



DuROCK PUCCS EIFS

Exterior Insulation Finish System for Insulated Concrete Form (ICF) Construction

MANUFACTURER'S SPECIFICATION 07 24 13

PART 1 – GENERAL

1.1. RELATED SECTIONS

- 1.1.1. Specification 03 30 00 – Cast-in-Place Concrete
- 1.1.2. Specification 07 27 00 – Air Barriers
- 1.1.3. Specification 07 60 00 – Flashing & Sheet Metal
- 1.1.4. Specification 07 90 00 – Joint Protection (Sealants)

1.2. SYSTEM DESCRIPTION

- 1.2.1. PUCCS EIFS for ICF is an Exterior Insulation Finish System (EIFS) intended for use on vertical Insulated Concrete Form (ICF) walls.
- 1.2.2. PUCCS EIFS for ICF includes a first and second plane of protection from precipitation, and a geometrically-defined, 10 mm deep, drained air space outboard of the second plane.
- 1.2.3. PUCCS EIFS for ICF is certified to the fire requirements of Articles 3.1.5.5. and 3.2.3.8. of the National Building Code of Canada.

SPEC NOTE	<ol style="list-style-type: none"> 1. <i>Code compliance – the suitability of this system, and the incorporation of expanded polystyrene, is subject to approval according to Municipal requirements. Check with all authorities having jurisdiction.</i> 2. <i>Fire-resistance ratings are specific to the substrate (supporting walls), and not to the EIFS. Fire requirements for wall assemblies incorporating EIFS are addressed in Articles 3.1.4.2, 3.1.5.5, 3.1.5.12, 3.2.3.7, 3.2.3.8, 9.10.14.5, 9.10.15.5, and 9.10.17.10 of the model building code. Ensure the wall assembly complies with the requirements of the applicable article(s).</i> 3. <i>PUCCS EIFS can be adapted to pressure-moderate. Please contact DuROCK for design, installation, venting, and compartmentalizing requirements necessary to achieve this.</i>
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1.3. DESIGN REQUIREMENTS

1.3.1. Substrate

- 1.3.1.1. Substrate shall be buried-web, Expanded Polystyrene (EPS) Insulated Concrete Forms (ICF). EPS shall be compliant with CAN/ULC-S701, with a maximum density of 24 kg/m³ (1.5 lb/ft³), and made by a manufacturer approved by DuROCK. Concrete shall be cured at least 28 days prior to the installation of PUCCS EIFS for ICF.
- 1.3.1.2. Substrate shall be structurally sound and continuously supported.
- 1.3.1.3. Substrate shall be designed to withstand the anticipated wind loads, and deflect no more than L/240.
- 1.3.1.4. Substrate shall be continuous, flat and plumb, with surface variations less than 6 mm over 2400mm (1/4 inch over 8 ft).
- 1.3.1.5. Substrate shall be clean, dry, and free of any deleterious material such as wax, oil, paint, dust and dirt which could negatively affect bonding.

1.3.2. Termination and Drainage

- 1.3.2.1. PUCCS EIFS for ICF shall terminate and drain at least 200 mm (8 inches) above finished grade.
- 1.3.2.2. PUCCS EIFS for ICF shall terminate and drain at least 50 mm (2 inches) above roofing systems, balconies, and other similar conditions.
- 1.3.2.3. PUCCS EIFS for ICF shall terminate and drain above windows, doors, soffits and other similar conditions.

1.3.3. Expansion and Termination Joints

- 1.3.3.1. Expansion and termination joints shall accommodate expansion and contraction of building materials due to thermal changes, moisture, wind, gravity, vibration, and seismic activity.
- 1.3.3.2. Expansion joints in PUCCS EIFS for ICF are required: where expansion joints in the substrate occur; where significant structural movement occurs; where substrate deflection exceeds L/240; where the substrate structural system changes; and where PUCCS EIFS for ICF abuts other cladding systems.
- 1.3.3.3. Termination joints are required where PUCCS EIFS for ICF abuts through wall penetrations such as windows and doors, and where PUCCS EIFS for ICF terminates at locations such as parapets.
- 1.3.3.4. Expansion joints shall be at least 20 mm (3/4 inch) wide and termination joints shall be at least 13 mm (1/2 inch) wide.
- 1.3.3.5. Joints shall be sealed to prevent ingress of precipitation, unless otherwise specified.

