



EIFS Quality Assurance Program Inc.

National Master Specification
Exterior Insulation and Finish
Systems

Section 07 24 00

Version 2.0 - 2014

EIFS Quality Assurance
Program Inc.
70 Leek Crescent
Richmond Hill, Ontario
www.eifsqap.com

EIFS Council of Canada
70 Leek Crescent
Richmond Hill, Ontario
www.eifscouncil.org





EQI Guide Note: This master specification section is written following the recommendations of the **Construction Specifications Canada (CSC) Manual of Practice**, including the most current versions of *MasterFormat*[™], *SectionFormat*[™] and *PageFormat*[™]. Optional text is indicated by brackets []; delete optional text in the final copy of the project specification. EQI Guide Notes precede, or immediately follow specification text; delete the notes in the final copy of project specification.

EQI Guide Note: Revise the section number and title to suit project requirements, specification practices and section content. Refer to **CSC MasterFormat** for other section numbers and titles that may be suitable for the project. Section numbers that are referenced in this Section, match the numbers and titles found in the most current version of MasterFormat.

EQI Guide Note: This specification section is based primarily on the requirements of **CAN/ULC S716 Series**, the **EIFS Quality Assurance Program Inc., (EQI)** and the **EIFS QAP Manual Document # P200-01**. An EIFS wall cladding satisfying the requirements of S716 Series is comprised of rigid insulation boards attached primarily to the substrate with adhesive, and covered with a lamina consisting of reinforcing mesh embedded in a base coat on the insulation board and covered with a finish coat. The EIFS is used in combination with a Water Resistive Barrier (WRB) and a drained air space, typically achieved through the use of geometrically shaped or grooved EPS or vertical ribbons/channels of adhesive, or a combination of the two.

PART 1 - General

1.1 SUMMARY

- .1 Section Includes: This Section specifies Exterior Insulation and Finish System (EIFS) and includes materials accessories and system placement recommendations.

1.2 RELATED REQUIREMENTS

EQI Guide Note: Although *CSC's MasterFormat* occasionally uses 8 digit numbers, it is recommended that no more than six digit numbers be used in an actual Project Manual.

- .1 Section [03 11 00 Concrete Forming]
- .2 Section [03 40 00 Precast Concrete]
- .3 Section [04 20 00 Unit Masonry]
- .4 Section [05 40 00 Cold-Formed Metal Framing]
- .5 Section [06 10 00 Rough Carpentry]
- .6 Section [07 26 00 – Vapour Retarders]
- .7 Section [07 27 00 – Air Barriers]
- .8 Section [07 65 00 - Flexible Flashings]
- .9 Section [07 90 00 – Joint Protection]



1.3 DEFINITIONS

- .1 *Adhesive* – A material supplied by the EIFS manufacturer and used to adhere the insulation board to the substrate, which includes the LA-WRB
- .2 *Base Coat* – A material supplied by the EIFS manufacturer and used for the embedding of reinforcing mesh over the insulation board (including wrapping details) and preparation of the system to receive finish coat application.
- .3 *Drainage Cavity* – A space between the substrate and the EIFS and formed through use of geometrically defined insulation board, adhesive ribbons, or a combination of the two.
- .4 *EIFS Quality Assurance Inc. (EQI)* - The legal corporation established to oversee the EIFS Quality Assurance Program (QAP).
- .5 *EQI Auditor* - A person who has been trained, certified and licensed by EQI to conduct surveillance audits on QAP Projects.
- .6 *EQI EIFS Manufacturer* – The developer and producer of the proprietary EIFS destined for use on the project for which this spec applies and licensed through EQI.
- .7 *EQI EIFS Mechanic* - An individual EIFS worker employed by the EIFS contractor, registered with EQI and certified as a Level 1 through 4 mechanic with Level 4 being the higher qualification.
- .8 *EQI EIFS Contractor* – An independent entity licensed through EQI for the execution of EIFS work where QAP is specified and to whom the EIFS contract is awarded

EQI Guide Note: All QAP projects require a minimum 1 Level 3 or 4 certified mechanic for every 1 level 2 or lower EIFS mechanic on the project.

- .9 *Geometrically Defined Drainage Cavity* – A space created between the substrate and the thermal insulation board through the use of thermal insulation board that has a pattern cut or formed into its back surface.
- .10 *Lamina*: A rendered composite consisting of reinforced base coat material and finish and providing the primary barrier to moisture intrusion on completed EIFS.
- .11 *Liquid Applied Water Resistive Barrier (LA-WRB)* – A low water absorption membrane that is fluid applied over the substrate by trowel, spray or roller providing an adhesively compatible substrate for the application of the EIFS as well as water ingress protection as part of the water resistive barrier system.
- .12 *Transition Membrane* – A sheet or fluid applied membrane designed to bridge and/or connect elements of the building envelope and WRB and maintaining continuity across substrate system interruptions such as at expansion joints.



- .13 Water Resistive Barrier System (WRB) - Material(s) possessing low water absorption properties that are applied over substrates and transition locations to create a continuous membrane that prevents water penetration into the wall assembly.

EQI Guide Note: Retain References Article when specifying products and installation by an industry reference standard. Indicate issuing authority name, acronym, standard designation and title. Contract Conditions or Section 01 42 19 - Reference Standards may establish the edition date of standards. This Article does not require compliance with a standard, but is merely a listing of references used. Article below should list only those industry standards referenced in this section after it has been edited for a project. Retain only those reference standards to be used within the text of the project specific Section.

Add and delete as required for specific project.

