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DuROCK PUCCS NC

Non-Combustible Cladding

Exterior Insulation Finish System (EIFS)

MANUFACTURER'S SPECIFICATION 07 24 40

PART 1 – GENERAL

1.1. RELATED SECTIONS

1.1.1. Specification 03 30 00 – Cast-in-Place Concrete
1.1.2. Specification 04 20 00 – Unit Masonry
1.1.3. Specification 05 40 00 – Cold-Formed Metal Framing
1.1.4. Specification 06 10 00 – Rough Carpentry
1.1.5. Specification 07 27 00 – Air Barriers
1.1.6. Specification 07 60 00 – Flashing & Sheet Metal
1.1.7. Specification 07 90 00 – Joint Protection (Sealants)
1.1.8. Specification 08 00 00 – Openings
1.1.9. Specification 09 28 00 – Backing Boards and Underlayments

1.2. SYSTEM DESCRIPTION

1.2.1. PUCCS NC is non-combustible, continuous insulation, rainscreen cladding that includes first and second planes of protection from precipitation, and a Geometrically Defined Drainage Cavity (GDDC) that is 10 mm deep and 37% open.

1.2.2. PUCCS NC incorporates an air barrier/water resistive barrier (WRB)/adhesive, non-combustible mineral fibre/wool insulation with a GDDC on the backside and an integral alkali-resistant fibreglass mesh on the front side, mechanical attachment, a reinforced base coat, a primer, and a finish.

1.2.3. PUCCS NC has been evaluated for compliance with the National Building Code of Canada, as confirmed in CCMC Evaluation Report 12969-R http://www.durock.ca/evaluation.pdf.

SPEC NOTE	*1. PUCCS NC is non-combustible cladding intended for use in both non-combustible and combustible construction alike, on walls where non-combustible cladding is required as well as those walls where combustible cladding is permitted.*
SPEC NOTE	*2. PUCCS NC can be adapted and designed to be prefabricated or panelized on unitized steel framing that has been engineered for attachment and the anticipated live and dead loads.*

1.3. DESIGN REQUIREMENTS

1.3.1 All Substrates

1.3.1.1. Substrates shall be structurally sound and continuously supported.
1.3.1.2. Substrates shall be designed to withstand the anticipated wind loads and deflect no more than L/240.
1.3.1.3. Substrates shall be continuous, flat, and plumb, with surface variations less than 6 mm over 2400 mm (1/4 inch over 8 feet).
1.3.1.4. Substrates 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. Mass Wall Substrates

1.3.2.1. Mass walls shall be cast-in-place concrete, concrete masonry units, prefabricated concrete, or brick.

1.3.2.2. Mass walls shall be free from release agents, efflorescence, and cracks.

1.3.2.3. Mass walls shall be at least 28 days old.

1.3.3. Sheathing Substrates

1.3.3.1. Sheathing shall be minimum 13 mm (1/2 inch) thick glass-fibre-faced gypsum sheathing compliant with ASTM C 1177, minimum 13 mm (1/2 inch) thick cement board compliant with ASTM C 1325 or ANSI A118.9, minimum 13 mm (½ inch) thick plywood compliant with CSA-O325.0, CSA-O121-M, CSA-O151-M or CSA-O153-M, or minimum 11 mm (7/16 inch) thick Oriented Strand Board (OSB) compliant with CSA-O437.

1.3.3.2. Sheathing shall be attached to framing in accordance with manufacturer's instructions, in general conformance to ASTM C 1280, and attached with corrosion resistant screws.

1.3.3.3. Sheathing shall be installed horizontally with vertical joints offset by at least one framing member, installed so that no joints align with corners of openings, such as windows or doors. Gaps between boards shall not exceed 3 mm (1/8 inch) in width.

