, and control joint accessories. All accessories shall meet the requirements of ASTM C 1063 and its referenced documents.
            1. PVC plastic in compliance with ASTM D 1784.
            2. Zinc in compliance with ASTM B 69.
            3. Galvanized metal in compliance with ASTM A 653 with G60 coating.
         5. Flashing: In accordance with Section 07 62 00 Sheet Metal Flashing and Trim.
      8. Re-Finishing System: Liquid coat specifically designed to renew the appearance of existing stucco substrates and/or change the existing surface colour.
         1. 100% acrylic based.
         2. Interior or exterior use.
         3. Pigmentation: Titanium dioxide and high-quality colourants.
         4. Colour and Texture: To match new stucco finish, as indicated on the Drawings, and approved by the Consultant.
         5. Basis of Design Material: REVIFLEX by ADEX Systems Inc.
   3. MIXES
      1. Mix materials to recommendations outlined by the stucco manufacturer's written instructions.
         1. Use clean, rust-free, high-speed mixer to stir finish to uniform consistency. Add small amounts of clean water to aid workability.
         2. Use of antifreeze agents, accelerators, rapid binders, or other additives is not permitted.
         3. Mix only as much material as can readily be used.
2. Execution
   1. examination
      1. Verification of Conditions: Verify that substrate conditions which have been previously installed under other sections or contracts meet design tolerances and are acceptable for product installation in accordance with stucco manufacturer's instructions prior to installation of exterior stucco finish system.
      2. Inspect surfaces to determine conditions as follows:
         1. Contamination from algae, chalkiness, dirt, dust, efflorescence, form oil, fungus, grease, laitance, mildew, or other foreign substances.
         2. Surface absorption and chalkiness.
         3. Surface cracks: Measure and record location.
         4. Damage and deterioration.
         5. Moisture content and moisture damage: Use moisture meter to determine if surface is dry enough to receive stucco.
         6. Inform Owner and Consultant of unacceptable conditions immediately upon discovery.
         7. Proceed with installation after verification and correction of surface conditions acceptable to manufacturer.
   2. PREPARATION
      1. Protect adjacent surfaces from damage or overspray resulting from stucco work.
         1. Cover adjacent surfaces, fixtures, equipment, landscaping, and other components to protect from over-spraying.
      2. Remove loose or damaged materials by wire brush.
      3. Resurface, patch or level surfaces to required tolerance and smoothness from stucco manufacturer's written instructions.
      4. Ensure foundation waterproofing material is correctly terminated in accordance with stucco manufacturer's written instructions.
   3. coordination
      1. Coordinate installation of foundation waterproofing, roofing membrane, windows, doors, and other wall penetrations to provide a continuous air barrier and continuous moisture protection. Provide protection of rough openings before installing windows, doors, and other penetrations through the wall and provide sill flashing.
      2. Commence the stucco installation after completion of all floors, roof construction and other construction that imposes dead loads on the walls to prevent excessive deflection (and potential cracking) of the stucco.
      3. Sequence interior work such as drywall installation prior to stucco installation to prevent stud distortion (and potential cracking) of the stucco.
      4. Attach penetrations through stucco to structural support and provide airtight and water-tight seals at penetrations.
   4. INSTALLATION
      1. Install in accordance with the manufacturer's written instructions and the contract documents, plumb, true, and level over clean substrate.
      2. Accessory Installation:
         1. Install foundation weep screed at the base of the wall securely to solid substrate or framing with the appropriate fastener. Locate foundation weep screed so that it overlaps the joint between the foundation and framing by a minimum of 25 mm (1"). Locate the foundation weep screed nosing minimum 100 mm (4") above earth grade, 51 mm (2") above finished grade.
         2. Install casing beads at stucco terminations. Install two piece expansion joints (or back-to-back casing beads) at building expansion joints, thru-wall joints in concrete or CMU, where the stucco is to be installed over dissimilar construction or substrates, at changes in building height, at floor lines, columns, and cantilevered areas.
         3. Install full accessory pieces where possible. Seal adjoining pieces by embedding ends in sealant. Abut horizontal into vertical joint accessories.
      3. Stucco Finish System:
         1. Base Coat and Reinforcing Mesh:
            1. Apply an initial layer of base coat to fill any surface cracks or mortar joints.
            2. Allow a minimum of twenty-four (24) hours of drying time before application of the second coat.
            3. Apply a second coat of the base coat mixture (according to the required thickness) to the wall to obtain a smooth and uniform surface.
            4. Embed the glass fibre mesh into the base coat:

The surface shall be smoothed until the mesh is fully embedded.

Lap mesh a minimum of 63 mm (2-1/2") on all sides.

Install glass fibre mesh to heights indicated in the plans.

* + - * 1. All battens and grooves shall have an outward-facing slope to prevent moisture from accumulating on them.
        2. Install an additional coat of the base coat mixture if, after drying, there are imperfections, or the mesh is not completely embedded.
        3. Allow twenty-four (24) hours of cure time prior to installing the finish coat.
      1. Finish Coat and Primer:
         1. With a roller, apply an even coat of primer prior to installing the finish coat.
         2. Trowel-apply a tight coat of the finish coat, texture to a thickness not greater than the largest aggregate. Apply the finish coat in a continuous fashion, maintaining a wet edge. Install finish coat so that levelling and texturing happen together, to provide a uniform appearance.
         3. Avoid applications in direct sunlight.
         4. Finish coat shall not be used where caulking will be applied.
    1. Re-Finishing System:
       1. Mix in accordance with manufacturers written instructions.
       2. Apply two coats of re-finishing liquid applied system using paintbrush, ling-bristled roller, or airless spray gun.
       3. Allow twenty-four (24) hours of cure time between each coat. Final curing of re-finishing system is two (2) weeks.
       4. Environmental Conditions:
          1. Ambient and surface temperatures must be at or above 5 deg C for a minimum of twenty-four (24) hours before, during and after installation.
          2. Do not apply over surfaces that are too hot or in direct sunlight.
  1. CLEANING AND PROTECTION
     1. Provide protection of installed materials from water infiltration into or behind the system. Provide protection of installed stucco, primer and finish coat from dust, dirt, precipitation, freezing, and continuous high humidity until fully dry.
     2. Provide sealant and backer material at stucco terminations to protect against air, water, and insect infiltration. Provide weeps at floor lines, window and door heads, and other areas to conduct water to the exterior.
     3. Progress Cleaning: Leave work area clean at the end of each workday, ensuring safe movement of passing pedestrians.
     4. Final Cleaning: At completion of installation, clean all surfaces so they are free of foreign matter using cleaners recommended by material manufacturer.
     5. Waste Management: Co-ordinate recycling of waste materials and packaging at appropriate facility, diverting waste from landfill. Certified installer shall be responsible for ensuring waste management efforts are practiced.
        1. Clean pails with water prior to recycling.
        2. Collect and separate for disposal paper, plastic, polystyrene, and corrugated cardboard packaging material in appropriate onsite bins for recycling.

END OF SECTION