



ICC Evaluation Service, Inc.
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September 1, 2009

TO: PARTIES INTERESTED IN EVALUATION REPORTS ON WATER-RESISTIVE COATINGS

SUBJECT: Proposed Revisions to the Acceptance Criteria for Water-resistive Coatings Used as Water-resistive Barriers over Exterior Sheathing, Subject AC212-B-1009-R1 (YM/MB)

Hearing Information:

Wednesday, October 7, 2009

8:00 a.m.

Sheraton Gateway Hotel Los Angeles

6101 West Century Boulevard

Los Angeles, California 90045

(888) 627-7104

Dear Madam or Sir:

The enclosed draft acceptance criteria was previously posted on the ICC-ES website for public comment under the alternate agenda. To view the proposed draft and cover letter you can visit, http://www.icc-es.org/Criteria_Development/0906-alt/AC212.pdf, and for the comments received you can visit, http://www.icc-es.org/Criteria_Development/0906-alt/AC212-comments.pdf.

There are two proposed revisions to the criteria under consideration:

1. Use of the water-resistive coating as an air barrier under the 2006 *International Energy Conservation Code* (IECC), with testing in accordance with ASTM E 2178.
2. Elimination of the intervening layer required over wood-based sheathing in stucco or one-coat stucco applications, as referenced in the Exception to IBC Section 2510.6 and the Exception to IRC Section R703.6.3.

The ICC-ES staff has the following comments:

1. The implementation of the air barrier material requirements are based on the same provisions found in the ICC-ES Acceptance Criteria for Water-resistive Barriers (AC38). We received two comments during the June 2009 alternate agenda posting, from the Air Barrier Association of America and W.R. Grace, both of which

were opposed to the use of a water-resistive coating as an air barrier material as indicated in the enclosed draft criteria. Both the Air Barrier Association of America and W.R. Grace stated that the physical requirements found in AC212 were insufficient to evaluate the performance of a water-resistive coating as an air barrier material, and indicated that a consensus standard is currently being developed to establish appropriate air barrier material requirements. A copy of the draft standard has not been submitted to ICC-ES. The Air Barrier Association of America and W.R. Grace also stated that a separate acceptance criteria for air barrier material should be developed. In response, the proponents have stated that the proposed provisions should also apply to water-resistive coatings, since AC38 has set a precedent for evaluation of water-resistive barriers as an air barrier material.

2. In lieu of using two layers of Grade D paper, the Exception to Section 2510.6 of the IBC, the Exception to Section R703.6.3 of the IRC, and Section 3.2.7 of the ICC-ES Acceptance Criteria for Exterior Cementitious Wall Coatings (AC11), permit a 60-minute Grade D paper separated from the stucco by an intervening layer 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. The proponent is seeking elimination of the intervening layer when water-resistive coatings are used, 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 requirements for testing for detrimental movement, as described in Section 4.9.1 of the enclosed criteria, to determine the level of adhesion 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:
 - a. As indicated above, the code requires that the water-resistive barrier be separated from the stucco by an intervening, substantially non-water absorbing layer or drainage space. Section 4.9.3 of the enclosed draft criteria states that the level of adhesion shall not be greater than 1 psi. It is not clear how the water-resistive coating can perform the function of an intervening layer, since there will be some adhesion of the coating to the sheathing. When the wood sheathing shrinks or expands, the water-resistive coating will undergo similar movement. Staff seeks input as to whether a 1 psi adhesion between the exterior plaster and the coating will result in detrimental effects on the plaster. Are there any tests that will duplicate this condition?
 - b. The intervening layer required by the code may also serve a function by providing drainage to the wall system. Staff would like to know how drainage can be achieved if the intervening layer is eliminated.
 - c. Section 4.9.2 requires a tensile strength test on the plaster used in the detrimental movement test assemblies. Since the tensile strength of exterior plaster is not typically referenced in exterior plaster standard

specifications, it is not clear what significance the tensile strength of the tested plaster will have for approval of other types of exterior plaster and the adhesion between other types of plaster and the water-resistive coating.

3. Revisions to this criteria to update it to the 2009 IBC, 2009 IRC, and 2009 IECC, will take place upon resolution of agenda item in AC212-A-1009-R1.

You are cordially invited to submit written comments on agenda items, or to attend the Evaluation Committee hearing and present verbal comments. If you wish to contribute to the hearing, please note the following:

1. Written comments that are received by the Los Angeles business/regional office by **September 18, 2009**, will be forwarded to the committee prior to the hearing, and will be posted on the ICC-ES web site shortly after the comment deadline.
2. Written comments received up to ten days before the meeting, and staff memos responding to comments, will be posted to the web site on **September 29, 2009**.
3. ICC-ES is no longer providing printed copies at the meeting of proposed acceptance criteria, staff memos or public comments. These documents will be available on a limited number of CDs at the meeting, for uploading to computers; and ICC-ES will make arrangements with the hotel business center to have hard copies available for photocopying.
4. Written comments that miss the deadline noted in item (1), above, will only be available at the meeting if you provide 35 copies, collated, stapled, and three-hole punched, either at the meeting itself or to the Los Angeles business/regional office by **September 29, 2009**.
5. If you plan to speak for more than 15 minutes, or offer a visual presentation lasting longer, you should notify ICC-ES staff as far as possible in advance. There will be a computer, projector, and screen available at the meeting for anyone wishing to make a visual presentation, and presentations in most cases will need to be in PowerPoint format. Also, ICC-ES will need to be provided with your presentation at least a half-hour before the start of the relevant meeting session (morning or afternoon) on either a CD or a flash card.
6. If you have any special needs related to a presentation, you should contact ICC-ES staff well in advance of the meeting.
7. Any visual aids for viewing at committee meetings (charts, overhead transparencies, slides, videos, electronic presentations, etc.) will be permitted only if a copy is provided to ICC-ES, before the presentation, in a medium that can be retained with other records of the meeting.

8. Any materials submitted for committee consideration are considered nonconfidential and available for public discussion, as noted in Section 2.7 of the ICC-ES Rules of Procedure for the Evaluation Committee.
9. Prior to the meeting, you should refrain from trying to communicate directly with committee members about agenda items, either verbally or in writing. Committee members reserve the right to refuse such communications.

Your cooperation with these guidelines is much appreciated, as is your interest in the deliberations of the Evaluation Committee. If you have any questions, please contact the undersigned at (800) 423-6587, extension 3260, or Michael Beaton, P.E. Senior Vice President, at extension 3289. You may also reach us by e-mail at es@icc-es.org.

Yours very truly,

A handwritten signature in black ink, appearing to read 'Y. Moya', with a large, sweeping flourish underneath.

Yamil Moya, P.E.
Staff Engineer

YM/jw

Enclosures

cc: Evaluation Committee



ICC EVALUATION SERVICE, INC., RULES OF PROCEDURE FOR THE EVALUATION COMMITTEE

1.0 PURPOSE

The purpose of the Evaluation Committee is to monitor the work of ICC-ES, in issuing evaluation reports; to evaluate and approve acceptance criteria on which evaluation reports may be based; and to sponsor related changes in the applicable codes.

2.0 MEETINGS

2.1 The Evaluation Committee shall schedule meetings that are open to the public in discharging its duties under Section 1, subject to Section 3.

2.2 All scheduled meetings shall be publicly announced.

2.3 Two-thirds ($\frac{2}{3}$) of the voting Evaluation Committee members shall constitute a quorum. A majority vote of members present is required on any action.

2.4 In the absence of the nonvoting chairman-moderator, Evaluation Committee members present shall elect an alternate chairman from the committee for that meeting. The alternate chairman shall be counted as a voting committee member for purposes of maintaining a committee quorum and to cast a tie-breaking vote of the committee.

