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June 1, 2009

TO: PARTIES INTERESTED IN WATER-RESISTIVE COATINGS

SUBJECT: Proposed Revisions to the Acceptance Criteria for Water-Resistive Coatings Used as a Water-Resistive Barrier Over Exterior Sheathing, Subject AC212-R1-0609 (YM/MB)

Dear Madam or Sir:

An evaluation report holder has proposed revisions, as noted below, to the subject acceptance criteria. The proposals are being posted on the ICC-ES web site. The purpose of the posting is to allow for public comment. The revisions will not be considered by the Evaluation Committee at this time.

1. Include procedures, as noted in Section 3.9 of the enclosed criteria draft, for qualification of the water-resistive coating to be used as an air barrier material. The proposed revisions are based on precedence established in the ICC-ES Acceptance Criteria for Water-resistive Barriers (AC38).
2. Include procedures in Section 3.10 of the enclosed criteria to evaluate the performance of the water-resistive coating when used as an alternate to two layers of Grade D building paper required over wood-based sheathing in exterior cement plaster and one-coat stucco applications.

Section 2510.6 of the IBC and Section 3.2.7 of the ICC-ES Acceptance Criteria for Exterior Cementitious Wall Coatings (AC11) require two layers of Grade D building paper over wood-based sheathing when used with exterior plaster, for the purpose of addressing detrimental movement between the plaster veneer and the wood-based sheathing. In the case of water-resistive coatings applied over wood-based sheathing, the code and AC11 require an intervening layer between the water-resistive coating and the plaster veneer. The proponent seeks to eliminate the intervening layer on the premise that if there is no significant adhesion between the water-resistive coating and the plaster stucco veneer, the intervening layer is not needed to counteract the effects of detrimental movement. The proposal includes detrimental movement tests, as described in Section 4.9.1 of the enclosed criteria, to determine the slip resistance between the water-resistive coating and the plastic veneer. The proposal also includes tensile strength tests on the plaster material, as described in Section 4.9.2 of the criteria. Staff is seeking input on the following items regarding this proposal:

- a. Section 4.9.3 of the enclosed criteria draft states that the maximum load at failure for the detrimental movement shall not be more than 1 psi. Staff questions whether this value should be assigned to the detrimental movement between the water-resistive coating and the stucco veneer.
- b. In addition to detrimental movement, the two layers of Grade D building paper over wood-based sheathing may provide other functions, in stucco applications, that have not been identified.
- c. Eliminating the intervening layer may result in premature cracking of the plaster veneer. Are there tests besides the detrimental movement test that should be considered?
- d. A minimum 100 psi tensile strength of the plaster veneer material, described in Section 4.9.3 of the enclosed criteria is proposed. The purpose for the test and the assigned condition of acceptance needs to be justified.

You are cordially invited to submit written comments, within 30 days of the date of this letter. Please use the comment form on the web site attaching any letters to the form. An explanation of the alternate criteria process can be found on our web site at http://www.icc-es.org/Criteria_Development/alternative_criteria_process.shtml.

All comments received in the 30-day comment period will be considered in preparing revisions to the criteria that may be considered at a future Evaluation Committee meeting. Comments received will be posted on the web site shortly after the close of the comment period.

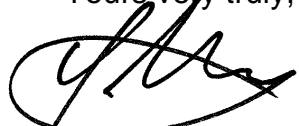
Your cooperation is requested in forwarding to the Los Angeles business/regional office all material directed to the Evaluation Committee. Parties interested in the deliberations of the committee should refrain from communicating, whether in writing or verbally, with committee members. The committee reserves the right to refuse communications that do not comply with this request.

Newly approved acceptance criteria may involve test methods or test protocols that are not currently included in the scope of testing services offered by accredited testing laboratories. As noted in the ICC-ES Rules of Procedure for Evaluation Reports, the scope of the laboratory's accreditation must include the type of testing that is to be reported to ICC-ES. We encourage accredited laboratories to expand their scopes of accreditation to include testing under newly approved acceptance criteria. Please note that testing laboratories must be accredited by the International Accreditation Service (IAS) or by another accreditation body that is a signatory to the International Laboratory Accreditation Cooperation Mutual Recognition Arrangement. For further information, please contact IAS at (562) 699-0541, extension 3309, or send an e-mail to pmccullen@iasonline.org.

Please submit all comments using the form on the web site. Attach any letters to the comment form. If you have any questions (not comments), please contact the

undersigned at (800) 423-6587, extension 3260, or Michael Beaton, P.E., at extension 3260. You may also reach us by e-mail at es@icc-es.org.

