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 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 which may be suitable for the project. Section numbers which 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**. The EIFS wall cladding system is comprised of Water Resistant Barrier (WRB), 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 finish coat. EIFS require a clear drainage path that is 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

### 1.01 SUMMARY

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

EQI Guide Note: Include in this Article only those sections that directly affect the work of this section. Do not include sections that do not appear in the project specification section. Do not include Division 00 or Division 01 sections since it is assumed that all technical sections are related to all project Division 00 and Division 01 sections to some degree. Sections referenced match section numbers and titles found in the most current version of *MasterFormat*.

### 1.02 RELATED REQUIREMENTS

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

.1 Section [07 21 13.13 – Foam Board Insulation].

.2 Section [07 26 00 – Vapour Retarders]

.3 Section [07 27 00 – Air Barriers].

.4 Section [07 65 00 - Flexible Flashings].

.5 Section [07 92 00 – Joint Sealants].

.6 Section [10 14 00 – Signage].

### 1.03 DEFINITIONS

.1 EIFS Site Auditor: Third party company responsible for monitoring quality of work and EQI requirements which reports directly and independently to EQI.

.2 Lamina: Finish consisting of base coat, reinforcing mesh and finish coat.

.3 EIFS Mechanic: Individual EIFS worker, installer or applicator certified and licensed to EQI.

.4 Water Resistive Barrier System (WRB): material(s) possessing low water absorption properties that are applied over substrates susceptible to water absorption to create a continuous surface 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.

## 1.04 REFERENCES

.1 ASTM International Inc. (ASTM)
- .1 ASTM C1382 [2005], Test Method for Determining Tensile Adhesion Properties of Sealants When Used in Exterior Insulation and Finish Systems (EIFS) Joints.

.2 Canada Green Building Council (CaGBC)
- .1 LEED Canada-NC Version 1.0-[2004], LEED (Leadership in Energy and Environmental Design): Green Building Rating System Reference Package For New Construction and Major Renovations (including Addendum [2007]).
- .2 LEED Canada-CI Version 1.0-[2007], LEED (Leadership in Energy and Environmental Design): Green Building Rating System Reference Guide For Commercial Interiors.

.3 EIFS Quality Assurance Program Inc. (EQI)
- .1 EIFS QAP Manual Document # P200-01.

.4 Health Canada/Workplace Hazardous Materials Information System (WHMIS)
- .1 Material Safety Data Sheets (MSDS).

.5 National Research Council of Canada (NRC)
- .1 Canadian Construction Materials Centre (CCMC) Evaluation Report.

.6 Underwriter's Laboratories of Canada (ULC).
- .1 CAN/ULC-S710.1 [2005], 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.
- .2 CAN/ULC-S710.2 [2005], Standard for Thermal Insulation – Bead-Applied One Component Polyurethane Air Sealant Foam, Part 2: Installation.

EQI Guide Note: At the time of the initial publication of this master guide specification section, ULC-S716.1 was in the final stages of redevelopment and publication. Only reference the documents if the updated version, later than 2009 has been published.

.3 CAN/ULC-S716.1 [2009], Standard for Exterior Insulation and Finish Systems (EIFS) – Materials and Systems.

EQI Guide Note: At the time of the initial publication of this master guide specification section, ULC-S716.2 and ULC-S716.3 were in the final stages of development and publication. Only reference the documents if they have been published.

.4 ULC-S716.2 [2010], Standard for Exterior Insulation and Finish Systems (EIFS) – Installation.
.5 ULC-S716.3 [2010], Standard for Exterior Insulation and Finish Systems (EIFS) – Design Practices Guide.

## 1.05 ADMINISTRATIVE REQUIREMENTS

.1 Pre-Installation Meeting: Convene meeting [1] week prior to beginning work of this Section [and on-site installation], with EIFS subcontractor, lead EIFS Mechanic, EIFS Site 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 EIFS manufacturer's written recommendations for sequencing construction operations with other work.

## 1.06 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 indicating VOC.
.2 Submit product data sheets for system materials, including product characteristics, performance criteria and limitations.
.3 Manufacturer's installation instructions.

EQI Guide Note: Use the following paragraph only if CCMC Evaluation is a requirement.

.3 Submit CCMC Evaluation Report.

.4 Shop Drawings: Indicate information on shop drawings as follows:
.1 Submit shop drawings showing EIFS, including components product names and accessories.

EQI Guide Note: Shop drawing details for connections of windows, louvres and other wall penetrations need to be co-ordinated with the work of various sub-trades.