2.5 Minutes of the meetings shall be kept.

2.6 An electronic audio record of meetings shall be made by ICC-ES; no other audio, video, electronic or stenographic recordings of the meetings will be permitted. Visual aids (including, but not limited to, charts, overhead transparencies, slides, videos, or presentation software) viewed at meetings shall be permitted only if the presenter provides ICC-ES before presentation with a copy of the visual aid in a medium which can be retained by ICC-ES with its record of the meeting and which can also be provided to interested parties requesting a copy. A copy of the ICC-ES recording of the meeting and such visual aids, if any, will be available to interested parties upon written request made to ICC-ES together with a payment as required by ICC-ES to cover costs of preparation and duplication of the copy. These materials will be available beginning five days after the conclusion of the meeting but will no longer be available after one year from the conclusion of the meeting.

2.7 Parties interested in the deliberations of the committee should refrain from communicating, whether in writing or verbally, with committee members regarding agenda items. All written communications and submissions regarding agenda items should be delivered to ICC-ES. All such written communications and submissions shall be considered nonconfidential and available for discussion in open session of an Evaluation Committee meeting, and shall be delivered at least ten days before the scheduled Evaluation Committee meeting if they are to be forwarded to the committee. Materials delivered to ICC-ES at least ten

days before the scheduled meeting will be posted on the ICC-ES web site (www.icc-es.org) prior to the meeting. After this time, parties wishing to submit materials for consideration by the Evaluation Committee must deliver a sufficient number of copies as directed by ICC-ES. Consideration of materials not received by ICC-ES at least ten days before the meeting is at the discretion of the Evaluation Committee. Following the meeting, ICC-ES will make all materials considered by the Evaluation Committee available on the web site for a maximum period of one year following the meeting. The committee reserves the right to refuse recognition of communications which do not comply with the provisions of this section.

3.0 CLOSED SESSIONS

Evaluation Committee meetings shall be open except that the chairman may call for a closed session to seek advice of counsel.

4.0 ACCEPTANCE CRITERIA

4.1 Acceptance criteria are established by the committee to provide a basis for issuing ICC-ES evaluation reports on products and systems under codes referenced in Section 2.0 of the Rules of Procedure for Evaluation Reports. They also clarify conditions of acceptance for products and systems specifically regulated by the codes.

Acceptance criteria may involve a product, material, method of construction, or service. Consideration of any acceptance criteria must be in conjunction with a current and valid application for an ICC-ES evaluation report, an existing ICC-ES evaluation report, or as otherwise determined by the Evaluation Committee.

4.2 Procedure:

4.2.1 Proposed acceptance criteria shall be developed by the ICC-ES staff and discussed in open session with the Evaluation Committee during a scheduled meeting, except as permitted in Section 5.0 of these rules.

4.2.2 Proposed acceptance criteria shall be available to interested parties at least 30 days before discussion at the committee meeting.

4.2.3 The committee shall be informed of all pertinent written communications received by ICC-ES.

4.2.4 Attendees at Evaluation Committee meetings shall have the opportunity to speak on acceptance criteria listed on the meeting agenda, to provide information to committee members.

4.3 Approval of acceptance criteria shall be as specified in Section 2.3 of these rules.

4.4 Actions of the Evaluation Committee may be

appealed in accordance with the ICC-ES Rules of Procedure for Appeal of Acceptance Criteria or the ICC-ES Rules of Procedure for Appeals of Evaluation Committee Technical Decisions.

5.0 COMMITTEE BALLOTING FOR ACCEPTANCE CRITERIA

5.1 Acceptance criteria may be issued without a public hearing following a 30-day public comment period and a majority vote for approval by the Evaluation Committee when, in the opinion of ICC-ES staff, one or more of the following conditions have been met:

1. The subject is nonstructural, does not involve life safety, and is addressed in nationally recognized standards or generally accepted industry standards.
2. The subject is a revision to an existing acceptance criteria that requires a formal action by the Evaluation Committee, and public comments raised were resolved by staff with commenters fully informed.
3. Other acceptance criteria and/or the code provide precedence for the revised criteria.