Yours very truly,



Yamil Moya, P.E.
Staff Engineer

YM/gh:raf

Enclosure

cc: Evaluation Committee

PROPOSED REVISIONS TO THE ACCEPTANCE CRITERIA FOR WATER-RESISTIVE COATINGS USED AS WATER-RESISTIVE BARRIERS OVER EXTERIOR SHEATHING

AC212

Proposed June 2009

Previously approved February 2005, June 2004 and June 2003

PREFACE

Evaluation reports issued by ICC Evaluation Service, Inc. (ICC-ES), are based upon performance features of the International family of codes and other widely adopted code families, including the Uniform Codes, the BOCA National Codes, and the SBCCI Standard Codes. Section 104.11 of the *International Building Code*® reads as follows:

The provisions of this code are not intended to prevent the installation of any materials or to prohibit any design or method of construction not specifically prescribed by this code, provided that any such alternative has been approved. An alternative material, design or method of construction shall be approved where the building official finds that the proposed design is satisfactory and complies with the intent of the provisions of this code, and that the material, method or work offered is, for the purpose intended, at least the equivalent of that prescribed in this code in quality, strength, effectiveness, fire resistance, durability and safety.

Similar provisions are contained in the Uniform Codes, the National Codes, and the Standard Codes.

ICC-ES may consider alternate criteria, provided the report applicant submits valid data demonstrating that the alternate criteria are at least equivalent to the criteria proposed in this document, and otherwise meet the applicable performance requirements of the codes. Notwithstanding that a product, material, or type or method of construction meets the requirements of the criteria proposed in this document, or that it can be demonstrated that valid alternate criteria are equivalent to the criteria in this document and otherwise meet the applicable performance requirements of the codes, ICC-ES retains the right to refuse to issue or renew an evaluation report, if the product, material, or type or method of construction is such that either unusual care with its installation or use must be exercised for satisfactory performance, or malfunctioning is apt to cause unreasonable property damage or personal injury or sickness relative to the benefits to be achieved by the use of the product, material, or type or method of construction.

Acceptance criteria are developed for use solely for purposes of issuing ICC-ES evaluation reports.

PROPOSED REVISIONS TO THE ACCEPTANCE CRITERIA FOR WATER-RESISTIVE COATINGS USED AS WATER-RESISTIVE BARRIERS OVER EXTERIOR SHEATHING

1.0 INTRODUCTION

1.1 Purpose: The purpose of this criteria is to establish requirements for recognition of water-resistive coatings, used as water-resistive barriers over exterior sheathing, in ICC Evaluation Service, Inc. (ICC-ES), evaluation reports under the 2006 *International Building Code*[®] (IBC), [the 2006 International Energy Conservation Code \(IECC\)](#), the 2006 *International Residential Code*[®] (IRC), the BOCA[®] *National Building Code/1999* (NBBC), the 1999 *Standard Building Code*[®] (SBC) and the 1997 *Uniform Building Code*[™] (UBC). The bases of recognition are IBC Section 104.11, IRC Section R104.11, NBBC Section 106.4, SBC Section 103.7 and UBC Section 104.2.8.

1.2 Scope: This criteria is limited to coatings that are used on exterior walls as alternatives to the water-resistive barriers specified in Section 1404.2 of the IBC, Section R703.2 of the IRC and Section 1406.3.6 of the NBBC, the weather-resistant sheathing paper specified Section 703.2 of the SBC, and the weather-resistive barriers specified in Section 1402.1 of the UBC, [and optionally as an air barrier material under IECC Sections 402.4.1 and 502.4.3](#). The coatings are covered with either a code-approved exterior wall covering, or one that is recognized in a current ICC-ES evaluation report. Substrates that can be considered under this criteria are wood-based and gypsum-based sheathings, and cementitious backer units complying with ANSI A118.9, or equivalent.

When the water-resistive coating is intended to be the intervening material between two layers of exterior cementitious coatings, detrimental relative movement of the system shall be considered.

This criteria is applicable to coatings that overlap flashing and accessories.

1.3 Definitions:

1.3.1 Water-resistive Barrier: For the purposes of this criteria, the term “water-resistive barrier” includes within its scope water-resistive barriers under Section 1404.2 of the IBC, Section R703 of the IRC and Section 1404.6.3.6 of the NBBC, weather-resistant sheathing paper under Section 703.2 of the SBC, weather-resistive barriers under Section 1402.1 of the UBC, and water-repellent panel sheathing under Section 1402.1 of the UBC.

1.3.2 Air Barrier Material: [A material in building construction that is designed and installed to reduce air leakage either into or through an opaque wall.](#)

1.4 Codes and Referenced Standards:

1.4.1 2006 *International Building Code*[®], International Code Council.