.2 Indicate wall layout, details, connections, expansion joints, finish system, installation sequence, including interface with doors, windows, air barriers, vapour retarders and other components.
.3 Indicate where higher impact reinforcing mesh is required.

EQI Guide Note: Owner or Owner's representative may request either submission of calculations or test reports, or they may require submission of both. Edit the following subparagraph to meet project requirements.

.4 Ensure Shop Drawings are reviewed by [Architect] [Engineer] licensed in [Province] [Territory] of [_____] and submit [calculations] to [Architect] [Consultant] [Owner].

.5 Samples: Submit as follows:

EQI Guide Note: Edit the following paragraph to ensure colour and texture samples are only requested if multiple finish coats are being used on the project.

.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 prefabricated panel construction showing corner section and exposed layers of EIFS application.
.3 Duplicate [150 x 150] mm samples of reinforcing mesh.

EQI Guide Note: At the time of the initial publication of this master guide specification section, ULC-S716.1 was in the final stages of redevelopment and publication. Only reference the documents if the updated version, later than 2009 has been published.

.6 Certification Reports: Submit certification reports showing compliance with specified performance characteristics and physical properties to [CAN/ULC-S716.1] [CCMC Evaluation Report].

EQI Guide Note: Use the following paragraph for LEED projects

.7 Sustainable Design Submittals:
.1 LEED Canada - [NC Version 1.0] [CI Version 1.0] submittals: in accordance with Section [01 35 21 – LEED Requirements].
.2 Construction Waste Management:
.1 Submit project [Waste Management Plan] [Waste Reduction Workplan] highlighting recycling and salvage requirements.
.2 Submit calculations on end-of-project recycling rates, salvage rates, and landfill rates demonstrating that [50] [75] % of construction wastes were recycled or salvaged.
.3 Low emitting materials:
.1 List and submit sealants and adhesives used in EIFS system, showing compliance with VOC and chemical component limits or restriction requirements imposed by authority having jurisdiction.

## 1.07 INFORMATION SUBMITTALS

.1 Quality Assurance:

EQI Guide Note: Edit the following paragraph to choose the manufacturer's quality assurance that best meets the project requirements or retain both options. Compliance with EQI is preferable.

.1 EIFS Manufacturer: Submit [verification of compliance with, EQI] [or] [verification of EIFS Council of Canada Membership].

EQI Guide Note: Edit the following paragraph to choose the contractor's quality assurance that best meets the project requirements or retain options Compliance with EQI is preferable.

.2 EIFS Contractor: Submit [verification of compliance with EQI] [or] [verification of EIFS Council of Canada Membership].
.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 Manufacturer's Field Reports: Submit manufacturer's field reports specified.

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

.3 EIFS Site Auditor's Field Reports: Submit EIFS Site Auditor's reports in accordance with EQI requirements.

**1.08 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 giving complete list of repair and replacement parts with cuts and identifying numbers.

.2 Include:

.1 Identification of Water Resistant Barrier (WRB).

.2 Finish coat colour batch numbers.

.3 Identification of each type of reinforcing mesh used.

.4 Identification of adhesive, base coat and finish coat products used.

**1.09 QUALITY ASSURANCE**

EQI Guide Note: Select the option for EQI licensed manufacturers, contractors and EIFS mechanics to meet project quality assurance requirements.

.1 Manufacturer Qualifications:

EQI Guide Note: Choose the option that best meets the project requirements or retain both options. Compliance with EQI is preferable.

.1 [EQI licensed] [or] [EIFS Council of Canada Member].

.2 Contractor Qualifications:

EQI Guide Note: Choose the option that best meets the project requirements or retain both options. Compliance with EQI is preferable.

.1 [EQI licensed] [or] [EIFS Council of Canada Member].

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 technical support specialists.

.3 Regulatory Requirements:

EQI Guide Note: EIFS must also 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 Article below as applicable.

.1 Comply with [National Building Code of Canada (NBC)] [Building Code for [Province] [Territory] of [_____] ].

EQI Guide Note: At the time of the initial publication of this master guide specification section, ULC-S716.1 was in the final stages of redevelopment and publication. Only reference the documents if the updated version, later than 2009 has been published.

.2 Comply with [CCMC Evaluation Report] [and] [CAN/ULC-S716 series of standards].

EQI Guide Note: A full scale mockup is recommended for all EIFS projects.

.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 Ensure mockup includes work of 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.