1.4 REFERENCES

- .1 ASTM International Inc.
- .1 ASTM C1382 [2005], Test Method for Determining Tensile Adhesion Properties of Sealants When Used in Exterior Insulation and Finish Systems (EIFS) Joints.
- .2 EIFS Quality Assurance Program Inc. (EQI)
- .1 EIFS QAP Manual Document # P200-01
- .3 Health Canada/Workplace Hazardous Materials Information System (WHMIS)
- .1 Material Safety Data Sheets (MSDSs).
- .4 National Research Council of Canada (NRC)
- .1 Canadian Construction Materials Centre (CCMC)
- .5 Underwriter's Laboratories of Canada (ULC).
- .1 CAN/ULC-S701-11 "Standard for Thermal Insulation, Polystyrene, Boards and Pipe Covering" / Annex A – forms a mandatory part of the standard for EPS thermal insulation boards destined for use within EIFS.
 - .2 CAN/ULC-S702-09 "Standard for Mineral Fibre Thermal Insulation for Buildings
 - .3 CAN/ULC-S710.1-11, "Standard for Thermal Insulation – Bead-Applied One Component Polyurethane Air Sealant Foam", Part 1: Materials Standard for Thermal Insulation - Bead - Applied One Component Polyurethane Air Sealant Foam, Part 1: Materials."
 - .4 CAN/ULC-S710.2 -11, "Standard for Thermal Insulation – Bead-Applied One Component Polyurethane Air Sealant Foam, Part 2: Installation."
 - .5 CAN/ULC-S716.1 -12, "Standard for Exterior Insulation and Finish Systems (EIFS) – Materials and Systems"
 - .6 ULC-S716.2 -12, "Standard for Exterior Insulation and Finish Systems (EIFS) – Installation."
 - .7 ULC-S716.3 -12, "Standard for Exterior Insulation and Finish Systems (EIFS) – Design Practices Guide."



EQI Guide Note: Dates associated with above referenced standards are the most current at the time of this specification and should be updated should a more current version become available. Earlier versions of the listed standards should not be considered applicable.

1.5 ADMINISTRATIVE REQUIREMENTS

- .1 Pre-Installation Meeting: Convene meeting [1] week prior to beginning work of this Section [and on-site installation], with *EQI EIFS Contractor*, lead *EQI EIFS Mechanic*, [*EQI Auditor*], [EIFS manufacturer's technical representative] and [Consultant] [Design Authority] in accordance with Section [01 31 19 - Project Meetings] to:
 - .1 Verify project requirements;
 - .2 Review installation and substrate conditions;
 - .3 Review co-ordination with other subtrades;
 - .4 Review manufacturer's written instructions and warranty requirements.
- .2 Sequencing: Comply with CAN/ULC-S716.2-12 for sequencing construction operations with other/related work.

1.6 ACTION SUBMITTALS

- .1 General: Submit listed action submittals in accordance with Contract Conditions and Section [01 33 00 - Submittal Procedures].
- .2 Product Data: Submit product data, including manufacturer's technical data sheet, for specified products.
 - .1 Submit WHMIS - Material Safety Data Sheets for all controlled products/materials.
 - .2 Submit product data sheets for system materials, including product characteristics, performance criteria and limitations.
 - .3 Current and complete *EQI EIFS Manufacturer's* installation instructions.
- .3 Submit *EQI EIFS Manufacturer's* current conformity "Listing" verifying the [specified system's] compliance with:
 - .1 CCMC Technical Guide for EIFS, or
 - .2 CAN/ULC-S716.1-12 "Standard for Exterior Insulation and Finish Systems (EIFS) System and Materials"
- .4 Shop Drawings: Indicate information on shop drawings as follows:
 - .1 Submit shop drawings showing EIFS including its components, product names and accessories.
 - .2 Indicate wall layout, details, expansion joints, perimeter joints, installation sequence, including interface with doors, windows, water resistive barrier system, air barrier system, vapour retarders, flashings and sealants.
 - .3 Ensure Shop Drawings are reviewed by [Architect] [Engineer] licensed in [Province] [Territory] of [_____].



EQI Guide Note: Shop drawing details for connections of windows, louvres and other wall penetrations need to be coordinated with the work of various sub-trades. Shop drawings are to indicate items forming part the *EQI EIFS Contractor's* scope of work. Items outside said scope shall be identified and coordinated across various sub-trades, the project's design consultant and the General Contractor. Shop drawings for expansion joints are to show how the expansion joint(s) will be detailed and executed, but do not define their location, which remains the responsibility of the project's design consultant and should be indicated on project plans. Owner or Owner's representative may request submission of test reports.

- .5 Samples: Submit as follows:
 - .1 Duplicate [150 x 150] mm colour samples of EIFS on backing of manufacturer's choice for each colour and texture of finish coat prior to construction of mockup.
 - .2 Duplicate [300 x 300] mm samples of EIFS component construction showing corner section and exposing layers of EIFS application applied over a sheathing that includes the LA-WRB and termination strategy for drainage locations.
 - .3 For prefabricated panelized EIFS, sample is to also include framing and panel perimeter treatment in the layered format as noted above.
 - .4 Duplicate [150 x 150] mm samples of reinforcing mesh.
- .6 Certification Reports: Submit certification reports showing compliance with specified performance characteristics and physical properties to [CAN/ULC-S716.1] [CCMC Evaluation Report].

1.7 INFORMATION SUBMITTALS

- .1 Quality Assurance:
 - .1 *EQI EIFS Manufacturer*: Submit verification of accreditation and licensing with EQI.
 - .2 *EQI EIFS Contractor*: Submit verification of accreditation and licensing with EQI.
 - .3 Certification Reports: Submit certification reports showing compliance with specified performance characteristics and physical properties, water infiltration and structural performance.