1.4.2 2006 *International Residential Code*[®], International Code Council.

1.4.3 [2006 International Energy Conservation Code Code](#)[®], International Code Council.

1.4.4 BOCA[®] *National Building Code/1999*.

1.4.5 1999 *Standard Building Code*[®].

1.4.6 1997 *Uniform Building Code*[™].

1.4.7 AATCC Test Method 127-1985, Water Resistance: Hydrostatic Pressure Test, American Association of Textile Chemists and Colorists.

1.4.8 ANSI A118.9-1999, Test Method and Specifications for Cementitious Backer Units, American National Standards Institute.

1.4.9 ASTM C 297-94, Standard Test Method for Flatwise Tensile Strength of Sandwich Constructions, ASTM International.

1.4.10 ASTM D 2247-97, Standard Practice for Testing Water Resistance of Coatings in 100% Relative Humidity, ASTM International.

1.4.11 ASTM E 72-02, Standard Test Methods of Conducting Strength Tests of Panels for Building Construction, ASTM International.

1.4.12 ASTM E 96-00^{e01}, Standard Test Method for Water Vapor Transmission of Materials, ASTM International.

1.4.13 ASTM E 331-00, Standard Test Method for Water Penetration of Exterior Windows, Skylights, Doors and Curtain Walls by Uniform Static Air Pressure Difference, ASTM International.

1.4.14 ASTM E 1233-97, Standard Test Method for Structural Performance of Exterior Windows, Curtain Walls and Doors by Cyclical Static Air Pressure Differential, ASTM International.

1.4.15 [ASTM E 2178-03, Standard Test Method for Air Permeance of Building Materials](#), ASTM International.

1.4.16 [ASTM C 1208-97, Standard Test Method for Determining the Static Friction of Ceramic Tile and Other Like Surfaces by the Horizontal Dynamometer Pull-Meter Method](#), ASTM International.

1.4.17 [ASTM C 190-85, Standard Test Method for Tensile Strength of Hydraulic Cement Mortars](#), ASTM International.

2.0 BASIC INFORMATION AND REPORTS OF TESTS

2.1 The following information shall be submitted:

2.1.1 Product Description: A complete description of the water-resistive coating material, including base material and the thinning agent, shall be submitted and shall include the following, as applicable:

2.1.1.1 Percent-solids content of the water-resistive coating material.

2.1.1.2 Type and amount of priming material applied to the substrate prior to the application of the coating.

2.1.1.3 Amount of liquid material per shipping container, and density.

2.1.1.4 Statements on product-use limitations, including ultraviolet exposure.

2.1.2 Installation Instructions: Printed installation procedures, available to the installer, shall be submitted, and shall include information as indicated below:

2.1.2.1 Application rate of liquid material applied to the substrate, measured in gallons per square foot

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(l/m²), and dry film thickness, shall be specified. Application procedures shall specify substrates. Conditions necessary for proper application, such as ambient temperature, site conditions (such as wet or muddy), and the material temperature, shall be included, as applicable.

2.1.2.2 Substrate preparation shall address the following:

2.1.2.2.1 Removal of deleterious materials that may affect bond and performance.

2.1.2.2.2 Treatments of voids, cracks, substrate joints and other excessively rough areas.

2.1.2.2.3 Applications of primers and other substrate conditioning materials with the water-resistive coating material.

2.1.2.2.4 Age of substrate and substrate temperature at time of preparation and coating application.

2.1.2.3 Cure time, drying period and other time-related requirements shall be specified.

2.1.2.4 Preparation of materials prior to application, including components, proportions, temperature and humidity conditions, method of mixing and pot life of mixture, shall be specified.

2.1.2.5 Type, location, and installation procedures for all flashing, counterflashing, caulking and other special treatments shall be specified.

2.1.2.6 Illustrative details shall be provided, showing water-resistive coating application, including interface with terminations, openings, penetrations, and other discontinuities, as applicable.

2.1.2.7 If the material is to be evaluated as an air barrier material in addition to a water-resistive barrier, installation instructions shall identify specific installation provisions for air barrier material applications.

2.1.3 Packaging and Identification: A description of the method of packaging and identifying the material shall be submitted. Labeling for field identification shall include the following:

1. Name and address of manufacturer.
2. Product name.
3. Identification of components.
4. Lot or batch number.
5. Quantity of material in packaged mix.
6. Storage instructions and shelf life.
7. Expiration date (when applicable).
8. Evaluation report number.