.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 sizes to suit project.
- .2 Include batch numbers or production date, mixing instructions, and applicable registration labels for fire listings.

.5 Storage and Protection:
- .1 Store materials protected from exposure to harmful weather conditions and at [4] degrees C minimum.
- .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 coatings (pail products) from freezing and temperatures in excess of 60 degrees C. Store away from direct sunlight.
- .6 Protect dry cement based materials (bag products) from moisture and humidity. Store above ground protected from sunlight, rain and ground moisture.

EQI GUIDE NOTE: Co-ordinate the following paragraph with Section 01 35 21 – LEED Requirements when the Section is included for LEED Projects

.6 Packaging Waste Management:

EQI Guide Note: The disposal of packaging waste into landfill sites demonstrates an inefficient use of natural resources and consumes valuable landfill space. Specifying appropriate packaging and construction waste management and disposal procedures may contribute to points required for LEED® construction project certification.

.1 Develop Construction Waste Management Plan related to work of this Section and in accordance with Section [01 35 21 – LEED Requirements.

.2 Separate waste materials for [reuse] [and] [recycling] in accordance with [Section 01 74 19 - Construction Waste Management and Disposal].

EQI Guide Note: Manufacturer may take back packaging and delivery materials for recycling. If manufacturer or supplier does not recycle pails or any of the packaging materials, delete the following paragraph and all of its subparagraphs in their entirety.

.3 Remove for reuse [and return] [by manufacturer] [pallets,] [crates,] [pails] [and] [packaging materials] as specified in [Construction Waste Management Plan] [Waste Reduction Workplan] in accordance with Section [01 74 21 - Construction/Demolition Waste Management And Disposal] [and] [Section 01 35 21 – LEED Requirements].

EQI Guide Note: Manufacturers and suppliers will only take back pails. In some cases they will only take them back if they have been thoroughly cleaned before pickup. If pails have not been cleaned before pickup the LEED Credit for waste management may be affected. If manufacturer or supplier does not recycle pails and packaging materials, edit the following subparagraphs to suit what can be recycled.

.1 Clean pails prior to recycling.

.2 Ensure that pails are cleaned immediately after use before residue product has chance to cure within pail.

.4 Remove from site and dispose of packaging materials at appropriate recycling facilities.

.5 Collect and separate for disposal [paper] [plastic] [polystyrene] [corrugated cardboard] packaging material [in appropriate onsite bins] for recycling.

## 1.11 PROJECT AMBIENT CONDITIONS

EQI Guide Note: Weather conditions affect application and drying time. Hot or dry conditions limit working time and accelerate drying and may require adjustments in the scheduling of work to achieve desired results; cool or damp conditions extend working time and retard drying and may require added measures of 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, and during application and after application until fully dry in accordance with EIFS manufacturer's written recommendations for project ambient conditions.

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, no heating is required during construction.

EQI Guide Note: When installing near minimum temperatures, temporary heat may be required on both the outside and inside space being enclosed as the drying material may cool by evaporation resulting in material temperatures lower than the heated space.

.2 Cover and heat space surrounding application as required to maintain minimum project ambient conditions.

.1 Ensure surface substrate temperature 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 gas which gives off water vapour as a by-product of combustion.

.2 Ensure adequate ventilation of covered space.

EQI Guide Note: Coordinate Article below with Contract Conditions and with 01 78 36 - Warranties.

### 1.12 WARRANTY

.1 Project Warranty: Refer to Contract Conditions for project warranty provisions.

.2 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 EIFS Subcontractor'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.

EQI Guide Note: Coordinate Article below with manufacturer's warranty requirements.

.4 Warranty: Commencing on date of acceptance of [Substantial Performance] by [Consultant].

## PART 2 - Products

### 2.01 MANUFACTURERS

EQI Guide Note: Choose the option that best meets the project requirements or retain both options. Compliance with EQI is preferable.

.1 [EQI Licensed] [or] [[EIFS Council of Canada Member].

EQI Guide Note: Use the following paragraph only if CCMC Evaluation is a requirement.

.2 CCMC Evaluation Report for specified EIFS.

### 2.02 DESCRIPTION

.1 Regulatory Requirements: Design system in accordance with [National Building Code of Canada] [Building Code of [Province] [Territo0ry] of [_____], Canada.

EQI Guide Note: At the time of the initial publication of this master guide specification section, ULC-S716.1 was in the final stages of redevelopment and publication. Only reference the documents if the updated version, later than 2009 has been published.

.1 Ensure system and materials [comply with criteria in CCMC Evaluation Report] [are to 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.

- All trim and projecting architectural features must have a minimum 6:12 (27 degrees) slope for drainage Which may be reduced if permitted by the EIFS manufacturer's written recommendations when added protection such as metal flashings or other means of waterproofing protection are specified for use. All horizontal reveals must have a minimum 6:12 (27 degrees) slope along their bottom surface. If metal flashing is used, the flashing must be sloped a minimum of 3/4: 12 (3.5 degrees).
- Avoid the use of trim and features that exceed the maximum allowable thickness of EPS permitted by code and as tested by manufacturer and in accordance with CCMC Evaluation Report. If additional insulation is required, refer to manufacturer's documentation. Periodic inspections and increased maintenance may be required to maintain surface integrity of EIFS on weather exposed sloped surfaces. Limit projecting features to easily accessible areas and limit total area to facilitate maintenance and minimize maintenance burden.

## 2.03 PERFORMANCE AND DESIGN CRITERIA

EQI Guide Note: At the time of the initial publication of this master guide specification section, ULC-S716.1 was in the final stages of redevelopment and publication. Only reference the documents if the updated version, later than 2009 has been published.

.1 Test system and components [to CAN/ULC-S716 Series] [and] [comply with criteria in CCMC Evaluation Report.

.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 changes in substrate material;
- .5 At changes in roof, building shape or structural system;

.6 Include [13] mm minimum expansion joint between EIFS and adjacent materials.

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];
- .1 Design joints with secondary moisture protection and drain joints to exterior;
- .2 Design joints to prevent air movement around building between sealant and air barrier;

.3 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];

.4 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].

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.

.8 Sealant Adhesion: To ASTM C1382.

EQI Guide Note: Specifying appropriate products and materials may contribute to points required for LEED construction project certification.

## 2.04 MATERIALS

EQI Guide Note: At the time of the initial publication of this master guide specification section, ULC-S716.1 was in the final stages of redevelopment and publication. Only reference the documents if the updated version, later than 2009 has been published.

.1 Ensure materials comply with [CAN/ULC S716.1] [criteria in CCMC Evaluation Report].

.2 WRB: To CAN/ULC –S716 Series and in accordance manufacturer's written recommendations.

EQI Guide Note: At the time of the initial publication of this master guide specification section, ULC-S716.1 was in the final stages of redevelopment and publication. Only reference the documents if the updated version, later than 2009 has been published.

.3 Adhesive: To [CAN/ULC S716.1] [criteria in CCMC Evaluation Report].

EQI Guide Note: Minimum required thickness is 25 mm and maximum allowable thickness should be in compliance with authority having jurisdiction. At the time of the initial publication of this master guide specification section, ULC-S716.1 was in the final stages of redevelopment and publication. Only reference the documents if the updated version, later than 2009 has been published.

.4 Insulation Board: To [CAN/ULC-S716.1] [criteria in CCMC Evaluation Report], moulded, expanded polystyrene [Type 1], square edge, [ [25] mm thick minimum] [thickness as indicated] and in accordance with Section [07 21 13.13 – Foam Board Insulation].

EQI Guide Note: It is essential that all components for an EIFS system are supplied by single manufacturer since mixing different manufacturers components may result in system failure. Depending

on the manufacturer, base coats come in a variety of forms including cementitious and non-cementitious, single and multi-component, with and without reinforcing, etc. At the time of the initial publication of this master guide specification section, ULC-S716.1 was in the final stages of redevelopment and publication. Only reference the documents if the updated version, later than 2009 has been published.

.5 Base Coat: To [CAN/ULC-S716.1] [criteria in CCMC Evaluation Report], and to manufacturer's written recommendations.

EQI Guide Note: At the time of the initial publication of this master guide specification section, ULC-S716.1 was in the final stages of redevelopment and publication. Only reference the documents if the updated version, later than 2009 has been published.

.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 Evaluation Report].

EQI Guide Note: Reinforcing mesh comes in a variety of weights depending on the manufacturer. Refer to manufacturer's technical literature for accurate mesh weights.

.1 Weight: [140] 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. Refer to manufacturer's technical documentation for further information.

EQI Guide Note: Specify heavy duty, high impact reinforcing mesh weighing 450 grams per square metre minimum for EIFS between grade and 1.8 m above grade. Refer to manufacturer's technical literature for accurate mesh weights.

.2 Impact resistance: Heavy duty, high, [450] grams per square metre minimum.

