

May 8, 2013

TO: Members of the MAG Building Codes Committee

FROM: Michael Williams, Queen Creek, Chair

SUBJECT: MEETING NOTIFICATION AND TRANSMITTAL OF TENTATIVE AGENDA

Wednesday, **May 15, 2013** - 2:00 pm
MAG Office, Second Floor, Ironwood Room
302 North 1st Avenue, Phoenix

A meeting of the MAG Building Codes Committee (BCC) has been scheduled for the time and place noted above. Members of the MAG Building Codes Committee may attend in person, by videoconference or by telephone conference call. Those attending by telephone conference call must make arrangements with Merry Holmgren at MAG at (602) 254-6300 at least one day prior to the meeting.

If you drive to the meeting, please park in the garage under the building and bring your ticket to the meeting; parking will be validated. For those using transit, the Regional Public Transportation Authority will provide transit tickets for your trip. For those using bicycles, please lock your bicycle in the bike rack in the garage.

Pursuant to Title II of the Americans with Disabilities Act (ADA), MAG does not discriminate on the basis of disability in admissions to or participation in its public meetings. Persons with a disability may request a reasonable accommodation, such as a sign language interpreter, by contacting Scott Wilken at the MAG office. Requests should be made as early as possible to allow time to arrange for accommodation.

Please be advised that under procedures approved by the MAG Regional Council on June 26, 1996, all MAG committees must have a quorum to conduct business. A quorum is a simple majority of the membership, or 12 people for the MAG Building Codes Committee. If you are unable to attend the meeting, please send a proxy from your jurisdiction or agency to represent you.

If you have any questions or require additional information, please contact Scott Wilken at (602) 254-6300 or swilken@azmag.gov.

TENTATIVE AGENDA
MAG Building Codes Committee Meeting
May 15, 2013

- | | |
|--|---|
| 1. <u>Call to Order</u> | 2. For information. |
| 2. <u>Introductions</u> | 3. Review and approve the minutes of the February 20, 2013 meeting. |
| 3. <u>February 20, 2013 Meeting Minutes</u> | 4. For information and discussion. |
| 4. <u>Call to the Audience</u>

Members of the public may request to speak on items that fall under the jurisdiction of the MAG Building Codes Committee (BCC) and are not scheduled on the agenda; or, on items on the agenda for discussion but not for action. A total of 15 minutes will be provided for the Call to the Audience, with a limit of three minutes per speaker, unless the Chair requests an exception to this limit. Those requesting to comment on action agenda items may be provided an opportunity to do so at the time the agenda item is heard. | 5. For information and discussion. |
| 5. <u>Comments From the Committee</u>

An opportunity will be provided for Building Codes Committee members to present a brief summary of current events. The Building Codes Committee is not allowed to propose, discuss, deliberate or take action at the meeting on any matter in the summary, unless the specific matter is properly noticed in accordance with the Arizona Open Meeting Law. | 6. For information, discussion and possible recommendation to the MAG Management Committee to approve the 2013 Building Code Amendments and Standards Manual and Building Code Amendments and Standards Historical Archive. |
| 6. <u>MAG Building Code Amendments and Standards Book</u>

Since January 2012, the Building Codes Committee has been reviewing documents related to amendments to building codes and other building-code related standards. The reviewed documents have been compiled into the draft Building Code Amendments and Standards (BCAS) Manual. The complete review draft of the BCAS Manual and the accompanying BCAS Historical Archive have been | |

made available to the committee members for review.

The committee will discuss and review the draft BCAS Manual and Historical Archive and is requested to recommend approval of these draft documents to the MAG Management Committee.

Please see **Attachment One** for updated Review Draft 2 of the BCAS and **Attachment Two** for the updated Review Draft 1 of the BCAS Historical Archive.

7. AZBO Code Amendments to the 2012 International Codes

AZBO has acted on its recommended amendments to the 2012 ICC family of codes. The amendments will be presented to the Committee for discussion and possible recommendation to the MAG Management Committee that if member agencies are, or will be, adopting the 2012 edition of the codes, they consider the AZBO amendments. Please see **Attachment Three** for the draft amendments.

8. Permissible Construction Hours

Review of a new chart listing the time and location restrictions of construction activities for each member agency. Please see **Attachment Four** for the draft Permissible Construction Times Chart.

9. Updated MAG Building Codes Committee Membership

We are requesting that Committee members review **Attachment Five**, Committee Roster, sent with this agenda. Please forward any changes to Scott Wilken prior to the meeting or provide them at the meeting.

10. Update Survey of Code Adoption

Attachment Six identifies the codes that member agencies have adopted. Please review this information and provide any updates or corrections to Scott Wilken.

7. For information, discussion, and possible action.

8. For information and discussion.

9. For information and discussion.

10. For information and discussion.

11. Topics for Future Agendas

Potential topics for the next meeting will be discussed. Please share any items of discussion or presentations that you would be interested in hearing about at future meetings.

The next meeting is scheduled for Wednesday June 19, 2013 at 2:00 p.m. in the MAG Ironwood Room.

12. Adjournment

11. For information and discussion.

12.

MINUTES OF THE
MARICOPA ASSOCIATION OF GOVERNMENTS
BUILDING CODES COMMITTEE

February 20, 2013

Maricopa Association of Governments Office
302 N. 1st Ave
Chaparral Room
Phoenix, AZ

COMMITTEE MEMBERS

Michael Williams, Tempe, Chair

*Randal Westacott, Avondale

Phil Marcotte, Buckeye

*Mike Tibbett, Carefree

Mike Baxley, Cave Creek

*Martin Perez, Chandler

A-Mary Dickson, El Mirage

*Jason Field, Fountain Hills

A-Tim Simanton for Larry Taylor, Gilbert

*Tom Paradise, Glendale

Ed Kulik, Goodyear

*Chuck Ransom, Litchfield Park

Tom Ewers, Maricopa County

John Sheffer for Steven Hether, Mesa

Bob Lee, Paradise Valley

*Dennis Marks, Peoria

*Julie Belyeu, Phoenix

Dustin Schroff for Michael Clack, Scottsdale

Dale Crandell, Tolleson

Kevin Bruce, Wickenburg

*Jim Fox, Youngtown

Jackson Moll, Home Builders Association

*Sharon Bonesteel, Salt River Project

OTHERS IN ATTENDANCE

Scott Wilken, MAG

Shannon Acevedo, MAG

Amanda Stanko, MAG

David Worley, MAG

Brigham Bennett, Surprise

Jon Sutula, Solar City

Nathan Jarrell, Solar City

Ken Kirschmann, Southwest Gas

Forrest Fielder, AZBO

*Those members neither present nor
represented by proxy.

A-Those members participating via
audioconference

1. Call to Order

Michael Williams, Chair, called to order the February 20, 2013 meeting of the MAG Building Codes Committee (BCC) at 2:07 p.m.

2. Introductions

Voting member Tim Simanton attended via telephone conference call. Vice Chair Mary Dickson attended via telephone conference from Maryland. All members and guests introduced themselves.

3. January 16, 2013 Meeting Minutes

Bob Lee made a motion to approve the January 16, 2013 minutes. Ed Kulik seconded the motion, and the motion passed unanimously.

4. Call to the Audience

There were no comments.

5. Comments From the Committee

Bob Lee reminded the committee of the AZBO educational institute in Prescott. Mary Dickson said the institute will be held April 8-12. Ed Kulik said there will be scholarships available for members from the central chapter of AZBO.

6. Solar City

Jon Sutula from Solar City gave a presentation on new solar panel installation techniques. He introduced SleekMount, a rail-less solar rooftop mounting installation system, which is a rebranding of the Zep system. He said it eliminates traditional photovoltaic (PV) rooftop mounting hardware. He said it allows less weight on the roof, and simpler installations. He described the process of installation and showed some examples of some installed equipment. He said that a traditional rail system has a rooftop weight of 4 pounds per square foot, and the SleekMount system is only 3 pounds per square foot. He said that it allows for lower profile arrays, takes less time to install, and that, because all the components are listed for grounding, it allows for safer operation and more longevity. He gave an example of the typical plans, and how the system is notated on plans. He also pointed out that, with this system, it's not possible to stagger penetrations, but it isn't necessary because of the reduced roof load. Nathan Jarrell added that if any inspectors or plan reviewers want a demonstration, they can schedule a time at the Solar City offices.

7. Digital Plan Review

Dustin Schroff gave an overview of the digital plan review system that the City of Scottsdale uses. He said it was rolled out in 2005, and since January 2005 there have been 12,393 submitted e-applications. He said some types of plans are required to be submitted digitally, while other types have that option. He said most plans are submitted as a .DWF file, while smaller plans can be submitted as PDF files. He said there is no limit to the number of sheets

that can be uploaded, but the file size limit is 25 megabytes. He said that more than one file can be uploaded if needed, but everything must be uploaded within 45 minutes from the time the application was started. He said that when a file has been uploaded, an email alert is sent to city staff members, who download the files to the network. He said after the plans are downloaded, the development services representative checks the application for completeness. Once the application has been deemed complete, the applicant is sent a payment link. He said the reviewers use free software called Auto Desk to do the review. He said the reviewers also use 23" to 27" monitors, plus an additional 19" monitor to view the plans. He said applicants can go online during the review to see where the application is in the review process. He said when the review is complete the file is stamped and secured as a DWF file. If the plans are approved, the applicant pays for the permit and then the stamped approved plans are uploaded for the applicant to retrieve. He said permits can be issued online once they are paid for, unless there are multiple permits to be issued for one plan review, in which case the applicant pays and picks up the permits at the one-stop shop.

Tom Ewers asked if the permit fees are a set amount or if they use a valuation. Dustin Schroff said that plan review fees are paid prior to review, and most are calculated per square foot. He said that permit fees are per square foot, as well. Kevin Bruce asked if hard copies of plans are required on the construction site. Dustin Schroff said that a paper plan is required on site, but the city does not print it. Bob Lee asked if the upload interface on the city website is proprietary. Dustin Schroff said the program was written in-house.

Michael Williams asked what percentage of plans are done electronically. Dustin Schroff said that he would estimate that fewer than half of all plans are done electronically. He said that all sign permits and most fire permit plans are done electronically, but very few new commercial buildings are submitted electronically. He said that very large plans with over 100 sheets do not lend themselves to their review system. Michael Williams asked if reviewers print out paper copies. Dustin Schroff said that some do. Michael Williams asked if comments are all redline comments or if a letter goes back with the plans. Dustin Schroff said that it depends on the department- some just redline, some write a letter, as well.

8. MAG Building Code Amendments and Standards Book

Scott Wilken discussed the status of the remaining building code amendments and standards that will be included in the initial Building Code Amendments and Standards (BCAS) manual. He said he will format and compile the documents that have been reviewed and send them to the committee members for review in advance of discussion at a future meeting.

9. AZBO Code Amendments to the 2012 International Codes

Bob Lee said that he does not think the AZBO Board has approved the amendments yet. Ed Kulik confirmed that a vote of the Board on the amendments is still pending. Michael Williams asked if the committee needs to wait for the AZBO Board to vote on it before the committee reviews and vote on the document. Bob Lee said that it isn't necessary for the Board to vote first. Michael Williams said that he will have the document sent to the committee members for their review and discussion at the next meeting.

10. Update MAG Building Codes Committee Membership

There were no updates.

11. Updated Survey of Code Adoption

There were no updates.

12. Topics for Future Agendas

There were no suggestions for future topics.

Scott Wilken said that as of June 30, 2013, the term of the Chair will expire, and the Vice Chair will ascend to the Chair. He asked for members to contact him if they are interested in becoming the new Vice Chair.

13. Adjournment

Dale Crandell made a motion to adjourn. Mike Baxley seconded the motion and the motion passed unanimously. The meeting was adjourned at 2:48 pm.

Maricopa Association of Governments
Building Code Amendments and Standards
Manual
2013 Edition

Review Draft 2

May 6, 2013

Note: This draft is for review by the MAG Building Codes Committee only and is not for distribution or attribution.

Introduction

The MAG Building Code Amendments and Standards (BCAS) is the result of the work of the MAG Building Codes Committee, which made up of municipal and county building officials from the MAG region, as well as others representing organizations interested in local building codes.

The goal of the BCAS is to provide a set of documents that supplement the standard building codes in order to address building issues specific to the MAG region. These documents have been reviewed and vetted by the members of the Building Codes Committee with an interest in using the national building codes to address local conditions.

The goal of the BCAS is not to create a standard set of building codes to be used by all jurisdictions in the MAG region. Adoption and use of the BCAS and the documents within it are completely optional at the discretion of the local jurisdictions. Jurisdictions may adopt the BCAS in whole, or may adopt specific documents within the BCAS as they see fit. Jurisdictions may also adopt and amend documents within the BCAS if desired.

The BCAS is designed to allow jurisdictions to refer to specific document citations as part of their local amendments to their adopted building codes.

The MAG Building Codes Committee typically recommends that its members adopt the most current versions of the standard national building codes. As such, the code references in the BCAS will always strive to refer to the most current national building code set. Jurisdictions not using the most current set of national codes should note that specific code references may need to be adjusted to reflect the code being amended.

The BCAS will be reviewed and updated as needed, typically once per year.



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Maricopa Association of Governments Building Code Amendments and Standards Manual BCAS #1	
Title: Sound Transmission Control near Luke Air Force Base	
Originally Reviewed by MAG Building Codes Committee: 4/17/1996	
Updated by MAG Building Codes Committee: 3/21/2012	

Section 1215 – Definitions

In this standard, unless the context otherwise requires:

“American Society for Testing and Materials (ASTM)” means an organization which develops and publishes recommended practices and standards for a broad range of testing and material properties issues.

“A-WEIGHTED SOUND LEVEL” means a quantity, in decibels, read from a standard sound level meter which discriminates against the lower frequencies to which the ear is less sensitive. The A-weighted scale attempts to approximate the auditory sensitivity of the human ear.

“DAY-NIGHT AVERAGE SOUND LEVEL (DNL)” means the A-weighted equivalent continuous sound exposure for a 24 hour period with a 10 dB adjustment added to sound levels occurring during nighttime hours (10 p.m. to 7 a.m.)

“INTERIOR NOISE LEVEL” means the sound level of noise in any habitable room with windows and doors closed.

“NOISE CONTOURS” mean lines which connect points subject to equal noise levels expressed in terms of average daily noise over a 24-hour period.

“R-VALUE” means insulation properties of an assembly. Insulation properties are further defined as the ability to reduce the factor of heat transmission or loss.

“SOUND TRANSMISSION CLASS (STC)” means a single-number rating for describing sound transmission loss of a wall, roof, floor, window, door, partition or other individual building components or assemblies.

Section 1217 – Application to New Buildings

The criteria of this ordinance establish the minimum requirements for acoustic design of the exterior envelope of buildings and for through-the-wall ventilation (HVAC) units and their parts. These requirements shall apply to all new buildings and alterations for first occupancy after October 1, 1996

that are located on property on which the average sound level is sixty-five decibels or greater. This noise level is defined by the noise contours for Luke Air Force Base prepared as a part of the 1988 Maricopa Association of Governments Westside Joint Land Use Study (see Exhibit 1). The criteria of this ordinance do not apply to ancillary buildings used in agricultural land use.

Section 1219 – Application to Existing Buildings

- A. Additions may be made to existing buildings without making the entire building comply with all the requirements of this ordinance for new construction.
- B. If the gross floor area of a building is expanded by less than fifty per cent, the requirements of this section apply only to the area of expansion. If the gross floor area of a non-residential building is expanded by fifty percent or more, the requirements of this section apply to the entire building.
- C. Any change in occupancy or use of a building shall not be permitted unless the building or portion of the building complies with this ordinance.

Section 1221 – Plans and Specifications

The plans and specifications shall show in sufficient detail all pertinent data and features of the building and the equipment and systems, as herein governed, including, but not limited to: exterior envelope component materials; STC ratings of applicable component assemblies; R-values of applicable insulation materials; size and type of apparatus and equipment; equipment and system controls and other pertinent data to indicate conformance with the requirements herein.

Section 1223 – Alternative Materials and Methods of Construction

- A. The provisions of this ordinance are not intended to prevent the use of any material or method of construction not specifically prescribed by this ordinance, provided any alternative has been approved and its use authorized by the building official.
- B. The building official may approve any such alternate, provided the building official finds that the proposed design is satisfactory and complies with the provisions of this ordinance and that the material or method of construction is, for the purpose intended, at least the equivalent of that prescribed in this ordinance in noise level reduction.
- C. The building official shall require that sufficient evidence or proof be submitted by a licensed architect or engineer to substantiate any claims that may be made regarding the use of alternative materials and methods. The details of any action granting approval of an alternate shall be recorded and entered in the files of the county, city or town.

Section 1225 – Building Requirements for a Noise Level Reduction of 25 dB Compliance with Section 1231 through Section 1239 in Appendix A shall be deemed to meet requirements for a minimum noise level reduction (NLR) of 25 decibels. This noise level reduction is required within the 65-70 DNL noise contours as depicted in Exhibit 1.

Section 1227 – Building Requirements for a Noise Level Reduction of 30 dB Compliance with Section 1241 through Section 1249 in Appendix A shall be deemed to meet requirements for a minimum noise

level reduction (NLR) of 30 decibels. This noise level reduction is required within the 70-75 DNL noise contours as depicted in Exhibit 1.

Section 1229 – Building Requirements for a Noise Level Reduction of 35 dB

Compliance with Section 1251 through Section 1259 in Appendix A shall be deemed to meet requirements for a minimum noise level reduction (NLR) of 35 decibels. This noise level reduction is required within the 75-80 DNL noise contours as depicted in Exhibit 1.

Appendix A

General		
25db Reduction (within 65-70 DLN Noise Contours)	30db Reduction (within 70-75 DLN Noise Contours)	35db Reduction (within 75-80 DLN Noise Contours)
Section 1231	Section 1241	Section 1251
A. Brick veneer, masonry blocks, or stucco exterior walls shall be constructed airtight. All joints shall be grouted or caulked airtight.	A. Brick veneer, masonry blocks, or stucco exterior walls shall be constructed airtight. All joints shall be grouted or caulked airtight.	A. Brick veneer, masonry blocks, or stucco exterior walls shall be constructed airtight. All joints shall be grouted or caulked airtight.
B. At the penetration of exterior walls by pipes, ducts, or conduits, the space between the wall and pipes, ducts, or conduits shall be caulked or filled with mortar.	B. At the penetration of exterior walls by pipes, ducts, or conduits, the space between the wall and pipes, ducts, or conduits shall be caulked or filled with mortar.	B. At the penetration of exterior walls by pipes, ducts, or conduits, the space between the wall and pipes, ducts, or conduits shall be caulked or filled with mortar.
C. Window and/or through-the-wall ventilation units (HVAC) shall not be used.	C. Window and/or through-the-wall ventilation (HVAC) units shall not be used.	C. Window and/or through-the-wall ventilation units (HVAC) shall not be used.
D. Through-the wall/door mail boxes shall not be used.	D. Through-the wall/door mail boxes shall not be used.	D. Through-the wall/door mail boxes shall not be used.
E. All sleeping spaces shall be provided with a sound-absorbing ceiling system and carpeted floors.	E. All sleeping spaces shall be provided with a sound-absorbing ceiling system and carpeted floors.	E. All sleeping spaces shall be provided with a sound-absorbing ceiling system and carpeted floors.
	F. Operational vented fireplaces shall not be used.	F. Operational vented fireplaces shall not be used.
		G. No glass or plastic skylight shall be used.
Exterior Walls		
25db Reduction (within 65-70 DLN Noise Contours)	30db Reduction (within 70-75 DLN Noise Contours)	35db Reduction (within 75-80 DLN Noise Contours)
Section 1233	Section 1243	Section 1253
A. Exterior walls, other than as described in this section, shall have a laboratory sound	A. Exterior walls, other than as described in this section, shall have a laboratory sound	A. Exterior walls, other than as described in this section, shall have a laboratory sound

transmission class rating of at least STC 39.	transmission class rating of at least STC 44.	transmission class rating of at least STC 49.
B. Masonry walls having a weight of at least 25 pounds per square foot do not require a furred (stud) interior wall. At least one surface of concrete block walls shall be plastered or painted with heavy "bridging" paint.	B. Masonry walls having a weight of at least 40 pounds per square foot do not require a furred (stud) interior wall. At least one surface of concrete block walls shall be plastered or painted with heavy "bridging" paint.	B. Masonry walls having a weight of at least 75 pounds per square foot do not require a furred (stud) interior wall. At least one surface of concrete block walls shall be plastered or painted with heavy "bridging" paint.
C. Stud walls shall be at least 4 inches in nominal depth and shall be finished on the outside with solid sheathing under an approved exterior wall finish: siding-onsheathing, stucco or brick veneer.	C. Stud walls shall be at least 4 inches in nominal depth and shall be finished on the outside with solid sheathing under an approved exterior wall finish: siding-onsheathing, stucco or brick veneer.	C. Stud walls shall be at least 4 inches in nominal depth and shall be finished on the outside with solid sheathing under an approved exterior wall finish: siding-onsheathing, stucco or brick veneer.
1. Interior surface of the exterior walls shall be of gypsum board or plaster at least ½ inch thick, installed on the studs.	1. Interior surface of the exterior walls shall be of gypsum board or plaster at least ½ inch thick, installed on the studs. The gypsum board or plaster may be fastened rigidly to the studs if the exterior is brick veneer or stucco. If the exterior is siding-on-sheathing, the interior gypsum board or plaster must be fastened resiliently to the studs.	1. Interior surface of the exterior walls shall be of gypsum board or plaster at least 5/8 inch thick, installed on the studs. The gypsum board or plaster may be fastened rigidly to the studs if the exterior is brick veneer or stucco. If the exterior is siding-on-sheathing, the interior gypsum board or plaster must be fastened resiliently to the studs or double thickness must be used.
2. Continuous composition board, plywood or gypsum board sheathing at least ½ inch thick shall cover the exterior side of the wall studs behind wood or metal siding. Asphaltic or wood shake shingles are acceptable in lieu of siding.	2. Continuous composition board, plywood, or gypsum board sheathing at least 3/4 inch thick shall cover the exterior side of the wall studs behind wood or metal siding. The sheathing and facing shall weigh at least 4 pounds per square foot.	2. Continuous composition board, plywood, or gypsum board sheathing at least 1 inch thick shall cover the exterior side of the wall studs. The sheathing and facing shall weigh at least 4 pounds per square foot.
3. Sheathing panels shall be butted tightly and covered on the exterior with overlapping building paper. The top and bottom edges of the sheathing shall be sealed.	3. Sheathing panels shall be butted tightly and covered on the exterior with overlapping building paper. The top and bottom edges of the sheathing shall be sealed.	3. Sheathing panels shall be butted tightly and covered on the exterior with overlapping building paper. The top and bottom edges of the sheathing shall be sealed.
4. Insulation material at least R-11 shall be installed continuously throughout the cavity space behind the exterior sheathing	4. Insulation material at least R-15 shall be installed continuously throughout the cavity space behind the exterior sheathing	4. Insulation material at least R-19 shall be installed continuously throughout the cavity space behind the exterior sheathing

and between wall studs. Insulation shall be glass fiber or mineral wool.	and between wall studs. Insulation shall be glass fiber or mineral wool.	and between wall studs. Insulation shall be glass fiber or mineral wool.
Exterior Windows		
25db Reduction (within 65-70 DLN Noise Contours)	30db Reduction (within 70-75 DLN Noise Contours)	35db Reduction (within 75-80 DLN Noise Contours)
Section 1234	Section 1244	Section 1254
A. Windows other than as described in this section shall have a laboratory sound transmission class rating of at least STC-28.	A. Windows other than as described in this section shall have a laboratory sound transmission class rating of at least STC-33.	A. Windows other than as described in this section shall have a laboratory sound transmission class rating of at least STC-38.
B. Glass shall be at least 3/16 inch thick, double glazed.	B. Glass shall be at least 3/16 inch thick, double glazed. Panes of glass shall be separated by a minimum 1/2 inch airspace.	B. Glass shall be at least 3/16 inch thick, double glazed. Panes of glass shall be separated by a minimum 1/2 inch airspace and shall not be equal in thickness.
C. All operable windows shall be weatherstripped and airtight when closed so as to conform to an air infiltration test not to exceed 0.5 cubic foot per minute per foot of crack length in accordance with ASTM E-283-65-T.	C. Double-glazed windows shall employ fixed sash or efficiently weatherstripped, operable sash. The sash shall be rigid and weatherstripped with material that is compressed airtight when the window is closed so as to conform to an infiltration test not to exceed 0.5 cubic foot per minute per foot of crack length in accordance with ASTM E-283-65-T.	C. Double-glazed windows shall employ fixed sash or efficiently weatherstripped, operable sash. The sash shall be rigid and weatherstripped with material that is compressed airtight when the window is closed so as to conform to an infiltration test not to exceed 0.5 cubic foot per minute per foot of crack length in accordance with ASTM E-283-65-T.
D. Glass of fixed sash windows shall be sealed in an airtight manner with a nonhardening sealant or a soft elastomer gasket or glazing tape.	D. Glass of fixed sash windows shall be sealed in an airtight manner with a nonhardening sealant or a soft elastomer gasket or glazing tape.	D. Glass of fixed sash windows shall be sealed in an airtight manner with a nonhardening sealant or a soft elastomer gasket or glazing tape.
E. The perimeter of window frames shall be sealed airtight to the exterior wall construction with a sealant conforming to one of the following Federal specifications: TT-S-00227, TT-S-00230 or TT-S-00153.	E. The perimeter of window frames shall be sealed airtight to the exterior wall construction with a sealant conforming to one of the following Federal specifications: TT-S-00227, TT-S-00230 or TT-S-00153.	E. The perimeter of window frames shall be sealed airtight to the exterior wall construction with a sealant conforming to one of the following Federal specifications: TT-S-00227, TT-S-00230 or TT-S-00153.
F. The total area of glass in both windows and doors in sleeping spaces shall not exceed 20% of the floor area.	F. The total area of glass in both windows and doors in sleeping spaces shall not exceed 20% of the floor area.	F. The total area of glass in both windows and doors in sleeping spaces shall not exceed 20% of the floor area.

Exterior Doors		
25db Reduction (within 65-70 DLN Noise Contours)	30db Reduction (within 70-75 DLN Noise Contours)	35db Reduction (within 75-80 DLN Noise Contours)
Section 1235	Section 1245	Section 1255
A. Doors other than as described in this section shall have a laboratory sound transmission class rating of at least STC-28.	A. Doors other than as described in this section shall have a laboratory sound transmission class rating of at least STC-33.	A. Doors other than as described in this section shall have a laboratory sound transmission class rating of at least STC 38.
B. All exterior side-hinged doors shall be solid-core wood or insulated hollow metal at least 1-3/4 inches thick and shall be fully weatherstripped.	B. Double door construction is required for all door openings to the exterior. Openings fitted with side-hinged doors shall have one solid core wood or insulated hollow metal door at least 1-3/4 inches thick separated by an airspace of at least 4 inches from another door, which can be a storm door. Both doors shall be tightly fitted and weatherstripped.	B. Double door construction is required for all door openings to the exterior. The doors shall be side-hinged and shall be solid core wood or insulated hollow metal door at least 1-3/4 inches thick, separated by a vestibule or enclosed porch at least 3 feet in length. Both doors shall be tightly fitted and weatherstripped.
C. Exterior sliding doors shall be weatherstripped with an efficient airtight gasket system with performance as specified in Section 1234 (c). The glass in the sliding doors shall be at least 3/16 inch thick.	C. The glass of double glazed sliding doors shall be separated by a minimum 1/2 inch airspace. Each sliding frame shall be provided with an efficiently airtight weatherstripping material as specified in Section 1244 (c).	C. The glass of double glazed sliding doors shall be separated by a minimum 1/2 inch airspace. Each sliding frame shall be provided with an efficiently airtight weatherstripping material as specified in Section 1254 (c).
D. Glass in doors shall be sealed in an airtight non-hardening sealant or in a soft elastomer gasket or glazing tape.	D. Glass in all doors shall be at least 3/16 inch thick. Glass in double sliding doors shall not be equal in thickness.	D. Glass of all doors shall be at least 3/16 inch thick. Glass in double sliding doors shall not be equal in thickness.
E. The perimeter of door frames shall be sealed airtight to the exterior wall construction (framing) as described in Section 1234 (e).	E. The perimeter of door frames shall be sealed airtight to the exterior wall construction (framing) as indicated in Section 1244 (e).	E. The perimeter of door frames shall be sealed airtight to the exterior wall construction (framing) as indicated in Section 1254 (e).
	F. Glass in doors shall be sealed in an airtight non-hardening sealant or in a soft elastomer gasket or glazing tape.	F. Glass in doors shall be sealed in an airtight non-hardening sealant or in a soft elastomer gasket or glazing tape.
Roofs		
25db Reduction (within 65-70 DLN Noise Contours)	30db Reduction (within 70-75 DLN Noise Contours)	35db Reduction (within 75-80 DLN Noise Contours)
Section 1236	Section 1246	Section 1256
A. Combined roof and ceiling	A. Combined roof and ceiling	A. Combined roof and ceiling

construction other than described in this section and Section 1237 shall have a laboratory sound transmission class rating of at least STC-39.	construction other than described in this section and Section 1247 shall have a laboratory sound transmission class rating of at least STC-44.	construction other than described in this section and Section 1257 shall have a laboratory sound transmission class rating of at least STC-49.
B. With an attic or rafter space at least 6 inches deep, and with a ceiling below, the roof shall consist of 1/2 inch composition board, plywood or gypsum board sheathing topped by roofing as required.	B. With an attic or rafter space at least 6 inches deep, and with a ceiling below, the roof shall consist of 3/4 inch closely butted composition board, plywood or gypsum board sheathing topped by roofing as required.	B. With an attic or rafter space at least 6 inches deep, and with a ceiling below, the roof shall consist of 1 inch composition board, plywood or gypsum board sheathing topped by roofing as required.
C. Open beam roof construction shall follow the energy insulation standard method for batt insulation.	C. Open beam roof construction shall follow the energy insulation standard method for batt insulation, except use 1 inch plywood decking with shakes or other suitable roofing material.	C. Open beam roof construction shall follow the energy insulation standard method for batt insulation, except use 1 inch plywood decking with concrete or clay tiles as roofing material.
D. If the underside of the roof is exposed, or if the attic or rafter spacing is less than 6 inches, the roof construction shall have a surface weight of at least 6 pounds per square foot. Rafters, joists, or other framing may not be included in the surface weight calculation.	D. If the underside of the roof is exposed, or if the attic or rafter spacing is less than 6 inches, the roof construction shall have a surface weight of at least 9 pounds per square foot. Rafters, joists or other framing may not be included in the surface weight calculations.	D. If the underside of the roof is exposed, or if the attic or rafter spacing is less than 6 inches, the roof construction shall have a surface weight of 9 pounds per square foot. Rafters, joists or other framing may not be included in the surface weight calculation.
E. Window or dome skylights shall have a laboratory sound transmission class rating of at least STC-28.	E. Window or dome skylights shall have a laboratory sound transmission class rating of at least STC-33.	
Ceiling		
25db Reduction (within 65-70 DLN Noise Contours)	30db Reduction (within 70-75 DLN Noise Contours)	35db Reduction (within 75-80 DLN Noise Contours)
Section 1237	Section 1247	Section 1257
A. Gypsum board or plaster ceilings at least 1/2 inch thick shall be provided where required by Section 1236 (B). Ceilings shall be substantially airtight with a minimum of penetrations.	A. Gypsum board or plaster ceilings at least 5/8 inch thick shall be provided where required by Section 1246 (B), above. Ceilings shall be substantially airtight with a minimum of penetrations.	A. Gypsum board or plaster ceilings at least 5/8 inch thick shall be provided where required by Section 1256 (B), above. Ceilings shall be substantially airtight with a minimum of penetrations. The ceiling panels shall be mounted on resilient clips or channels.
B. Glass fiber or mineral wool insulation at least R-19 shall be	B. Glass fiber or mineral wool insulation at least R-25 shall be	B. Glass fiber or mineral wool insulation at least R-30 shall be

provided above the ceiling between joists.	provided above the ceiling between joists.	provided above the ceiling between joists.
Floors		
25db Reduction (within 65-70 DLN Noise Contours)	30db Reduction (within 70-75 DLN Noise Contours)	35db Reduction (within 75-80 DLN Noise Contours)
Section 1238	Section 1248	Section 1258
A. Openings to any crawl spaces below the floor of the lowest occupied rooms shall not exceed 2% of the floor area of the occupied rooms.	A. The floor of the lowest occupied rooms shall be slab on fill, below grade, or over a fully enclosed basement or crawl space. All door and window openings in the fully enclosed basement shall be tightly fitted. Crawl space ventilation shall comply with section 1238.	A. The floor of the lowest occupied rooms shall be slab on fill or below grade.
Ventilation		
25db Reduction (within 65-70 DLN Noise Contours)	30db Reduction (within 70-75 DLN Noise Contours)	35db Reduction (within 75-80 DLN Noise Contours)
Section 1239	Section 1249	Section 1259
A. A mechanical ventilation system shall be installed that will provide the minimum air circulation and fresh air supply requirements for various uses in occupied rooms without the need to open any windows, doors or other openings to the exterior. The inlet and discharge openings shall be fitted with sheet metal transfer ducts of at least 20 gauge steel, which shall be lined with 1 inch thick coated glass fiber, and shall be at least 5 feet long with one 90 degree bend.	A. A mechanical ventilation system shall be installed that will provide the minimum air circulation and fresh air supply requirements for various uses in occupied rooms without the need to open any windows, doors or other openings to the exterior. The inlet and discharge openings shall be fitted with sheet metal transfer ducts of at least 20 gauge steel, which shall be lined with 1 inch thick coated glass fiber, and shall be at least 5 feet long with one 90 degree bend.	A. A mechanical ventilation system shall be installed that will provide the minimum air circulation and fresh air supply requirements for various uses in occupied rooms without the need to open any windows, doors or other openings to the exterior. The inlet and discharge openings shall be fitted with sheet metal transfer ducts of at least 20 gauge steel, which shall be lined with 1 inch thick coated glass fiber, and shall be at least 10 feet long with one 90 degree bend.
B. Gravity vent openings in attics shall not exceed code minimum in number and size, as practical.	B. Gravity vent openings in attics shall not exceed code minimum in number and size, as practical. The openings shall be fitted with transfer ducts at least 3 feet in length containing internal 1 inch thick coated fiberglass sound-absorbing duct lining. Each duct shall have a lined 90 degree bend in the duct such that there	B. Gravity vent openings in attics shall be as close to code minimum in number and size, as practical. The openings shall be fitted with transfer ducts at least 6 feet in length containing internal 1 inch thick coated fiberglass sound-absorbing duct lining. Each duct shall have a lined 90 degree bend in the duct

	is no direct line-of-sight from the exterior through the duct into the attic.	such that there is no direct line-of-sight from the exterior through the duct into the attic.
C. If a fan is used for forced ventilation, the attic inlet and discharge openings shall be fitted with sheet metal transfer ducts of at least 20 gauge steel, which shall be lined with coated glass fiber 1 inch thick, and shall be at least 5 ft long with one 90 degree bend.	C. If a fan is used for forced ventilation, the attic inlet and discharge openings shall be fitted with sheet metal transfer ducts of at least 20 gauge steel, which shall be lined with coated glass fiber 1 inch thick, and shall be at least 5 ft long with one 90 degree bend.	C. If a fan is used for forced ventilation, the attic inlet and discharge openings shall be fitted with sheet metal transfer ducts of at least 20 gauge steel, which shall be lined with 1 inch thick coated glass fiber, and shall be at least 10 ft long with one 90 degree bend.
D. All other vent ducts connecting the interior space to the outdoors, shall contain at least a 5-foot length of internal sound absorbing duct lining. Each duct shall be provided with a bend in the duct such that there is no direct line-of-sight through the duct from the venting cross-section to the room opening cross-section. Duct lining shall be coated glass fiber duct liner at least 1 inch thick approved and suitable for the intended use.	D. All other vent ducts connecting the interior space to the outdoors, shall contain at least a 10-foot length of internal sound-absorbing duct lining. Each duct shall be provided with a lined 90 degree bend in the duct such that there is no direct line-of sight through the duct from the venting cross-section to the room opening cross-section. Duct lining shall be coated glass fiber duct liner at least 1 inch thick approved and suitable for intended use.	D. All other vent ducts connecting the interior space to the outdoors, shall contain at least a 10-foot length of internal sound-absorbing duct lining. Each duct shall be provided with a lined 90 degree bend in the duct such that there is no direct line-of-sight through the duct from the venting cross section to the room-opening cross section. Duct lining shall be coated glass fiber duct liner at least 1 inch thick approved and suitable for intended use.
E. Domestic range exhaust ducts connecting the interior space to the outdoors shall contain a baffle plate across the exterior termination which allows proper ventilation. The dimensions of the baffle plate should extend at least one diameter beyond the line of sight into the vent duct. The baffle plate shall be of the same material and thickness as the vent duct material.	E. Domestic range exhaust ducts connecting the interior space to the outdoors shall contain a self-closing baffle plate across the exterior termination which allows proper ventilation. Each duct shall be provided with a bend in the duct such that there is no direct line-of sight through the duct from the venting cross-section to the room opening cross-section. The dimensions of the baffle plate should extend at least one diameter beyond the line of sight into the vent duct. The baffle plate shall be made of the same material and thickness as the vent duct material.	E. Domestic range exhaust ducts connecting the interior space to the outdoors shall contain a self-closing baffle plate across the exterior termination which allows proper ventilation. The dimensions of the baffle plate should extend at least one diameter beyond the line of sight into the vent duct. The baffle plate shall be of the same material and thickness as the vent duct material. The duct shall be offset such that there is no direct line-of-sight through the duct.
F. Fireplaces shall be provided with well fitted dampers as required for the type of fuel	F. Building heating units with flues or combustion air vents shall be located in a closet or	F. Building heating units with flues or combination air vents shall be located in a closet or

being used and tightly fitted glass doors.	room closed off from the occupied space by doors.	room closed off from the occupied space by doors.
	G. Doors between occupied space and mechanical equipment areas shall be solid core wood or 20 gauge insulated steel hollow metal at least 1-3/4 inch thick and shall be fully weather stripped.	G. Doors between occupied space and mechanical equipment areas shall be solid core wood or 20 gauge insulated hollow metal at least 1-3/4 inch thick and shall be fully weather stripped.

DRAFT

Maricopa Association of Governments Building Code Amendments and Standards Manual BCAS #2	
Title: MAG Model Standard for Fireplaces, Wood Stoves, and Other Solid Fuel Burning Devices	
Originally Reviewed by MAG Building Codes Committee: 10/22/1997	
Updated by MAG Building Codes Committee: 6/20/2012	

Section 1 – Purpose

The purpose of this standard is to regulate fireplaces, woodstoves, or other solid-fuel burning devices to reduce the amount of air pollution caused by particulate matter and carbon monoxide.

Section 2 – Effective Date

The effective date of the regulations and prohibitions set forth in this standard shall take effect no earlier than December 31, 1998.

Section 3 – Definitions

In this standard, unless the context otherwise requires:

“Fireplace” means a built-in-place masonry hearth and fire chamber or a factory-built appliance, designed to burn solid fuel or to accommodate gas or electric log insert or similar device, and which is intended for occasional recreational or aesthetic use, not for cooking, heating, or industrial purposes.

“Solid Fuel” includes but is not limited to: wood, coal, or other nongaseous or non-liquid fuels, including those fuels defined by the Maricopa County Air Pollution Control Officer as “inappropriate fuel” to burn in residential wood-burning devices.

“Woodstove” means a solid fuel-burning heating appliance including a pellet stove, which is either freestanding or designed to be inserted into a fireplace.

Section 4 – Installation Restrictions

- A. On or after the effective date, no person, firm, or corporation shall construct or install a fireplace or woodstove, and the Building Official shall not approve or issue a permit to construct or install a fireplace or woodstove, unless the fireplace or woodstove complies with one of the following:
 1. A fireplace which has a permanently installed gas or electric log;
 2. A fireplace, woodstove, or other solid fuel-burning appliance which has been certified by the United States Environmental Protection Agency (EPA) as conforming to 40 Code Federal Regulations Part 60, Subpart, AAA as in effect on July 1, 1990;

3. A fireplace, woodstove, or other solid fuel-burning appliance which has been tested and listed by a nationally recognized testing agency to meet performance standards equivalent to those adopted by 40 Code of Federal Regulations Part 60, Subpart AAA as in effect on July 1, 1990;
 4. A fireplace, woodstove, or other solid fuel-burning appliance which has been determined by the Maricopa County Air Pollution Control Officer to meet the performance standards equivalent to those adopted by 40 Code of Federal Regulations Part 60, Subpart AAA as in effect on July 1, 1990; or
 5. A fireplace which has a permanently installed woodstove insert which complies with subsection 2, 3, or 4 above.
- B. The following installations are not regulated by this standard and are not prohibited by this standard:
1. Furnaces, boilers, incinerators, kilns, and other similar space heating or industrial process equipment;
 2. Cookstoves, barbecue grills, and similar appliances designed primarily for cooking; or
 3. Fire pits, barbecue grills, and other outdoor fireplaces.

Section 5 – Fireplace or Woodstove Alterations Prohibited

- A. On or after the effective date, no person, firm, or corporation shall alter or remove a gas or electric log insert or a woodstove insert from a fireplace for purposes of converting the fireplace to directly burn wood or other solid fuel.
- B. On or after the effective date, no person, firm, or corporation shall alter a fireplace, woodstove or other solid fuel-burning appliance in any manner that would void its certification or operational compliance with the provisions of this standard.

Section 6 – Permits Required

In addition to the provisions and restrictions of this standard, construction, installation or alteration of all fireplaces, woodstoves, and other gas, electric, or solid fuel-burning appliances and equipment shall be done in compliance with provisions of the Construction Code and shall be subject to the permits and inspections required by the Construction Code.

Maricopa Association of Governments Building Code Amendments and Standards Manual BCAS #3	
Title: Standards for Earthen Structures and Straw Bale Construction	
Originally Reviewed by MAG Building Codes Committee: 2/17/1999	
Updated by MAG Building Codes Committee: 11/14/2012	

Earthen Wall Structures

Section R614.1 General. Earthen wall structures in Seismic Design Category A, B or C with basic wind speed of 90 mph or less with wind exposure category of A, B, or C may be designed and constructed in accordance with the provisions of this standard.

This Section shall comply with the seismic requirements of the *International Residential Code*.

Exception: Structures with any site conditions may be designed with accepted engineering practice for earthen wall structures and the provisions of the approved Standard for IBC Earthen Structures.

Section R614.1.1 Earthen materials. This section shall establish minimum standards for safety for construction of earthen materials structures, collectively known as adobe, rammed earth, and hydraulic pressed unit construction.

Section R614.1.2 Professional registration not required. When the empirical design provisions of this section are used to design wall systems, project drawings, typical details and specifications are not required to bear the seal of an architect or engineer.

Section R614.1.3 Professional registration required. When the earthen structure exceeds the empirical design provisions of this standard, the plans and specifications shall be prepared by an Arizona Registrant. All such projects shall be designed in accordance with the approved Standard for IBC Earthen Structures.

Section R614.2 Dimensions of earth walls. Dimensions of earthen walls shall conform to the requirements of this section.

Section R614.2.1 Thickness and Height. The minimum thickness and maximum height of earthen walls and parapets shall be in accordance with Tables R614.2.1 (1 to 6) based upon the S_d value for the project site. Wall thickness shall be measured from face to face of walls with concave joints. Walls with rake joints shall be measured surface of joint to surface of joint. The thickness of wall sections shall not be combined without full cross bonding of the masonry units throughout the wall.

Exception: Walls supported only at ground level and only supported at the base of the wall shall be limited to a height of $\frac{1}{2}$ that allowed by Tables R614.2.1 (1 to 6).

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Table R614.2.1 (1)

Seismic Sites w/ Sds

0.00 TO 0.25

Assuming zero tension out-of-plane

Actual Wall Thickness (in)											
	10	11	12	13	14	15	16	18	20	22	24
Maximum Wall Height (in)											
Exterior	NP	83	99	116	135	144	144	144	144	144	144
Interior	127	140	144	144	144	144	144	144	144	144	144
Parapet	NP	22	24	26	28	30	32	36	40	44	48
Bond Beam Size and Steel Requirements											
All Bond Beams 8" Minimum Height											
Exterior Wall No Parapet											
Type "A"	2 - #4	2 - #4	2 - #5	2 - #5	2 - #5	2 - #5	2 - #4	2 - #4	2 - #4	2 - #4	2 - #4
Type "B"	2 - #5	2 - #5	2 - #5	4 - #4	4 - #4	4 - #4	2 - #5	2 - #4	2 - #4	2 - #4	2 - #4
Type "C"	NP	NP	NP	NP	NP	4 - #5	4 - #4	2 - #4	2 - #4	2 - #4	2 - #4
Exterior Wall w/ Full Parapet											
Type "A"	2 - #4	2 - #4	2 - #5	2 - #5	2 - #5	2 - #5	2 - #4	2 - #4	2 - #4	2 - #4	2 - #4
Type "B"	2 - #5	2 - #5	2 - #5	4 - #4	4 - #4	4 - #4	2 - #5	2 - #4	2 - #4	2 - #4	2 - #4
Type "C"	NP	NP	NP	NP	NP	4 - #5	4 - #4	2 - #4	2 - #4	2 - #4	2 - #4
Interior Wall w/ infill between beams											
Type "A"	2 - #4	2 - #4	2 - #5	2 - #5	2 - #5	2 - #5	2 - #4	2 - #4	2 - #4	2 - #4	2 - #4
Type "B"	2 - #5	2 - #5	2 - #5	4 - #4	4 - #4	4 - #4	2 - #5	2 - #4	2 - #4	2 - #4	2 - #4
Type "C"	NP	NP	NP	NP	NP	4 - #5	4 - #4	2 - #4	2 - #4	2 - #4	2 - #4

NP = This Wall is Not Permitted

Table R614.2.1 (2)

Seismic Sites w/ Sds

0.25 TO 0.30

Assuming zero tension out-of-plane

Actual Wall Thickness (in)											
	10	11	12	13	14	15	16	18	20	22	24
Maximum Wall Height (in)											
Exterior	NP	83	99	116	135	144	144	144	144	144	144
Interior	106	116	127	137	144	144	144	144	144	144	144
Parapet	NP	22	24	26	28	30	32	36	40	44	48
Bond Beam Size and Steel Requirements											
All Bond Beams 8" Minimum Height											
Exterior Wall No Parapet											
Type "A"	2 - #4	2 - #5	2 - #5	2 - #5	4 - #4	4 - #4	2 - #5	2 - #4	2 - #4	2 - #4	2 - #4
Type "B"	2 - #5	4 - #4	4 - #4	4 - #5	4 - #5	4 - #5	4 - #4	2 - #5	2 - #4	2 - #4	2 - #4
Type "C"	NP	NP	NP	NP	NP	4 - #5	4 - #5	2 - #5	2 - #4	2 - #4	2 - #4
Exterior Wall w/ Full Parapet											
Type "A"	2 - #4	2 - #5	2 - #5	2 - #5	4 - #4	4 - #4	2 - #5	2 - #4	2 - #4	2 - #4	2 - #4
Type "B"	2 - #5	4 - #4	4 - #4	4 - #5	4 - #5	4 - #5	4 - #4	2 - #5	2 - #4	2 - #4	2 - #4
Type "C"	NP	NP	NP	NP	NP	4 - #5	4 - #5	2 - #5	2 - #4	2 - #4	2 - #4
Interior Wall w/ infill between beams											
Type "A"	2 - #4	2 - #5	2 - #5	2 - #5	4 - #4	4 - #4	2 - #5	2 - #4	2 - #4	2 - #4	2 - #4
Type "B"	2 - #5	4 - #4	4 - #4	4 - #5	4 - #5	4 - #5	4 - #4	2 - #5	2 - #4	2 - #4	2 - #4
Type "C"	NP	NP	NP	NP	NP	4 - #5	4 - #5	2 - #5	2 - #4	2 - #4	2 - #4
Bond Beam Load	46	61	79	100	125	125	108	80	42	0	0
Bond Beam Load	81	103	130	160	194	204	198	194	183	171	203
Bond Beam Load	84	100	118	137	150	151	152	155	158	161	164

NP = This Wall is Not Permitted

Table R614.2.1 (3)

Seismic Sites w/ Sds

0.30 TO 0.35

Assuming zero tension out-of-plane

Actual Wall Thickness (in)											
	10	11	12	13	14	15	16	18	20	22	24
Maximum Wall Height (in)											
Exterior	NP	83	99	116	127	136	144	144	144	144	144
Interior	91	100	109	118	127	136	144	144	144	144	144
Parapet	NP	22	24	26	28	30	32	36	40	44	48
Bond Beam Size and Steel Requirements											
All Bond Beams 8" Minimum Height											
Exterior Wall No Parapet											
Type "A"	2 - #5	2 - #5	2 - #5	4 - #4	4 - #4	4 - #5	4 - #5	4 - #4	2 - #5	2 - #4	2 - #4
Type "B"	4 - #4	4 - #4	4 - #5	4 - #5	4 - #5	4 - #5	4 - #5	4 - #4	2 - #5	2 - #4	2 - #4
Type "C"	NP	NP	NP	NP	NP	4 - #6	4 - #6	4 - #5	4 - #4	2 - #5	2 - #4
Exterior Wall w/ Full Parapet											
Type "A"	2 - #5	2 - #5	2 - #5	4 - #4	4 - #4	4 - #5	4 - #5	4 - #4	2 - #5	2 - #4	2 - #4
Type "B"	4 - #4	4 - #4	4 - #5	4 - #5	4 - #5	4 - #5	4 - #5	4 - #4	2 - #5	2 - #4	2 - #4
Type "C"	NP	NP	NP	NP	NP	4 - #6	4 - #6	4 - #5	4 - #4	2 - #5	2 - #4
Interior Wall w/ infill between beams											
Type "A"	2 - #5	2 - #5	2 - #5	4 - #4	4 - #4	4 - #5	4 - #5	4 - #4	2 - #5	2 - #4	2 - #4
Type "B"	4 - #4	4 - #4	4 - #5	4 - #5	4 - #5	4 - #5	4 - #5	4 - #4	2 - #5	2 - #4	2 - #4
Type "C"	NP	NP	NP	NP	NP	4 - #6	4 - #6	4 - #5	4 - #4	2 - #5	2 - #4
Bond Beam Load	53	71	92	117	137	157	176	156	127	88	40
Bond Beam Load	94	121	151	186	218	250	281	289	291	287	277
Bond Beam Load	86	103	120	140	160	182	203	206	210	213	216

NP = This Wall is Not Permitted

Table R614.2.1 (4)

Seismic Sites w/ Sds

0.35 TO 0.40

Assuming zero tension out-of-plane

Actual Wall Thickness (in)											
	10	11	12	13	14	15	16	18	20	22	24
Maximum Wall Height (in)											
Exterior	NP	83	95	103	111	119	127	143	144	144	144
Interior	79	87	95	103	111	119	127	143	144	144	144
Parapet	NP	22	24	26	28	30	32	36	40	44	48
Bond Beam Size and Steel Requirements											
All Bond Beams 8" Minimum Height											
Exterior Wall No Parapet											
Type "A"	2 - #5	2 - #5	4 - #4	4 - #4	4 - #4	4 - #5	4 - #5	4 - #5	4 - #4	2 - #5	2 - #5
Type "B"	4 - #4	4 - #5	4 - #5	4 - #5	4 - #5	4 - #5	4 - #5	4 - #5	4 - #5	4 - #4	2 - #5
Type "C"	NP	NP	NP	NP	NP	4 - #6	4 - #6	4 - #6	4 - #5	4 - #5	2 - #5
Exterior Wall w/ Full Parapet											
Type "A"	2 - #5	2 - #5	4 - #4	4 - #4	4 - #4	4 - #5	4 - #5	4 - #5	4 - #4	2 - #5	2 - #5
Type "B"	4 - #4	4 - #5	4 - #5	4 - #5	4 - #5	4 - #5	4 - #5	4 - #5	4 - #5	4 - #4	2 - #5
Type "C"	NP	NP	NP	NP	NP	4 - #6	4 - #6	4 - #6	4 - #5	4 - #5	2 - #5
Interior Wall w/ infill between beams											
Type "A"	2 - #5	2 - #5	4 - #4	4 - #4	4 - #4	4 - #5	4 - #5	4 - #5	4 - #4	2 - #5	2 - #5
Type "B"	4 - #4	4 - #5	4 - #5	4 - #5	4 - #5	4 - #5	4 - #5	4 - #5	4 - #5	4 - #4	2 - #5
Type "C"	NP	NP	NP	NP	NP	4 - #6	4 - #6	4 - #6	4 - #5	4 - #5	2 - #5
Bond Beam Load	61	81	101	118	137	157	179	227	211	181	142
Bond Beam Load	108	138	168	198	229	263	299	379	399	409	412
Bond Beam Load	89	105	123	143	163	186	209	260	268	272	276

NP = This Wall is Not Permitted

Table R614.2.1 (5)

Seismic Sites w/ Sds

0.40 TO 0.45

Assuming zero tension out-of-plane

Actual Wall Thickness (in)											
	10	11	12	13	14	15	16	18	20	22	24
Maximum Wall Height (in)											
Exterior	NP	78	85	92	99	106	113	127	141	144	144
Interior	70	78	85	92	99	106	113	127	141	144	144
Parapet	NP	22	24	26	28	30	32	36	40	44	48
Bond Beam Size and Steel Requirements											
All Bond Beams 8" Minimum Height											
Exterior Wall No Parapet											
Type "A"	2 - #5	2 - #5	4 - #4	4 - #4	4 - #4	4 - #5	4 - #5	4 - #5	4 - #5	4 - #5	4 - #4
Type "B"	4 - #5	4 - #5	4 - #5	4 - #5	4 - #5	4 - #5	4 - #5	4 - #5	4 - #6	4 - #5	4 - #5
Type "C"	NP	NP	NP	NP	NP	4 - #6	4 - #6	4 - #6	4 - #6	4 - #6	4 - #5
Exterior Wall w/ Full Parapet											
Type "A"	2 - #5	2 - #5	4 - #4	4 - #4	4 - #4	4 - #5	4 - #5	4 - #5	4 - #5	4 - #5	4 - #4
Type "B"	4 - #5	4 - #5	4 - #5	4 - #5	4 - #5	4 - #5	4 - #5	4 - #5	4 - #6	4 - #5	4 - #5
Type "C"	NP	NP	NP	NP	NP	4 - #6	4 - #6	4 - #6	4 - #6	4 - #6	4 - #5
Interior Wall w/ infill between beams											
Type "A"	2 - #5	2 - #5	4 - #4	4 - #4	4 - #4	4 - #5	4 - #5	4 - #5	4 - #5	4 - #5	4 - #4
Type "B"	4 - #5	4 - #5	4 - #5	4 - #5	4 - #5	4 - #5	4 - #5	4 - #5	4 - #6	4 - #5	4 - #5
Type "C"	NP	NP	NP	NP	NP	4 - #6	4 - #6	4 - #6	4 - #6	4 - #6	4 - #5
Bond Beam Load	68	85	101	118	137	157	179	227	280	274	243
Bond Beam Load	121	149	177	208	241	276	314	398	491	530	548
Bond Beam Load	91	108	126	146	167	189	213	265	322	339	343

NP = This Wall is Not Permitted

Table R614.2.1 (6)

Seismic Sites w/ Sds

0.45 TO 0.50

Assuming zero tension out-of-plane

Actual Wall Thickness (in)											
	10	11	12	13	14	15	16	18	20	22	24
Maximum Wall Height (in)											
Exterior	NP	70	76	82	89	95	101	114	127	140	144
Interior	63	70	76	82	89	95	101	114	127	140	144
Parapet	NP	22	24	26	28	30	32	36	40	44	48
Bond Beam Size and Steel Requirements											
All Bond Beams 8" Minimum Height											
Exterior Wall No Parapet											
Type "A"	2 - #5	2 - #5	4 - #4	4 - #4	4 - #4	4 - #5	4 - #5	4 - #5	4 - #5	4 - #5	4 - #5
Type "B"	4 - #5	4 - #5	4 - #5	4 - #5	4 - #5	4 - #5	4 - #5	4 - #5	4 - #6	4 - #6	4 - #6
Type "C"	NP	NP	NP	NP	NP	4 - #6	4 - #6	4 - #6	4 - #6	4 - #6	4 - #6
Exterior Wall w/ Full Parapet											
Type "A"	2 - #5	2 - #5	4 - #4	4 - #4	4 - #4	4 - #5	4 - #5	4 - #5	4 - #5	4 - #5	4 - #5
Type "B"	4 - #5	4 - #5	4 - #5	4 - #5	4 - #5	4 - #5	4 - #5	4 - #5	4 - #6	4 - #6	4 - #6
Type "C"	NP	NP	NP	NP	NP	4 - #6	4 - #6	4 - #6	4 - #6	4 - #6	4 - #6
Interior Wall w/ infill between beams											
Type "A"	2 - #5	2 - #5	4 - #4	4 - #4	4 - #4	4 - #5	4 - #5	4 - #5	4 - #5	4 - #5	4 - #5
Type "B"	4 - #5	4 - #5	4 - #5	4 - #5	4 - #5	4 - #5	4 - #5	4 - #5	4 - #6	4 - #6	4 - #6
Type "C"	NP	NP	NP	NP	NP	4 - #6	4 - #6	4 - #6	4 - #6	4 - #6	4 - #6
Bond Beam Load	70	85	101	118	137	157	179	227	280	338	345
Bond Beam Load	129	156	185	218	252	290	330	417	515	623	683
Bond Beam Load	93	110	129	149	170	193	217	269	327	390	417

NP = This Wall is Not Permitted

Section R614.2.2 Maximum length. The maximum length of any earthen wall laterally braced by Bond Beams per Section R614.5.2 shall be 20 feet (6,096 mm) between perpendicular bracing walls. Any wall in excess of 20 feet (6,096 mm) shall be designed in accordance with the approved Standard for IBC Earthen Structures.

Section R614.3 Support conditions. Earthen walls shall be supported on a solid concrete, solid masonry foundation system the width of which shall be not be less than 1/2 inch narrower than the earthen wall which it supports. Earthen structures shall not be less than 6 inches above adjacent grade.

Section R614.3.1 Moisture barrier. A moisture barrier equal to 30 lb. asphalt impregnated building paper, or equivalent moisture resistant barrier, shall be installed between the supporting foundation and the earthen wall material.

Section R614.4 Allowable stresses. Allowable compressive, tensile and shear stresses in earthen walls shall not exceed the values prescribed in Table R614.4. In determining the stresses in masonry, the effects of all loads and conditions of loading and the influence of all forces affecting the design and strength of the several parts shall be taken into account. Bolts in shear shall be limited to those values in *International Building Code* Table 2109.3.3.1.

Section R614.4.1 Combined units. In walls composed of different kinds or grades of units, materials or mortars, the maximum stress shall not exceed the allowable stress for the weakest of the combination of units, materials and mortars of which the wall is composed. The net thickness of any facing unit of earthen materials used to resist stress shall not be less than 3 inches (76.2 mm).

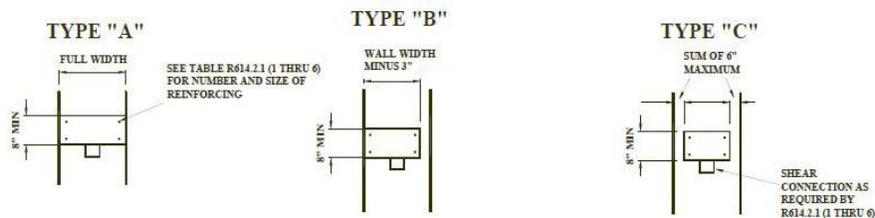
When dissimilar materials, (e.g. concrete masonry or steel) are used to support earth wall construction, such elements shall be structurally isolated from other earth wall elements. The design shall recognize, with specific detailing, the effects shrinkage of the earth wall construction may have on the structural integrity of the structure.

Table R614.4			
Allowable Stresses for Empirical Design of Earthen Wall Structures			
Strength of Unit, Gross Area		Allowable Stresses, Gross Sectional Area ¹	
Compression:	300 psi	Compressive Stress:	30 psi
Modulus of rupture:	50 psi	Allowable tension w/o tensile reinforcing:	0 psi
Shear:	N/A	Shear with Special Inspection:	8 psi
		Shear w/o Special Inspection:	4 psi
Modulus of Elasticity:	60,000 psi	Allowable Deflection:	Less than 0.5%
Notes:			
1. Gross cross-sectional area shall be calculated on the actual rather than the nominal dimensions.			

Section R614.5 Lateral support. Earthen walls constructed of earthen units shall be bonded and tied to intersecting earthen walls and laterally supported in the vertical direction in accordance with one of the methods in Section R614.5.2 or Section R614.5.3.

Section R614.5.2 Bond Beams. A continuous concrete bond beam system embedded in the earthen walls, designed to provide lateral support for the walls without the aid of additional bracing elements such as roof diaphragm. Bond beams shall be not less than the width of the wall minus 6 inches (152.4 mm) and a height of not less than 8 inches. Bond beams shall be reinforced as required by Tables R614.2.1 (1 to 6). Bars shall be placed not more than 1 ½" from the inside face of the form or veneer block as indicated in Figure R614.5.2.1.

Figure R614.5.2.1



Section R614.5.2.2.1 Bond beam anchorage. Bond beams shall be anchored to earthen walls at intervals of not over 48 inches (1219 mm) by a connection with shear strength of not less than 200 lbs. per lineal foot plus an additional 25 lbs. per lineal foot for every inch of thickness in excess of 16" thick.

Section R614.5.3 Roof diaphragm. A roof diaphragm complying with the *International Residential Code* adequate to provide not less than 200 lbs. per lineal foot of lateral support may be used to brace earthen walls. Earthen walls shall be anchored to roof diaphragms with connections to resist loads of not less than 200 lbs. per lineal foot plus an additional 25 lbs. per lineal foot for every inch of thickness in excess of 16" thick. This anchorage shall be tie beams as specified in Section R614.5.3.2 or other anchorage methods of equal strength.

Section R614.5.3.1 Tie beams. A tie beam is a concrete or masonry, beam built into the earthen wall for the purpose of anchoring the roof diaphragm and transferring the lateral perpendicular and parallel forces. Tie beams shall be provided for all earthen walls laterally braced by a roof diaphragm. Tie beams shall be anchored to the roof diaphragm system at intervals not exceeding 4 feet (1219 mm).

Tie beams shall be not less than ½ the width of the earthen wall, a minimum of 8 inches (203.2 mm) high and reinforced with 2 - #4 reinforcing bars.

Section R614.5.3.2 Tie beam anchorage. Tie beams shall be anchored to earthen walls at intervals of not over 48 inches (1219 mm) by a connection with shear strength of not less than 200 lbs. per lineal foot plus an additional 25 lbs. per lineal foot for every inch of thickness in excess of 16" thick.

Section R614.6 Lintels. Earthen walls over openings shall be supported by steel lintels, reinforced concrete or masonry lintels or earthen arches designed to support load imposed. Lintels shall not be supported by rigid structural columns, frames or posts with rigidities greater than the earthen wall unless the design allows for the potential for differential settlements.

Small openings less than 12" may be constructed without structural lintels.

Section R614.7 Shear walls. earthen walls subject to in-plane loads shall be designed with at least one earthen wall shear panel, at least 4 feet long, free of openings, with a length as computed by Equation R614.7-1.

Equation R614.7-1

$$L = (\text{Sqrt } PL \times Sds \times 4)$$

Where:

L= Length of shear panel

PL = Sum of overall length of walls perpendicular to the panel.

Sds = Sds factor as determined by the International Building Code.

Section R614.8 Jambs at openings. Portions of walls between openings or corner shall be constructed with lengths of not less than 1 ½ times the thickness of the wall in which they occur.

Section R614.9 Piers. The thickness of isolated earthen piers shall be not less than 1 ½ times those wall thickness values indicated in Table R614.2.1 (1 to 6). When structural posts or columns are provided within the pier ties, attachments shall be provided to the earthen wall system to laterally secure it.

Section R614.9.1 Pier Cap. A solid concrete cap shall be provided at the top of load bearing piers under all concentrated loads. The cap shall cover not less than 50% of the top of the pier.

Section R614.10 Chases. Chases and recesses in earthen walls shall not be deeper than one-half the thickness of the wall. The maximum length of a horizontal chase or horizontal projection shall not exceed 4 feet (1219 mm), and shall have at least 8 inches (203.2 mm) of masonry in back of the chases and recesses and between adjacent chases or recesses and the jambs of openings.

Chases and recesses in earthen walls shall be designed and constructed so as not to reduce the required strength or required fire resistance of the wall and in no case shall a chase or recess be permitted within the required area of a pier. Masonry directly above chases or recesses wider than 12 inches (304.8 mm) shall be supported on noncombustible lintels.

Section R614.11 Stack bond. When the earthen wall is constructed of units, (e.g. adobe brick), units shall not be laid in stack bond. Units shall, in all locations throughout the wall system, overlap the courses below by not less than one-third the dimension of the units.

Section R614.12 Metal reinforcement. In addition to bonding earthen walls shall be anchored at their intersections, all walls shall be reinforced with joint reinforcement at vertical intervals of not more than 16 inches (406.4 mm). Horizontal reinforcement shall be continuous at the intersections. Reinforcement shall be not more than 4 inches narrower than the wall thickness.

Section R614.13 Veneer. All veneers using earthen materials shall be installed in accordance with this section. Such veneers shall be installed with a noncombustible foundation, over concrete masonry, a backing of wood or cold-formed steel and shall be limited to the first story above grade and be not less than 4 inches (101.6 mm) or greater than 8 inches (203.2 mm) in thickness. Veneers shall not exceed a height of over 20 times their thickness without structural vertical support.

Section R614.13.1 Anchorage. Earth units shall be anchored to the supporting wall with a corrosion-resistant veneer tie system mechanically attached to continuous horizontal joint reinforcement continuously installed in the veneer bed joint not less than 16 inches (406.4 mm) on center vertically. When earth mortar systems are used the tie system shall prevent the accumulation of mortar at the base of the veneer. Conventional brick ties shall not be used to anchor earth units.

Section R614.13.2 Air space. The veneer shall be separated from the sheathing by an air space of a

minimum of 1 inch (25.4 mm) but not more than 2 inches (50.8 mm). A moisture-resistant barrier or 15 lb. asphalt-saturated felt shall be provided except when veneer is applied over concrete masonry or concrete backing.

Section R614.13.3 Flashing. Approved corrosion-resistive flashing shall be provided in the exterior wall envelop in such a manner as to prevent entry of water into the wall cavity or penetration of water into the building structural framing components. The flashing shall extend to the surface of the exterior wall finish and shall be installed to prevent water from reentering the exterior wall envelope. Flashing shall be located beneath the first course of veneer, and at other points of support, including structural floors, shelf angles and lintels. Approved corrosion-resisting flashing shall be installed at all of the following locations:

1. At top of all exterior window and door openings in such a manner as to be leak proof.
2. At the intersection of chimneys or other masonry construction with frame or stucco walls, with projecting lips on both sides under stucco copings.
3. Under and at the ends of masonry, wood or metal copings and sills.
4. Where exterior porches, decks or stairs attach to a wall or floor assembly of wood-frame construction.
5. At wall and roof intersections.

Section R614.13.4 Weep holes. Weep holes shall be provided in the outside withe of masonry walls at a maximum spacing of 33 inches (838.2 mm) on center. Weep holes shall not be less than 3/16 inches (4.76 mm) in diameter. Weep holes shall be located immediately above the flashing.

Section R614.13.5 Plaster veneer. Both interior and exterior faces of earthen walls which are to be plastered with cement plaster shall be lathed and plastered in accordance with the International Residential Code.

Section R614.14 Buttresses. Earthen walls used as buttresses shall not extend beyond an average length perpendicular to the wall to be braced a distance of 6 feet (1829 mm) without consideration to out-of-plane bending of the buttress.

Section R614.15 Gable end walls. Gable end walls shall be constructed using veneer construction or shall be provided with lateral bracing to prevent overturn designed in accordance with the approved Standard for IBC Earthen Structures.

Section R614.16 Ledgers. Ledgers shall not be used to support vertical live and dead loads in excess of 75 lbs. per lineal foot.

Section R614.17 Construction documents. Drawings for earthen structures shall include the following:

1. The Sds number of the site.
2. The wind speed and site exposure coefficient of the site.
3. The material standard to which the earthen materials will comply.

4. The foundation supporting system and moisture barrier material.
5. The length, height and thickness in the actual dimensions of all earthen walls and parapets.
6. The bond beam or tie beam construction and attachment method to the earthen wall.
7. Lintel design, construction and end bearing area.
8. Veneer dimensions, attachment methods, moisture barrier and supporting structure.
9. Flashing materials and installation.
10. Metal reinforcement type and location.

Section R614.18 Corbeled wall elements. The maximum corbeled projection beyond the face of the wall shall not be more than one fourth of the wall thickness.

Section R614.19 Material standards. The materials used in earthen wall structures shall comply with the following material standards. For each of the tests prescribed in these standards, five full size sample units shall be selected at random from each lot of units or fraction thereof produced. Mass wall systems such as rammed earth shall provide at least five tests for each required standard test series.

Section R614.19.1 Manufacturers of earthen materials. Established manufacturers of earthen materials shall certify compliance with these standards. Copies of their periodic testing shall be supplied to the building official when requested. Literature, advertising and other information supplied by the manufacturer to designers and users of earthen materials shall include the actual dimensions of units, not nominal dimensions.

Section R614.19.2 Onsite earthen materials. Earthen units, mortar, rammed earth wall materials mined, mixed, formulated, and or molded on site shall be tested for compliance with these standards. For individual structures, a set of tests shall be provided for the first 2500 square feet of wall and an additional test for each additional 2500 square feet or portion thereof in the structure. At least one set of tests shall be made for each structure and for each 2500 square feet of patio wall. The fabricator of the materials used in the project shall certify in writing to the building official compliance with these standards. The certification shall include the number of units site molded, size of the units, volume of material used as mortar, dates of fabrication, and results of testing of the material. If materials from established manufacturers and onsite materials are used in the project, copies of records including sources, quantities, and location of use within the structure shall be provided to the building official upon request.

Section R614.19.3 Categories of earthen materials. Type I, II, III, and IV earthen materials are approved for use.

Exception: Type I adobe shall only be used for repairs and small additions in which new walls do not exceed 10% of the surface area of existing walls of Type I construction and for structures constructed of a similar material system and for projects requiring this class of materials to meet historic guidelines.

Required plaster veneer. Adobe of Type I and II shall be protected on the exterior with exterior plaster meeting the requirements of *International Residential Code* applied over wire lath. Type I and II adobe

shall not be used within 4 inches of the floor or at the top of parapet walls or near potential sources of water which may affect the stability of the earth wall system. Other Types of adobe may be left unplastered and may be used without separation from the floor.

Adobe units and mortar. Moisture resistant stabilized adobe units and mortar shall meet the following testing standards as indicated in Table. Type S Portland cement mortar may be used for Type II, III, and IV adobe in lieu of earth mortar.

Table R614.19.3
Required Tests by Material Type

<i>Material Type</i>	Dry Compression	Wet Compression	Modulus of Rupture	Absorption <2.5%	Absorption <5.0%	Moisture Content
I	X		X			X
II	X		X		X	X
III	X		X	X		X
IV		X	X			X

X – Indicates that material must pass the test standards prescribed in this Section

Section R614.19.3.1 Dry compression strength. Determine the compressive strength of the required number of samples in accordance with the following:

1. Dry the specimen. Dry the specimen at a temperature of 85° F+-15° F in an atmosphere having relative humidity of not more than 50 percent. Weigh the specimen at one-day intervals until constant weight is attained.
2. Cap the specimen. The specimen may be suitably capped with calcined gypsum mortar or the bearing surfaces may be rubbed smooth and true. Then calcined gypsum is used for capping, conduct the test after the capping has set and the specimen has been dried to constant weight in accordance with item 1 of this section.
3. Test the Specimen. Test the specimens in the position in which the earthen unit is designed to be used. And bed on and cap with a felt pad not less than 1/8 inch or more than ¼ inch in thickness.
4. Testing equipment. The loading head shall completely cover the bearing area of the specimen and the applied load shall be transmitted through a spherical bearing block of proper design. The speed of the moving head of the testing machine shall not be more than 0.05 inch per minute.
5. Reporting results. Calculate the average compressive strength of the specimens tested and report this as the compressive strength of the block. Units shall have an average dry compressive strength of 300 psi and no individual unit may have a strength of less than 250 psi.

Section R614.19.3.2 Wet compression strength. Determine the compressive strength of the required number of specimen in accordance with the following:

1. Wetting the specimen. Submerge the specimen under water for not less than 8 hours or longer as required until fully saturated.

2. Test the specimen. Immediately test the specimen in the position in which the earthen unit is designed to be used. And bed on and cap with a felt pad not less than 1/8 inch or more than ¼ inch in thickness.
3. Testing equipment. The loading head shall completely cover the bearing area of the specimen and the applied load shall be transmitted through a spherical bearing block of proper design. The speed of the moving head of the testing machine shall not be more than 0.05 inch per minute.
4. Reporting results. Calculate the average compressive strength of the specimens tested and report this as the compressive strength of the block. Adobe units shall have an average wet compressive strength of 300 psi. Five samples shall be tested and no individual unit may have a wet compressive strength of less than 250 psi.

Section R614.19.3.3 Modulus of rupture. Adobe units shall have an average modulus of rupture of 50 psi when tested in accordance with the following procedure. Five samples shall be tested and no individual unit shall have a modulus of rupture of less than 35 psi.

Section R614.19.3.3.1 Support conditions. A cured unit shall be simply supported by 2-inch-diameter cylindrical supports located 2 inches in from each end and extending the full width of the unit.

Section R614.19.3.3.2 Loading conditions. A 2-inch-diameter cylinder shall be placed at mid-span parallel to the supports.

Section R614.19.3.3.3 Testing procedure. A vertical load shall be applied to the cylinder at the rate of 500 pounds per minute until failure occurs.

Section R614.19.3.3.4 Modulus of rupture determination. The modulus of rupture shall be determined by the formula:

Equation 2116.3.3.4-1

$$Fr = 3WLs/2bt^2$$

Where, for the purposes of this section only:

b = Width of the test specimen measured parallel to the loading cylinder, inches.

fr = Modulus of rupture, psi.

Ls = Distance between supports, inches.

T = Thickness of the test specimen measured parallel to the direction of load, inches.

W = The applied load at failure, pounds.

Section R614.19.3.4 Absorption less than 2.5%. A 4-inch cube, cut from an adobe unit fired to a constant weight in a ventilated oven at 212 degrees F to 239 degrees F, shall not absorb more than 2 ½ percent moisture by weight when placed upon a constantly water-saturated, porous surface for 7 days. A minimum of five specimens shall be tested and each specimen shall be cut from a separate unit.

Section R614.19.3.5 Absorption less than 5.0%. A 4-inch cube, cut from an adobe unit fired to a constant weight in a ventilated oven at 212 degrees F to 239 degrees F, shall not absorb more than 5 percent moisture by weight when placed upon a constantly water-saturated, porous surface for 7 days. A minimum of five specimens shall be tested and each specimen shall be cut from a separate unit.

Section R614.19.3.6 Additional Requirements. All earthen units shall meet the following requirements:

1. Moisture content requirements. Earthen units shall have a moisture content not exceeding 4 percent by weight at the time of use.
2. Shrinkage cracks. All earthen units shall not contain more than three shrinkage cracks and any single shrinkage crack shall not exceed 3 inches in length or 1/8 inch in width.
3. Soil requirements. Soil used for moisture resisting adobe units and mortar shall be chemically compatible with the stabilizing material. The soil shall contain sufficient clay to bind the particles together without the aid of stabilizers. The soil shall contain not more than 0.2 percent of water-soluble salts.

Section R614.19.3.7 Cement Stabilized Rammed Earth. Cement stabilized Rammed Earth shall meet the following standards:

1. Testing before Construction. The installer of cement stabilized Rammed Earth shall provide the following testing before issuance of a building permit.
2. Materials from a Licensed Sand and Gravel Producer. A copy of Proctor ASTM D 698 shall be provided for each soil type and source or combination of sources. Periodic testing as provided by the supplier may be supplied to meet this requirement. The soil shall contain not more than 0.2 percent of water-soluble salts.
3. Material Mined and Mixed on Site. A copy of ASTM D 698, ASTM C 117, ASTM C 136, and ASTM D 4318 shall be provided for each soil type and source or combination of sources. Such tests shall be repeated as required to assure that all materials to be used have been tested and are represented by the tests. The soil shall contain not more than 0.2 percent of water-soluble salts.
4. Testing required during Construction. The installer of cement stabilized Rammed Earth shall provide the following tests made during the construction process. A certified testing laboratory shall provide field density tests for comparison to the pre-construction Proctor ASTM D 698, percent moisture ASTM D 2216, dry density ASTM D 698, and percent moisture ASTM D 1556. Cement Stabilized Rammed Earth walls shall meet or exceed 95% maximum dry density (ASTM D 698). Samples taken from the wall shall exceed 300 psi compression (ASTM D 1633) 14 days after placement.

Approved Standard for Earthen IBC Structures

EARTHEN STRUCTURES

Rated Fire-Resistance for Earthen Walls

Material	Item	Construction	4 hour	3 hour	2 hour	1 hour
1a Earthen Walls	1a – 1.1	Solid wall construction utilizing earth as the structural wall	14	12	10	8

Section 2114.1 General. Earthen structures with any site condition may be designed with accepted engineering practice for earthen wall structures and with the provisions of this standard.

Section 2114.1.1 Earthen materials. This section shall establish minimum standards for safety for construction of earthen materials structure, collectively known as adobe, burnt adobe, rammed earth, and hydraulic pressed unit construction.

Section 2114.1.2 Professional registration required. Plans and specifications designed under the provisions of this standard shall be prepared by an Arizona Registrant.

Section 2114.2. Minimum thickness. The minimum thickness of earthen structures shall be designed to limit tension to zero unless tensile reinforcement is provided. Walls shall be designed to meet forces prescribed by the *International Building Code*. The measurement of height of walls shall be the distance between points of lateral support. Wall thickness shall be measured from face to face of each wall with the thickness of walls using raked joints shall be the surface to surface distance of the mortar joints. The withes of wall sections shall not be combined without cross bonding of the masonry units throughout the structural element. Cross bonding shall mean overlapping of not less than 1/3 of the dimension of the masonry units.

Section 2114.3 Support conditions. Earthen structures shall be supported on a solid concrete, solid masonry foundation system the width of which shall be not greater than 1/6 inch narrower than the earthen structure which it supports. Earthen structures shall not be less than 6 inches above adjacent grade.

Section 2114.4 Corbeled wall elements. The maximum corbeled projection beyond the face of the wall shall not be more than 4 inches. Such corbeled projections shall add additional thickness to the wall, the opposite face of the wall remaining plane with the primary wall plane.

Section 2114.5 Moisture barrier. A moisture barrier equal to 30 lb. asphalt impregnated building paper, or equivalent moisture resistant barrier, shall be installed between the supporting foundation and the earthen material.

Section 2114.6 Allowable stresses. Allowable compressive, tensile and shear stresses in earthen structures shall not exceed the values prescribed in Table 2114.6.A. In determining the stresses, the effects of all loads and conditions of loading and the influence of all forces affecting the design and strength of the several parts shall be considered. Bolt values shall not exceed those set forth in *International Building Code* Table 2109.3.3.1.

Section 2114.6.1 Combined units. In walls composed of different kinds or grades of units, materials or mortars, the maximum stress shall not exceed the allowable stress for the weakest of the combination of units, materials and mortars of which the wall is composed. The net thickness of any facing unit of earthen materials used to resist stress shall not be less than 3 inches (76 mm).

When dissimilar materials, (e.g. concrete masonry or steel) are used to support earth wall construction, such elements shall be structurally isolated from other earth wall elements. The design shall recognize, with specific detailing, the effects shrinkage of the earth wall construction may have on the structural integrity of the structure.

Table 2114.6.A	
Allowable Stresses for Empirical Design of Earthen Wall Structures	
Strength of Unit, Gross Area	Allowable Stresses, Gross Sectional Area ¹
Compression: 300 psi	Compressive Stress: 30 psi
Modulus of rupture: 50 psi	Allowable tension w/o tensile reinforcing: 0 psi
Shear: N/A	Shear with Special Inspection: 8 psi
	Shear w/o Special Inspection: 4 psi
Modulus of Elasticity: 60,000 psi	Allowable Deflection: Less than 0.5%
Notes:	
1. Gross cross-sectional area shall be calculated on the actual rather than the nominal dimensions.	

Section 2114.7 Lateral support. Earthen walls shall be laterally supported in the vertical direction and at intersection with other earthen walls. Support at the top of the wall shall in accordance with one of the methods in Section 2114.7.1 or Section 2114.7.2.

Section 2114.7.1 Bond beams. A continuous bond beam system embedded in the earthen walls, designed to provide lateral support for the walls without the aid of additional bracing elements such as roof diaphragm. Bond beams of concrete or masonry shall be not less than the width of the wall minus 6 inches (152.4 mm).

Section 2114.7.1.1 Bond beam anchorage. Bond beams shall be anchored to earthen walls at intervals of not over 48 inches (1219 mm) by a connection with shear strength of not less than the

shear forces in both directions. The shear between a cast in place concrete bond beam and the earthen wall shall not exceed 1/8 the dead load at the base of the bond beam unless alternate attachment is provided compatible with the allowable stresses in Table 2114.6.A or *International Building Code* Table 2109.3.3.1.

Section 2114.7.2 Roof diaphragm. A roof diaphragm complying with other provisions of this code adequate to provide lateral support may be used to brace earthen walls. Anchorage shall be tie beams as specified in Section 2114.7.2.2 or other anchorage methods of equal strength.

Section 2114.7.2.1 Tie beams. A tie beam is a beam built into the earthen wall for the purpose of anchoring the roof diaphragm and transferring the lateral perpendicular and parallel forces. Tie beams shall be provided for all earthen walls laterally braced by a roof diaphragm.

Section 2114.7.2.2 Tie beam anchorage. Tie beams shall be anchored to earthen walls at intervals of not over 48 inches (1219 mm) by a connection with shear strength of not less than the shear forces in both directions. The shear between a cast in place concrete or masonry tie beam and the earthen wall shall not exceed 1/8 the dead load at the base of the bond beam unless alternate attachment is provided compatible with the allowable stresses in Table 2114.6.A or *International Building Code* Table 2109.3.3.1.

Section 2114.8 Lintels. Earthen walls over openings shall be supported by steel lintels, reinforced concrete or masonry lintels or earthen material arches designed to support load imposed. Lintels shall not be supported by rigid structural columns, frames or posts with rigidities greater than the earthen wall unless the design allows for the potential for differential settlements. Small openings less than 12" (304.8 mm) may be constructed without structural lintels.

Section 2114.9 Shear walls. Earthen walls subject to in-plane loads shall be designed to be tension free unless tensile reinforcement is provided. Solid panels less than 4 feet (1219 mm) shall not be considered shear walls.

Section 2114.10 Opening jambs. Portions of walls between openings shall be constructed with lengths of not less than 1 ½ times the thickness of the wall in which they occur.

Section 2114.11 Freestanding piers. Piers independent of earthen walls shall be designed to support vertical and horizontal loads unless braced by other elements of the structure. Tensile reinforcement shall be provided where tension occurs. When structural posts or columns are provided within the pier ties, attachments shall be provided to the earthen wall system to laterally secure it.

Section 2114.11.1 Pier cap. A solid concrete cap shall be provided at the top of load bearing piers under all concentrated loads. The cap shall cover not less than 50% of the top of the pier.

Section 2114.12 Chases. Chases and recesses in earthen walls shall not be deeper than one-third the thickness of the wall thickness. The maximum length of a horizontal chase or horizontal projection shall not exceed 4 feet (1219 mm), and shall have at least 8 inches (203 mm) of earthen construction in back of the chases and recesses and between adjacent chases or recesses and at least 12 inches (305 mm) between the chase and the jambs of openings.

Chases and recesses in earthen walls shall be designed and constructed so as not to reduce the

required strength or required fire resistance of the wall and in no case shall a chase or recess be permitted within the required area of a pier. Earthen walls directly above chases or recesses wider than 16 inches (305 mm) shall be supported on noncombustible lintels.

Section 2114.13 Stack bond. When the earthen wall is constructed of units, (e.g. adobe brick), units shall not be laid in stack bond. Units shall, in all locations throughout the wall system, overlap the courses below by not less than one-third the dimension of the units.

Exception: Ornamental non-structural elements may be laid in stack bond if properly tied to the main structure.

Section 2114.14 Metal reinforcement. All walls shall be anchored at their intersections, at vertical intervals of not more than 16 inches (406 mm) with joint reinforcement of at least 9 gage when using earthen units (e.g. adobe block). Horizontal reinforcement shall be used throughout the wall system and be continuous at the intersections. Reinforcement used throughout the wall system shall be not more than 4 inches narrower than the wall thickness.

Section 2114.15 Veneer. All veneers using earthen materials shall be installed in accordance with this section. Such veneers shall be installed with a noncombustible foundation, over concrete masonry, a backing of wood or cold-formed steel and the veneer shall be not less than 4 inches (101 mm) or greater than 8 inches (203 mm) in thickness.

Section 2114.15.1 Anchorage. Earth units shall be anchored to the supporting wall with a corrosion-resistant veneer tie system mechanically attached to continuous horizontal joint reinforcement continuously installed in the veneer bed joint not less than 16 inches (406 mm) on center vertically. When earth mortar systems are used the tie system shall prevent the accumulation of mortar at the base of the veneer. Conventional brick ties shall not be used to anchor earth units.

Section 2114.15.2 Air space. The veneer shall be separated from the sheathing by an air space of a minimum of 1 inch (25 mm) but not more than 2 inches (51 mm). A weather-resistant membrane or 15 lb. asphalt-saturated felt shall be provided except when veneer is applied over concrete masonry or concrete backing.

Section 2114.15.3 Flashing. Approved corrosion-resistive flashing shall be provided in the exterior wall envelop in such a manner as to prevent entry of water into the wall cavity or penetration of water into the building structural framing components. The flashing shall extend to the surface of the exterior wall finish and shall be installed to prevent water from reentering the exterior wall envelope. Flashing shall be located beneath the first course of veneer, and at other points of support, including structural floors, shelf angles and lintels. Approved corrosion-resisting flashing shall be installed at all of the following locations:

- At top of all exterior window and door openings in such a manner as to be leak proof.
- At the intersection of chimneys or other masonry construction with frame or stucco walls, with projecting lips on both sides under stucco copings.
- Under and at the ends of masonry, wood or metal copings and sills.
- Where exterior porches, decks or stairs attach to a wall or floor assembly of wood – frame construction.

- At wall and roof intersections.

Section 2114.15.4 Weep holes. Weep holes shall be provided in the outside with of masonry walls at a maximum spacing of 33 inches (838 mm) on center. Weep holes shall not be less than 3/16 inches (4.8 mm) in diameter. Weep holes shall be located immediately above the flashing.

Section 2114.16 Buttresses. Earthen walls used as buttresses shall not extend beyond an average length perpendicular to the wall to be braced a distance of 6 feet (1830 mm) without consideration to out-of-plane bending of the buttress.

Section 2114.17 Gable End Walls. Gable end walls shall be constructed using veneer construction as required by Section 2114.15 or shall be provided with lateral bracing to prevent overturn.

Section 2114.18 Ledgers. Ledgers shall not be used to support vertical live and dead loads in excess of 75 lbs. per lineal foot unless the tension in the wall due to bending from out-of-plane loads and the eccentric load from the ledger is zero.

Section 2114.19 Material standards. The materials used in earthen wall structures shall comply with the following material standards. For each of the tests prescribed in these standards, five full size sample units shall be selected at random from each lot of units or fraction thereof produced. Mass wall systems such as rammed earth shall provide five tests for each required standard test series.

Section 2114.19.1 Manufacturers of earthen materials. Established manufacturers of earthen materials shall certify compliance with these standards. Copies of their periodic testing shall be supplied to the building official when requested. Literature, advertising and other information supplied by the manufacturer to designers and users of earthen materials shall include the actual dimensions of units, not nominal dimensions.

Section 2114.19.2 Onsite earthen materials. Earthen units, mortar, rammed earth wall materials mined, mixed, formulated, and or molded on site shall be tested for compliance with these standards. For individual structures, a set of tests shall be provided for the first 2500 square feet of wall and an additional test for each additional 2500 square feet or portion thereof in the structure. At least one set of tests shall be made for each structure and for each 2500 square feet of patio wall. The fabricator of the materials used in the project shall certify in writing to the building official compliance with these standards. The certification shall include the number of units site molded, size of the units, volume of material used as mortar, dates of fabrication, and results of testing of the material. If materials from established manufacturers and onsite materials are used in the project, copies of records including sources, quantities, and location of use within the structure shall be provided to the building official upon request.

Section 2114.19.3 Categories of earthen materials. Type I, II, III, and IV earthen materials are approved for use in construction of projects designed in accordance with Section 2114.

Exception: Type I adobe shall only be used for repairs and small additions in which new walls do not exceed 10% of the surface area of existing walls of Type I construction and for structures constructed of a similar material system and for projects requiring this class of materials to meet historic guidelines.

Required plaster veneer. Adobe of Type I and II shall be protected on the exterior with exterior plaster

meeting the requirements of IBC Section 2512 applied over wire lath. Type I and II adobe shall not be used within 4 inches (102mm) of the floor or at the top of parapet walls or near potential sources of water which may affect the stability of the earth wall system. Other Types of adobe may be left unplastered and may be used without separation from the floor.

Adobe units and mortar. Moisture resistant stabilized adobe units and mortar shall meet the following testing standards as indicated in Table 2114.19. Type S portland cement mortar may be used for Type II, III, and IV adobe in lieu of earth mortar.

Table 2114.16.3.1

<i>Material Type</i>	Dry Compression	Wet Compression	Modulus of Rupture	Absorption <2.5%	Absorption <5.0%	Moisture Content
I	X		X			X
II	X		X		X	X
III	X		X	X		X
IV		X	X			X

X – Indicates that material must pass the test standards prescribed in this Section

Section 2114.19.4.1 Dry compression strength. Determine the compressive strength of the required number of samples in accordance with the following:

1. Dry the specimen. Dry the specimen at a temperature of 85° F+-15° F in an atmosphere having relative humidity of not more than 50 percent. Weigh the specimen at one-day intervals until constant weight is attained.
2. Cap the specimen. The specimen may be suitably capped with calcined gypsum mortar or the bearing surfaces may be rubbed smooth and true. Then calcined gypsum is used for capping, conduct the test after the capping has set and the specimen has been dried to constant weight in accordance with item 1 of this section.
3. Test the Specimen. Test the specimens in the position in which the earthen unit is designed to be used. And bed on and cap with a felt pad not less than 1/8 inch or more than ¼ inch in thickness.
4. Testing equipment. The loading head shall completely cover the bearing area of the specimen and the applied load shall be transmitted through a spherical bearing block of proper design. The speed of the moving head of the testing machine shall not be more than 0.05 inch (1.27mm) per minute.
5. Reporting results. Calculate the average compressive strength of the specimens tested and report this as the compressive strength of the block. Units shall have an average dry compressive strength of 300 psi (2068 kPa) and no individual unit may have a strength of less than 250 psi (1724 kPa).

Section 2114.19.4.2 Wet compression strength. Determine the compressive strength of the required number of specimen in accordance with the following:

1. Wetting the specimen. Submerge the specimen under water for not less than 8 hours or longer as required until fully saturated.
2. Test the specimen. Immediately test the specimen in the position in which the earthen unit is designed to be used. And bed on and cap with a felt pad not less than 1/8 inch (3.2mm) or more than ¼ inch (6.4mm) in thickness.
3. Testing equipment. The loading head shall completely cover the bearing area of the specimen and the applied load shall be transmitted through a spherical bearing block of proper design. The speed of the moving head of the testing machine shall not be more than 0.05 inch (1.27mm) per minute.
4. Reporting results. Calculate the average compressive strength of the specimens tested and report this as the compressive strength of the block. Adobe units shall have an average wet compressive strength of 300 psi (2068 kPa). Five samples shall be tested and no individual unit may have a wet compressive strength of less than 250 psi (1724 kPa).

Section 2114.19.5 Modulus of rupture. Adobe units shall have an average modulus of rupture of 50 psi (345 kPa) when tested in accordance with the following procedure. Five samples shall be tested and no individual unit shall have a modulus of rupture of less than 35 psi (241 kPa).

Section 2114.19.5.1 Support conditions. A cured unit shall be simply supported by 2-inch-diameter (51 mm) cylindrical supports located 2 inches (51 mm) in from each end and extending the full width of the unit.

Section 2114.19.5.2 Loading conditions. A 2-inch-diameter (51 mm) cylinder shall be placed at midspan parallel to the supports.

Section 2114.19.5.3 Testing procedure. A vertical load shall be applied to the cylinder at the rate of 500 pounds per minute (37 N/s) until failure occurs.

Section 2114.19.5.4 Modulus of rupture determination. The modulus of rupture shall be determined by Equation 2116.3.1.3.4-1.

Equation 2114.19.5.4

$$Fr = 3WLs/2bt^2$$

Where, for the purposes of this section only:

b = Width of the test specimen measured parallel to the loading cylinder, inches (mm).

fr = Modulus of rupture, psi (Mpa).

Ls = Distance between supports, inches (mm).

t = Thickness of the test specimen measured parallel to the direction of load, inches (mm).

W = The applied load at failure, pounds (N).

Section 2114.19.6 Absorption less than 2.5%. A 4-inch (102 mm) cube, cut from an adobe unit fired to a constant weight in a ventilated oven at 212 degrees F to 239 degrees F, shall not absorb more than 2 ½ percent moisture by weight when placed upon a constantly water-saturated, porous surface for 7 days. A minimum of five specimens shall be tested and each specimen shall be cut from a separate unit.

Section 2114.19.7 Absorption less than 5.0%. A 4-inch (102 mm) cube, cut from an adobe unit fired to a constant weight in a ventilated oven at 212 degrees F to 239 degrees F, shall not absorb more than 5

percent moisture by weight when placed upon a constantly water-saturated, porous surface for 7 days. A minimum of five specimens shall be tested and each specimen shall be cut from a separate unit.

Section 2114.19.8 Additional requirements. All earthen units shall meet the following requirements:

1. Moisture content requirements. Earthen units shall have a moisture content not exceeding 4 percent by weight at the time of use.
2. Shrinkage cracks. All earthen units shall not contain more than three shrinkage cracks and any single shrinkage crack shall not exceed 3 inches (76.2mm) in length or 1/8 inch (3.2mm) in width.
3. Soil requirements. Soil used for moisture resisting adobe units and mortar shall be chemically compatible with the stabilizing material. The soil shall contain sufficient clay to bind the particles together without the aid of stabilizers. The soil shall contain not more than 0.2 percent of water-soluble salts.

Section 2114.19.9 Cement stabilized rammed earth. Cement stabilized Rammed Earth shall meet the following standards:

1. Testing before construction. The installer of cement stabilized Rammed Earth shall provide the following testing before issuance of a building permit.
2. Materials from a licensed sand and gravel producer. A copy of Proctor ASTM D 698 shall be provided for each soil type and source or combination of sources. Periodic testing as provided by the supplier may be supplied to meet this requirement. The soil shall contain not more than 0.2 percent of water-soluble salts.
3. Material mined and mixed on site. A copy of ASTM D 698, ASTM C 117, ASTM C 136, and ASTM D 4318 shall be provided for each soil type and source or combination of sources. Such tests shall be repeated as required to assure that all materials to be used have been tested and are represented by the tests. The soil shall contain not more than 0.2 percent of water-soluble salts.
4. Testing required during construction. The installer of cement stabilized Rammed Earth shall provide the following tests made during the construction process. A certified testing laboratory shall provide field density tests for comparison to the pre-construction Proctor ASTM D 698, percent moisture ASTM D 2216, dry density ASTM D 698, and percent moisture ASTM D 1556. Cement Stabilized Rammed Earth walls shall meet or exceed 95% maximum dry density (ASTM D 698). Samples taken from the wall shall exceed 300 psi compression (2068 kPa) (ASTM D 1633) 14 days after placement.

Approved Standard for Straw-Bale Construction

Straw-Bale Structures

Section 101 Purpose. The purpose of this appendix chapter is to establish minimum prescriptive standards of safety for the construction of structures which use baled straw as a load bearing or non-load bearing material.

Section 102 Scope. The provisions of this chapter shall apply to all structures utilizing straw-bales in the construction of wall systems.

Section 103 Definitions. For the purpose of this chapter, certain terms are defined as follows:

STRAW is the dry stems of cereal grains left after the seed heads have been removed.

BALES are rectangular compressed blocks of straw, bound by strings or wire.

FLAKES are slabs of straw removed from an untied bale. Flakes are used to fill small gaps between the ends of stacked bales.

LAID FLAT refers to stacking bales so that the sides with the largest cross-sectional area are horizontal and the longest dimension of this area is parallel with the wall plane.

LAID ON-EDGE refers to stacking bales so that the sides with the largest cross-sectional area are vertical and the longest dimension of this area is horizontal and parallel with the wall plane.

Section 104 Materials

Section 104.1 Specifications for Bales.

Section 104.1.1 Type of Straw. Bales of various types of straw, including, but not limited to, wheat, rice, rye, barley, oats and similar plants, shall be acceptable if they meet the minimum requirements for density, shape, moisture content, and ties.

Section 104.1.2 Shape. Bales shall be rectangular in shape.

Section 104.1.3 Dimensions. Bales used within a continuous wall shall be of consistent height and width to ensure even distribution of loads within wall systems.

Section 104.1.4 Ties. Bales shall be bound with ties of either polypropylene string or baling wire. Bales with broken or loose ties shall not be used unless the broken or loose ties are replaced with ties which restore the original degree of compaction of the bale.

Section 104.1.5 Moisture Content. Moisture content of bales, at time of installation, shall not exceed 20% of the total weight of the bale. Moisture content of bales shall be determined by one of the following:

1. Field Method. A suitable moisture meter, designed for use with baled straw or hay, and equipped with a probe of sufficient length to reach the center of the bale, shall be used to determine the average moisture content of 5 bales randomly selected from the bales to be used.
2. Laboratory Method. A total of 5 samples, taken from the center of each of 5 bales randomly selected from the bales to be used, shall be tested for moisture content by a recognized testing lab.

Section 104.1.6 Density. Bales in load-bearing structures shall have a minimum calculated dry density of 7.0 pounds per cubic foot ($112.13\text{kg}/\text{m}^3$). The calculated dry density shall be determined after reducing the actual bale weight by the weight of the moisture content, as determined in Section 104.1.5. The calculated dry density shall be determined by dividing the calculated dry weight of the bale by the volume of the bale.

Section 104.1.7 Custom Size Bales. Where custom-made partial bales are used, they shall be of the same density, same string or wire tension, and, where possible, use the same number of ties as the standard size bales.

Section 105 Construction and General Requirements

Section 105.1 General. Bale walls, when covered with plaster, drywall or stucco shall be deemed to have the equivalent fire resistive rating as wood frame construction with the same wall-finishing system.

Section 105.2 Wall Thickness. Nominal minimum bale wall thickness shall be 14 inches.

Section 105.3 Wall Height. Bale walls shall not exceed one story in height and the bale portion shall not exceed a height to width ratio of 5.6:1 (for example, the maximum height for the bale portion of a 23 inch thick wall would be 10 feet - 8 inches), unless the structure is designed by an Arizona Registrant.

Exception: In the non-load bearing exterior end walls of structures with gable or shed roofs, an approved continuous assembly shall be required at the roof bearing assembly level.

Section 105.4 Unsupported Wall Length. The ratio of unsupported wall length to thickness, for bale walls, shall not exceed 13:1 (for a 23-inch thick wall, the maximum unsupported length allowed is 25 feet), unless the structure is designed by an Arizona Registrant.

Section 105.5 Allowable Loads. The allowable vertical load (live and dead load) on the top of bale walls shall not exceed 360 pounds per square foot (psf) ($15.17\text{kg}/\text{m}^2$) and the resultant load shall act at the center of the wall. Bale structures shall be designed to withstand all vertical and horizontal loads as specified in the *International Building Code* or the *International Residential Code*.

Section 105.6 Foundations. Foundations shall be sized to accommodate the thickness of the bale wall and the load created by the wall and roof live and dead loads. Foundation (stem) walls which support bale walls shall extend to an elevation of not less than 6 inches (152.4mm) above adjacent ground at all points. The minimum width of the footing shall be the width of the bale it supports, except that the bales may overhang the exterior edge of the foundation by not more than 3 inches (76.2mm) to accommodate rigid perimeter insulation. Footings shall extend a minimum of 12 inches (304.8mm) below natural, undisturbed soil, or to frost line, whichever is lower.

Section 105.7 Wall and Roof Bearing Assembly Anchorage

Section 105.7.1 General. Vertical reinforcing bars with a minimum diameter of 1/2" (12.7mm), shall be embedded in the foundation a minimum depth of 6 inches (152.4mm), and shall extend above foundation a minimum of 12 inches (304.8mm). These vertical bars shall be located along the centerline of the bale wall, spaced not more than 2 feet apart (609.6mm). A vertical bar shall also be located within 1 foot (304.8mm) of any opening or corner, except at locations occupied by anchor bolts.

Section 105.7.2 Intersecting Walls. Walls of other materials intersecting bale walls shall be attached to the bale wall by means of one or more of the following methods or an acceptable equivalent:

1. Wooden dowels at least 5/8" (15.88mm) in diameter of sufficient length to provide 12 inches (304.8mm) of penetration into the bale, driven through holes bored in the abutting stud, and spaced to provide one dowel connection per bale.
2. Pointed wooden stakes, at least 12 inches (304.8mm) in length and 1-1/2" (38.1mm) by 3-1/2" (88.9mm) at the exposed end, fully driven into each course of bales, as anchorage points.
3. Bolted or threaded rod connection of the abutting wall, through the bale wall, to a steel nut and steel or plywood plate washer, a minimum of 6 inches (152.4mm) square and a minimum thickness of 3/16" (4.76mm) for steel and 1/2" (12.7mm) for plywood, in at least three locations.

Section 105.7.3 Anchor Bolts. Load bearing bale walls shall be anchored to the foundation by 1/2" (12.7mm) diameter steel anchor bolts embedded at least 7 inches (177.8mm) in the foundation at intervals of 6 feet (1828.8mm) or less. A minimum of two anchor bolts per wall shall be provided with one bolt located within 36 inches (914.4mm) of each end of each wall. Sections of 1/2" (12.7mm) diameter threaded rod shall be connected to the anchor bolts, and to each other, by means of threaded coupling nuts and shall extend through the roof bearing assembly and be fastened with a steel washer and nut. Bale walls and roof bearing assemblies may be anchored to the foundation by means of other methods which are adequate to resist uplift forces resulting from the design wind load. There shall be a minimum of two points of anchorage per wall, spaced not more than 6 feet (1828.8mm) apart, with one located within 36 inches (914.4mm) of each end of each wall.

The dead load of the roof and ceiling systems will produce vertical compression of the bales. Regardless of the anchoring system used to attach the roof bearing assembly to the foundation, prior to installation of wall finish materials, bolts or straps shall be re-tightened to compensate for this compression.

Section 105.7.4 Moisture Barrier. A moisture barrier shall be used between the top of the foundation and the bottom of the bale wall to prevent moisture from migrating through the foundation into the bottom course of bales. This barrier shall consist of one of the following:

1. Cementitious waterproof coating;
2. Type 30 asphalt felt over an asphalt emulsion;
3. Sheet metal flashing, sealed at joints;
4. Other approved building moisture barrier. All penetrations through the moisture barrier, as well as all joints in the barrier, must be sealed with asphalt, caulking or an approved sealant.

Section 105.7.5 Stacking and Pinning. Bales in load-bearing walls shall be laid flat and stacked in running bond where possible, with each bale overlapping the two bales beneath it. Bales in non load-bearing walls may be laid either flat or on-edge and stacked in running bond where possible. Overlaps shall be a minimum of 12 inches (304.8mm). Gaps between the ends of bales which are less than 6 inches (152.4mm) in width can be filled by an untied flake inserted snugly into the gap.

The first course of bales shall be laid by impaling the bales on the vertical bars or threaded rods, if any, extending from the foundation. When the fourth course has been laid, #4 rebar pins, or an acceptable equivalent, long enough to extend through all four courses, shall be driven down through the bales, two in each bale, located so that they do not pass within 6 inches (152.4mm) of, or through the space between the ends of any two bales. The layout of these pins shall approximate the layout of the vertical bars extending from the foundation. As each subsequent course is laid, two such pins, long enough to extend through the course being laid and the three courses immediately below it, shall be driven down through each bale. This pinning method shall be continued to the top of the wall. In walls seven or eight courses high, pinning at the fifth course may be eliminated.

Only full-length bales shall be used at corners of load bearing walls, unless exceptions are designed by an Arizona Registrant.

Vertical #4 rebar pins, or an acceptable alternative, shall be located within 1 foot of all corners or door openings.

Staples, made of #3 or larger rebar formed into a "U" shape, at least 18 inches (457.2mm) long with two 6 inch (152.4mm) legs, shall be used at all corners of every course, driven with one leg into the top of each abutting corner bale. In lieu of staples, corner bales may be tied together, by a method approved by the building official.

Section 105.7.5.1 Alternative Pinning Method. When the third course has been laid, vertical #4 rebar pins, or an acceptable equivalent, long enough to extend through all three courses, shall be driven down through the bales, two in each bale, located so that they do not pass within 6 inches (152.4mm) of, or through the space between the ends of any two bales. The layout of these rebar pins shall approximate the layout of the rebar pins extending from the foundation. As each subsequent course is laid, two such pins, long enough to extend through that course and the two courses immediately below it shall be driven down through each bale. This pinning method shall be continued to the top of the wall.

Section 105.7.6 Roof Bearing Assembly. Load bearing bale walls shall have a roof bearing assembly at the top of the wall to bear the roof load and to provide a means of connecting the roof structure to the foundation. The roof bearing assembly shall be continuous along the tops of structural walls.

An acceptable roof bearing assembly option consists of two double 2" X 6" (50.8mm X 152.4mm), or larger, horizontal top plates, one located at the inner edge of the wall and the other at the outer edge. Connecting the two doubled top plates and located horizontally and perpendicular to the length of the wall shall be 2" X 6" (50.8mm X 152.4mm) cross members spaced no more than 72 inches (1828.8mm) center to center, and as required to align with the threaded rods extending from the anchor bolts in the foundation. The double 2" X 6" (50.8mm X 152.4mm) top plates shall be face nailed with 16d nails staggered at 16 inches (406.4mm) on center, with laps and intersections face nailed with four 16d nails. The cross members shall be face nailed to the top plates with four 16d nails at each end. Corner connections shall include overlaps nailed as above or an acceptable equivalent such as plywood gussets

or metal plates. Alternatives to this roof bearing assembly option must provide equal or greater vertical rigidity and provide horizontal rigidity equivalent to a continuous double 2" X 4" (50.8mm X 101.6mm) top plate.

The connection of roof framing members to the roof bearing assembly shall comply with the appropriate sections of the *International Residential Code* or *International Building Code*.

Section 105.7.7 Openings and Lintels. All openings in load bearing bale walls shall be a minimum of one full bale length from any outside corner, unless exceptions are designed by an Arizona Registrant.

Section 105.7.7.1 Openings. Openings in exterior bale walls shall not exceed 50 percent of the total wall area, based on interior dimensions, where the wall is providing resistance to lateral loads, unless the structure is designed by an Arizona Registrant.

Section 105.7.7.2 Lintels. Wall and/or roof load present above any opening shall be carried, or transferred to the bales below by one of the following:

1. A structural frame,
2. A lintel (such as an angle-iron cradle, wooden beam, wooden box beam). Lintels shall be at least twice as long as the opening is wide and extend at least 24" (609.6mm) beyond either side of the opening. Lintels shall be centered over openings, and shall not exceed the load limitations of Section 105.5 by more than 25 percent.

Section 105.7.8 Moisture Protection. All weather-exposed bale walls shall be protected from water damage. An approved building moisture barrier shall be used to protect at least the bottom course of bales, but not more than the lower one-third of the vertical exterior wall surface, in order to allow natural transpiration of moisture from the bales. The moisture barrier shall have its upper edge inserted at least 6 inches (152.4mm) into the horizontal joint between two courses of bales, and shall extend at least 3 inches (76.2mm) below the top of the foundation. Bale walls shall have special moisture protection provided at all window sills. Unless protected by a roof, the tops of walls shall also be protected. This moisture protection shall consist of a waterproof membrane, such as asphalt-impregnated felt paper, polyethylene sheeting, or other acceptable moisture barrier, installed in such manner as to prevent water from entering the wall system at window sills or at the tops of walls.

Section 105.7.9 Wall Finishes. Interior and exterior surfaces of bale walls shall be protected from mechanical damage, flame, animals, and prolonged exposure to water. Bale walls adjacent to bath and shower enclosures shall be protected by a moisture barrier.

Cement stucco shall be reinforced with galvanized woven wire stucco netting or an acceptable equivalent. Such reinforcement shall be secured by attachment through the wall at a maximum spacing of 24 inches (609.6mm) horizontally and 16 inches (406.4mm) vertically.

Where bales abut other materials, the plaster/stucco shall be reinforced with galvanized expanded metal lath, or an acceptable equivalent, extending a minimum of 6 inches (152.4mm) onto the bales.

Earthen and lime-based plasters may be applied directly onto the exterior and interior surface of bale walls without reinforcement, except where applied over materials other than straw. Weather-exposed earthen plasters shall be stabilized.

Lime based plasters may be applied directly onto the exterior surface of bale walls without reinforcement, except where applied over materials other than straw.

Section 105.7.10 Electrical. Type NM or UF cable may be used, or wiring may be run in metallic or nonmetallic conduit systems. Electrical boxes shall be securely attached to wooden stakes driven a minimum of 12 inches into the bales, or an acceptable equivalent.

Section 105.7.11 Plumbing. Water or gas pipes within bale walls shall be encased in a continuous pipe sleeve to prevent leakage within the wall. Where pipes are mounted on bale walls, they shall be isolated from the bales by a moisture barrier.

Section 106 Patio/Landscape Walls

Section 106.1 General. This section covers freestanding or attached bale privacy or landscape walls, not exceeding 6 feet (1828.8mm) in height, from final grade to top of wall. Bales may be stacked either flat or on-edge. Alternate methods, other than those listed in this section, may be approved by the building official.

Section 106.2 Foundations. The minimum foundation shall consist of an 8 inch thick reinforced concrete stem wall, over an approved footing. Minimum width of the stem wall shall be equal to the width of the bottom bale. Stem walls shall have continuous horizontal reinforcement consisting of two #4 bars with 24 inches (609.6mm) minimum lap at splices.

Section 106.2.1 Reinforcement. Vertical reinforcing bars, a minimum 3/8" (9.53mm) in diameter, shall be placed in the center of the stem wall, two per bale, and extend up a minimum of 24 inches (609.6mm), and be embedded a minimum of 4 inches (101.6mm) into the concrete stem wall. Bales shall be pinned, using two 3/8" (9.53mm) diameter bars per bale, and use pins long enough to provide at least one vertical bar from stem wall to top of wall, with a minimum of one full bale overlap where not continuous.

For the purpose of attaching stucco mesh to the wall, 12d or larger galvanized common double-headed nails shall be embedded in the concrete a minimum of 1 inch (25.4mm) below the top of the stem wall, with the heads embedded a minimum of 2 inches (50.8mm) into the concrete, and the points extending a minimum of 3/4" (19.05mm) from the face of the stem wall, and spaced a minimum of 6" (152.4mm) on center on both sides of the wall.

Section 106.2.2 Moisture Barrier. A moisture barrier shall be used between the top of the stem wall and the first course of bales. A moisture barrier shall also be used to protect the tops of bales at the top of walls, and shall extend 6 inches (152.4mm) down on either side of the wall.

Section 106.2.3 Stucco Mesh. Stucco mesh, 20 gauge or heavier, shall be attached by means of clinching the embedded nails on one side of the wall, stretching a continuous piece of netting tightly over the top of the wall, and fastening the netting in the same manner on the opposite side of the wall.

Section 106.2.4 Wall Finish. Walls shall be finished with cement stucco, or stabilized mud plaster, with a minimum thickness of 7/8" (22.23mm).

Maricopa Association of Governments Building Code Amendments and Standards Manual BCAS #4	
Title: Revision to International Residential Code Table R301.2(1)	
Originally Reviewed by MAG Building Codes Committee: 11/14/2001	
Updated by MAG Building Codes Committee: 4/17/2013	

Table R301.2(1), insert the following design criteria:

GROUND SNOW LOAD	0 psf
WIND DESIGN Speed	90 mph Exposure B
WIND DESIGN Topographic effects	NO
SEISMIC DESIGN CATEGORY	B
SUBJECT TO DAMAGE FROM Weathering	NEGLIGIBLE
SUBJECT TO DAMAGE FROM Frost Line Depth	12"
SUBJECT TO DAMAGE FROM Termite	MODERATE TO HEAVY
WINTER DESIGN TEMP	34 degrees F
ICE BARRIER UNDERLAYMENT REQUIRED	NO
FLOOD HAZARDS	National Flood Insurance Program 040049"
AIR FREEZING INDEX	0
MEAN ANNUAL TEMP	71.2 degrees F

In footnotes i and j delete "www.ncdc.noaa.gov/fpsf.html" and replace with www.ncdc.noaa.gov/oa/fpsf/AFI-pubreturn.pdf

Maricopa Association of Governments Building Code Amendments and Standards Manual BCAS #5	
Title: Sample Agreement to Relocate a Gas Line without a Permit	
Originally Reviewed by MAG Building Codes Committee: 2/20/2002	
Updated by MAG Building Codes Committee: 11/14/2012	

To: Southwest Gas Corporation
From: _____ (Town, City or County Name)
Date: _____
Subject: House-line permitting and inspections

The _____ (Town, City or County) of _____ (Name) agrees to allow Southwest Gas Corporation and/or its contractors to extend above ground, external house-lines up to a maximum of twenty feet (20', one length of pipe with no elbows or couplings) without the need of permits or inspections - when conditions make it necessary to relocate company facilities. Southwest Gas Corporation or its contractors will not alter or make repairs to any other portion of the existing house-line without first obtaining a permit and inspection. A meter clock test or drop test will be performed on the customer's house-line and liquid leak detector (soap) will be used on all visible connections.

Southwest Gas Corporation will extend house-lines up to a maximum of twenty feet (20', one length of pipe with no elbows or couplings), without permits and inspections, only when the company generates the need. When the customer generates the need, Southwest Gas Corporation will follow the normal permitting and inspection process.

Maricopa Association of Governments Building Code Amendments and Standards Manual BCAS #6	
Title: Permit Submittal Requirements for Residential Solar Domestic Hot Water Systems	
Originally Reviewed by MAG Building Codes Committee: 4/16/2003	
Updated by MAG Building Codes Committee: 5/16/2012	

This standard sets forth submittal requirements for securing the necessary plumbing/building permits for single-family residential Solar Domestic Hot Water systems.

1. The location of the solar panel system shall be indicated on the plans, including roof plan, elevation and mounting details for panel installation.
2. Structural analysis shall be required and/or on file for systems with water storage on roof (e. g. – integrated collector storage systems or thermosyphon systems).
3. Systems structural engineering analysis shall not be required for flat plate collectors whose weight does not exceed 20 lbs per square foot on roof slopes of 4/12 or less and 16 lbs per square foot on roof slopes greater than 4/12.
4. Standard plans (where permitted by local jurisdiction) shall be on file, including Solar Rating and Certification Corporation (SRCC) System Data (specification sheet).
5. Note on plans that Solar Domestic Water Heating equipment shall be installed in accordance with applicable plumbing codes and in accordance with SRCC and State of Arizona Guidelines.
6. Replacement of Solar Domestic Water Heating systems shall be treated the same as a water heater replacement.

NOTE:

Local planning and zoning regulations involving such requirements as setback, height limitations, color, reflectivity or other design considerations, may apply. See the local governing jurisdiction for further information.

Maricopa Association of Governments Building Code Amendments and Standards Manual BCAS #7	
Title: Uniform Application for Fireblocking per Section 302.11 of the 2012 International Residential Code (IRC)	
Originally Reviewed by MAG Building Codes Committee: 5/21/2003	
Updated by MAG Building Codes Committee: 6/20/2012	

2012 IRC Section 302.11 states: “**Fireblocking.** In combustible construction, fireblocking shall be provided to cut off all concealed draft openings (both vertical and horizontal) and to form an effective fire barrier between stories, and between a top *story* and the roof space.

Fireblocking shall be provided in wood-frame construction in the following locations:

1. In concealed spaces of stud walls and partitions, including furred spaces and parallel rows of studs or staggered studs, as follows:
 - 1.1 Vertically at the ceiling and floor levels.
 - 1.2 Horizontally at intervals not exceeding 10 feet (3048 mm).
2. At all interconnections between concealed vertical and horizontal spaces such as occur at soffits, drop ceilings and cove ceilings.
3. In concealed spaces between stair stringers at the top and bottom of the run. Enclosed spaces under stairs shall comply with Section R302.7.
4. At openings around vents, pipes, ducts, cables and wires at ceiling and floor level, with an *approved* material to resist the free passage of flame and products of combustion. The material filling this annular space shall not be required to meet the ASTM E 136 requirements.
5. For the fireblocking of chimneys and fireplaces, see Section R1003.19.
6. Fireblocking of cornices of a two-family *dwelling* is required at the line of *dwelling unit* separation.”

2012 IRC Section 302.11.1 states, “**Fireblocking materials.** Except as provided in Section R302.11, Item 4, fireblocking shall consist of the following materials:

1. Two-inch (51 mm) nominal lumber.
2. Two thicknesses of 1-inch (25.4 mm) nominal lumber with broken lap joints.
3. One thickness of 23/32-inch (18.3 mm) wood structural panels with joints backed by 23/32-inch (18.3 mm) wood structural panels.
4. One thickness of 3/4-inch (19.1 mm) particleboard with joints backed by 3/4-inch (19.1 mm) particleboard.
5. One-half-inch (12.7 mm) gypsum board.
6. One-quarter-inch (6.4 mm) cement-based millboard.
7. Batts or blankets of mineral wool or glass fiber or other *approved* materials installed in such a manner as to be securely retained in place.
8. Cellulose insulation installed as tested for the specific application.”

2012 IRC Section 302.11.2 states, “**Fireblocking integrity.** The integrity of all fireblocks shall be maintained.”

Analysis of discussion and recommendation

Based on the fact that foam products which are not tested to comply with ASTM E814 or ANSI/UL 1479 are not approved fire block material, the MAG Building Codes Committee consensus is to not allow the use of foam products that are not listed as such to maintain the fireblocking integrity required in the 2012 IRC Section 302.11.2.

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Maricopa Association of Governments Building Code Amendments and Standards Manual BCAS #8	
Title: Recommendations from the Phoenix Residential Post-Tension Round Table Committee	
Originally Reviewed by MAG Building Codes Committee: 10/14/2003	
Updated by MAG Building Codes Committee: 6/20/2013	

Prepared by: **Phoenix Residential Post-Tension Round Table Committee**

This document has been prepared by the Phoenix Residential Post-Tension Round Table Committee as a supplement to the Construction and Maintenance Procedures Manual, 2nd Edition, issued by the Post-Tensioning Institute. This document is intended as a recommended general guide for the design, placement, installation, inspection and maintenance of residential post-tensioned slabs-on-ground in the Phoenix area. The purpose of this document is to address the unique characteristics of residential post-tensioned slabs-on-ground in the Phoenix area.

Recommendations for All Stakeholders

1. Construction shall be performed in conformance with the approved plans and specifications.
2. Any deviation from plans and specification shall require the Engineer's written approval.
3. Any repairs shall require the Engineer's written approval.
4. Engineer shall be notified prior to any slab cutting.
5. Concrete cutting and removal should only be performed by a qualified concrete contractor or post-tension contractor.

Recommendations for the Concrete Contractor

1. Concrete shall be placed monolithically across the entire slab area to be post-tensioned.
2. Cold joints at the garage tire stop, garage stem walls or any other location are unacceptable without the approval of the Engineer of Record. Warm joints (still plastic) shall be squared off prior to subsequent pour.
3. The use of a vibrator or other means of concrete consolidation is critical during the placement of the concrete, especially around the stressing and fixed end anchorage zones. This process eliminates voids in these areas and greatly reduces the possibility of honeycombing, which may lead to concrete blowouts.
4. Tooled control joints may be used, when applicable, to control cracking prior to stressing or for aesthetic reasons. Joint depth shall not exceed 1/5 of slab thickness.
5. A warning stamp that reads "Post-Tension Slab Do Not Cut or Drill" shall be placed in a conspicuous location in the garage.
6. Sub-base shall be compacted to a smooth, level and firm base.

Recommendations for the Post-Tension Contractor

1. Corner bars shall be installed as shown or stated in the Plans.
2. Plumbing boxes shall be reinforced as shown or stated in the Plans.
3. All intersections of slab tendons shall be secured with tie wire *or other means (such as snap chairs)* to prevent displacement during placement of concrete.
4. If wedges are offset more than 1/8 inch, reseal wedges.

Recommendations for the Engineer-of-Record

1. Specify sub-base requirements and choose appropriate coefficient of friction.
2. Identify each tendon by number, with length and elongation range listed.
3. Minimum slab width to receive tendons shall be 10 feet. Any slab width less than 10 feet shall be conventionally reinforced rather than post-tensioned.
4. Perimeter details for equivalent thickness slabs shall show the tendons at mid-depth of the slab and should provide a minimum of 2 inches of concrete cover to the anchor.
5. Backup bars shall be in compliance with the ICBO Report for the specific anchors used in construction.
6. Re-entrant corner bars shall consist of one #5.
7. No reinforcement is required around plumbing pipe penetrations outside of the anchor zone.
8. Reinforcement for plumbing boxes shall be clearly defined.
9. Reinforcement for penetrations in the anchor zone shall be clearly defined.
10. Specify slab thickness tolerance limits.
11. Options should be clearly described and labeled.
12. Vertical concentrated loads associated with holdowns and/or posts shall be addressed in the post-tension slab design.
13. When the post-tension slab is designed by an engineer other than the Engineer-of-Record for the superstructure, the Engineer-of-Record shall review the slab design for conformance with the design of the superstructure.
14. GENERAL NOTES shall include the following:
 - a. Reference to "Construction and Maintenance Procedures Manual for Post-Tensioned.
 - b. Slab-on-Ground Construction", 2nd Edition, by the Post-Tensioning Institute.
 - c. Maximum plumbing box size shall be 12" x 12", located a minimum of 6" from any edge.
 - d. Plumbing shall be boxed and wrapped prior to post-tension installation.
 - e. Slabs shall be formed and poured as monolithic slabs. If a cold joint occurs within a slab, contact Engineer of Record prior to proceeding with subsequent pour.
 - f. Slabs shall be stressed prior to roof tile stocking.

Recommendations for the Special Inspector

1. Inspections shall be done under the direct supervision of an individual who has PTI certification.
2. Inspectors are required to be at stressing of slab.

Recommendations for the Home Builder

1. The condition of the building pad should meet the requirements of the geotechnical report prior to the start of foundation construction.

2. Pumping concrete is recommended to reduce tendon displacement, sub-base disruption and vehicular traffic on building pads.
3. Engineer of Record shall be notified who will be performing the Special Inspections.
4. Proper grading/slopes shall be installed on all sides of the home after the slab is poured. Proper grading/slopes shall be maintained through the course of construction and for the life of the structure.
5. The main water shut off valve shall have a tag of durable, non-corrosive metal, permanently attached identifying the building as having a post-tensioned slab.

Recommendations for the Municipal Plan Review

1. Identify each tendon by number, with length and elongation range listed.
2. All intersections of slab tendons shall be secured with tie wire or other means (such as snap chairs) to prevent displacement during placement of concrete.
3. Reinforcement for plumbing boxes shall be clearly defined.
4. Reinforcement for penetrations in the anchor zone shall be clearly defined.

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Maricopa Association of Governments Building Code Amendments and Standards Manual BCAS #9	
Title: Uniform Requirement of Pad Certification per Section R401.2 of the 2012 International Residential Code (IRC)	
Originally Reviewed by MAG Building Codes Committee: 12/16/2004	
Updated by MAG Building Codes Committee: 11/14/2012	

The requirements of the 2012 IRC Section R401.2, states “Fill soils that support footings and foundations shall be designed, installed and tested in accordance with accepted engineering practice.”

Upon completion of the soils investigation, the testing agency may include an expiration date for pad certifications.

As local jurisdictions are unable to verify if the original pad certification is still current, each builder shall provide a current pad certification for all single-family lots in tract subdivisions at the time of the footing inspection.

Maricopa Association of Governments Building Code Amendments and Standards Manual BCAS #10	
Title: Uniform Requirement of Weep Screed per Section R703.6.2.1 of the 2012 International Residential Code (IRC)	
Originally Reviewed by MAG Building Codes Committee: 12/16/2004	
Updated by MAG Building Codes Committee: 11/14/2012	

The requirements of the 2012 IRC Section R703.6.2.1, states “The weep screed shall be placed a minimum of 4 inches (102mm) above the earth or 2 inches (51 mm) above paved areas and shall be of a type that will allow trapped water to drain to the exterior of the building.”

The clearance required above the paved areas cannot be maintained when the Builder provides a no step entry.

It is the purpose of this code section to allow excess moisture inside the wall to drain to the exterior of the building. As an alternate method, the installation of a deco drain directly below the weep screed meets this requirement.

Maricopa Association of Governments Building Code Amendments and Standards Manual BCAS #11	
Title: Service Entry Section (SES) Installation Practices	
Originally Reviewed by MAG Building Codes Committee: 11/19/2005	
Updated by MAG Building Codes Committee: 6/20/2013	

Background

In 2005, Sections 312.5 and 314.17 of the 2002 National Electrical Code (NEC) and sections E3807.7 and E3806.1.1 of the 2003 International Residential Code (IRC) addressed cabinets, boxes and conduit bodies and the entry of said cabinets, boxes and conduit bodies by cables and conduit (*NOTE: the current code sections are 312.5 and 314.17 of the 2011 NEC and E3907.7 and E3906.1.1 of the 2012 IRC*). These sections required the enclosure of openings through which cables enter a cabinet, box or conduit body, required that nonmetallic cables be permitted to enter the top of a surface-mounted enclosure only and that the nonmetallic cable be protected at points of entry into a cabinet, box or conduit body from damage and abrasion, where cables are used, each cable be secured to the cabinet, cutout box or meter socket enclosure. At the time of original review by the Committee, these requirements had been largely ignored by installers and enforcers in the State of Arizona.

A code change proposal was submitted to the Code Making Panel of National Fire Protection Association (NFPA) to validate the method of installation traditionally occurring in this region. That code change proposal, 9-12 Log #463, was rejected by the Code Making Panel.

The Committee believed that the immediate and strict adherence to and enforcement of in their entirety these sections would pose a change in standard practice in this region and both industry and the enforcement community would benefit from a “phase-in” or transition period.

The Committee recommended that the abovementioned sections be enforced in their entirety so that each cable would be secured to the cabinet, cutout box or meter socket enclosure where it enters. This recommendation had an effective date of December 1, 2005.

Exhibit A

Reference the 2011 National Electrical Code and replace the first paragraph with the following (The remainder of Section 312.5 to remain the same)

312.5 Cabinets, Cutout Boxes, and Meter Socket Enclosures. Conductors entering enclosures within the scope of this article shall be protected from abrasion and shall comply with 312.5(A) through (C).

Exception: For one- and two-family dwellings, cables with entirely nonmetallic sheaths shall be permitted to enter the back of a surface-mounted enclosure through one or more nonflexible raceways not more than 75 mm (3 in.) in diameter, and not less than 75 mm (3 in.) and not more than 600 mm (24 in.) in length, provided all of the following conditions are met:

- A. Each cable is fastened within 200 mm (8 in.), measured along the sheath of the outer end of the raceway.
- B. The raceway extends directly into an enclosed wall space.
- C. A fitting is provided on each end of the raceway to protect the cable(s) from abrasion.
- D. The raceway is sealed or plugged using approved means so as to prevent access to the enclosure through the raceway.
- E. The cable sheath is continuous through the raceway and extends into the enclosure beyond the fitting not less than 50 mm (2 in.).
- F. The raceway, if greater than 305 mm (12 in.) is fastened at its outer end in accordance with the applicable article.
- G. The raceway shall be permitted to be filled to 60 percent of its total cross sectional area, and 310.15(B)3 adjustment factors need not apply to this condition.

Maricopa Association of Governments Building Code Amendments and Standards Manual BCAS #12	
Title: Storage Space Lighting	
Originally Reviewed by MAG Building Codes Committee: 6/21/2006	
Updated by MAG Building Codes Committee: 11/14/2012	

The storage or equipment spaces that are located underfloor or in attics would require lighting fixtures and shall be installed based on section E3903.4 of the 2012 International Residential Code (IRC). Some MAG jurisdictions have interpreted that under-stair spaces are to be considered as “underfloor” spaces and have required the installation of luminaires in such locations. The Committee has determined that the intent of the code is to require luminaires in storage spaces that are truly underfloor, namely crawl spaces only.

The Committee recommends that storage space located under stairs not be considered as underfloor spaces requiring lighting for the sake of consistency throughout Maricopa County.

The original effective date of this recommendation was July 1, 2006.

Maricopa Association of Governments Building Code Amendments and Standards Manual BCAS #13	
Title: City of Phoenix Approved Steel Fabricators Program	
Originally Reviewed by MAG Building Codes Committee: 6/21/2006	
Updated by MAG Building Codes Committee: 6/20/2013	

The Uniform Building Code and International Building Code require special inspection for structural steel, subject to the requirements and alternatives established by the codes. These codes do not require the special inspections on shop-fabricated portions of structural steel if these items subject to special inspection are fabricated on the premises of an "approved" fabrication shop. The City of Phoenix administers a program that generates and maintains a list of approved steel fabricators that meet some or all of the following approvals: the American Institute of Steel Construction (AISC); City of Los Angeles, California; Clark County, Nevada; International Code Council (ICC); International Accreditation Service (IAS); or some other authority approved by the City of Phoenix. The City of Phoenix Approved Steel Fabricators program requires that each and every fabricated piece of steel shall be identified to indicate the shop of origin.

The Committee recommends that member jurisdictions recognize and accept the City of Phoenix Approved Structural Steel Fabricators program and list as meeting the special structural inspections alternatives for structural steel fabricated by an approved fabricator as allowed in the building codes.

The original effective date of this recommendation was July 1, 2006.

Maricopa Association of Governments Building Code Amendments and Standards Manual BCAS #14	
Title: 2007 Supplement to the International Residential Code	
Originally Reviewed by MAG Building Codes Committee: 6/18/2008	
Updated by MAG Building Codes Committee: 6/20/2012	

At the June 18, 2008, Building Codes Committee meeting, the Committee reviewed a supplement to the 2007 International Residential Code (IRC), which focused on story height and wall bracing requirements. The Committee voted to support the supplement.

At the June 20, 2012 meeting, the Committee noted that this supplement was incorporated into the 2009 IRC. The Committee that a majority of jurisdictions were using codes older than 2009, and this supplement is still relevant to those jurisdictions.

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CHAPTER 6 WALL CONSTRUCTION

Table R602.3(1) Change table and footnote h to read as shown: (RB170-06/07; S72-06/07 Part II, S75-06/07 Part II)

**TABLE R602.3(1)
FASTENER SCHEDULE STRUCTURAL MEMBERS**

DESCRIPTION OF BUILDING MATERIALS	DESCRIPTION OF FASTENER ^{b, c, e}	SPACING OF FASTENERS	
		Edges (Inches)	Intermediate supports ^{c, e} (inches)
Wood structural panels, subfloor, roof and wall sheathing to framing, and particleboard wall sheathing to framing			
3/8" - 1/2" □	6d common (2" × 0.113" □) nail (subfloor wall) 8d common (2 1/2" × 0.131" □) nail (roof)	6	12 ^g
Other wall sheathing^h			
1/2" structural cellulose fiberboard sheathing	1 1/2" galvanized roofing nail, 7/16" crown or 1" crown staple 16 ga., 1 1/4" long	3	6
25/32" structural cellulose fiberboard sheathing	1 3/4" galvanized roofing nail, 7/16" crown or 1" crown staple 16 ga., 1 1/2" long	3	6
1/2" gypsum sheathing ^d	1 1/2" galvanized roofing nail; staple galvanized, 1 1/2" long; 1 1/4" screws, Type W or S	4	8
5/8" gypsum sheathing ^d	1 3/4" galvanized roofing nail; staple galvanized, 1 5/8" long; 1 5/8" screws, Type W or S	4	8

For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm, 1 mile per hour = 0.447 m/s; 1ksi = 6.895 MPa.

h. Gypsum sheathing shall conform to ASTM C 1396 and shall be installed in accordance with GA 253. Fiberboard sheathing shall conform to ASTM C 208.

(Portions of table and footnotes not shown remain unchanged)

Table R602.3(3) Change table to read as shown: (S72-06/07 Part II)

**TABLE R602.3(3)
WOOD STRUCTURAL PANEL WALL SHEATHING**

Panel Span Rating	Panel Nominal Thickness (inch)	Maximum Stud Spacing (inches)	
		Siding nailed to: ^a	
		Stud	Sheathing
16/0, 20/0, or wall – 16 o.c.	3/8	16	16 ^b
24/0, 24/16, 32/16 or wall – 24 o.c.	3/8, 7/10, 15/32, 1/2	24	24 ^c

For SI: 1 inch = 25.4 mm.

- Blocking of horizontal joints shall not be required.
- Plywood sheathing 3/8-inch thick or less shall be applied with long dimension across studs.
- Three-ply plywood panels shall be applied with long dimension across studs.

Section R602.6.1 Change to read as shown: (RB172-06/07)

R602.6.1 Drilling and notching of top plate. When piping or ductwork is placed in or partly in an exterior wall or interior load-bearing wall, necessitating cutting, drilling or notching of the top plate by more than 50 percent of its width, a galvanized metal tie of not less than 0.054 inch thick (1.37 mm) (16 ga) and 1 1/2 inches (38 mm) wide shall be fastened across and to the plate at each side of the opening with not less than eight 10d (0.148 inch diameter) nails having a minimum length of 1 1/2 inches (38 mm) nails at each side or equivalent. The metal tie must extend a minimum of 6 inches past the opening. See Figure R602.6.1.

Exception: When the entire side of the wall with the notch or cut is covered by wood structural panel sheathing.

2007 SUPPLEMENT TO THE IRC**Section R602.8 Change to read as shown: (RB176-06/07)**

R602.8 Fireblocking required. Fireblocking shall be provided to cut off all concealed draft openings (both vertical and horizontal) and to form an effective fire barrier between stories, and between a top story and the roof space. Fireblocking shall be provided in wood-frame construction in the following locations.

1. In concealed spaces of stud walls and partitions, including furred spaces and parallel rows of studs or staggered studs; as follows:
 - 1.1. Vertically at the ceiling and floor levels.
 - 1.2. Horizontally at intervals not exceeding 10 feet(3048 mm).
2. At all interconnections between concealed vertical and horizontal spaces such as occur at soffits, drop ceilings and cove ceilings.
3. In concealed spaces between stair stringers at the top and bottom of the run. Enclosed spaces under stairs shall comply with Section R311.2.2.
4. At openings around vents, pipes, ducts, cables and wires at ceiling and floor level, with an approved material to resist the free passage of flame and products of combustion. The material filling this annular space shall not be required to meet the ASTM E 136 requirements.
5. For the fireblocking of chimneys and fireplaces, see Section R1003.19.
6. Fireblocking of cornices of a two-family dwelling is required at the line of dwelling unit separation.

Sections R602.8.1 Change to read as shown: (FS146-06/07 Part II)

R602.8.1 Fireblocking materials. Except as provided in Section R602.8, Item 4, fireblocking shall consist of the following materials:

1. 2-inch (51 mm) nominal lumber.
2. Two thicknesses of 1-inch (25.4 mm) nominal lumber with broken lap joints.
3. One thickness of 23/32-inch (18.3 mm) wood structural panels with joints backed by 23/32-inch (18.3 mm) wood structural panels.
4. One thickness of 3/4-inch (19.1 mm) particleboard with joints backed by 3/4-inch (19.1 mm) particleboard.
5. 1/2-inch (12.7 mm) gypsum board.
6. 1/4-inch (6.4 mm) cement-based millboard.
7. Batts or blankets of mineral wool or glass fiber or other approved materials installed in such a manner as to be securely retained in place.

Section R602.8.1.1 Add new section to read as shown: (FS146-06/07 Part II)

R602.8.1.1 Batts or blankets of mineral or glass fiber. Batts or blankets of mineral or glass fiber or other approved nonrigid materials shall be permitted for compliance with the 10-foot (3048 mm) horizontal fireblocking in walls constructed using parallel rows of studs or staggered studs.

(Renumber subsequent sections)

Section R602.8.1.3 Add new section to read as shown: (FS146-06/07 Part II)

R602.8.1.3 Loose-fill insulation material. Loose-fill insulation material shall not be used as a fireblock unless specifically tested in the form and manner intended for use to demonstrate its ability to remain in place and to retard the spread of fire and hot gases.

(Renumber subsequent sections)

Sections R602.10, R602.11; Change to read as shown: (RB179-06/07, RB181-06/07, RB187-06/07, RB196-06/07, RB197-06/07, RB199-06/07, RB200-06/07, RB201-06/07, RB205-06/07, RB207-06/07, RB209-06/07, RB211-06/07, RB213-06/07, RB214-06/07, RB217-06/07, RB220-06/07, RB223-06/07, RB225-06/07, RB227-06/07, RB231-06/07, RB236-06/07, S72-06/07 Part II, S90-06/07 Part II)

(NOTE: The content of Sections R602.10 and R602.11 has been completely revised and reorganized. The text, tables and figures shown in this supplement replace the 2006 code text in its entirety.)

R602.10 Wall bracing. All exterior walls shall be braced in accordance with this section. In addition, interior braced wall lines shall be provided in accordance with Section R602.10.1. Where a building, or portion thereof, does not comply with one or more of the bracing requirements in this section, those portions shall be designed and constructed in accordance with accepted engineering practice.

Exception: Detached one- and two-family dwellings located in Seismic Design Category C are exempt from the seismic bracing requirements of this section. Wind speed provisions for bracing shall be applicable to detached one- and two-family dwellings.

R602.10.1 Braced wall lines. Braced wall lines, both interior and exterior, shall be provided with braced wall panels in the percentage and location specified in this section.

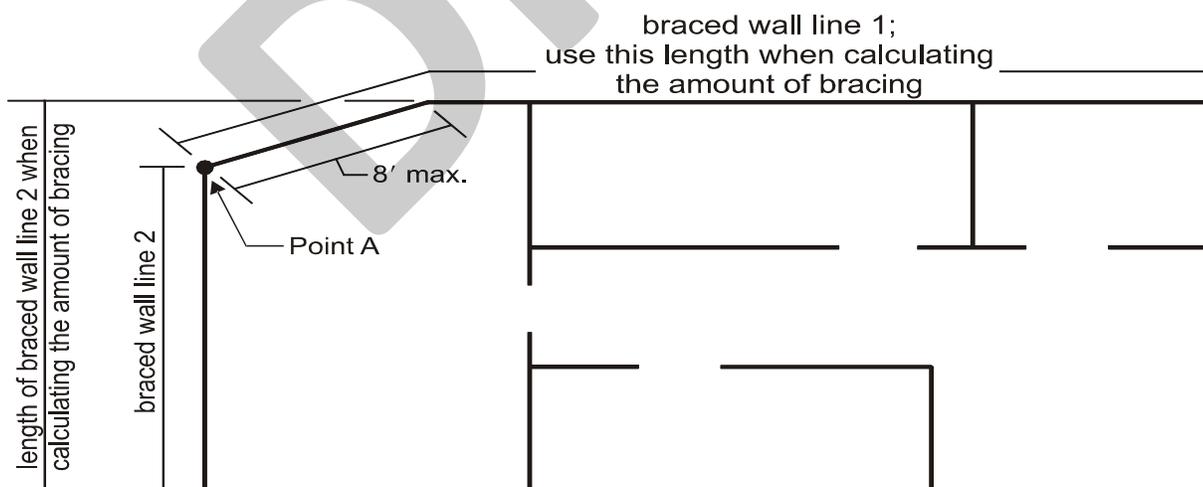
Braced wall panels shall be in accordance with one of the bracing methods specified in Section R602.10.2, the alternate braced wall method of Section R602.10.3.2, or the continuous structural panel sheathing method of Section R602.10.4. Bracing method shall be permitted to vary as follows:

1. Variation in bracing method from story to story is permitted.
2. Variation in bracing method from braced wall line to braced wall line within a story is permitted, except that continuous structural panel sheathing shall conform to the additional requirements of Section R602.10.4.
3. In Seismic Design Categories A and B, and detached dwellings in Seismic Design Category C, variation in bracing method within a braced wall line is permitted. The required sheathing percentage for the braced wall line with mixed sheathing types shall have the higher bracing percentage, in accordance with Table R602.10.1(1), of all types of bracing used. Wall lines using continuous wood structural panel sheathing shall conform to the additional requirements of Section R602.10.4.

R602.10.1.1 Percentage of bracing. The percentage of bracing along each braced wall line shall be in accordance with Table R602.10.1(1) and shall be the greater of that required by the Seismic Design Category or the design wind speed. Adjustments to the percent of braced wall specified in Table R602.10.1(1) shall be as specified in Table R602.10.1(2)

Section R602.10.1.2 Add new section to read as shown: (RB187-06/07)

R602.10.1.2 Angled corners. At corners, braced wall lines shall be permitted to angle out of plane up to 45 degrees with a maximum diagonal length of 8 feet (2438 mm). When determining the percentage of bracing, the length of each braced wall line shall be determined as shown in Figure R602.10.1.2. The placement of bracing for the braced wall lines shall begin at the point where the braced wall line, which contains the angled wall adjoins the adjacent braced wall line (Point A as shown in Figure R602.10.1.2). Where an angled corner is constructed at an angle equal to 45 degrees and the diagonal length is no more than 8 feet (2438 mm) in length, the angled wall may be considered as part of either of the adjoining braced wall lines, but not both. Where the diagonal length is greater than 8 feet (2438 mm), it shall be considered its own braced wall line and be braced in accordance with Section R602.10.1 and methods in Section R602.10.2.



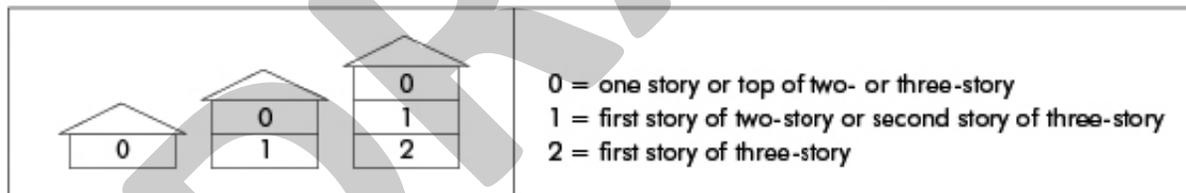
**FIGURE R602.10.1.2
ANGLED CORNERS**

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TABLE R602.10.1(1)^{a,b,c}
WALL BRACING

SEISMIC DESIGN CATEGORY (SDC) OR WIND SPEED	STORIES ABOVE BRACED WALL LINE ^d	METHOD OF BRACING PERMITTED	PERCENTAGE OF FULL-HEIGHT BRACING PER WALL LINE		MAXIMUM SPACING BETWEEN BRACED WALL LINES (FT)
			For Method 3 Bracing	For other methods permitted ^e	
SDC A and B (S_s 0.35g and S_{ds} 0.33g), 100 mph	0	Methods 1-8	16%	16%	35 (See Section R602.10.1.4 for exceptions)
	1	Methods 1-8	16%	25%	
	2	Methods 2-8	25%	35%	
SDC C (S_s 0.6g and S_{ds} 0.53g), < 110 mph	0	Methods 1-8	16%	25%	
	1	Methods 2-8	30%	45%	
	2	Methods 2-8	45%	60%	
SDC D ₀ & D ₁ (S_s 1.25g and S_{ds} 0.83g), < 110 mph	0	Methods 2-8	20%	30%	25 (See Section R602.10.1.4.1 for exceptions)
	1	Methods 2-8	45%	60%	
	2	Methods 2-8	60%	85%	
SDC D ₂ , < 110 mph	0	Methods 2-8	25%	40%	
	1	Methods 2-8	55%	75%	
	Cripple wall	Method 3	75%	Not Permitted	

- a. Wall bracing percentages are based on a soil site class "D." Interpolation of bracing percentage between the S_{ds} values associated with the Seismic Design Categories shall be permitted when a site-specific S_{ds} value is determined in accordance with Section 1613.5 of the *International Building Code*.
- b. Foundation cripple wall panels shall be braced in accordance with Section R602.10.8.
- c. Methods of bracing shall be as described in Section R602.10.2. The alternate braced wall panels described in Section R602.10.3.2 shall also be permitted.
- d. Stories above braced wall line. 0 = one story or top of two or three story. 1 = first story of two story or second story of three story. 2 = first story of three story.



- e. Method 1 bracing exempt from percentage bracing requirement.

**TABLE R602.10.1(2)
ADJUSTMENT FACTORS TO THE PERCENTAGE OF REQUIRED WALL BRACING ^a**

ADJUSTMENT BASED ON:		MULTIPLY PERCENTAGE OF BRACING PER WALL LINE BY:	APPLIES TO:	
Story height ^b (Section 301.3)	10 ft	1.0	All bracing methods - R602.10.2	
	> 10 12 ft	1.2		
Braced wall line spacing in SDC A-C ^{b,d}	≤ 35 ft	1.0		
	> 35 50 ft	1.43		
Wall dead load ^e	> 8 15	1.0		
	8 psf	0.85		
Roof/ceiling dead load for wall supporting ^{b,c} :	roof only or roof plus one story	15 psf		1.0
	roof only	> 15 psf 25 psf		1.1
	roof plus one story	> 15 psf 25 psf		1.2
Walls with stone or masonry veneer in SDC C-D ₂	See Section R703.7, Exception 1-4			
Cripple walls	See Section R 602.10.8			

- The total percentage of bracing required for a given wall line is the product of all applicable adjustment factors.
- Linear interpolation shall be permitted.
- Bracing required for a site's wind speed shall not be adjusted for dead load.
- Braced wall line spacing in excess of 35-ft shall be in accordance with R602.10.1.4.
- The adjusted percentage of bracing shall not be less than that required for the site's wind speed.

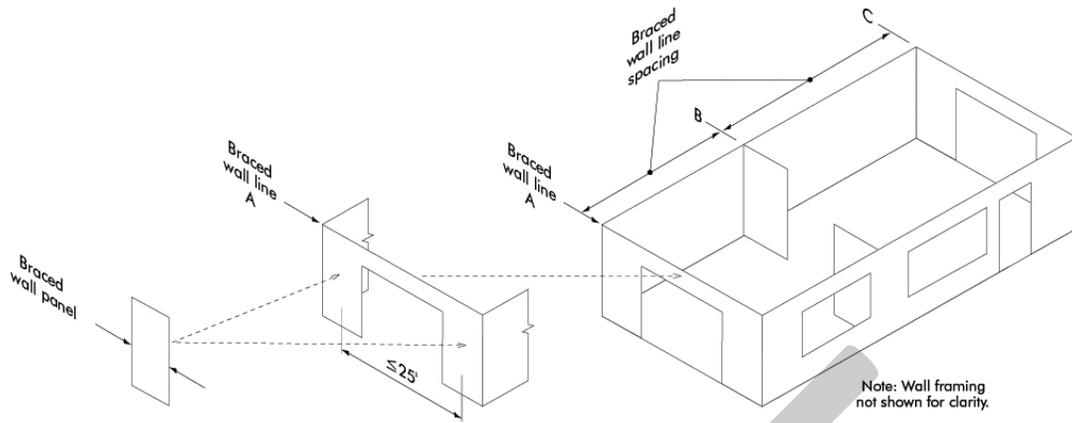
R602.10.1.3 Braced wall panel location. Braced wall panels shall be located in accordance with Table R602.10.1(1) and Figure R602.10.1.3(1). Braced wall panels shall be located at least every 25 feet on center and shall begin no more than 12.5 feet (3810 mm) from each end of a braced wall line in accordance with Figure R602.10.1.3(2). Braced wall panels may be offset out-of-plane up to 4 feet (1219 mm) provided that the total out-to-out offset in any braced wall line is not more than 8 feet (2438 mm) in accordance with Figure R602.10.1.3(3).

R602.10.1.3.1 Braced wall panel location in Seismic Design Categories D₀, D₁ and D₂. Exterior braced wall lines shall have a braced wall panel located at each end of the braced wall line.

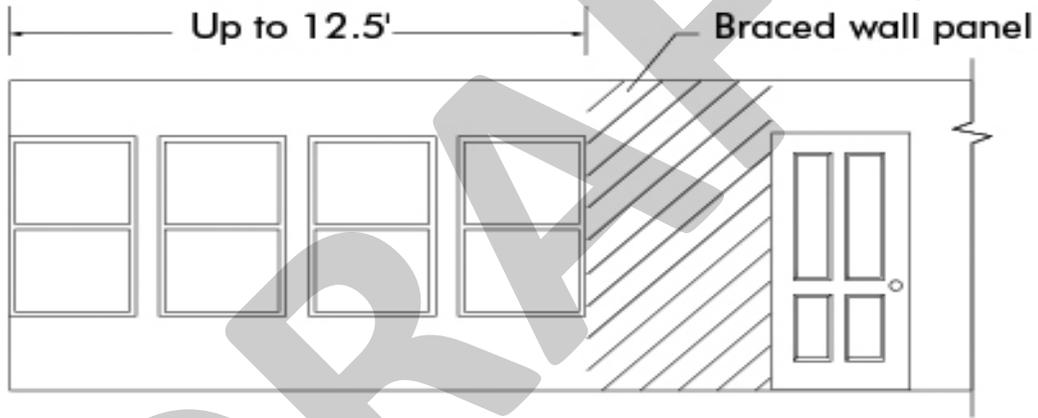
Exception: For braced wall panel construction Method 3 of Section R602.10.2, the braced wall panel shall be permitted to begin no more than 8 feet (2438 mm) from each end of the braced wall line provided one of the following is satisfied in accordance with Figure R602.10.1.3.1:

- A minimum 24-inch-wide (610 mm) panel is applied to each side of the building corner and the two 24-inch-wide (610 mm) panels at the corner shall be attached to framing in accordance with Figure R602.10.4.3(1), or
- The end of each braced wall panel closest to the corner shall have a tie-down device fastened to the stud at the edge of the braced wall panel closest to the corner and to the foundation or framing below. The tie-down device shall be capable of providing an uplift allowable design value of at least 1,800 pounds (8 kN). The tie-down device shall be installed in accordance with the manufacturer's recommendations.

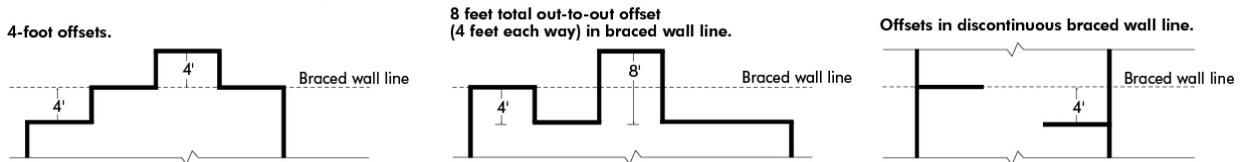
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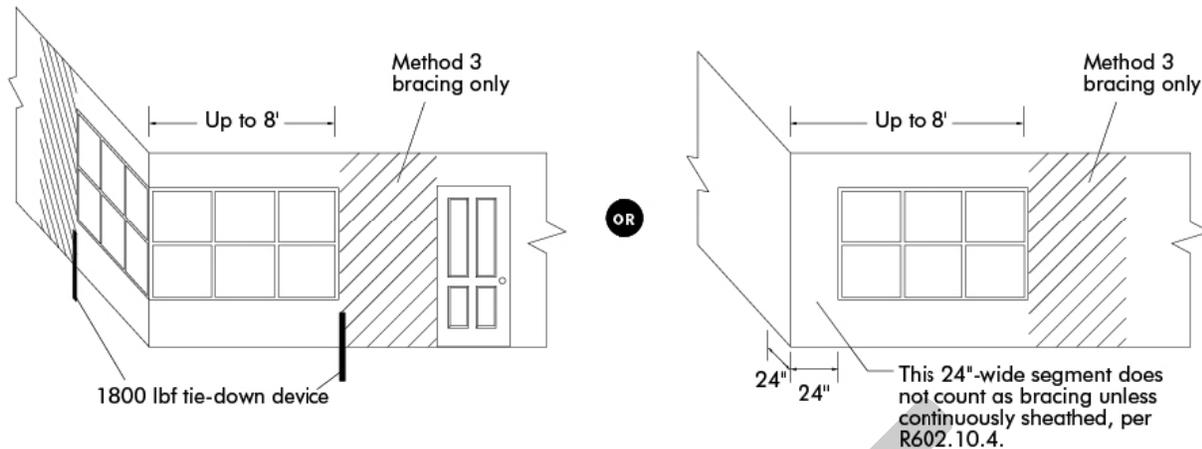
**FIGURE R602.10.1.3 (1)
BRACED WALL PANELS AND BRACED WALL LINES**



**FIGURE R602.10.1.3(2)
PERMITTED BRACED WALL PANEL DISTANCES FROM ENDS OF
A BRACED WALL LINE (SDC A, B and C)**



**FIGURE R602.10.1.3(3)
OFFSETS PERMITTED FOR BRACED WALL LINES**



**FIGURE R602.10.1.3.1
BRACED WALL PANELS AT BRACED WALL-LINE ENDS IN SEISMIC DESIGN
CATEGORIES D₀, D₁ AND D₂**

R602.10.1.4 Braced wall line spacing. Spacing of braced wall lines shall not exceed 35 feet (10 668 mm) on center in both the longitudinal and transverse direction in each story.

Exception: Spacing of braced wall lines not exceeding 50 feet (15 240 mm) shall be permitted where:

1. The wall bracing provided equals or exceeds the percentage of bracing required by Table R602.10.1(1) multiplied by a factor equal to the braced wall line spacing divided by 35 feet (10 668 mm), and
2. The length-to-width ratio for the floor/roof diaphragm as measured between braced wall lines does not exceed 3:1.

R602.10.1.4.1 Braced wall line spacing for Seismic Design Categories D₀, D₁ and D₂. Spacing between braced wall lines in each story shall not exceed 25 feet (7 620 mm) on center in both the longitudinal and transverse directions.

Exception: In one-and two-story buildings, spacing between two adjacent braced wall lines shall not exceed 35 feet (10 668 mm) on center in order to accommodate one single room not exceeding 900 square feet (84 m²) in each dwelling unit. Spacing between all other braced wall lines shall not exceed 25 feet (7 620 mm). A spacing of 35 feet (10 668 mm) or less shall be permitted between braced wall lines where the length of wall bracing required by Table R602.10.1(1) is multiplied by the appropriate adjustment factor from Table R602.10.1.4.1, the length-to-width ratio for the floor/roof diaphragm does not exceed 3:1, and the top plate lap splice face nailing shall be twelve 16d nails on each side of the splice.

**TABLE R602.10.1.4.1
ADJUSTMENTS OF BRACING PERCENTAGE FOR BRACED WALL LINES GREATER THAN 25 FEET^{a,b}**

BRACED WALL LINE SPACING (feet)	MULTIPLY BRACING PERCENTAGE IN TABLE R602.10.1(1) BY:
25	1.0
30	1.2
35	1.4

For SI: 1 foot = 304.8 mm

Notes:

- a. Linear interpolation is permissible.
- b. For an interior braced wall, the adjustment for the larger spacing between braced wall lines shall be used.

R602.10.2 Braced wall panel construction methods. The construction of braced wall panels shall be in accordance with one of the following methods:

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1. Nominal 1-inch-by-4-inch (19.1 mm by 88.9 mm) continuous diagonal braces let in to the top and bottom plates and the intervening studs or approved metal strap devices installed in accordance with the manufacturer's specifications. The let-in bracing shall be placed at an angle not more than 60 degrees (1.06 rad) or less than 45 degrees (0.79 rad) from the horizontal.
2. Wood boards of 5/8-inch (15.9 mm) net minimum thickness applied diagonally on studs spaced a maximum of 24 inches (610 mm). Diagonal boards shall be attached to studs in accordance with Table R602.3(1).
3. Wood structural panel sheathing with a thickness not less than 3/8 inch (9.5 mm) for 16-inch (406 mm) or 24-inch (610 mm) stud spacing. Wood Structural panels shall be installed in accordance with Table R602.3(3) and Table R602.3(1).
4. One-half-inch (12.7 mm) or 25/32-inch (19.8 mm) thick structural fiberboard sheathing applied vertically or horizontally on studs spaced a maximum of 16 inches (406 mm) on center. Structural fiberboard sheathing shall be installed in accordance with Table R602.3(1).
5. Gypsum board with minimum 1/2-inch (12.7 mm) thickness placed on studs spaced a maximum of 24 inches (610 mm) on center and fastened at panel edges including top and bottom plates at 7 inches (178 mm) on center with the size nails specified in Table R602.3(1) for sheathing and Table R702.3.5 for interior gypsum board.
6. Particleboard wall sheathing panels installed in accordance with Table R602.3(4) and Table R602.3(1).
7. Portland cement plaster on studs spaced a maximum of 16 inches (406 mm) on center and installed in accordance with Section R703.6.
8. Hardboard panel siding when installed in accordance with Table R703.4.

Exception: Alternate braced wall panels constructed in accordance with Sections R602.10.3.2.1 or R602.10.3.2.2 shall be permitted to replace any braced wall panel in any of the above methods of braced wall panels.

R602.10.2.1 Braced wall panel interior finish material. Braced wall panels shall have gypsum wall board installed on the side of the wall opposite the bracing material. Gypsum wall board shall be not less than 1/2 inch (12.7 mm) in thickness and be fastened in accordance with Table R702.3.5 for interior gypsum wall board.

Exceptions:

1. Wall panels that are braced in accordance with Method 5.
2. Wall panels that are braced in accordance with Section R602.10.3.2 .
3. When an approved interior finish material with an in-plane shear resistance equivalent to gypsum board is installed.
4. For Methods 2, 3, 4, 6, 7, and 8, gypsum wall board is permitted to be omitted provided the percentage of bracing in Table R602.10.1(1) is multiplied by a factor of 1.5.

R602.10.2.2 Adhesive attachment of sheathing in Seismic Design Categories C, D₀, D₁ and D₂. Adhesive attachment of wall sheathing shall not be permitted in Seismic Design Categories C, D₀, D₁ and D₂.

R602.10.3 Minimum length of braced panels. For Methods 2, 3, 4, 6, 7 and 8 above, each braced wall panel shall be at least 48 inches (1219 mm) in length, covering a minimum of three stud spaces where studs are spaced 16 inches (406 mm) on center and covering a minimum of two stud spaces where studs are spaced 24 inches (610 mm) on center. For Method 5 above, each braced wall panel and shall be at least 96 inches (2438 mm) in length where applied to one face of a braced wall panel and at least 48 inches (1219 mm) where applied to both faces. For Methods 2, 3, 4, 6, 7 and 8, for purposes of computing the percentage of panel bracing required in Table R602.10.1(1), the effective length of the braced wall panel shall be equal to the actual length of the panel. When Method 5 panels are applied to only one face of a braced wall panel, bracing percentages required in Table R602.10.1(1) for Method 5 shall be doubled.

Exceptions:

1. Lengths of braced wall panels for continuous wood structural panel sheathing shall be in accordance with Section R602.10.4.
2. Lengths of alternate braced wall panels shall be in accordance with Section R602.10.3.2.1 or Section R602.10.3.2.2.
3. For Methods 2, 3, 4, 6, 7 and 8 in Seismic Design Categories A, B, and C: Panels between 36 inches and 48 inches in length shall be permitted to count towards the required percentage of bracing in Table R602.10.1(1), and the effective contribution shall comply with Table R602.10.3.

TABLE R602.10.3
EFFECTIVE LENGTHS FOR BRACE WALL PANELS LESS THAN 48 INCHES IN ACTUAL LENGTH
(BRACE METHODS 2, 3, 4, 6, 7, AND 8^a)

Actual Length of Braced Wall Panel (inches)	Effective Length of Braced Wall Panel (inches)		
	8-foot Wall Height	9-foot Wall Height	10-foot Wall Height
48	48	48	48
42	36	36	N/A
36	27	N/A	N/A

For SI: 1 inch = 25.4mm

Interpolation shall be permitted.

R602.10.3.1 Adjustment of length of braced panels. When story height (H), measured in ft, exceeds 10 feet (3048 mm), in accordance with Section R301.3, the minimum length of braced wall panels specified in Section R602.10.3 shall be increased by a factor H/10. See Table R602.10.3.1. Interpolation is permitted.

TABLE R602.10.3.1
MINIMUM LENGTH REQUIREMENTS FOR BRACED WALL PANELS

SEISMIC DESIGN CATEGORY AND WIND SPEED	BRACING METHOD	HEIGHT OF BRACED WALL PANEL				
		8 ft.	9 ft.	10 ft.	11 ft.	12 ft.
SDC A, B, C, D _o , D ₁ and D ₂ Wind speed < 110 mph	2,3,4,6,7,8 and Method 5 when double sided	4'-0"	4'-0"	4'-0"	4'-5"	4'-10"
	Method 5, single sided	8'-0"	8'-0"	8'-0"	8'-10"	9'-8"

For SI: 1 inch = 25.4mm, 1 foot = 305 mm

R602.10.3.2 Alternative bracing panels. As an alternate to the bracing methods in Section R602.10.2, wall bracing panels in accordance with Sections R602.10.3.2.1 and R602.10.3.2.2 shall be permitted.

R602.10.3.2.1 Alternate braced wall panels. Alternate braced wall panels constructed in accordance with one of the following provisions shall be permitted to replace each 4 feet (1219 mm) of braced wall panel as required by Section R602.10.3. The maximum height and minimum length and tie-down force of each panel shall be in accordance with Table R602.10.3.2.1:

1. In one-story buildings, each panel shall be sheathed on one face with 3/8-inch-minimum-thickness (9.5 mm) wood structural panel sheathing nailed with 8d common or galvanized box nails spaced in accordance with Table R602.3(1) and blocked at all wood structural panel sheathing edges. Two anchor bolts installed in accordance with Figure R403.1(1) shall be provided in each panel. Anchor bolts shall be placed 6 to 12 inches from each end of the plate. Each panel end stud shall have a tie-down device fastened to the foundation, capable of providing an uplift capacity in accordance with Table R602.10.3.2.1. The tie-down device shall be installed in accordance with the manufacturer's recommendations. The panels shall be supported directly on a foundation or on floor framing supported directly on a foundation, which is continuous across the entire length of the braced wall line. This foundation shall be reinforced with not less than one No. 4 bar top and bottom. When the continuous foundation is required to have a depth greater than 12 inches (305 mm), a minimum 12-inch-by-12-inch (305 mm by 305 mm) continuous footing or turned down slab edge is permitted at door openings in the braced wall line. This continuous footing or turned down slab edge shall be reinforced with not less than one No.4 bar top and bottom. This reinforcement shall be lapped 15 inches (381 mm) with the reinforcement required in the continuous foundation located directly under the braced wall line.
2. In the first story of two-story buildings, each braced wall panel shall be in accordance with Item 1 above, except that the wood structural panel sheathing edge nailing spacing shall not exceed four inches on center.

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**TABLE R602.10.3.2.1
MINIMUM LENGTH REQUIREMENTS AND TIE-DOWN FORCES
FOR ALTERNATE BRACED WALL PANELS**

SEISMIC DESIGN CATEGORY AND WIND SPEED		HEIGHT OF BRACED WALL PANEL				
		8 ft.	9 ft.	10 ft.	11 ft.	12 ft.
SDC A, B and C Wind speed < 110 mph	Minimum Sheathed Length	2'-4"	2'-8"	2'-10"	3'-2"	3'-6"
	R602.10.3.2.1, Item 1 Tie-down Force (lbs)	1800	1800	1800	2000	2200
	R602.10.3.2.1, Item 2 Tie-down Force (lbs)	3000	3000	3000	3300	3600
SDC D _o , D ₁ and D ₂ Wind speed < 110 mph	Minimum Sheathed Length	2'-8"	2'-8"	2'-10"	NP ^a	NP ^a
	R602.10.3.2.1, Item 1 Tie-down Force (lbs)	1800	1800	1800	NP ^a	NP ^a
	R602.10.3.2.1, Item 2 Tie-down Force (lbs)	3000	3000	3000	NP ^a	NP ^a

For SI: 1 inch = 25.4 mm, 1 foot = 305 mm, 1 pound = 4.44822 Newtons

a. NP = Not Permitted. Maximum height of 10 feet (3,048 mm).

R602.10.3.2.2 Alternate bracing wall panel adjacent to a door or window opening. Alternate braced wall panels constructed in accordance with one of the following provisions are also permitted to replace each 4 feet (1219 mm) of braced wall panel as required by Section R602.10.3 for use adjacent to a window or door opening with a full-length header:

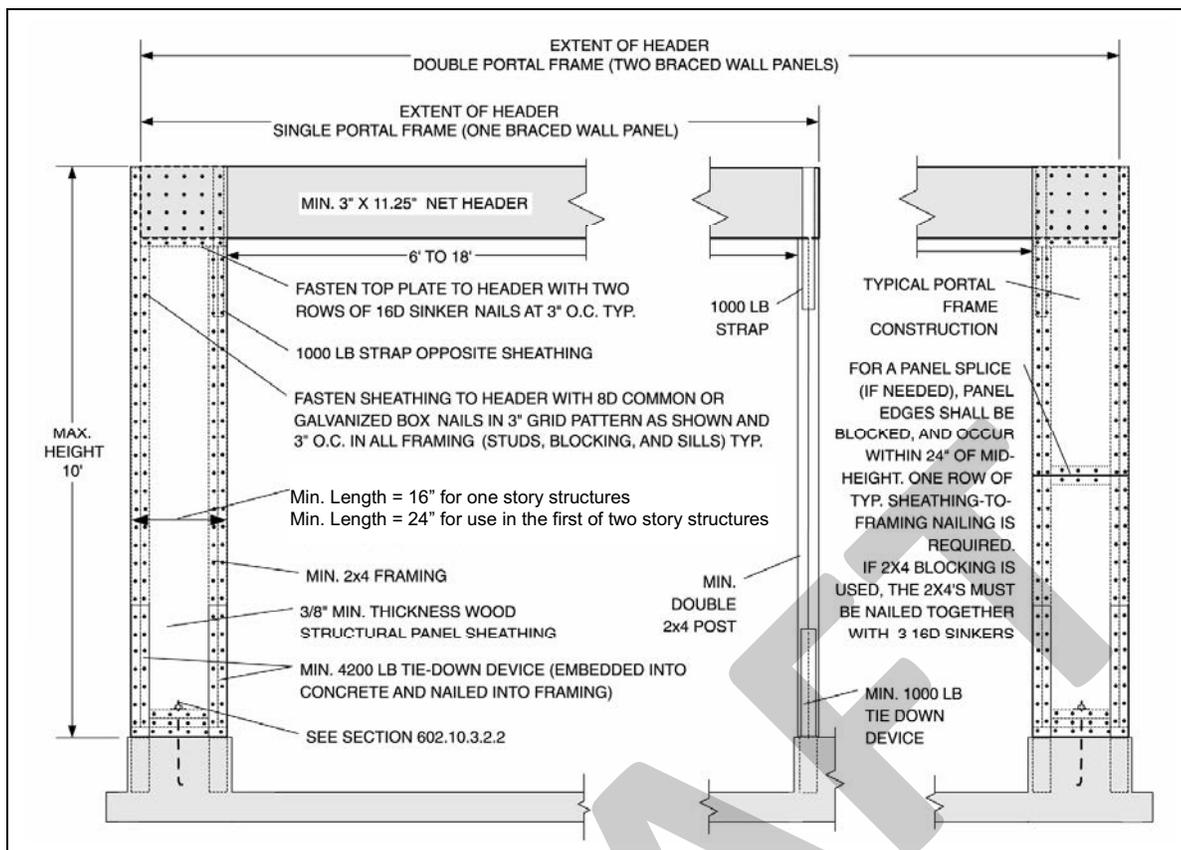
1. In one-story buildings, each panel shall have a length of not less than 16 inches (406 mm) and a height of not more than 10 feet (3048 mm). Each panel shall be sheathed on one face with a single layer of 3/8-inch-minimum-thickness (9.5 mm) wood structural panel sheathing nailed with 8d common or galvanized box nails in accordance with Figure R602.10.3.2.2. The wood structural panel sheathing shall extend up over the solid sawn or glued-laminated header and shall be nailed in accordance with Figure R602.10.3.2.2. A built-up header consisting of at least two 2 X 12s and fastened in accordance with Table R602.3(1) shall be permitted to be used. A spacer, if used, shall be placed on the side of the built-up beam opposite the wood structural panel sheathing. The header shall extend between the inside faces of the first full-length outer studs of each panel. The clear span of the header between the inner studs of each panel shall be not less than 6 feet (1829 mm) and not more than 18 feet (5486 mm) in length. A strap with an uplift capacity of not less than 1000 pounds (4448 N) shall fasten the header to the side of the inner studs opposite the sheathing. One anchor bolt not less than 5/8-inch-diameter (16 mm) and installed in accordance with Section R403.1.6 shall be provided in the center of each sill plate. The studs at each end of the panel shall have a tie-down device fastened to the foundation with an uplift capacity of not less than 4,200 pounds (18 683 N). The tie-down devices shall be an embedded-strap type, installed in accordance with the manufacturer's recommendations.

Where a panel is located on one side of the opening, the header shall extend between the inside face of the first full-length stud of the panel and the bearing studs at the other end of the opening. A strap with an uplift capacity of not less than 1,000 pounds (4448 N) shall fasten the header to the bearing studs. The bearing studs shall also have a tie-down device fastened to the foundation with an uplift capacity of not less than 1,000 pounds (4448 N).

The panels shall be supported directly on a foundation, which is continuous across the entire length of the braced wall line. The foundation shall be reinforced with not less than one No. 4 bar top and bottom.

Where the continuous foundation is required to have a depth greater than 12 inches (305 mm), a minimum 12-inch-by-12-inch (305 mm by 305 mm) continuous footing or turned down slab edge is permitted at door openings in the braced wall line. This continuous footing or turned down slab edge shall be reinforced with not less than one No. 4 bar top and bottom. This reinforcement shall be lapped not less than 15 inches (381 mm) with the reinforcement required in the continuous foundation located directly under the braced wall line.

2. In the first story of two-story buildings, each wall panel shall be braced in accordance with item 1 above, except that each panel shall have a length of not less than 24 inches (610 mm).



**FIGURE R602.10.3.2.2
ALTERNATE BRACED WALL PANEL ADJACENT TO A DOOR OR WINDOW OPENING**

For SI: 1 inch = 25.4 mm, 1 foot = 305 mm

R602.10.4 Continuously-sheathed braced wall line using Method 3 (wood structural panel). Continuously sheathed braced wall lines using wood structural panels shall comply with this section. Different bracing methods shall not be permitted within a continuously sheathed braced wall line. Other bracing methods prescribed by this code shall be permitted on other braced wall lines on the same story level or on different story levels of the building.

Exception: All exterior braced wall lines shall be continuously sheathed where required by Section R602.10.4.7.

R602.10.4.1 Continuously-sheathed braced wall line requirements. Continuously-sheathed braced wall line shall be in accordance with Figure R602.10.4(1) and shall comply with all of the following requirements:

1. Structural sheathing shall be applied to all exterior sheathable surfaces of a braced wall line including areas above and below openings.
2. Only full-height braced wall panels shall be used for calculating the braced wall percentage in accordance with Table R602.10.1(1).

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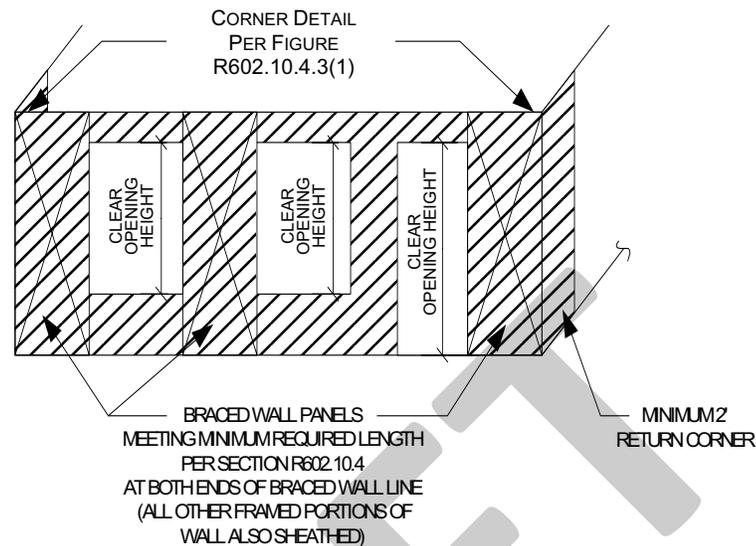


FIGURE R602.10.4(1)
CONTINUOUSLY-SHEATHED BRACED WALL LINE

R602.10.4.2 Braced wall panel length. In a continuously-sheathed wood structural panel braced wall line, the minimum braced wall panel length shall be permitted to be in accordance with Table R602.10.4.2.

TABLE R602.10.4.2
LENGTH REQUIREMENTS FOR BRACED WALL PANELS
IN A CONTINUOUSLY SHEATHED WALL ^a

MINIMUM LENGTH OF BRACED WALL PANEL (inches)			MINIMUM OPENING CLEAR HEIGHT NEXT TO THE BRACED WALL PANEL (% of wall height)
8-foot wall	9-foot wall	10-foot wall	
48	54	60	100%
32	36	40	85%
24	27	30	67%

For SI: 1 inch = 25.4 mm, 1 foot = 305 mm

a. Interpolation shall be permitted.

R602.10.4.3 Braced wall panel location and corner construction. A braced wall panel shall be located at each end of a continuously-sheathed braced wall line. A minimum 24-inch (610 mm) wood structural panel corner return shall be provided at both ends of a continuously-sheathed braced wall line in accordance with Figure R602.10.4.3(1). In lieu of the corner return, a tie-down device with a minimum uplift design value of 800 lb shall be fastened to the corner stud and to the foundation or framing below in accordance with Figure R602.10.4.3(2).

Exception: The first braced wall panel shall be permitted to begin 12 feet 6 inches (3810 mm) from each end of the braced wall line in Seismic Design Categories A, B, and C and 8 feet in Seismic Design Categories D₀, D₁, and D₂ provided one of the following is satisfied:

1. A minimum 2-foot-long (610 mm), full-height wood structural panel is provided at both sides of a corner constructed in accordance with Figure R602.10.4.3(1) at the braced wall line ends in accordance with Figure R602.10.4.3(3), or
2. The braced wall panel closest to the corner shall have a tie-down device with a minimum uplift design value of 800 lb (36 kg) fastened to the stud at the edge of the braced wall panel closest to the corner and to the foundation or framing below in accordance with Figure R602.10.4.3(4).

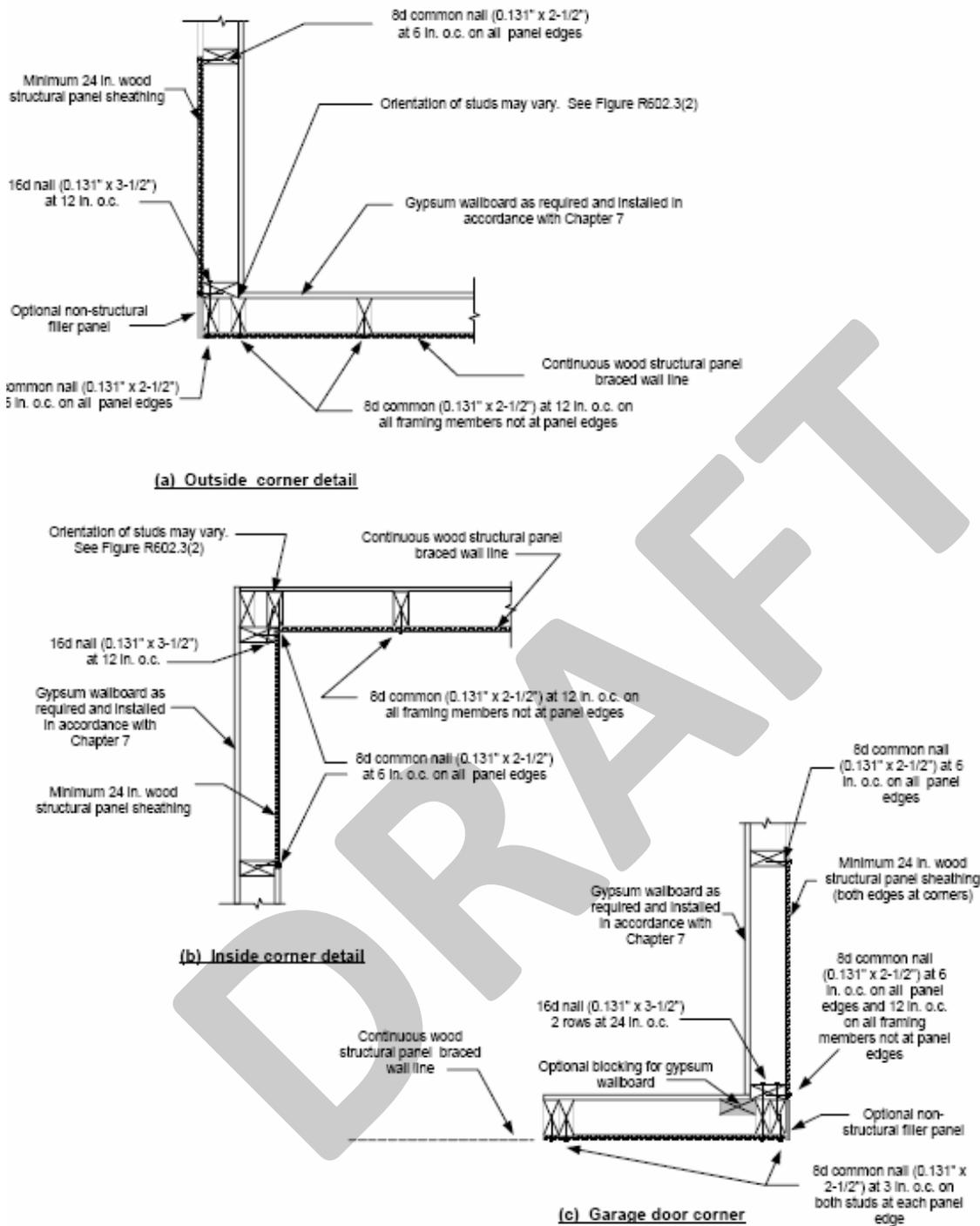
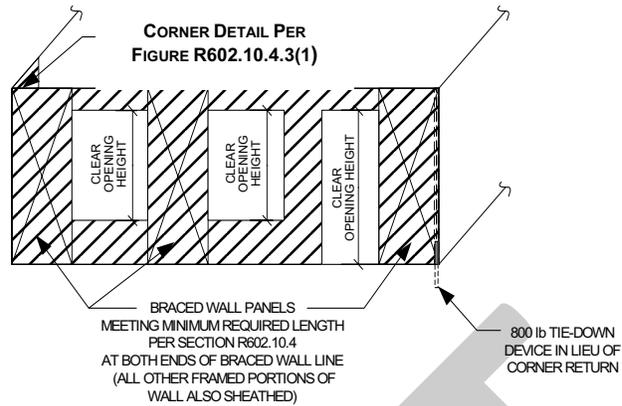
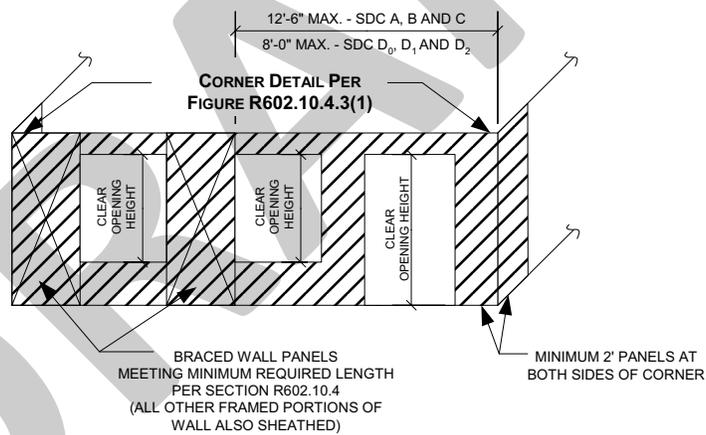


FIGURE R602.10.4.3(1)
TYPICAL EXTERIOR CORNER FRAMING FOR CONTINUOUS STRUCTURAL
PANEL SHEATHING SHOWING REQUIRED STUD-TO-STUD NAILING

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**FIGURE R602.10.4.3(2)
CONTINUOUSLY SHEATHED BRACED WALL LINE – WITHOUT CORNER RETURN**



**FIGURE R602.10.4.3(3)
CONTINUOUSLY SHEATHED BRACED WALL LINE – FIRST
BRACED WALL PANEL AWAY FROM END OF WALL LINE WITHOUT TIE DOWN**

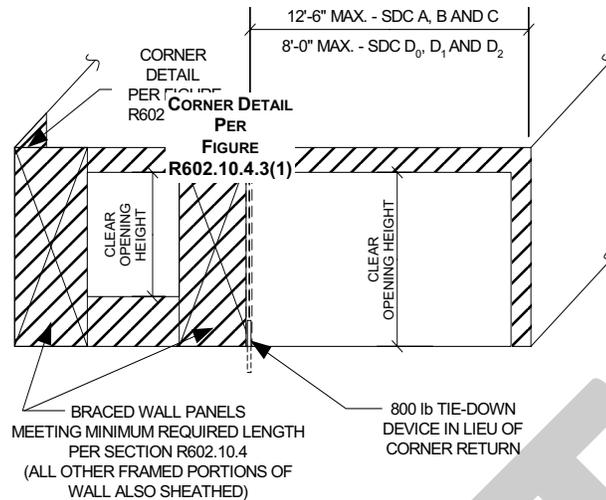


FIGURE R602.10.4.3(4)
CONTINUOUSLY SHEATHED BRACED WALL LINE – FIRST BRACED
WALL PANEL AWAY FROM END OF WALL LINE WITH TIE DOWN

R602.10.4.4 Braced wall percentage. In addition to bracing percentage adjustments specified elsewhere in this code, the braced wall percentages for Method 3 from Table 602.10.1(1) shall be permitted to be multiplied by a factor in accordance with Table R602.10.4.4.

TABLE R602.10.4.4
ADJUSTMENT FACTORS TO THE PERCENTAGE OF REQUIRED BRACING PER WALL LINE –
CONTINUOUSLY SHEATHED

ADJUSTMENT BASED ON MAXIMUM WALL CLEAR OPENING HEIGHT:	MULTIPLY PERCENTAGE OF BRACING PER WALL LINE BY:	
Continuous wood structural panel sheathing when maximum opening height in wall line does not exceed ^a (Section 301.2.2.2.1)	85% of wall height	0.9
	67% of wall height	0.8

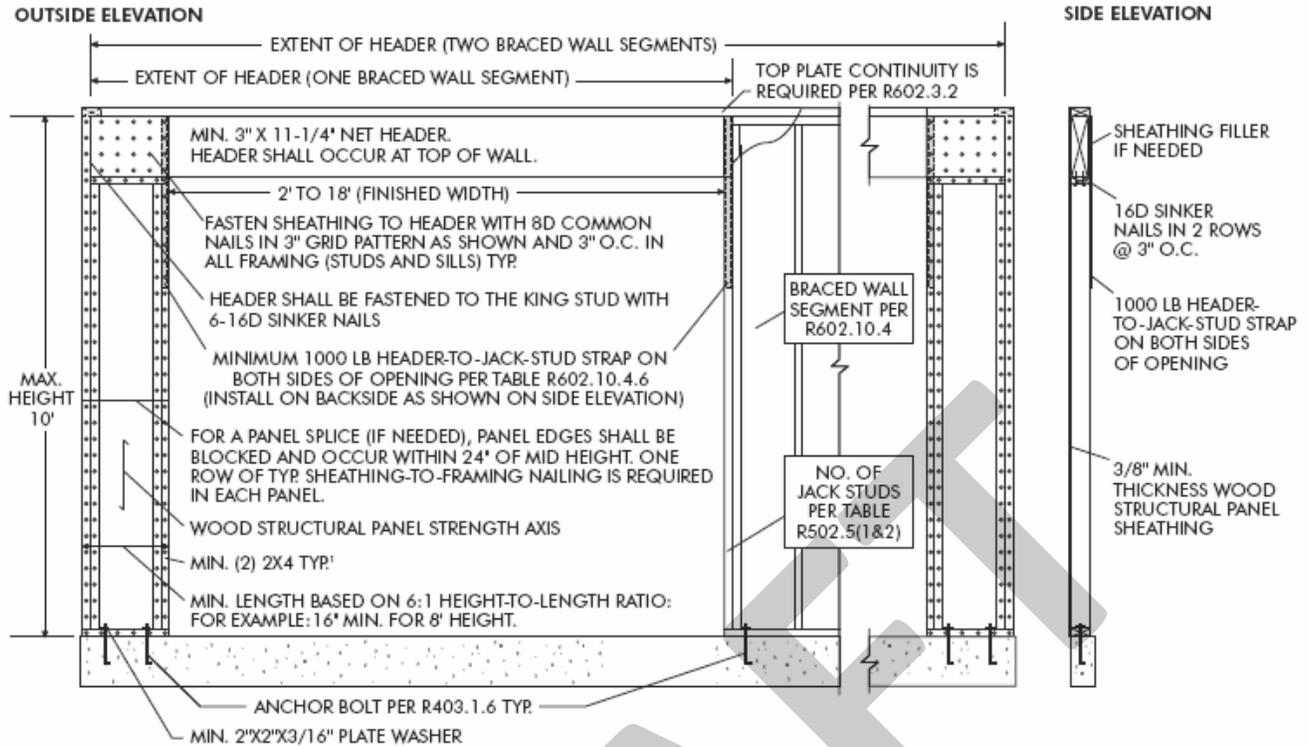
a. Percentage of bracing for continuous wood structural panel sheathing shall be based on Method 3 requirements.

R602.10.4.5 4:1 aspect ratio segments at garage door openings used with continuous structural panel sheathing. A 4:1 aspect ratio shall be permitted for full-height sheathed wall segments on either side of garage openings that support light frame roofs only, with roof covering dead loads of 3 psf (0.14 kN/m²) or less. For purposes of calculating the percentage of panel bracing required by Table R602.10.1(1), the length of the full height sheathing segment shall be equal to its measured length. This option is limited to one wall of the garage.

R602.10.4.6 6:1 aspect ratio segments used with continuous structural panel sheathing. Wall segments having a maximum 6:1 height to width ratio shall be permitted to be built in accordance with Figure R602.10.4.6. The maximum 6:1 height-to-width ratio is based on height being measured from top of header to the bottom of the wall segment bottom-plate. For purposes of calculating the percentage of panel bracing required by Table R602.10.1(1), the width of the full-height sheathing segment shall be equal to its measured width. Corners at the ends of walls using this option shall be constructed in accordance with Figure R602.10.4.3(1). The reduction factors for continuously braced walls from Section R602.10.4.4 shall be applied when calculating applicable percentages of wall bracing. The number of wall segments having a maximum 6:1 height to width ratio in a wall line shall not exceed four. In multi-story buildings, wall segments having a maximum 6:1 height to width ratio are not permitted to be directly stacked vertically. For purposes of resisting wind pressures acting perpendicular to the wall, in accordance with Section R301.2, the minimum requirements of Figure R602.10.4.6 shall be sufficient for wind speeds less than 110 mph in Exposure Category B. For Exposure Categories C and D, the header to jack stud strap requirements and the number of additional jack studs shall be in accordance with Table R602.10.4.6.

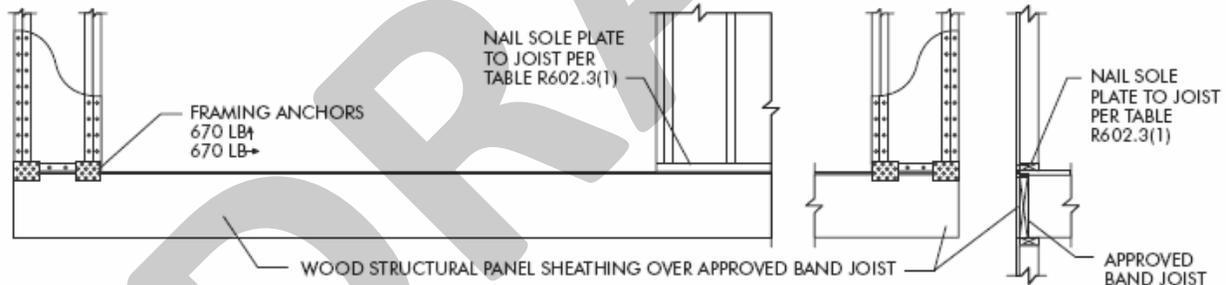
R602.10.4.7 Continuously-sheathed braced wall lines. Where a continuously-sheathed braced wall line is used in Seismic Design Categories D₀, D₁, and D₂ or regions where the basic wind speed exceeds 100 miles per hour, all other exterior braced wall lines in the same story shall be continuously sheathed.

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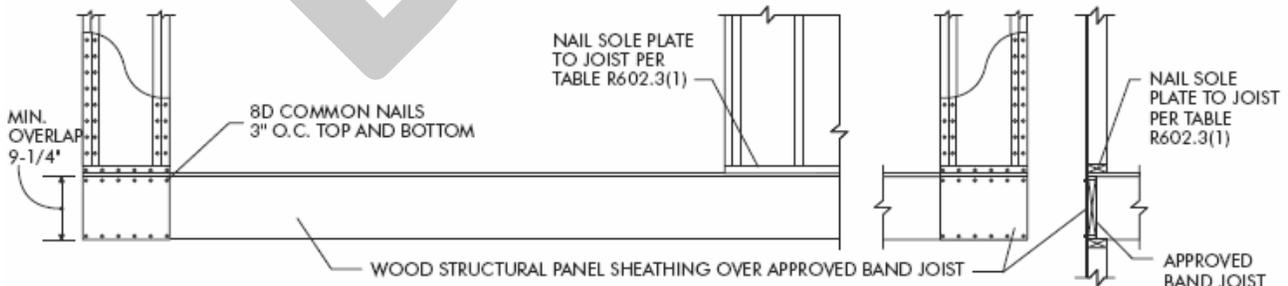


*FOR WIND EXPOSURE CATEGORIES C AND D, ADDITIONAL JACK STUDS MAY BE REQUIRED PER TABLE R602.10.4.6

OVER CONCRETE OR MASONRY BLOCK FOUNDATION



OVER RAISED WOOD FLOOR OR SECOND FLOOR – FRAMING ANCHOR OPTION



OVER RAISED WOOD FLOOR OR SECOND FLOOR – WOOD STRUCTURAL PANEL OVERLAP OPTION

NOT TO SCALE

FIGURE R602.10.4.6
WALLS WITH 6:1 ASPECT RATIO USED WITH CONTINUOUS WOOD STRUCTURAL PANEL SHEATHING

**TABLE R602.10.4.6
HEADER TO JACK STUD STRAP AND THE NUMBER OF ADDITIONAL JACK STUDS
REQUIRED FOR RESISTING WIND PRESSURES PERPENDICULAR TO 6:1 ASPECT RATIO WALLS
LOCATED IN WIND EXPOSURE CATEGORIES C AND D**

Required	Wall Height (ft)	Wind Exposure Category C			Wind Exposure Category D		
		85 mph	90 mph	less than 110 mph	85 mph	90 mph	less than 110 mph
Strap Capacity(lb) ^a	10 and less	1000	1200	2275	1375	1750	3050
Number of additional 2x4 Jack Studs ^b	8	--	--	--	--	--	1
	9	--	--	1	--	1	2
	10	--	1	2	1	2	3

- a. If 2x6 framing is used, then the required strap capacity may be multiplied by 0.65, but in no case shall the required strap capacity be less than 1,000 lb.
- b. If 2x6 framing is used, then no additional framing shall be required.

R602.10.5 Braced wall panel support Braced wall panels shall be supported on floor framing or foundations as follows:

- Where joists are perpendicular to braced wall lines above or below, blocking shall be provided between the joists at braced wall panel locations to permit fastening of wall plates in accordance with Table R602.3(1).
- Where joists are parallel to braced wall lines above or below, a rim joist or other parallel framing member shall be provided at the wall to permit fastening of wall plates in accordance with Table R602.3(1)
- Braced wall panels shall be permitted to be supported on cantilevered floor joists meeting the cantilever limits of Section R502.3.3 provided joists are blocked at the nearest bearing wall location, except such blocking shall not be required in Seismic Design Categories A, B, and C for cantilevers not exceeding 24 inches (610 mm) where a full height rim joist is provided.
- Elevated post or pier foundations supporting braced wall panels shall be designed in accordance with accepted engineering practice.

R602.10.5.1 Interior braced wall panel connections for Seismic Design Categories D₀, D₁ and D₂. Interior braced wall lines shall be fastened to floor and roof framing in accordance with Table R602.3(1), to required foundations in accordance with Section R602.11.1, and in accordance with the following requirements:

- Floor joists parallel to the top plate shall be toe-nailed to the top plate with at least 8d nails spaced a maximum of 6 inches (150 mm) on center.
- Top plate laps shall be face-nailed with at least eight 16d nails on each side of the splice.

R602.10.6 Interior braced wall support. In Seismic Design Categories A through D₁, interior braced wall lines shall be supported as provided in Section R502.4.

R602.10.6.1 Interior braced wall support for Seismic Design Category D₂. In one-story buildings located in Seismic Design Category D₂, interior braced wall lines shall be supported on continuous foundations at intervals not exceeding 50 feet (15 240 mm). In two story buildings located in Seismic Design Category D₂, all interior braced wall panels shall be supported on continuous foundations.

Exception: Two-story buildings shall be permitted to have interior braced wall lines supported on continuous foundations at intervals not exceeding 50 feet (15 240 mm) provided that:

- The height of cripple walls does not exceed 4 feet (1219 mm).
- First-floor braced wall panels are supported on doubled floor joists, continuous blocking or floor beams.
- The distance between bracing lines does not exceed twice the building width measured parallel to the braced wall line.

R602.10.7 Panel joints. All vertical joints of panel sheathing shall occur over, and be fastened to common studs. Horizontal joints in braced wall panels shall occur over, and be fastened to common blocking of a minimum 1-1/2 inch (38 mm) thickness.

2007 SUPPLEMENT TO THE IRC**Exceptions:**

1. Blocking at horizontal joints shall not be required in wall segments that are not counted as braced wall panels.
2. Where the bracing percentage provided is at least twice the minimum percentage required by Table R602.10.1(1) blocking at horizontal joints shall not be required in braced wall panels constructed using Methods 3, 4, 5, 6, or 8.

R602.10.8 Cripple wall bracing. In Seismic Design Categories other than D₂, cripple walls shall be braced with a percentage and type of bracing as required for the wall above in accordance with Table R602.10.1(1) with the following modifications for cripple wall bracing:

1. The percentage of bracing as determined from Table R602.10.1(1) shall be multiplied by a factor of 1.15, and
2. The wall panel spacing shall be decreased to 18 feet (5486 mm) instead of 25 feet (7620 mm).

R602.10.8.1 Cripple wall bracing in Seismic Design Categories D₀, D₁ and D₂. In addition to the requirements of Section R602.10.8, where interior braced wall lines occur without a continuous foundation below, the length of parallel exterior cripple wall bracing shall be one and one-half times the length required by Table R602.10.1(1). Where cripple walls braced using Method 3 of Section R602.10.2 cannot provide this additional length, the capacity of the sheathing shall be increased by reducing the spacing of fasteners along the perimeter of each piece of sheathing to 4 inches (102 mm) on center.

In Seismic Design Category D₂, cripple walls shall be braced in accordance with Table R602.10.1(1).

R602.10.8.2 Redesignation of cripple walls. In any Seismic Design Category, cripple walls shall be permitted to be redesignated as the first story walls for purposes of determining wall bracing requirements. If the cripple walls are redesignated, the stories above the redesignated story shall be counted as the second and third stories respectively.

R602.11 Wall anchorage. Braced wall line sills shall be anchored to concrete or masonry foundations in accordance with Sections R403.1.6 and R602.11.1

602.11.1 Wall anchorage for all buildings in Seismic Design Categories D₀, D₁ and D₂ and townhouses in Seismic Design Category C. Plate washers, a minimum of 0.229 inch by 3 inches by 3 inches (5.8 mm by 76 mm) in size, shall be provided between the foundation sill plate and the nut except where approved anchor straps are used. The hole in the plate washer is permitted to be diagonally slotted with a width of up to 3/16 inch (5 mm) larger than the bolt diameter and a slot length not to exceed 1-3/4 inches (44 mm), provided a standard cut washer is placed between the plate washer and the nut.

R602.11.2 Stepped foundations in Seismic Design Categories D₀, D₁ and D₂. In all buildings located in Seismic Design Categories D₀, D₁ or D₂, where the height of a required braced wall line that extends from foundation to floor above varies more than 4 feet (1220 mm), the braced wall line shall be constructed in accordance with the following:

1. Where the lowest floor framing rests directly on a sill bolted to a foundation not less than 8 feet (2440 mm) in length along a line of bracing, the line shall be considered as braced. The double plate of the cripple stud wall beyond the segment of footing that extends to the lowest framed floor shall be spliced by extending the upper top plate a minimum of 4 feet (1219 mm) along the foundation. Anchor bolts shall be located a maximum of 1 foot and 3 feet (305 and 914 mm) from the step in the foundation. See Figure R602.11.3.
2. Where cripple walls occur between the top of the foundation and the lowest floor framing, the bracing requirements of Sections R602.10.8 and R602.10.8.1 shall apply.
3. Where only the bottom of the foundation is stepped and the lowest floor framing rests directly on a sill bolted to the foundations, the requirements of Sections R403.1.6 and R602.11.1 shall apply.

Section R606.3 Change to read as shown: (RB238-06/07)

R606.3 Corbeled masonry. Corbeled masonry shall be in accordance with Sections R606.3.1 through R606.3.3.

Section R606.3.1, R606.3.2, R606.3.3 Add new sections to read as shown: (RB238-06/07)

R606.3.1 Units. Solid masonry units or masonry units filled with mortar or grout shall be used for corbeling.

2007 SUPPLEMENT TO THE IRC

R301.2.2.3.5 Cold-formed steel framing in Seismic Design Categories D₀, D₁ and D₂. In Seismic Design Categories D₀, D₁ and D₂ in addition to the requirements of this code, cold-formed steel framing shall comply with the requirements of COFS/PM.

R301.2.2.3.6 Masonry chimneys. Masonry chimneys shall be reinforced and anchored to the building in accordance with Sections R1003.3 and R1003.4.

R301.2.2.3.7 Anchorage of water heaters. Water heaters shall be anchored against movement and overturning in accordance with Section M1307.2.

R301.2.2.4 Seismic Design Category E. Buildings in Seismic Design Category E shall be designed in accordance with the *International Building Code*, except when the seismic design category is reclassified to a lower seismic design category in accordance with Section R301.2.2.1.

Section R301.2.3 Change to read as shown: (RB34-06/07)

R301.2.3 Snow loads. Wood framed construction, cold-formed steel framed construction and masonry and concrete construction, and structural insulated panel construction in regions with ground snow loads 70 pounds per square foot (3.35 kPa) or less, shall be in accordance with Chapters 5, 6 and 8. Buildings in regions with ground snow loads greater than 70 pounds per square foot (3.35 kPa) shall be designed in accordance with accepted engineering practice.

Section R301.2.4 Change to read as shown: (RB48-06/07)

R301.2.4 Floodplain construction. Buildings and structures constructed in whole or in part in flood hazard areas (including A or V Zones) as established in Table R301.2(1) shall be designed and constructed in accordance with Section R324.

Exception: Buildings and structures located in whole or in part in identified floodways shall be designed and constructed in accordance with *Flood Resistant Design and Construction* (ASCE 24).

Section R301.2.4.1 Add new section to read as shown: (RB48-06/07)

R301.2.4.1 Alternative provisions. As an alternative to the requirements in Section R324.3 for buildings and structures located in whole or in part in coastal high hazard areas (V Zones), ASCE 24 is permitted subject to the limitations of this code and the limitations therein.

Section R301.3 Change to read as shown: (S100-06/07 Part II)

R301.3 Story height. Buildings constructed in accordance with these provisions shall be limited to story heights of not more than the following:

1. For wood wall framing, the laterally unsupported bearing wall stud height permitted by Table R602.3(5) plus a height of floor framing not to exceed 16 inches.

Exception: For wood framed wall buildings with bracing in accordance with Table R602.10.1, the wall stud clear height used to determine the maximum permitted story height may be increased to 12 feet (3658 mm) without requiring an engineered design for the building wind and seismic force resisting systems provided that the length of bracing required by Table R602.10.1 is increased by multiplying by a factor of 1.20. Wall studs are still subject to the requirements of this section.

2. For steel wall framing, a stud height of 10 feet (3048 mm), plus a height of floor framing not to exceed 16 inches (406 mm).
3. For masonry walls, a maximum bearing wall clear height of 12 feet (3658 mm) plus a height of floor framing not to exceed 16 inches (406 mm).

Exception: An additional 8 feet (2438 mm) is permitted for gable end walls.

4. For insulating concrete form walls, the maximum bearing wall height per story as permitted by Section R611 tables plus a height of floor framing not to exceed 16 inches (406 mm).
5. For structural insulated panel walls, the maximum bearing wall height per story as permitted by Section 614 tables plus a height of floor framing not to exceed 10 feet (3048 mm).

Individual walls or walls studs shall be permitted to exceed these limits as permitted by Chapter 6 provisions, provided story heights are not exceeded. Floor framing height shall be permitted to exceed these limits provided the story height does not exceed 11 feet 7 inches (3531 mm). An engineered design shall be provided for the wall or wall framing members when they exceed the limits of Chapter 6. Where the story height limits are exceeded, an engineered design shall be provided in accordance with the *International Building Code* for the overall wind and seismic force resisting systems.

Table R301.5 Delete the row for "Exterior balconies" and Change row "Decks" and footnotes to read as shown: (RB49-06/07 and S9-06/07 Part II)

TABLE R301.5
MINIMUM UNIFORMLY DISTRIBUTED LIVE LOADS
(in pounds per square foot)

USE	LIVE LOAD
Balconies (exterior) and decks ^e	40

(Portions of table not shown remain unchanged)

For SI: 1 pound per square foot = 0.0479 kPa, 1 square inch = 645 mm², 1 pound = 4.45 N.

- a. Elevated garage floors shall be capable of supporting a 2,000-pound load applied over a 20-square-inch area.
- b. Attics without storage are those where the maximum clear height between joist and rafter is less than 42 inches, or where there are not two or more adjacent trusses with the same web configuration capable of containing a rectangle 42 inches high by 2 feet wide, or greater, located within the plane of the truss. For attics without storage, this live load need not be assumed to act concurrently with any other live load requirements.
- c. Individual stair treads shall be designed for the uniformly distributed live load or a 300-pound concentrated load acting over an area of 4 square inches, whichever produces the greater stresses.
- d. A single concentrated load applied in any direction at any point along the top.
- e. See Section R502.2.2 for decks attached to exterior walls.
- f. Guard in-fill components (all those except the handrail), balusters and panel fillers shall be designed to withstand a horizontally applied normal load of 50 pounds on an area equal to 1 square foot. This load need not be assumed to act concurrently with any other live load requirement.
- g. For attics with limited storage and constructed with trusses, this live load need be applied only to those portions of the bottom chord where there are two or more adjacent trusses with the same web configuration capable of containing a rectangle 42 inches high or greater by 2 feet wide or greater, located within the plane of the truss. The rectangle shall fit between the top of the bottom chord and the bottom of any other truss member, provided that each of the following criteria is met:
 1. The attic area is accessible by a pull-down stairway or framed opening in accordance with Section R807.1; and
 2. The truss has a bottom chord pitch less than 2:12.
 3. Required insulation depth is less than the bottom chord member depth.

The bottom chords of trusses meeting the above criteria for limited storage shall be designed for the greater of the actual imposed dead load or 10 psf, uniformly distributed over the entire span.
- h. Attic spaces served by a fixed stair shall be designed to support the minimum live load specified for sleeping rooms.
- i. Glazing used in handrail assemblies and guards shall be designed with a safety factor of 4. The safety factor shall be applied to each of the concentrated loads applied to the top of the rail, and to the load on the in-fill components. These loads shall be determined independent of one another, and loads are assumed not to occur with any other live load.

Code Modification Attachment

A request is hereby made for an appeal, interpretation or modification related to Section(s) IRC 2006 R301.3 Story Height & R602.10 Wall Bracing of the Construction Code, which require(s) that:

Story Height

R301.3 Story height, which requires that floor framing not exceed 16 inches in height.

Wall Bracing

R602.10 Wall bracing subsection *R602.10.5 Continuous wood structural panel sheathing*, which requires that sheathing be provided in accordance with Method 3 on all sheathable areas of all exterior walls, and interior braced wall lines, where required.

State the precise relief, remedy, or result requested:

Story Height

Remedy: Permit the use of 2007 IRC Supplement *R301.3 Story height* in lieu of 2006 IRC *R301.3 Story height*.

The 2006 IRC precludes the use of 20" deep floor framing that is commonly used for residential construction in the Phoenix metropolitan area. The 2007 Supplement permits the use of 20" floor framing stating:

Individual walls or walls studs shall be permitted to exceed these limits [16" deep floor framing] as permitted by Chapter 6 provisions, provided story heights are not exceeded. Floor framing height shall be permitted to exceed these limits provided the story height does not exceed 11 feet 7 inches (3531 mm).

Wall Bracing

Remedy: Permit the use of 2007 IRC Supplement *R602.10.4 Continuously-sheathed braced wall line requirements* in lieu of IRC 2006 *R602.10.5 Continuous wood structural panel sheathing*.

The 2006 IRC section R602.10.5 requires the installation of sheathing on all exterior walls of a home. The 2007 Supplement permits the continuous sheathing method of bracing to be used on a wall line-by-wall line basis.

State the factual and/or legal basis for the appeal, interpretation, or modification. If a modification is requested, include the reason(s) why the proposed modification of the code meets the intent of the code.

Story Height & Wall Bracing

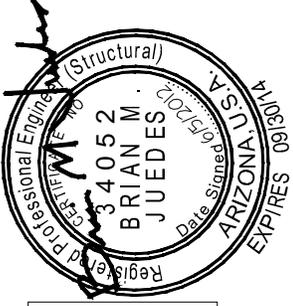
The 2007 IRC Supplement is a recognized model building code developed through the International Code Council's code development process. Permitting the use of provisions from the 2007 IRC Supplement is justifiable because it provides the latest development towards the code's purpose as stated in *R301.3 Purpose*.

A national builder seeks to submit home plans citing prescriptive construction methods to this city for the construction of new homes. The builder desires to employ prescriptive bracing via continuous sheathing on a wall line-by-wall line basis as a means of reducing construction costs and delays.

Maricopa Association of Governments Building Code Amendments and Standards Manual BCAS #15	
Title: 9.5 Course Wall Details for Wind Exposure B and C	
Originally Reviewed by MAG Building Codes Committee: 6/20/2013	
Updated by MAG Building Codes Committee: none	

At the June 20, 2012 Building Codes Committee meeting, the Committee hosted representatives from the Arizona Masonry Guild, who presented a new standard detail for 4" masonry block walls. This detail was created and sealed by the Felten Group, and is intended to be used for free by contractors and homeowners who need an engineered wall detail as part of a building permit application. Using the detail would allow a contractor or homeowner to submit an engineered detail without needing to hire and pay an architect or engineer for the design.

At the August 15, 2012, meeting, the Committee voted to make the detail available to any member agency in order to distribute the detail to interested parties for their use as needed.



REVISIONS	ENGINEERED BY / DATE
Δ	G.FELTEN / BMJ
Δ	06/05/12
SHEET 5/1	
PRESUMPTIVE SOIL	
LATERAL SOIL PASSIVE PRESSURE OF 200 PSF/FT	

ARIZONA MASONRY GUILD

EXP. B WIND

9 1/2 COURSE FENCE STANDARD

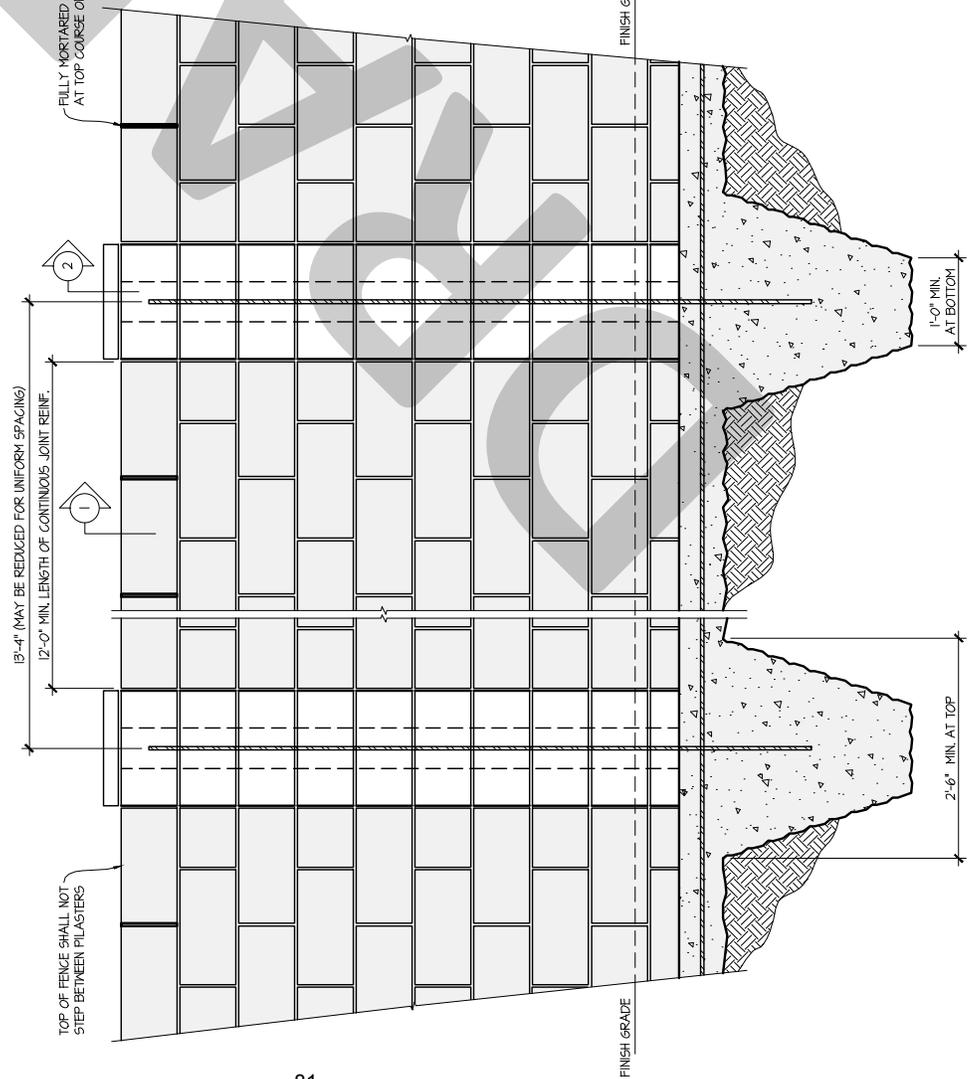
DETAIL DRAWN BY:



18325 N. ALLIED WAY
SUITE 200
PHOENIX, AZ 85054

* SEE SHEET GSN FOR GENERAL STRUCTURAL NOTES

TOP VIEW
AT PILASTERS SHOWING
4" INTERSECTING WALL



13'-4" MAY BE REDUCED FOR UNIFORM SPACING)
12'-0" MIN. LENGTH OF CONTINUOUS JOINT REIN.

TOP OF FENCE SHALL NOT
STEP BETWEEN PILASTERS

FULLY MORTARED HEAD JOINT
AT TOP COURSE ONLY

8" NOM.

2" GAP BLOCK
AT PILASTERS

8" PILASTER BLOCK W/
MORTARED BED JOINTS
9 1/2 COURSES

4" NOM.

9 GA. LADDER JOINT REIN. AT 16" O.C.
CONTINUOUS FOR 12'-0" (I.E. NO LAP JOINTS
(2 ROWS AS SHOWN))

4" NOMINAL FENCE BLOCK
W/ MORTARED BED JOINTS
AND OPEN HEAD JOINTS
9 1/2 COURSES

(#5 VERTICAL CENTERED
IN PILASTER GROUT SOLID

6" MAX. UNEAL. FILL

6" MIN.

FINISH GRADE

FINISH GRADE

FINISH GRADE

1'-0" MIN. AT BOTTOM

3'-2" MIN.

10" MIN.

12" EMBED MIN.

6" MAX. UNEAL. FILL

1'-6" MIN. EMBED

2'-8" MIN.

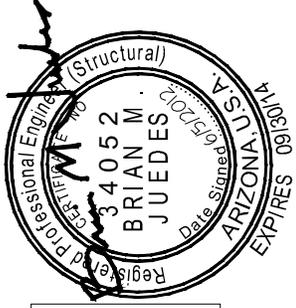
CONT. CONCRETE FOOTING
W/ (1) #4 CONT.

SECTION 1

SECTION 2

4" INTERLOCKING BLOCK WALL W/ PILASTERS

SCALE: 1/2" = 1'-0"



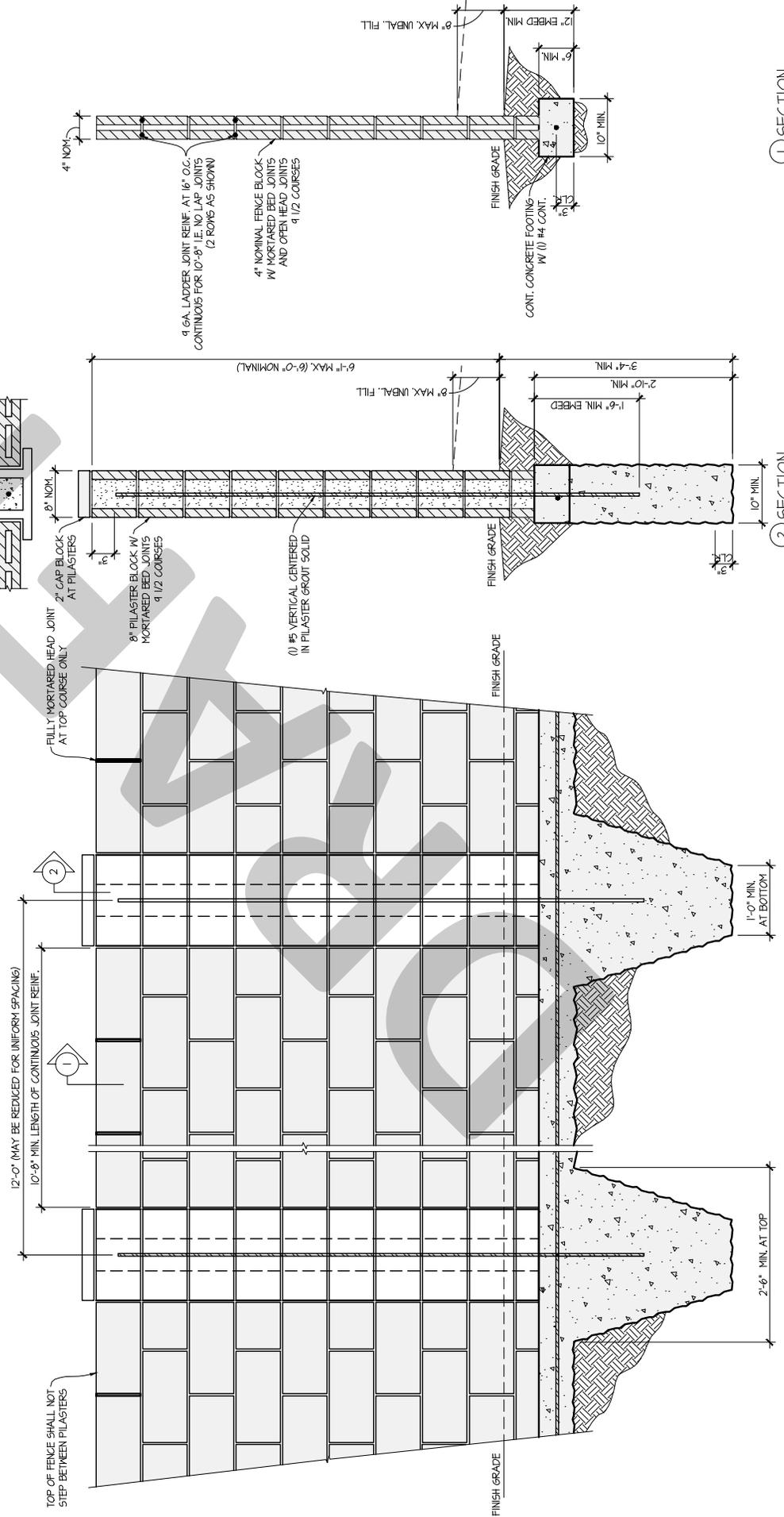
REVISIONS
 Δ 6 FELTEN / BMJ
 06/05/12
 SHEET
 S.I.1
 REGISTERED PROFESSIONAL ENGINEER
 PRESUMPTIVE SOIL
 LATERAL SOIL PASSIVE PRESSURE OF 200 PSF/FT

ARIZONA MASONRY GUILD
 EXP. G WIND
 9 1/2 COURSE FENCE STANDARD

DETAIL DRAWN BY:
FELTEN GROUP
 ENGINEERS • ARCHITECTS • DESIGNERS
 18325 N. ALLIED WAY
 SUITE 200
 PHOENIX, AZ 85054

* SEE SHEET GSN FOR GENERAL STRUCTURAL NOTES

TOP VIEW
 AT PILASTERS SHOWING
 4" INTERSECTING WALL

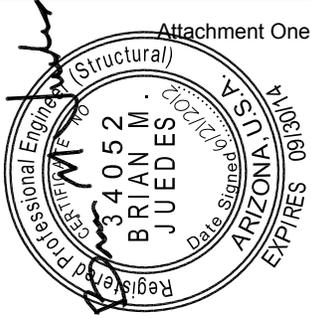


SECTION 1

SECTION 2

4" INTERLOCKING BLOCK WALL W/ PILASTERS

SCALE: 1/2" = 1'-0"



ENGINEERED BY / DATE
G FELTEN / BMJ
06/21/12

SHEET
GSN

ARIZONA MASONRY GUILD
GENERAL STRUCTURAL NOTES
FOR MASONRY FENCES

DETAIL DRAWN BY:
FELTEN GROUP
ENGINEERS - ARCHITECTS - DESIGNERS
18325 N. ALLIED WAY
SUITE 200
PHOENIX, AZ 85054

* SEE SHEET S.I.I. FOR MASONRY FENCE DESIGN

<p>METHOD OF CONSTRUCTION</p> <ol style="list-style-type: none"> 1. THE CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR CONSTRUCTION MEANS, METHODS, TECHNIQUES, SEQUENCES, AND PROCEDURES. 2. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE SAFETY OF THE STRUCTURE DURING CONSTRUCTION AND SHALL PROVIDE ADEQUATE SHORING AND BRACING DURING CONSTRUCTION. CONTRACTOR SHALL COMPLY WITH ALL APPLICABLE SAFETY REGULATIONS. 3. THE CONTRACTOR SHALL COORDINATE THE WORK OF ALL TRADES AND SHALL CHECK ALL DIMENSIONS. ANY DISCREPANCIES SHALL BE CALLED TO THE ATTENTION OF THE ARCHITECT OR ENGINEER AND SHALL BE RESOLVED BEFORE PROCEEDING WITH THE WORK AFFECTED. 	<p>GRADING AND DRAINAGE</p> <ol style="list-style-type: none"> 1. PROPER GRADING SHALL BE PROVIDED DURING CONSTRUCTION AS WELL AS THROUGHOUT THE LIFE OF THE STRUCTURE. 2. LANDSCAPE WATERING SHOULD NOT LEAD TO MOISTURE INFILTRATION OR MOISTURE CONTENT FLUCTUATION IN THE SOILS UNDER THE FOUNDATION. IT IS RECOMMENDED THAT VEGETATION BE KEPT A MINIMUM OF 3 FEET FROM THE STRUCTURE AND THAT THE VEGETATION BE DESERT TYPE. (SHALLOW WATERING; MOISTURE NOT TO PENETRATE INTO THE SOIL MORE THAN 8 INCHES). 3. IT IS RECOMMENDED THAT TREES BE KEPT AWAY FROM THE STRUCTURE SUCH THAT THE DRIP LINE OF THE MATURE TREE DOES NOT OVERLAP THE FOUNDATION. 	<p>CONCRETE</p> <ol style="list-style-type: none"> 1. ALL MATERIALS, PROCEDURES, PLACEMENT, FORMWORK, LAPS, ETC. TO CONFORM TO THE LATEST ACI STANDARDS. 2. SHALL MEET ALL THE REQUIREMENTS OF ACI 301, TYPE II GEMENT UNO. MINIMUM STRENGTHS AT 28 DAYS SHALL BE AS FOLLOWS, UNO: CONVENTIONAL FOUNDATIONS - 2500 PSI 3. MAXIMUM SIZE OF AGGREGATE SHALL BE 1 INCH. AGGREGATE PER ASTM C571 OR C33. 4. MAXIMUM SLUMP TO BE 8 INCHES. 5. CALCIUM CHLORIDE OR ADMIXTURES CONTAINING CALCIUM CHLORIDE SHALL NOT BE USED AS ADDITIVES. 6. FLYASH MAY BE USED PROVIDED IT MEETS ASTM C618 TYPE F AND DOES NOT EXCEED 20% OF THE WEIGHT OF TOTAL CEMENTITIOUS MATERIAL FOR CONCRETE STRENGTH UP TO AND INCLUDING 3000 PSI. 7. PROTECT CONCRETE FROM DAMAGE OR REDUCED STRENGTH FROM COLD OR HOT WEATHER IN COMPLIANCE WITH ACI 305 AND ACI 306. 8. THE CONTRACTOR SHALL PROVIDE PROPER CURING TO MINIMIZE SHRINKAGE CRACKING AND ENHANCE PROPER STRENGTH GAIN. 9. EVALUATION AND ACCEPTANCE OF CONCRETE SHALL BE BASED ON CYLINDER STRENGTH TESTS AS OUTLINED IN THE APPLICABLE BUILDING CODE. 10. CONCRETE THAT IS IN DIRECT CONTACT WITH NATIVE SOILS CONTAINING WATER-SOLUBLE SULFATES SHALL CONFORM TO THE FOLLOWING: FOR SULFATE CONCENTRATIONS GREATER THAN OR EQUAL TO 0.18 BUT LESS THAN 0.28 BY WEIGHT CONCRETE SHALL BE MADE WITH ASTM C 150 TYPE II CEMENT, OR AN ASTM C 545 OR C 157 HYDRAULIC CEMENT MEETING MODERATE SULFATE-RESISTANT HYDRAULIC CEMENT (M5) DESIGNATION. FOR SULFATE CONCENTRATIONS EQUAL TO OR GREATER THAN 0.28 BY WEIGHT, CONCRETE SHALL BE MADE WITH ASTM C 150 TYPE V CEMENT OR AN ASTM C 545 OR C 157 HYDRAULIC CEMENT MEETING HIGH SULFATE-RESISTANT HYDRAULIC CEMENT (H5) DESIGNATION AND SHALL HAVE A MINIMUM COMPRESSIVE STRENGTH OF 3000 PSI AT 28 DAYS.
<p>GENERAL</p> <ol style="list-style-type: none"> 1. ALL WORK SHALL COMPLY WITH THE GENERAL NOTES, DRAWINGS, APPLICABLE BUILDING CODES AND ALL LOCAL ORDINANCES, LAWS, REGULATIONS, AND PROTECTIVE COVENANTS GOVERNING THE SITE OF WORK. 2. IN CASE OF CONFLICT, THE MORE STRINGENT REQUIREMENTS SHALL GOVERN. 3. TYPICAL DETAILS SHALL APPLY UNLESS SHOWN OTHERWISE IN THE DRAWINGS. 4. NO STRUCTURAL MEMBERS SHALL BE CUT, NOTCHED OR OTHERWISE PENETRATED UNLESS SPECIFICALLY APPROVED BY THE STRUCTURAL ENGINEER IN ADVANCE OR AS SHOWN ON THESE DRAWINGS. 5. THE STANDARD OF CARE FOR ALL PROFESSIONAL ENGINEERING, AND RELATED SERVICES PERFORMED OR FURNISHED BY FELTEN GROUP, WILL BE THE CARE AND SKILL ORDINARILY USED BY MEMBERS OF THE SUBJECT PROFESSION PRACTICING UNDER SIMILAR CIRCUMSTANCES AT THE SAME TIME AND IN THE SAME LOCALITY. FELTEN GROUP MAKES NO WARRANTIES, EXPRESS OR IMPLIED, OR OTHERWISE, IN CONNECTION WITH FELTEN GROUP'S SERVICES. FELTEN GROUP AND ITS CONSULTANTS MAY USE OR RELY UPON THE DESIGN SERVICES OF OTHERS, INCLUDING, BUT NOT LIMITED TO, ENGINEERS, ARCHITECTS, DESIGNERS, CONTRACTORS, MANUFACTURERS, AND SUPPLIERS. 6. ALL DESIGN DOCUMENTS PREPARED OR FURNISHED BY FELTEN GROUP ARE INSTRUMENTS OF SERVICE, AND FELTEN GROUP RETAINS OWNERSHIP AND PROPERTY INTEREST (INCLUDING THE COPYRIGHT) IN SUCH DOCUMENTS, WHETHER OR NOT THE PROJECT IS COMPLETED. CLIENT SHALL NOT REUSE THE DOCUMENTS WITHOUT WRITTEN PERMISSION FROM FELTEN GROUP. 7. THE CONTRACTOR, NOT FELTEN GROUP, IS RESPONSIBLE FOR THE CONSTRUCTION OF THE PROJECT, AND FELTEN GROUP IS NOT RESPONSIBLE FOR THE ACTS OR OMISSIONS OF ANY CONTRACTOR, SUBCONTRACTOR OR MATERIAL SUPPLIER. FOR SAFETY PRECAUTIONS, PROGRAMS OR ENFORCEMENT FOR CONSTRUCTION MEANS, METHODS, TECHNIQUES, SEQUENCES AND PROCEDURES EMPLOYED BY THE CONTRACTOR. FELTEN GROUP SHALL NOT AT ANY TIME SUPERVISE, DIRECT OR HAVE CONTROL OVER ANY CONTRACTOR NOR FELTEN GROUP NEITHER GUARANTEES THE PERFORMANCE OF ANY CONTRACTOR NOR ASSUMES RESPONSIBILITY FOR ANY CONTRACTOR'S FAILURE TO FURNISH AND PERFORM ITS WORK IN ACCORDANCE WITH THE CONTRACT BETWEEN CLIENT AND SUCH CONTRACTOR. FELTEN GROUP WILL NOT HAVE CONTROL OVER NOR BE NEITHER RESPONSIBLE NOR LIABLE IN ANY WAY FOR SAFETY PROCEDURES, SAFETY TRAINING AND PROGRAMS OR OTHER SAFETY RELATED ASPECTS OF THE CONTRACTOR. 10. WALL HEIGHT SHOWN BASED ON ACTUAL 8" TALL BLOCK HEIGHT 11. TOP OF FENCE SHALL NOT STEP BETWEEN PILLASTERS 	<p>SOIL</p> <ol style="list-style-type: none"> 1. SEE SHEET S.I.I. FOR GEOTECHNICAL REPORT INFORMATION 2. IN THE ABSENCE OF A GEOTECHNICAL REPORT, PRESUMPTIVE SOIL DESIGN VALUES SHALL BE USED. THE CLIENT ACCEPTS FULL RESPONSIBILITY FOR THE ADEQUACY OF THE PRESUMPTIVE SOIL DESIGN VALUES USED FOR THE PROJECT. THE CLIENT ALSO ASSUMES FULL RESPONSIBILITY FOR THE ADEQUACY OF THE ASSIGNED NON-EXPANSIVE, NON-COLLAPSIBLE AND NON-CORROSIVE SOIL PROPERTIES 3. PRESUMPTIVE SOIL DESIGN VALUES ARE: ALLOWABLE SOIL BEARING = 1000 P.S.F. 12" BELOW GRADE, EQUIVALENT FLUID PRESSURE = 55 psf/ft, PASSIVE PRESSURE = 200 psf/ft, COEFFICIENT OF FRICTION = 35 4. SOIL IS ASSIGNED TO BE NON-EXPANSIVE NON-COLLAPSIBLE, AND NON-CORROSIVE. 5. ALL EXCAVATION FILL (INCLUDING RETAINING COMPACTION, AND SOIL RELATED OPERATIONS SHALL BE PERFORMED ACCORDING TO THE GEOTECHNICAL REPORT. 	<p>MASONRY</p> <ol style="list-style-type: none"> 1. ALL MATERIALS, PROCEDURES, PLACEMENT, LAPS, ETC. TO CONFORM TO THE LATEST ACI STANDARDS. 2. CONCRETE MASONRY UNITS - NET AREA COMPRESSIVE STRENGTH OF CMU = 1900 PSI, ASTM C90, Fm = 1500 PSI 3. GROUT - 2000 PSI CONFORMING TO ASTM C416 4. TO ASTM C270. MORTAR MAY BE USED IN LIEU OF GROUT IN THE PILLASTER CELL PROVIDED THAT THE MORTAR IS PLACED IN 8 INCH LETS AS THE FENCE IS BUILT 5. JOINT REINFORCING TO BE CONTINUOUS (NO SPLICES) AT THE BOTTOM OF THE FIRST AND THIRD COURSE FROM THE TOP OF THE WALL AS SHOWN IN THE DRAWINGS AS AN ALTERNATE JOINT REINFORCING MAY BE SPLICED WITH NO LAP PROVIDED THAT AN ADDITIONAL ROW OF JOINT REINFORCING IS PLACED AT THE BOTTOM OF THE SECOND AND FOURTH COURSE FROM THE TOP OF THE WALL AND PROVIDED THAT THE SPLICES BETWEEN ADJACENT ROWS OF JOINT REINFORCEMENT ARE STAGGERED BY A MINIMUM OF 4 FEET 7. ALL REINFORCED CELLS OR PILLASTERS SHALL BE SOIL ROOTED 8. MASONRY UNITS AND MORTAR THAT ARE IN DIRECT CONTACT WITH NATIVE SOILS CONTAINING WATER-SOLUBLE SULFATES SHALL BE ADDRESSED BY THE CONTRACTOR 9. CMU EXPOSURE TO WATER (BOTH ABOVE AND BELOW GRADE) IS NOT ADDRESSED IN THIS DESIGN AND SHALL BE ADDRESSED BY THE CONTRACTOR.
<p>WIND</p> <ol style="list-style-type: none"> 1. 10 PSF LATERAL WIND PRESSURE. 2006/2009 IBC, 40 MPH, EXP. B ASCE 7-05/10 NOTE: ASCE 7-02 FIGURE 6-20 TO REPLACE 7-05 FIGURE 6-20 TO KEEP LATERAL WIND FORCE CONSISTENT FOR RESIDENTIAL FENCES AND IS AN ACCEPTED PRACTICE FOR MANY JURISDICTIONS IN ARIZONA. (FOR EXAMPLE THE CITY OF PHOENIX ADDED EXCEPTION 5 TO 2006 IBC SECTION 609.11) FOR DESIGN WIND LOADS ON SOLID FREESTANDING WALLS AND SOLID SIGNS PER ASCE 7-05, SECTION 6.5.14, FIGURE 6-20 OF ASCE 7-02 MAY BE USED) 12.5 PSF LATERAL WIND PRESSURE. 2006/2009 IBC, 40 MPH, EXP. C ASCE 7-05/10 NOTE: ASCE 7-02 FIGURE 6-20 TO REPLACE 7-05 FIGURE 6-20 TO KEEP LATERAL WIND FORCE CONSISTENT FOR RESIDENTIAL FENCES AND IS AN ACCEPTED PRACTICE FOR MANY JURISDICTIONS IN ARIZONA. FOR EXAMPLE THE CITY OF PHOENIX ADDED EXCEPTION 5 TO 2006 IBC SECTION 609.11) FOR DESIGN WIND LOADS ON SOLID FREESTANDING WALLS AND SOLID SIGNS PER ASCE 7-05, SECTION 6.5.14, FIGURE 6-20 OF ASCE 7-02 MAY BE USED) 	<p>DISCREPANCIES</p> <ol style="list-style-type: none"> 1. THE CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFICATION OF ALL DIMENSIONS AND CONDITIONS WITH THE DRAWINGS PRIOR TO START OF CONSTRUCTION. THE CONTRACTOR SHALL INFORM THE ARCHITECT OR ENGINEER OF ANY DISCREPANCIES OR OMISSIONS NOTED ON THE DRAWINGS. ANY SUCH DISCREPANCIES, OMISSIONS, OR VARIATION NOT REPORTED SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR. 2. NOTED DIMENSIONS TAKE PRECEDENT OVER SCALED. 	<p>STEEL REINFORCEMENT</p> <ol style="list-style-type: none"> 1. SHALL BE SUPPLIED AND INSTALLED PER THE LATEST ACI STANDARDS. 2. USE ASTM A615 GRADE 60 3. THE FOLLOWING MINIMUM CONCRETE COVER SHALL BE PROVIDED FOR REINFORCEMENT. CAST AGAINST AND PERMANENTLY EXPOSED TO EARTH 3" EXPOSED TO EARTH OR WEATHER 1 1/2" NOT EXPOSED TO WEATHER OR IN CONTACT WITH GROUND 3/4" 4. UNLESS NOTED OTHERWISE, LAP SPLICES SHALL BE 48 BAR DIAMETERS MINIMUM. STAGGER ALTERNATE SPLICES A MINIMUM OF 1 LAP LENGTH. PROVIDE BENT CORNER BARS TO WATCH AND LAP WITH HORIZONTAL BARS AT CORNERS AND INTERSECTIONS OF FOOTINGS AND WALLS. 5. SECURELY TIE ALL BARS IN LOCATION BEFORE PLACING CONCRETE.
<p>SUBSTITUTIONS</p> <ol style="list-style-type: none"> 1. ALL PRODUCT SUBSTITUTIONS SHALL BE SUBMITTED TO THE ENGINEER FOR REVIEW PRIOR TO CONSTRUCTION. CONTRACTOR TO SUBMIT DOCUMENTATION TO DEMONSTRATE THAT THE PROPOSED SUBSTITUTION IS EQUAL TO THE SPECIFIED PRODUCT. PRODUCT SUBSTITUTIONS MAY BE USED PROVIDED THEY ARE APPROVED BY THE ENGINEER OF RECORD IN WRITING. 	<p>DAMP PROOFING</p> <ol style="list-style-type: none"> 1. DAMPROOFING OF THOSE PORTIONS OF FENCES BELOW GRADE IS NOT REQUIRED PER CODE BUT MAY BE USED BY CONTRACTOR AT THEIR DISCRETION. 2. AS AN ALTERNATE TO DAMPROOFING, INTEGRAL WATER REPELLANT UNITS AND WATER REPELLANT MORTAR MAY BE USED. 	<p>SPECIAL INSPECTION</p> <ol style="list-style-type: none"> 1. SPECIAL INSPECTION SHALL BE PROVIDED AS REQUIRED BY THE LOCAL BUILDING OFFICIAL

Maricopa Association of Governments Building Code Amendments and Standards Manual BCAS #16	
Title: 2012 IECC/IRC Residential Testing Protocols	
Originally Reviewed by MAG Building Codes Committee: 1/16/2013	
Updated by MAG Building Codes Committee: none	

2012 IRC

Add Section N1102.1.2

N1102.1.2 RESNET Testing & Inspection Protocol. The Residential Energy Services Network (RESNET) Mortgage Industry National Home Energy Rating System Standards Protocol for third party testing and inspections shall be deemed to meet the requirements of sections N1102.4.1.1, N1102.4.1.2 and N1103.2.2 and shall meet the following conditions:

1. Third Party Testing and Inspections shall be completed by RESNET certified Raters or Rating Field Inspectors and shall be subject to RESNET Quality Assurance Field Review procedures.
2. Sampling in accordance with Chapter 6 of the RESNET Standards shall be performed by Raters or Rating Field Inspectors working under a RESNET Accredited Sampling Provider.
3. Third Party Testing is required for the following items:
 - a. N1102.4.1.1 –Building Envelope – Thermal and Air Barrier Checklist
 - b. N1102.4.1.2 –Testing – Air Leakage Rate
 - c. N1103.2.2 – Sealing – Duct Tightness
4. The other requirements identified as “mandatory” in Chapter 4 shall be met.
5. Alternate testing and inspection programs and protocols shall be allowed when approved by the Code Official.

2012 IECC

Add Section R102.1.2

R102.1.2 RESNET Testing & Inspection Protocol. The Residential Energy Services Network (RESNET) Mortgage Industry National Home Energy Rating System Standards Protocol for third party testing and inspections shall be deemed to meet the requirements of sections R402.4.1.1, R402.4.1.2 and R403.2.2 and shall meet the following conditions:

1. Third Party Testing and Inspections shall be completed by RESNET certified Raters or Rating Field Inspectors and shall be subject to RESNET Quality Assurance Field Review procedures.
2. Sampling in accordance with Chapter 6 of the RESNET Standards shall be performed by Raters or Rating Field Inspectors working under a RESNET Accredited Sampling Provider.
3. Third Party Testing is required for the following items:
 - d. R402.4.1.1 –Building Envelope – Thermal and Air Barrier Checklist
 - e. R402.4.1.2 –Testing – Air Leakage Rate
 - f. R403.2.2 – Sealing – Duct Tightness
4. The other requirements identified as “mandatory” in Chapter 4 shall be met.
5. Alternate testing and inspection programs and protocols shall be allowed when approved by the Code Official.

Maricopa Association of Governments
Building Code Amendments and Standards
Historical Archive
2013 Edition

Review Draft 1

March 5, 2013

Note: This draft is for review by the MAG Building Codes Committee only and is not for distribution or attribution.

Introduction

The MAG Building Code Amendments and Standards (BCAS) is the result of the work of the MAG Building Codes Committee, which made up of municipal and county building officials from the MAG region, as well as others representing organizations interested in local building codes.

The goal of the BCAS is to provide a set of documents that supplement the standard building codes in order to address building issues specific to the MAG region. These documents have been reviewed and vetted by the members of the Building Codes Committee with an interest in using the national building codes to address local conditions.

The goal of the BCAS is not to create a standard set of building codes to be used by all jurisdictions in the MAG region. Adoption and use of the BCAS and the documents within it are completely optional at the discretion of the local jurisdictions. Jurisdictions may adopt the BCAS in whole, or may adopt specific documents within the BCAS as they see fit. Jurisdictions may also adopt and amend documents within the BCAS if desired.

The BCAS is designed to allow jurisdictions to refer to specific document citations as part of their local amendments to their adopted building codes.

The MAG Building Codes Committee typically recommends that its members adopt the most current versions of the standard national building codes. As such, the code references in the BCAS will always strive to refer to the most current national building code set. Jurisdictions not using the most current set of national codes should note that specific code references may need to be adjusted to reflect the code being amended.

The BCAS will be reviewed and updated as needed, typically once per year.

Historical Archive

As the BCAS is reviewed and updated, documents may be determined to be no longer relevant. This could be due to the amendment or standard getting incorporated into the standard building codes, changes in building construction practice, the original problem a document was created to address no longer existing, or many other reasons. When a document is deemed no longer relevant by the Building Codes Committee, will be removed from the BCAS and placed in BCAS Historical Archive and exist as a reference of past recommendations of the Building Codes Committee.

When a document is removed from the BCAS, it will be given a new reference number, beginning with the letter H, and an introductory statement providing the original discussion related to the item and the reason for its removal from the BCAS.

Please note that documents H1 to H17 were documents reviewed by the Committee prior to the creation of the BCAS and determined to be no longer relevant at the time of the BCAS creation in 2013.



**2013 Building Code Amendments and Standards
Historical Archive
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Maricopa Association of Governments Building Code Amendments and Standards Manual BCAS #H1	
Title: One Coat Stucco Compliance Program	 MARICOPA ASSOCIATION of GOVERNMENTS BCAS Manual Historical Archive
Originally Reviewed by MAG Building Codes Committee: 1/27/1993	
Archived to Historical Section by MAG Building Codes Committee: 3/21/2012	

At the January 27, 1993, Building Codes Committee meeting, the Committee reviewed the final draft of a standard for Third Party Inspection Programs for One-Coat Stucco Systems.

At the March 21, 2012 Building Codes Committee meeting, the Committee reviewed the earlier document. The Committee determined that whatever problems existed in 1993 that necessitated this inspection program have been solved, and that this document is no longer relevant. The Committee voted unanimously to move this document to the Historical Archive.

One Coat Stucco Compliance Program

May 10, 1993

The MAG Building Codes Committee (BCC) takes this opportunity to inform all stucco manufacturers, contractors, and designers engaged in construction projects within the jurisdictions of Maricopa County of the new One Coat Stucco Compliance Program.

Effective July 1, 1993, the jurisdictions listed below shall require one coat stucco installations to comply with the attached One Coat Stucco Compliance Program. As an integral part of the program, each one coat stucco manufacturer must submit to the Building Safety Department of each jurisdiction on a quarterly basis a current listing of installers authorized to install their system in order to be recognized as an approved stucco system.

The manufacturer's installation card will be required to be posted at the time of the lath inspection identifying the installer's name, address, and phone number. Only installers listed on the manufacturer's currently listing will be approved to proceed with stucco installation. In order to avoid construction project delays, we recommend that each one coat stucco manufacturer submit a copy of their authorized installers to each jurisdiction prior to July 1, 1993.

The following jurisdictions will be enforcing the provisions of the compliance program:

Carefree	Paradise Valley
Chandler	Peoria
Fountain Hills	Phoenix
Gilbert	Scottsdale
Glendale	Surprise
Goodyear	Tempe
Litchfield Park	Maricopa County

One Coat Stucco Compliance Program

July 1, 1993

1. Purpose

Local Adjustments for exterior one coat stucco systems are required based upon the recent history of irregularities and failure of the products to perform as intended; the non-conformance of installers/plastering contractors to comply with the installation requirements of the International Conference of Building Officials, Evaluation Service (ICBO-ES) or Council of American Building Officials, National Evaluation Service (CABO-NES) evaluation reports; and the apparent failure of the manufacturers to train installers and, in general, ensure that the product installations comply with their approved ICBO-ES or CABO-NES evaluation reports.

The following requirements are for exterior one coat stucco systems not covered by the requirements of Chapter 47 of the Uniform Building Code (UCB).

2. Evaluation Report Required

All exterior one coat stucco systems shall be listed and approved by either ICBO-ES or CABO-NES and have a current evaluation report.

3. Installers Must Be Manufacturer-Approved

All installers of one coat stucco systems must be approved by the manufacturer of each system. At the beginning of each quarter of the year (January, April, July, and October) the manufacturer must submit to each jurisdiction a current list of installers authorized to install their systems.

The approved installer listings shall include the installers' State of Arizona contractor's license number along with the category of the license. Installers not properly licensed will not be accepted as an approved installer by the jurisdictions. Appropriate city or county business licenses must also be acquired.

Home owners must hire an approved installer, or must obtain a manufacturer's written approval to be an authorized installer. Homeowners are exempt from the State contractor's licensing requirements.

4. Design and Installation Details

All jurisdictions participating in this agreement require compliance with the following design and installation details:

- a. Evaluation reports: Each system must be installed exactly in accordance with the manufacturer's installation instructions and with details of the ICBO-ES or CABO-NES evaluation report for that particular product.

- b. Weather-Resistive Barrier Required: Weather-resistive barrier shall be required for full wall height on all installations.
- c. Weep Screed Required: Approved weep screeds are required at the base of all walls as prescribed in the ICBO-ES or CABO-NES evaluation report.
- d. Control Joints Required: Control joints shall be installed as shown on the elevation drawings submitted for plan review and approved for the permit, in a location determined by the building designer.

5. Installation and Application Card

Installation of any one coat stucco system shall be done only by manufacturer-approved installers who are listed with the jurisdiction where the installation is to be done.

- a. Installation Card and Evaluation Report to be Posted:
 - i. Post the ICBO-ES or CABO-NES evaluation report for the product to be used on the site of installation.
 - ii. Post the installation card on the job site indicating the name, address, and phone number of the installer at the time of lath inspection. The card shall not be signed and certified until after complete installation.
- b. Inspections Required: Inspection and approval of the lath installation must be obtained prior to application of the stucco as required by the local jurisdiction.
- c. Final Inspection/Installation Card Required: The completed installation card for each job must be left at the job site for the owner and a copy submitted to the jurisdiction upon completion of the work or prior to the final inspection of the project. Failure to submit the installation card to the jurisdiction or evidence of a non-complying installation is cause for rejection of the stucco system until the manufacturer submits a satisfactory independent third-party test report on the completed installation.

6. Participating Jurisdictions

Under the authority of Section 105 of the UBC, the following jurisdictions agree to accept and follow the procedures set forth in this agreement. Questions regarding factors or conditions not considered in the provisions of this agreement should be addressed to the individual jurisdictions.

Carefree	Paradise Valley
Chandler	Peoria
Fountain Hills	Phoenix
Gilbert	Scottsdale
Glendale	Surprise
Goodyear	Tempe
Litchfield Park	Maricopa County

Maricopa Association of Governments Building Code Amendments and Standards Manual BCAS #H2	
Title: Special Inspections Manual	 MARICOPA ASSOCIATION of GOVERNMENTS BCAS Manual Historical Archive
Originally Reviewed by MAG Building Codes Committee: 5/24/1995	
Archived to Historical Section by MAG Building Codes Committee: 11/14/2012	

At the May 24, 1995, Building Codes Committee meeting, the Committee reviewed the final draft of the City of Phoenix Special Inspections Manual. The Manual was created to assist in implementing a special inspection program and in promoting uniformity in the enforcement of special inspection code provisions identified in the Uniform Building Code.

At the November 14, 2012 Building Codes Committee meeting, the Committee reviewed the original document. The City of Phoenix representative indicated that the city no longer uses this manual, and instead follows the special inspections provisions in the International Building Code. As the manual was no longer relevant, the Committee voted unanimously to move this document to the Historical Archive.

Special Inspections Manual

Prepared by the MAG Subcommittee for Special Inspections
March 22, 1995

Committee Members:

Dan Fleming, City of Phoenix, Committee Chair
Joe Gervasio, Bldg Safety Advisory Board, City of Phoenix
Mac McFarland, City of Tempe
Jay Mundy, City of Phoenix
Sohrab Navaz, City of Chandler
David Potter, City of Scottsdale
Larry Richards, City of Glendale
Doug Sherwood, Maricopa County
Pat Trueblood, City of Peoria
Michael Williams, City of Tempe

Electrical Subcommittee:

Lanny McMahon, City of Phoenix, Committee Chair
Jim Evans, Sullivan Durand, Inc.
John Hobbins, EHTC
Rob Meade, Grommes-Meade Engineering
Joel Rencsok, City of Phoenix
Bob Schuerger, Electro Test, Inc.

DRAFT

Introduction

Special Inspection, as required by the 1994 Uniform Building Code (UBC) Section 1701, is best defined as the monitoring of the materials and workmanship which are critical to the integrity of the building structure or building service equipment and require special attention. This requires inspection by persons with specially-developed skills to check the material and workmanship against the approved plans, specifications and contract documents.

This document will be revised from time to time as dictated by experience gained in its implementation and as necessary due to changing practice and technology.

This manual is a descriptive procedure for special inspection administration. It defines the duties and responsibilities of the engineer or architect of record, special inspector, contractor, building official, and project owner.

This manual is divided into six sections as follows:

1. Special Inspection – An Overview:
Gives an overview of jobsite quality control through special inspection.
2. General Program Guidelines:
Describes overall purposes for special inspection, and respective duties and responsibilities of project owners, engineer or architect of record, special inspectors, building officials and contractors.
3. Procedures for Special Inspection – Job Task Analysis:
List of job tasks required of special inspectors.
4. Procedures for Materials Sampling and Testing:
Lists basic tests in use locally that supplement or alter the national standards and are considered local standard practice.
5. Special Inspector Qualifications:
Lists competency and experience standards, and references performance standards for special inspectors. These suggested qualifications are designed to assist the building official in determining the special inspector's competence to perform specific tasks as listed in the 1994 UBC Section 1701.5.
6. Special Inspection Forms.

Section 1: Special Inspection – An Overview

Under this program, the owner is required to provide specially qualified inspectors for inspection during construction in addition to called inspections provided by the local jurisdiction and in addition to periodic site visits provided by the architect/engineer.

The use of special inspectors is not discretionary. The 1994 UBC Section 1701 clearly states the conditions under which they must be utilized, but there is a provision for the building official to waive special inspection for work of a minor nature.

The code intent is to provide continuous inspection at all times work requiring special inspection occurs except "some inspections may be made on a periodic basis and satisfy the requirements of continuous

inspection, provided this periodic scheduled inspection is performed as outlined in the project plans and specifications and is approved by the building official.” Additionally, some exceptions are specifically listed in the inspection codes as indicated in the 1994 UBC (see Section 1701.5).

Continuity of inspection is very important and is best provided by using one individual as Special Inspector for each discipline that requires special inspection. This paragraph is intended to discourage the use of multiple inspectors performing a given task.

An additional provision allows the building official to use discretion for the requirement of a special inspector in other cases where it is deemed appropriate.

The use of special inspectors is reserved for complex installations requiring certain specially developed inspection skills for the following types of work:

Inspection Code (as listed in the 1994 UBC 1701.5)

1. Concrete – during the taking of test specimens and placing of reinforced concrete and pneumatically placed concrete.
2. Bolts installed in concrete – during installation of bolts and placing of concrete around such bolts
3. Special moment resisting concrete frames
- 4.1 Pre-stressing steel tendons – during stressing and grouting of pre-stressed concrete and placing of reinforcing steel, placing of tendons, and pre-stressing steel.
- 4.2 Reinforcing steel – prior to placement of concrete.
- 5.0 Structural welding – of ductile moment-resisting steel frames for structural welding and for lateral diaphragm metal decks.
- 5.1 General welding – any member designed to resist loads and forces.
- 5.2 Special moment resisting frames.
- 5.3 Welding of reinforcement steel.
6. High-strength bolting – during all bolt installations and tightening operations.
- 7.0 Structural masonry – during preparation of masonry wall prisms, sampling, and placing of masonry units, placement of reinforcement, inspection of grout spaces, and during all grouting operations.
- 7.1 Masonry other than fully grouted open-end hollow unit block.
- 7.2 Masonry fully grouted open-end hollow unit block.
8. Reinforced gypsum concrete – when cast-in-place Class B gypsum concrete is being mixed and placed.
9. Insulating concrete fill – during the application of insulating concrete fill when used as part of a structural system.

10. Spray-applied fireproofing.
11. Piling, drilled piers and caissons – during driving and testing of piles and construction of cast-in-place drilled piles or caissons.
12. Shotcrete – during the taking of test specimens and placing of shotcrete.
13. Special grading, excavation, and filling.
14. Smoke control system.
15. Adhered veneer.
16. Anchored veneer.
17. Accessibility for the disabled.
18. Complex electrical installation.
19. Special cases – work, when in the opinion of the Building Official involves special conditions or unusual hazards. (Examples: poke through penetrations, window and spandrel walls, architectural precast connections, structural light gauge metal structures.)

Section 2: General Guidelines

A. Duties and Responsibilities of the Engineer or Architect of Record (E/AR)

The Engineer or Architect of Record (E/AR) shall be the design professional who sealed the calculations and plans for the types of work requiring special inspection as defined in Section 1 of this document. Structural special inspectors are required for work types 1, 2, 3, 4A, 4B, 5, 6, 7, 8, 9, 12, 15, and 16. Architectural special inspectors are required for Inspection Codes 10 and 17. Geotechnical special inspectors are required for Inspection Codes 11 and 13. Electrical special inspectors are required for work type 18. Mechanical and fire special inspections are required for Inspection Code 14. Duties and responsibilities of the E/AR shall include the following:

1. Identify the need for special inspection services.
The project plans which are submitted to the building official shall clearly indicate the design parameters, material selection and where special inspection is necessary in accordance with the Code.
2. Determine the qualification(s) of all special inspectors.
3. Coordination of inspection activities.
 - a. The E/AR shall be responsible for designation and coordination of the activities of the Special Inspector for the items for which he is responsible.
 - b. The E/AR shall certify his special inspector(s) as meeting Stage 1 minimum qualification requirements. (See Staging Criteria).
4. Chair pre-conditioning meeting.
Coordinate attendees with General Contractor. Establish agenda, review duties and responsibilities of attendees, establish reporting requirements, and review special cases.
5. Site visits required.
The E/AR(s) shall visit the site at least monthly during the construction of the inspection code items for which he is responsible. This is in addition to the special inspections performed by the field inspector(s).

6. Specification of testing and test procedures.
The E/AR shall be responsible for defining and specifying tests and testing procedures as may be required for the E/AR's work.
 7. Submission of required reports.
The E/AR shall submit, under his seal, all the required reports to the Building Department.
 8. Document all revisions.
The E/AR shall document all plan revisions to the Building Department.
 9. Designated Engineer of Record (DE/AR).
With concurrence of the Building Official and the E/AR, or Project Owner, a Designated Engineer of Record may assume the responsibilities and duties of items 2, 3, 4, 6, and 9 for E/AR.
 10. Submit Special Inspection Certificate.
Upon completion of all requirements, the E/AR shall submit the sign Special Inspection Certificate and other documentation as may be necessary to the Building Department for all items for which this professional was responsible. The Special Inspection Certificate shall be sign by the E/AR.
- B. Duties and Responsibilities of the Special Inspector
The special inspector shall be the E/AR or his designated representative(s) working under his direct supervision who observes those critical features which they are qualified to inspect. Duties of special inspectors include the following:
1. Signify presence at jobsite.
Special inspectors shall notify contractor personnel of their presence and responsibilities at the jobsite.
 2. Inspect all work for which they are responsible.
Special inspectors shall inspect all work for conformance with the official building department approved drawings and specifications, and applicable provisions of the Construction Code.
 3. Separately identify all nonconforming work.
Special inspectors shall bring all nonconforming items to the immediate attention of the contractor. If any such item is not resolved in a timely manner, or is about to be incorporated in the work, the building official and the E/AR shall be notified immediately by telephone or in person, and the special inspector shall issue a discrepancy notice.
 4. Issue discrepancy notice.
The special inspector shall post the discrepancy notice at the jobsite. This notice shall contain, as a minimum, the following information about each nonconforming item:
 - a. Description and exact location.
 - b. Reference to applicable detail of approved plans/specifications.
 - c. Name and title of each individual notified and method of notification.
 - d. Resolution or corrective action.
 5. Provide daily reports
The special inspector shall complete written inspection reports for each inspection visit. These reports shall be organized on a daily format and a copy shall remain at the jobsite with the contractor. Special inspectors shall:
 - a. Describe inspections and tests made with applicable locations.
 - b. List all nonconforming items, parties notified, time and method of notification.
 - c. Indicate how nonconforming items were resolved.
 - d. List unresolved items.

- e. Provide daily reports to the contractor for retention on jobsite.
 - 6. Provide semi-monthly report.
Building Department and Owner shall receive copies of the following documents mailed each month on the 15th and last day of the month:
 - a. Sealed form commenting on testing results and listing the dates of all special inspections made.
 - b. Attached all special documents and testing results received to date.
 - c. All current design changes and corrections documented and sealed.
 - 7. Provide final reports.
 - a. When construction reaches the point that inspections are only required to verify discrepancy corrections, the semi-monthly report shall be noted "Final Report." This Final Report shall list all unresolved discrepancies.
 - b. E/AR or D/EAR will only sign Special Inspection Certificate after all outstanding issues are resolved.
- C. Duties and Responsibilities of the General Contractor
The general contractor's (as designated on the building permit) duties include the following:
- 1. Responsible for setting up the pre-construction conference.
 - a. Prior to construction establish date and location for meeting. Coordinate attendee list with the E/AR. Attendees shall include: all E/ARs for required inspection codes, General Contractor, building official, Special Inspector, and others as necessary.
 - b. In cases where the earthwork begins before the building permit is issued, the General Contractor shall call two meetings. The first meeting shall include the Geotechnical E/AR, General Contractor, Special Inspector, Building Structural Engineer, Earthwork Subcontractor and other as necessary. The second meeting is after the building permit is issued and is the same as paragraph a.
 - c. In case of multiple building permits, more than two meetings may be required.
 - 2. Notify the special inspector.
The contractor is responsible for notifying the special inspector of the work progress and when construction items are ready for inspection. Adequate notice shall be provided so that the special inspector has time to schedule all inspections.
 - 3. Provide access to the project.
The contractor is responsible for providing the special inspector access to the jobsite at the work.
 - 4. Retain records on jobsite.
The contractor is responsible for retaining at the jobsite approved city drawings, all special inspection records, and reports by the special inspector. Upon request he shall provide these documents for review by the building official.
 - 5. Notification.
The contractor shall, in addition to calling for special inspections, notify the building department of all other required inspections in accordance with UBC Section 305 which will result in an inspection by the building official.
 - 6. Performance of the Work.
The contractor is charged with the construction of the project in compliance with the official plans approved by the Building Official. The contractor is responsible for installation of all items in accordance with applicable Codes and Standards. If a conflict arises between the Code and the official plans, this conflict will immediately be brought to the attention of the E/AR.

D. Duties and Responsibilities of the Building Official

The specific provisions of providing for special inspection services are mandatory under Section 108.1 which states, "All construction or work for which a permit is required shall be subject to inspection by the building official." In addition, certain types of construction shall have continuous or periodic inspection as specified in Section 1701.5 in addition to local required inspections.

1. Review and examine plans, specifications and other contract documents for compliance with special inspection requirements
The building official is charged with the legal authority to review the plans and specifications for compliance with the requirements of the UBC (Code reference: UBC Sections 302b, 303a, AND 306A).
2. Communicate special inspection requirements to the E/AR, contractor and project owner.
Once special inspection requirements are identified in the plan approval process, the building official shall require the owner and E/AR to sign the Special Inspection Certificate.
3. Monitor the special inspection activities.
The building official shall monitor the jobsite to see that special inspection is provided as required and that an adequate number of special inspection staff is present depending upon extent and complexity of the project. (Code reference: UBC Section 108.1 and 1701.5)
4. Review inspection reports.
The building official receives and makes the semi-monthly inspection reports part of the inspection records (Code reference: UBC Section 1701.3).
5. Inspection of jobsite.
The building official shall perform all inspections required under Section 108. Failure to have the required Special Inspector's inspection reports available to the building official shall be cause for the building official to stop work on those items requiring special inspection until such time that all required reports are provided.
6. Issue Certificate of Occupancy/Final Acceptance.
The building official shall perform a final inspection and issue a Certificate of Occupancy or final acceptance, where applicable. This inspection and issuance shall not be done until after the final report has been received and accepted by the building official and the Special Inspection Certificate has been signed and sealed by the E/AR.

E. Duties and Responsibilities of the Project Owner.

The project owner is responsible for employing special inspection services (Code Reference: UBC Section 1701.1).

1. Participate in choosing the special inspector when designated engineer or architect is assigned.
2. Notify the design engineer in the event a D/EAR is chosen to provide the special inspection duties as described in paragraph A.8, Duties and Responsibilities of the E/AR.
3. Amend the Special Inspection Certificate and forward to the building official.

F. Pre-Job Conference.

For Determination of Responsibility

1. Refer to Duties of the E/AR, page 2-1.
2. Refer to Duties of the Contractor, page 2-4.

Section 3: Special Inspector Job Task Listing

The job tasks listed in this section are intended to represent the basic inspection tasks and do not necessarily describe every detail of the job descriptions. For more specific analysis consult your local codes or regulations applicable to the task in question. Inspection codes shown refer to inspection codes listed on pages 1-1, 1-2.

A. Reinforced and Prestressed Concrete Job Tasks

UBC Codes 1, 2, 3, 4A and B.

1. Concrete preparation
 - a. Mix Design
Check with the E/AR in order to verify concrete product codes.
 - b. Batch Plant
Verify that batch plant has current annual inspection by an accepted inspection agency for conformance to National Ready Mixed Concrete Association recommendations.
 - c. Trip Ticket
Determine that mixer truck delivery ticket specifies required mix and batch time.
2. Concrete Reinforcement
 - a. Rebar Type and Grade
Inspect type, grade, and visual conformity of rebar with specifications.
 - b. Rebar Condition
Inspect that rebar is free of oil, dirt, excessive rust and damage in shipment to jobsite.
 - c. Rebar Tying and Bracing
Inspect that rebar is adequately tied, chaired, and supported to prevent displacement during concrete placement.
 - d. Rebar Clearance
Inspect minimum and maximum clear distances between bars and minimum structural distance to outside of concrete and to surface of concrete.
 - e. Rebar Placement
Inspect the size, location, and quantity of rebar. Verify bar laps for proper length and stagger, and bar bends for minimum diameter, slope, and length.
 - f. Rebar Welding
Inspect that welding of rebar is with proper rods and procedures.
3. Concrete Formwork and Embedded Items
 - a. Concrete Construction Joints.
Inspect proper preparation of construction joint surface prior to placing.
 - b. Formwork Construction
Inspect that the formwork is tight to prevent leakage. Generally inspect inside dimensions of formwork.
 - c. Embedded Items
Inspect that embedded items are properly spaced and sized.
 - d. Prestressing Steel Anchorage
Inspect location, size and placement of prestressing steel anchorage as detailed in plans and specifications.
4. Concrete Preparation, Placement, Curing and Protection

- a. **Prepour Base Moisture**
Inspect that the concrete base is properly wetted and standing water is removed before concrete is placed.
 - b. **Concrete Placement**
Inspect that concrete conveyance and depositing avoids segregation due to rehandling or flowing and proper joint construction.
 - c. **Concrete Vibrated**
Inspect that concrete is vibrated
 - d. **Concrete Curing**
Inspect that appropriate curing is performed.
 - e. **Protection**
Determine that appropriate hot- and cold-weather measures are taken for protection of the concrete and grout.
5. **Samples and Tests**
- a. **Test Type**
Determine the type and number of concrete, grout, and reinforcing steel tests required.
 - b. **Test samples**
Observe sampling of fresh concrete and grout, slump tests, and molding of test specimens.
 - c. **Hardened Concrete Test Samples**
Observe removal of test samples and perform other test procedures on hardened concrete.
 - d. **Specimen Handling/Protection**
Observe proper handling, field curing, and place specimens in protected area after preparation and arrangement for transportation of specimens to test facility.
6. **Prestressing Steel.**
- a. **Prestressing Steel Type and Grade.**
Determine that prestressing steel type, size, and grade, and tendon fabrication in conformance with specifications.
 - b. **Prestressing Steel Condition.**
Determine that prestressing steel is free of oil, dirt, scale, pitting, excessive rust; is free from damage; and is properly wrapped as required.
 - c. **Prestressing Steel Ties and Supports.**
Determine that prestressing steel tendons and post-tensioning ducts are adequately tied, chaired and supported to prevent displacement during concrete placement, and are adequate for intended stresses.
 - d. **Prestressing Steel Clearance.**
Inspect for minimum and maximum clear distances between prestressing steel and minimum structural distance to outside of concrete and to surface of concrete.
 - e. **Prestressing Steel Placement.**
Inspect placement of prestressing steel, tendons, or ducts as detailed in plans and specifications.
 - f. **Post-tensioning Ducts.**
Verify that post-tensioning ducts are correctly sized, are mortar-tight and nonreactive with concrete, tendons and filler materials.

- b. Base Conditions
Inspect that masonry footing surfaces are clean.
 - c. Condition of Units
Inspect that masonry units are clean and sound.
 - d. Placement
Inspect the laying of masonry units, checking temperature, laying of masonry units, for stack or running bond or variations as per plans. Check that there is no deep furrowing of bed joints. Inspect mortar joints for proper thickness and tooling.
 - e. Joints
Inspect construction, expansion, and contraction joints in accordance with details on approved drawings.
4. Masonry Reinforcement
- a. Vertical Reinforcement
Inspect the placement and alignment of vertical bars and dowels for size, grade, and spacing. Inspect length of lap splices, clearances between bars, clearances to masonry units and positioning of steel.
 - b. Horizontal Reinforcement
Inspect horizontal joint reinforcement (HJR) steel and stagger, bond beam reinforcement bars for size, length of lap splices, dowels, clearances between bars, clearance to masonry units and positioning of steel.
 - c. Ties
Inspect ties in masonry for straightness, embedment, spacing, and size.
 - d. Anchor Connections
Inspect the installation of masonry anchor bolts, joist anchors, insert and straps.
5. Grout Mix
- a. Ready-mix Grout
Inspect ready-mixed grout for conformance with mix design and workability.
 - b. Grout Use
Determine elapsed time since mixing of grout.
6. Masonry Grouting
- a. Grout Spaces
Inspect that grout spaces are correctly sized and clean, cleanouts, when required, are closed after inspection and grout barriers are in place before grouting.
 - b. Grouting
Inspect proper grouting techniques including mechanical vibration to approved height of grout space.
 - c. Dry Packing
Inspect proper applications of dry packing.
7. Sample and Tests
- a. Test Prisms
Inspect the construction of test prisms including those required prior to beginning construction. Check that test prisms contain the same masonry units, moisture content, mortar and workmanship as used in the building.
 - b. Tests and Specimens
Determine the type and number of masonry, mortar, grout and reinforcing steel tests required.

- c. Specimen Handling/Protection
Observe protection of test specimens and arrangements for pickup or delivery of specimens to appropriate persons.
 - d. Masonry Samples
Observe removal of test specimens from completed masonry.
- C. Structural Steel and Welding Job tasks
UBC Inspection Code 5, 6
- 1. Steel and Welding Materials
 - a. Structural Steel Materials
Review mill test reports (MTR), steel identification markings, or other documentation of structural steel for compliance with plans and specifications. Visually inspect bolts, nuts, and washers for conformance.
 - b. Welding Consumables
Review welding consumables for identification markings, or other documentation of welding materials for compliance with plans and specifications. Inspect rod containers for damage.
 - 2. Welding
 - a. Qualification of Welders
Review qualification of welders, welding operators and tackers for conformance with the appropriate AWS code and the plans and specifications.
 - b. Welding Consumable Storage
Review Low Hydrogen Electrode storage conditions to determine material has been purchased in a hermetically sealed container and that storage ovens meet the minimum temperature and utilization requirements.
Review procedures for maintaining maximum atmospheric exposure times for Low Hydrogen consumable utilization.
 - c. Welding and Joint Preparation
Inspect that the material to be welded is smooth, uniform, free from fins, tears, and cracks, and that cut edges are acceptable and free from foreign material.
 - d. Welding Procedures
Visually review that welding is done in conformance with AWS requirements for process, materials, workmanship, number of passes, preheat and interpass temperatures, cleaning between passes, weld lengths, welding technique and welding sequence. Review specifications for unusual requirements.
 - e. Weld Repairs and Heat Straightening
Inspect that weld repairs and heat straightening of structural members is done in compliance with approved procedures and AWS standards.
 - f. Welding of Reinforcing Steel
Review the Welding Procedure Specification and the Welding Procedure Qualification for compliance with AWS D1.4 and the contract documents. Note: There are no pre-qualified welding procedures for welding reinforcing bars; a Procedure Qualification Record (PQR) is required.
 - 3. Steel Erection
 - a. Base Plates and Anchor Bolts
Inspect anchor bolt size and pattern size of base plates and anchor bolt hole pattern and size. Inspect the setting of the base plate for proper nut tightening and thread projection.

- b. Members
Inspect to determine size and dimensions for weight, determine the weight, general location, shape, and proper connection of structural members.
- c. Faying Surfaces
Inspect faying surfaces on connections utilizing high-strength bolts for compliance to applicable standards.
- d. Bolts
 1. Inspect correct type, location, and size of bolts, size of bolt holes and alignment in connections.
 2. Inspect tightness of high strength bolts to applicable standards.
- 4. Samples and Nondestructive Tests
 - a. Bolt and Nut Sampling
Observe and sample bolts, nuts, and washers for testing, if required.
 - b. Nondestructive Testing
Observe nondestructive testing in accordance with approved procedures.
- D. Anchored Veneer Job Tasks
UBC Inspection Code 16
 1. Veneer Material Certifications and Storage
 - a. Veneer Material Certifications
Inspect veneer material certifications including material strength test results, or other documentation of veneer units, cement, lime, additives, and stone backing. Determine materials are in acceptable condition.
 - b. Construction Documents
Inspect installation design documents to determine that they have been properly sealed and approved by the Engineer of Record and the City.
 - c. Veneer Connection Material Certifications
Review veneer connection material certifications, or other documentation of connectors and corrosive protection. Determine that connection materials and connectors are in acceptable condition.
 - d. Storage of Materials
Reject cement and lime that has been exposed to excessive moisture. Reject aggregates that are contaminated.
 2. Mortar Mix
Requirements same as structural masonry, Section 2.b.
 3. Veneer Preparation and Placement.
 - a. Dowels/Anchors/Ties
Inspect alignment of dowels, anchors, and ties extending out of the footing or walls.
 - b. Base Conditions
Determine that bearing surfaces are clean and level.
 - c. Condition of Units
Determine that veneer units are required size and thickness, clean, sound, and free of cracks or chips that may adversely affect their attachment.
 - d. Placement
Inspect the setting of veneer units, for stack or running bond or variations as per plans. Determine that there is no deep furrowing of bed joints. Inspect mortar joints for proper thickness and tooling. Do not allow the installation of saturated or frozen veneer.

- e. Joints
 - Inspect construction, expansion, and contraction joints for locations and as detailed.
- 4. Veneer Connectors
 - a. Inspect the placement and alignment of connectors for size, type material and spacing. Inspect for required bearing lengths and widths, size and depth of embedment, straightness, edge and end distances of dowels and connectors in both the veneer and backup structural supports.
 - b. Inspect mortar spot backups at connectors for size, location, and soundness.
 - c. Inspect epoxy anchorages for type epoxy to be used and manufacturer's requirements for installation. Inspect size, depth of embedment, straightness and cleanness of surfaces to receive epoxy.
- 5. Veneer Ventilation
 - Inspect the placement, size, type of material and location of weep holes. Inspect that weep holes are not clogged or obstructed, preventing their use.
- 6. Veneer Dampproofing
 - a. Inspect veneer backing for compliance with manufacturer's requirements.
 - b. Inspect flashing, gauge, shape, material, and installation.
- 7. Samples and Tests
 - a. Field Mockup
 - Inspect the materials and construction of field mockup, when required, prior to commencing with installation of veneer on structure.
 - b. Test Prisms
 - Witness the construction, when required, of test specimens, including those required prior to beginning construction.
- E. Adhered Veneer Job Tasks
 - UBC Inspection Code 15
 - 1. Pre-Application Verification
 - Inspect the backing membrane for preparation and weatherproofing. Verify that height of adhered veneer does not exceed 30 feet, or size and weight limitations.
 - 2. Application
 - a. Inspect the mortar and epoxy bed for code and manufacturer conformance and check for absorption.
 - b. Observe the placement of units closely for workmanship and provide necessary testing to determine adequacy of unit strength.
- F. Accessibility for the Disabled Job Tasks
 - UBC Inspection Code 17
 - 1. At this time, there are no specific requirements for job tasks. Generally the E/AR is responsible to provide inspection of the entire project for conformance with applicable local laws for compliance with handicap provisions.
 - 2. Specialty areas requiring systems not generally inspected by the building official (e.g. hearing impairment, Braille, audio/visual).
- G. Electrical Installation Job Tasks
 - UBC Inspection Code 18
 - 1. Ground-Fault Protection Performance Test
 - a. Visual Inspection
 - 1. Inspect for physical damage and compliance with engineered drawings and specifications.

2. Verify proper nameplate markings and ratings.
 3. Verify integrity of grounded conductor.
 4. Verify pickup and time delay settings are in accordance with settings provided by the engineer.
 - b. Mechanical Inspection
 1. Inspect for proper mechanical operation.
 - c. Electrical Tests
 1. Tests shall comply with engineered plans and specifications.
 2. Tests shall be performed in accordance with manufacturer's recommendations or nationally recognized standards and practices.
 3. Test grounded conductor insulation resistance to ground.
 4. Test relay pickup current by current injection at the sensor and operate the circuit-interrupting device.
 5. Test relay timing.
 6. Test primary control voltage at not more than 57 percent of its rated voltage.
2. Switchboards, Panelboards, Motor Control Centers and other Equipment Rated 1000 Amperes or more, or over 600 Volts.
 - a. Visual Inspection
 1. Inspect for physical damage and compliance with engineered drawings and specifications.
 2. Verify proper nameplate markings and ratings.
 3. Inspect proper anchorage, support, and alignment.
 4. Verify barrier installation.
 5. Verify connection and termination points for proper torque and alignment.
 - b. Mechanical Inspection
 1. Inspect interlocks, switches, draw-out breakers, and auxiliary devices for proper mechanical operation.
 - c. Electrical Tests
 1. Tests shall comply with engineered plans and specifications.
 2. Tests shall be performed in accordance with manufacturer's recommendations or nationally recognized standards and practices.
 3. Test grounded conductor insulation resistance and verify continuity of equipment grounding system.
 4. Perform insulation resistance test on each bus and protective device. Test phase-to-phase and phase-to-ground.
 5. Perform phase test on double ended systems.
 6. Test control power transformer, control power circuits and potential circuits.
 7. Test control and protective devices for proper operation.
3. Transformers Rated 100 KVA or More Single Phase and 300 KVA or More Three Phase
 - a. Visual Inspection
 1. Inspect for physical damage and compliance with engineered drawings and specifications.
 2. Verify proper nameplate markings and ratings.
 3. Inspect for proper anchorage and support.
 4. Inspect for proper equipment and core grounding.

5. Verify compliance with manufacturer's installation requirements.
- b. Mechanical Inspection
 1. Inspect auxiliary devices for proper mechanical operation.
- c. Electrical Tests
 1. Tests shall comply with engineered plans and specifications.
 2. Tests shall be performed in accordance with manufacturer's recommendations or nationally recognized standards and practices.
 3. Perform insulation resistance test on each winding. Test winding-to-winding and windings-to-ground.
 4. Perform a turns-ratio test for each winding at all tap settings.
 5. Test control power transformer, control power circuits and potential circuits.
 6. Test control and protective devices for proper operation.
4. Conductors that Supply Equipment Rated at 1000 Amperes or More, or Over 600 Volts
 - a. Visual Inspection
 1. Inspect for physical damage and compliance with engineered drawings and specifications.
 2. Verify proper markings and ratings.
 - b. Electrical Tests
 1. Tests shall comply with engineered plans and specifications.
 2. Tests shall be performed in accordance with manufacturer's recommendations or nationally recognized standards and practices.
 3. Perform insulation resistance test on each conductor. Test phase-to-phase and phase-to-ground.
 4. Perform dc high-potential test on each conductor. Test phase-to-phase and phase-to-ground.
5. Emergency and Standby Power Systems: Switchboards, Panelboards, Distribution Boards, Transfer Equipment, Power Source, Conductors, Fire Pumps, Exhaust and Ventilation Fans
 - a. Visual Inspection
 1. Inspection for physical damage and compliance with engineered drawings and specifications.
 2. Verify proper markings, ratings, and signs.
 3. Inspect equipment for proper anchorage and support.
 4. Inspection for proper barriers, separation, protection, and location.
 5. Verify instruction manuals, special tools, testing devices, and manufacturer recommended spare parts are available.
 6. Verify maintenance and operation testing program is in place and maintained on the premises.
 - b. Mechanical Inspection
 1. Inspect equipment for proper mechanical operation.
 2. Verify functional operation of system. Perform manual transfer operation.
 - c. Electrical Tests
 1. Tests shall comply with engineered plans and specifications.
 2. Tests shall be performed in accordance with manufacturer's recommendations or nationally recognized standards and practices.
 3. Test control and protective devices for proper operation.

4. Perform phase rotation test.
5. Perform insulation resistance test on feeder conductors and equipment. Test phase-to-phase and phase-to-ground.
6. Perform automatic load transfer test. Test normal and emergency power, or normal and standby power, or both. Simulate loss of emergency and normal power, or standby and power, or both. Simulate all forms of single-phase condition.
7. Conduct operational test on system under load conditions.

H. Special Cases Job Tasks

UBC Inspection Code 19

1. The special case shall be identified by the building official before obtaining permits.
 - a. The building official, with the E/AR's assistance, shall establish, prior to the special case construction, a job task analysis in writing for the specific area concerned.
2. The building official reserves the right to require special inspection when unusual or unanticipated conditions arise during the course of construction. The building official, with assistance from the E/AR, shall establish the job tasks required in these situations.
3. Sewer Installation

This Special Inspection shall apply to the installation of sewer lines where it is impractical due to the depth of the street sewer or to the structural features or to the arrangement of any building or structure, to obtain the minimum slope required by the Uniform Plumbing Code Section 1106.

 - a. Inspect sewer for proper material, support, alignment, and uniform slope.
 - b. Verify that the sewer has been installed in accordance with the approved design and to the grades shown on the approved plans.
4. Unlisted Mechanical Equipment

Reports which are submitted to the building official, as an alternative to a listing agency approval for those products or equipment which require approval, are not acceptable unless they provide at least the following:

 - a. Date issued.
 - b. Address at which the product or equipment is installed.
 - c. General description of the product or equipment which is the subject of the report.
 - d. Proposed objective to be achieved as a result of this examination.
 - e. Data plate information which shall include at least the following:
 1. Manufacturer's name.
 2. Model and serial number.
 3. Type of fuel for fuel burning devices – input/output ratings.
 4. Electrical rating – volts, amps, phase (if applicable).
 5. Operating pressures (if applicable).
 - f. Listing of specific test criteria:
 1. ASTM Standards
 2. ANSI Standards
 3. UL Standards
 4. AGA Standards
 5. Other standards
 - g. Description of specific tests performed.

3. Fill Placement Verification
Inspect, observe, and test as required all fill placement, moisture conditioning, and compactions are as specified and that all fill slope configurations are as specified.
 4. Utility Excavations and Backfilling Verification
Inspect, observe, and test as required the location, placement, moisture conditioning and compaction of backfills within specified areas of the site for conformance with plans and specifications.
 5. Foundation Excavation Verification
Inspect, observe, and test as required all foundation excavations as to depth, size, bearing material, depth into bearing material, and cleaning of bearing surface for conformance with plans and specifications.
 6. Material Verifications
Inspect the steel reinforcement and concrete placement as specified in accordance with sections of this part.
- K. Reinforced Gypsum Concrete Job Task
UBC Inspection Code 8
1. The inspection of reinforced gypsum concrete shall be as determined by the E/AR and the building official and be defined at the pre-job conference.
- L. Shotcrete Job Tasks
UBC Inspection Code 12
1. General
 - a. Shotcrete shall be defined as mortar or concrete pneumatically projected at high velocity onto a surface.
 - b. Shotcrete placed for swimming pools and shotcrete work fully supported on earth and minor repairs, when in the opinion of the building official presents no special hazard, shall be exempt from special inspection.
 2. Concrete Mix Verification
 - a. Mix Design
Review proposed concrete mix design, that cement type is as specified, that aggregate type, weight and size are as specified and that admixture are correct.
 - b. Preconstruction Verification
A test panel shall be shot, cored, examined and tested prior to commencement of operations for the purpose of verifying the mix design and to qualify the nozzleman. The test panel shall be representative of the project and simulate job conditions as closely as possible. The panel thickness and reinforcing shall reproduce the thickest and most congested area specified in the structural design. It shall be shot at the same angle, using the same concrete mix design, the same equipment, and the same nozzleman that will be used on the project.
 - c. Delivery Ticket
Redi-mix Concrete: Determine that mixer truck delivery ticket specifies required mix and batch time.
 - d. On-site Materials
Concrete mixed on-site: Review certifications or other documentation of aggregates, cement and additives for compliance with plans and specifications. Determine that materials are in acceptable condition.
 - e. Storage of Materials
Reject cement or additives that have been exposed to excessive moisture. Reject aggregate that are contaminated.

f. Reinforcing Material Certifications

Inspect reinforcing materials certifications, or other documents for compliance with codes, plans and specifications. Check reinforcing materials for acceptable conditions.

M. Spray Applied Fireproofing Job Tasks

UBC Inspection Code 10

1. General

This Inspection shall apply to direct contact spray applied fire protection materials, such as “sprayed fiber” or “cementitious mixtures.”

2. Application

Sprayed products shall be inspected and tested when applied to members such as beams, columns, floor systems and related components.

3. Inspection Procedures

a. Condition of Substrates

Surfaces of substrates to receive the sprayed fire protection material shall be free of dirt, oil, grease, release agents, loose scale, loose paint and any extraneous materials.

b. Thickness of Application

Thickness of spray applied fire protection shall be determined in accordance with ASTM E605-77.

c. Floor and Wall Sections

A thickness test shall be conducted for every 2,500 square feet. Each unit or bay shall be divided into quarters. In each quarter, a 12 inch square shall be laid out and thickness measurements as described in ASTM E605-77 taken at each corner, averaged and reported as a single measurement.

d. Beams and Columns

Four sets of random measurements shall be taken for each bay or unit. The test locations on individual members shall be conducted as described in ASTM E605-77.

e. Density

Density of the fire protection material shall be tested in accordance with ASTM E605-77. Samples for density determination shall be one for each 10,000 square feet of floor area, but shall be no less than two per floor.

4. Condition of Finished Application

Inspect sprayed fire protection materials upon drying and curing. They shall be free of deep or wide cracks, voids, spalls, or any exposure of the substrate.

5. Patching

The special inspector shall insure that corrective measures have been applied to areas requiring re-spraying or patching where materials have been deliberately removed for testing, been damaged, or removed by other trades.

Maricopa Association of Governments Building Code Amendments and Standards Manual BCAS #H3	
Title: Uniform Reporting to the County Assessor	 MARICOPA ASSOCIATION of GOVERNMENTS BCAS Manual Historical Archive
Originally Reviewed by MAG Building Codes Committee: 6/21/1995	
Archived to Historical Section by MAG Building Codes Committee: 3/21/2012	

At the June 21, 1995, Building Codes Committee meeting, the Committee discussed the activities of the Maricopa County Assessor's Task Force. The Task Force established a number of goals and objectives related to expediting taxation and incorporating GIS in local jurisdictions. Included among those goals and objectives was a goal of creating a uniform method of reporting building permit information to the Assessor, as opposed to establishing a uniform building permit across all jurisdictions. The Committee voted in favor of supporting the concept of uniform reporting information to the County Assessor.

At the March 21, 2012 Building Codes Committee meeting, the Committee discussed the current methods used to report information to the County Assessor and determined that the Assessor had established standards which each jurisdiction seemed to be following, and that a policy like this was no longer needed. The Committee voted unanimously to move this document to the Historical Archive.

**MAG Building Codes Committee Statement on Uniform Reporting of
Information to County
Assessor**

June 21, 1995

A motion was passed that the Building Codes Committee supports the concept of uniform reporting of information to the County Assessor as opposed to a standard building permit system.

Motion passed unanimously.

DRAFT

Maricopa Association of Governments Building Code Amendments and Standards Manual BCAS #H4	
Title: MAG BCC Statement on Utility Companies Installing Lighting on Private Property	 MARICOPA ASSOCIATION of GOVERNMENTS BCAS Manual Historical Archive
Originally Reviewed by MAG Building Codes Committee: 4/17/1996	
Archived to Historical Section by MAG Building Codes Committee: 9/19/2012	

At the April 17, 1996, Building Codes Committee meeting, the Committee discussed the practice of utility companies installing lighting on private property without obtaining municipal zoning approval, building permits, or electrical inspections. The utility companies contended that the lights are exempt from municipal regulations because the utilities own the poles and simply sell the lighting to the private property owners. The perspective of the municipalities was that light poles and wiring on private property are subject to municipal codes for zoning and for electrical safety. The Committee voted unanimously to recommend that MAG support the position that utility companies installing lighting on private property be subject to all MAG member agency code requirements including permits and inspections. At the May 15, 1996, MAG Management Committee meeting, the Management Committee voted to support this recommendation. At the May 29, 1996, MAG Regional Council meeting, the Regional Council approved MAG support of the position that utility companies installing lighting on private property be subject to all MAG member agency code requirements including permits and inspections.

At the September 19, 2012, Building Codes Committee meeting, the Committee discussed the original statement, its intent, and the circumstances that necessitated its creation in 1996. The Committee determined that the wording of the original statement required a permit to be obtained and that the current building codes require a permit for this type of work. Because of this, the Committee determined that the statement as written was no longer needed. The Committee voted unanimously to move this document to the Historical Archive. The Committee also discussed revisiting the original intent of this document at a future meeting, to ensure that MAG and member agency policy is clear on this topic.

**MAG Building Codes Committee Statement on Utility
Companies
Installing Lighting on Private
Property**

April 17, 1996

A motion was passed stating that utility companies installing lighting on private property be subject to all MAG member agency code requirements including permits and inspections.

Motion passed unanimously.

DRAFT

Maricopa Association of Governments Building Code Amendments and Standards Manual BCAS #H5	
Title: Standard for Marking Trusses	 MARICOPA ASSOCIATION of GOVERNMENTS BCAS Manual Historical Archive
Originally Reviewed by MAG Building Codes Committee: 4/16/2000	
Archived to Historical Section by MAG Building Codes Committee: 6/20/2012	

At the April 19, 2000, Building Codes Committee meeting, the Committee reviewed the standard for marking trusses that had been developed by the MAG Building Inspector/Plan Reviewer group.

At the June 20, 2012 Building Codes Committee meeting, the Committee reviewed the original document. A survey had been conducted to determine the current use of the standard. The vast majority of respondents did not use the standard anymore. The Committee voted unanimously to move this document to the Historical Archive.

DRAFT

Truss Identification per UBC Section 2343.6

March 10, 2000

Volume 2 of the UBC, specifically section 2343.6, requires each truss be legibly branded, marked or otherwise have permanently affixed thereto the following information located within 2 feet of the center of the span on the face of the bottom cord. A tag of composite material that will not be affected by the elements affixed by a metal connector plate within 2 feet of the center of the span on the face of the bottom cord is acceptable.

1. Identity of the company manufacturing the truss.
MAG approved truss fabricator.
2. The design load.
The designed live and dead load for the top and bottom cords.
3. The spacing of trusses.
The maximum designed on center spacing.

Section 22343.7.4.4 Alternatives: Special bearing location, permanent bracing and orientation of trusses may be identified by means of engineering drawings, erection plans and/or special details.

Manufacturers truss calculation drawings approved by the Authority having Jurisdiction.

Explanation of Recommendations from MAG Building Inspector/Plan Reviewer Forum

Composite Tags

The forum discussed the use of a composite tag and felt it was acceptable. The composite tag should provide a more reliable means of identification and source of information required on the truss.

1. This item is self explanatory per the code. The manufacturer shall also be listed and currently inspected on the MAG Approved Truss Manufacturers List.
2. The forum felt the code was addressing repetitive truss members with normal loads applied.
3. Again self explanatory, provide the maximum on center spacing the truss is designed for.

Alternatives:

The code allows the use of drawings for special conditions. The manufacturer's engineered truss calculation drawings submitted to the jurisdiction are the most consistent form for this information.

Maricopa Association of Governments Building Code Amendments and Standards Manual BCAS #H6	
Title: MAG Building Codes Committee Statement on Accessibility Standards	 MARICOPA ASSOCIATION of GOVERNMENTS BCAS Manual Historical Archive
Originally Reviewed by MAG Building Codes Committee: 11/1/2000	
Archived to Historical Section by MAG Building Codes Committee: 5/16/2012	

At the November 1, 2000, Building Codes Committee meeting, the Committee discussed Fair Housing Act and the Arizonans with Disabilities Act as they relate to building codes. The Committee voted to recommend compliance with the accessibility standards in the Fair Housing Act or the 1997 UBC Chapter 11 either by ordinance or through the alternate design methods section of the UBC.

At the May 16, 2012 Building Codes Committee meeting, the Committee reviewed the original statement. It was determined that, starting with the 2006 edition, the IBC now includes those standards in the code. The Committee voted unanimously to move this document to the Historical Archive.

MAG Building Codes Committee Statement on Accessibility Standards

November 1, 2000

A motion was passed to recommending compliance with the accessibility standards in the Fair Housing Act either through use of the Fair Housing Act Accessibility Guidelines or 1997 Uniform Building Code (UBC) Chapter 11 with either document being adopted by ordinance or use of the alternative design methods second of the UBC.

Motion passed 10 to 2 with 3 abstaining.

DRAFT

Maricopa Association of Governments Building Code Amendments and Standards Manual BCAS #H7	
Title: Uniform Application Roof Access through Hatches/Scuttle Openings per 1997 UMC	 MARICOPA ASSOCIATION of GOVERNMENTS BCAS Manual Historical Archive
Originally Reviewed by MAG Building Codes Committee: 2/14/2001	
Archived to Historical Section by MAG Building Codes Committee: 5/16/2012	

At the February 14, 2001, Building Codes Committee meeting, the Committee reviewed a recommendation from the MAG Building Inspectors/Plans Examiners forum that section 307.5.2.1.5 of the 1997 UMC be interpreted to allow the use of one ladder extension device as meeting the intent of the code.

At the May 16, 2012, Building Codes Committee meeting, the Committee reviewed the original document. The Committee determined that this interpretation had been incorporated into the IMC and was no longer needed. The Committee voted unanimously to move this document to the Historical Archive.

Uniform Application Roof Access through Hatches/Scuttle Openings per 1997 UMC Section 307.5.2.1.5

2/14/2001

The requirements of the 1997 Universal Mechanical Code (UMC) Section 307.5.2.1.5 state “have side railings which extend at least 30 inches above the scuttle opening or coping to the step off.” The MAG Building Codes Committee makes the interpretation that the use of one ladder extension device is acceptable as meeting the intent of the code.

DRAFT

Maricopa Association of Governments Building Code Amendments and Standards Manual BCAS #H8	
Title: MAG Building Codes Committee Statement on Pressure-Treated Sill Plates	 MARICOPA ASSOCIATION of GOVERNMENTS BCAS Manual Historical Archive
Originally Reviewed by MAG Building Codes Committee: 9/21/2001	
Archived to Historical Section by MAG Building Codes Committee: 5/16/2012	

At the September 21, 2001, Building Codes Committee meeting, the Committee reviewed a recommendation from the MAG Building Inspectors/Plans Examiners Forum that pressure-treated sill plates be required in both interior and exterior applications as required by Section 2306.4 of the UBC.

At the May 16, 2012 Building Codes Committee meeting, the Committee reviewed the original document. The Committee determined that both the IRC and IBC have clarified this issue. The Committee voted unanimously to move this document to the Historical Archive.

MAG Building Codes Committee Statement on Pressure-Treated Sill Plates

September 12, 2001

A motion was passed to require pressure treated sill plates in both interior and exterior applications as required by UBC Section 2306.4.

Motion passed unanimously.

DRAFT

Maricopa Association of Governments Building Code Amendments and Standards Manual BCAS #H9	
Title: Compliance with the IRC Energy Codes Chapter 11	 MARICOPA ASSOCIATION of GOVERNMENTS BCAS Manual Historical Archive
Originally Reviewed by MAG Building Codes Committee: 3/20/2002	
Archived to Historical Section by MAG Building Codes Committee: 5/16/2012	

At the March 20, 2002, Building Codes Committee meeting, the Committee reviewed recommendation for alternative for complying with Chapter 11 of the 2000 IRC Energy Codes.

At the May 16, 2012 Building Codes Committee meeting, the Committee reviewed the original document. The Committee voted unanimously to move this document to the Historical Archive.

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Compliance with the IRC Energy Codes Chapter 11

3/20/2002

The MAG Building Codes Committee (BCC) recognizes that there are multiple approaches to meeting the energy efficiency requirements of Chapter 11 of the International Residential Code (IRC). Compliance can be demonstrated by one of the following methods:

- A. For detached one- and two-family dwellings (Type A-1) with glazing area that does not exceed 15% of the gross area of exterior walls, compliance may be demonstrated by meeting one of the following requirements:
 - a. Chapter 11 of the IRC; or
 - b. Chapter 6 of the International Energy Conservation Code (IECC); or
- B. For detached one- and two-family dwellings (Type A-1) with glazing area that exceeds 15% of the gross area of exterior walls, compliance may be demonstrated by meeting one of the following requirements:
 - a. Chapter 4, System Analysis and Design of Buildings Utilizing Renewable Energy Sources, of the IECC; or
 - b. Chapter 5, Component Performance Approach, of the IECC; or
- C. For any detached one- and two-family dwelling, compliance may be demonstrated by complying with one of the packages entitled "Zone 3 Single-Family Prescriptive Packages – 1998/2000 IECC"; or
- D. For any detached one- and two-family dwelling, compliance may be demonstrated by participation in the Energy Star, Engineered for Life, Environments for Living or other such nationally recognized third party energy programs.

Maricopa Association of Governments Building Code Amendments and Standards Manual BCAS #H10	
Title: MAG Building Codes Committee Statement on IMC Exception Clause Section 403.3 for Schools	 MARICOPA ASSOCIATION of GOVERNMENTS BCAS Manual Historical Archive
Originally Reviewed by MAG Building Codes Committee: 3/20/2002	
Archived to Historical Section by MAG Building Codes Committee: 5/16/2012	

At the March 20, 2002, Building Codes Committee meeting, the Committee reviewed a document regarding HVAC system requirements when schools renovate those systems.

At the May 16, 2012, Building Codes Committee meeting, the Committee reviewed the original document. The original issue in 2002 was due to schools receiving federal money to upgrade mechanical equipment. The Committee determined that a statement like this is no longer needed as a jurisdiction adopts an energy code. The Committee voted unanimously to move this document to the Historical Archive.

**MAG Building Codes Committee Statement on International
Mechanical
Code Exception Clause Section 403.3 for Schools**

March 20, 2002

The MAG Building Codes Committee recognizes that the exception clause in the International Mechanical Code section 403.3 may be used in evaluating the outdoor ventilation air requirements for schools.

Motion passed 7-6 with one abstention.

DRAFT

Maricopa Association of Governments Building Code Amendments and Standards Manual BCAS #H11	
Title: AZBO Code Review and Development Committee Report of Final Actions 2001-2002	 MARICOPA ASSOCIATION of GOVERNMENTS BCAS Manual Historical Archive
Originally Reviewed by MAG Building Codes Committee: 10/16/2002	
Archived to Historical Section by MAG Building Codes Committee: 5/16/2012	

At the October 16, 2002, Building Codes Committee meeting, the Committee reviewed the report of final actions of the AZBO Code Review and Development Committee for 2001-2002.

At the May 16, 2012, Building Codes Committee meeting, the Committee reviewed the original document. The Committee voted unanimously to move this document to the Historical Archive.

DRAFT

ARIZONA BUILDING OFFICIALS

CODE REVIEW AND DEVELOPMENT
COMMITTEE

REPORT OF FINAL ACTIONS
2001-2002

July 15, 2002

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INTRODUCTION LETTER

Mr. Terry Vosler, CBO
Chairman – Arizona Building Officials
Oro Valley, Arizona

July 14, 2002

Mr. Chairman;

The work of the Arizona Building Officials (AZBO) Code Change Committee continues. During the last year we have changed our name to the Code Review and Development Committee (CR&D) to better reflect what we are doing but our goals and mission remain the same.

In our continuing desire to assist the jurisdictions and the development community in Arizona, the AZBO CR&D Committee has been reviewing the International family of codes as requested by the organization to develop recommendations for common amendments for the State of Arizona. While new items were addressed in our local meetings, we also attended the International Code Council (ICC) Code Hearings in Pittsburgh, Pennsylvania in April to present those proposals that the Code Change Committee developed last year. See page VI for a report on that activity.

During the last year we have met seven times throughout the state as the full committee and five times as the structural subcommittee. While the meetings have been open to all, pages II, III and IV list the actual participants. As you see attendees represented many jurisdictions from around the state, architects, engineers, designers and builders. We very much value the partnerships with other construction professionals that have evolved out of this committee's activities.

Through this process the completeness and accuracy of the International family of codes has been reiterated. While thousands of hours have been spent reviewing and enforcing these codes, the number of proposals has declined appreciably from previously low levels. It has been an expressed goal of the committee to make as few changes as necessary.

Several significant items have been discussed at the meetings during the year. While no action has been taken on some of them, the work goes on. Probably the most important single item has been the work of Mr. Forrest Fielder of the City of Surprise in working with the Arizona Department of Health Services in developing code requirements for assisted living facilities that meet state laws and meet the needs of the inhabitants. Likewise Mr. Anthony Floyd of the City of Scottsdale brought forward proposals about the energy provisions of the International Residential Code that were enlightening for all the participants. Mr. Charles McKinney of Ranch West Properties did extensive research on attic access in bringing a proposal forward also.

It is with much pride that we, the members of the Arizona Building Officials Code Review and Development Committee, present these proposals to the Board and to the Organization with a recommendation that you support them to all the jurisdictions throughout the state.

Please feel free to contact me at (480) 488-6632 or email at blee@cavecreek.org if you have any questions.

Robert D. Lee, CBO
Chairman – AZBO Code Review and Development Committee
Cave Creek, Arizona

DEDICATION

In an effort to encourage uniformity in the amendments and adoption of the construction codes enforced throughout the State of Arizona; and to assist in the uniform use and application of those codes, the AZBO Code Review and Development Committee continues to partner with the construction development community. The membership of the Code Review and Development Committee includes Building Officials, Fire Officials, Plans Examiners, Building Inspectors, Fire Inspectors, Architects, Engineers, Designers and Contractors. The Committee jointly reviewed the International Codes and developed amendments to the Codes to address five basic areas:

1. Errors in the printed codes
2. Coordination between the codes
3. Climatic/geographic considerations
4. Life and health safety issues
5. Local community issues

On behalf of the Board of Directors of the Arizona Building Officials, I would like to thank all of the Committee members for their dedication and hard work. Their willingness to work together in the effort of improving the Codes we all use and in providing a common set of amendments for use throughout Arizona is commendable.

A special dedication goes to Bob Lee, CBO, Building Official for Cave Creek, Arizona and Chairman of the 2001-2002 Code Review and Development Committee for his never-ending commitment to continued partnerships between the Arizona construction industry and the Building and Fire Code Enforcement Professionals and to the protection of the health, safety and welfare of the general public.

Terry Vosler, CBO
Town of Oro Valley, AZ Building Official
2001-2002 Chairman – Arizona Building Officials

2002-2003 AZBO CODE REVIEW & DEVELOPMENT COMMITTEE

Name & initial if attended	Representing	Phone & Fax Numbers	Internet Contact Information
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2000-2001 AZBO <u>CODE REVIEW & DEVELOPMENT STRUCTURAL SUBCOMMITTEE</u>
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Name & initial if attended	Representing	Phone & Fax Numbers	Internet Contact Information
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AZBO CR& D Proposal Status

Item #	AZBO Code Committee #	ICC Code Development #	ICC Code Development Action
1	IBC-3	G1-02	D
2	IBC-4	S12-02	D
3	IBC-7	S90-02	D
4	IBC-9	S99-02, Item 1	D
5	IBC-12	G36-02	D
6	IBC-15	G9-02, Item 1	D
7	IBC-17	F123-02, Item 1	D
8	IRC-1	FG6-02	D
9	IRC-2	M8-02, Item 2	D
10	IRC-6	S99-02, Item 2	WP
11	IRC-7	G65-02, Item 2	WP
12	IRC-8	G65-02, Item 2	WP
13	IRC-10	G9-02, Item 9	D
14	IRC-13	RB45-02, Item 1	D
15	IRC-14	RP18-02	WP
16	IRC-16	F123-02, Item 2	AS
17	IRC-17	RB4-02	D
18	IRC-19	RB65-02	AS
19	IRC-20	RB99-02	AS
20	IRC-23	RB13-02, Item 2	AS
21	IRC-34	RB144-02, Item 1	AS
22	IRC-38	RM17-02	AS
23	IMC-1	M8-02, Item 1	D *
24	IMC-3	M12-02	WP
25	IMC-4	M3-02	D
26	IMC-5	FG13-02	WP

IBC-2, IBC-14, IRC-5, IRC-11, IRC-12 and IRC-15 were withdrawn.

AS = Approved as Submitted, D = Disapproved, WP = Withdrawn by Proponent

D * will be challenged (others may be challenged also).

CODE REVIEW AND DEVELOPMENT COMMITTEE

GOAL – *It shall be the goal of the Code Review and Development Committee to review the family of International Codes, the Code Requirements for Housing Accessibility, the provision for adult group care homes, and the Uniform Code for Building Conservation during the coming year.*

SCOPE OF WORK – *Review codes and develop amendments as necessary to promote uniformity and consistency in code enforcement.*

MISSION STATEMENT – *In an effort to provide better service to the developers, builders, and citizens within the State of Arizona, The Arizona Building Officials (AZBO), Code Review and Development Committee will work to develop a minimum set of uniform code amendments and/or revisions for the codes designated by AZBO utilizing the participation and assistance of the development, construction and design communities as well as that of all jurisdictions and all other interested parties throughout the state.*

The five areas to address are; errors in the printed codes, coordination between codes, climatic/geographic considerations, life and health safety issues, and local community issues.

CODE REVIEW AND DEVELOPMENT COMMITTEE

STRUCTURAL SUBCOMMITTEE

GOAL – *It shall be the goal of the Code Review and Development Structural Subcommittee to review the family of International Codes and prepare amendments and/or revisions to be submitted to the full committee, if necessary.*

SCOPE OF WORK – *Review codes and develop amendments as necessary to promote uniformity and consistency in code enforcement.*

MISSION STATEMENT – *In an effort to provide better service to the developers, builders, and citizens within the State of Arizona, The Arizona Building Officials (AZBO), Code Review and Development Structural Subcommittee will work to develop a minimum set of uniform code amendments and/or revisions for the structural provisions of the codes designated by AZBO utilizing the participation and assistance of the engineering community as well as that of all jurisdictions and all other interested parties throughout the state.*

BENCHMARK OR TEST – *Proposed amendments should address one of the following areas: errors in the printed codes, coordination between codes, climatic/geographic considerations, life and health safety issues, and local community issues.*

QUORUM – *7 members shall be considered a quorum and a simple majority is required to pass any proposal.*

AZBO Code Change Committee
Final Actions Summary

Legend: AS = Approved as Submitted; AM = Approved as Modified; D = Disapproved; WP = Withdrawn by proponent; FS – Further Study.

Item #	Code Section / Subject	Committee Action	Meeting Location	Action Date
IBC-18	Appendices	WP	Town of Cave Creek	Sep 7, 2001
IBC-20	Chapter 11 Accessibility	AM	Town of Cave Creek	Sep 7, 2001
IBC-21	2113.1.1 Spark arrestor	FS	Home Builders' Association of Central Arizona	Dec 7, 2001
IBC-22	308.2,308.3, 310.1,310.2, (new) 419 Adult care homes	FS	City of Glendale	Feb 1, 2002
IBC-23	1209.3 Shower walls	WP	City of Goodyear	Apr 5, 2002
Structural 2	Table 1607.1 Attic storage loads	AM	City of Casa Grande	Dec 14, 2001
Structural 4	1607.11.2.1 Roof live load & pitch	AM	City of Chandler	Feb 15, 2002
Structural 5	1704.5 Masonry construction	AS	City of Chandler	Mar 15, 2002

Item #	Code Section / Subject	Committee Action	Meeting Location	Action Date
IRC-27	R324.1 Subterranean termite control	AM	Town of Cave Creek	Sep 7, 2001
IRC-35	M1308.2 Foundations and supports	AM	Town of Cave Creek	Sep 7, 2001
IRC-37	M1703.4 Attic combustion air	WP	Town of Cave Creek	Sep 7, 2001
IRC-39	E3801.11 HVAC outlet	AM	Town of Prescott Valley	Nov 2, 2001
IRC-40	P3005.2.4 Plumbing cleanouts	FS	Town of Prescott Valley	Nov 2, 2001
IRC-41	G2414.9 Gas line burial depth	AM	Town of Prescott Valley	Nov 2, 2001
IRC-42	R310.1 Emergency escape and rescue openings	AS	Home Builders' Association of Central Arizona	Dec 7, 2001
IRC-43	E3802.9 Arc-fault circuit interrupters	AS	Home Builders' Association of Central Arizona	Dec 7, 2001

IRC-44	P2503.6 Water supply system testing	AS	Home Builders' Association of Central Arizona	Dec 7, 2001
IRC-45	P3103.1 Plumbing vent termination	AS	Home Builders' Association of Central Arizona	Dec 7, 2001
IRC-46	R1001.1.2 Spark arrestor	FS	Home Builders' Association of Central Arizona	Dec 7, 2001
IRC-47	Figure R602.3 (2)	AM	City of Goodyear	Apr 5, 2002
IRC-48	E3512.1 & E3512.2 Ranges and Clothes Dryer plugs and cords	FS	City of Glendale	Feb 1, 2002
IRC-49	N1101.2.1 Energy compliance	WP	City of Glendale	Feb 1, 2002
IRC-50	Table N1102.1 Insulation values	WP	City of Glendale	Feb 1, 2002
IRC-51	Table R602.3(1) Top plate lap	AS	City of Goodyear	Apr 5, 2002
IRC-52	R807.1 Attic access	WP	City of Goodyear	Apr 5, 2002
Structural 1	R401.4.2 (R401.5) Geotechnical Report	AM	City of Casa Grande	Dec 14, 2001
Structural 3	Table R301.4 Attic storage loads	AM	City of Chandler	Feb 15, 2002

Item #	Code Section / Subject	Committee Action	Meeting Location	Action Date
IFG-4	304.14	AS	City of Glendale	Feb 1, 2002

AZBO Code Review and Development Committee Report of Final Actions

2000 International Building Code

IBC-19

Revision to: Appendices

Proponent: Bob Lee, Town of Cave Creek

Proposal:

Only the following appendices are adopted:

- Appendix B Board of Appeals
- Appendix C Group U – Agricultural Buildings
- Appendix I Patio Covers

Reason: This change will create uniformity throughout the state.

Committee Action: Withdrawn by proponent

IBC-20 (Previously IBC-18)

Revision to: Chapter 11 Accessibility

Proponent: Bob Lee, Town of Cave Creek

Proposal: Delete Chapter 11, Accessibility, in its entirety and substitute the following:

ARIZONANS WITH DISABILITIES ACT

"Arizonans with Disabilities Act" (Arizona Revised Statutes, Title 41, Chapter 9, Article 8), and the "Arizonans with Disabilities Act Implementing Rules" (Arizona Administrative Code, Title 10, Chapter 3, Article 4), which rules incorporate The federal "Americans with Disabilities Act Accessibility Guidelines for Buildings and Facilities," be and the same is hereby adopted as the Arizonans with Disabilities Act of the Town, City or County, and shall apply to new construction and alterations and are not required in buildings or portions of existing buildings that do not meet the standards and specifications and this act is hereby referred to, adopted and made a part hereof as though fully set forth in this section.

Amendments to Arizonans with Disabilities Act

The Arizonans with Disabilities Act § 41-1492.07 "Exemptions for private clubs and religious organizations" shall be deleted.

Reason: The regulation of accessibility is currently governed by the Arizonan's with Disability Act. This change will create uniformity throughout the state.

Cost impact: None

Committee Action: AM

Proposal: Delete Chapter 11, Accessibility, in its entirety and substitute the following:

ARIZONANS WITH DIABILITIES ACT

"Arizonans with Disabilities Act" (Arizona Revised Statutes, Title 41, Chapter 9, Article 8), and the "Arizonans with Disabilities Act Implementing Rules" (Arizona Administrative Code, Title 10, Chapter 3, Article 4), which rules incorporate The federal "Americans with Disabilities Act Accessibility Guidelines for Buildings and Facilities," be and the same is hereby adopted as the Arizonans with Disabilities Act of the Town, City or County, and shall apply to new construction and alterations and are not required in buildings or portions of existing buildings that do not meet the standards and specifications and this act is hereby referred to, adopted and made a part hereof as though fully set forth in this section.

Reason: All jurisdictions within the state are required by state law to enforce these provisions so this code change merely brings the International Building Code into compliance.

IBC-21

Revision to: Section 2113.1 General

Proponent: Dave Fizzell, City of Prescott

Proposal: **2113.1.1 Spark arrester.** Where determined necessary by the building official due to local climatic conditions or where sparks escaping from the chimney would create a hazard, and chimneys attached to any appliance or fireplace that burns solid fuel shall be equipped with an approved spark arrester. The net free area of the spark arrester shall not be less than four times the net free area of the outlet of the chimney. The spark arrester screen shall have heat and corrosion resistance equivalent to 0.109-inch (2.77 mm) (No. 12 B.W. gage) wire, 0.042-inch (1.07 mm) (No. 19 B.W. gage) galvanized wire or 0.022-inch (0.56 mm) (No. 24 B.W. gage) stainless steel. Openings shall not permit the passage of spheres having a diameter larger than ½ inch (12.7 mm) and shall not block the passage of spheres having a diameter of less than 3/8 inch (9.5 mm).

Chimneys used with fireplaces or having heating appliances in which solid or liquid fuel is used shall be provided with a spark arrester as required in the Fire Code.

EXCEPTION: Chimneys that are located more than 200 feet (60,960 mm) from any mountainous, brush-covered or forest-covered land or land covered with flammable material and that are not attached to a structure having less than a Class C roof covering, as set forth in this code.

Reason: When buildings are located in or near heavily wooded or brushy areas preventing burning embers from escaping the chimney is extremely important. Adding this language, which is in the Uniform Building Code, will provide the building official with the means to require this equipment.

Committee Action: Tabled for further study.

IBC-22

Revision to: Sections 308.2,308.3, 310.1,310.2, (new) 419

Proponent: Forrest Fielder, City of Surprise

Proposal: 308.2 Group I-1. This occupancy shall include a building or part thereof housing more than ~~16~~ 10 persons, on a 24-hour basis, who because of age, mental disability or other reasons, live in a supervised residential environment that provides ~~personal~~ supervisory care services. The occupants are capable of responding to an emergency situation without physical assistance from staff. This group shall include, but not be limited to, the following: residential board and care facilities, assisted living facilities, halfway houses, group homes, congregate care facilities, social rehabilitation facilities, alcohol and drug centers, and convalescent facilities. A facility such as the above with ~~five~~ 10 or fewer persons shall be classified as a group R-4 Condition 1. ~~A facility such as the above, housing at least six and not more than 16 persons shall be classified as a Group R-4.~~

308.3 Group I-2. This occupancy shall include buildings and structures used for medical, surgical, psychiatric, nursing or custodial care on a 24-hour basis of more than ~~five~~ 10 persons who are not capable of ~~self preservation~~ responding to an emergency situation without physical assistance from staff. This group shall include, but not be limited to the following: hospitals, nursing homes (both intermediate care facilities and skilled nursing facilities), mental hospitals, and detoxification facilities. A facility such as the above with ~~five~~ 10 or fewer persons shall be classified as a Group ~~R-3~~ R-4 Condition 2.

310.1...R-4. Residential occupancies shall include buildings arranged for occupancy as Residential Care/Assisted Living Facilities including ~~more than five but not more than 16 occupants~~ up to 10 occupants, excluding staff.

310.1.1 Condition 1. This occupancy condition shall include facilities licensed to provide supervisory care services, in which occupants are capable of responding to an emergency situation without physical assistance from staff. Condition 1 occupancies

shall meet the requirements for construction as defined in Group R-3 except for the height and area limitations provided in Section 503. Condition 1 facilities housing more than 10 persons shall be classified as a Group I-1.

310.1.2 Condition 2. This occupancy condition shall include facilities licensed to provide personal or directed care services, in which occupants are incapable of responding to an emergency without physical assistance from staff. Condition 2 occupancies shall be designed and constructed in accordance with Section 419. Condition 2 facilities housing more than 10 persons shall be classified as Group I-2.

310.2 Definitions

PERSONAL CARE SERVICE. The care of residents who do not require chronic or convalescent medical or nursing care. Assistance with activities of daily living that can be performed by persons without professional skills or professional training and includes the coordination or provision of intermittent nursing services and the administration of medications and treatments, as provided in ARS Title 9, Article 7. Personal care involves responsibility for the safety of the resident while inside the building.

DIRECTED CARE SERVICE. Care of residents, including personal care services, who are incapable of recognizing danger, summoning assistance, expressing need, or making basic care decisions, as provided in ARS Title 9, Article 7.

SUPERVISORY CARE SERVICE. General supervision, including daily awareness of resident functioning and continuing needs, as provided in ARS Title 9, Article 7.

RESIDENTIAL CARE/ASSISTED LIVING FACILITY. A building or part thereof housing a maximum of ~~16~~ 10 persons, on a 24-hour basis, who because of age, mental disability or other reasons, live in a supervised residential environment which provides supervisory, personal, or directed care services. ~~The occupants are capable of responding to an emergency situation without physical assistance from staff.~~ This classification shall include, but not be limited to, the following: residential board and care facilities, assisted living facilities, halfway houses, group homes, congregate care facilities, social rehabilitation facilities, alcohol and drug rehabilitation centers, and convalescent care facilities. ~~Residential care/assisted living facilities housing more than 16 persons shall be classified as Group I-1.~~

419 RESIDENTIAL CARE/ASSISTED LIVING FACILITIES

419.1 Applicability. The provisions of this section shall apply to a building or part thereof housing up to 10 persons, on a 24-hour basis, who because of age, mental disability or other reasons, live in a supervised residential environment which provides personal or directed care services. Except as specifically required by this division, R-4 Condition 2 occupancies shall meet all applicable provisions of this code.

419.2 General. Buildings or portions of buildings classified as R-4 Condition 2 occupancies may be constructed of any materials allowed by this code, shall not exceed two stories in height nor be located above the second story in any building, and shall not exceed 2000 square feet above the first story except as provided in Section 506.

419.3 Special Provisions. R-4 Condition 2 occupancies having more than 2000 square feet of floor area above the first floor shall be of not less than one-hour fire-resistive construction throughout.

419.3.1 Mixed Uses. R-4 Condition 2 occupancies shall be separated from other uses as provided in Table 302.3.3.

419.4 Access and Means of Egress Facilities.

419.4.1 Accessibility. R-4 Condition 2 occupancies shall be provided with at least one accessible route per Section 1104.

419.4.2 Exits

419.4.2.1 Number of Exits. Every story, basement, or portion thereof shall have not less than two exits.

Exception: Basements and stories above the first floor containing no sleeping rooms may have one exit.

419.4.2.2 Distance to Exits. The maximum travel distance from the center point of any room to an exterior exit door shall not exceed 75 feet.

419.4.2.3 Emergency Exit Illumination. In the event of a power failure, exit illumination shall be automatically provided from an emergency system powered by storage batteries or an onsite generator set installed in accordance with the National Electric Code.

419.4.3 Smoke Detectors and Sprinkler Systems

419.4.3.1 Smoke Detectors. All habitable rooms and hallways in R-4 Condition 2 occupancies shall be provided with smoke detectors installed in accordance with Section 907.2.10.

419.4.3.2 Sprinkler Systems. R-4 Condition 2 occupancies shall be provided with a sprinkler system installed in accordance with NFPA 13D.

Reason: The purpose of this amendment is to bring the provisions of the code into agreement with the licensing rules of the Arizona Department of Health Services. DHS license categories have a threshold of 10 residents to move from a residential home setting to an institutional setting. DHS rules (R9-10-701) state, “Assisted living home” or

“home” means an assisted living facility that provides resident rooms to (10) or fewer residents, as distinct from an “assisted living center”, which provides services to more than (10) persons. In addition, the license classifications to provide “personal care services” and “directed care services” to residents allow for residents to be bed-bound. The use of “Condition” distinctions is reflective of similar distinctions in I-occupancies.

Each state has unique agency programs for assisted living occupancies, which establish license categories based on numbers of residents and the familiar ambulatory/non-ambulatory distinction. Uniformity could be accomplished by either trusting health service agencies nationally to agree to uniform thresholds and other licensing characteristics, or by amending building codes to allow each state to adapt to that state’s unique rules. If numerical thresholds are provided on a “fill in the blanks” basis, condition categories can be added or deleted, and definitions can be customized to match licensure definitions, the hazards associated with these facilities can be addressed comprehensively on a state-by-state basis.

The most hazardous scenario is a facility in an ordinary, un-rated residential structure, occupied by (10) bed-bound residents, supervised by a single caregiver. Provisions for exiting, smoke detectors, emergency illumination, sprinklers, et al, can substantially increase the chances of survival in a fire or other emergency for these residents.

Committee Action: Tabled for further study.

IBC-23

Revision to: Section 1209.3

Proponent: Robert D. Lee, Town of Cave Creek

Proposal: 1209.3 Showers. Shower compartments and walls above bathtubs with installed shower heads shall be finished with a smooth, nonabsorbent surface to a height not less than 72 70 inches (1829 1778 mm) above the drain inlet.

Reason: This change brings the IBC into agreement with Section R307.2 of the IRC that states, “**R307.2 Bathtub and shower spaces.** Bathtub and shower floors and walls above bathtubs with installed showerheads and in shower compartments shall be finished with a nonabsorbent surface. Such wall surfaces shall extend to a height of not less than 6 feet (1829 mm) above the floor.”

Committee Action: Withdrawn by proponent.

Structural 2

Revision to: Table 1607.1

Proponent: Brian Juedes

Proposal: Add a new footnote.

OCCUPANCY OR USE	UNIFORM (psf)	CONCENTRATED (lbs.)
27. Residential Uninhabitable attics without storage ⁱ (no other changes in item 27)		

i. This live load need not be considered as acting simultaneously with other live loads imposed upon the ceiling framing or its supporting structure.

Reason: For temporary safety and construction load, not for the life of the structure. This issue has been addressed in a previous nationally recognized model code; therefore, setting a precedence on this issue.

Committee Action: Approved as modified.

Proposal:

OCCUPANCY OR USE	UNIFORM (psf)	CONCENTRATED (lbs.)
27. Residential Uninhabitable attics without storage ⁱ (no other changes in item 27)		

i. For trussed systems, this live load need not be considered as acting simultaneously with other live loads imposed upon the ceiling framing or its supporting structure.

Structural 4

Revision to: Section 1607.11.2.1

Proponent: Mark Luther

Proposal: $R_2 = 1.2 - 0.05 F$ for $4 < F < 12$ (Equation 16-9)

Exception : For light frame construction 5 stories or less, Pitch 4/12 to 8/12 live load to be 16 psf.

Reason: This would reconcile the differences between the IRC and the IBC regarding roof live load and pitch. Construction load is the largest applied live load and, historically, for pitched roofs 16 psf has been more than adequate.

Committee Action: Approved as modified.

Proposal: $R_2 = 1.2 - 0.05 F$ for $4 < F < 12$ (Equation 16-9)^a

- a. For light frame construction 3 stories or less with a slope equal to 4/12 or greater R_2 may be used as 0.8.

Reason: This would provide consistency between the IRC Table R301.5 and the IBC Section 1607.11.2.1 regarding roof live load and pitch.

Structural 5

Revision to: Section 1704.5

Proponent: Edward J. Courtney

- Proposal:**
3. Masonry fences six feet or less in height above grade.
 4. Masonry retaining walls four feet or less in height from bottom of footing to top of wall unless supporting a surcharge or impounding flammable liquids.
 5. Masonry walls 10 feet or less in height and fireplaces of one and two family dwellings when designed at $\frac{1}{2}$ stress.

Reason: Exception 3 – No previous codes ever required special inspection for masonry fences 6 feet in height or less.

Exception 4 – Retaining walls 4 feet or less in height from bottom of footing to top of wall and not supporting a surcharge or flammable liquids are exempt from building permit requirement.

Exception 5 – Special inspection for masonry walls of one and two family residences increase the cost of home construction and do little to improve life safety since designing at $\frac{1}{2}$ stress is superior to the prescriptive method of design in the IRC.

Committee Action: Approved as submitted.

2000 International Residential Code

IRC-27

Revision to: Section R324.1

Proponent: Chuck King, Town of Oro Valley

Proposal: R324.1 Subterranean termite control. In areas favorable to termite damage designated as “moderate or heavy”, as established by table ~~R301.2 (1)~~ R301.2 (6), methods of protection shall be by chemical soil treatment, pressure preservative treated wood in accordance with the AWPA standards listed in Section R323.1, naturally

termite-resistant wood, or physical barriers (such as metal or plastic termite shields). ~~or any combination of these methods.~~

Reason: The first revision is due to the fact that “favorable to termite damage” is not defined. The table number revision is editorial. The final revision delete the last part of the sentence, is due to the fact that it just isn’t necessary. These specified treatments stand alone as acceptable, and are not intended to work in combination with one another to become effective.

Committee Action: Approved as Modified

Proposal: R324.1 Subterranean termite control. In areas ~~favorable to termite damage~~ designated as “slight to moderate”, “moderate to heavy” and “very heavy”, as established by Table R301.2(1), methods of protection shall be by chemical soil treatment, pressure preservative treated wood in accordance with the AWWA standards listed in Section R323.1, naturally termite-resistant wood, or physical barriers (such as metal or plastic termite shields), or any combination of these methods.

IRC-35

Revision to: Section 1403.2

Proponent: Chuck King, Town of Oro Valley

Proposal: M1403.2 Foundations and supports. Supports and foundations for ~~the~~ outdoor ~~unit of a heat pump~~ mechanical equipment shall be raised at least 3 inches (76 mm) above ~~the ground to permit free drainage of defrost water~~ the finished grade, and shall also conform to the manufacturer’s installation instructions.

Reason: It is necessary to protect all outdoor equipment from problems associated with grade level installations, not just heat pumps.

Committee Action: Approved as Modified

Proposal: M1308.2 Foundations and supports. Foundations and supports for outdoor mechanical systems shall be raised at least 3 inches (76 mm) above the finished grade, and shall also conform to the manufacturer’s installation instructions.

IRC-37

Revision to: Section M1703.4

Proponent: Chuck King, Town of Oro Valley

Proposal: Section M1703.4-#3 Figure M1703.3 is referenced, but should be Figure M1703.2 (3).

Reason: This revision is editorial in nature.

Committee Action: Withdrawn by proponent

IRC-39

Revision to: Section E3801.11

Proponent: Bob Lee, Town of Cave Creek

Proposal: E3801.11 HVAC outlet. A convenience receptacle outlet shall be installed for the servicing of heating, air-conditioning and refrigeration equipment ~~located in attics and crawl spaces~~. The receptacle shall be accessible and shall be located on the same level and within 25 feet (7620 mm) of ~~the heating, air conditioning and refrigeration~~ any mechanical equipment installed. The receptacle outlet shall not be connected to the load side of the HVAC equipment disconnecting means.

Reason: The equipment needs servicing wherever it is located so the qualifying of the location to attics and crawl spaces is not required.

Committee Action: Approved as Modified

Proposal: E3801.11 HVAC outlet. A convenience receptacle outlet shall be installed for the servicing of heating, air-conditioning and refrigeration equipment ~~located in attics and crawl spaces~~. The receptacle shall be accessible and shall be located on the same level and within 25 feet (7620 mm) of the heating, air-conditioning and refrigeration equipment. The receptacle outlet shall not be connected to the load side of the HVAC equipment disconnecting means.

IRC-40

Revision to: Section P3005.2.4

Proponent: Bob Lee, Town of Cave Creek

Proposal: P3005.2.4 Change of direction. Cleanouts shall be installed at each change of direction of the drainage system greater than ~~45~~ 135 degrees, except not more than one cleanout shall be required in each 40 feet (12 192 mm) of run regardless of change of direction.

Reason: Uniform Plumbing Code Section 707.5 has allowed up to a 135 degrees of change of direction for years without any problem and a change to 45 degrees would be unnecessary, unwarranted and costly.

Committee Action: Tabled for further study.

IRC-41

Revision to: Section G2414.9

Proponent: Bob Lee, Town of Cave Creek

Proposal: G2414.9 (404.9) Minimum burial depth. Underground piping systems shall be installed a minimum depth of 12 inches (305 mm) below grade for metal piping and 18 inches (457mm) for plastic piping, ~~except as provided for in Section G2414.9.1.~~

~~**G2414.9.1 (404.9.9) Individual outside appliances.** Individual lines to outside lights, grills or other appliances shall be installed a minimum of 8 inches (203 mm) below finished grade, provided that such installation is approved and is installed in locations not susceptible to physical damage.~~

Reason: The distinction between metal piping and plastic piping in regards to burial depth is because the plastic piping is more susceptible to damage and needs the increased depth for protection.

The elimination of the section addressing individual outside appliances is because the risks are the same whether the line serves multiple appliances or a single appliance. With similar risks, similar depths should be required.

Committee Action: Approved as Modified

Proposal: G2414.9 (404.9) Minimum burial depth. Underground piping systems shall be installed a minimum depth of 12 inches (305 mm) below grade for metal piping and 18 inches (457mm) for plastic piping, except as provided for in Section G2414.9.1.

IRC-42

Revision to: Section R310.1 Emergency escape and rescue openings

Proponent: Dave Fizzell, City of Prescott

Proposal: Add another sentence at the end of the paragraph to read as follows:

Such openings shall open directly into a public street, public alley, yard or court.

Reason: This is the same language that is in IBC Section 1009.1. Without this requirement the emergency escape and rescue window could open into a carport or enclosed patio.

Committee Action: Approved as submitted.

IRC-43

Revision to: Section E3802.9 Arc-fault circuit interrupters

Proponent: Robert D. Lee, Town of Cave Creek

Proposal: **E3802.9 Arc-fault Protection.** All branch circuits that supply 125-volt, single-phase, 15- and 20-ampere receptacle outlets installed in dwelling unit bedrooms shall be protected by an arc-fault circuit interrupter(s).

Reason: The title of Section E3802 is “GROUND-FAULT AND ARC-FAULT CIRCUIT-INTERRUPTER PROTECTION” but the body of that section does not mention arc-fault protection. Clearly some arc-fault protection was intended. Since Chapter 33 GENERAL REQUIREMENTS states that Chapters 33 through 42 are based on the 1999 *National Electric Code* (NEC) (NFPA 70-1999), the arc-fault requirement was extracted from NEC 210-12 (b).

Committee Action: Approved as submitted.

IRC-44

Revision to: Section P2503.6 Water supply system testing

Proponent: Robert D. Lee, Town of Cave Creek

Proposal: A sentence at the end of this subsection should be added that reads: The test shall maintain such pressure for 15 minutes.

Reason: A specific length of time has been an industry standard practice and 15 minutes would allow sufficient time to determine that there are no leaks.

Committee Action: Approved as submitted.

IRC-45

Revision to: Section P3103.1 Plumbing vent termination

Proponent: Robert D. Lee, Town of Cave Creek

Proposal: P3103.1 Roof Extension. All open vent pipes which extend through a roof shall be terminated at least 6 ~~[number]~~ inches above the roof or 6 ~~[number]~~ inches above the anticipated snow accumulation, except that where a roof is to be used for any purpose other than weather protection, the vent extensions shall be run at least 7 feet (2134 mm) above the roof.

Reason: For the sake of uniformity and continuity, a single number should be used by all jurisdictions. The 6" number comes from Section 906.1 of the 1994 Uniform Plumbing Code and would not constitute a change from the existing rules. The 7 feet above roofs used for other than weather protection comes from Section 906.3 of the 1994 Uniform Plumbing Code and indicates that this section is a logical one from which to select a number.

Committee Action: Approved as submitted.

IRC-46

Revision to: Section R1001.1.2 Spark arrester

Proponent: Dave Fizzell, City of Prescott

Proposal: R1001.1.2 Spark arrester. Where determined necessary by the building official due to local climatic conditions or where sparks escaping from the chimney would create a hazard, and chimneys attached to any appliance or fireplace that burns solid fuel shall be equipped with an approved spark arrester. The net free area of the spark arrester shall not be less than four times the net free area of the outlet of the chimney. The spark arrester screen shall have heat and corrosion resistance equivalent to 0.109-inch (2.77 mm) (No. 12 B.W. gage) wire, 0.042-inch (1.07 mm) (No. 19 B.W. gage) galvanized wire or 0.022-inch (0.56 mm) (No. 24 B.W. gage) stainless steel. Openings shall not permit the passage of spheres having a diameter larger than 1/2 inch (12.7 mm) and shall not block the passage of spheres having a diameter of less than 3/8 inch (9.5 mm).

Chimneys used with fireplaces or having heating appliances in which solid or liquid fuel is used shall be provided with a spark arrester as required in the Fire Code.

EXCEPTION: Chimneys that are located more than 200 feet (60,960 mm) from any mountainous, brush-covered or forest-covered land or land covered with flammable material and that are not attached to a structure having less than a Class C roof covering, as set forth in this code.

Reason: When buildings are located in or near heavily wooded or brushy areas preventing burning embers from escaping the chimney is extremely important. Adding

this language, which is in the Uniform Building Code, will provide the building official with the means to require this equipment.

Committee Action: Tabled for further study.

IRC-47

Revision to: Section 602.3 and Figure R602.3 (2)

Proponent: Robert D. Lee, Town of Cave Creek

Proposal: R602.3.2 Top Plate. Wood stud walls shall be capped with a double top plate installed to provide overlapping at corners and intersections with bearing partitions. End joints in top plates shall be offset at least ~~48~~ 24 inches (~~1219~~ 610 mm).

The exception to remain unchanged.

Reason: IRC Table R602.3 (1), on line ten states, “Double top plates, minimum 48-inch offset of end joints, face nail in lapped areas”. Also, IBC Section 2308.9.2.1 Top Plates states, “End joints in double top plates shall be offset at least 48 inches (1219 mm), and shall be nailed with not less than eight 16d face nails on each side of the joint.” This revision would arrive at consistency within provisions of the IRC and between the IRC and the IBC.

Committee Action: Approved as Modified.

Proposal: Figure R602.3 (2) Framing Details The note in the upper right corner of the page is edited to read “STAGGER JOINTS ~~24~~ ft IN. OR USE SPLICE PLATES—SEE SECTION R602.3.2”.

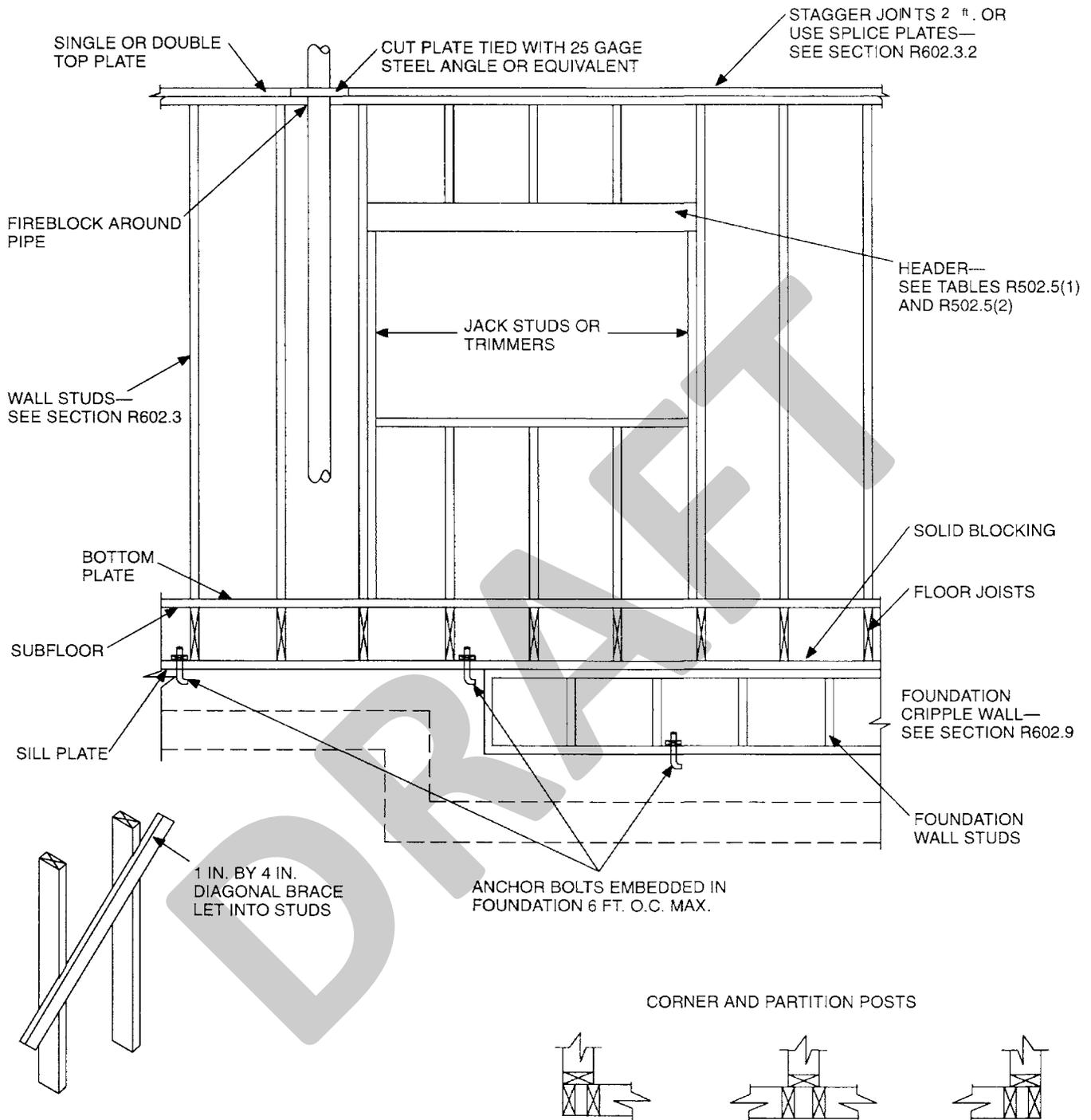
The remainder of the figure is to remain unchanged.

Reason: Section R602.3.2 states, “End joints in top plates shall be offset at least 24 inches (610 mm).” By revising the Figure, the information is consistent with the text of the code.

IRC-48

Revision to: Chapter 35

Proponent: Dave Fizzell, City of Prescott



APPLY APPROVED SHEATHING OR BRACE EXTERIOR WALLS WITH 1 IN. BY 4 IN. BRACES LET INTO STUDS AND PLATES AND EXTENDING FROM BOTTOM PLATE TO TOP PLATE, OR OTHER APPROVED METAL STRAP DEVICES INSTALLED IN ACCORDANCE WITH THE MANUFACTURER'S SPECIFICATIONS. SEE SECTION R602.10.

For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm.

Note: A third stud and/or partition intersection backing studs shall be permitted to be omitted through the use of wood backup cleats, metal drywall clips or other approved devices that will serve as adequate backing for the facing materials.

FIGURE R602.3(2)
FRAMING DETAILS

Proposal: SECTION E3512 FRAMES OF RANGES AND CLOTHES DRYERS

E3512.1 Frames of ranges and clothes dryers. This section shall apply to existing branch-circuit installations only. New branch-circuit installations shall comply with Section E3512.2. Frames of electric ranges, wall-mounted ovens, counter-mounted cooking units, clothes dryers, and outlet or junction boxes that are part of the circuit for these appliances shall be grounded in the manner specified by Section E3512.2; or shall be permitted to be grounded to the grounded circuit conductor if all of the following conditions are met.

(1) The supply circuit is 120/240-volt, single-phase, 3-wire; or 208Y/120-volt derived from a 3-phase, 4-wire wye-connected system.

(2). The grounded conductor is not smaller than No. 10 copper or No. 8 aluminum.

(3) The grounded conductor is insulated, or the grounded conductor is uninsulated and part of a Type SE service-entrance cable and the branch circuit originates at the service equipment.

(4) Grounding contacts of receptacles furnished as part of the equipment are bonded to the equipment.

E3512.2 Cord- and plug-connected equipment. Noncurrent-carrying metal parts of cord- and plug-connected equipment if grounded, shall be grounded by one of the following methods.

(a) By Means of an Equipment Grounding Conductor. By means of an equipment grounding conductor run with the power supply conductors in a cable assembly or flexible cord properly terminated in a grounding-type attachment plug with one fixed grounding contact.

Exception: The grounding contacting pole of grounding-type plug-in ground-fault circuit interrupters shall be permitted to be of the movable, self-restoring type on circuits operating at not over 150 volts between any two conductors, or over 150 volts between any conductor and ground.

(b) By Means of a Separate Flexible Wire or Strap. By means of a separate flexible wire or strap, insulated or bare, protected as well as practicable against physical damage, where part of equipment.

Reason: This language is the same as that in the 1996 NEC. It is felt that this should be included in the IRC to clearly state that it is necessary to separately ground these appliances.

Committee Action: Tabled for further study.

IRC-49**Revision to:** Section N1101.2.1 Residential buildings, Type A-1**Proponent:** Anthony Floyd, City of Scottsdale**Proposal: N1101.2.1 Residential Buildings, Type A-1.** Compliance shall be demonstrated by either:

1. Meeting the requirements of this chapter for buildings with a glazing area that does not exceed 25 ~~45~~ percent of the gross area of the exterior walls; or
2. Meeting the requirements of the *International Energy Conservation Code* for residential buildings, Type a-1.

Reason: Compliance should not differ between single family dwellings and townhomes as there are no substantive differences in the structures.**Committee Action:** Withdrawn by proponent.**IRC-50****Revision to:** Table N1102.1 Insulation values**Proponent:** Anthony Floyd, City of Scottsdale**Proposal:**

CDD	MAXIMUM GLAZING U-FACTOR	MINIMUM INSULATION R-VALUE [(hr·ft ² ·°F)/Btu]					
		Ceilings	Walls	Floors	Basement walls	Slab perimeter R-value and depth	Crawl space walls
0-4,000	Any	R-30	R-19	R-19	R-0	R-0	R-0

The table above is an addition to the table as it appears.

Reason: The table addresses Heating Degree Days and the prescriptive requirements that are needed for cooler climates but neglects those climates where cooling is equally significant.**Committee Action:** Withdrawn by proponent.**IRC-51****Revision to:** Table R602.3 (1) Top plate lap**Proponent:** Robert D. Lee, Town of Cave Creek

Proposal: Table R602.3 (1) FASTENER SCHEDULE FOR STRUCTURAL MEMBERS Under the column entitled “**DESCRIPTION OF BUILDING ELEMENTS**”, change the tenth line to read, “Double top plates, minimum ~~24~~ 48 – inch offset of end joints, face nail in lapped area”. The remainder of the table is to remain unchanged.

Reason: IRC Section R602.32, states, “Wood stud walls shall be capped with a double top plate installed to provide overlapping at corners and intersections with bearing partitions. End joints in top plates shall be offset at least 24 inches (610 mm).” This change brings the Table into agreement with the text of the code.

Committee Action: Approved as submitted.

IRC-52

Revision to: Section R807.1 Attic access

Proponent: Charles M. McKinney, Ranch West Properties, L L C

Proposal: In buildings with combustible ceiling or roof construction, an attic access opening shall be provided to attic areas that exceed 30 square feet (2.8m²) and have a vertical height of 30 inches (762 mm) or greater. The vertical height being defined as the distance from the bottom of the roof-framing member to the top of a platform provided for access and protection of building materials.

Reason: Clarification of when an attic is created is needed on low-sloped roofs.

Committee Action: Withdrawn by proponent.

Structural 1

Revision to: Sections R401.5 & R401.4.2

Proponent: Daryl Young

Proposal: R401.5 ~~Compressible~~ Collapsible or shifting soil. When top or subsoils are ~~compressible~~ collapsible or shifting, such soils shall be removed to a depth and width sufficient to assure stable moisture content in each active zone and shall not be used as fill or stabilized within each active zone by chemical, dewatering, or presaturation.

Reason: The reason for rewording R401.5 is that many soils investigation reports classify bearing soils as compressible and design procedures exist for designing foundations on compressible soils (e.g., PTI Design and Construction of Post Tensioned

Slabs-On-Ground). Thus, it is not necessary for all compressible soils to be removed; rather, it is the decision of the geotechnical engineer as to the best course of action to deal with any compressible soils. Also, it appears that the intent of this section is to avoid construction on unstable, shifting, and/or collapsible soils, such as quicksand, hydro-collapsible soils, landslides, etc.

Committee Action: Approved as modified.

Proposal: Add a new section.

R401.4.2 In lieu of a complete geotechnical evaluation, when top or subsoils are compressible or shifting, such soils shall be removed to a depth and width sufficient to assure stable moisture content in each active zone and shall not be used as fill or nor stabilized within each active zone by chemical, dewatering, or presaturation.

~~**R401.5 Compressible or shifting soil.** When top or subsoils are compressible or shifting, such soils shall be removed to a depth and width sufficient to assure stable moisture content in each active zone and shall not be used as fill or stabilized within each active zone by chemical, dewatering, or presaturation.~~

Structural 3

Revision to: Table R301.4

Proponent: Mark Luther

Proposal: Revise Table by adding footnote “g”:

USE	LIVE LOAD
Attics without storage ^{b, e, g}	10

(No other changes to Table)

g. Live load need not be considered as acting simultaneously with other live loads imposed upon the ceiling framing or its supporting structure.

Reason: For temporary construction and service load, not for the life of the structure. This issue has been addressed in a previous nationally recognized model code: therefore, setting precedence on this issue.

Committee Action: Approved as modified.

Proposal: Revise Table by adding footnote “g”:

USE	LIVE LOAD
Attics without storage ^{b, e, g}	10

(No other changes to Table)

g. For trussed systems, this load need not be considered as acting simultaneously with other live loads imposed upon the ceiling framing or its supporting structure.

2000 International Fuel Gas Code

IFGC-4

Revision to: Section 304.14

Proponent: Robert D. Lee, Town of Cave Creek

Proposal: 304.14 Louvers and grilles. In calculating free area in Sections 304.10, 304.11 and 304.12, the required size of openings for combustions, ventilation and dilution air shall be based on the net free area of each opening. If the free area through a design of louver or grille is known, it shall be used in calculating the size opening required to provide the free area specified. If the design and free area are not known, it shall be assumed that wood louvers will have 20—25 percent free area and metal louvers and grilles will have 60—75 percent free area. Louvers and grilles shall be fixed in the open position.

The exception shall remain unchanged.

Reason: The required size of louvers and grilles is a specific number and the net free area is a specific number for known louvers and grilles. Assuming a range of free areas may lead to confusion and nothing is gained in having a range. The choice of allowing the larger net free area was arbitrary.

Committee Action: Approved as submitted.

Maricopa Association of Governments Building Code Amendments and Standards Manual BCAS #H12	
Title: MAG Building Codes Committee Statement on Ventless Attics	 MARICOPA ASSOCIATION of GOVERNMENTS BCAS Manual Historical Archive
Originally Reviewed by MAG Building Codes Committee: 1/15/2003	
Archived to Historical Section by MAG Building Codes Committee: 5/16/2012	

At the January 15, 2003, Building Codes Committee meeting, the Committee reviewed a statement that allowed for the possibility of a jurisdiction permitting a ventless attic.

At the May 16, 2012 Building Codes Committee meeting, the Committee reviewed the original document. The Committee determined that the original statement is now part of the code. The Committee voted unanimously to move this document to the Historical Archive.

DRAFT

MAG Building Codes Committee Statement on Ventless Attics

January 15, 2003

Due to the climatic conditions in our area and recent research into the field of energy conservation, the Maricopa Association of Governments Building Codes Committee recognizes that there are circumstances and methods that allow the use of ventless attics. This recognition would encourage member jurisdictions to look at those circumstances and those methods with the goal of energy conservation in mind.

Motion passed 15-1.

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Maricopa Association of Governments Building Code Amendments and Standards Manual BCAS #H13	
Title: MAG Standard for Installation of Residential Dryer Vents	 MARICOPA ASSOCIATION of GOVERNMENTS BCAS Manual Historical Archive
Originally Reviewed by MAG Building Codes Committee: 2/19/2004	
Archived to Historical Section by MAG Building Codes Committee: 1/16/2013	

At the February 19, 2004, Building Codes Committee meeting, the Committee reviewed a standard tag that would be required to be affixed near residential clothes dryers.

At the January 16, 2013 Building Codes Committee meeting, the Committee reviewed the original document. The Committee determined that this requirement is part of the 2012 code. The Committee voted unanimously to move this document to the Historical Archive.

DRAFT

MAG Standard for Installation of Residential Dryer Vents February 19, 2004

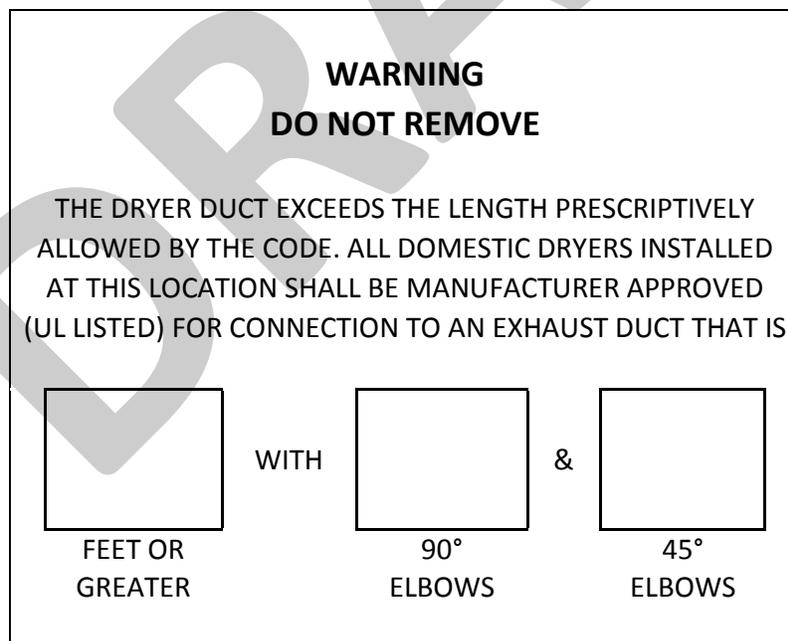
International Residential Code Section M1501.3 Length limitation states:

“The maximum length of a clothes dryer exhaust duct shall not exceed 25 feet (7620 mm) from the dryer location to the wall or roof termination. The maximum length of the duct shall be reduced 2.5 feet (762 mm) for each 45-degree (0.79 rad) bend and 5 feet (1524 mm) for each 90-degree (1.6 rad) bend. The maximum length of the exhaust duct does not include the transition duct.

Exception: Where the make and model of the clothes dryer to be installed is known and the manufacturer’s installation instructions for such dryer are provided to the building official, the maximum length of the exhaust, including any transition duct, shall be permitted to be in accordance with the dryer manufacturer’s installation instructions.”

Since it is not possible to know what dryer make and model will be installed by subsequent building occupants and the intent of the code is to ensure a safe installation, a placard will be required on all installations that do not meet the 25-foot length with reductions.

A durable placard, at least 3 inches vertically and 4 inches horizontally, shall be permanently affixed near the dryer and contain the following message:



Maricopa Association of Governments Building Code Amendments and Standards Manual BCAS #H14	
Title: AZBO Code Review and Development Committee Annual Report 2003	 MARICOPA ASSOCIATION of GOVERNMENTS BCAS Manual Historical Archive
Originally Reviewed by MAG Building Codes Committee: 11/19/2003	
Archived to Historical Section by MAG Building Codes Committee: 6/20/2012	

At the November 19, 2003, Building Codes Committee meeting, the Committee reviewed the AZBO Code Review and Development Committee annual report for 2003.

At the June 20, 2012 Building Codes Committee meeting, the Committee reviewed the original document. The Committee voted unanimously to move this document to the Historical Archive.

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AZBO
CODE REVIEW AND DEVELOPMENT COMMITTEE
ANNUAL REPORT
July 2003
Revised November 2003

DRAFT

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INTRODUCTION LETTER

Imad Eldurubi
Chair - Arizona Building Officials

June 20, 2003

Revised November 12, 2003
Steve Brown
Chair – Arizona Building Officials

Mr. Chair,

The work of the Arizona Building Officials (AZBO) Code Review and Development Committee (CR & D) continues in an ongoing effort to encourage uniformity in the amendments and adoption of the construction codes enforced throughout the State of Arizona.

During the past year, Mr. Bob Lee has been the Chairperson of the AZBO CR & D Committee from August 2002 to March 7 2003. Mr. Bob Lee resigned in March 2003 and announced Vice Chair Autumn Hartsoe as the acting Chairperson of the Committee for the remaining term. Mr. Tom Hedges volunteered to assume the Vice Chair position for the remaining term.

During the past year, the Committee has met approximately every other month in various locations throughout the State to evaluate code change proposals to the International Family of Codes. In addition, the Structural Subcommittee met several times to evaluate specific structural issues of the International Building Code and the International Residential Code. Members of the Structural Subcommittee decided to disband in March of 2003 due to lack of issues being presented to the Committee. The Structural Subcommittee successfully addressed and resolved many structural issues. Meetings for both the full committee and the subcommittee have been open to all stakeholders in the development industry - refer to pages 5-7 for list of participants. Membership on the AZBO CR & D Committee is offered to anyone with an interest in developing the International Family of Codes and all members are permitted to vote.

The AZBO CR & D Committee has continued to follow the established five basic guidelines for reviewing and approving proposed amendments to the Codes. The five basic guidelines are as follows:

- Errors in the printed codes
- Coordination between codes
- Climatic/geographic considerations
- Life and health safety issues
- Local community issues

During the Inception of this committee, committee members were given the directive to remove code change proposals that were not approved by ICC during the code hearing process. The committee requests the AZBO Board of Directors to review and consider approval of a revision to this directive. The committee requests allowance for the AZBO CR & D Committee to reevaluate proposals that have been denied by ICC. The committee will either revise the proposal to

resubmit to ICC, will approve the proposal to remain as a State of Arizona amendment, or will remove the proposal from the committee's subsequent package of amendments.

The members of the AZBO CR & D Committee present two reports to the AZBO Board of Directors with a recommendation of support and approval of these reports. The first report titled *Report of Final Actions*, is a summary of the Committee's work during the past year - refer to pages 13-42. This report lists all submitted code change proposals, along with their current status. The second report titled *2000 ICC Amendments Reformatted to the 2003 ICC Codes*, is a compilation of code change proposals approved by the CR & D Committee during the past three years - refer to pages 43-69. These approved code change proposals have been reformatted to the 2003 ICC Codes to assist jurisdictions and the development community with the adoption process of the 2003 ICC Codes. In addition, the committee reviewed and revised the amendment packet at the October 1, 2003 committee meeting to reflect the results of the September ICC Code Hearings. The committee will meet on January 9, 2004 to review the 2002 amendment packages that currently exist throughout the State. The committee will review and take action on these existing amendment packages to the current AZBO guidelines for approving code change proposals. The committee will provide to the AZBO Board a supplement amendment package of recommended amendments to the 2002 NEC.

Please feel free to contact me at (623) 932-3004 or email at ahartsoe@ci.goodyear.az.us with questions or concerns.

Sincerely,

Autumn Hartsoe
Chairperson - AZBO Code Review and Development Committee
Goodyear, Arizona

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2000-2001 AZBO CODE REVIEW & DEVELOPMENT STRUCTURAL SUBCOMMITTEE

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AZBO Code Change Committee Final Actions Summary

Legend: AS = Approved as Submitted; AM = Approved as Modified; D = Disapproved; WP = Withdrawn by proponent; FS – Further Study.

Item #	Code Section / Subject	Original Committee Action	Az. Only Amd.	Action Date	Committee Action if denied by ICC	Action Date	Notes
IBC 3	101.2 exc 1	AM			Delete	10/1/03	
IBC 4	1604.8.1	AS			Delete	10/1/03	
IBC 5	Table 1607.1	AS	Yes		Az.Only Amd.	10/1/03	
IBC 7	1704.1	AS			Delete	10/1/03	
IBC 9	1805.3.1	AS			Delete	10/1/03	
IBC 10	3109	AS	Yes		Az.Only Amd.	10/1/03	
IBC 12	310.1	AS			Delete	10/1/03	
IBC 14	406.1.4 item1	AM	Yes		Az.Only Amd.	10/1/03	
IBC 15	201.4	AM			Delete	10/1/03	
IBC 17	907.2.10.1.1 907.2.10.1.2	AS			Delete	10/1/03	
IBC 20	Chapter 11	AM	Yes		Az.Only Amd.	10/1/03	

Item #	Code Section / Subject	Original Committee Action	Az. Only Amd.	Action Date	Committee Action if denied by ICC	Action Date	Notes
IBC-22	308.2 et al Adult care homes	AM	Yes	5/2/03			
IBC-22a (Individually submitted to ICC by Tom H. & Forrest F.- Committee to support)	308.2 et al Adult care homes	AS		5/2/03			
IBC-24	507.3 Accessory Occupancy	AS		11/7/03	Resubmit to ICC	11/7/03	
IBC-25	1607.1 Canopy Loads	AS		2/6/03			Included in 2003 IBC
IBC-26	Table 2111.1 Chimney	AM		3/7/03	Delete	10/1/03	
IBC-27	Table 2902.1 Service Sink	AS		11/7/03	Submit to ICC	11/7/03	
IBC-28	1008.2 Egress	AS		2/6/03			Approved As Submitted ICC 9/03
IBC-29	1003.3.1.9 Panic Hardware	AM		2/6/03			Approved As Submitted ICC 9/03
IBC-30	2107.2.1 Half Stress Masonry	WD		3/7/03			
IBC-30a	1704.5.2 Half Stress Masonry	FS		3/7/03			

Item #	Code Section / Subject	Committee Action	Az. Only Amd.	Action Date	Committee Action if denied by ICC	Action Date	Notes
IBC-31	1704.1 Special Inspection	AS		3/7/03	Delete	10/1/03	
IBC-32	1804.2 Presumptive Loads	AS		3/7/03			Approved As Submitted ICC 9/03
IBC-33	1503.4 Roof Drainage	AS	YES	11/7/03			
IRC-1	G2403 Appliances	AS		3/2/01	Delete	10/1/03	
IRC-2	M1307.3 Clothes Dryer	AM		5/4/01	Delete	10/1/03	
IRC-3	Table R301.4 Attic LL	AM	Yes		Az.Only Amd.	10/1/03	
IRC-5	E3603.2	AS			Delete	10/1/03	
IRC-6	R403.1.7.1 Footing Slope	AS			Delete	10/1/03	
IRC-7	R309.1 Garage Door	AM	Yes		Revise & Resubmit to ICC	10/1/03	
IRC-8	R309.2 Table R702.3.4	AS			Delete	10/1/03	
IRC-9	Appendix	AM	Yes		Az Only Amd	10/1/03	
IRC-10	R201.4 Dictionary	AM			Delete	10/1/03	
IRC-11	M1307.6 LPG	AS	Yes		Az Only Amd	10/1/03	
IRC-12	G2406.2 LPG	AM	Yes		Az Only Amd	10/1/03	

Item #	Code Section / Subject	Committee Action	Az. Only Amd.	Action Date	Committee Action if denied by ICC	Action Date	Notes
IRC-13	R305.1 Ceiling height	AM			Delete	10/1/03	
IRC-14	P2710.1 Shower Walls	AM					Included in 2003 IRC
IRC-15	M1703.2 LPG Venting	AM		5/4/01	Delete	10/1/03	
IRC-16	R313.1 Smoke Alarms	AM		4/6/01	Delete	10/1/03	Possibly resubmit to ICC, revising to "Smoke Alarms"
IRC-17	R105.2 Exempt Work	AS		6/1/01	Delete	10/1/03	
IRC-18	R316.2 Guard	AS		6/1/01			Included in 2003 IRC
IRC-19	R313.1.1 Smoke alarm	AS		6/1/01	Delete	10/1/03	
IRC-20	Table R503.2.1.1 (1)	AS		6/1/01			Included in 2003 IRC
IRC-23	R113.3 Notice	AS		6/1/01			Included in 2003 IRC
IRC-27	R320.1 Termite	AM					Approved As Submitted ICC 9/03
IRC-34	Figure R1003.1 Fireplace	AS		6/1/01			Included in 2003 IRC
IRC-35	M1308.3 Mech Equip	AM					Approved As Submitted ICC 9/03
IRC-38	M2006.2 Pool Heater	AS		6/1/01			Included in 2003 IRC
IRC-39	E3801.11 HVAC Outlet	AM			Delete	10/1/03	
IRC-41	G2415.9 Burial Depth	AM	Yes		Az Only Amd	10/1/03	

Item #	Code Section / Subject	Committee Action	Az. Only Amd.	Action Date	Committee Action if denied by ICC	Action Date	Notes
IRC-42	R310.1 Emergency Escape	AS					Approved As Submitted ICC 9/03 – Floor Vote
IRC-43	E3802.9 Arc-Fault	AS					Included in 2003 IRC
IRC-44	P2503.6 Water Supply	AS					Approved As Modified ICC 9/03
IRC-45	P3103.1 Plmg Vent	AS	Yes		Az Only Amd	10/1/03	
IRC-47	Figure R602.3(2) Top Plate	AS					Included in 2003 IRC
IRC-51	Figure R602.3(1) Top Plate	AS					Included in 2003 IRC
IRC-53	R202 Exterior Wall	AM		2/6/03			Revise to ICC RB-21 Similar Amd Approved by ICC 9/03
IRC-54	M1411.3.1 Secondary Drains	AM		2/6/03			Approved As Submitted ICC 9/03
IRC-55	Table R1003.1 Chimney	AM		3/7/03	Revise & Resubmit to ICC	10/1/03	
IRC-56	M1305.1.5 Roof Equipment	AS		3/7/03	Delete	10/1/03	
IRC-57	G2406.2 Prohibited Locations	D		2/6/03			

Item #	Code Section / Subject	Committee Action	Az. Only Amd.	Action Date	Committee Action if denied by ICC	Action Date	Notes
IRC-58	R315.1 Handrails	WP		3/7/03			
IRC-59	P2803.6.1 Req. of Discharge Pipe	AS		3/7/03	Revise & Resubmit to ICC	10/1/03	
IRC- 60	R2404.9	WP		11/7/03			
IFG-1	202 Appliance	AS		3/2/01	Delete	10/1/03	
IFG-2	305.3 Clothes Dryer	AM		5/4/01	Delete	10/1/03	
IFG-3	201.4 Dictionary	AM		4/6/01	Delete	10/1/03	
IMC-1	304.3 Clothes Dryer	AM		5/4/01	Delete	10/1/03	
IMC-3	306.5 Roof Ladder	AS		4/6/01			Included in 2003 IMC
IMC-4	201.4 Dictionary	AM		4/6/01	Delete	10/1/03	
IMC-5	303.3 Prohibited locations	AM		5/4/01	Delete	10/1/03	
IPC-1	101 Appendices	AS	Yes	3/2/01	AZ Only Amd	10/1/03	
IPC-2	201.4 Dictionary	AM		4/6/01	Delete	10/1/03	
IPC-3	312.5	AS		9/6/02			Approved As Modified ICC 9/03

Item #	Code Section / Subject	Committee Action	Az. Only Amd.	Action Date	Committee Action if denied by ICC	Action Date	Notes
IPC-4	504.6.1	AS	Yes	3/7/03	AZ Only Amd	10/1/03	
Structural 1	R401.5 & R401.4.2 Soils	AM					Approved As Submitted ICC 9/03
Structural 2	Table 1607.1 Truss Design	AM			Resubmit to ICC	10/1/03	Challenge to be submitted to ICC – IRC Structural 3 was appr as submitted 9/03
Structural 3	Table R301.5 Truss Design	AM					Approved As Submitted ICC 9/03
Structural 4	1607.11.2	AM			Delete	10/1/03	
Structural 5	1704.5 Special Insp.	AM	Yes		AZ Only Amd	10/1/03	Deleted original Proposal item #5

2003 AZBO to ICC Code Submittals Tracking Summary

AZBO Code Committee #	ICC Submittal to Code & Section #	2003 Code Section #	ICC Code Change #	Comments	Results from 9/03 ICC Code Hearings
IBC 15	IBC, IMC, IPC, IFGC, IRC, IECC, ICCEC, IPSDC, IPMC 201.4	No Change	G17-03/04	2 nd time submitted	Committee, Disapproved
IBC 17	IBC, IFC 907.2.10.1.1 & 907.2.10.1.2	No Change	F117-03/04	2 nd time submitted	Committee, Disapproved
IBC 24	IBC 507.3	No Change	G114-03/04		Committee, Disapproved
IBC 25	IBC Table 1607.1			Already corrected by errata per Alan Carr	
IBC 26	IBC Table 2111.1	No Change	S58-03/04		Committee, Disapproved Already approved in code
IBC 28	IBC 1008.2	1024.3	E105-03/04	Section #s revised to 2003 by ICC	Committee, approved as submitted
IBC 29	IBC 1003.3.1.9	1008.1.9	E32-03/04		Committee, Disapproved
IBC 31	IBC 1704.1 Exception 3	No Change	S33-03/04		Committee, Disapproved Needs proposal for Amd. to Chap. 21 (1/2 stress masonry)
IBC 32	IBC 1804.2	No Change	S48-03/04		Committee, approved as submitted
IFGC 4	IFGC 304.14			Per Greg Gress, Change already occurred in 2003 to Section 304.10	
IMC 1	IMC 304.3	No Change	M6-03/04	2 nd time submitted	Committee, Disapproved Items 1 & 2
IPC 3	IPC 312.5	No Change	P9-03/04		Committee, approved as modified Items 1 & 2
IPC 4	IPC 504.6.1	No Change	P46-03/04		Committee, Disapproved Items 1 & 2
IRC 1	IRC G2403	No Change		Proposal withdrawn 7/21/03	Committee, Disapproved Items 1 & 2
IRC 2	IRC M1307.3	No Change	M6-03/04	2 nd time submitted	Committee, Disapproved Items 1 & 2
IRC 17	IRC R105.2	No Change	RB6-03/04	2 nd time submitted	Committee, Disapproved

AZBO Code Committee #	ICC Submittal to Code & Section #	2003 Code Section #	ICC Code Change #	Comments	Results from 9/03 ICC Code Hearings
IRC 27	IRC R324.1	R320.1	RB109-03/04	2 nd time submitted, Errata per Larry Frank & will announce @ hearing keep last sentence of proposal & delete last 2 sentences of reason	Committee, approved as submitted
IRC 35	IRC M1308.2	M1403.2	RM19-03/04	2 nd time submitted, not included in original monograph, will be in Code Change Website errata	Committee, approved as submitted
IRC 39	IRC E3801.11			Per Larry Franks, ICC, will need to be submitted through NFPA - Proposal withdrawn	
IRC 42	IRC R310.1	No Change	RB69-03/04	2 nd time submitted	Floor vote, approved as submitted
IRC 43	IRC E3802.9			Change already occurred in 2003 - Section 3802.11	
IRC 44	IRC P2503.6	No Change	P9-03/04	2 nd time submitted	Committee, approved as modified Items 1 & 2
IRC 45	IRC P3103.1	No Change	RP27-03/04	2 nd time submitted Minor revision to proposal by ICC	Committee, Disapproved
IRC 47	IRC Figure R602.3(2)			Per Larry Franks, ICC, corrected by errata	
IRC 51	IRC Table R602.3(1)			Per Larry Franks, ICC, corrected by errata	
IRC 53	IRC R202	No Change	RB22-03/04	ICC will revise reason	Committee, Disapproved
IRC 54	IRC M1411.3.1	No Change	RM4-03/04		Committee, approved as submitted
IRC 55	IRC Table 1003.1	No Change	RB260-03/04	Per Larry Simpson, corrected by errata for vertical & horizontal reinforcing & bond beam. All other proposals to Table will be processed	Committee, Disapproved
IRC 56	IRC M1305.1.5 & M1305.1.5.1	No Change	RM2-03/04		Committee, Disapproved
AZBO Code Committee #	ICC Submittal to Code & Section #	2003 Code Section #	ICC Code Change #	Comments	Results from 9/03 ICC Code Hearings

IRC 59	IRC P2803.6.1	No Change	P46-03/04		Committee, Disapproved Items 1 & 2
Structural 1	IRC R401.5	R401.4.2	RB123-03/04		Committee, approved as submitted
Structural 2	IBC 1607.1	No Change	S13-03/04		Committee, Disapproved
Structural 3	IRC Table R301.4	R301.5	S13-03/04		Committee, approved as submitted
Structural 4	IBC 1607.11.2.1	No Change	S15-03/04	Rewritten as exception to formula per advice from Alan Carr - 9/2/03 will w/drawl proposal @ hearings due to analysis from ICC (o.k. w/ original proponent)	Committee, Disapproved
Structural 5	IBC 1704.5	No Change	S36-03/04		Committee, Disapproved

DRAFT

AZBO CODE REVIEW AND DEVELOPMENT COMMITTEE

REPORT of FINAL ACTIONS

DRAFT

**AZBO Code Review and Development Committee
Report of Final Actions**

IBC-22

Revision to: Sections 308.2,308.3, 310.1,310.2, (new) 419, 309.2.9, 1003.3.1.2, 1003.3.1.8.2

Proponent: Forrest Fielder - City of Surprise, Tom Hedges - Stantec

308.2 Group I-1. This occupancy shall include buildings, structures or parts thereof housing more than 10 persons, on a 24-hour basis, who because of age, mental disability or other reasons, live in a residential environment that provides supervisory care services. The occupants are capable of responding to an emergency situation without physical assistance from staff. This group shall include, but not be limited to, the following:

- Residential board and care facilities
- Assisted living centers
- Halfway houses
- Group homes
- Congregate care facilities
- Social rehabilitation facilities
- Alcohol and drug abuse centers
- Convalescent facilities

A facility such as the above with 10 or fewer persons shall be classified as a Group R-4 Condition 1 or shall comply with the *International Residential Code* in accordance with Section 101.2 where the building is in compliance with Section 419 of this code.

308.3 Group I-2. This occupancy shall include buildings and structures used for medical, surgical, psychiatric, nursing, custodial, personal, or directed care on a 24-hour basis of more than five persons who are not capable of self-preservation by responding to an emergency situation without physical assistance from staff. This group shall include, but not be limited to, the following:

- Hospitals
- Nursing homes (both intermediate-care facilities and skilled nursing facilities)
- Mental hospitals
- Detoxification facilities

A facility such as the above with five or fewer persons shall be classified as Group R-3 or shall comply with the *International Residential Code* in accordance with Section 101.2.

This occupancy shall also include buildings and structures used for assisted living homes providing supervisory, personal, or directed care on a 24-hr basis of more than 10 persons who are not capable of self-preservation by responding to an emergency situation without physical assistance from staff. A facility such as the above with ten or fewer persons shall be classified as R-4 Condition 2.

310.1...R-4 Residential occupancies shall include buildings arranged for occupancy as residential care/assisted living homes including not more than 10 occupants, excluding staff.

310.1.1 Condition 1. This occupancy condition shall include facilities licensed to provide supervisory care services, in which occupants are capable of self preservation by responding to an emergency situation without physical assistance from staff. Condition 1 facilities housing more than 10 persons shall be classified as a Group I-1.

310.1.2 Condition 2. This occupancy condition shall include facilities licensed to provide personal or directed care services, in which occupants are incapable of self preservation by responding to an emergency without physical assistance from staff. Condition 2 facilities housing more than 10 persons shall be classified as Group I-2.

R-4 occupancies shall meet the requirements for construction as defined in Group R-3 except as otherwise provided for in this code, and Section 419 or shall comply with the International Residential Code in accordance with section 101.2 where the building is in compliance with Section 419 of this code

310.2 Definitions

PERSONAL CARE SERVICE. Assistance with activities of daily living that can be performed by persons without professional skills or professional training and includes the coordination or provision of intermittent nursing services and the administration of medications and treatments.

DIRECTED CARE SERVICE. Care of residents, including personal care services, who are incapable of recognizing danger, summoning assistance, expressing need, or making basic care decisions.

SUPERVISORY CARE SERVICE. General supervision, including daily awareness of resident functioning and continuing needs.

RESIDENTIAL CARE/ASSISTED LIVING HOME. A building or part thereof housing a maximum of 10 persons, excluding staff, on a 24-hour basis, who because of age, mental disability or other reasons, live in a supervised residential environment which provides supervisory, personal, or directed services. This classification shall include, but not be limited to, the following: residential board and care facilities, assisted living homes, halfway houses, group homes, congregate care facilities, social rehabilitation facilities, alcohol and drug abuse centers and convalescent facilities.

419 RESIDENTIAL CARE/ASSISTED LIVING HOMES

419.1 Applicability. The provisions of this section shall apply to a building or part thereof housing not more than 10 persons, excluding staff, on a 24-hour basis, who because of age, mental disability or other reasons, live in a supervised residential environment which provides licensed care services. Except as specifically required by this division, R-4 occupancies shall meet all applicable provisions of Group R-3.

419.2 General. Buildings or portions of buildings classified as R-4 occupancies shall meet all the applicable provisions of Group R-3, may be constructed of any materials allowed by this code, shall not exceed two stories in height nor be located above the second story in any building, and shall not exceed 2000 square feet above the first story except as provided in Section 506.

419.3 Special Provisions. R-4 occupancies having more than 2000 square feet of floor area above the first floor shall be of not less than one-hour fire-resistive construction throughout.

419.3.1 Mixed Uses. R-4 occupancies shall be separated from other uses as provided in Table 302.3.2.

419.4 Access and Means of Egress Facilities.

419.4.1 Accessibility. R-4 occupancies shall be provided with at least one accessible route per the Arizonaans with disabilities act. Sleeping rooms and associated toilets shall be accessible.

Exception: Existing buildings shall comply with Section 3409. Bathing and toilet facilities need not be made accessible, but shall be provided with grab bars in accordance with ICC/ANSI A 117.1.

419.4.2 Exits

419.4.2.1 Number of Exits. Every story, basement, or portion thereof shall have not less than two exits.

Exception: Basements and stories above the first floor containing no sleeping rooms may have one means of egress as provided in Chapter 10.

419.4.2.2 Distance to Exits. The maximum travel distance shall comply with Section 1004, except that the maximum travel distance from the center point of any sleeping room to an exit shall not exceed 75 feet.

419.4.2.3 Emergency Exit Illumination. In the event of a power failure, exit illumination shall be automatically provided from an emergency system powered by storage batteries or an onsite generator set installed in accordance with the ICC Electric Code.

419.4.2.4 Emergency Escape and Rescue. R-4 occupancies shall comply with the requirements of Section 1025, except that Exception 1 to Section 1025.1 does not apply to R-4 occupancies.

419.4.2.5 Delayed egress locks. In R-4 Condition 2 occupancies, delayed egress locks shall be permitted in accordance with Sections 1008.1.3.4 and 1008.1.8.6, items 1, 2, 4, 5 and 6.

419.5 Smoke Detectors and Sprinkler Systems

419.5.1 Smoke Alarms. All habitable rooms and hallways in R-4 occupancies shall be provided with smoke alarms installed in accordance with Section 907.2.10.

419.5.2 Sprinkler Systems. R-4 occupancies shall be provided with a sprinkler system installed in accordance with Section 903.2.9. Sprinkler systems installed under this Section shall be installed throughout, including attached garages, and in Condition 2 facilities shall include attics and concealed spaces of or containing combustible materials. Such systems may not contain unsupervised valves between the domestic water riser control valve and the sprinklers. In R-4 Condition 2 occupancies, such systems shall contain water-flow switches electrically supervised by an approved supervising station, and shall sound an audible signal at a constantly attended location.

1008.1.2 Door swing. Egress doors shall be side-hinged swinging.

Exceptions:

1. Private garages, office areas, factory and storage areas with an occupant load of 10 or less.
2. Group I-3 occupancies used as a place of detention.
3. Doors within or serving a single dwelling unit in Groups R-2, and R-3 as applicable in Section 101.2, and R-4.
4. (no other changes)

Reason: The purpose of this amendment is to bring the provisions of the code into agreement with the licensing rules of the Arizona Department of Health Services. DHS license categories have a threshold of 10 residents to move from a residential home setting to an institutional setting. DHS rules (R9-10-701) state, "Assisted living home" or "home" means an assisted living facility that provides resident rooms to (10) or fewer residents, as distinct from an "assisted living center", which provides services to more than (10) persons. In addition, the license classifications to provide "personal care services" and "directed care services" to residents allow for residents to be bed-bound. The use of "Condition" distinctions is reflective of similar distinctions in I-occupancies.

Each state has unique agency programs for assisted living occupancies, which establish license categories based on numbers of residents and the familiar ambulatory/non-ambulatory distinction. Uniformity could be accomplished by either trusting health service agencies nationally to agree to uniform thresholds and other licensing characteristics, or by amending building codes to allow each state to adapt to that state's unique rules. If numerical thresholds are provided on a "fill in the blanks" basis, condition categories can be added or deleted, and definitions can be customized to match licensure definitions, the hazards associated with these facilities can be addressed comprehensively on a state-by-state basis.

The most hazardous scenario is a facility in an ordinary, un-rated residential structure, occupied by (10) bed-bound residents, supervised by a single caregiver. Provisions for exiting, smoke detectors, emergency illumination, sprinklers, et al, can substantially increase the chances of survival in a fire or other emergency for these residents.

IBC-1-01 Reason: To bring the Building Code into agreement with Arizona Administrative Code, Title 9 Health Services, Article 7 Assisted Living Facilities. R9-10-701 states, “Assisted living home” or “home” means an assisted living facility that provides resident rooms to ten or fewer residents.’ An “Assisted living center” (rooms or residential units for eleven or more residents) is required to have “an individually keyed entry door” and “a kitchen area” by R9-10-720. Since the distinction for the state is between ten and eleven residents, it is felt that the Building Code should reflect the same distinction.

See [http://www.sosaz.com/public_services/Title 09/9-10.htm](http://www.sosaz.com/public_services/Title_09/9-10.htm) for the entire rule.

It is felt that the word “abuse” was inadvertently omitted for the definition of Group I-1 Occupancy.

Cost Impact: Slight

Committee Action: Approved as Submitted

IBC-24

Revise 507.2 & 507.3

Proponent: Tom Hedges, Stantec

Revise as follows:

507.2 Sprinklered, one story. The area of a one-story, Group B, F, M or S building or a one-story Group A-4 building of other than Type V construction shall not be limited when the building is provided with an automatic sprinkler system throughout in accordance with Section 903.3.1.1, and is surrounded and adjoined by public ways or yards not less than 60 feet (18 288 mm) in width.

Exceptions:

1. (No change)
2. (No change)

Such buildings may contain other occupancies, without H fire areas, provided that such occupancies do not occupy more than 10 percent of the area of any floor of a building, nor more than the tabular values permitted in the occupancy by Table 503 for such occupancy.

Exception: Group H fire areas as permitted by Section 507.6.

507.3 Two story. The area of a two-story, Group B, F, M or S building shall not be limited when the building is provided with an automatic sprinkler system in accordance with Section 903.3.1.1 throughout, and is surrounded and adjoined by public ways or yards not less than 60 feet (18 288 mm) in width.

Such buildings may contain other occupancies, without H fire areas, provided that such occupancies do not occupy more than 10 percent of the area of any floor of a building, nor more than the tabular values permitted in the occupancy by Table 503 for such occupancy.

Exception: Group H fire areas as permitted by Section 507.6.

Reason: The purpose of this proposal is to expand minor uses that would be permitted in an unlimited area building constructed in compliance with Sections 507.2 and 507.3. The current text is overly restrictive. As written, these buildings would not be allowed to contain separate tenants such as daycare, dance school, out-patient surgical center, restaurants, etc.. These would be considered different occupancies and no text exists to permit such uses in an unlimited area building of B, F, M or S occupancies.

It makes little sense to restrict other occupancies, while allowing an A-4, certain H's or motion picture theaters to be in unlimited area buildings.

This change will allow other use groups to be located in an unlimited area building of B, F, M or S uses as long as the aggregate area of the occupancies do not exceed 10% of the floor area of the main occupancy and further that the aggregate area of such occupancy does not exceed the tabular area permitted in Table 503.

Communications and interpretations from ICC staff in ICBO and Boca offices have confirmed there is a need for a change to allow these minor occupancies in an unlimited area building. This provision is in at least one other national code.

This change should provide a reduction in costs.

Cost Impact: None

Committee Action: Approved as Submitted

IBC-25

Revision to: Table 1607.1

Proponent: Edward J. Courtney, Pima County

Proposal: Revise Item 24 of Table 1607.1

**Table 1607.1 MINIMUM UNIFORMLY DISTRIBUTED LIVE LOADS
AND MINIMUM CONCENTRATED LIVE LOADS**

OCCUPANY OR USE	UNIFORM (psf)	CONCENTRATED (lbs.)
24. Marquees and canopies	75	---

Reason:

Canopy live load is already covered in IBC Section 1607.2.4,

"1607.11.2.4 Awnings and canopies. Awnings and canopies shall be designed for a uniform live load of 5 pounds per square foot (0.240 kN/m²) as well as for snow loads and wind loads as specified in Sections 1608 and 1609."

Cost Impact: None

Committee Action: Approved as Submitted

IBC-26

Revision to: Table 2111.1

Proponent: Autumn Hartsoe, City of Goodyear

Proposal: Revise Table as follows:

TABLE 2111.1

ITEM	LETTER	REQUIREMENTS	SECTION
Hearth and hearth extension thickness	A	4-inch minimum thickness for hearth, 2-inch minimum thickness for hearth extension.	2111.9
Hearth extension (each side of opening)	B	8 inches for fireplace opening less than 6 square feet. 12 inches for fireplace opening greater than or equal to 6 square feet.	2111.10
Hearth extension (front of opening)	C	16 inches for fireplace opening less than 6 square feet. 20 inches for fireplace opening greater than or equal to 6 square feet.	2111.10
Firebox dimensions	D	20-inch minimum firebox depth. 12-inch minimum firebox depth for Rumford fireplaces.	2111.11

Hearth and hearth extension reinforcing	D	Reinforced to carry its own weight and all imposed loads	2111.9
Thickness of wall of firebox	E	10 inches solid masonry or 8 inches where firebrick lining is used.	2111.5
Distance from top of opening to throat.	F	8 inches minimum.	2111.7
Smoke chamber wall thickness dimensions	G	6 inches lined; 8 inches unlined. Not taller than opening width; walls not inclined more than 45 degrees from vertical for prefabricated smoke chamber linings or 30 degrees from vertical for corbelled masonry.	2111.8
Chimney vertical reinforcing ^b	H	Four No. 4 full-length bars for chimney up to 40 inches wide. Add two No. 4 bars for each additional 40 inches or fraction of width, or for each additional flue.	2111.3.1, 2113.3.1
Chimney horizontal reinforcing ^b	J	1/4-inch ties at each 18 inches, and two ties at each bend in vertical steel.	2111.3.2, 2113.3.2
Fireplace lintel	L	Noncombustible material with 4-inch bearing length of each side of opening.	2111.7
Chimney walls with flue lining	M	4-inch-thick solid masonry with 5/8-inch fireclay liner or equivalent. 1/2-inch grout or airspace between fireclay liner and wall	2113.10, 2113.11, 2113.12
Effective flue area (based on area of fireplace opening and chimney)	P	See Section 2113.16.	2113.16
Clearances From chimney From fireplace Combustible trim or materials Above roof	R	2 inches interior, 1 inch exterior 2 inches back or sides 6 inches from opening 3 feet above roof penetration, 2 feet above part of structure within 10 feet.	2113.19 2111.12 2111.13 2113.9
Anchorage ^b Strap Number Embedment into chimney Fasten to Bolts	S	3/16 inch by 1 inch Two 12 inches hooked around outer bar with 6-inch extension. 4 joists Two 1/2-inch diameter.	2111.4 2113.4.1
Footing Thickness Width	T	12-inch minimum. 6 inches each side of fireplace wall.	2111.2

For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm, 1 square foot = 0.0929 m².

- This table provides a summary of major requirements for the construction of masonry chimneys and fireplaces. Letter references are to Figure 2111.1, which shows examples of typical construction. This table does not cover all requirements, nor does it cover all aspects of the indicated requirements. For the actual mandatory requirements of the code, see the indicated section of text.
- Not required in Seismic Design Category A,B, or C.

Reason: Also adding footnote "b" for clarification on seismic reinforcing of masonry or concrete fireplaces in accordance with IBC Section 2111.3

Cost Impact: None

Committee Action: Approved as Modified

TABLE 2111.1^a

ITEM	LETTER	REQUIREMENTS	SECTION
Hearth and hearth extension thickness	A	4-inch minimum thickness for hearth, 2-inch minimum thickness for hearth extension.	2111.9

Hearth extension (each side of opening)	B	8 inches for fireplace opening less than 6 square feet. 12 inches for fireplace opening greater than or equal to 6 square feet.	2111.10
Hearth extension (front of opening)	C	16 inches for fireplace opening less than 6 square feet. 20 inches for fireplace opening greater than or equal to 6 square feet.	2111.10
Firebox dimensions	D	20-inch minimum firebox depth. 12-inch minimum firebox depth for Rumford fireplaces.	2111.11
Hearth and hearth extension reinforcing	D	Reinforced to carry its own weight and all imposed loads	2111.9
Thickness of wall of firebox	E	10 inches solid masonry or 8 inches where firebrick lining is used.	2111.5
Distance from top of opening to throat.	F	8 inches minimum.	2111.7
Smoke chamber wall thickness dimensions	G	6 inches lined; 8 inches unlined. Not taller than opening width; walls not inclined more than 45 degrees from vertical for prefabricated smoke chamber linings or 30 degrees from vertical for corbelled masonry.	2111.8
Chimney vertical reinforcing ^b	H	Four No. 4 full-length bars for chimney up to 40 inches wide. Add two No. 4 bars for each additional 40 inches or fraction of width, or for each additional flue.	2111.3.1, 2113.3.1
Chimney horizontal reinforcing ^b	J	1/4-inch ties at each 18 inches, and two ties at each bend in vertical steel.	2111.3.2, 2113.3.2
Fireplace lintel	L	Noncombustible material with 4-inch bearing length of each side of opening.	2111.7
Chimney walls with flue lining	M	4-inch-thick solid masonry with 5/8-inch fireclay liner or equivalent. 1/2-inch grout or airspace between fireclay liner and wall	2113.10, 2113.11, 2113.12
Effective flue area (based on area of fireplace opening and chimney)	P	See Section 2113.16.	2113.16
Clearances From chimney From fireplace Combustible trim or materials Above roof	R	2 inches interior, 1 inch exterior 2 inches back or sides 6 inches from opening 3 feet above roof penetration, 2 feet above part of structure within 10 feet.	2113.19 2111.12 2111.13 2113.9
Anchorage ^b Strap Number Embedment into chimney Fasten to Bolts	S	3/16 inch by 1 inch Two 12 inches hooked around outer bar with 6-inch extension. 4 joists Two 1/2-inch diameter.	2111.4 2113.4.1
Footing Thickness Width	T	12-inch minimum. 6 inches each side of fireplace wall.	2111.2

For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm, 1 square foot = 0.0929 m².

- c. This table provides a summary of major requirements for the construction of masonry chimneys and fireplaces. Letter references are to Figure 2111.1, which shows examples of typical construction. This table does not cover all requirements, nor does it cover all aspects of the indicated requirements. For the actual mandatory requirements of the code, see the indicated section of text.
- d. Not required in Seismic Design Category A,B, or C.

Reason: This proposal will create uniformity and will delete conflicts between IBC Table 2111.1 and IRC Table R1003.1 Also adding footnote "b" for clarification on seismic reinforcing of masonry or concrete fireplaces in accordance with IBC Section 2111.3

IBC-27

Revision to: Table 2902.1

Proponent: Autumn Hartsoe, City of Goodyear

Proposal: Revise Table as follows:

Revise Items 2 and 6 of table (remainder of table unchanged):

**TABLE 2902.1
MINIMUM NUMBER OF REQUIRED PLUMBING FACILITIES^a**

No.	CLASSIFICATION	USE GROUP	DESCRIPTION	WATER CLOSETS (SEE SECTION 419.2 OF THE INTERNATIONAL PLUMBING CODE FOR URINALS)		LAVATORIES		BATHTUBS OR SHOWERS	DRINKING FOUNTAINS (SEE SECTION 410.1 OF THE INTERNATIONAL PLUMBING CODE)	OTHER
				MALE	FEMALE	MALE	FEMALE			
2	Business (see Sections 2902.2, 2902.4, 2902.4.1 and 2902.6)	B	Buildings for the transaction of business, professional services, other services involving merchandise, office buildings, banks, light industrial and similar uses	1 per 25 for the first 50 and 1 per 50 for the remainder exceeding 50		1 per 40 for the first 50 and 1 per 80 for the remainder exceeding 50		—	1 per 100	1 service sink
6	Mercantile (see Section 2902.2, 2902.5 and 2902.6)	M	Retail stores, service stations, shops, salesrooms, markets and shopping centers	1 per 500		1 per 750		—	1 per 1,000	1 service sink

REASON: The current requirement for 1 service sink for mercantile and business occupancies is not necessary due to the nature of the occupancy. The majority of business and mercantile occupancies do not warrant the need to clean up spills that often occur in other occupancies. The requirement for a service sink often becomes overly restrictive to small tenant spaces. This revision will not apply if another governing agency, such as The State Health Department, requires a service sink.

Cost Impact: None

Committee Action: Approved as Submitted

IBC-28**Revision to: Section 1008.2****Proponent:** Tom Hedges, Stantec**Proposal:** Revise as follows:

1008.2 Assembly other exits. In addition to having access to a main exit, each level of an occupancy in Group A having an occupant load of greater than three hundred shall be provided with additional ~~exits~~ means of egress that shall provide an egress capacity for at least one-half of the total occupant load served by that level and comply with Section 1004.2.2.

Reason: The IBC defines 'exit' in 1006 as being exterior doors, vertical exit enclosure, smokeproof enclosure, exit passageway and horizontal exits. ICC staff has interpreted that this section does not mean each 'additional exit' is required to comply solely with Section 1006. But that the code intends that assembly rooms may also be served by exit-access elements. If this interpretation is correct, then the Code should reflect the correct intent. By changing the word 'exit' to 'means of egress' clarifies the purported intent correctly.

Cost Impact: None, may lower.**Committee Action:** Approved as Submitted**IBC-29****Revision to: Section 1003.3.1.9****Proponent:** Tom Hedges, Stantec**Proposal:** Revise as follows:

1003.3.1.9 Panic and fire exit hardware. Where panic and fire exit hardware is installed, it shall comply with the following:

1. The actuating portion of the releasing device shall extend at least one-half of the door leaf width.
2. A maximum unlatching force of 15 pounds (67 N).

Each door in a means of egress from an occupancy of Group A or E having an occupant load of 100 or more and any occupancy of Group H-1, H-2, H-3 or H-5 shall not be provided with a latch or lock unless it is panic hardware or fire exit hardware.

Exception. A main exit, of a Group A use, in compliance with Section 1003.3.1.8
Exception 2.

If balanced doors are used and panic hardware is required, the panic hardware shall be of the push-pad type and the pad shall not extend more than one-half the width of the door measured from the latch side.

Reason: Current text is overly restrictive. As written, these occupancies can not contain a lunch room if the occupant load is 51 persons as this would be an A-2 Occupancy and no text exists to permit such use in an unlimited area building of B, F, M or S uses.

The IBC has a conflict between Section 1003.3.1.8, Exception 2 and the second paragraph of Section 1003.3.1.9. Section 1003.3.1.9 requires panic hardware on all egress doors serving a Group A having an occupant load of 100 or more. However, Section 1003.3.1.8, Exception 2 permits the use of key operated locking devices on the egress side of the main exit door where the occupant load is 300 or less. In applying conflict resolution from Section 102.1, it is difficult to determine which of these sections is a general requirement and which is a specific requirement nor can you readily determine which is the more restrictive. By adding this exception to the second paragraph of Section 1003.3.1.9 the code will be consistent interpretations found in the 2000 IBC Q & A Application Guideline.

Reason: The IBC has a conflict between Section 1003.3.1.8, Exception 2 and the second paragraph of Section 1003.3.1.9. Section 1003.3.1.9 requires panic hardware on all egress doors serving a Group A having an occupant load of 100 or more. However, Section 1003.3.1.8, Exception 2 permits the use of key operated locking devices on the egress side of the main exit door where the occupant load is 300 or less. In applying conflict resolution from Section 102.1, it is difficult to determine which of these sections is a general requirement and which is a specific requirement nor can you readily determine which is the more restrictive. By adding this exception to the second paragraph of Section 1003.3.1.9 the code will be consistent with interpretations found in the 2000 IBC Q & A Application Guideline.

Cost Impact: None

Committee Action: Approved as Modified

IBC-30

Revision to: Section 2107.2.1

Proponent: Steven Hess, Caruso Turley Scott, Inc.

Proposal: Revise as follows:

Committee Action: Approved as Modified

1003.3.1.9 Panic and fire exit hardware. Where panic and fire exit hardware is installed, it shall comply with the following:

1. The actuating portion of the releasing device shall extend at least one-half of the door leaf width.
2. A maximum unlatching force of 15 pounds (67 N).

Each door in a means of egress from an occupancy of Group A or E having an occupant load of 100 or more and any occupancy of Group H-1, H-2, H-3 or H-5 shall not be provided with a latch or lock unless it is panic hardware or fire exit hardware.

Exception. A main exit, of a Group A use, in compliance with Section 1003.3.1.8 Exception 2.

If balanced doors are used and panic hardware is required, the panic hardware shall be of the push-pad type and the pad shall not extend more than one-half the width of the door measured from the latch side.

2107.2.1 ACI 530/ASCE 5/TMS 402, Chapter 2. Special inspection during construction shall be provided as set forth in Section 1704.5. Special inspection will not be required when one-half allowable masonry stresses are used with the value of $f'm$ limited to a maximum of 1500 psi for concrete or clay masonry for the following criteria.

1. The maximum height to width (nominal) ratio of a building wall is limited to 20.
2. The maximum soil retainage for a retaining wall is 5'-0" from the top of footing for an 8 inch wall or 7'-0" for a 12 inch wall.
3. The maximum height to width ratio of 10 for a cantilevered fence or combination fence and retaining wall as determined from the top of footing to the top of wall.

Committee Action: Withdrawn by Proponent

IBC-30a**Revision to: Section 1704.5.2****Proponent:** Steven Hess, Caruso Turley Scott, Inc.**Proposal:** Revise as follows:

1704.5.2 Exception: When quality assurance provisions do not include requirements for special inspection as prescribed in Section 1704.5, the allowable stresses for masonry in Section 2107 shall be reduced by one half. The following limitations shall apply to this exception.

4. The maximum unsupported height (or length) to width (nominal) ratio of a building wall is limited to 20.
5. The maximum soil retaining for a retaining wall is 4'-0" from the top of footing for an 8 inch wall or 6'-0" for a 12 inch wall.
6. The maximum height to width ratio of 10 for a cantilevered fence or combination fence and retaining wall as determined from the top of footing to the top of wall.

Reason: Historically, one-half stresses in masonry has been allowed for years in the UBC. This proposal will again allow it in low profile buildings, short retaining walls, and fences thus eliminating the added burden and expense of special inspections.

Cost Impact: None, may lower**Committee Action:** Further Study**IBC-31****Revision to: Section 1704.1****Proponent:** Edward J. Courtney, Pima County**Proposal:** Revise 1704.1 Exception 3 as follows:

3. ~~Unless otherwise required~~ When permitted by the building official, special inspections are not required for occupancies in Group R-3 as applicable in Section 101.2 and occupancies in Group U that are accessory to a residential occupancy including, but not limited to, those listed in Section 312.1. Masonry construction exempt from special inspection by this Section shall be designed at 1/2 stress.

Reason: The term "Unless otherwise required" assume that special inspections will not be routinely performed on residences and garages. In order for a special inspection to be performed, the building official must be proactive and place the requirement for a special inspection on the builder. In past times, with the relative lack of sophistication in residential construction, this approach may have been acceptable.

Today's higher level of specialized materials and construction techniques require the use of special inspections in many circumstances that include post-tensioned slabs, epoxied connectors, grout lifts in excess of code maximums and even structural steel welding. These materials and activities are not an aberration or unusual occurrences any longer.

Rather than put the building official in the proactive position of requiring special inspections in many circumstances, this change would recognize that these technically sophisticated materials and techniques are used and do require the services of a special inspector even in residential buildings. This change will still allow discretion by the building official to exempt the requirement for special inspection on a case-by-case basis.

Cost Impact: None, may lower**Committee Action:** Approved as Submitted

IBC-32

Revision to: Section 1804.2

Proponent: Edward J. Courtney, Pima County

Proposal: Revise 1704.1 Exception 3 as follows:

1804.2 Presumptive load-bearing values. The maximum allowable foundation pressure, lateral pressure or lateral sliding resistance values for supporting soils ~~at or~~ near the surface shall not exceed the values specified in Table 1804.2 unless data to substantiate the use of a higher value are submitted and approved.

Presumptive load-bearing values shall apply to materials with similar physical characteristics and dispositions.

Mud, organic silt, organic clays, peat or unprepared fill shall not be assumed to have a presumptive load bearing capacity unless data to substantiate the use of such a value are submitted.

EXCEPTION: A presumptive load-bearing capacity is permitted to be used where the building official deems the load-bearing capacity of mud, organic silt or unprepared fill is adequate for the support of lightweight and temporary structures.

Reason: The wording at or near the surface would lead one to believe that the soil bearing values of Table 1804.2 may be applied at the ground surface. Where as Section 1805.2 states as follows:

1805.2 Depth of footings. The minimum depth of footings below the undisturbed ground surface shall be 12 inches (305 mm). Where applicable, the depth of footings shall also conform to Sections 1805.2.1 through 1805.2.3.

Cost Impact: None

Committee Action: Approved as Submitted

IBC-33

Revise Section 1503.4

Proponent: Tom Hedges, Stantec

[P] 1503.4 Roof drainage. Design and installation of roof drainage systems shall comply with Section 1503.4 and the *International Plumbing Code*.

1503.4.1 Gutters. Gutters and leaders placed on the outside of buildings, other than Group R-3 as applicable in Section 101.2, private garages and buildings of Type V construction, shall be of noncombustible material or a minimum of Schedule 40 plastic pipe.

1503.4.2 Where required. All roofs, paved areas, yards, courts and courtyards shall drain into a separate storm sewer system, or a combined sewer system, or to an approved place of disposal.

1503.4.3 Roof design. Roofs shall be designed for the maximum possible depth of water that will pond thereon as determined by the relative levels of roof deck and overflow weirs, scuppers, edges or serviceable drains in combination with the deflected structural elements. In determining the maximum possible depth of water, all primary roof drainage means shall be assumed to be blocked.

1503.4.4 Overflow drainage required. Overflow (emergency) roof drains or scuppers shall be provided where the roof perimeter construction extends above the roof in such a manner that water will be entrapped if the primary drains allow buildup for any reason.

1503.4.4.1 Separate systems required. Overflow roof drain systems shall have the end point of discharge separate from the primary system. Discharge shall be above grade, in a location, which would normally be observed by the building occupants or maintenance personnel.

1503.4.4.2 Overflow drains and scuppers. Where roof drains are required, overflow drains having the same size as the roof drains shall be installed with the inlet flow line located 2 inches (51 mm) above the low point of the roof, or overflow scuppers having three times the size of the roof drains may be installed in the adjacent parapet walls. Scuppers shall be sized to prevent the depth of ponding water from exceeding that for which the roof was designed as determined by the plumbing code. Scuppers shall not have an opening dimension of less than 4 inches (102 mm). The flow through the primary system shall not be considered when sizing the secondary roof drain system.

REASON: This is proposed as an Arizona only amendment to resolve the problem of using the UPC rather than the IPC. The I codes place roof drainage in the plumbing code. The U codes have drainage required in the UBC and piping system design is per the UPC and scuppers per the UBC. When the IBC is used with the UPC, there is a gaping hole in having sufficient requirements to obtain a safe roof drainage system.

New Section 1503.4.2 is from IPC 1101.2. Section 1503.4.3 is from IPC 1101.7. Section 1503.4.4 is from IPC 1107.1. Section 1503.4.4.1 is from IPC 1107.2. Section 1503.4.4.2 is a combination of IRC R903.4.1 and IPC 1107.3.

The text from the IRC provides the three times scupper sizing that existed in the UBC. Note that jurisdictions that have adopted the 2000 IPC without amendments will require overflow piping to be two times the size of the main piping but have no over sizing requirement for the scuppers. The 2003 no longer requires the overflow piping size to be doubled but still does not have the three times size for the scuppers.

Cost Impact: None

Committee Action: Approved as Submitted

2000 INTERNATIONAL RESIDENTIAL CODE

IRC-53

Revision to: Section R202

Proponent: Bob Lee, Town of Cave Creek

Proposal: Revise R202 Definitions as follows:

EXTERIOR WALL. An above-grade wall enclosing conditioned and unconditioned space. Includes between floor spandrels, peripheral edges of floors, roofs and basement knee walls, dormer walls, gable end walls, walls enclosing a mansard roof, and basement walls with an average below grade wall area that is less than 50 percent of the total opaque and nonopaque area of that enclosing side.

Reason: When limiting Exterior Walls to those enclosing conditioned space in Section R302.1, it is possible to erect a wall enclosing unconditioned space such as a garage with a fire separation distance of less than 3 feet without a 1-hour fire-resistance rating. By also including those walls enclosing unconditioned space in the definition, any wall with a fire separation distance of less than 3 feet will be required to have the same 1-hour fire-resistance rating.

Cost Impact: None

Committee Action: Approved as Modified

R202 DEFINITIONS

EXTERIOR WALL - Energy Conservation. An above-grade wall enclosing conditioned space. Includes between floor spandrels, peripheral edges of floors, roofs and basement knee walls, dormer walls,

gable end walls, walls enclosing a mansard roof, and basement walls with an average below grade wall area that is less than 50 percent of the total opaque and nonopaque area of that enclosing side.

EXTERIOR WALL. A wall, bearing or nonbearing, that is used as an enclosing wall for a building and that has a slope of 60 degrees (1.05 rad) or greater with the horizontal plane. Includes between floor spandrels, peripheral edges of floors, roof and basement knee walls, dormer walls, gable end walls, walls enclosing a mansard roof, and basement walls.

Reason: The IRC uses the term exterior wall(s) in 71 different sections. Of those, only 3 sections in Chapter 11 are related to insulated walls around conditioned spaces. The remaining 68 sections use the terms in a similar manner to the definition in the IBC. This proposed change clarifies that the existing definition is for use in Chapter 11 and proposes a new definition for the remainder of the IRC. The proposed definition combines the IBC definition with the existing IRC definition to clarify intent related to fire resistance, structural, weather resistance and other conditions not related to energy conservation.

When limiting Exterior Walls to those enclosing conditioned space in Section R302.1, it is possible to erect a wall enclosing unconditioned space such as a garage with a fire separation distance of less than 3 feet without a 1-hour fire-resistance rating. By adding an additional definition, any wall with a fire separation distance of less than 3 feet will be required to have the same 1-hour fire-resistance rating.

If you picture a dwelling with an attached garage having the outside wall, bearing and non-bearing, of the garage with a separation distance of less than 3 feet apply each of the following code sections to the existing definition, one can readily see the need for an additional definition.

The following are the IRC Sections using the terms exterior wall(s):

R105.2 Work exempt from permit.

9. Window awnings supported by an **exterior wall**.

R202

EXTERIOR WALL. An above-grade wall enclosing conditioned space. Includes between floor spandrels, peripheral edges of floors, roof and basement knee walls, dormer walls, gable end walls, walls enclosing a mansard roof, and basement walls with an average below grade wall area that is less than 50 percent of the total opaque and nonopaque area of that enclosing side.

GRADE. The finished ground level adjoining the building at all **exterior walls**.

GRADE PLANE. A reference plane representing the average of the finished ground level adjoining the building at all **exterior walls**.

GROSS AREA OF EXTERIOR WALLS. The normal projection of all **exterior walls**, including the area of all windows and doors installed therein.

BUILDING THERMAL ENVELOPE. The basement walls, **exterior walls**, floor, roof and any other building element that enclose conditioned spaces.

STANDARD TRUSS. Any construction that does not permit the roof/ceiling insulation to achieve the required *R*-value over the **exterior walls**.

R302.1 Exterior walls. **Exterior walls** with a fire separation distance less than 3 feet (914 mm) shall have not less than a one hour fire-resistive rating with exposure from both sides. Projections shall not extend beyond the distance determined by the following two methods, whichever results in the lesser projections:

1. A point one-third the distance to the property line from an assumed vertical plane located where protected openings are required.

2. More than 12 inches (305 mm) into areas where openings are prohibited.

Projections extending into the fire separation distance shall have not less than one-hour fire-resistive construction on the underside. The above provisions shall not apply to walls which are perpendicular to the line used to determine the fire separation distance.

Exception: Tool and storage sheds, playhouses and similar structures exempted from permits by Section R105.2 are not required to provide wall protection based on location on the lot. Projections beyond the **exterior wall** shall not extend over the lot line.

**TABLE R301.4, MINIMUM UNIFORMLY DISTRIBUTED LIVE LOADS
(in pounds per square foot)**

Footnote f. See Section R502.2.1 for decks attached to **exterior walls**.

R301.6 Deflection. The allowable deflection of any structural member under the live load listed in Sections R301.4 and R301.5 shall not exceed the values in Table R301.6.

TABLE R301.6, ALLOWABLE DEFLECTION OF STRUCTURAL MEMBERS

STRUCTURAL MEMBER	ALLOWABLE DEFLECTION
Rafters having slopes greater than 3/12 with no finished ceiling attached to rafters	L/180
Interior walls and partitions	H/180
Floors and plastered ceilings	L/360
All other structural members	L/240
Exterior walls with plaster or stucco finish	H/360
Exterior walls —wind loads with brittle finishes	L/240
Exterior walls —wind loads with flexible finishes	L/120

R318.2.5 Siding backer board. Foam plastic board of not more than 1/2-inch (12.7 mm) thickness may be used as siding backer board when separated from interior spaces by not less than 2 inches (51 mm) of mineral fiber insulation or 1/2-inch (12.7 mm) gypsum wallboard or installed over existing **exterior wall** finish in conjunction with re-siding, providing the plastic board does not have a potential heat of more than 2,000 Btu per square foot (22 720 kJ/m²) when tested in accordance with NFPA 259.

R321.1 Two-family dwellings. Dwelling units in two-family dwellings shall be separated from each other by wall and/or floor assemblies of not less than 1-hour fire-resistive rating when tested in accordance with ASTM E 119. Fire-resistance rated floor-ceiling and wall assemblies shall extend to and be tight against the **exterior wall**, and wall assemblies shall extend to the underside of the roof sheathing.

R321.2 Townhouses. Each townhouse shall be considered a separate building and shall be separated by fire-resistance rated wall assemblies meeting the requirements of Section R302 for **exterior walls**.

R321.2.4 Structural independence. Each individual townhouse shall be structurally independent.

Exceptions:

1. Foundations supporting **exterior walls** or common

R327.1.7 Flood-resistant materials. Building materials used below the design flood elevation shall comply with the following:

1. All wood, including floor sheathing, shall be pressure preservative treated in accordance with AWPA C1, C2, C3, C4, C9, C15, C18, C22, C23, C24, C28, P1, P2 and P3 or decay-resistant heartwood or redwood, black locust, or cedars.
2. Materials and installation methods used for flooring and interior and **exterior walls** shall conform to the provisions of FEMA/FIA-TB-2.

R327.2.2 Enclosed area below design flood elevation. Enclosed areas, including crawl spaces, that are below the design flood elevation shall:

1. Be used solely for parking of vehicles, building access or storage.
2. Be provided with flood openings which shall meet the following criteria:

2.1. There shall be a minimum of two openings on different sides of each enclosed area; if a building has more than one enclosed area below the design flood elevation, each area shall have openings on **exterior walls**.

R403.1 General. All **exterior walls** shall be supported on continuous solid or fully grouted masonry or concrete footings, wood foundations, or other approved structural systems which shall be of sufficient design to accommodate all loads according to Section R301 and to transmit the resulting loads to the soil within the limitations as determined from the character of the soil. Footings shall be supported on undisturbed natural soils or engineered fill.

R403.1.2 Continuous footings in Seismic Design Categories D1 and D2. The braced wall panels at **exterior walls** of all buildings located in Seismic Design Categories D1 and D2 shall be supported by continuous footings. All required interior braced wall panels in buildings with plan dimensions greater than 50 feet (15 240 mm) shall also be supported by continuous footings.

TABLE R402.2
MINIMUM SPECIFIED COMPRESSIVE STRENGTH OF CONCRETE

Basement walls, foundation walls, **exterior walls** and other vertical concrete work exposed to the weather.

R403.1.6 Foundation anchorage. (2nd paragraph)

The wood sole plate at **exterior walls** on monolithic slabs and wood sill plate shall be anchored to the foundation with anchor bolts spaced a maximum of 6 feet (1829 mm) on center. Anchor bolts shall also be located within 12 inches (305 mm) from the ends of each plate section. (12.7 mm) anchor bolts.

R403.1.6.1 Foundation anchorage in Seismic Design Categories D1 and D2. In addition to the requirements of Section R403.1.6, the following requirements shall apply to light-wood frame structures in Seismic Design Categories D1 and D2. Anchor bolts shall be located within 12 inches (305 mm) from the ends of each plate section at interior bearing walls, interior braced wall lines and at all **exterior walls**. Plate washers a minimum of 2 inches by.....

R408.1 Ventilation. The under-floor space between the bottom of the floor joists and the earth under any building (except space occupied by a basement or cellar) shall be provided with ventilation openings through foundation walls or **exterior walls**. The minimum net area of ventilation openings shall not be less than 1 square foot for each 150 square feet (0.67 m² for each 100 m²) of under-floor space area. One such ventilating opening shall be within 3 feet (914mm) of each corner of said building space. See Section M1305.1.4 for access requirements where mechanical equipment is located under floors.

R502.2.1 Decks. Where supported by attachment to an exterior wall, decks shall be positively anchored to the primary structure and designed for both vertical and lateral loads as applicable. Such attachment shall not be accomplished by the use of toenails or nails subject to withdrawal. Where positive connection to the primary building structure cannot be verified during inspection, decks shall be self-supporting. For decks with cantilevered framing members, connections to **exterior walls** or other framing members, shall be designed and constructed to resist uplift resulting from the full live load specified in Table R301.4 acting on the cantilevered portion of the deck.

R504.2.2 Moisture barrier. Polyethylene sheeting of minimum 6-mil (0.15 mm) thickness shall be placed over the granular base. Joints shall be lapped 6 inches (152 mm) and left unsealed. The polyethylene membrane shall be placed over the pressure preservative treated-wood sleepers and shall not extend beneath the footing plates of the **exterior walls**.

R504.1 General. Pressure preservative treated-wood basement floors and floors on ground shall be designed to withstand axial forces and bending moments resulting from lateral soil pressures at the base of the **exterior walls** and floor live and dead loads. Floor framing shall be designed to meet joist deflection requirements in accordance with Section R301.

R602.3 Design and construction. **Exterior walls** of wood frame construction shall be designed and constructed in accordance with the provisions of this chapter and Figures R602.3(1) and R602.3(2) or in accordance with AF&PA's NDS. Components of **exterior walls** shall be fastened in accordance with Tables R602.3(1) through R602.3(4).

R602.4 Interior load-bearing walls. Interior load-bearing walls shall be constructed, framed and fire blocked as specified for **exterior walls**.

FIGURE R602.3(2)

APPLY APPROVED SHEATHING OR BRACE **EXTERIOR WALLS** WITH 1 IN. BY 4 IN. BRACES LET INTO STUDS AND PLATES AND EXTENDING FROM BOTTOM PLATE TO TOP PLATE, OR OTHER APPROVED METAL STRAP DEVICES INSTALLED IN ACCORDANCE WITH THE MANUFACTURER'S SPECIFICATIONS. SEE SECTION R602.10.

R602.6 Drilling and notching—studs. Any stud in an **exterior wall** or bearing partition may be cut or notched to a depth not exceeding 25 percent of its width. Studs in nonbearing partitions may be notched to a depth not to exceed 40 percent of a single stud width. Any stud may be bored or drilled, provided that the diameter of the resulting hole is no greater than 40 percent of the stud width, the edge of the hole is no closer than 5/8 inch (15.9 mm) to the edge of the stud, and the hole is not located in the same section as a cut or notch. See Figures R602.6(1) and R602.6(2). [See Figures R602.6(1) and R602.6(2).]

Exceptions:

1. A stud may be bored to a diameter not exceeding 60 percent of its width, provided that such studs located in **exterior walls** or bearing partitions are doubled and that not more than two successive studs are bored.

R602.6.1 Drilling and notching of top plate. When piping or ductwork is placed in or partly in an **exterior wall** or interior, braced or load-bearing wall, necessitating a cutting of the top plate by more than 50 percent of its width, a galvanized metal tie not less than 0.054 inch thick (1.37 mm) (16 gage) and 1.5 inches (38 mm) wide shall be fastened to each plate across and to each side of the opening with not less than six 16d nails. See Figure R602.6.1.

FIGURE R602.6(1)

NOTCHING AND BORED HOLE LIMITATIONS FOR EXTERIOR WALLS AND BEARING WALLS

R603.1.1 Applicability limits. The provisions of this section shall control the construction of exterior steel wall framing and interior load-bearing steel wall framing for buildings not greater than 60 feet (18 288 mm) in length perpendicular to the joist or truss span, not greater than 36 feet (10 973mm) in width parallel to the joist span or truss, and not greater than two stories in height with each story not greater than 10 feet (3048 mm) high. All **exterior walls** installed in accordance with the provisions of this section shall be considered as load-bearing walls. Steel walls constructed in accordance with the provisions of this section shall be limited to sites subjected to a maximum design wind speed of 130 miles per hour (209 km/h) Exposure A, B or C and a maximum ground snow load of 70 pounds per foot (3.35 kN/m²).

R603.5 Exterior wall covering. The method of attachment of **exterior wall** covering materials to cold-formed steel stud wall framing shall conform to the manufacturer's installation instructions.

R603.6 Headers. Headers shall be installed above wall openings in all **exterior walls** and interior load-bearing walls in accordance with Figure R603.6 and Tables R603.6(1), R603.6(2), and R603.6(3). The number of jack and king studs shall comply with Table R603.6(4). King and jack studs shall be of the same dimension and thickness as the adjacent wall studs. Headers shall be connected to king studs in accordance with Table R603.6(5). One-half of the total number of screws shall be applied to the header and one-half to the king stud by use of a minimum 2-inch by 2-inch (51 mm by 51 mm) clip angle or 4-inch (102 mm) wide steel plate. The clip angle or plate shall extend the depth of the header minus 1/2 inch (12.7 mm) and shall have a minimum thickness of the header members or the wall studs, whichever is thicker.

R603.7 Structural sheathing. In areas where the basic wind speed is less than 110 miles per hour (177 km/h), wood structural sheathing panels shall be installed on all **exterior walls** of buildings in accordance with this section. Wood structural sheathing panels shall consist of minimum 7/16-inch (11.1 mm) thick oriented strand board or 15/32-inch (11.9 mm) thick plywood and shall be installed on all **exterior wall** surfaces in accordance with Section R603.7.1 and Figure R603.3. The minimum length of full height sheathing on **exterior walls** shall be determined in accordance with Table R603.7, but shall not be less than 20 percent of the braced wall length

in any case. The minimum percentage of full height sheathing in Table R603.7 shall include only those sheathed wall sections, uninterrupted by openings, which are a minimum of 48 inches (1120 mm) wide. The minimum percentage of full-height structural sheathing shall be multiplied by 1.10 for 9-foot (2743 mm) high walls and multiplied by 1.20 for 10-foot (3048 mm) high walls.

In addition, structural sheathing shall:

**TABLE R603.7
MINIMUM PERCENTAGE OF FULL HEIGHT STRUCTURAL SHEATHING ON EXTERIOR WALLS**

R603.8.1.4 Attachment of braced walls to foundations and floor and roof diaphragms.

(6th paragraph)

In regions where the basic wind speed equals or exceeds 110 miles per hour (177 km/h), the bottom track in **exterior walls** shall also comply with the provisions of Section R603.8.3.2.6 for uplift.

R603.8.3.1 Braced wall design.

(5th paragraph)

Exterior walls shall be sheathed with wood structural sheathing panels or other approved materials. Wood structural sheathing panels, and their attachments, shall comply with Section R603.8.1.2 except in regions where the basic wind speed exceeds 110 miles per hour (177 km/h) wood structural sheathing panels attached to framing spaced 24 inches (610 mm) on center shall be a minimum of 19/32 inch (15.1 mm). Attachment of wall sheathing materials other than wood structural sheathing panels shall comply with the manufacturer's instructions.

**TABLE R603.8.2.2
LIGHT WEIGHT ROOF AND LIGHT WEIGHT EXTERIOR WALL**

R603.8.3.2.2 Uplift connection—wall assembly to wall assembly. **Exterior wall** studs in the upper story wall of a two-story building shall be attached to the in-line framing wall studs in the supporting wall below, with connections capable of resisting the uplift loads listed in Table R603.8.3.2.2(1). Alternatively, a 1.25-inch-by-33-mil (32 mm by 0.84 mm) steel uplift strap shall be permitted with minimum No. 8 screws attached to each stud, as required by Table R603.8.3.2.2(2).

R603.8.3.2.3 Uplift connection—wall assembly to foundation or floor assembly. **Exterior wall** studs in bottom-story walls shall be attached to a wood sill plate or directly attached to the foundation by connections capable of resisting the uplift loads listed in Table R603.8.3.2.3(1). Alternatively,

R603.8.3.2.6 Wall bottom track to foundation. The bottom track of **exterior walls** shall be connected to a wood sill plate as shown in Figure R603.3.1(2).

R603.8.3.2.5.2 Bottom story of a two-story building. Uplift connections shall be provided to fasten the **exterior wall** studs in the upper story wall of a two-story building to the header below by connections capable of resisting the uplift loads listed in Table R603.8.3.2.2(1).

Uplift connections shall be provided to fasten the header to the jack studs by connectors capable of resisting the uplift loads listed in Table R603.8.3.2.2(1), multiplied by the number of framing members displaced, divided by two. An additional uplift strap shall be provided to fasten **exterior wall** studs in the upper story to king studs

**TABLE R606.14.1
MINIMUM CORROSION PROTECTION**

**TABLE R611.7(8)
MINIMUM PERCENTAGE OF SOLID WALL LENGTH ALONG EXTERIOR WALL LINES**

R611.7.4 Minimum length of wall without openings. Exterior ICF walls shall have a minimum of solid wall length to total wall length in accordance with Table R611.7(8), but not less than 15 percent for ICF walls supporting a light framed roof or 20 percent for ICF walls supporting an ICF or light framed second story and light framed roof. For attached dwellings in Seismic Design Category C, the minimum percentage of solid wall length shall be greater than or equal to the requirements in Table R611.7(9).

The minimum percentage of solid wall length shall include only those solid wall segments that are a minimum of 24 inches (610 mm) in length. The maximum distance between wall segments included in determining solid wall length shall not exceed 18 feet (5486 mm). A minimum length of 24 inches (610 mm) of solid wall segment, extending the full height of each wall story, shall occur at all corners of **exterior walls**.

R702.3.5 Application. Maximum spacing of supports and the size and spacing of fasteners used to attach gypsum board shall comply with Table R702.3.5. Gypsum sheathing shall be attached to **exterior walls** in accordance with Table R602.3(1). Gypsum board shall be applied at right angles or parallel to framing members. All edges and ends of gypsum board shall occur on the framing members, except those edges and ends that are perpendicular to the framing members. Interior gypsum board shall not be installed where it is exposed to the weather.

R703.1 General. Exterior walls shall provide the building with a weather-resistant exterior wall envelope. The exterior wall envelope shall include flashing as described in Section R703.8. The exterior wall envelope shall be designed and constructed in such a manner as to prevent the accumulation of water within the wall assembly by providing a water resistive barrier behind the exterior veneer as required by Section R703.2. A weather-resistant permeable membrane shall be provided over all sheathing, with horizontal overlaps in the membrane of not less than 2 inches (51 mm) and vertical overlaps of not less than 6 inches (152 mm). Where furring strips are used, they shall be 1 inch by 3 inches or 1 inch by 4 inches (25.4 mm by 76 mm or 25.4 mm by 102 mm) and shall be fastened horizontally to the studs with 7d or 8d box

R703.2 Weather-resistant sheathing paper. Asphalt-saturated felt free from holes and breaks, weighing not less than 14 pounds per 100 square feet (0.683 kg/m²) and complying with ASTM D 226 or other approved weather-resistant material shall be applied over studs or sheathing of all **exterior walls** as required by Table R703.4. exceed the maximum exposure specified in Table R703.5.2.

Exception: Such felt or material is permitted to be omitted in the following situations:

3. Under **exterior wall** finish materials as permitted in Table R703.4.

TABLE R703.5.2

MAXIMUM WEATHER EXPOSURE FOR WOOD SHAKES AND SHINGLES ON EXTERIOR WALLS

R703.8 Flashing. Approved corrosion-resistive flashing shall be provided in the exterior wall envelope in such a manner as to prevent entry of water into the wall cavity or penetration of water to the building structural framing components. The flashing shall extend to the surface of the **exterior wall** finish and shall be installed to prevent water from reentering the exterior wall envelope. Approved corrosion-resistant flashings shall be installed at all of the following locations:

R804.3.3.1 Rafter framing. Rafters shall be connected to a parallel ceiling joist to form a continuous tie between **exterior walls** in accordance with Figures R804.3 and R804.3.1(1) and Table R804.3.1(3).....

R905.2.7.1 Ice protection. In areas where the average daily temperature in January is 25EF (-4EC) or less, an ice barrier that consists of a least two layers of underlayment cemented together or of a self-adhering polymer modified bitumen sheet, shall be used in lieu of normal underlayment and extend from the eave's edge to a point at least 24 inches (610 mm) inside the **exterior wall** line of the building.

R905.5.3 Underlayment. In areas where the average daily temperature in January is 25EF (-4EC) or less, an ice barrier that consists of at least two layers of underlayment cemented together or of a self-adhering polymer modified bitumen sheet shall extend from the eave's edge to a point at least 24 inches (610 mm) inside the **exterior wall** line of the building. Underlayment shall conform with ASTM D 226, Type I.

R905.6.3 Underlayment. In areas where the average daily temperature in January is 25EF (-4EC) or less, an ice barrier that consists of at least two layers of underlayment cemented together or of a self-adhering polymer modified bitumen sheet shall extend from the eave's edge to a point at least 24 inches (610 mm) inside the **exterior wall** line of the building. Underlayment shall comply with ASTM D 226, Type II. