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September 1, 2009

**TO: PARTIES INTERESTED IN EVALUATION REPORTS ON MOLDED PLASTIC FOOTING PADS**

**SUBJECT: Proposed Revisions to the Acceptance Criteria for Molded Plastic Footing Pads, Subject AC49-1009-R1 (MO/BG)**

**Hearing Information:**

Thursday, October 8, 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:

Proposed revisions to the subject acceptance criteria will be on the agenda for the Evaluation Committee hearing noted above. The criteria was approved October 2008 for residential deck construction and Group U (Agricultural Buildings). The proponent of the October 2008 revisions has requested that a product be evaluated for use with post frame Type V construction, any occupancy. The following are proposed revisions for consideration by the committee:

1. The term post-and-beam frame construction has been changed to refer to post-frame building systems, and a new definition has been provided in Section 1.4.3 of the criteria. The new definition is consistent with language used by the National Frame Builders Association (NFBA). The NFBA is preparing code changes to submit to ICC for the next code change cycle addressing post-frame building systems in the IBC and IRC.
2. Section 1.2 (Scope) has been modified to allow the use of the molded plastic footing pads with post-frame building systems of any occupancy type allowed by the code for Type V construction. The proponent has documented in the attached letter the reasons for including all Type V construction in this criteria.

Staff requests input and testimony from the National Frame Builders Association (NFBA), the applicant and other interested parties to clarify the following:

- a. Design procedure for post-frame building systems for uplift and lateral loads for the molded plastic footing pads that do not have a positive connection to the post. Since the definition proposed in Section 1.4.3 implies that all loads will be transferred to the foundation by the posts, it is unclear how a complete load path for lateral and uplift loadings is accomplished, since the subject footing pads are evaluated for vertical download capacity only.
  - b. Use of post-frame building systems and this product in other than residential decks Group R-3 and agricultural buildings Group U. It is unclear whether structures built for other occupancies can tolerate the 0.75-inch movement permitted by Section 4.5.4.3.
3. References to the 2009 *International Building Code*<sup>®</sup> and the 2009 *International Residential Code*<sup>®</sup> was added to the criteria in Sections 1.1, 1.1.1, 1.1.2, 1.1.3 and 1.3. Revisions to the 2009 I-Codes do not affect the criteria.
  4. Section 5.3 has been revised to clarify quality control testing needed to document footing properties.

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:

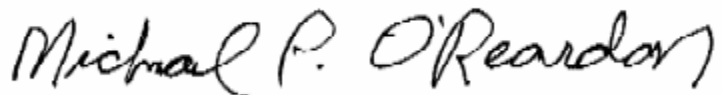
1. Written comments that are received by the Los Angeles business/regional office by **September 18, 2009**, will be forwarded to the committee prior to the hearing, and will be posted on the ICC-ES web site shortly after the comment deadline.
2. Written comments received up to ten days before the meeting, 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 5698, or Brian Gerber, Principal Structural Engineer, at extension 3255. You may also reach us by e-mail at [es@icc-es.org](mailto:es@icc-es.org).

Yours very truly,



Michael O'Reardon, P.E.  
Regional Manager

MPO/raf

Enclosures

cc: Evaluation Committee

# GE Engineering

473 White Oak Lane

Barrington, IL 60010

Phone (847) 277-7996

**TO: ICC-ES Evaluation Committee**  
Attention: Mike O' Reardon, P.E.  
Regional Manager

## **RE: AC49 Proposed Revisions To The Acceptance Criteria For Plastic Footing Pads**

Dear Mr. O'Reardon:

This is in reply to the request for written comment concerning revisions to the above referenced acceptance criteria.

A post frame building is a Type -V construction type and can be used as permitted for all occupancy groups. Since the referenced plastic footing pads can support the vertical loads of this type of building their use should be considered in all occupancies.

Engineering practices for this type of construction has a rational basis for the required lateral and uplift capacity for the embedded post. Cleats secured at the base of the post provide the uplift resistance. Lateral loads are resisted by post embedment, knee braces, and diaphragm design. Vertical loads are resisted by a spread footing which can be the type reference in this proposed acceptance criteria.

It is respectfully requested that the proposed AC49 be revised as follows:

**1.13 Revised to reference all occupancy groups permitted for Type V construction.**

**1.2 Revise underlined to - and all permitted occupancies of post frame construction.**

**1.4.3 Revise reference "Post-and-beam frame" to "Post frame".**

**6.2.2 Revise underlined to - residential decks or post columns for post frame buildings of type V construction under the IBC or any construction under the IRC.**

It is hopeful the evaluation committee will accept the above revisions.

Respectfully,

Gerald Eckhoff, P.E.(Signed)



## 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](http://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

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

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 MOLDED PLASTIC FOOTING PADS

AC49

Proposed September 1, 2009

Previously approved October 2008, October 2007 and September 1990

### 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 purposes of issuing ICC-ES evaluation reports.*

# PROPOSED REVISIONS TO THE ACCEPTANCE CRITERIA FOR MOLDED PLASTIC FOOTING PADS

## 1.0 INTRODUCTION

**1.1 Purpose:** The purpose of this acceptance criteria is to establish requirements for molded plastic footing pads to be recognized in an ICC Evaluation Service, Inc. (ICC-ES), evaluation report under the [2009 and 2006 International Building Code®](#) (IBC) and the [2009 and 2006 International Residential Code®](#) (IRC). Bases of recognition are IBC Section 104.11 and IRC Section R104.11. Applicable code sections are:

**1.1.1 Footings and Foundations:** [2006 IBC Sections 1805 \(Footings and Foundations\), 1805.1 \(General\), 1805.2 \(Depth of Footings\), and 1805.4 \(Footings\); 2009 IBC Sections 1808 \(Foundations\) and 1809 \(Shallow Foundations\); and 2009 and 2006 IRC Sections R401 \(Foundations—General\), R402 \(Foundations—Materials\), and R403 \(Foundations—Footings\).](#)

**1.1.2 Residential Decks:** [2006 IBC Sections 310 \(Residential Group R-3 One- and Two-Family Dwelling Units\), Section 1602.1 \(Definitions—Deck\), 1604.8.3 \(Anchorage – Decks\), Table 1607.1 \(Live Loads\), 1613 \(Earthquake Loads—Exception 1\); 2009 IBC Sections 310 \(Residential Group R-3 One- and Two-Family Dwelling Units\), 1604.8.3 \(Anchorage – Decks\), Table 1607.1 \(Live Loads\), 1613 \(Earthquake Loads—Exception 1\); and 2006 IRC Sections R101.2 \(Scope\), R202 \(Definitions—Deck\), R502.2.2 \(Decks\); 2009 IRC Sections R101.2 \(Scope\) and R502.2.2 \(Decks\).](#)

**1.1.3 Agricultural Buildings Group U Occupancies:** [2009 and 2006 IBC Sections 312 \(Utility and Miscellaneous Group U\), Table 1604.5 \(Occupancy Category of Buildings and Other Structures\), 1613.1 \(Earthquake Loads—Exception 3\), and Appendix C \(Group U—Agricultural Buildings\)](#)

The reason for the development of this acceptance criteria is to allow the evaluation of molded plastic footing pads as an alternative footing material, since the codes do not provide requirements for the evaluation of molded plastic footing pads.

**1.2 Scope:** The molded plastic footing pad is a footing for the support of a [wood column on an exterior residential deck, and post and beam frame and post-frame agricultural buildings for Type V construction](#). The molded plastic footing pad shall only be used as an individual isolated footing supporting downward compression loads.

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

**1.3.1** [2009 International Building Code® \(IBC\), International Code Council.](#)

**1.3.2** [2006 International Building Code® \(IBC\), International Code Council.](#)

**1.3.3** [2009 International Residential Code® \(IRC\), International Code Council.](#)

**1.3.4** [2006 International Residential Code® \(IRC\), International Code Council.](#)

**1.3.5** [ASTM D 790-03 07<sup>et</sup>](#), Standard Test Methods for Flexural Properties of Unreinforced and Reinforced Plastics and Electrical Insulating Materials, ASTM International.

**1.3.6** [ASTM D 2990-01](#), Standard Test Methods for Tensile, Compressive, and Flexural Creep and Creep-Rupture of Plastics, ASTM International.

**1.3.7** [ICC-ES Acceptance Criteria for Air-conditioning Equipment Pads \(AC100\).](#)

## 1.4 Definitions:

**1.4.1 Molded Plastic Footing Pads:** Circular ribbed plastic pads injection-molded from of a mix of virgin or recycled plastic, and used as a shallow rigid footing that transmits design bearing load uniformly to the supporting soil.

**1.4.2 Deck:** Refer to the definitions in [2006 IBC Section 1602 and 2006 IRC Chapter 2.](#)

**1.4.3 Post-and-beam Frame:** ~~Post-and-beam frame construction is a type of framing with horizontal framing members connected to vertical posts that are embedded in the ground and supported by the molded plastic footing pad.~~ **Post-frame Building System:** [A post-frame building system is characterized by primary structural frames of posts as columns and trusses or rafters as roof framing. The roof framing is attached to the posts, either directly or indirectly through structural headers. Posts are typically graded lumber, graded timbers, or laminated lumber, or are fabricated of composite or hybrid material. Posts are embedded in the soil and supported on isolated footings, or are attached to the top of piers, concrete or masonry walls, slabs-on-grade, or other suitable foundations. Secondary framing members, purlins in the roof and girts in the walls, are attached to the primary framing members to provide lateral support and to transfer sheathing loads, both in-plane and out-of-plane, to the posts and roof framing. Structures are sheathed with a wide variety of materials, including metal and wood structural panels or other suitable materials.](#)

## 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. This information shall be submitted with the quality documentation required under Section 5.2.

**2.1.2 Installation Instructions:** Installation details and limitations, include allowable loads based on soil bearing capacity.

**2.1.3 Packaging and Identification:** A description of the method of packaging and field identification of the molded plastic footing pad. Identification provisions shall include the evaluation report number.

**2.1.4 Field Preparation:** Field modification or fabrication of this product is not permitted.

**2.2 Testing Laboratories:** Testing laboratories shall comply with Section 2.0 of the ICC-ES Acceptance Criteria

## PROPOSED REVISIONS TO THE ACCEPTANCE CRITERIA FOR MOLDED PLASTIC FOOTING PADS

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 molded plastic footing pad for tests under this criteria shall comply with Section 3.2 of AC85.

### 3.0 TEST AND PERFORMANCE REQUIREMENTS

The performance characteristics for molded plastic footing pads described in Sections 3.1, 3.2, 3.4, 3.5 and 3.6 shall be documented by testing and shall be conducted for each type of plastic material used in manufacturing the pads. Full-size molded plastic footing pads in each size and configuration to be listed in the evaluation report shall be tested to document performance characteristics described in Sections 3.5 and 3.6.

**3.1 Exposure to Soil:** The test methods are noted in Section 4.1 of this criteria.

**3.2 Low-temperature Brittleness:** The test methods are noted in Section 4.2.

**3.3 Density:** The test methods are noted in Section 4.3.

**3.4 Stiffness:** The test methods are noted in Section 4.4.

**3.5 Allowable Vertical Load Tests:** The test methods are noted in Section 4.5.

**3.6 Creep Test:** The test methods are noted in Section 4.6.

### 4.0 TEST METHODS

**4.1 Exposure to Soil Environment:** Testing shall be conducted for in-ground use in accordance with Section 4.3.1 of AC100.

**4.2 Low-temperature Brittleness:** Testing shall be conducted in accordance with Section 4.3.2 of AC100.

**4.3 Density:** Testing shall be conducted in accordance with Section 4.3.3 of AC100.

**4.4 Stiffness:** Test samples representative of the molded plastic footing pads to be listed in the evaluation report shall be tested for flexural modulus of elasticity in accordance with ASTM D 790 to evaluate the molded plastic footing pad as a rigid footing which transmits loads uniformly to the supporting soil. Five identical specimens of footing pad shall be tested.

**Conditions of Acceptance:** The average of the five identical test specimens must exhibit a flexural modulus of elasticity of 250,000 psi (1725 MPa) or greater.

#### 4.5 Allowable Vertical Load Test:

**4.5.1 Purpose:** The purpose of this test is to evaluate the strength of the molded plastic footing pad under simulated support conditions. The footing shall be tested on a substrate with the following characteristics: readily definable strength characteristics, relatively uniform stiffness throughout, consistent and/or repeatable stiffness between multiple tests.

**4.5.2 Evaluation and Selection of Soil Substrate:** A substrate material composed of expanded polystyrene (EPS) or extruded polystyrene (XPS) shall be selected for

use as a test substrate. Other materials meeting the basic requirements of Section 4.5.2.1 may also be used for laboratory testing. If actual soil is to be used as the test substrate in laboratory testing, special consideration must be given to the factors influencing soil stiffness and repeatability, such as soil confinement and compaction methods between subsequent tests.

#### 4.5.2.1. Substrate Stiffness Classification:

Molded plastic footings pads shall be tested on a Class of Materials 5 substrate (Table 1) having a maximum modified modulus of soil reaction,  $k$ , not to exceed the values in Table 1. Subsequent testing on stiffer substrates may be performed where increased load capacity on stiffer soils is desired.

**4.5.2.2. Substrate Evaluation:** The modified modulus of soil reaction of the substrate shall be assessed using the procedure described below. The report shall indicate the test soil classification and the actual modulus of soil reaction,  $k$ , in psi/in. (kPa/mm).

All substrate material and test specimens shall be conditioned at standard laboratory conditions of 73.4 + 3.6°F (23.0 + 15.8°C) and 50 + 5 percent relative humidity for not less than 48 hours prior to testing. Standard laboratory conditions shall be maintained throughout testing.

The configuration (width, depth, thickness, and material lot/batch) of the substrate material during the stiffness evaluation shall be the same size substrate that is to be used during the test of the footing as required in Section 4.5.3.

The modulus of soil reaction,  $k$ , shall be measured by centering a 1-inch-thick (25.4 mm), 12-inch-diameter (304.8 mm) steel plate on the representative substrate. A load of 1131 lbf (10 psi) [5090 N (69 kPa)] shall be applied to the center of the plate at a uniform rate. The full load shall be applied over an interval not to exceed 1 minute. The full load shall be maintained for 10 minutes.

A deflection gauge having a resolution of 0.001 inch (0.03 mm) shall be positioned to measure the deflection at the point of load application. Load and deflection readings shall be logged continuously to produce a load-deflection plot for the substrate.

The modulus of soil reaction,  $k$ , shall be calculated as 10 divided by the total deformation of the plate under the 1131 lbf load (10 psi) [5090 N (69 kPa)]. The total deformation measurement shall be the total deformation measured at 10 minutes of sustained load, including the deflection occurring during the initial loading. A "toe-correction" may be applied to the total deflection value to account for the load required to bring the loading plate into full bearing with the substrate.

The substrate is acceptable for use if the modified modulus of soil reaction,  $k$ , does not exceed the value in Table 1, for the class of soil being evaluated.

**4.5.3 Procedure:** The molded plastic footing pad shall be supported on the test substrate while subjected to a concentrated load using the following procedure:

The footing shall be centered on the test substrate material from the same batch qualified for use in accordance with Section 4.5.2.2. The substrate shall not

## PROPOSED REVISIONS TO THE ACCEPTANCE CRITERIA FOR MOLDED PLASTIC FOOTING PADS

be less than 4 inches (102 mm) thick and shall be of sufficient size to extend beyond the footing by not less than 1.5 inches (38.1 mm) on all sides.

The molded plastic footing pad shall be oriented as required by the manufacturer's installation instructions (i.e., stiffening ribs facing up).

The test load shall be applied to the footing over an area simulating the minimum contact area anticipated in service.

The test load shall be applied with an eccentricity that is to be the maximum permitted in-service eccentricity. The eccentricity shall be taken as the distance from the geometric center of the footing to the center of the applied load. A minimum eccentricity of 0.5 inch (12.7 mm) shall be used.

The rate of loading shall be such that presumptive load-bearing value for the soil class being qualified is reached in approximately 10 minutes [e.g., for Class 5 soil, the loading rate (in lbf/minute) equals the pad area times 1500 psf (72 000 Pa) per 10 minutes]. The load shall be applied at this rate until ultimate is reached.

Deflection gauges having a resolution of 0.001 inch (0.03 mm) shall be positioned to measure the deflection at the point of load application and at two locations along the edge of the footing. The gauges at the edge of the footing shall be positioned along the same line, that which intersects the center of the applied load, on opposite sides of the applied load, with one gauge along the closest edge to the applied load and the other gauge along the edge farthest from the applied load. Load and deflection readings shall be logged continuously to produce a load-deflection plot for each test.

**4.5.4 Allowable Vertical Load:** The allowable vertical load for the molded plastic footing pad shall be taken as the lesser of the following:

1. Maximum load divided by 3.0.
2. Maximum presumptive load for the soil class being assessed (i.e., presumptive load-bearing value times the area of the plastic footing).
3. Load at which a 0.75-inch (19.05 mm) deflection occurs at the point of load application (total deflection). A "toe correction" may be applied to the deflection measurements to account for the load required to bring the plastic footing pad into full bearing with the substrate.

Three tests of each size of footing are required, with none of the results varying more than 15 percent from the average of the three, unless the lowest test value is used. The average result from a minimum of five tests may be used regardless of the variations. The results from two tests may be used when the higher value does not exceed the lower value by more than 5 percent and the lower value is used.

### 4.6 Creep Test:

**4.6.1 Purpose:** The purpose of this test is to evaluate the strength of the molded plastic footing pad under sustained loads.

**4.6.2 Procedure:** The footing shall be subjected to a sustained concentrated load for 2000 hours in accordance with ASTM D 2990 except as modified below:

All test specimens shall be conditioned at standard laboratory conditions of 73.4 + 3.6° F (23 + 15.8° C) and 50 + 5% relative humidity for not less than 48 hours prior to testing. Standard laboratory conditions shall be maintained throughout testing.

Specimens shall be continuously supported around the perimeter of the footing on a rigid support. The support shall have a radius of 0.125 inch (3.18 mm) and shall have a test span equal to the nominal footing dimension minus 1 inch (25.4 mm) in each direction being supported. The circular footings shall be supported on a rigid circular support having a diameter equal to the nominal footing diameter minus 1 inch (25.4 mm). The specimen shall be centered on the support so that the specimen overhangs the support by  $\frac{1}{2}$  inch (12.7 mm) on all sides.

The footing shall be oriented as required by the manufacturer's installation instructions (i.e., stiffening ribs facing up).

The test load shall be applied to the footing over an area simulating the minimum contact area anticipated in service.

The test load shall be applied with an eccentricity that is to be the maximum permitted in-service eccentricity. The eccentricity shall be taken as the distance from the geometric center of the footing to the center of the applied load. A minimum eccentricity of 0.5 inch (12.7 mm) shall be used.

The average net deflection of the footing under the allowable load must be calculated. The net deflection of the footing shall be calculated as the deflection at the point of load application minus the average of the two deflections recorded at the edge of the footer. This deflection shall be determined at the allowable load using the load deflection curves generated in accordance with Section 4.5. The allowable load shall be calculated as specified in Section 4.5.4.

The creep test load shall be equal to the applied load required to produce an immediate (short-term) deflection at point of load application that is equal to the net deflection determined in Section 4.6.2. The creep test load shall be determined using the support conditions for the creep test, as required in Section 4.6.2. The purpose of this procedure is to produce the same state of flexural strain when testing according to Section 4.5 (flexible support) except under the support conditions required in Section 4.6.2 (rigid support).

A deflection gauge having a resolution of 0.001 inch (0.03 mm) shall be positioned to measure the deflection at the point of load application. Deflection measurements shall be taken at the intervals specified in ASTM D 2990, except the interval between readings shall not exceed 1 week (168 hours), or 24 hours where there is evidence of tertiary creep (increasing creep rate).

The deflection data shall be presented in two plots: one plotting the creep deformation (inches) versus time (hours), and the other plotting the creep rate (in./hour) versus time (hours). The report shall indicate clearly whether tertiary creep is evidenced in the data.

**4.6.3 Conditions of Acceptance:** The molded plastic footing pad shall not exhibit tertiary creep

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(increasing creep rate) under 2000 hours of sustained load. Upon failure, the footing may be retested under a reduced creep load; however, the immediate deflection produced by the reduced creep load shall be used to calculate the corresponding allowable load from the load deflection plots produced in accordance with Section 4.5. The overall allowable load rating for the footing shall not exceed this reduced load.

**5.0 QUALITY CONTROL**

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

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

**5.3 Quality Control Tests:** ~~Quality control testing of the molded plastic footing pads shall be conducted in accordance with Section 4.3.12 of AC100.~~ Quality control tests shall be conducted during the production of the pads in conformance with procedures set forth in the in-house quality control manual. The quality control tests and conditions of acceptance shall be as follows:

**5.3.1** One flexural test in accordance with ASTM D 790 shall be performed for every 1,000 pads produced, and one concentrated load test in accordance with Section 4.6 of this report shall be performed for every 3,000 pads produced.

**5.3.2** The test samples shall be randomly taken from the injection-molded products.

**5.3.3** Percentages and types of material used shall be recorded for each day of production. If different types of materials, or materials with different percentages or sources, are introduced into any production run, tests noted above shall be performed and documented in accordance with procedures set forth in the in-house quality control manual.

**5.3.4** Conditions of Acceptance: The determined flexural modulus and flexural strength shall not be less than 95 percent of the lowest control sample values reported in the initial qualification test report. The allowable deflection under load shall not be more than 95 percent of the value reported in the qualification test report.

**6.0 EVALUATION REPORT RECOGNITION**

**6.1 Installation:** The following is information that shall be included in the ICC-ES evaluation report on the molded plastic footing pads:

**6.1.1** Table of allowable load capacities of each footing size based on soil bearing capacity.

**6.1.2** Figure showing plan and cross-sectional view of footing pad with dimensions noted and rib configuration shown.

**6.1.3** Detailed description of installation of molded plastic footing pads.

**6.2 Conditions of Use:** The following Conditions of Use for molded plastic footing pads shall be included in the evaluation report:

**6.2.1** The [name of product defined as molded plastic footing pads] must be installed in accordance with this report and the applicable code.

**6.2.2** The [name of product defined as molded plastic footing pads] are used to support wood posts used to support exterior residential decks or wood post columns for ~~post-and-beam frame~~ post-frame building systems for construction of Group U (Agricultural Buildings), Type V, construction under the IBC or any construction under the IRC.

**6.2.3** The [name of product defined as molded plastic footing pads] must be installed below the frost line of the locality.

**6.2.4** The [name of product defined as molded plastic footing pads] are used as individual isolated footings to resist bearing loads only and are not used to resist lateral or uplift loads.

**6.2.5** The [name of the product defined as molded plastic footing pads] have not been evaluated for seismic or wind loads.

**6.2.6** Mechanical fasteners must not be used with the molded plastic footing pads.

**6.2.7** Patio covers or other types of roof construction must not be connected to residential decks supported by molded plastic footing pads

**6.2.8** Design calculations must be submitted to the code official documenting uplift and lateral load resistance. ■

**TABLE 1—SOIL CLASSIFICATION**

CLASS OF MATERIALS	PRESUMPTIVE LOAD-BEARING VALUE (psf)	MINIMUM MODIFIED MODULUS OF SOIL REACTION, <i>k</i> (psi/in)
1. Crystalline bedrock	12,000	—
2. Sedimentary and foliated rock	4,000	—
3. Sandy gravel and/or gravel (GW and GP)	3,000	800
4. Sand, silty sand, clayey sand, silty gravel and clayey gravel (SW, SP, SM, SC, GM and GC)	2,000	400
5. Clay, sandy clay, silty clay, clayey silt, silt and sandy silt (CL, ML, MH and CH)	1,500	100

For **SI**: 1 psf = 48 Pa, 1 psi = 6.9 kPa, 1 inch = 25.4 mm.