.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. At the time of the initial publication of this master guide specification section, ULC-S716.1 was in the final stages of redevelopment and publication. Only reference the documents if the updated version, later than 2009 has been published.

.1 Backwrapping mesh: [140] grams per square metre minimum, open-weave, flexible, symmetrical, interlaced glass fibre fabric with alkaline resistant coating to [CAN/ULC S716.1] [criteria in CCMC Evaluation Report].

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. At the time of the initial publication of this master guide specification section, ULC-S716.1 was in the final stages of redevelopment and publication. Only reference the documents if the updated version, later than 2009 has been published.

.2 Corner reinforcing mesh: [200] grams per square metre minimum, pre-creased open-weave, glass fibre fabric with alkaline resistant coating to [CAN/ULC S716.1] [criteria in CCMC Evaluation Report].

.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.

EQI Guide Note: The Light Reflectance Value is expressed as a percentage of the light reflected back from the surface of the finished material. The use of dark colours is not recommended with EIFS that incorporate expanded polystyrene (EPS). EPS has a 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.

.10 Flashing: In accordance with Section [07 65 00 - Flexible Flashings].

**2.05 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 A3000, Type GU.

EQI Guide Note: Concrete conditioner is required to bind dust to the concrete 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. Before using this paragraph check with the manufacturer for compatibility issues between the concrete conditioner and the EIFS adhesive or base coat.

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

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

.4 Liquid 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 the manufacturers that the wrong substrate leveller could cause adhesion problems for the EIFS. Before using this paragraph check with the manufacturer for compatibility issues between the substrate leveller and the EIFS adhesive or base coat.

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

**2.06 SOURCE QUALITY CONTROL**

.1 Ensure EIFS components, WRB, base coat, finish coat materials and accessories are from single manufacturer.

EQI Guide Note: Edit Article below to suit project requirements. If substitutions are permitted, edit text below. Co-ordinate with Section 01 25 13 - Product Substitution Procedures.

**2.07 PRODUCT SUBSTITUTIONS**

.1 Substitutions: [In accordance with Section 01 25 13 - Product Substitution Procedures] [No substitutions permitted].

## PART 3 - Execution

### 3.01 INSTALLERS

.1 Supply experienced and qualified mechanics to carry out work.

### 3.02 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.

### 3.03 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 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 EIFS.
- .3 Inform [Consultant] of unacceptable conditions immediately upon discovery.
- .4 Proceed with installation only after unacceptable conditions have been remedied.

### 3.04 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 overspraying.

.3 Resurface, patch or level surfaces to required tolerance and smoothness with [appropriate] levelling materials as recommended in manufacturer's written instructions and to CAN/ULC-S716.2.

### 3.05 MIXING

EQI Guide Note: At the time of the initial publication of this master guide specification section, ULC-S716.1 was in the final stages of redevelopment and publication. Only reference the documents if the updated version, later than 2009 has been published.

.1 Mix materials to [CAN/ULC-S716.1] [criteria in CCMC Evaluation Report] 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.

**3.06 INSTALLATION - GENERAL**

.1 Do EIFS work to CAN/ULC-S716.2.

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.

.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.

.4 Coordinate EIFS work with work of other trades, for correct installation time and sequence.

**3.07 INSTALLATION**

EQI Guide Note: Pre-wrapping is done to the insulation board at horizontal joints, window heads, and other locations intended to drain water. 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.

EQI Guide Note: Delete the following paragraph when starter tracks are being used.

.1 Pre-wrapping: To CAN/ULC-S716 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 encapsulated in a base coat or adhesive and is adhered to the substrate 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 Series.
  .1 Back wrap insulation board at terminations with base coat and mesh prior to installation where water is expected to drain.
    .1 Rasp back of insulation board to permit water to drain freely when installed over flashing.
    .2 Allow adequate amount of mesh to wrap around board edge and cover [100] mm minimum on outside surface of board.
    .3 Allow adhesive to dry completely.

EQI Guide Note: with respect to drainage geometric shaped boards. Drainage of EIFS can be achieved by the application of adhesive ribbons between the insulation board and the substrate or by the use of geometrically shaped insulation boards. In the following paragraph choose the option for adhesive ribbons or geometrically shaped insulation board only when they are needed to meet project requirements. The use of geometrically shaped insulation boards or adhesive ribbons are dependent on

the individual manufacturer's preference for their EIFS. Check with the manufacturer before using and editing the following paragraph.

.3 Apply [adhesive] [base coat] to CAN/ULC-S716.2 in accordance with manufacturers written recommendations.