EQI Guide Note: Coordinate paragraph below with Part 3 Field Quality Requirements Article. Retain or delete as applicable.

- .2 *EQI EIFS Manufacturer's* Field Reports: Submit manufacturer's field reports when and where issued. Manufacturer's reports do not supplant the findings of an EQI Auditor's report(s).

EQI Guide Note: Coordinate paragraph below with Part 3 Field Quality Requirements Article. Retain or delete as applicable.

- .3 *EQI Auditor's* Field Reports: Submit *EQI Auditor's* reports in accordance with EQI requirements.



1.8 CLOSEOUT SUBMITTALS

- .1 Warranty: Submit warranty documents specified.
- .2 Operation and Maintenance Data: Submit Operation and Maintenance data for installed products in accordance with Section [01 78 00 - Closeout Submittals].
 - .1 Include manufacturer's instructions covering maintenance requirements.
 - .2 Submit to EQI Daily Work Record as per Section 7.6.1.3 of the QAP manual
 - .3 Submit to the [building owner] [building owner's representative] the QAP Project Completion Declaration as per Section 7.6.1.4 of the QAP manual.

1.9 QUALITY ASSURANCE

- .1 Manufacturer Qualifications:
 - .1 EQI licensed and accredited for the system and materials specified to meet the performance requirements of this specification.
 - .2 Manufacturing under a quality assurance program overseen by the Certification Body under whose certification mark the materials are produced.
- .2 Contractor Qualifications:
 - .1 EQI Licensed, accredited and duly bonded under EQI for projects [>100 <5000 square feet] [>5000 <10000 square feet] [>10000 <20000 square feet] [>20000 square feet] and within gross annual installed area allowance for bonding level.
 - .2 Minimum [5] years experience on projects of similar [size], [scope] and [complexity].
 - .3 Recognized by the specified *EQI EIFS Manufacturer* and possessing the manufacturer's training certificate for the EIFS specified.
 - .4 Employ and have on site at all times no less than one Level 4 EQI Licensed Mechanic and one Level 3 or 4 EQI Licensed Mechanic for every Level 1 or 2 EQI Registered Mechanic on site.

EQI Guide Note: Article below should list obligations for compliance with specific code requirements particular to this section. General statements to comply with a particular code are typically addressed in Contact Conditions and Section 01 41 00 - Regulatory Requirements. Repetitive statements should be avoided. Current data on building code requirements and product compliance may be obtained from manufacturer's technical support specialists.

.3 Regulatory Requirements:

EQI Guide Note: EIFS must meet the requirements of building codes and zoning bylaws issued by Federal, Provincial, Territorial and Municipal government authorities having jurisdiction. Ensure that project specification section reflects the need to meet these requirements. Edit Articles below as applicable.



- .1 Comply with [National Building Code of Canada (NBC)] [Building Code for [Province] [Territory] of [_____]].
 - .2 [System is to comply with Article 3.1.5.5. Combustible Components in Exterior Walls for use in noncombustible construction.]
 - .3 [System is to comply with testing requirements of Article 3.2.3.8. where spatial separations require.]
 - .4 Comply with [CCMC Evaluation Report] [or] [CAN/ULC-S716 series of standards].
- .4 Mockup: Construct in accordance with Section [01 43 39 - Mockups].
- .1 Construct [3 x 3] m full-scale mock-up of typical EIFS wall assembly including window installation and sample of other penetration or critical detail where directed by [Consultant].
 - .2 Insure mockup includes all adjacent materials
 - .3 Allow [48] hours for inspection of mock-up by [Consultant] [and] [or] [EIFS Site Auditor] [EIFS manufacturer's technical representative].
 - .4 Start work only after receipt of written acceptance from [Consultant].
 - .5 Mockup will demonstrate minimum quality of work for this project.
 - .6 Mockup may [not] be included as part of work.

1.10 DELIVERY, STORAGE AND HANDLING

- .1 Deliver store and handle in accordance with Section [01 61 00 - Common Product Requirements] and to CAN/ULC-S716.2.-12
- .2 Ordering: Comply with manufacturer's ordering instructions and lead-time requirements to avoid construction delays.
- .3 Comply with requirements of Workplace Hazardous Materials Information System (WHMIS) regarding use, handling, storage, and disposal of hazardous materials.
- .4 Delivery:
 - .1 Deliver materials in manufacturer's original packaging with identification labels intact and in quantities to suit project.
 - .2 EIFS material labeling to include Certification Mark (e.g. ULC or Warnock Hersey) [and/or CCMC Evaluation Report Number]. Products not so labeled will not be allowed on site.
 - .3 Include batch numbers or production date, expiration date, mixing instructions and required WHMIS information,
- .5 Storage and Protection:
 - .1 Store materials protected from exposure to harmful weather conditions and at [4] degrees C minimum, 60 degrees C maximum.
 - .2 Store thermal insulation boards in original packaging until time of use, stacked flat, fully supported, off ground, dry, and under cover.
 - .3 Avoid damage to edges, ends, or surfaces. Do not expose to direct sunlight before use.
 - .4 Store reinforcing mesh cartons on side (not upright) in dry area protected from sunlight.
 - .5 Protect dry cement based materials (bag products) from moisture and humidity. Store off the ground, protected from sunlight, rain and ground moisture.



1.11 PROJECT AMBIENT CONDITIONS

EQI Guide Note: Weather conditions affect application and drying time. Hot and/or dry conditions limit working time and accelerate drying that may require adjustments in the scheduling of work to achieve desired results; cool and/or damp conditions extend working time and retard drying and may require added measures for protection against wind, dust, dirt, rain and freezing.

