



ACCEPTANCE CRITERIA FOR AUTOMATIC FOUNDATION FLOOD VENTS

AC364

Approved October 2007

Effective November 1, 2007

Previously approved October 2006

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.

This acceptance criteria has been issued to provide all interested parties with guidelines for demonstrating compliance with performance features of the applicable code(s) referenced in the acceptance criteria. The criteria was developed and adopted following public hearings conducted by the ICC-ES Evaluation Committee, and is effective on the date shown above. All reports issued or reissued on or after the effective date must comply with this criteria, while reports issued prior to this date may be in compliance with this criteria or with the previous edition. If the criteria is an updated version from the previous edition, a solid vertical line (|) in the margin within the criteria indicates a technical change, addition, or deletion from the previous edition. A deletion indicator (→) is provided in the margin where a paragraph has been deleted if the deletion involved a technical change. This criteria may be further revised as the need dictates.

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 set forth in this document, and otherwise demonstrate compliance with the performance features of the codes. Notwithstanding that a product, material, or type or method of construction meets the requirements of the criteria set forth in this document, or that it can be demonstrated that valid alternate criteria are equivalent to the criteria in this document and otherwise demonstrate compliance with the performance features 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 if 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.

Copyright © 2007

ACCEPTANCE CRITERIA FOR AUTOMATIC FOUNDATION FLOOD VENTS

1.0 INTRODUCTION

1.1 Purpose: The purpose of this acceptance criteria is to establish requirements for automatic foundation flood vents (AFFVs) to be recognized in an ICC Evaluation Service, Inc. (ICC-ES), evaluation report under the 2006 *International Building Code*® (IBC) and the 2006 *International Residential Code*® (IRC). Bases of recognition are IBC Sections 104.11, 1203.3, 1612, and G103.1; and IRC Sections R104.11 and R324.2.2.

The reason for the development of this criteria is that the IBC and IRC contain requirements for flood-resistant construction, but do not provide guidance on the methods by which AFFVs can be evaluated.

1.2 Scope: This acceptance criteria is intended to establish testing criteria for AFFVs serving as engineered openings, as noted in ASCE/SEI 24, in enclosures below the design flood elevation. AFFVs are designed to remain in the closed position when not subjected to flood conditions and can be used to provide under-floor ventilation. When subjected to rising flood waters on either side, the AFFV is designed to open and allow a path for equalization of the water level and pressure.

1.3 Codes and Referenced Standards:

1.3.1 2006 *International Building Code*® (IBC), International Code Council.

1.3.2 2006 *International Residential Code*® (IRC), International Code Council.

1.3.3 ASCE/SEI 24-05, Flood Resistant Design and Construction, American Society of Civil Engineers/Structural Engineering Institute.

1.4 Definitions:

1.4.1 Automatic Foundation Flood Vents (AFFVs): AFFVs are engineered openings, as noted in Section 2.6 of ASCE/SEI 24, intended for installation in walls below the design flood elevation, to provide for the automatic entry and exit of floodwaters during design flood conditions.

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, field cutting, fastening methods, joint treatments, and face treatments.

2.1.3 Packaging and Identification: A description of the method of packaging and field identification of the AFFV. Identification provisions shall include the evaluation report number.

2.1.4 Field Preparation: A description of the methods involved in any allowed field modifications and applications.

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: Sampling of the AFFV for tests under this criteria shall comply with Section 3.2 of AC85.

3.0 TEST METHODS AND PERFORMANCE REQUIREMENTS

3.1 General:

3.1.1 The material from which the AFFV is formed shall be corrosion-resistant material, such as stainless steel.

3.1.2 Where used to provide under-floor ventilation, the net free area of the AFFV shall be calculated by a registered design professional. The net free area for any airflow pathway (airway) shall be the gross cross-sectional area less the area of any physical obstructions at the smallest or most critical cross-sectional area in the airway. The net free area shall be determined for each airway in the installed device. The NFVA for the device shall be the sum of the net free areas determined for all airways in the installed device. Opening size and materials shall be documented as conforming with requirements contained in IBC Section 1203.3.1 and IRC Section 408.2.

3.1.3 Openings in the AFFV shall be not less than 3 inches (76.2 mm) in any direction in the plane of the wall.

3.1.4 The minimum total net area of the required openings in non-breakaway walls shall be calculated by a registered design professional in accordance with Section 2.6.2.2 of ASCE 24.

3.2 Performance Testing:

3.2.1 Test Apparatus: Testing shall be conducted in a tank with an interior length of 131 inches (3327.4 mm), width of 48 inches (1219.2 mm), and depth of 40 inches (1016 mm). The tank shall be sealed to be water-resistant and shall be provided with a water inlet and drain on each of the long sides. The drains and inlets shall be sized to allow the flow rates necessary to produce the minimum elevation change rates specified for each test below. A water-resistant wall shall be constructed in the manner for which recognition is sought. The test wall shall be installed halfway along and perpendicular to the long wall of the tank to divide the tank into two compartments, to be designated "exterior" and "interior." The AFFV shall be installed in the center wall in accordance with the manufacturer's published installation instructions, with the bottom edge of the AFFV located 8 inches (203.2 mm) above the floor in the center of the wall.

3.2.2 Flood and Release Test, Interior to Exterior:

3.2.2.1 Minimum Rate of Rise: Water is introduced into the tank's interior compartment at two rates, of 50 and 300 gpm (3.15 and 18.93 L/s). The rate of rise in the interior compartment shall be recorded for both flow rates. The condition of acceptance is that the minimum rise shall exceed 5 feet (1524 mm) per hour.

3.2.2.2 Actuation Level: Measuring from the bottom of the opening, the level of water required to open the AFFV shall be recorded at both flow rates. The condition of acceptance is that the level at which actuation of the AFFV occurs shall not exceed 1 foot (304.8 mm).

3.2.2.3 Submerged Flow Test Interior to Exterior: This test is designed to show that the vent will stay unlatched during a flood that totally covers the entire vent door. The vent is held closed mechanically and the interior

ACCEPTANCE CRITERIA FOR AUTOMATIC FOUNDATION FLOOD VENTS

tank filled to 1 foot (305 mm) above the vent. The exterior side is filled to the top of the vent. Water is introduced on the interior of the vent at a rate of 300 gallons per minute while simultaneously allowing the vent to open. If the water reaches equilibrium at a level below the top of the vent, water will continue to be added at a rate of 300 gallons per minute until the water level is 1 foot (305 mm) above the vent on both sides. The test will be stopped when the water is 1 foot (305 mm) above the vent on both sides. Criteria for passing is that at no time can there be a difference of more than 1 foot (305 mm) between the water heights on the exterior and interior sides, measured from the bottom of the vent opening, and the vent must remain unlatched while submerged.

3.2.3 Flood and Release Test, Exterior to Interior:

3.2.3.1 Minimum Rate of Rise: Water shall be introduced into the tank's exterior compartment at two rates, of 50 and 300 gpm (3.15 and 18.93 L/s). The rate of rise in the exterior compartment is recorded for both flow rates. The condition of acceptance is that the minimum rise must exceed 5 feet (1524 mm) per hour.

3.2.3.2 Actuation Level: Measuring from the bottom of the opening, the level of water required to open the AFFV is recorded at both flow rates. The condition of acceptance shall be that the level at which actuation of the AFFV occurs must not exceed 1 foot (304.8 mm).

3.2.3.3 Submerged Flow Test Exterior to Interior: This test is designed to show that the vent will stay unlatched during a flood that totally covers the entire vent door. The vent is held closed mechanically and the exterior tank filled to 1 foot (305 mm) above the vent. The interior side is filled to the top of the vent. Water is introduced on the exterior of the vent at a rate of 300 gallons per minute while simultaneously allowing the vent to open. If the water reaches equilibrium at a level below the top of the vent, water will continue to be added at a rate of 300 gallons per minute until the water level is 1 foot (305 mm) above the vent on both sides. The test will be stopped when the water is 1 foot (305 mm) above the vent on both sides. Criteria for passing is that at no time can there be a difference of more than 1 foot (305 mm) between the water heights on the exterior and interior sides, measured from the bottom of the vent opening, and the vent must remain unlatched while submerged.

3.2.4 Flood Recession Test, Exterior to Interior: Both the interior and exterior compartments shall be filled until the level is at least 12 inches (304.8 mm) above the top of the AFFV. The interior side shall then be drained, and the rate of falling water shall be recorded and verified to exceed 5 feet (1524 mm) per hour. The differential height of the water shall be monitored until no more water is flowing out of the AFFV. The conditions of acceptance are that the water level measured from the bottom of the vent opening shall not exceed a 1-foot difference between the two compartments, and that the AFFV shall remain unlatched while submerged.

3.2.5 Flood Recession Test, Interior to Exterior: Both the interior and exterior compartments shall be filled until the level is at least 12 inches (304.8 mm) above the top of the AFFV. The exterior side shall then be drained, and the rate of falling water shall be recorded and verified to exceed 5 feet (1524 mm) per hour. The differential height of the water shall be monitored until no more water is flowing out of the AFFV. The conditions of acceptance are that the water level measured from the bottom of the vent opening shall not exceed a 1-foot difference between the two compartments, and that the AFFV shall remain unlatched while submerged.

3.2.6 Debris Test, Interior: A minimum of 216 cubic inches (3542 mL) of dried leaves, 216 cubic inches (3542 mL) of grass clippings, and fifteen 3-inch-diameter (76.2 mm) balls shall be added to the interior compartment. Water shall be introduced to the interior compartment at a rate of 300 gpm (18.9 L/s). The conditions of acceptance are that the AFFV shall unlatch and remain open, and the water level measured from the bottom of the vent opening shall not exceed a 1-foot difference between the two compartments.

3.2.7 Debris Test, Exterior: A minimum of 216 cubic inches (3542 mL) of dried leaves, 216 cubic inches (3542 mL) of grass clippings, and fifteen 3-inch-diameter (76.2 mm) balls shall be added to the exterior compartment. Water shall be introduced to the exterior compartment at a rate of 300 gpm (18.9 L/s). The conditions of acceptance are that the AFFV shall unlatch and remain open, and the water level measured from the bottom of the vent opening shall not exceed a 1-foot difference between the two compartments.

4.0 QUALITY CONTROL

4.1 Quality documentation complying with the ICC-ES Acceptance Criteria for Quality Documentation (AC10) shall be submitted.

4.2 Third-party follow-up inspections are not required under this acceptance criteria.

5.0 EVALUATION REPORT RECOGNITION

5.1 When the AFFV is used to provide under-floor ventilation, the evaluation report shall note the minimum net free ventilation area provided by each AFFV. If there is no such use, the evaluation report shall contain a condition of use indicating the AFFV has not been evaluated for use as an opening for under-floor ventilation.

5.2 The report shall include a condition of use stating that AFFVs shall not be used in the place of "breakaway walls" in coastal high hazard areas, but are permitted for use in conjunction with breakaway walls in other areas.

5.3 The evaluation report shall state the maximum square footage of wall area recognized for each AFFV. The evaluation report shall contain a condition of use requiring a minimum of two openings on different sides of each enclosed area below the design flood elevation. ■