SPEC NOTE	4. <i>Location and joint size are the responsibility of the designer. Joint width should be four times the anticipated range of movement.</i>
SPEC NOTE	5. <i>Drained joints employing DuROCK Uni-Track do not require sealant. It is the Designer's prerogative to specify sealant at those locations.</i>

1.3.4. Joint Sealant

- 1.3.4.1. Sealant shall be used to seal expansion and termination joints, unless otherwise specified.
- 1.3.4.2. Sealant material shall be low modulus, and shall be compatible with PUCCS EIFS for ICF.
- 1.3.4.3. Sealant shall be installed with closed-cell foam backer rod or bond breaker tape in accordance with manufacturers instructions, and in general conformance with ASTM C 1481.
- 1.3.4.4. Sealant shall be vented to permit drying and drainage of incidental moisture.

SPEC NOTE	6. <i>DuROCK recommends Sikaflex 15LM sealant by Sika. The following sealants are also compatible with PUCCS EIFS for ICF: Spectrem 1, 3, and 4 by Tremco; 790 and Contractors Concrete by Dow Corning; and Sonolastic 150 by Sonneborn. Designers wishing to specify other sealants should consult DuROCK.</i>
SPEC NOTE	7. <i>Sealant vents should be spaced no more than 3 m (10 ft) apart. Vents should provide a nominal venting area of no less than 1 sq. cm. (0.1550 sq in). Venting may incorporate plastic masonry vents, equivalent pest screens, or vent tubes.</i>

1.3.5. Flashing

- 1.3.5.1. Flashing is required where PUCCS EIFS for ICF is expected to drain moisture to the exterior and anywhere the exposed top edge of PUCCS EIFS for ICF does not have a minimum slope of 3:12 rise over run for runs up to 102 mm (4 inches) wide, or 6:12 rise over run for wider runs up to 305 mm (12 inches) wide.
- 1.3.5.2. Termination of PUCCS EIFS for ICF at roof parapets shall be protected by a waterproof membrane and metal cap flashing.
- 1.3.5.3. Flashing material shall be corrosion-resistant.
- 1.3.5.4. Flashing shall be installed in accordance with the model building code.

1.3.6. Decorative Elements (mouldings, shapes, trim, window sills, etc.)

- 1.3.6.1. Unless protected by metal flashing, the upward facing portion of a projection that is exposed to precipitation shall be sloped not less than 6:12 rise over run for projections up to 305 mm (12 inches) wide, or 3:12 rise over run for projections up to 102 mm (4 inches) wide.
- 1.3.6.2. Horizontal projections wider than 305 mm (12 inches) shall be protected by structurally supported metal flashing.
- 1.3.6.3. Horizontal projections shall be designed, consistent with governing codes and standards, such that these will not be configured or construed as roofing or loadbearing (pedestrian or otherwise).
- 1.3.6.4. Pre-manufactured decorative elements shall be applied after the base coat has dried, and before primer or finish is applied.

1.3.7. Aesthetic Reveals

- 1.3.7.1. Aesthetic reveals may be cut into the insulation layer provided the insulation thickness behind the reveal is not less than 20 mm (3/4 inch) exclusive of the PUCCS groove, and 30 mm (9/8 inch) inclusive of the PUCCS groove.
- 1.3.7.2. Horizontal reveals shall be sloped to shed water.

SPEC NOTE	8. <i>Aesthetic reveals should not align with corners of through wall penetrations such as windows and doors.</i>
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1.4. PERFORMANCE REQUIREMENTS

- 1.4.1. EIFS shall comply with the objectives of the model building code.

1.5. SUBMITTALS

- 1.5.1. Upon request, DuROCK will supply finish coat samples, approximately 200 x 200 mm (8 x 8 inches), providing representation of the texture and colour.

1.6. QUALITY ASSURANCE

- 1.6.1. PUCCS EIFS for ICF shall be installed by a competent, knowledgeable, experienced contractor.
- 1.6.2. PUCCS EIFS for ICF shall be installed in accordance with these specifications and the corresponding details.