- .1 Installation Location: Maintain ambient and substrate surface temperatures above 4 degrees C for 24 hours before application. After application maintain ambient at required minimum temperature to insure applied material's surface temperatures is sustained at a minimum 4 degrees C until fully dry in accordance with EIFS manufacturer's published recommendations.

EQI Guide Note: If outside weather conditions prevent application, covering and space heating may be utilized to maintain the substrate at 4°C. Once the insulation is installed the adhesive will be insulated from the exterior, and may drop below 4°C despite exterior temporary heating. In these situations, the interior temperature of the facility must also be maintained above 4°C. Once EIFS materials have dried, heating is no longer required. Further, maintaining a wet material's surface temperature at 4 degrees C will require an increase in ambient temperatures from the minimum 4 degrees C until majority of water has evaporated. Curing will require no less than 4 degrees C, or higher for the period of time specified by the manufacturer.

- .2 Cover and heat space surrounding application area as required to maintain minimum project ambient, surface and material temperature conditions.
 - .1 Ensure surface temperature of applied materials remains above 4°C.

EQI Guide Note: Heating of the covered space may increase the moisture content of the air, which in turn may affect the drying time of the base coat, finish coat or the complete lamina. This is particularly evident when heating by direct fired propane, or natural gas, which produces water vapour as a by-product of combustion. Indirect forced air heaters are preferable.

- .2 Ensure adequate ventilation of covered space.

EQI Guide Note: Coordinate Article below with Contract Conditions and with 01 78 36 – Warranties, EQI requirements and those of the EIFS manufacturer.

1.12 WARRANTY

- .1 Project Warranty: Refer to Contract Conditions for project warranty provisions.
- .2 *EQI EIFS Manufacturer's Warranty*: Submit, for Owner's acceptance, manufacturer's standard warranty document executed by authorized company official. Manufacturer's limited material warranty covers materials for period of [5] years.
- .3 *EQI EIFS Contractor's Warranty*: Submit, for Owner's acceptance, contractor's warranty document executed by authorized company official. Contractor's limited installation warranty covers installation for period of [5] years.
- .4 Warranty: Commencing on date of acceptance of [Substantial Completion] by [Consultant] and no more than 6 months from the date of EIFS completion



PART 2 - Products

2.1 MANUFACTURERS

EQI Guide Note: Choose the option that best meets the project requirements.

- .1 EQI Licensed for the specified EIFS

EQI Guide Note: At the time of this publication, both CCMC Evaluation Reports and S716.1 Certification reports were considered acceptable to EQI.

- .2 [CCMC Evaluation Report], [or] [S716.1-12 Certification report] for specified EIFS,
- .3 Certification report for compliance with [CAN/ULC-S134-92], [CAN/ULC-S101] for system type and specified insulation thickness.

2.2 DESCRIPTION

- .1 Regulatory Requirements: Specified EIFS to have required testing in accordance with [National Building Code of Canada] [Building Code of [Province] [Territory] of []], Canada.

- .1 Ensure system and materials [comply with criteria in [CCMC Evaluation Report] [CAN/ULC S716.1].
- .2 Design system in accordance with ULCS716.3 and EIFS Best Practice Guide

EQI Guide Note: 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 vapour diffusion and condensation. Adjust insulation thickness and/or other wall assembly components accordingly to minimize the risk of condensation.

2.3 PERFORMANCE AND DESIGN CRITERIA

- .1 Test system and components [to CAN/ULC-S716 Series] [and] [comply with criteria in CCMC Technical Guide for EIFS].
- .2 Substrate Maximum System Deflection Normal to Wall Plane: L/240.

EQI Guide Note: Supply flashing to direct water to the exterior where it is likely to penetrate components in the wall assembly, especially where upper walls do not align with lower walls.

- .3 Supply flashing at doors, windows, sills, roof and wall intersections, abutments of lower walls with higher walls, above projecting features, and, at wall bases.
- .4 Ensure higher impact resistance of system to [1.8 metres] minimum above grade and in locations indicated.
- .5 Include [20] mm minimum expansion joints as indicated and at locations as follows:
 - .1 At substrate expansion joints;
 - .2 At changes in building height;
 - .3 At floor lines of wood structures;
 - .4 At floor lines in cold-formed steel framed structures where deflection track



- (nested stud assembly) is used.
- .5 At changes in substrate material that result in differential substrate deflection and/or substrate behavior;
 - .6 At changes in roof, building shape or structural system;
 - .7 Where EIFS abuts dissimilar material

- .6 Include [13] mm minimum perimeter expansion joint between EIFS and adjacent components such as doors and windows..

EQI Guide Note: Sealant joints and air barrier connections should be included at windows, doors and other penetrations through the EIFS.

- .7 Include sealant joints and air barrier connections at penetrations through EIFS as follows:
 - .1 Ensure joint widths are [4] times minimum greater than anticipated range of movement;
 - .2 Sealant width to depth ratio: [4:1] [3:1] [2:1];
 - .3 Design joints with secondary moisture protection and drain joints to exterior;
 - .4 Design joints to prevent air movement around building between sealant and air barrier.
 - .5 Design joints using two stage seals, closed cell backer rod, bond breaker tape, primer and accessories in accordance with Section [07 92 00 – Joint Sealants];
 - .7 Connect to [vapour retarder] [and] [air barrier system][s] in accordance with Section [07 26 00 – Vapour Retarders] [and Section] [07 27 00 – Air Barriers].
- .8 Sealant Adhesion: To ASTM C1382.