2.2 Testing Laboratories: Testing laboratories shall comply with Section 2.0 of the ICC-ES Acceptance Criteria for Test Reports (AC85), and Section 4.2 of the ICC-ES Rules of Procedure for Evaluation Reports.

2.3 Test Reports: Test reports shall comply with the AC85.

2.4 Product Sampling: Test specimens shall be sampled in accordance with Sections 3.2, 3.3 and 3.4 of AC85.

3.0 TEST AND PERFORMANCE REQUIREMENTS

3.1 Report(s) of tensile bond testing as set forth in Section 4.1 of this criteria.

3.2 Report(s) of freeze-thaw testing as set forth in Section 4.2 of this criteria.

3.3 Report(s) of water-resistance testing as set forth in Section 4.3 of this criteria.

3.4 Report(s) of water-vapor transmission testing as set forth in Section 4.4 of this criteria.

3.5 Report(s) of water-penetration testing as set forth in Section 4.5 of this criteria. This requirement applies to exterior wall coverings capable of demonstrating water-penetration resistance in accordance with ASTM E 331 with a minimum 2.86 psf (137 Pa) static air pressure differential on a minimum 4-foot-by-8-foot (1219 mm by 2438 mm) sample.

3.6 Report(s) of structural, racking, and restrained environmental conditioning as set forth in Section 4.6 of this criteria. This requirement limits the products' use beneath exterior wall coverings capable of demonstrating water-penetration resistance in accordance with ASTM E 331 with a minimum 2.86 psf (137 Pa) static air pressure differential on a minimum 4-foot-by-8-foot (1219 mm by 2438 mm) sample.

3.7 Report(s) of structural, racking, restrained environmental conditioning and water-penetration tests as set forth in Section 4.7 of this criteria. This requirement permits use of water-resistive coatings beneath all exterior wall coverings.

3.8 Report(s) of ultraviolet light exposure and water resistance testing as set forth in Section 4.8 of this criteria.

3.9 When the product is to be evaluated as an air barrier material, reports of air permeance testing in accordance with ASTM E 2178 shall be submitted. A minimum of three specimens shall be tested. Minimum conditions of acceptance shall be an air permeance less than or equal to 0.2 L/sAm² at 75 Pa (0.004 cfm/ft² at 0.3 inch w.g. (1.57 psf)) for each specimen.

3.10 When the water-resistive coating is to be considered as an alternate to two layers of Grade D building paper in stucco application, detrimental relative movement shall be evaluated as set forth in Section 4.9 of this criteria.

4.0 TEST METHODS

4.1 Tensile Bond Testing:

4.1.1 Testing shall comply with ASTM C 297. Specimens shall be representative of those used in actual construction.

4.1.1.1 For each sheathing substrate for which recognition is sought, five specimens are prepared by applying the water-resistive coating to the sheathing substrate. The purpose of this test is to determine the adhesive performance of the coating when applied to a substrate. If joint treatment material is the same material as is used on the substrate surface, only testing set forth in Section 4.1.1.2 of this criteria is required.

4.1.1.2 For each sheathing substrate for which recognition is sought, five specimens, with joints, are prepared by applying the water-resistive coating and the joint treatment material to the sheathing substrate. The

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purpose of this test is to determine the adhesive performance of the coating and joint treatment when applied to a substrate.

4.1.1.3 For each flashing (including weep screed) material for which recognition is sought, five specimens are prepared by applying the water-resistive coating, and the flashing treatment, to the flashing material. The purpose of this test is to determine the adhesive performance of the coating and flashing treatment when applied to flashing.

4.1.2 Conditions of Acceptance: The flatwise tensile strength of each specimen shall be a minimum of 15 psi (105 kPa).

4.2 Freeze-thaw Tests:

4.2.1 For each sheathing substrate for which recognition is sought, five 6-inch-square (23 226 mm²) specimens are tested. Sheathing specimens shall consist of two sheathing sections assembled with a ¹/₈-inch-wide (3.2 mm) joint. The joint is treated as it would be in the field and the water-resistive coating is applied to the substrate surface in accordance with the manufacturer's recommended application instructions. The backs and sides of the specimens shall be sealed with an impervious material that need not be the coating. Specimens shall be representative of those used in actual construction.

4.2.2 Specimens are subjected to 10 freeze-thaw cycles. Each cycle consists of air-drying at a temperature of 120°F (49°C) for a minimum of eight hours, followed by total immersion in water at 70°F to 80°F (21.1°C to 26.7°C) for eight hours, and exposure to a temperature of -20°F (-28.9°C) for 16 hours.

4.2.3 Conditions of Acceptance: Failure is defined as surface changes, as viewed by minimum 5× magnification, such as cracking, checking, crazing, erosion or other characteristics, that may affect performance as a water-resistive barrier. There shall be no delamination, or indications of delamination, between components.

4.3 Water-resistance Testing:

4.3.1 For each sheathing substrate for which recognition is sought, three specimens, a minimum of 4 inches by 6 inches (102 mm by 152 mm) in size, and containing a ¹/₄-inch-wide (6.4 mm) joint, are tested. Sheathing specimens shall consist of two sheathing sections assembled with a ¹/₄-inch-wide (6.4 mm) joint. The joint is treated as described in Section 2.1.2.2.2 of this criteria, and the water-resistive coating is applied to the substrate surface in accordance with the manufacturer's recommended application instructions. The backs and sides of the specimens shall be sealed with the coating or other impervious material. Specimens shall be representative of those used in actual construction. The evaluation report shall include details for support of joints larger than those tested.

4.3.2 Testing shall be in accordance with ASTM D 2247. Periodic inspections shall be conducted. Testing may be concluded after 14 days, or after deleterious effects of exposure to water are observed.

4.3.3 Conditions of Acceptance: There shall be no deleterious effects from 14 days of exposure to water, such as cracking, checking, crazing, erosion or other

characteristics, that may affect performance as a water-resistive barrier.

4.4 Water-vapor Transmission Testing:

4.4.1 Three specimens of the water-resistive coating are prepared by applying the coating, at the recommended thickness, to a nonadhesive surface. After curing for a duration specified by the manufacturer, the films are removed from the surface; the average thickness is determined from material density, area, and weight. The films are used to set up three wet cups in accordance with ASTM E 96, Water Method. Specimens are conditioned at 75°F ± 5°F (24°C ± 3°C) and 50 percent relative humidity for 40 hours before testing. Each cup is placed in a room with controlled conditions of 75°F ± 5°F (24°C ± 3°C) and 50 percent relative humidity. Reduction in weight is recorded daily. Water vapor transmission and permeance are calculated in accordance with Section 13 of ASTM E 96, and reported in grams per square meter per 24 hours and perms, respectively.

If the coating is applied such that a lap or seam occurs in the installed materials, an additional three specimens shall be tested with the lap or seam, applied in accordance with the manufacturer's recommended installation instructions.

4.4.2 Conditions of Acceptance: Water vapor transmission shall satisfy one of the grade requirements in Table 14-1-A of UBC Standard 14-1 or Table 1 of the ICC-ES Acceptance Criteria for Weather-resistive Barriers (AC38).

4.5 Water-Penetration Testing: Three samples are prepared by applying the water-resistive barrier coating to the substrate. The substrate shall be attached to the supporting framework as required by the substrate manufacturer. The test samples shall be a minimum of 4 feet by 8 feet (1219 mm by 2438 mm) in size, and shall include a minimum of two vertical joints and one horizontal joint within the sheathing substrate. Joints within the substrates shall be a minimum of ¹/₈ inch (3.2 mm) wide.

Each sample shall be tested in accordance with ASTM E 331. A minimum 2.86 psf (137 Pa) air-pressure differential shall be maintained, across the test specimen, for 15 minutes.

4.5.1 Conditions of Acceptance: There shall be no visible water penetration at sheathing joints, as viewed from the back of the panel.

4.6 Structural, Racking and Restrained Environmental Conditioning Tests: (Limits product use to wall coverings demonstrating water-penetration resistance in accordance with ASTM E 331 with a minimum 2.86 psf (137 Pa) static air pressure differential)

4.6.1 Transverse Load (Structural): One specimen is prepared by applying the water-resistive coating to each applicable sheathing substrate. The substrate shall be attached to either steel or wood framing members (size of wood or size and gage of steel shall be specified).

The test specimen shall be a minimum of 8 feet by 8 feet (2438 mm by 2438 mm) in size, and substrates shall include a minimum of two vertical joints and one horizontal joint within the sheathing substrate. Joints within the substrate shall be a minimum of ¹/₈ inch (3.2 mm) wide. If flashing is to be recognized, it shall be included in the specimen. The water-resistive coating is applied to the

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substrate surface, including joints, in accordance with the coating manufacturer's recommended application instructions. The specimen shall be tested in accordance with ASTM E 1233, Procedure A, at a specified deflection (specified by proponent) in accordance with Table 1604.3 of the IBC. The specimen shall be cycled for a minimum of 10 positive load cycles.

4.6.1.1 Conditions of Acceptance: There shall be no cracking of the water-resistive coating as determined by visual examination within the field of the panel, at substrate joints and at the interface of the flashing. If there is cracking, the racking test shall not go forward.

4.6.2 Racking: The intent of the racking procedure is to subject the water-resistive barrier (coating) to racking stress. Test setup, measurements and application of load shall comply with ASTM E 72.

4.6.2.1 Test shall be conducted on the same specimen used under Section 4.6.1 of this criteria. Application of load shall be in increments as described in the ASTM E 72 test method with or without hold-downs. Load shall be applied until a $\frac{1}{2}$ -inch (12.7 mm) net deflection without hold-downs or $\frac{1}{8}$ -inch (3.2 mm) net deflection with hold-downs is achieved. As an alternate, load shall be applied until the shear design value of the sheathing is achieved, except net deflection shall not exceed $\frac{1}{2}$ inch (12.7 mm) without hold-downs or $\frac{1}{8}$ inch (3.2 mm) with hold-downs. Throughout the test, the coated surface of the wall shall be inspected for signs of cracking or tearing of the water-resistive coating within the field of the panel, and at substrate joints, and at the interface of the flashing.

4.6.2.2 Conditions of Acceptance: There shall be no cracking of the water-resistive coating as determined by visual examination within the field of the panel, at substrate joints and at the interface of the flashing.

4.6.3 Restrained Environmental Conditioning: The intent of this test is to evaluate the cracking performance of the water-resistive coating after exposure to cycles of wetting and drying and change in temperature when the coating is applied to sheathing in a manner representative of in-service conditions.

4.6.3.1 The test shall be conducted on the same specimen used under Sections 4.6.1 and 4.6.2 of this criteria. There shall be a water spray apparatus capable of uniformly wetting the entire test surface, and a radiant heater capable of providing a uniform radiant heat of $120^{\circ}\text{F} \pm 5^{\circ}\text{F}$ ($49^{\circ}\text{C} \pm 2.8^{\circ}\text{C}$) as measured on a 1 mm thick aluminum plate painted mat black and affixed to the test surface at a minimum of four locations, symmetrically distributed. Temperature shall be measured with a covered thermocouple attached to the surface of the black plate. The top edge of the water-resistive coating shall be flashed and the back side of the assembly protected from moisture. Periods of exposure to ambient conditions not exceeding 48 hours are permitted during the tests, to accommodate laboratory operations.

4.6.3.2 The entire surface is subjected to five cycles of the following uniform exposure conditions:

1. Water spray—24 hours
2. Radiant heat—24 hours

4.6.3.3 Throughout the test, the wall surface is inspected for signs of cracking of the coating within the field of the panel and at the substrate joints.

4.6.3.4 Conditions of Acceptance: There shall be no cracking of the water-resistive coating as determined by visual examination within the field of the panel, at substrate joints and at the interface of the flashing.

4.7 Structural, Racking, Restrained Environmental Conditioning, and Water Penetration Testing:

4.7.1 Transverse Load (Structural): One specimen is prepared by applying the water-resistive coating to each applicable sheathing substrate. The substrate shall be attached to either steel or wood framing members (size of wood or size and gage of steel shall be specified). The test specimen shall be a minimum of 8 feet by 8 feet (2438 mm by 2438 mm) in size, and substrates shall include a minimum of two vertical joints and one horizontal joint within the sheathing substrate. Joints within the substrate shall be a minimum of $\frac{1}{8}$ inch (3.2 mm) wide. If flashing is to be recognized, it shall be included in the specimen. The water-resistive coating is applied to the substrate surface, including joints, in accordance with the coating manufacturer's recommended application instructions. The specimen shall be tested in accordance with ASTM E 1233, Procedure A, at a specified deflection (specified by proponent) in accordance with Table 1604.3 of the IBC. The specimen shall be cycled for a minimum of 10 positive load cycles.

4.7.1.1 Conditions of Acceptance: There shall be no cracking of the water-resistive coating as determined by visual examination within the field of the panel, at substrate joints and at the interface of the flashing. If there is cracking, the racking test protocol shall not go forward.

4.7.2 Racking: The intent of the racking procedure is to subject the water-resistive barrier coating to racking stress. Test setup, measurements and application of load shall comply with ASTM E 72.

4.7.2.1 Test shall be conducted on the same specimen used under Section 4.7.1 of this criteria. Application of load shall be in increments as described in the ASTM E 72 test method with or without hold-downs. Load shall be applied until a $\frac{1}{2}$ -inch (12.7 mm) net deflection without hold-downs or $\frac{1}{8}$ -inch (3.2 mm) net deflection with hold-downs is achieved. As an alternate, load shall be applied until the shear design value of the sheathing is achieved, except net deflection shall not exceed $\frac{1}{2}$ inch (12.7 mm) without hold-downs or $\frac{1}{8}$ inch (3.2 mm) with hold-downs. Throughout the test, the coated surface of the wall shall be inspected for signs of cracking or tearing of the water-resistive coating within the field of the panel, and at substrate joints, and at the interface of the flashing.

4.7.2.2 Conditions of Acceptance: There shall be no cracking of the water-resistive coating as determined by visual examination within the field of the panel, at substrate joints and at the interface of the flashing. If there is cracking, the restrained environmental test protocol shall not go forward.

4.7.3 Restrained Environmental Cycling Test: The intent of this test is to evaluate the cracking

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performance of the water-resistive coating after exposure to cycles of wetting and drying and changes in temperature, when the coating is applied to sheathing in a manner representative of in-service conditions.

4.7.3.1 Test shall be conducted on the same specimen used under Sections 4.7.1 and 4.7.2 of this criteria. There shall be a water spray apparatus capable of uniformly wetting the entire test surface, and a radiant heater capable of providing a uniform radiant heat of 120°F ± 5°F (49°C ± 2.8°C) as measured on a 1 mm thick aluminum plate painted mat black and affixed to the test surface at a minimum of four locations, symmetrically distributed. Temperature shall be measured with a covered thermocouple attached to the surface of the black plate. The top edge of the water-resistive coating shall be flashed and the back side of the assembly protected from moisture. Periods of exposure to ambient conditions not exceeding 48 hours are permitted during the tests, to accommodate laboratory operations.

4.7.3.2 The entire exterior surface is subjected to five cycles of the following uniform exposure conditions:

1. Water spray—24 hours
2. Radiant heat—24 hours

4.7.3.3 Throughout the test, the wall surface is inspected for signs of cracking of the coating within the field of the panel and at the substrate joints.

4.7.3.4 Conditions of Acceptance: There shall be no cracking of the water-resistive coating as determined by visual examination within the field of the panel, at substrate joints and at the interface of the flashing.

4.7.4 Water Penetration Testing:

4.7.4.1 Test shall be conducted on the same specimen used under Sections 4.7.1, 4.7.2, and 4.7.3. The sample shall be tested in accordance with ASTM E 331. A minimum 2.86 psf (137 Pa) air pressure differential shall be maintained across the test specimen for 15 minutes.

4.7.4.2 Conditions of Acceptance: There shall be no visible water penetration at sheathing joints, as viewed from the back of the panel.

4.8 Weathering Test: Five specimens are prepared in accordance with Section 4.3.1, except the sides only shall be sealed with an impervious material that need not be the coating. These samples shall be exposed to light from ultraviolet light, followed by accelerated aging in accordance with Sections 4.8.1 and 4.8.2 of this criteria, respectively. Following exposure, the specimens shall be tested in accordance with Section 4.8.3 of this criteria.

4.8.1 Ultraviolet Light Exposure: The samples shall be exposed to light from ultraviolet sun lamps for 210 hours (10 hours per day for 21 days) in an enclosure. Ultraviolet light exposure must be directed on the entire sample surfaces that will be exposed to sunlight in normal application. Lamps and enclosure shall be adjusted so the specimen temperature is between 135°F and 140°F (57°C and 60°C). Sunlamp bulbs shall be General Electric Type H275 RUV (275 W) or equivalent bulbs, providing UV characteristics of 5.0 W/m²/nm irradiance at a wavelength of 315 to 400 nm at 1 meter. Bulbs shall be located 2 feet (610 mm) above samples.

4.8.2 Accelerated Aging: The samples shall be subjected to 25 cycles of drying and soaking as follows:

1. Oven drying at 120°F (49°C) for three hours, with all surfaces exposed.
2. The coating surface shall be immersed in room temperature water for three hours.
3. After removal from the water, specimens are blotted dry, then air-dried for 18 hours at a 75°F ± 5°F (23.8°C ± 2.8°C) room temperature, with all surfaces exposed.

4.8.3 Hydrostatic Pressure Test: The samples shall be tested in accordance with AATCC Test Method 127-1985, except that the specimens shall be held at a hydrostatic head of 550 millimeters for a period of 5 hours.

4.8.4 Conditions of Acceptance: There shall be no cracking of the coating, or bond failure between the coating and the substrate. There shall be no water penetration on the plane of the exterior facing side of the substrate.