1.7. DELIVERY, STORAGE & HANDLING

- 1.7.1. All materials and components shall be delivered to the jobsite in the original, unopened packaging with labels clearly identifying each component.
- 1.7.2. All materials and components shall be inspected upon delivery. Any defective or frozen, materials or components shall not be used.
- 1.7.3. All materials and components shall be stored off the ground, and protected from precipitation and direct sunlight.
- 1.7.4. All water-based materials supplied in plastic pails shall be delivered and stored at temperatures above 4°C (40°F) and below 40°C (104°F).
- 1.7.5. All dry-bagged materials shall be protected from high humidity.

1.8. SITE CONDITIONS

- 1.8.1. Surface and ambient conditions for application of wet-state-materials shall be above 4°C (40°F) and shall remain so for a minimum of 24 hours and until all work has dried. Drying may require more than 24 hours under humid conditions or at low temperatures.
- 1.8.2. At temperatures below 10°C (50°F), adhesives shall be allowed to dry for a minimum of 48 hours. Drying may require more than 48 hours under humid conditions.
- 1.8.3. Wet-state-materials shall not be applied in direct sunlight at temperatures exceeding 30°C (86°F), or when the substrate temperature exceeds 40°C (104°F).
- 1.8.4. All work shall be protected from rain, snow, hail, and wind exceeding 25 km/hr (15 mph) until it has dried.

1.9. WARRANTY

- 1.9.1. PUCCS EIFS for ICF is eligible for a limited manufacturer’s warranty starting from the date of substantial completion. A formal warranty request shall be submitted to DuROCK upon completion of the work.
- 1.9.2. DuROCK’s warranty is effective only when materials are paid for in full, and the workmanship complies with this specification.
- 1.9.3. Substitution of materials or components shall void the manufacturer’s warranty.

PART 2 – MATERIALS

2.1. GENERAL

- 2.1.1. All materials and components of PUCCS EIFS for ICF shall be supplied by DuROCK Alfacing International Limited, or it’s appointed distributors.

2.2. MATERIALS

2.2.1. Moisture Barrier

2.2.1.1. DuROCK Cement Bear moisture barrier is vapour permeable, and may also serve as an air barrier and adhesive. It is a wet mix, water-based acrylic dispersion that is field mixed with Type 10, 20, or 30 Portland cement 1:1 by weight, and applied by stainless steel trowel or spray equipment.

2.2.2. Drainage Accessories

2.2.2.1. DuROCK Uni-Track – polyvinyl chloride (PVC) extrusion used to facilitate drying and drainage at the base of the wall.

2.2.2.2. DuROCK Drainage Flash – polyvinyl chloride (PVC) extrusion used to facilitate drying and drainage above windows and other similar protrusions.

SPEC NOTE	9. <i>DuROCK recommends drainage accessories be employed at all locations where the system is expected to drain, however it is the Designer’s responsibility to specify where they shall be used.</i>
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2.2.3. Insulation

2.2.3.1. DuROCK PUCCS insulation is typically Type I Expanded Polystyrene (EPS) [minimum thermal resistance RSI 0.65/25mm (R 3.7/inch) and average density 16 kg/m³ (1 lb/ft³)], however it is also available in Type II EPS [minimum thermal resistance RSI 0.70/25mm (R 4.0/inch) and average density 24 kg/m³ (1.5 lb/ft³)]. Both Types I & II are compliant with CAN/ULC-S701 and are made from 100% virgin materials.

2.2.3.2. DuROCK PUCCS insulation is made by a manufacturer approved by DuROCK, and is packaged in bags with DuROCK’s logo plainly visible.

2.2.3.3. DuROCK PUCCS insulation is aged and cut according to the requirements of ASTM E 2430, nominal size of sheets being height and width of 610 x 1219 mm (24 x 48 inches).

2.2.3.4. DuROCK PUCCS insulation is available in 38, 51, 64, 76, 89, 102, 114, 127, 140, & 152 mm (1½, 2, 2½, 3, 3½, 4, 4½, 5, 5½, & 6 inch) thicknesses.

SPEC NOTE	10. <i>It is the Designer’s responsibility to specify the insulation thickness. For wall assemblies required to comply with Article 3.2.3.8 of the model building code, the maximum combined insulation thickness of the exterior ICF & the PUCCS EIFS is 152 mm (6 inches). For wall assemblies required to comply with Article 3.1.5.5 of the model building code, the maximum combined insulation thickness of the exterior ICF & the PUCCS EIFS is 127 mm (5 inches).</i>
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2.2.3.5. DuROCK PUCCS insulation has router-cut grooves 10 mm (13/32 inch) deep by 16 mm (5/8 inch) wide in 51 mm (2 inch) radii, in such a way that each sheet has seventy-two circles cut equidistantly on 102 mm (4 inches) vertical and horizontal centres, tangentially overlapped.

2.2.3.6. Spray-in-Place Polyurethane Foam, compliant with CAN/ULC-S710.1 - single component, moisture cure, low expansion rate foam, used for insulation board joints as a gap filling material.

2.2.4. Base Coat/Adhesives

2.2.4.1. DuROCK Prep Coat base coat/adhesive - a wet mix, water-based acrylic dispersion that is field mixed with Type 10, 20, or 30 Portland cement 1:1 by weight, applied by stainless steel trowel or spray equipment.

2.2.4.2. DuROCK Prep Coat D base coat/adhesive – a dry mix, polymer-modified cementitious material that is field mixed with potable water, applied by stainless steel trowel or spray equipment.

2.2.5. Alkali-Resistant Glass-Fibre Mesh

2.2.5.1. DuROCK Starter Mesh for Backwrapping– nominal 145 g/m² (4.3 oz/yd²) weight, supplied in 241 mm (9½ in) wide by 45.7 m (150 ft) long, and 965 mm (38 in) wide by 45.7 m (150 ft) long rolls.

2.2.5.2. DuROCK 5 oz Reinforcing Mesh – nominal weight 165 g/m² (4.9 oz/yd²), supplied in 1 m (39 in) wide by 44 m (144 ft) long rolls. The DuROCK logo appears on the mesh.

2.2.5.3. DuROCK 11 oz Reinforcing Mesh – nominal weight 370 g/m² (11.0 oz/yd²), supplied in 965 mm (38 in) wide by 22.9 m (75 ft) long rolls.

2.2.5.4. DuROCK 15 oz Impact Mesh – nominal weight 522 g/m² (15.4 oz/yd²), supplied in 965 mm (38 in) wide by 22.9 m (75 ft) long rolls.

SPEC NOTE	<p>11. Reinforcing mesh weight governs the impact resistance of EIFS. PUCCS EIFS for ICF with 5 oz reinforcing mesh is <u>not</u> designed to withstand all impact caused by human force. DuRock recommends 11 oz reinforcing mesh for areas requiring greater impact resistance, and 15 oz impact mesh with 5 oz reinforcing mesh for areas requiring even greater impact resistance. Please note however that PUCCS EIFS for ICF is not intended for areas subject to vehicle impact or intentional abuse. It is the Designer's responsibility to specify where 11 oz and 15 oz mesh are to be used.</p>
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2.2.6. Primer and Finish Coats

- 2.2.6.1. DuROCK Base Primer – water-based, colour-pigmented acrylic dispersion used as a primer for DuROCK Finishes, applied by roller, brush, or spray equipment.
- 2.2.6.2. DuROCK Roll-On – water-based, colour-pigmented acrylic coating with a fine sand texture, used as a finish on decorative trim and mouldings, applied by roller, brush, or spray equipment.
- 2.2.6.3. DuROCK Finishes – water-based acrylic finish available in several textures and numerous colours, used as a finish on trim and walls, applied by stainless steel trowel or spray equipment.
- 2.2.6.4. DuROCK Specialty Finishes – water-based, exposed coloured aggregate finishes with integral texture, applied by stainless steel trowel or spray equipment.

SPEC NOTE	<p>12. DuROCK recommends the application of primer to enhance the color consistency and durability of the finish, especially for dark coloured finishes, and applications in hot weather conditions. The Designer must specify if primer is required.</p>
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2.3. MIXING