EQI Guide Note: The application of joint sealants is normally specified in a separate Section of the specifications. Specify compatible backer rod and sealant that has been evaluated to ASTM C1382, "Test Method for Determining Tensile Adhesion Properties of Sealants When Used in Exterior Insulation and Finish System (EIFS) Joints," and that meets minimum 50% elongation after conditioning. Installation of sealants should be to ASTM C1481 "Standard Guide for Use of Joint Sealants with Exterior Insulation and Finish Systems (EIFS)". It is recommended that the specification Section for joint sealants include a requirement that the sealant manufacturer coordinate the proposed sealant material with the EIFS system and ensure:

- surface preparation requirements;
- priming and application procedures;
- proper joint backing material is selected;
- sealants are suitable for purposes intended and joint designs;
- sealants are compatible with other materials and products with which they come in contact, including but not limited to cladding systems and finishes, air/vapour barriers, membranes, metals and metal finishes;
- sealant system will not stain the EIFS finish;
- sealant is suitable for temperature, humidity and weather conditions at the time of application.



2.4 MATERIALS

- .1 Ensure materials comply with [CAN/ULC S716.1] [criteria in CCMC Technical Guide for EIFS] and are listed in accompanying conformity report for system specified.

EQI Guide Note: It is essential that all components for the EIF system be supplied by a single manufacturer. Mixing different manufacturers' components may result in unknown behavior or system failure. Depending on the manufacturer, there may be a number of different LA-WRBs and base coat/adhesives to choose from for any particular system. Insure whichever material is selected has been tested in accordance with specified evidence of conformity (e.g. S716.1-12).

- .2 LA-WRB: To [CAN/ULC –S716.1-12] [CCMC Technical Guide for EIFS] and in accordance manufacturer's written recommendations.
- .3 Adhesive: To [CAN/ULC-S716.1] [criteria in CCMC Technical Guide for EIFS], and to manufacturer's written recommendations

EQI Guide Note: Minimum required thickness is 25 mm and maximum allowable thickness should be in compliance with tested thickness to required test method as prescribed by code and authority having jurisdiction.

- .4 Insulation Board: CAN/ULC-S701.1-11 Annex A, Type 1 Expanded Polystyrene [25] mm thick minimum [thickness as indicated]
- .5 Base Coat: To [CAN/ULC-S716.1] [criteria in CCMC Technical Guide for EIFS], and to manufacturer's written recommendations.
- .6 Reinforcing Mesh: Open-weave, [symmetrical], [interlaced] [double strand] interwoven glass fibre fabric with alkaline resistant coating to [CAN/ULC S716.1] [criteria in CCMC Technical Guide for EIFS].
 - .1 Weight: [145] grams per square metre and providing no less than standard impact resistance of 10 J.
 - .2 Impact resistance: [Ultra-high], [High], [450] grams per square metre minimum

EQI Guide Note: To achieve ultra-high impact resistance classification, heavy duty reinforcing mesh must be used beneath regular reinforcing mesh. It is recommended that ultra-high impact resistance be specified for areas accessible to pedestrian traffic or other public spaces to a height of no less than 1.8m above grade. Refer to manufacturer's technical documentation for mesh requirements and additional information.

- .7 Specialty Reinforcing Mesh:

EQI Guide Note: Specify backwrapping mesh for both backwrapping applications and aesthetic detailing applications. Reinforcing mesh comes in a variety of weights depending on the manufacturer. Refer to manufacturer's technical literature for accurate mesh weights.

- .1 Backwrapping mesh: [140] grams per square metre minimum, open-weave, flexible, symmetrical, interlaced glass fibre fabric with alkaline resistant coating and meeting [CAN/ULC S716.1] [criteria in CCMC Technical Guide for EIFS].



EQI Guide Note: Use the following paragraph to specify heavier duty reinforcing mesh for both inside and outside corners. Reinforcing mesh comes in a variety of weights depending on the manufacturer. Refer to manufacturer's technical literature for accurate mesh weights.

- .2 Corner reinforcing mesh: [200] grams per square metre minimum, pre-cresed open- weave, glass fibre fabric with alkaline resistant coating to [CAN/ULC S716.1] [criteria in CCMC Technical Guide for EIFS].
- .8 Primer: Acrylic based, tinted to match finish colour
- .9 Finish Coat: acrylic based textured wall coating [1 to 3] mm thick minimum with graded aggregate and meeting [CAN/ULC S716.1] [criteria in CCMC Technical Guide for EIFS].

EQI Guide Note: The Light Reflectance Value is expressed as a percentage of light reflected back from the surface of the finished material. The use of very dark colours is not recommended with EIFS that incorporate expanded polystyrene (EPS). EPS has a sustained service temperature limitation of approximately 71°C. Colours with a Light Reflectance Value of less than 20% may result in deterioration and breakdown of the insulation material in some exposure conditions. Refer to manufacturer's technical documentation for Light Reflectance Values for various colours. Note that on northern exposed walls the risk is less. Consider adding a colour schedule for multi colour EIFS projects either at the end of this section or on the drawings. See sample schedule at end of Section.

- .1 Colour [] with Light Reflectance Value [20] % minimum.

2.5 ACCESSORIES

- .1 Mixing Water: Clean, potable and free from deleterious materials.

EQI Guide Note: Type GU Portland Cement was previously known as Type 10.

- .2 Portland Cement: To CAN/CSA A3001, Type GU.

EQI Guide Note: Concrete surface conditioner is beneficial to bind dust which otherwise could inhibit adhesion. There is also a concern among the manufacturers that the wrong concrete conditioner could cause adhesion problems for the EIFS. Insure concrete conditioner is supplied by the EIFS manufacturer.

- .3 Concrete Conditioner: Acrylic based surface conditioner in accordance with EIFS manufacturer's written recommendations.

EQI Guide Note: Check with manufacturer before specifying bead applied foam insulation.