4.9 Detrimental Relative Movement Evaluation

4.9.1 Detrimental Movement Test:

4.9.1.1 Minimum of five samples consisting of minimum nominally 1/2-inch-thick-by-12-inch-by-12-inch (12.7 by 305 by 305 mm) exterior plywood (grade C-D or better) or 1/16-inch Exposure 1 oriented strand board (OSB) sheathing shall be prepared. A water-resistive coating is applied in accordance with manufacturer's application instructions over sheathing and allowed to dry a minimum of 24 hours. In the center of the water-resistive coated samples, the minimum 3/8-inch-thick (10 mm) cementitious exterior wall coating (one-coat stucco), or minimum 1/8-inch-thick (22 mm) portland cement plaster (stucco) is applied in a 6-inch-by-6-inch (152 by 152 mm) area. The portland cement plaster shall comply with accordance with ASTM C 926.

4.9.1.2 After the one-coat stucco or stucco is cured for a minimum of 28 days, shear load is applied parallel to the coating/stucco interface as shown in Figure 1, using a suitable load-measuring instrument such as a dynamometer described in ASTM C 1028, or Universal Tester with load cell capable or reporting results in 0.1 psi (689 Pa) increments.

4.9.2 Tensile Strength of One-coat Stucco or Stucco

4.9.2.1 A minimum of five samples are prepared in accordance with ASTM C 190, using the same batch for the test specimens described in Section 4.9.2.1 of this criteria.

4.9.2.2 Tests are conducted a minimum of 28 days after molding of the specimens.

4.9.3 Conditions of Acceptance: The maximum average load at failure in the Detrimental Movement Test shall be no more than 1 psi (6894 Pa), and the minimum average tensile strength of the one-coat stucco or stucco material shall not be less than 100 psi (689 kPa).

5.0 QUALITY CONTROL

5.1 Water-resistive coatings shall be manufactured under a quality control program documented in accordance with the ICC-ES Acceptance Criteria for Quality Documentation (AC10). The program shall include,

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but not be limited to, verification of coating properties described in Section 2.1 of this criteria.

5.2 Follow-up inspections by an inspection agency are not required under this criteria.

5.3 Field Inspection and Reporting:

5.3.1 Installation shall be by a contractor recognized by the evaluation report holder as being trained to perform such installations. A list of the names and addresses of recognized contractors shall be maintained by the evaluation report holder, and shall be made available to the building official or ICC-ES upon request.

5.3.2 UBC: An installation card, having the format shown in ~~Exhibit A~~, [Figure 1](#), shall be completed by the recognized contractor and shall be presented to the building official at the completion of each project.

5.3.3 IBC, IRC and BNBC: For recognition under the IBC, IRC or BNBC, special inspections are required at the jobsite in accordance with Sections 1704.1 and 1704.14 of the IBC, which also apply to the IRC, or

Sections 1705.1 and 1705.13 of the BNBC. Duties of the inspector include verifying field preparation of materials, expiration dates, installation of components, curing of components, installation of joints and sealants, applied dry-film thickness and interface of coating material with flashings.

6.0 EVALUATION REPORT RECOGNITION

The evaluation report shall include the following information:

1. Product description, installation instructions, and packaging and identification information, based on requirements in Section 2.1 of this criteria.
2. Permitted substrates qualified by the tests described in Section 4.0 of this criteria.
3. Water vapor transmission values, described in Section 4.4.2 of this criteria.
4. Special inspection or installation certification, based on Sections 5.3.2 and 5.3.3 of this criteria.■

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EXHIBIT A

(WATER-RESISTIVE COATING CONTRACTOR NAME)

Completion Date: _____

THE WATER-RESISTIVE COATING INSTALLED ON THE STRUCTURE LOCATED AT THE ADDRESS INDICATED BELOW:

_____ CONFORMS

TO (WATER-RESISTIVE COATING MANUFACTURER NAME) RECOMMENDED INSTALLATION PRACTICES AND SECTION (S) _____ OF EVALUATION REPORT ESR-_____.

Address of Structure:

Product Component Names:

Reinforcing Fabric _____
Coating _____

INSTALLATION

CONFORMS

A. Substrate Type and Tolerance

B. Water-resistive Coating

C. The information entered above is offered in testimony that the water-resistive coating application conforms with the manufacturer's installation methods and procedures, and the water-resistive coating manufacturer's evaluation report.

NOTE: An installation card shall be received from the water-resistive coating installer indicating that the water-resistive coating application conforms with the water-resistive coating evaluation report and water-resistive coating manufacturer's installation methods and procedures must accompany this declaration.

Water-resistive Coating Contractor Company Name and Address:

Signature of responsible Officer: _____

Typed Name and Title of Officer: _____

Telephone Number: (____) _____

cc: Original Building Department
Copy: Water-resistive Coating Manufacturer

FIGURE 1—INSTALLATION CARD

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FIGURE NO. 2—DETRIMENTAL MOVEMENT TEST