SPEC NOTE	*3. PUCCS NC was specifically evaluated for use in non-combustible construction. The use of PUCCS NC on wood sheathing is subject to approval from the AHJ.*
SPEC NOTE	*4. PUCCS NC is designed for attachment to framing that is spaced at 406 mm (16 inch) centres. Framing spaced more than 406 mm (16 inches) apart requires additional support for mechanical attachment of the insulation.*

1.3.4. Water Resistive Barrier Continuity

1.3.4.1. Polyester-faced self-adhering transition membrane (aka EIFS Tape) shall maintain continuity of the water resistive barrier at expansion and movement joints in the substrate, at interfaces with other sheathing membranes and roof membranes, at interfaces with metal flashing that drains PUCCS to the exterior, and at openings and through wall penetrations in the substrate.

1.3.4.2. Polyester-faced self-adhering transition membrane (aka EIFS Tape) shall be installed in accordance with membrane manufacturer requirements.

1.3.5. Termination and Drainage

1.3.5.1. PUCCS NC shall terminate and drain at least 200 mm (8 inches) above finished grade.

1.3.5.2. PUCCS NC shall terminate and drain at least 50 mm (2 inches) above roofing systems, balconies, and other similar conditions.

1.3.5.3. PUCCS NC shall drain above windows, doors, soffits, and other similar conditions.

1.3.6. Expansion and Termination Joints

1.3.6.1. Expansion and termination joints shall accommodate expansion and contraction of building materials due to thermal changes, moisture, wind, gravity, vibration, and seismic activity.

1.3.6.2. Expansion joints 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; at deflection tracks in steel frame construction; at floor lines in wood frame construction; and where PUCCS NC abuts other cladding systems.

1.3.6.3. Termination joints are required where PUCCS NC abuts through wall penetrations such as windows and doors.

1.3.6.4. 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.

1.3.6.5. Joints shall be sealed to prevent ingress of precipitation, unless otherwise specified.

SPEC NOTE	*5. Location and joint size are the responsibility of the designer. Joint width should be four times the anticipated range of movement.*

SPEC NOTE	*6. Wood framed construction that incorporates engineered wood joist systems may not necessarily require expansion joints. It is the Designer's prerogative to omit expansion joints at these locations.*
SPEC NOTE	*7. Drained joints employing DuROCK drainage accessories do not require sealant. It is the Designer's prerogative to specify sealant at those locations.*

1.3.7. Joint Sealant

1.3.7.1. Sealant shall be used to seal expansion and termination joints, unless otherwise specified.

1.3.7.2. Sealant shall be compatible with DuROCK base coats, sealant shall be tested in accordance with ASTM C 1382, and sealant shall be capable of at least 50% elongation.

1.3.7.3. Sealant shall be installed with closed-cell foam backer rod or bond breaker tape in accordance with manufacturer instructions and in general conformance with ASTM C 1481.

1.3.7.4. Sealant shall not be applied to DuROCK finish coat.

1.3.7.5. Sealant shall be vented to permit drying and drainage of incidental moisture.

SPEC NOTE	*8. The following sealants are suitable for use with PUCCS NC: Sikaflex 15LM and Sikasil WS 290; DOWSIL 790 and DOWSIL 795; Tremco Spectrem 1, 3, and 4; and BASF Sonolastic 150. Consult DuROCK regarding the use of other sealants.*
SPEC NOTE	*9. The dimensions of sealant vents spaced 3 m (10 ft) apart should not exceed the joint width. Vent area should be proportionately reduced for vents spaced closer together. Sealant vents may incorporate plastic masonry vents, equivalent pest screens, or vent tubes.*

1.3.8. Flashing

1.3.8.1. Flashing is required where PUCCS NC is expected to drain moisture to the exterior and where the exposed top edge of PUCCS NC does not have a minimum slope of 1:2.

1.3.8.2. PUCCS NC shall be protected at roof parapets by a waterproof membrane and cap flashing.

1.3.8.3. Flashing materials shall be corrosion resistant.

1.3.8.4. Flashing shall be installed in accordance with the model building code.

1.3.9. Mouldings (sills, cornices, bands, keystones, quoins, etc.)

1.3.9.1. Unless protected by flashing, the upward facing portion of a moulding that is exposed to precipitation shall be sloped not less than 1:2 for mouldings up to 300 mm (12 inches) wide.

1.3.9.2. Mouldings wider than 300 mm (12 inches) shall be protected by structurally supported metal flashing.

1.3.9.3. Mouldings 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).

1.3.9.4. Pre-manufactured mouldings shall be applied after the base coat has dried, and before primer or finish is applied.

1.3.10. Aesthetic Reveals

1.3.10.1. Aesthetic reveals may be incorporated into the system provided the insulation thickness behind the reveal is not less than 25 mm (1 inch) over and above the 10 mm (3/8 inch) grooved air space on the backside of the insulation board. Maximum reveal depths are 13 mm (1/2 inch) for 50 mm (2 inch) insulation and 38 mm (1-1/2 inch) for 75 mm (3 inch) insulation.

1.3.10.2. Reveals shall not align with framing members.

1.3.10.3. Horizontal reveals shall have a minimum slope of 1:2 to shed water.

SPEC NOTE	*10. Aesthetic reveals should not align with corners of through wall penetrations such as windows and doors.*

1.4. PERFORMANCE REQUIREMENTS

1.4.1. The water resistive barrier (WRB)/adhesive shall meet the requirements of CAN/ULC-S716.1 as well as the air barrier requirement in National Building Code of Canada Article 5.4.1.2.

1.4.2. The insulation shall meet the requirements of CAN/ULC-S702.1 and CAN/ULC-S114.
1.4.3. The base coat shall meet the requirements of CAN/ULC-S716.1 and CAN/ULC-S114.
1.4.4. The reinforcing mesh shall meet the requirements of CAN/ULC-S716.1.
1.4.5. The finish shall meet the requirements of CAN/ULC-S716.1.

1.5. SUBMITTALS
1.5.1. Upon request, DuROCK will supply finish coat samples providing representation of the texture and colour.

1.6. QUALITY ASSURANCE
1.6.1. PUCCS a competent, knowledgeable, experienced contractor shall install NC.
1.6.2. PUCCS NC shall be installed in accordance with this specification and the corresponding details.

1.7. DELIVERY, STORAGE & HANDLING
1.7.1. All materials shall be delivered to the jobsite in the original, unopened packaging with labels clearly identifying each component.
1.7.2. All materials shall be inspected upon delivery. Any defective or frozen materials shall not be used.
1.7.3. All materials 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 when the substrate surface temperature exceeds 40°C (104°F).
1.8.4. All work shall be protected from rain, snow, hail, and wind exceeding 25 kph (15 mph) until it has dried.
1.8.5. Exposed insulation board edges and drainage cavities shall be protected from precipitation until the base coat has been applied and allowed to dry.

1.9. WARRANTY
1.9.1. PUCCS NC 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 only effective if the system is installed in accordance with this specification and is only effective once DuROCK has received payment in full.
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 NC shall be supplied by DuROCK Alfacing International Limited, or its distributors.

2.2. MATERIALS
2.2.1. Water Resistive Barrier (WRB)/Adhesive
2.2.1.1. DuROCK Cement Bear is a cementitious, vapour permeable, water resistive barrier, air barrier, and adhesive. Cement Bear is compliant with CAN/ULC-S716.1 and it meets the air barrier requirement in National Building Code of Canada Article 5.4.1.2.
2.2.1.2. DuROCK Polar Bear is a non-cementitious, vapour permeable, water resistive barrier, air barrier, and adhesive. Polar Bear is compliant with CAN/ULC-S716.1 and it meets the air barrier requirement in National Building Code of Canada Article 5.4.1.2.

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

SPEC NOTE	*11. 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.*

2.2.3. Insulation

2.2.3.1. DuROCK PUCC-ROCK insulation is non-combustible mineral fibre/wool board manufactured by ROCKWOOL, compliant with CAN/ULC-S702.1 and CAN/ULC-S114.

2.2.3.2. PUCC-ROCK incorporates a geometrically defined drainage cavity (GDDC) on the backside that is 10 mm deep and 37% open, and it includes an integral alkali-resistant fibreglass mesh on the front side.