- .4 Bead Applied Foam Insulation: Single component, moisture cure, low expansion rate spray-in-place polyurethane liquid foam insulation to ULC-S710.1 and in accordance with manufacturer's written recommendations.

EQI Guide Note: There is concern among EIFS manufacturers that the wrong substrate leveler could cause adhesion problems for the EIFS. Before using this paragraph check with the EIFS manufacturer for availability of a proprietary leveler. Where not available from the *EQI EIFS Manufacturer*, insure compatibility between the substrate leveler and the EIFS LA-WRB.



- .5 Substrate Leveler: Polymer-modified, cement-based, glass fibre reinforced concrete leveler in accordance with EIFS manufacturer's written recommendations.

2.6 SOURCE QUALITY CONTROL

- .1 Ensure all EIFS components, LA-WRB, WRB, base coat, finish coat materials and accessories are from a single EIFS manufacturer and meeting the requirements of this specification.

PART 3 - Execution

3.1 INSTALLERS

- .1 All installers to be registered with EQI
 - .1 One Level 4 *EQI Licensed Mechanic* shall be on site at all times during the EIFS installation.
 - .2 There shall be no less than one Level 3 or 4 *EQI Licensed Mechanic* for every Level 2 or 1 EQI Mechanic on site.

3.2 MANUFACTURER'S INSTRUCTIONS

- .1 Compliance: Comply with manufacturer's written data, including product technical bulletins, product catalogue installation instructions, product carton installation instructions and technical data sheets.

3.3 EXAMINATION

- .1 Site Verification of Conditions:
 - .1 Verify that substrate conditions which have been previously installed under other sections or contracts meet design tolerances to CAN/ULC-S716.2 and are acceptable for product installation in accordance with manufacturer's instructions prior to installation of EIFS.
 - .2 Inspect surfaces to determine conditions as follows:
 - .1 Contamination from algae, chalkiness, dirt, dust, efflorescence, form release agents, 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 moisture content is dry enough to receive EIFS.
 - .3 Inform [Consultant] [Project Authority] of unacceptable conditions immediately upon discovery.
 - .4 Proceed with installation only after unacceptable conditions have been remedied by responsible party and conditions have been verified by Project Authority as acceptable.



3.4 PREPARATION

- .1 Prepare substrates to receive EIFS to CAN/ULC S716.2 and as recommended in manufacturer's written instructions.
 - .1 Ensure concrete surfaces are free from form release agents, efflorescence and other deleterious materials.
- .2 Protect adjacent surfaces from damage or overspray resulting from EIFS work.
 - .1 [Mask] [Cover] adjacent surfaces, fixtures, equipment, landscaping and other components to protect from over-spraying.
- .3 Resurface, patch or level surfaces to required tolerance and smoothness with [manufacturer's] [appropriate] leveling materials as recommended in manufacturer's written instructions and to CAN/ULC- S716.2-12.

3.5 MIXING

- .1 Mix materials to [CAN/ULC-S716.2] and as recommended in 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.
 - .1 Ensure drill rotational speed is 500 rpm maximum.
 - .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.

3.6 INSTALLATION - GENERAL

- .1 Do all EIFS work in accordance with CAN/ULC-S716.2-12.

EQI Guide Note: Co-ordinate installation as indicated on architectural details and with the manufacturer's written installation instructions. Refer to manufacturer's written EIFS installation instructions.

- .2 Install WRB in accordance with manufacturers written instructions and to CAN/ULC-S716.2.-12.
- .3 Install EIFS in accordance with manufacturer's written instructions.
 - .1 Incorporate expansion joints as required.
 - .2 Ensure expansion joints align with building structural expansion joints, as identified on project plans and as itemized in Section 2.3.5. of this specification.
- .4 Coordinate EIFS work with work of other trades, for correct installation time and sequence.



3.7 INSTALLATION

EQI Guide Note: Pre-wrapping is done to the insulation board at horizontal joints, window heads, and other locations. Although pre-wrapping could still be done elsewhere, other areas are generally treated by “back-wrapping”. Wrapping of insulation board with full encapsulation of reinforcing mesh must be done at all board terminations including, but not limited to system penetrations, door frames, window frames, expansion joints, system terminations and at joints with roofs, appurtenances and other materials. Insure that all wrapping whether by pre-wrapping or backwrapping is consistent with manufacturer’s termination details for the accommodation of drainage to the exterior and fire listings when and where applicable.

.1 Pre-wrapping: To CAN/ULC-S716-12 Series.

- .1 Pre-wrap insulation boards at terminations with [base coat] [adhesive] and mesh prior to installation of panels at horizontal edges and window edges.

When back-wrapping, the mesh is adhered to the substrate by embedding in base coat/adhesive first, then insulation board is installed and the mesh is wrapped around the board when the base coat is installed.

.2 Back Wrapping: To CAN/ULC-S716-12 Series.

- .1 Backwrap insulation board at terminations with base coat and mesh prior to installation where required by manufacturer’s termination requirements for drainage performance. .
- .1 Rasp back of insulation board to maintain minimum drainage cavity as identified in manufacturer’s test report.
- .2 Allow adequate amount of mesh to wrap around board edge and cover [as required by manufacturer’s test report in mm] minimum on outside surface of board.
- .3 Allow adhesive to completely dry.

EQI Guide Note: Rainscreen EIFS can be achieved by the application of adhesive ribbons between the insulation board and the WRB, by the use of geometrically shaped insulation board, or a combination of both. Regardless of strategy employed, all systems must meet the drainage efficiency requirements of S716.1-12, or CCMC Technical Guide for EIFS. In the following paragraph, choose the option for the base system specified and meeting project requirements for substrate type and construction tolerances.