- 2.3.1. DuROCK Cement Bear shall be mixed by a medium duty power-drill (400 – 500 RPM) with stainless steel or corrosion-resistant paddle-mixing-blades. It shall be mixed to a uniform consistency prior to mixing with Portland cement. 13.5 kg (30 lbs) of Type 10, 20, or 30 Portland Cement shall be gradually added to one-half pail of Cement Bear, mixing continuously until a workable consistency is attained. The mixture shall be allowed to stand for approximately 5 minutes, then remixed again to temper and increase pot life.
- 2.3.2. DuROCK Prep Coat shall be mixed by a medium duty power-drill (400 – 500 RPM) with stainless steel or corrosion-resistant paddle-mixing-blades. It shall be mixed to a uniform consistency prior to mixing with Portland cement. 15 kg (33 lbs) of Type 10, 20, or 30 Portland Cement shall be gradually added to one-half pail of Prep Coat, mixing continuously until a workable consistency is attained. The mixture shall be allowed to stand for approximately 5 minutes, then remixed again to temper and increase pot life, adding up to 250 mL (8 oz) of potable water if required to adjust viscosity.
- 2.3.3. DuROCK Prep Coat D shall be mixed by a medium duty power-drill (400 – 500 RPM) with stainless steel or corrosion-resistant paddle-mixing-blades. One bag of Prep Coat D shall be gradually added to 6 L (1.3 imp gal) of potable water, mixing continuously until a workable consistency is attained. The mixture shall be allowed to stand for approximately 5 minutes, then remixed again to temper and increase pot life, adding up to 250 mL (8 oz) of potable water if required to adjust viscosity.
- 2.3.4. DuROCK Base Primer, Roll-On, Finishes, and Specialty Finishes shall be mixed to a uniform consistency by a medium duty power-drill (400 – 500 RPM) with stainless steel or corrosion-resistant paddle-mixing-blades prior to application. Up to 250 mL (8 oz) of potable water may be added to DuROCK Finishes when being applied in hot weather, however, water shall not be added to heavily pigmented finishes, i.e. dark colours. Water shall not be added to DuROCK Base Primer, Roll-On, or Specialty Finishes.
- 2.3.5. Discard any material that has become stiff or hard.

PART 3 – EXECUTION

3.1. GENERAL

- 3.1.1. Deficiencies in the substrate shall be rectified prior to commencing the work of this section.
- 3.1.2. The work of this section shall be co-coordinated with the work of other related sections.
- 3.1.3. PUCCS EIFS for ICF shall be installed in accordance with these specifications and the corresponding details.
- 3.1.4. The work of other sections shall be protected to ensure the work of this section does not stain or otherwise damage them.

3.2. ICF PREPARATION

- 3.2.1. On buildings over three storeys in height, fire stopping shall be incorporated into the ICF at no more than three floor intervals. A minimum 100 mm (4 inch) wide band of the exterior ICF insulation shall be removed. Reinforced base coat shall be applied onto the exposed concrete lapping a minimum of 100 mm (4 inches) onto the face of the ICF both above and below the cut out. The resulting void in the ICF shall be filled with non-combustible mineral fibre insulation board which shall be adhered to the reinforced base coat.
- 3.2.2. Gaps in the formwork that exceed 1.6 mm (1/16 inch) in width shall be filled with insulation material.
- 3.2.3. The ICF shall be rasped to ensure the surface is plane, smooth, and free of ultraviolet radiation degradation.
- 3.2.4. Reinforced base coat shall be applied at all termination points lapping a minimum of 100 mm (4 inches) onto the face of the ICF and a minimum of 100 mm (4 inches) onto the concrete within the form.

3.3. MOISTURE BARRIER

- 3.3.1. A continuous, uniform coat of moisture barrier shall be applied to the ICF including the areas where fire stopping is in place. Reinforcing mesh shall be immediately embedded into it, and the surface shall be rendered uniform and smooth. Reinforcing mesh joints shall be overlapped a minimum of 100 mm (4 inches).
- 3.3.2. The reinforced moisture barrier shall overlap the base coat at terminations a minimum of 100 mm (4 inches).
- 3.3.3. The moisture barrier shall be allowed to dry, the minimum dry thickness shall be 1.6 mm (1/16 inch), and the mesh shall not be visible.

3.4. DRAINAGE ACCESSORIES

- 3.4.1. Accessories shall be either adhesively or mechanically fastened to the substrate at locations indicated on the architectural drawings. Ends shall be butted tightly together, and sealed at termination points and corners.
- 3.4.2. Moisture barrier shall be applied to the interface of the accessory and the substrate to effectively prevent water from breaching it, and to direct water into its trough.