2.2.3.3. PUCC-ROCK is available in 51, 76, 102, 127, and 152 mm (2, 3, 4, 5, and 6 inch) thicknesses. Respective thermal resistance values are RSI 1.3 for 51 mm; RSI 2.0 for 76 mm; RSI 2.7 for 102 mm; RSI 3.4 for 127 mm; and RSI 4.1 for 152 mm (R 7.4 for 2"; R 11.4 for 3"; R 15.4 for 4"; R 19.4 for 5"; and R 23.4 for 6").

SPEC NOTE	*12. It is the Designer's responsibility to specify the insulation thickness, which must be designed to minimize the potential for condensation within the supporting wall.*

2.2.4. Base Coat

2.2.4.1. DuROCK Prep Coat base coat compliant with CAN/ULC-S716.1 and CAN/ULC-S114 - 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.

2.2.5. Mechanical Fasteners

2.2.5.1. For concrete and masonry substrates: Wind-Lock ULP-302 washers with ITW Buildex Tapcon anchors; or EJOT STR H washers with EJOT FBS-R-6.3 anchors. The depth and diameter of fastener holes shall be appropriate for the anchor being used and anchors shall penetrate a minimum of 25 mm (1 inch) into the concrete or masonry.

2.2.5.2. For steel framing: Wind-Lock ULP-302 washers with EJOT Dabo TKR-4.8 self-drilling screws that penetrate a minimum of 8 mm (5/16 inch) through the steel framing.

2.2.5.3. For wood framing: Wind-Lock ULP-302 washers with coarse-thread, green deck screws that penetrate a minimum of 25 mm (1 inch) into the wood framing.

2.2.6. Alkali-Resistant Glass-Fibre Mesh

2.2.6.1. DuROCK 5 oz Reinforcing Mesh is alkali-resistant fibreglass mesh compliant with CAN/ULC-S716.1 and the DuROCK logo appears on the mesh.

2.2.6.2. DuROCK 15 oz Impact Mesh is alkali-resistant fibreglass mesh compliant with CAN/ULC-S716.1.

SPEC NOTE	*13. PUCCS NC with one layer of 5 oz reinforcing mesh provides up to 19 Joules impact resistance. PUCCS NC with two layers of 5 oz reinforcing mesh provides up to 37 Joules impact resistance. PUCCS NC with one layer of 15 oz impact mesh plus one layer of 5 oz reinforcing mesh provides more than 40 Joules impact resistance. It is the Designer's responsibility to specify where additional layers of mesh are required, and which mesh weights are to be used.*
SPEC NOTE	*14. PUCCS NC is not designed to withstand vehicular impact. Wherever possible, curbs, bollards, or sidewalks should be employed to create a buffer between PUCCS NC and vehicular traffic.*

2.2.7. Primer and Finish Coats

2.2.7.1. DuROCK Base Primer – water-based, colour-pigmented acrylic dispersion used as a primer for DuROCK Finishes, applied by roller, brush, or spray equipment.

2.2.7.2. 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.
2.2.7.3. 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.
2.2.7.4. DuROCK Specialty Finishes – water-based, exposed coloured aggregate finishes with integral texture, applied by stainless steel trowel or spray equipment.

2.3. MIXING

2.3.1. 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. Gradually add 13.5 kg (30 lbs) of Type 10 or GU Portland cement 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 and then remixed again to temper and increase pot life.
2.3.2. 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. Polar Bear, 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.
2.3.4. 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 coordinated with the work of other related sections.
3.1.3. PUCCS NC shall be installed in accordance with this specification 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. WATER RESISTIVE BARRIER (WRB)

3.2.1. Self-adhering membrane shall be applied at framing locations where the puck will not align with the stud.
3.2.2. Polar Bear shall be used as the first coat WRB for plywood and OSB substrates. Cement Bear shall be used as the first coat WRB for all other substrates and as the second coat WRB/adhesive for all substrates.
3.2.3. WRB shall be uniformly applied to the substrate and allowed to dry. Polar Bear minimum dry thickness shall be 1.2 mm (47 mils) and Cement Bear minimum dry thickness shall be 1.0 mm (40 mils). WRB shall be continuous with the self-adhering membrane.

3.3. DRAINAGE ACCESSORIES

3.3.1. 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.
3.3.2. WRB 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.

3.4. WRAPPING

3.4.1. Insulation shall be wrapped at all terminations and at all expansion joints.
3.4.2. Wrapping shall encapsulate exposed insulation board edges with mesh-reinforced base coat.
3.4.3. Wrapping shall be adhered to the WRB.
3.4.4. Wrapping shall not block the drainage path at the underside of the insulation.

INSULATION

3.4.5. Insulation shall be installed such that the pucks on the backside align with framing members.

3.4.6. Insulation shall be installed such that boards are butted tightly together, oriented lengthwise horizontally with vertical joints staggered a minimum of 150 mm (6 inches) from framing members and a minimum of 100 mm (4 inches) from vertical joints in neighbouring rows. Gaps between boards that exceed 1.6 mm (1/16 inch) in width shall be filled with insulation material.

3.4.7. Insulation shall be interlocked at inside and outside corners. The puck shall be cut away at outside corners to close the drainage cavity (see detail D10-A).

3.4.8. Adequate space shall be left at termination and expansion joints to allow for wrapping and sealant.

3.4.9. Cement Bear WRB/adhesive shall be applied in a continuous, uniform coat and the insulation shall be immediately adhered to it. Minimum wet thickness shall be 1.25 mm (50 mils). Mechanical fasteners shall be placed through the dimples on the front of the insulation before the adhesive dries. Fasteners that penetrate the self-adhering membrane need not be placed through the dimples.

3.4.10. Fasteners shall penetrate a minimum of 8 mm (5/16 inch) into steel framing and a minimum of 25 mm (1 inch) into wood framing, concrete, or masonry, with the washer seated flush with the insulation board face. The depth and diameter of fastener holes drilled into mass wall substrates shall be appropriate for the fastener being used.

3.4.11. Fasteners shall be spaced no more than 400 mm (16 inches) apart horizontally and 300 mm (12 inches) apart vertically, and fasteners shall be placed within 150 mm (6 inches) of all terminations, openings, corners, and expansion joints.

3.4.12. Aesthetic reveals shall be cut as indicated on the architectural drawings. The minimum insulation thickness behind reveals shall be 25 mm (1 inch) over and above the 10 mm (3/8 inch) grooved air space on the backside of the insulation board. Horizontal reveals shall be sloped to shed water. Reveals shall not align with insulation board joints or fasteners. Reveals should not align with corners of through wall penetrations such as windows and doors.

3.5. BASE COAT & FIBRE MESH

3.5.1. Mechanical fasteners shall be covered with base coat and allowed to dry prior to coating the wall.

3.5.2. 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.

3.5.3. Base coat shall be applied continuously over the insulation and in areas that have been treated with impact mesh. Reinforcing mesh shall be immediately embedded into the wet base coat and the surface shall be rendered uniform and smooth.

3.5.4. Reinforcing mesh joints shall be overlapped a minimum of 75 mm (3 inches) in the field of the wall and at least 150 mm (6 inches) on both sides of outside corners.

3.5.5. An additional layer of mesh shall be installed at a 45^{o} angle to corners of through wall penetrations.

3.5.6. Minimum base coat thickness shall be 3 mm (120 mils). Base coat shall be allowed to dry prior to application of primer.

3.6. PRIMER & FINISH COAT

3.6.1. Primer shall be applied to all areas that are to receive finish and shall be allowed to dry for a minimum of four hours prior to finish coat application.

3.6.2. Finish coat shall be applied, and trowel-applied finishes shall be floated, to match the approved texture.

3.6.3. Finish coat shall not be applied onto surfaces that are to receive sealant.

3.6.4. Temporary protection shall remain in place until sealant and flashing are installed.

3.6.5. Leftover materials and debris shall be removed from the jobsite.

End of Specification 07 24 40

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