- .3 Apply [adhesive] [LA-WRB Adhesive] as per CAN/ULC-S716.2-12 and in accordance with manufacturers written instructions.

EQI Guide Note: Use the following paragraph for spray applied adhesive applications. Delete paragraph if trowel applied.

- .4 Spray apply adhesive to substrate to a minimum [6] mm thick.

EQI Guide Note: Use the following paragraph for adhesive ribbons only when they are needed to meet project requirements.

- .5 Form uniform vertical ribbons of adhesive using notched trowel on the back side of the insulation board.



- .6 Press boards to substrate ensuring full adhesion. Do not slide boards into position.
 - .1 Insure the insulation board joints bridge vertical and horizontal sheathing joints by no less than 150mm.
 - .2 Apply boards in running bond pattern offset [75] mm minimum with long edge parallel to horizontal.
 - .1 Apply firm pressure over entire surface of each board to insure uniform bond.
 - .2 Install insulation boards tight to adjacent boards, free of gaps or voids.
 - .3 Interlock thermal insulation joints at inside and outside corners.
 - .3 Terminate insulation an additional [3] mm minimum from expansion joint locations when forming EIFS joint so to achieve minimum [20]mm wide completed joint width following backwrapping.
 - .4 Cut insulation board in L-shaped pattern to fit around openings.
 - .5 Ensure board joints do not align with corners of openings.
 - .6 Butt boards tightly together avoiding adhesive between the insulation board joints (included at inside and outside corners) at all times.

EQI Guide Note: CAN/ULC-S716.2-12 allows use of use of bead applied expanding foam in gaps not exceeding 3.2 mm. Edit the following paragraph to meet project requirements.

- .7 Fill open joints between insulation boards greater than 1.6 mm with [slivers of insulation board material] [spray-in-place polyurethane foam installed to CAN/ULC-S710.2].
 - .1 Use expanding foam insulation only in gaps 3.2 mm or smaller.
 - .2 Ensure bead applied foam insulation penetrates 19 mm minimum into gaps between thermal insulation boards.
- .8 Allow adhesive to dry [24] hours minimum prior to start of rasping

EQI Guide Note: Thicker insulations applied under cool, or heating and hoarding conditions may required a considerably longer wait time between adhesive application and start of rasping. Increase minimum period to allow adhesive to harden and form its bond to the substrate. Verify bond by insulation board removal and replacement during mock-up construction and adjust/increase cure period accordingly.

- .9 Rasp insulation board to produce smooth even surface.
 - .1 Ensure no planar difference at insulation board joints when rasping is completed,
 - .2 Ensure surface variance is [3] mm in 1220 mm maximum in each direction across flat wall areas.
 - .3 Thermal insulation board thickness after rasping shall be no less than 20 mm at any location.

EQI Guide Note: Over time, UV degradation of foam plastic insulation is apparent by a yellowing and/or powder on the surface of the thermal insulation board. If this occurs, the residue must be entirely removed by rasping the surface before the application of the base coat.

- .10 Rasp insulation affected by ultraviolet rays in accordance with CAN/ULC-S716.2.
- .11 Replace any damaged insulation and rasp flat prior to completion of rasping and commencing with base coat application.

EQI Guide Note: Use the following paragraph when mechanical fastening is used for securing back wrapped insulation board panels instead of adhesive. Only use mechanical fasteners under exceptional circumstances.



- .7 Mechanical Fastening: Mechanically fasten insulation board panels to substrate system.
 - .1 Ensure mechanical fasteners are sealed against moisture penetration.
 - .2 Use mechanical fasteners only after receipt of written approval from [Consultant].
 - .3 Pre-spot over mechanical fasteners with base coat and allow to dry completely before continuation of EIFS application.

EQI Guide Note: The recommended method is to apply the base coat in two (or more) applications. The total dry thickness of the base coat as measured from the surface of the thermal insulation board at any point of the measure should not be less than the minimum specified by the EIFS manufacturer as complying with the requirements of their S716 or CCMC Evaluation report, or 1.6mm whichever is greater and may not be averaged over any given area. The reinforcing mesh colour should not be visible through the base coat although the reinforcing mesh pattern may be slightly visible.

- .8 Base Coat Application: To CAN/ULC-S716.2-12.
 - .1 Using stainless steel trowels, apply base coat over the insulation board in areas that allow for the immediate embedding of mesh into wet material and repeat until the entire surface is fully reinforced.
 - .1 Install high impact and pre-formed corner reinforcing mesh at locations indicated on project plans. Tightly butt high impact mesh with gaps no greater than 3 mm at seams. Do not overlap high impact mesh joints.
 - .2 Areas of high impact mesh are to be allowed to set, or fully dry in accordance with manufacturer's published instructions.
 - .3 Install standard mesh over high impact mesh and balance of exposed insulation.
 - .4 Standard mesh is to be overlapped at mesh joint locations minimum of 67mm or greater as required by the manufacturer's published instructions. Inside and outside corners are to have no vertical joints in the mesh within 200mm of either side of the corner and no less than two layer of mesh applied from opposing sides of the corner.
 - .5 Trowel smooth to ensure mesh colour is not visible while maintaining full encapsulation of the mesh in base coat.
 - .6 Reinforce first [1.8] m minimum above grade using [1] layer of standard reinforcing mesh and [1] layer of heavy duty reinforcing mesh.
 - .7 Reinforce corner of openings "butterfly" of detail reinforcing mesh [200] mm minimum, in accordance with manufacturer's written instructions.
 - .2 Apply base coat [2.0] mm minimum over entire surface of insulation board, including areas with high impact and corner reinforcing mesh and adequate material to completely embed reinforcing mesh.
 - .3 Trowel mesh from center to outside edges.
 - .1 Feather out base coat on each side of mesh overlaps.
 - .2 Avoid wrinkles in mesh.
 - .4 Ensure mesh is fully embedded and mesh colour is not visible when base coat application is completed.
 - .1 Base coat thickness: [1.6] mm minimum, as required by *EIFS Manufacturer's* conformity assessment and at no time less thick. Thickness may not be average across the field of the wall.



EQI Guide Note: use the following paragraph only if mechanical fasteners are used to secure back wrapped insulation board panels.

- .5 Ensure base coat completely covers and seals mechanical fasteners.

EQI Guide Note: Use the following paragraph for sloped surfaces.

- .6 Apply base coat to weather exposed slope when trim, reveals, aesthetic bands, cornice profiles, sills or other architectural features projecting vertical wall plane.
 - .1 Ensure slope is minimum [22.5] [45] degrees to horizontal.
- .7 Allow base coat to dry [24] hours minimum prior to applying primer.

EQI Guide Note: Rapid drying of finish coat may cause surface to tear during floating process. If work is exposed to ambient conditions that will cause rapid drying, protect work from conditions for duration of installation and application of EIFS.

- .9 Finish Coat Application:

EQI Guide Note: Include the following paragraph if primer is required.

- .1 Prime reinforced, base coat covered boards prior to application of finish coat.
 - .1 Allow primer to completely dry prior to applying finish coat.
 - .2 Small amount of mixing water may be added with finish coat materials to aid workability.
 - .3 Apply finish coat directly over primed base coat.
 - .4 Apply finish coat to primed base coat using [trowel] [spray applicator equipment].
 - .1 Apply finish coat at thickness equal to size of largest texturing aggregate
 - .2 Shade work to prevent application in direct sunlight and rapid setting of finish.
 - .3 Use tarpaulins to protect finish from scaffold shadow texture lines.
 - .4 Supply equipment, materials and work crew of sufficient size to ensure a continuous application within boundaries of wall area between natural break without cold joints.
 - .5 Ensure separate batches of finish coat are not installed side by side.
 - .6 Ensure finish coat is not installed into joints to receive sealants.
- .10 Seal joints to ASTM C1481.
 - .1 Do joint sealing in accordance with Section [07 92 00 – Joint Sealants].



3.8 FIELD QUALITY CONTROL

EQI Guide Note: Co-ordinate with Submittals in Part 1 of this Section.

EQI Guide Note: EQI site audits are completely independent of any inspections requested by and conducted for the Building Owner. The EQI site audit is not intended to replace any third-party inspections that the Building Owner may require. As with any building envelope and cladding project, it is recommended that the Owners representative, (Engineer, Architect, Consultant or third party inspector) periodically examine and monitor the EIFS installation for compliance with the specifications, drawings and generally accepted good building practice.

EQI Guide Note: Use the following Articles when EIFS Site Auditor will be inspecting work

- .1 EIFS Site Auditor's Services: Have EIFS Site Auditor schedule site visits and reports in accordance with EQI requirements.
 - .1 Have EIFS Site Auditor immediately report inconsistencies and discrepancies to [Consultant] and EIFS subcontractor upon discovery.

EQI Guide Note: Manufacturer's technical representative acts only to verify conditions as they appear at the time of the site visit and cannot be expected to verify installation already completed.

EQI Guide Note: The contract between the Owner and the General Contractor cannot impose requirements upon the EIFS manufacturer since they are not a party to the Contract. The project specification can only advise the General Contractor to request the manufacturer's presence. The manufacturer reserves the right to refuse the request if the issues can be resolved by other means of communication.

- .2 Request manufacturer's technical representative's presence [during critical periods of installation] [unresolved substrate concerns] [unresolved design details] [product application concerns] identified at project pre-installation meeting and during mockup construction.

3.9 FINAL CLEANING

- .1 Progress Cleaning: Clean in accordance with Section [01 74 00 - Cleaning and Waste Management].
 - .1 Leave work area clean and tidy at end of each day.
- .2 Final Cleaning: Upon completion, remove surplus and excess materials, rubbish, tools and equipment.
- .3 Waste Management: separate waste materials for [reuse] [recycling] in accordance with Section [01 74 21 – Construction/Demolition Waste Management and Disposal] [01 35 21 – LEED Requirements].
 - .1 Remove recycling containers and bins from site and dispose of materials at appropriate facility.



3.10 PROTECTION

EQI Guide Note: Protection of the integrity of the EIFS after the EIFS sub-contractor has completed their portion of the work is essential. In particular any penetrations through the EIFS for such things such as signage must be done in accordance with manufacturer's recommendations especially items of work related to sealing around penetrations.

- .1 Signage: Ensure work carried out under Section [10 14 00 – Signage] is sealed in accordance with EIFS manufacturer's published recommendations.

EQI Guide Note: Co-ordinate the following Article with Section 01 76 00 - Protecting Installed Construction.

- .2 Protect installed product from damage during construction in accordance with Section [01 76 00 - Protecting Installed Construction].
- .3 Post appropriate warning signs while work is in progress and during curing period.
- .4 Make good damage to adjacent materials caused by EIFS installation.

END OF SECTION

Sample Colour Schedule: Edit to suit project requirements.

Colour	Minimum Light Reflectance Value (%)	Location
Colour 1 [<i>descriptive name</i>]	[20]	[<i>Location Description</i>]
Colour 1 [<i>descriptive name</i>]	[20]	[<i>Location Description</i>]
Colour 1 [<i>descriptive name</i>]	[20]	[<i>Location Description</i>]
Colour 1 [<i>descriptive name</i>]	[20]	[<i>Location Description</i>]