5.2 Negative votes must be based upon one or more of the following, for the ballots to be considered valid and require resolution:

- a. *Lack of clarity:* There is insufficient explanation of the scope of the acceptance criteria or insufficient description of the intended use of the product or system; or the acceptance criteria is so unclear as to be unacceptable. (The areas where greater clarity is required must be specifically identified.)
- b. *Insufficiency:* The criteria is insufficient for proper evaluation of the product or system. (The provisions of the criteria that are in question must be specifically identified.)
- c. *The subject of the acceptance criteria is not within the scope of the applicable codes:* A report issued by ICC-ES is intended to provide a basis for approval under the codes. If the subject of the acceptance criteria is not regulated by the codes, there is no basis for issuing a report, or a criteria. (Specifics must be provided concerning the inapplicability of the code.)

d. *The subject of the acceptance criteria needs to be discussed in a public hearings.* The committee member requests additional input from other committee members, staff or industry.

5.3 An Evaluation Committee member, in voting on an acceptance criteria, may only cast the following ballots:

- Approved
- Approved with Comments
- Negative: Do Not Proceed

6.0 COMMITTEE COMMUNICATION

Direct communication between committee members, and between committee members and an applicant or concerned party, with regard to the processing of a particular acceptance criteria or evaluation report shall take place only in a public hearing of the Evaluation Committee. Accordingly:

6.1 Committee members receiving an electronic ballot should respond only to the sender (staff). Committee members who wish to discuss a particular matter with other committee members, before reaching a decision, should ballot accordingly and bring the matter to the attention of ICC-ES staff, so the issue can be placed on the agenda of a future committee meeting.

6.2 Committee members who are contacted by an applicant or concerned party on a particular matter that will be brought to the committee will refrain from private communication and will encourage the applicant or concerned party to forward their concerns through the ICC-ES staff in writing, and/or make their concerns known by addressing the committee at a public hearing, so that their concerns can receive the attention of all committee members.■

Effective March 18, 2008

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

AC212-B

Proposed September 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 by ICC-ES for purpose 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* (BNBC), 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, BNBC 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 BNBC, 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.

[For exterior cement plaster and one-coat stucco applications with installation over wood-based sheathing, two layers of Grade D building paper are required. When the water-resistive coating is used as the water-resistive barrier, the water-resistive coating must be equivalent to 60-minute Grade D paper and have an intervening layer between the water-resistive coating and the stucco. If the intervening layer is excluded, the water-resistive coating shall be evaluated in accordance with Section 4.9.](#)

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 BNBC, 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.

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

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 (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.

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

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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 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 $\frac{1}{8}$ -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 $\frac{1}{4}$ -inch-wide (6.4 mm) joint, are tested. Sheathing specimens shall consist of two sheathing sections assembled with a $\frac{1}{4}$ -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 $\frac{1}{8}$ 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).

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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.

4.6.1.1 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.

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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 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 $120^{\circ}\text{F} \pm 5^{\circ}\text{F}$ ($49^{\circ}\text{C} \pm 2.8^{\circ}\text{C}$) 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.

4.7.3.2 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 $5.0 \text{ W/m}^2/\text{nm}$ 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 $75^{\circ}\text{F} \pm 5^{\circ}\text{F}$ ($23.8^{\circ}\text{C} \pm 2.8^{\circ}\text{C}$) 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 1/2-inch (12.7 mm) thick by 12-inches (305 mm) by 12-inches (305 mm) exterior plywood (grade C-D or better) or 7/16-inch Exposure 1 Oriented Strand Board (OSB) sheathing shall be prepared. Apply water-resistive coating in accordance with manufacturer's application instructions over sheathing and allow to dry, minimum of 24 hours. In the center of the water-resistive coated samples, apply (without lath) the minimum 3/8-inch (10 mm) thick cementitious exterior wall coating (one-coat stucco), or minimum 7/8-inch (22 mm) thick Portland Cement Plaster (Stucco) in a 6-inch (152 mm) by 6-inch (152 mm) area. The Portland cement plaster shall comply with accordance with ASTM C 926.

4.9.1.2 After curing the one-coat stucco or stucco for minimum of 28 days, apply shear load parallel to the coating/stucco interface 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 to 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 Conduct tests minimum 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).

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

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, 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, 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.■

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

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