3.5. WRAPPING

- 3.5.1. PUCCS insulation shall be wrapped at all fire stop locations, terminations, and expansion joints.
- 3.5.2. Wrapping shall encapsulate exposed insulation board edges with mesh-reinforced base coat.
- 3.5.3. Wrapping shall extend a minimum of 100 mm (4 inches) behind the insulation.
- 3.5.4. Wrapping shall be adhered to the substrate.
- 3.5.5. Wrapping shall not block the drainage path on the backside of the insulation.

3.6. PUCCS INSULATION

- 3.6.1. There are two methods by which PUCCS insulation may be adhered.
- 3.6.2. Under the One-Step Method, Cement Bear shall be applied in a continuous, uniform coat, at a minimum wet film thickness of 2 mm (1/12 inch), and the insulation shall be immediately adhered to it. Installer shall ensure the insulation remains in contact with the wet adhesive until it is dry.
- 3.6.3. Under the Two-Step Method, adhesive shall be applied to the substrate in vertical ribbons that are no less than 9.5 mm (3/8 inch) thick and spaced at no more than 75 mm (3 inches) o.c. The insulation shall be immediately adhered to it, and shall be firmly held in place by it.

SPEC NOTE	<i>13. The Designer has the prerogative to specify the method of installation.</i>
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- 3.6.4. Under both methods, the insulation shall be installed such that boards are butted tightly together, vertical joints are staggered a minimum of 75 mm (3 inches), boards are oriented lengthwise horizontally, and inside and outside corners are interlocked. Insulation board joints shall not align with corners of through-wall penetrations such as windows and doors. Adequate space shall be left at termination and expansion joints to allow for wrapping and sealant, except no space for sealant shall be left at fire stop locations. Gaps between boards that exceed 1.6 mm (1/16 inch) in width shall be filled with insulation material. Gaps at outside corners shall also be filled with insulation material.
- 3.6.5. The adhesive shall be allowed to dry prior to rasping. The insulation shall be rasped to ensure the surface is plane, smooth, and free of ultraviolet radiation degradation. The minimum insulation thickness after rasping shall be 20 mm (3/4 inch) exclusive of the PUCCS groove, and 30 mm (9/8 inch) inclusive of the PUCCS groove.
- 3.6.6. Aesthetic reveals shall be cut as indicated on the architectural drawings. The minimum insulation thickness behind reveals shall be 20 mm (3/4 inch) exclusive of the PUCCS groove, and 30 mm (9/8 inch) inclusive of the

PUCCS groove. Horizontal reveals shall be sloped to shed water. Reveals shall not align with insulation board joints. Reveals should not align with corners of through wall penetrations such as windows and doors.

3.7. BASE COAT & FIBRE MESH

- 3.7.1. Where specified, impact mesh shall be embedded in base coat, and allowed to dry, prior to application of the reinforcing mesh. All areas that are treated with impact mesh shall also receive reinforcing mesh. Impact mesh joints shall be butted together, and not overlapped.
- 3.7.2. Base coat shall be applied continuously over the insulation, including areas that have been treated with impact mesh, and areas that have been wrapped at fire stop locations. Reinforcing mesh shall be immediately embedded into it, and the surface shall be rendered uniform and smooth.
- 3.7.3. Reinforcing mesh joints shall be overlapped a minimum of 100 mm (4 inches) in the field of the wall, and at least 200 mm (8 inches) on both sides of outside corners..
- 3.7.4. An additional layer of reinforcing mesh shall be installed at a 45° angle to corners of through wall penetrations.
- 3.7.5. Minimum base coat thickness shall be 2 mm (1/12 inch). Base coat shall be allowed to dry prior to application of primer and finish.

3.8. PRIMER & FINISH COAT

- 3.8.1. Where specified, primer shall be applied to the reinforced base coat, and allowed to dry for a minimum of 4 hours prior to finish coat application.
- 3.8.2. Finish coat shall be applied, and trowel-applied finishes shall be floated, to match the approved texture.
- 3.8.3. Finish coat shall not be applied onto surfaces that are to receive sealant.
- 3.8.4. Temporary protection shall remain in place until sealant and flashing are installed.
- 3.8.5. Leftover materials and debris shall be removed from the jobsite.

End of Specification 07 24 13

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