ICC EVALUATION SERVICE

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May 13, 2010

TO: **PARTIES INTERESTED IN EVALUATION REPORTS ON WOOD STRUCTURAL PANELS WITH FACTORY-APPLIED FIRE-RETARDANT COATINGS**

SUBJECT: Proposed Acceptance Criteria for Wood Structural Panels with Factory-applied Fire-retardant Coatings, Subject AC405-0610-R5 (MO/SF)

Hearing Information:
Thursday, June 17, 2010
8:00 a.m.
DoubleTree Hotel
808 South 20th Street
Birmingham, Alabama 35205
(800) 222-8733

Dear Madam or Sir:

The subject proposed new acceptance criteria will be on the agenda for the Evaluation Committee noted above. The proposed new criteria provides performance and testing requirements for wood structural panels with factory-applied fire-retardant (intumescent) coatings. The scope of the proposed criteria is limited to use of the wood structural panels as roof sheathing to provide fire wall continuity in accordance with Section 706.6, Exception 4.3, of the 2009 *International Building Code*® (IBC); Section 705.6, Exception 4.3, of the 2006 *International Building Code*®; Section R302.2.2 (2), Exception, of the 2009 *International Residential Code*® (IRC); and Section R317.2.2 (2), Exception, of the 2006 *International Residential Code*® .

On June 2, 2009, the proposed new criteria was held for further study by the ICC-ES Evaluation Committee. Questions were raised, both in written comments and at the hearing. There was detailed testimony given during the hearing concerning long-term performance of the fire-retardant coating and freeze/thaw, abrasion and durability and exterior wetting of the panels. The committee could not reach an agreement. Therefore, it was decided that the action of the committee from the previous meeting, in February 2009 to hold the proposed criteria for further study, should still stand.

In light of the comments provided at the hearing, and in an attempt to resolve what staff considered the major issue to be resolved before the criteria could move forward, staff recommended that the proponent consider large-scale fire testing to document actual end-use configuration of their product as roof sheathing to provide fire wall continuity. The proponent has provided staff with a proposal to use a comparative fire test of their product and code-complying fire-retardant-treated plywood, using a large-scale

performance fire test that is described in the new Sections 3.4 and 4.4 of the criteria, using a modified ASTM E 119 horizontal furnace.

The criteria, as presented at the June 2009 hearing, has been revised for consideration by the committee. The revisions are shown in the attached draft in underline and ~~strikeout~~ format. The following are the proposed revisions:

1. Section 1.2 was revised to clarify that the system is evaluated as an alternative in accordance with 2009 IBC Section 706.6, Exception 4.3; 2006 IBC Section 705.6, Exception 4.3; 2009 IRC Section R302.2.2 (2), Exception; and 2006 IRC Section R317.2.2 (2), Exception; and that the system is evaluated as a symmetrical system by performance testing in accordance with ASTM E 119 for the underside and ASTM E 108 for the roof covering assembly.

2. In Section 1.3 .2, the ASTM D standards were editorially relocated to precede the ASTM E standards.

3. In Section 1.3.2, references were added to ASTM E 119 and ASTM E 2579 test standards.

4. Sections 1.3.3 and 4.1 were revised to refer to UL 723-03, for surface burring testing, as equivalent to ASTM E 84.

5. Sections 1.4.1, 2.1.3, and 3.4 were revised to define the wood structural panel with the fire-retardant coating as the “finished panel.”

6. Section 2.1.3 was revised to require the “finished panel” to be labeled with the structural capacity and span rating.

7. Section 2.1.4 was revised to add guidance on field repairs of the panels.

8. New Sections 3.4 and 4.4 were added to provide performance testing to document roof sheathing fire wall continuity in accordance with 2009 IBC Section 706.6, Exception 4.3; 2006 IBC Section 705.6, Exception 4.3; 2009 IRC Section R302.2.2 (2), Exception; and 2006 IRC Section R317.2.2 (2), Exception. **Staff Comment:** Staff requests clarification of the modified ASTM E 119 test procedure. Is one assembly tested with FRTW plywood, and then is there a separate test with FRC panels tested in the furnace, each as a full-size assembly with wood joists representative of field installations? How are the fasteners installed, what is the fastener pattern and how many fasteners are used to demonstrate performance of the FRC panels after penetration by fasteners? These items may need to be included in the description in Section 4.4 of the modified ASTM E 119 procedure.

9. Section 3.5 (formerly Section 3.4) was revised to clarify that the finished panels will need an inspection program for regrading of the panels for structural applications when durability testing in accordance with Section 4.2 demonstrates a need to regrade.

10. Section 4.1 was revised to add a reference to ASTM E 2579 and change exposure conditions for duration and temperature.

11. Section 4.2.1 was revised to clarify that test specimens with and without fire-retardant coatings shall be tested. The conditions of acceptance were revised to delete 90 percent surface area and require no loss of coating at the end of exposure testing**. Staff Comment:** Staff requests clarification of this revision, which was requested by the applicant. Is the requirement to have no loss of coating, practical and measurable, since the product will be penetrated by fasteners when installed and may also be damaged during shipping?

12. In Sections 4.2.2 and 4.2.3, the conditions of acceptance were revised to clarify.

13. Section 4.3 was revised to clarify species to be tested, and to add testing of Southern pine to allow for all species types. **Staff Comment:** Staff requests clarification of this revision, which was requested by the applicant. OSB panels may have mixed species, and all species in the OSB may not be known for certain.

14. Section 5.3, Quality Control, was revised, to clarify.

15. A new condition of use, Section 6.7, was added to clarify the minimum classified roof covering required.

16. Section 6.4 was revised to add unvented attic use in accordance with Section R806.4 of the 2009 IRC. **Staff Comment:** Staff requests clarification concerning use in unvented attics. Does the testing required by this criteria document this use?

17. Editorial revisions were also made throughout the criteria.

Underline and ~~strikeout~~ are provided to clarify changes made to the proposal since the last committee meeting. The entire criteria is under consideration by the committee, not just the underline and ~~strikeout.~~

The applicant and the applicant's consultant are preparing a presentation for the committee that provides results of their testing.

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 **June 1, 2010,** 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 **June 10, 2010**.

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 **June 10, 2010**.

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.

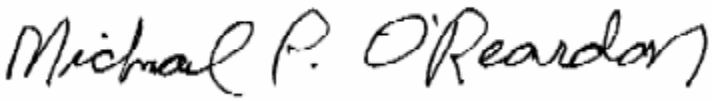
7. Any visual aids for viewing at committee meetings (charts, overhead transparencies, slides, videos, electronic presentations, etc.) will be permitted only if a copy is provided to ICC-ES, before the presentation, in a medium that can be retained with other records of the meeting.

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 question, please contact the undersigned at (800) 423-6587, extension 5685, or Si Farvardin, Senior Evaluation Specialist, at extension 6238. You may also reach us by e-mail at es@icc-es.org.

Yours very truly,



Michael O'Reardon, P.E.
Regional Manager

MPO/raf

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 ($^2/_3$) 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

ICC EVALUATION SERVICE

www.icc-es.org | (800) 423-6587 | (562) 699-0543 *A Subsidiary of the International Code Council®*

PROPOSED ACCEPTANCE CRITERIA FOR WOOD STRUCTURAL PANELS WITH FACTORY-APPLIED FIRE-RETARDANT COATINGS

AC405

Proposed May 2010

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 ACCEPTANCE CRITERIA FOR WOOD STRUCTURAL PANELS WITH FACTORY-APPLIED FIRE-RETARDANT COATINGS

1.0 INTRODUCTION

1.1 Purpose: The purpose of this criteria is to establish requirements for wood structural panels with a factory-applied fire-retardant coating to be recognized in an ICC Evaluation Service, Inc. (ICC-ES), evaluation report under the 2009 *International Building Code*® (2009 IBC), 2006 *International Building Code*® (2006 IBC), 2009 *International Residential Code*® (2009 IRC) and the 2006 *International Residential Code*® (2006 IRC). The bases of recognition are IBC Section 104.11 and IRC Section R104.11. Applicable code sections are listed in Section 1.2.

The reason for the development of this criteria is to allow evaluation of wood structural panels with factory-applied fire-retardant coatings for the uses described in Section 1.2, since the codes do not provide test methods and performance requirements for documenting the compliance of such products.

1.2 Scope: Wood structural panels with factory-applied fire-retardant coatings undergoing third-party inspection are used for roof sheathing in buildings of Type III, IV and V construction for a distance of 4 feet (1220 mm) on both sides of a fire wall to provide continuity [2009 IBC Section 706.6, Exception 4.3, 2006 IBC Section 705.6, Exception 4.3, 2009 IRC Section R302.2.2 (2) Exception and 2006 IRC Section R317.2.2 (2) Exception]. This acceptance criteria describes the requirements for wood structural panels with a factory-applied fire-retardant coating to be used as an alternative to the assemblies described in the applicable code. When qualified under this criteria, the panels are evaluated for resistance to both fire exposure below the roof

deck, by comparative testing following the ASTM E 119 methodology; and to fire exposure above the roof deck, by testing as a component of a fire-classified roof covering assembly in accordance with ASTM E 108. ~~When used for this application, the panels, as a component of a fire classified roof covering assembly, shall have a minimum Class B roof covering classification when installed under the IBC and a minimum Class C roof covering classification when installed under the IRC. Refer to Sections 3.3 and 4.3 of this criteria.~~

1.3 Codes and Referenced Standards: Where standards are referenced in this criteria, the standards shall be applied consistently with the code upon which compliance is based.

1.3.1 Codes:

1.3.1.1 2009 *International Building Code*® (2009 IBC), International Code Council.

1.3.1.2 2006 *International Building Code*® (2006 IBC), International Code Council.

1.3.1.3 2009 *International Residential Code*® (2009 IRC), International Code Council.

1.3.1.4 2006 *International Residential Code*® (2006 IRC), International Code Council.

1.3.2 ASTM International, Standards:

1.3.2.1 ASTM D 968-05 ^{e01}, Standard Test Methods for Abrasion Resistance of Organic Coatings by Falling Abrasive.

1.3.2.2 ASTM D 3359-08, Standard Test Methods for Measuring

Adhesion by Tape Test.

1.3.2.3 ASTM D 5516-03, Standard Test Method for Evaluating the Flexural Properties of Fire-Retardant-Treated Softwood Plywood Exposed to Elevated Temperatures.

1.3.2.4 ASTM D 6305-02^{e01}, Standard Practice for Calculating Bending Strength Design Adjustment Factors for Fire-Retardant-Treated Plywood Roof Sheathing.

1.3.2.5 ASTM E 84-[-04, 2006 IBC; -07, 2009 IBC] [-04, 2006 IRC, -07, 2009 IRC], Standard Test Method for Surface Burning Characteristics of Building Materials.

1.3.2.6 ASTM E 108-[04, 2006 IBC; -07a, 2009 IBC] [-04, 2006 IRC, -07a, 2009 IRC], Standard Test Methods for Fire Tests of Roof Coverings.

1.3.2.7 ASTM E 119-[-00, 2006 IBC; -07, 2009 IBC] [-00, 2006 IRC, -07, 2009 IRC], Standard Test Methods for Fire Tests of Building Construction and Materials.

1.3.2.8 ASTM E 2579-07, Standard Practice for Specimen Preparation and Mounting of Wood Products to Assess Surface Burning Characteristics.

~~**1.3.2.9** ASTM D 968-05^{e01}, Standard Test Methods for Abrasion Resistance of Organic Coatings by Falling Abrasive~~

~~**1.3.2.10** ASTM D 3359-08, Standard Test Methods for Measuring Adhesion by Tape Test~~

~~**1.3.2.11** ASTM D 5516-03, Standard Test Method for Evaluating the Flexural Properties of Fire-Retardant-Treated Softwood Plywood Exposed to Elevated~~

~~Temperatures.~~

~~**1.3.2.12** ASTM D 6305-02^{e01}, Standard Practice for Calculating Bending Strength Design Adjustment Factors for Fire-Retardant-Treated Plywood Roof Sheathing.~~

1.3.3 Underwriters Laboratories Inc.

1.3.3.1 UL 723-03, Standard Test for Surface Burning Characteristics of Building Materials—with Revisions through May 2005.

1.3.3.2 UL 790-[-98, 2006 IBC; -04, 2009 IBC] [-04, 2006 and 2009 IRC], Standard for Test for Fire Resistance of Roof Covering Materials–with Revisions though July 1998.

1.3.4 ICC-ES Acceptance Criteria for Proprietary Wood Preservative Systems—Common Requirements for Treatment Process, Test Methods and Performance (AC326).

1.4 Definitions:

1.4.1 Wood Structural Panel with a Factory-applied Fire-retardant Coating (Finished Panel): A wood structural panel complying with Section 2303.1.4 of the IBC of Section R604.1 of the IRC, ~~to~~ one side of which includes a ~~is~~ factory-applied proprietary intumescent fire-retardant coating (as defined in the quality documentation required under Section ~~5.2~~ 5.1). [*The following strikeout has been moved to Section 5.1]* ~~The factory-applied fire-retardant coating shall have been applied in a minimum wet-film thickness and using an application rate as defined in the quality documentation and the published evaluation report. The factory-applied fire-retardant coating application and the finished panel shall be under third-party inspection. The coating~~

~~thickness of the factory-applied fire-retardant coating shall be measured in a minimum of three locations on tests panels as specified in the quality documentation.~~

2.0 BASIC INFORMATION

2.1 General: The following information shall be submitted:

2.1.1 Product Description: Complete information concerning material specifications, thickness, size and the manufacturing process.

2.1.2 Installation Instructions: Installation details and limitations, fastener materials, and installation manual.

2.1.3 Packaging and Identification: A description of the method of packaging and field identification of the panel. ~~Identification provisions must include the evaluation report number and the name or logo of the inspection agency.~~

All wood structural panels with a factory-applied fire-retardant coating shall be identified by legible marking with an ink stamp or label. At least one mark shall be applied to every panel. The marking shall be issued by an IAS-accredited inspection agency having a service for inspection of ~~material~~s finished panels including structural capacity and span rating at the factory. The ink stamp or label shall be in accordance with Section 2303.2.1 of the IBC and shall include the following additional information:

1. ICC-ES evaluation report number.
2. Flame-spread index and smoke development index values from an ASTM E84 test extended to a 30-minute duration ~~test indices (flame-spread and smoke developed)~~. These values shall be accompanied by ~~and~~ a statement indicating that the flame front during the test does not progress more than 10.5 feet (3200 mm) beyond the

centerline of the burners at any time during the test and that the tested product exhibits no evidence of significant progressive combustion when the test is extended to 30 minutes.

3. Name (or identification number) and location of manufacturing plant.

4. Month and year the panels were processed.

5. Span rating of the finished panel.

6. Name or logo of the accredited inspection agency conducting inspections of the finished panels for span ratings and ASTM E 84.

7. The phrase “This side shall face the interior of the building ~~attic~~”

2.1.4 Field Preparation: A description of the methods of field-cutting, application and finishing. Additional details required include method of repair of any damaged application; panel joint details and installation; and procedures for verifying thickness of repaired treating. All field repairs shall be done in accordance with the instructions in the manufacturer’s application manual.

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 AC85.

2.4 Product Sampling: Products shall be sampled in accordance with Section 3.1 of AC85.

3.0 TEST AND PERFORMANCE REQUIREMENTS

3.1 Surface-burning Characteristics and Stability: The wood structural

panels with a factory-applied fire-retardant coating shall be tested to document compliance with the performance characteristics noted in Section 2303.2 of the IBC or Section R604 of the IRC. The test methods are noted in Section 4.1 of this acceptance criteria.

3.2 Durability

3.2.1 Structural Flexural Performance When Exposed to Elevated Temperatures: The panels shall be exposed to elevated temperatures and tested for flexure to document degradation. The test methods are noted in Section 4.2.1.

3.2.1 Material Degradation: The panels shall be tested to document material degradation as noted in Sections 4.2.2 and 4.2.3.

3.3 Fire Classified Roof Covering Assemblies: When the panels are used in a fire classified roof covering assembly, fire testing of the assembly shall be performed to determine the classification (Class A, B or C). The test methods are noted in Section 4.3 of this acceptance criteria.

3.4 Roof Sheathing Fire Wall Continuity Fire Testing: Performance fire testing is required to document use of the product as roof sheathing in buildings of Type III, IV and V construction for a distance of 4 feet (1220 mm) on both sides of a fire wall, to provide continuity [2009 IBC Section 706.6, Exception 4.3; 2006 IBC Section 705.6, Exception 4.3; 2009 IRC Section R302.2.2 (2), Exception; and 2006 IRC Section R317.2.2 (2), Exception]. The test method is noted in Section 4.4 of this acceptance criteria.

3.5 ~~Substrates~~ Finished Panels: Documentation shall be submitted to demonstrate that the wood structural panels used in production of the finished panels

comply with Section 2303.1.4 of the IBC or Section 604 of the IRC. The documentation shall consist of either a current ICC-ES evaluation report on the wood structural panels (in cases where the factory application of the fire-retardant coating does not result in degrading the panels) or test data from an accredited testing laboratory and an inspection program that includes regrading of the structural wood panels. If the processing treatment obliterates the structural wood panel markings, ink stamping or labels or other means shall be applied to the finished panels to indicate conformance with Sections 2303.1.4 and 2303.2.1 of the IBC and Sections R604 and R802.1.3.1 of the IRC.

4.0 TEST METHODS

4.1 Surface-burning Characteristics and Stability: The surface-burning characteristics of the wood structural panels with a factory-applied fire-retardant coating shall be determined by testing in accordance with ASTM E 84 or UL 723, with test duration extended for 30 minutes. The processed samples shall be tested with the factory-applied fire-retardant coating exposed to the interior of the tunnel. Test samples shall be constructed with a joint [joint width shall be a minimum of 0.125 inch (3 mm)] running the length of the tunnel and with fasteners driven through the wood structural panels, from the side of the panel with the wood surface and penetrating the factory-applied fire-retardant coating, and with the nail points protruding through the fire shield and exposed in the tunnel. Fasteners shall be corrosion-resistant roofing nails, spaced a minimum of 8 inches (203.2 mm) on center along the length of the tunnel, one row on each side of the panel joint. ASTM E 2579 provides additional guidance on specimen preparation. Surface burning testing shall be performed on each type of wood

structural panel (i.e. OSB and plywood) and on each species or species group ~~different species~~ (such as pine, aspen and Douglas-fir) with the factory-applied fire-retardant coating for which recognition is sought. Testing shall be performed using the maximum thickness of each type of wood structural panels and of each wood species for which recognition is sought. ~~The testing shall be continued for an additional 20-minute period.~~ The final test report shall document the thickness of the factory-applied fire-retardant coating for each of the ~~all~~ panels tested.

When the panels are evaluated for ~~use~~ exposed use in attics, flame spread index testing shall be performed in accordance with this section on samples that have been subjected for ~~42~~ 70 days to a controlled temperature of ~~140ºF~~ 170°F ± 5ºF (~~60ºC~~ 77°C ± 2ºC) and a relative humidity of ~~70%~~ 50% ± 5%. The flame spread index testing after the ~~42-day~~ 70-day exposure ~~testing~~ shall be required on only one combination of panel type and species (e.g. Southern pine OSB) and shall apply also to other products.

Conditions of Acceptance: The product shall exhibit ~~have~~ a flame-spread index not exceeding 25 and a smoke-developed index ~~rating~~ not exceeding 450, representing a Class A interior finish. The flame front shall not progress more than 10.5 feet (3200 mm) beyond the centerline of the burners at any time during the test, and there shall be no evidence of significant progressive combustion.

4.2 Durability

4.2.1 Structural Flexural Performance When Exposed to Elevated Temperatures

Temperatures: Testing for exposure to elevated temperatures and humidity shall be ~~is~~ conducted in accordance with ASTM D 5516, ~~with design values determined in~~

~~accordance with ASTM D 6305~~ using specimens with and without the factory-applied fire-retardant coating. Testing shall be performed on each type of wood structural panel (i.e., OSB and plywood) with the factory-applied fire-retardant coating for which recognition is sought.

Conditions of Acceptance: The samples exposed to elevated temperatures shall have design values equal to or better than those of the control samples. At the end of the exposures to the elevated temperature and humidity, ~~During the testing~~, the factory-applied fire-retardant coatings shall remain adhered to the panels. ~~for not less than 90 percent of the surface area of the panel.~~ An engineering analysis shall be submitted evaluating the test data.

4.2.2 Adhesion Testing: Panels with the factory-applied fire-retardant coating shall be tested in accordance with Method A of ASTM D 3359. Testing shall be conducted using finished panels.

Conditions of Acceptance: A classification of 3A or better per Section 7.7 of ASTM D 3359 shall be obtained where ~~there may be~~ jagged removal along the incisions up to $^{1}\!/_{16}$ inch (1.6 mm) on either side of the incision is allowed.

4.2.3 Abrasion Testing: Panels with factory-applied fire-retardant coatings shall be tested in accordance with ASTM D 968, Method A.

Conditions of Acceptance: Testing shall result in a minimum mean abrasion resistance of 2.3 quarts (2.5 liters) of sand per mil (0.025 mm) of coating thickness.

4.3 Fire Classified Roof Covering Assemblies: The wood structural panels with factory-applied fire-retardant coatings shall be tested as a component of a fire classified roof covering assembly in accordance with ~~under~~ ASTM E 108 or UL 790.

Testing shall be performed on each type of wood structural panel (i.e., OSB and plywood) and either each wood species and species group shall be tested, or Southern pine shall be used to represent all species and species groups with factory-applied coating for which recognition is sought. The fire classified roof covering assembly shall be completely described in the test report, along with the corresponding fire classification (Class A, B or C). The orientation of the factory-applied fire-resistant coating shall be noted in the test report.

4.3.1 Asphalt Fiberglass Shingles: The accredited test laboratory shall select and test a minimum of two roof assemblies using two brands of classified asphalt fiberglass shingles complying with ASTM D 3018, and which represent the lower range with respect to finish weight specifications. The testing shall be used to document recognition of the panels ~~as an alternative roof sheathing and underlayment~~ in a classified roof covering assembly, when the asphalt fiberglass shingles have the minimum specifications determined by the testing.

4.3.2 Other Roof Coverings: Roof assembly classifications for other code-complying roof coverings shall be determined by testing roof covering materials that represent the lower range with respect to physical or mechanical properties deemed relevant by the accredited test laboratory and approved by ICC-ES staff. The test plan must be submitted to ICC-ES staff for approval prior to testing.

Conditions of Acceptance: The fire classified roof covering assemblies tested shall comply with Section 12, Conditions of Classification, of ASTM E 108, or Section 12, Conditions of Acceptance, of UL 790. The assemblies shall be described in the published evaluation report. The fire classified roof covering assembly

shall have a minimum Class B roof covering classification when installed under the IBC and a minimum Class C roof covering classification when installed under the IRC.

4.4 Roof Sheathing Fire Wall Continuity Fire Testing: The wood structural panels with factory-applied fire-retardant coatings shall be tested in the horizontal orientation under exposure to the time-temperature curve of Section 5 of ASTM E 119. The test assembly shall be described in the test report and have a roof covering as described in Sections 4.3.1 and 4.3.2 of this criteria. Fasteners shall protrude through the coating and be exposed to the fire. The unexposed surface temperatures of each panel shall be measured at five locations (center of panel and in the center of each quadrant) in the manner described in ASTM E 119. The test specimens shall be described in the test report. Pressure-impregnated fire-retardant-treated plywood panels of the same thickness as the wood structural panel with factory-applied fire-retardant coating shall be tested at the same time, using the same configuration of assemblies for comparative test results evaluation. The fire-retardant-treated plywood shall comply with Section 2303.2 of the 2009 and 2006 IBC, or Section R802.1.3 of the 2009 and 2006 IRC.

Conditions of Acceptance: The assembly of wood structural panels with factory-applied fire-retardant coatings shall exhibit a fire-resistance rating equal to or better than that of pressure-impregnated fire-retardant panels of the same thickness.

4.5 Corrosion Testing for Fire-retardant Coatings: Panels with factory-applied fire-retardant coating shall be tested in accordance with Section 4.6 of AC326.

Conditions of Acceptance: The conditions of acceptance shall be as noted in Section 4.6 of AC326.

5.0 QUALITY CONTROL

5.1 General: Panels with factory-applied fire-retardant coatings shall be produced at plants under a quality assurance program, with inspections conducted by an inspection agency accredited by the International Accreditation Service (IAS) or otherwise acceptable to ICC-ES.

The factory-applied fire-retardant coating shall have been applied in a minimum wet-film thickness and using an application rate as defined in the quality documentation and the published evaluation report. The factory-applied fire-retardant coating application and the finished panel shall be under third-party inspection. The thickness of the factory-applied fire-retardant coating shall be measured in a minimum of three locations on tests panels as specified in the quality documentation.

Each plant shall be qualified based on its equipment and its in-house quality control program.

Requirements for the quality control of production material shall be based upon the production and testing of the qualification material. These quality control requirements shall include coating thickness and small-scale fire tests or other validated methods as delineated in the approved quality documentation.

Quality documentation prepared in accordance with the ICC-ES Acceptance Criteria for Quality Documentation (AC10) shall be submitted for initial qualification. The documentation shall include information on quality control tests as set forth in this criteria, and information on key processing parameters of the manufacturing

procedures. Checklists used by the quality assurance agency for monthly inspections shall be included in the quality documentation.

5.2 Plant Quality Control:

5.2.1 Program Requirements:

5.2.1.1 Each plant shall maintain a quality control program. The plant shall appoint a quality control supervisor who will be responsible for the quality control program and who will have the authority to take action as required to ensure compliance of all material produced by the plant. The plant quality control supervisor will serve as the primary contact for the quality control inspection agency.

5.2.1.2 The plant shall be equipped with the process equipment, measuring instruments, records, and laboratory equipment necessary to accurately monitor the manufacturing, drying and testing procedures conducted at the plant. The equipment shall be properly calibrated and maintained in good working order, and personnel shall be properly trained in the use thereof.

5.2.1.3 The materials used to manufacture the fire-retardant coating shall be controlled so that the fire-retardant coating used for manufacturing operations is of the same composition, within qualified tolerances, as the fire-retardant coating used for the treatment of qualification-test specimens.

5.2.2 Coating Process Control:

5.2.2.1 Critical operating parameters for the coating process shall be monitored and the limiting tolerances of these critical parameters shall be as noted in the quality documentation.

5.2.2.2 All coated wood shall be stored in weather-protected locations or shall be protected by waterproof wrapping. All coated wood shall be stored above the ground.

5.2.2.3 Records shall be kept for a minimum of two years to document that all fire-retardant coated wood panels meet the quality control inspection agency requirements and that quality control procedures have been properly conducted.

5.2.3 Chemical Verification: In all cases, chemical verification shall conform to requirements outlined in the approved quality documentation. Verification shall be by means of small-scale fire tests or other test methods that have been validated to correlate to the results of fire tests conducted in accordance with Section 4.1 of this criteria. The approved quality documentation shall include a description of the verification method and the conditions of acceptance.

5.3 Third-party Quality Assurance Inspection: The quality assurance inspection agency shall be permitted to be the same organization as the testing laboratory. Different quality assurance inspection agencies shall be permitted to be used to monitor phases of production associated with different properties.

5.3.1 The quality assurance inspection agency shall inspect every plant at least once a month. It is possible that more frequent inspection will be necessary for plants operating more than one shift per day, or operating more than five days per week. The visits shall not be made on a regular schedule, but shall be coordinated with the plant quality control supervisor so that materials will be available for testing during the inspection. The inspector shall review plant records recorded since the last inspection, to verify that the required records are being maintained in a complete and

accurate fashion, and that all fire-retardant-coated wood panels have been properly tested and have complied with the established quality control requirements. While at the plant, the inspector shall witness small-scale fire tests or verify compliance with other validated methods specified in the approved quality documentation. The inspector shall keep a report of findings and copies of records of all witnessed tests.

5.3.2 The inspector shall review plant records to verify that the required documentation is being maintained, that all fire-retardant coated wood panels have been properly coated, and that the panels have complied with the established quality control requirements. While at the plant, the inspector shall witness process control tests and small-scale fire tests. The inspector shall keep a report of findings and copies of records of all witnessed tests.

5.3.3 The inspection agency shall examine production records to ensure proper accounting in accordance with Sections 2.1.4 and 2.1.5 of ICC-ES AC10, which require the inspection agency to have total control of the identification methods. A system of traceability of each finished product to the coating application process, and associated quality control records, must be provided.

5.3.4 The quality assurance inspection agency must verify ongoing compliance with the surface burning characteristics and strength properties.

5.4 Resolution of Noncompliance:

5.4.1 If a plant fails to maintain all required records in a complete and accurate manner, the quality control inspection agency shall give the plant a written warning, including details of the deficiencies. Three consecutive monthly warnings, or four warnings in a six-month period, shall result in suspension of the plant's marking

privileges and removal of all stamps and labels from the plant, until such time as the requirements are met to the satisfaction of the quality control inspection agency.

5.4.2 If the agency discovers nonconformance with the requirements of this criteria, the quality control procedures or the approved quality documentation, the agency shall initiate double-frequency inspections until two consecutive inspections show full conformance. If three consecutive inspections show nonconformance, or if four inspections in a six-month period show nonconformance, the plant's marking privileges shall be suspended and all stamps and labels removed from the plant until such time as all requirements are met to the satisfaction of the quality control inspection agency and ICC-ES.

5.4.3 The coating thickness shall be within the range specified in the quality documentation. If the fire-retardant coating thickness on the wood panels is too low, the panels shall be recoated.

5.4.4 The analysis of coating documentation by the quality assurance inspection agency shall confirm proper chemical composition and concentration. If nonconforming, appropriate corrective action shall be taken by the plant. Additional samples shall then be analyzed on a weekly basis until conformance has been demonstrated in two consecutive samples. All panels found to have been coated with a nonconforming solution shall be segregated and labeled as nonconforming. A representative sampling of the nonconforming panels, selected by the quality assurance inspection agency, shall be tested, and shall meet the flame spread and strength requirements of the code before the materials are released.

~~**5.2** The products shall be manufactured under an approved quality control program with inspections by an inspection agency accredited by the International Accreditation Service (IAS), or otherwise acceptable to ICC-ES.~~

~~**5.3** Quality documentation complying with the ICC-ES Acceptance Criteria for Quality Documentation (AC10), and including the information required by Sections 5.2.1 and 5.3 of this criteria, shall be submitted.~~

~~**5.3.1 Third-party Inspection**~~

~~**5.3.1.1** Factory-applied fire-retardant panels shall be produced at plants with a third-party quality assurance program. The quality control agency shall inspect every plant at least once a quarter. More frequent inspections may be necessary for some plants. The visits shall not be made on a regular schedule and may include plant inspections at any time during business hours. Inspections shall be unannounced, and inspectors shall have free and immediate access to plant premises where the product is fabricated, processed, finished, stored or located.~~

~~**5.3.1.2** The inspector shall review plant records to verify that the required documentation is being maintained, that all panels have been properly tested, and that the panels have complied with the established quality control requirements. While at the plant, the inspector shall witness process control tests and in-house fire tests. The inspector shall keep a report of his findings and copies of records of all witnessed tests.~~

~~**5.3.1.3** The inspection agency shall sample finished panels from each plant quarterly. The samples shall be obtained from the production line at the time of the inspection. The samples shall be labeled and sent to the inspection agency or a~~

~~designated independent accredited laboratory to confirm surface burning characteristics in accordance with Section 4.1. The agency shall verify records of plant testing.~~

~~**5.3.1.4** The inspection agency shall examine production records to ensure proper accounting in accordance with Sections 2.1.4. and 2.1.5 of the ICC-ES Acceptance Criteria for Quality Documentation (AC10), which require the inspection agency to have total control of the identification methods. A system of traceability of finished product to the coating application process, and associated quality control records, must be provided.~~

~~**5.3.1.5** The inspection agency shall verify ongoing compliance with the surface burning characteristics and strength properties.~~

~~**5.3.2 Program Requirements:**~~

~~**5.3.2.1** Each plant is to maintain a quality control program. The plant will appoint a quality control person who will be responsible for the quality control program and who will have the authority to take action as required to ensure compliance of all material produced by the plant. The plant quality control person will serve as the primary contact for the quality control inspection agency.~~

~~**5.4 Plant Quality Control:**~~

~~**5.4.1** The plant shall be equipped with the process equipment, measuring instruments, and records necessary to accurately monitor the processing and the testing procedures conducted at the plant. The associated equipment shall be properly calibrated and maintained in good working order.~~

~~Each plant shall be qualified based on its equipment, and its in-house quality control program.~~

~~Checklists used by the quality control agency for quarterly inspections shall be included in the quality documentation.~~

~~**5.4.2 Manufacturing Process:** In all cases, chemical verification shall conform to requirements outlined in the approved quality documentation. Verification shall be by means of in-house fire tests where fire performance is measured under controlled conditions using procedures specified in the quality documentation or in nationally recognized test methods or other methods that have been validated to relate to results of fire tests conducted in accordance with Sections 4.1 of this criteria. The result of this analysis shall substantiate equivalency to the qualification analysis. When the coating process is verified by methods other than in-house tests or chemical assay, the approved quality documentation shall include a description of the verification method and conditions of acceptance.~~

~~**5.4.2.1** The fire retardant formulation shall be mixed under controlled conditions and shall be agitated to ensure uniform consistency.~~

~~**5.4.2.2** The application equipment settings are set to ensure uniform coating for each board.~~

~~**5.4.2.3** The process must provide consistency of application to each wood structural panel.~~

~~**5.4.3 Manufacturing Quality Testing**~~

~~**5.4.3.1** The panels will be tested during the manufacturing process to ensure consistent application to the panels throughout. The quality tests include visual inspection, coating gauge inspection and in-house fire testing where fire~~

~~performance is measured under controlled conditions using procedures specified in the quality documentation.~~

~~**5.4.3.2** Panels that pass the various inspection points shall not be shipped until curing is completed.~~

~~**5.4.4 Finished/Final Product Quality Test:**~~

~~**5.4.4.1** One "first article" panel will be fire-tested for each application batch. If any panel fails the in-house fire test where fire performance is measured under controlled conditions using procedures specified in the quality documentation the entire batch must be evaluated. Tested panels will be retained in a designated area for a period of one month.~~

~~**5.4.5 Test Equipment**~~

~~**5.4.5.1** Calibration records for quality control test equipment are maintained by the quality control manager. Test equipment is calibrated annually in accordance with ISO 17025 standard.~~

~~**5.4.6 Documentation**~~

~~**5.4.6.1** Quality records shall be maintained by the quality control manager. The minimum retention time for all quality records is two years. The following documents are examples of acceptable records: forms, reports, minutes of meetings, signed or stamped documents, computer files or databases.~~

~~**5.4.6.2** Traceability records shall record receiving and inspection of raw materials, mill identification, suppliers, dimensions and span, application batch number, date processed, number of panels produced in the batch, all testing results, number of pieces shipped, shipping destination, and date shipped.~~

~~**5.4.7 Nonconforming Items, Preventive and Corrective Action:**~~

~~**5.4.7.1** All nonconformances shall be recorded, root-cause analysis generated, corrective action taken and follow-up documented. The type and extent of nonconformity shall be documented in order to establish trends and to identify where improvements can be implemented for continuous quality improvement.~~

~~**5.4.8 Handling, Storage, Packaging, Labeling, Stamping, Marking, Preservation, and Shipping**~~

~~**5.4.8.1** Materials and equipment shall be identified by the presence of a manufacturer's or supplier's part number, description label, or other marking for each item. The identification of the item may be on the packaging or on the item itself. All items with serial numbers shall be recorded individually. The objective shall be to prevent damage or deterioration of materials, supplies, products and goods while in storage, during manufacture, while in maintenance and up to shipment of the product to the customer.~~

~~**5.4.8.2** The wood structural panels with factory-applied fire-retardant coating are rated for interior use only. The panels must be kept dry, stored flat on pallets, and elevated so they do not touch the ground. Bundles are covered to prevent damage from potential wetting. Excessive moisture build-up is not allowed in storage areas. If panels become wet, they must be allowed to dry and inspected for damage. If damage is visible, any good portions may be salvaged and the rest discarded.~~

~~**5.3.9 Resolution of Noncompliance:**~~

~~**5.3.9.1** If a plant fails to maintain all required records in a complete and accurate manner, the inspection agency shall give the plant a written warning, including details of the deficiencies. Failure to take corrective action to bring the records into compliance may result in loss of marking privileges and removal of all stamps and labels from the plant, until such time as the requirements are met to the satisfaction of the inspection agency.~~

6.0 EVALUATION REPORT RECOGNITION

The evaluation report on wood structural panels with factory-applied fire-retardant coatings covered by this acceptance criteria shall include the following conditions of use:

6.1 The scope of this evaluation report does not include the structural design of the panels. The structural system shall be designed in accordance with the *International Building Code*® (IBC) or the *International Residential Code*® (IRC).

6.2 The wood structural panels with factory-applied fire-retardant coatings must only be used for the applications noted in the evaluation report. (Product uses are limited to those described in Section 1.2 of this criteria.)

6.3 When installed as roof sheathing in buildings of Type III, IV and V construction for a distance of 4 feet (1220 mm) on both sides of a fire wall to provide continuity, the panels must be installed with the factory-applied fire-retardant coating facing the interior of the building.

6.4 Attic ventilation must be in accordance with IBC Section 1203.2 or IRC Sections R806.1, R806.2 and R806.3. <u>Use in unvented attics in accordance with Section R806.4 of the 2009 IRC is permitted.</u>

6.5 Exposure to precipitation during storage or installation shall be avoided. If a factory-applied fire-retardant coated wood structural panel ~~material does~~ becomes wet, it shall be replaced or permitted to dry (maximum 15 percent moisture content) prior to covering or enclosure by wallboard or other construction materials (except for protection during construction).

6.6 Openings in the roof shall not be located within 4 feet (1220 mm) of the fire wall.

6.7 The panels, as a component of a fire classified roof covering assembly, must have a minimum Class B roof covering classification when installed under the IBC and a minimum Class C roof covering classification when installed under the IRC.

6.8 Special inspection is required for field-repaired panels and for panels exposed to conditions described in Section 6.5. ~~of this criteria~~. ■