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

.4 Spray apply adhesive to substrate [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 from bottom of wall upward.

.6 Press boards to substrate ensuring full adhesion. Do not slide boards into position.
- .1 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.
- .2 Stagger vertical joints.
- .3 Terminate insulation [6] mm minimum from expansion joint when forming EIFS joint.
- .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.
- .7 Prevent adhesive from getting between board joints.

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

- .8 Fill open joints between insulation boards greater than 1.6 mm with [slivers of insulation board material] [spray-in-place polyurethane liquid foam installed to CAN/ULC-S710.2].
  - .1 Use liquid foam insulation only in gaps 3.2 mm maximum.
  - .2 Ensure liquid foam insulation penetrates 10 mm minimum into gaps between thermal insulation boards.
- .9 Allow adhesive to dry [24] hours minimum prior to start of base coat application.
- .10 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.

  Thermal insulation board thickness after rasping: [20] mm minimum.
- .11 Install thermal insulation board immediately after application of adhesive.

EQI Guide Note: Use the following paragraph when EIFS is applied to exterior sheathing.

- .12 Ensure thermal insulation board joints are offset [150] mm minimum from horizontal and vertical sheathing board joints.

EQI Guide Note: Over time, visible UV degradation of foam plastic insulation is manifested by a yellow 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

.13 Rasp insulation damaged by ultraviolet rays in accordance with CAN/ULC-S716.2.

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.
- .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, unless otherwise specified by the EIFS manufacturer's written recommendations. 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 CCMC Evaluation Report or 1.6 mm, 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 visible.

.8 Base Coat Application: To CAN/ULC-S716.2.
- .1 Apply base coat over entire surface of insulation board, including areas with high impact and corner reinforcing mesh, using stainless steel trowel.
  - .1 Install high impact and corner reinforcing mesh at locations indicated. Tightly butt reinforcing mesh with gaps no greater than 3 mm at seams. Do not overlap high impact mesh joints.
  - .2 Apply horizontally or vertically in strips of [900] mm and immediately embed standard reinforcing mesh into wet base coat.
  - .3 Trowel smooth to ensure mesh colour is not visible while maintaining full encapsulation of mesh in base coat.

EQI Guide Note: First 1.8 m above grade requires extra reinforcing. This can be accomplished by using multiple layers of reinforcing mesh or by using heavy duty reinforcing mesh. Ultra-High impact mesh application is recommended to a minimum height of 1.8 m above finished grade at all areas accessible to pedestrian traffic and other areas exposed to abnormal stress or impact.

  - .4 Reinforce first [1.8] m minimum above grade using [1] layer of standard reinforcing mesh and [1] layer of heavy duty reinforcing mesh.
  - .5 Reinforce corner of openings "butterfly" of detail reinforcing mesh [200] mm minimum, in accordance with manufacturer's written instructions.
  - .6 Reinforce inside and outside corners with [pre-formed reinforced mesh corner strips] [double wrap of standard reinforcing mesh].
  - .7 Allow base coat for extra reinforcing to dry prior to application of regular base coat and reinforcing mesh.
- .2 Apply base coat [1.6] 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 centre to edge.
  - .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.

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.

EQI Guide Note: If it is likely that an accumulation of snow or ice could occur on the sloped surface, then ensure that the slope is at least 45 degrees minimum to horizontal.

.2 Ensure slope is [22.5] [45] degrees minimum 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 which 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 [ [4] hours minimum] 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].

EQI Guide Note: Thickness of finish coat may vary depending on desired texture.

.1 Apply [1 - 3] mm thick minimum finish coat only to cooler surfaces not exposed to sun.
.2 Shade work to prevent 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 operation without cold joints.

.5 Apply finish in continuous application.
.1 Maintain wet edge.
.2 Work to architectural break in wall.

.6 Ensure separate batches of finish coat are not installed side by side.

.7 Ensure finish coat is not installed in joints to receive sealants.

.10 Seal joints to ASTM C1481.
.1 Do joint sealing in accordance with Section [07 92 00 – Joint Sealants].

## 3.08 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.

## 3.09 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.

EQI Guide Note: Reuse and recycling of construction waste materials may contribute towards LEED credits.

.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 [*descriptive name*] | [20] | [*Location Description*] |
| Colour 1 [*descriptive name*] | [20] | [*Location Description*] |
| Colour 1 [*descriptive name*] | [20] | [*Location Description*] |
| Colour 1 [*descriptive name*] | [20] | [*Location Description*] |