August 1, 2018

TO: PARTIES INTERESTED IN PATIO COVERS

SUBJECT: Proposed Revisions to the Acceptance Criteria for Patio Covers, Subject AC340-0818-R1 (VY/YM)

Dear Colleague:

We are seeking your comments on proposed revisions to the subject acceptance criteria, as presented in the enclosed draft which is being posted on the ICC-ES website for 30 days of public comment. The intent of the revisions is to update the criteria to add the 2018 International Building Code® (IBC) and the 2018 International Residential Code® (IRC). The most notable changes due to the 2018 IBC and IRC update may be summarized as follows:

1. Update the criteria to include ASCE 7-16 for evaluation under the 2018 IBC.

2. Reference “partially open” buildings in Section 3.1.5 as an enclosure classification under the 2018 IBC and IRC as referenced in ASCE 7-16 Sections 26.2 and 26.12.1.

3. Revise Section 3.1.5.2 to reference ASCE 7-16 Section 30.11 for “Attached Canopies (Patio Covers)” as defined in ASCE 7-16 Section 26.2 under the 2018 IBC and IRC.

4. Revise Section 3.1.5.3.1 to include ground elevation factor, $K_e$, as referenced in ASCE 7-16 under the 2018 IBC and IRC.

5. Revise Section 3.1.5.3.2 to reference new Figures from ASCE 7-16 to address new $G_{Cp}$ factors under the 2018 IBC and IRC.

The wind analysis provisions under ASCE 7-16 (as referenced by the 2018 IBC and IRC) are significantly different from earlier editions of ASCE 7 and will require additional structural calculations for current report holders who seek to evaluate their reports under the 2018 IBC and IRC. There is no compliance date for this revision.

While the Evaluation Committee will be voting on the revised criteria during the 30-day comment period, we will seriously consider all comments from the public and will pull the criteria back for reconsideration if public comments raise major issues. In
that case, we would seek a new committee vote; further revise the draft and post it for a new round of public comments; or put the revised criteria on the agenda for a future Evaluation Committee hearing.

If they are of interest, please review the proposed revisions and send us your comments at the earliest opportunity. At the end of the 30-day comment period, we will post on our web site the correspondence we have received and, in memo form, the responses of our technical staff.

To submit your comments, please use the form on the web site and attach any letters or other materials. If you would like an explanation of the "alternate criteria process," under which we are soliciting comments, this too is available on the ICC-ES web site.

Please do not try to communicate directly with any Evaluation Committee member about a criteria under consideration, as committee members cannot accept such communications.

Thank you for your interest and your contributions. If you have any questions, please contact me at (800) 423-6587, extension 3284, or Yamil Moya, P.E. Senior Staff Engineer, at extension 3691. You may also reach us by e-mail at es@icc-es.org.

Yours very truly,

Vince Yang, P.E.
Staff Engineer

VY:YM/raf

Encl.

cc: Evaluation Committee
PROPOSED REVISIONS TO THE ACCEPTANCE CRITERIA
FOR PATIO COVERS

AC340

Proposed August 2018

Previously approved June 2012, October 2010, February 2007,
October 2006, February 2006

(Previously editorially revised May 2016, August 2013)

PREFACE

Evaluation reports issued by ICC Evaluation Service, LLC (ICC-ES), are based upon performance features of
the International family of codes. (Some reports may also reference older code families such as the BOCA
National Codes, the Standard Codes, and the Uniform 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.

ICC-ES may consider alternate criteria for report approval, provided the report applicant submits 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. ICC-ES retains the right to refuse
to issue or renew any evaluation report, if the applicable product, material, or method of construction is such that
either unusual care with its installation or use must be exercised for satisfactory performance, or if
malfuctioning is apt to cause injury or unreasonable damage.

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

Copyright © 2018 ICC Evaluation Service, LLC. All rights reserved.
1.0 INTRODUCTION


The reason for the development of this criteria is to provide a guideline for the evaluation of patio covers, particularly with regard to consistency in the utilization of the wind and snow load provisions cited in ASCE 7 (as referenced by Section 1609 of the IBC). Also, since the IRC does not include provisions for determining design wind loads on structures located in regions with basic wind speeds less than 110 mile per hour (49 m/s), uniformity in the design analysis based on the IRC is necessary.

1.2 Scope: This acceptance criteria applies to patio covers as described in IBC Appendix I or IRC Appendix H. The patio cover shall be either:

1.2.1 Attached to a dwelling unit and shall remain open or have enclosure walls as permitted by IBC Appendix I or IRC Appendix H; or

1.2.2 Freestanding and shall remain open without enclosure walls.

This acceptance criteria specifies the structural design characteristics of patio covers and enclosure walls for use under both the IBC or IRC, based on the wind load provisions cited in Chapter 16 of the IBC. Other characteristics shall comply with the applicable provisions of the IBC or an ICC-ES acceptance criteria.

This acceptance criteria is not applicable to patio covers with poured and debridged structural members.

1.3 Codes and Referenced Standards:


1.3.3 ASTM E455-04, Standard Practice for Static Load Test for Shear Resistance of Framed Floor or Roof Diaphragm Constructions for Buildings, ASTM International.

1.3.4 SEI/ASCE 7 (-16 for the 2018 IBC and IRC, -10 with Supplement No. 1 for the 2015 IBC and IRC, -10 for the 2012 IBC and IRC, -05 including Supplements No. 1 and 2 for the 2009 IBC and IRC, -05 including Supplement No. 1 for the 2006 IBC and IRC), Minimum Design Loads for Buildings and Other Structures, American Society of Civil Engineers.

1.4 Definitions:

1.4.1 Attached Patio Cover: A patio cover attached to a dwelling unit. The cover’s ability to withstand (1) vertical live loads, snow loads, earthquake loads and wind loads, and (2) horizontal wind or earthquake loads, is provided by connection of the cover to the existing dwelling and to beams and columns located along one or more of the other sides.

1.4.2 Components and Cladding: Elements of the structure’s envelope that do not qualify as part of the main wind-force-resisting system. Examples of components and cladding for vertical wind pressures include roof panels, purlins and connections attaching the roof elements to supports. Examples of components and cladding for horizontal wind pressures include enclosure wall panels, mullions, doors, windows and their connections.

1.4.3 Freestanding Patio Cover: A patio cover not attached to a dwelling unit. The cover’s ability to withstand vertical live loads, snow loads and wind loads, and horizontal wind or earthquake loads, is provided by the members such as beams, columns, and foundations and connections between members, including anchorage to foundations.

1.4.4 Hurricane-prone Regions: Areas vulnerable to hurricanes are defined as: (1) the U.S. Atlantic Ocean and Gulf of Mexico coasts where the ultimate design wind speed, $V_{uw}$, for Risk Category II buildings is greater than 115 mph (51.4 m/s) for the 2018, 2015 and 2012 IBC and IRC [basic wind speed is greater than 90 mph (40 m/s) for the 2009 and 2006 IBC and IRC] and (2) Hawaii, Puerto Rico, Guam, the Virgin Islands and American Samoa.

1.4.5 Main Wind-force-resisting System (MWFRS): An assemblage of structural elements assigned to provide support and stability for the overall patio cover. Examples of elements of the MWFRS for vertical wind pressures include columns, headers, structural fias, ledgers and concrete footings. Examples of the MWFRS for horizontal wind pressures include the roof as a horizontal diaphragm, shear walls, wall bracing and anchorage to foundation.

1.4.6 Patio Cover with Enclosure Walls: A patio cover with enclosure walls as permitted by IBC Appendix I or IRC Appendix H.

1.4.7 Patio Cover: As defined in IBC Appendix Sections 1101 and 1102 and IRC Appendix Sections AH101 and AH102 for the 2018, 2015 and 2012 IRC (AH102 and AH103 for the 2009 and 2006 IRC).

2.0 BASIC INFORMATION

2.1 General: The following information shall be submitted:

2.1.1 Product Description: Complete information on all components of the patio cover, including, material description, specifications, protective coatings, fasteners, and the manufacturing process.

2.1.2 Installation Instructions: A copy of the installation instructions as packaged with the patio covers.

2.1.3 Plans: Plans, prepared and sealed by a registered design professional, shall be submitted and shall include: dimensioned, scaled drawings; detailed load/span or spacing tables for the structural components (e.g., structural headers, roof panels and columns); footing sizes; installation details, noting installation limitations and the types, sizes, locations of fasteners; and notice of any product installation limitations. The plans shall also include recommended installation details for the patio cover system at typical areas of termination, such as walls, intersections with other materials, expansion and control...
joints, column to foundation, and beam to column. For attached patio covers, the plans shall indicate the assumed maximum length, width and height of the existing building used in the analysis when considering horizontal wind loads. The plans shall be of camera-ready quality, provided in a pdf or equivalent format, for inclusion in the evaluation report, and shall be consistent with the recommended installation instructions.

2.1.4 Packaging and Identification: Method of packaging (bundles, cartons, etc.) and identifying components shall be noted. Identification shall include the ICC-ES evaluation report number and notice of any product installation limitations.

2.1.5 Field Preparation: A description of the methods of field-cutting, trimming or forming, and treatment of cut edges, shall be included in the installation instructions.

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. Each test report shall be in sufficient detail to identify specimen properties that might affect performance. In addition, the test reports shall include the following:

2.3.1 Preparation of test specimens and complete information on items such as component shapes (beam, column, lattice, etc.) to be considered, connection methods and connector spacing.

2.3.2 Description of test procedures.

2.3.3 Test observations, including description of test specimens after completion of tests.

2.3.4 Statement of passing or failing, where applicable.

2.3.5 A photographic record of tests, where applicable.

2.4 Product Sampling: Sampling of the patio cover components, except prefabricated assemblies such as welded metal or sandwich panels, for tests under this criteria shall comply with Section 3.2 of AC85. Sampling of prefabricated assemblies for tests conducted in accordance with this or other criteria shall comply with Section 3.1 of AC85.

2.5 A qualification test plan shall be submitted to and approved by ICC-ES staff prior to any testing being conducted.

3.0 TEST AND PERFORMANCE REQUIREMENTS

3.1 Patio Cover Structural Design:

3.1.1 General: Patio covers shall be designed to resist vertical dead, live, rain, wind, earthquake and snow loads, and horizontal wind and earthquake loads described in IBC Chapter 16, IBC Appendix I, or IRC Appendix H. Specific details are in Section 3.1.3 for vertical load analysis (dead, live, rain and snow), Section 3.1.4 for earthquake analysis, Section 3.1.5 for wind load analysis, Section 3.2 for lateral load (wind and seismic) analysis, and Section 3.1.2 for load combinations.

3.1.2 Load Combinations: The engineering analysis for patio covers and enclosures under both the IBC and IRC shall be based on the design load combinations in IBC Section 1605.

3.1.3 Vertical Load (Dead, Live, Rain and Snow) Analysis:

3.1.3.1 Minimum Roof Live Load: Patio covers shall be designed and constructed to sustain, within the limits of the materials used in the fabrication of the structural elements, all applicable dead loads plus a minimum vertical roof live load of 10 pounds per square foot (0.48 kN/m²) in accordance with IBC Appendix I Section I105.1 for the 2018, 2015 and 2012 IBC (Section I104.1 for the 2009 and 2006 IBC) or IRC Appendix H Section AH105.1 for the 2018, 2015 and 2012 IRC (Section AH104.1 for the 2009 and 2006 IRC). Snow loads shall be used where such snow loads exceed the minimum roof live load.

3.1.3.2 Snow Loads for Patio Covers: For evaluation reports to include patio covers subject to snow loads, the patio covers shall be designed for roof snow loads. Design shall comply with Chapter 7 of ASCE 7. The thermal factor shall be a minimum of 1.2. Effects of partial loading and unbalanced roof snow loads shall be considered, as applicable. Effects of drifts (including lower roof of a structure and adjacent structures) and sliding snow are optional, provided such exclusions are noted on the plans.

3.1.3.3 Ponding Instability: Ponding instability shall be investigated for roofs in accordance with Section 7.11 of ASCE 7 (snow) and Section 8.4 of ASCE 7 (rain). The analysis shall lead to determination of the minimum roof slope to preclude ponding instability.

3.1.4 Earthquake Load Analysis: Patio covers, their supports, and attachments shall be designed and constructed to resist the effects of earthquake motions. Design procedures shall comply with Section 1613 of the IBC or Section R301.2.2 of the IRC, as applicable.

3.1.5 Wind Load Analysis: The determination of vertical and horizontal wind loads used in the analysis of the patio covers shall be based on either the patio cover being attached to an existing structure or freestanding in accordance with IBC Section 1609, Chapters 26 to 30 of ASCE 7-16 for the 2018 IBC and IRC, ASCE7-10 for the 2015 and 2012 IBC and IRC (Chapter 6 of ASCE 7-05 for the 2009 and 2006 IBC and IRC), IRC Section R301.2.1 or methods described in this section. In all cases, all design limitations shall be explicitly stated in the report.

The buildings (patio covers) shall be classified as open, partially open, partially enclosed, or enclosed, as applicable, in accordance with Section 26.2 of ASCE 7-16 for the 2018 IBC and IRC, ASCE 7-10 for the 2015 and 2012 IBC and IRC (Section 6.2 of ASCE 7-05 for the 2009 and 2006 IBC and IRC). The classification shall consider placement as freestanding or attached relative to adjacent buildings and the amount of openings in walls with or without enclosures. Where multiple classifications are possible, the critical case shall apply to the design of the structure.

3.1.5.1 Wind Loads for Freestanding Patio Covers without Enclosure Walls: These structures shall be designed in accordance with ASCE 7-16 Sections
PROPOSED REVISIONS TO THE ACCEPTANCE CRITERIA FOR PATIO COVERS (AC340)

3.1.5.2 Vertical Wind Loads for Attached Patio Covers without Enclosure Walls: These structures shall be designed in accordance with ASCE 7-16 Section 30.11 for the 2018 IBC and IRC or as partially enclosed structures per ASCE 7-10 Chapter 28, Part 1 and Chapter 30, Part 1 for the 2015 and 2012 IBC and IRC (ASCE 7-05 Sections 6.5.12.2 and 6.5.12.4 for the 2009 and 2006 IBC and IRC) and as open structures per ASCE 7-10 Sections 27.4.3 and 30.8.2 for the 2015 and 2012 IBC and IRC (ASCE 7-05 Section 6.5.13 for the 2009 and 2006 IBC and IRC), as applicable. The analysis shall include the obstructed wind flow cases in ASCE 7-10 Figures 27.4-4 through 27.4-7 and 30.8-1 through 30.8-3 for the 2015 and 2012 IBC and IRC (ASCE 7-05 Figures 6-18A through 6-18D and 6-19A through 6-19C for the 2009 and 2006 IBC and IRC) that properly represent the dwelling walls. The analysis shall also include the applicable clear flow cases.

3.1.5.3 Vertical Wind Loads for Attached Patio Covers with Enclosure Walls: The structural analysis for determining vertical wind loads on patio covers attached to buildings and installed with enclosure walls shall consider the patio cover to be an extension of the building. The analysis shall consider the vertical wind loading conditions on the patio cover described in Sections 3.1.5.3.1 and 3.1.5.3.2. These vertical wind loading conditions are based on the Envelope Procedure of ASCE 7-16 for the 2018 IBC and IRC, ASCE 7-10 for the 2015 and 2012 IBC and IRC (Method 2 of ASCE 7-05 for the 2009 and 2006 IBC and IRC), with the patio cover attached to a low-rise, enclosed or partially-enclosed building.

3.1.5.3.1 Main Wind-force-resisting System (MWFRS): The vertical design wind loads on the MWFRS for attached patio covers shall be determined in accordance with ASCE 7-16 Section 28.3.1 for the 2018 IBC and IRC, ASCE 7-10 Section 28.3.1 for the 2015 and 2012 IBC and IRC (ASCE 7-05 Section 6.5.12.2.2) for cases where wall enclosure configuration results in a partially enclosed or enclosed building (patio cover).

For downward pressure, loads shall be determined in accordance with ASCE 7-16 Section 28.3.1 for the 2018 IBC and IRC, ASCE 7-10 Section 28.4.1 for the 2015 and 2012 IBC and IRC (ASCE 7-05 Section 6.5.12.2.2 for the 2009 and 2006 IBC and IRC).

The velocity pressure, \( q_h \), evaluated in accordance with the provisions cited in ASCE 7-16 Section 26.10.2 for the 2018 IBC and IRC, ASCE 7-10 Section 28.3.2 for the 2015 and 2012 IBC and IRC (ASCE 7-05 Section 6.5.10 for the 2009 and 2006 IBC and IRC) for a mean roof height of the structure to which the cover is attached shall be determined in accordance with Eq.-2:

\[
q_h = 0.00256 K_h K_w K_{ps} V^2 \text{ (lb/ft}^2\text{)} \quad \text{(Eq.-2)}
\]

where:

\( K_h \) = Velocity pressure exposure coefficient evaluated at a mean roof height of the structure to which the cover is attached and defined in ASCE 7-16 Section 26.10.1 for the 2018 IBC and IRC, ASCE 7-10 Section 28.3.1 for the 2015 and 2012 IBC and IRC (ASCE 7-05 Section 6.5.6.6 for the 2009 and 2006 IBC and IRC) for MWFRS utilizing Table 26.10-1 of the ASCE 7-16 and Table 28.3-1 of the ASCE 7-10 (Case 1 of Table 6-3 of the ASCE 7-05).

\( K_{ps} \) = Topographic factor defined in ASCE 7-16 Section 26.8.2 for the 2018 IBC and IRC, ASCE 7-10 Section 26.8.2 for the 2015 and 2012 IBC and IRC (ASCE 7-05 Section 6.5.7.1). When the patio cover analysis and design assumes \( K_{ps} = 1 \), the evaluation report shall indicate that the patio covers are not permitted in the geographical areas cited in ASCE 7-16 and ASCE 7-10 Section 26.8.1 (ASCE 7-05 Section 6.5.7.1).

\( q_v \) = Velocity pressure determined in accordance with ASCE 7-16 Section 26.10.2 for the 2018 IBC and IRC, ASCE 7-10 Section 28.3.2 for the 2015 and 2012 IBC and IRC (ASCE 7-05 Section 6.5.10 for the 2009 and 2006 IBC and IRC) and evaluated at the mean roof height of the structure to which the patio cover is attached using the exposure category defined in ASCE 7-16 Section 26.7.3 for the 2018 IBC and IRC, ASCE 7-10 Section 26.7.3 for the 2015 and 2012 IBC and IRC (ASCE 7-05 Section 6.5.6.3 for the 2009 and 2006 IBC and IRC).
It is permitted to take $K_c = 1$ for all elevations as indicated in ASCE 7-16 Section 26.9.

$$ V = \text{Basic wind speed, mps or m/s, corresponding to a 3-second gust at 33 feet (10 m) above ground in Exposure Category C, defined in ASCE 7-16 Section 26.5 for the 2018 IBC and IRC, ASCE 7-10 Section 26.5 for the 2015 and 2012 IBC and IRC (ASCE 7-05 Section 6.5.4 for the 2009 and 2006 IBC and IRC). Under the 2018 IBC and IRC, basic wind speed prescribed in IBC Figure 1609.3(1)(ASCE 7-16 Figure 26.5-1B) shall be used unless a larger wind speed required by ASCE 7-16 Section 26.5.2 or 26.5.3 is used. Under the 2015 and 2012 IBC and IRC, basic wind speed prescribed in IBC Figure 1609.3(1A (ASCE 7-10 Figure 26.5-1A) shall be used unless a larger wind speed required by ASCE 7-10 Section 26.5.2 or 26.5.3 is used.}

$$ l = 1.0, \text{importance factor for structures classified as Category II in accordance with Table 6-1, ASCE 7-05 for the 2009 and 2006 IBC and IRC. Under the 2018, 2015 and 2012 IBC and IRC, a default importance factor of 1.0 is applicable to any structure as explained in the ASCE 7-16 (2018 IBC) and ASCE 7-10 (2015 and 2012 IBC) Commentary Section C26.5.1.}

### 3.1.5.3.2 Components and Cladding:

The design vertical wind loads on the components and cladding for attached patio covers shall be determined in accordance with ASCE 7-16 Chapter 30, Part 1 for the 2018 IBC and IRC, ASCE 7-10 Chapter 30, Part 1 for the 2015 and 2012 IBC and IRC (ASCE 7-05 Section 6.5.12.4.1 for the 2009 and 2006 IBC and IRC):

The selection of the $G_{cp}$ factor from ASCE 7-16 Figures 30.3.2-A through 30.3.2-1 and ASCE 7-10 Figures 30.4-2A through 30.4-2C (ASCE 7-05 Figures 6-11B through 6-11D) shall be based on the anticipated worst-case location for patio covers installed along the longitudinal or transverse walls of the existing building. Patio covers not designed for the higher wind loads occurring at the corners of the existing building as cited in ASCE 7-16 Figures 30.3.2-A through 30.3.2-1 and ASCE 7-10 Figure 30.4-2B (ASCE 7-05 Figure 6-11C) will be limited in the evaluation report to installations along the transverse or longitudinal wall lengths of the existing building away from its corners a distance equal to 10 percent of the building's least horizontal dimension or 0.4 times the mean roof height of the existing building, whichever is smaller, but not less than either 4% of the building's least horizontal dimension or 3 feet (0.9 m).

### 3.1.5.4 Horizontal Wind Loads for Attached Patio Covers with or without Enclosure Walls:

The structural analysis for determining horizontal wind loads on patio covers attached to buildings with or without enclosure walls shall consider the patio cover an integral element of the existing building, requiring the patio cover's vertical exposed surface area to be subjected to the same wind-loading conditions applied to the wall structural components of the existing building. The analysis shall assume a maximum length, width and height of the existing building to which the patio cover is to be attached with the assumed dimensions specified as limitations of use in the evaluation report. The analysis shall consider two wind loading conditions: (1) the cover's main wind-force-resisting system (MWFRS) and (2) the cover's structural components and cladding. (The analysis shall also consider the combined effects of vertical wind and horizontal wind loading on the patio cover's ability to support the design wind loads.)

#### 3.1.5.4.1 Patio covers with enclosure walls shall be evaluated as both a partially open, partially enclosed, or and enclosed building, as applicable, as defined in ASCE 7-16 and ASCE 7-10 Section 26.2 (ASCE 7-05 Section 6.2), except openings enclosed with insect screening may be considered partially enclosed provided the conditions in ASCE 7-16 and ASCE 7-10 Section 26.2 (ASCE 7-05 Section 6.2) for partially enclosed buildings is satisfied.

#### 3.1.5.4.2 Patio covers with enclosure walls in a wind-borne debris region with glazing shall be protected with impact-resistant covers or glazing as specified in 2018 IBC Section 1609.2 (2015, 2012, 2009 and 2006 IBC Section 1609.1.2).

#### 3.1.5.4.3 Main Wind-force-resisting System for Attached Patio Covers with Enclosure Walls: The design horizontal wind loads on the MWFRS for attached patio covers with enclosure walls shall be determined in accordance with ASCE 7-16 Chapter 28, Part 1 for the 2018 IBC and IRC and ASCE 7-10 Chapter 28, Part 1 for the 2015 and 2012 IBC and IRC (ASCE 7-05 Section 6.5.12.2.2 for the 2009 and 2006 IBC and IRC).

The analysis shall establish the maximum length, width and height of the existing building to which the patio cover is to be attached, with the established dimensions specified as limitations of use in the evaluation report. The patio cover shall be designed for wind loads corresponding to building surfaces located along the distance “2a” described in ASCE 7-16 Figure 28.3-1 and ASCE 7-10 Figure 28.4-1 (ASCE 7-05 Figure 6-10). Also, since the roof slope of the existing building is unknown, the external pressure coefficient, $G_{cp}$ on the windward vertical projected area shall be equal to 0.80 (Surface 1E as described in ASCE 7-16 Figure 28.3-1 and ASCE 7-10 Figure 28.4-1 [ASCE 7-05 Figure 6-10]). The external pressure coefficient, $G_{cp}$, on the leeward vertical projected area of the cover shall be equal to -0.64 (Surface 4E as cited in ASCE 7-16 Figure 28.3-1 and ASCE 7-10 Figure 28.4-1 [ASCE 7-05 Figure 6-10]).

#### 3.1.5.4.4 Components and Cladding for Attached Patio Covers with Enclosure Walls: The design horizontal wind load on the components and cladding for attached patio covers with enclosure walls shall be determined in accordance with ASCE 7-16 Chapter 30, Part 1 for the 2018 IBC and IRC and ASCE 7-10 Chapter 30, Part 1 for the 2015 and 2012 IBC and IRC (ASCE 7-05 Section 6.5.12.4.1 for the 2009 and 2006 IBC and IRC) and using the following criteria.

The analysis shall establish a maximum length, width and height of the existing building to which the patio cover is to be attached, with the established dimensions specified as limitations of use in the evaluation report. The patio cover’s wall components shall be designed for wind loads corresponding to building surfaces located along the distance “a” described in Figure 30.3-1 of ASCE 7-16 and
PROPOSED REVISIONS TO THE ACCEPTANCE CRITERIA FOR PATIO COVERS (AC340)

Figure 30.4-1 of ASCE 7-10 (Figure 6-11A of ASCE 7-05). The external pressure coefficient, GCp, on the windward vertical projected area may vary from a maximum equal to 1.0 to a minimum equal to 0.7 (Surface 5 as described in ASCE 7-16 Figure 30.3-1 and ASCE 7-10 Figure 30.4-1 [ASCE 7-05 Figure 6-11A]). The external pressure coefficient, GCp, on the leeward vertical projected area of the cover may vary from a maximum equal to -1.4 to a minimum equal to -0.8 (Surface 5 as cited in ASCE 7-16 Figure 30.3-1 and ASCE 7-10 Figure 30.4-1 [ASCE 7-05 Figure 6-11A]). The internal pressure coefficient GCp shall be as given in ASCE 7-16 Table 26.13-1 and ASCE 7-10 Table 26.11-1 (ASCE 7-05 Figure 6-5) for partially enclosed buildings.

3.1.5.4.5 Horizontal Wind Loads for Attached Patio Covers without Enclosure Walls: Patio covers without enclosure walls (except for the wall to which the structure is attached) shall be considered open structures. These structures shall be designed to resist the horizontal loads specified in ASCE 7-16 Chapter 27, Part 1 Section 27.3.2 and Chapter 30, Part 5 Section 30.7.2 for the 2018 IBC and IRC and ASCE 7-10 Chapter 27, Part 1, Section 27.4.3 and Chapter 30, Part 5, Section 30.8.2 for the 2015 and 2012 IBC and IRC (ASCE 7-05 Section 6.5.13 for the 2009 and 2006 IBC and IRC), if applicable.

3.1.5.5 Minimum Wind Loads: Attached and freestanding patio covers shall be designed to resist the minimum design wind loads cited in IBC Section 1609 or IRC Section R301.2.1 (ASCE 7-16 Sections 27.1.5, 28.3.4, 29.7, and 30.2.2 for the 2018 IBC and IRC and ASCE 7-10, Section 27.1.5 [note: this section is relocated from Section 27. 4.7, described in the January 11, 2011 errata by ASCE), Sections 27.4.7, 28.4.4, 29.8, and 30.2.2 for the 2015 and 2012 IBC and IRC; ASCE 7-05 Section 6.1.4 for the 2009 and 2006 IBC and IRC).

3.2 Lateral Load Analysis: If the patio cover's horizontal roof framing members and/or roof panels are utilized to distribute earthquake and wind lateral loads to other members of the lateral force-resisting system, or to the existing building to which the patio cover is attached, creating a complete load path for distribution of the lateral forces, engineering analysis shall demonstrate adequate resistance to loads determined in accordance with IBC Sections 1609 and 1613 or IRC Sections R301.2.1 and R301.2.2; or lateral load tests on the patio cover's horizontal lateral load-resisting system shall be conducted in accordance with ASTM E455.

If the lateral load testing option is used, at least three test specimens in accordance with Section 8 of ASTM E455, dependent on the most critical roof panel span(s), roof framing members’ spacing, fastener type and spacing and roof panel type and thickness, shall be evaluated. A structural analysis, sealed by a registered design professional, is required. The analysis shall determine allowable lateral wind and seismic loads that may be imposed on the patio cover for the load combinations set forth in IBC Section 1605.3. A minimum factor of safety of 2.5 shall be maintained between the allowable loads determined from the design properties and average ultimate test values. For LRFD, the design strength shall be less than or equal to average ultimate test values multiplied by the resistance factor, φ, of 0.55.

The design values for engineering analyses without physical testing shall comply with the IBC, referenced standards or rational analysis.

3.3 Patio Cover Components: Components, including determination of structural capacities, shall comply with the requirements in the IBC, IRC, associated reference standards, and ICC-ES acceptance criteria, as applicable.

4.0 QUALITY CONTROL

4.1 Quality control documentation complying with ICC-ES Acceptance Criteria For Quality Documentation (AC10) shall be submitted. The quality control program shall verify dimensions, weight, mechanical properties, chemical formulation, treatment and other relevant physical properties of the patio cover components.

4.2 Roof and wall sandwich panels shall be manufactured under an approved quality control program with inspections by ICC-ES or by a properly accredited inspection agency that has a contractual relationship with ICC-ES.

4.3 A qualifying inspection shall be conducted at each manufacturing facility in accordance with the requirements of the ICC-ES Acceptance Criteria for Inspections and Inspection Agencies (AC304).

5.0 EVALUATION REPORT RECOGNITION

The evaluation report shall include the following:

5.1 Basic information required by Section 2.1, including product description, installation procedures, packaging and identification.

5.2 Statements noting the structures are used as patio covers only, subject to limitations described in Section 1.2.

5.3 Allowable loads, and dimensions for the components, patio covers and the structure to which they are attached, shall be described based on information specified in Section 3.0 and utilized in the analysis of the patio covers. Wind loads shall be reported in terms of basic wind speeds, exposures and heights. For attached patio covers, the evaluation report shall specify the mean roof height of the structure to which the patio cover is attached, as used in the wind analysis, as a limitation of use. Where the wind analysis assumes $k_{nw} = 1$, the evaluation report shall indicate that the patio covers are not permitted in the geographical areas cited in Section 26.8.1 of ASCE 7-16 and ASCE 7-10 (Section 6.5.7.1 of ASCE 7-05). Earthquake loads shall be reported in terms of Seismic Design Categories (SDCs), Response Modification Coefficient, R, Overstrength Factor, $\Omega_0$, and Deflection Amplification Factor, $C_d$, as defined in IBC Section 1613 and ASCE 7 Chapters 12 and 15, as applicable.

5.4 Plans, details and specifications, concerning proper installation of the patio cover, that are applicable to the specific building under consideration, shall be part of the plans submitted to the building official for approval.

5.5 For patio covers with snow loads, a statement shall be placed on the first page of the plans indicating that calculations prepared by a registered design professional shall be submitted to the building official demonstrating that the design snow loads do not exceed the allowable roof snow loads specified on the plans; and
that calculations shall address the snow load provisions of IBC Section 1608, including, but not limited to, rain-on-snow surcharge load, unbalanced snow and snow drift. This statement shall be clear, legible, located in an area of the plans not cluttered with other information, and in text twice the size of other text placed on the first page of the submitted plans.

5.6 Detailed description, in table and diagram format, of loads that are imposed on the existing building structures by the attached patio covers. There shall be a statement that the adequacy of the existing structure supporting the additional loads from the attached patio covers shall be evaluated. This evaluation shall be performed by a registered design professional when required by the statutes of the jurisdiction where the project is located, and shall be subject to approval by the building official.

5.7 All limitations inherent in the calculations shall be explicitly stated in the evaluation report and plans.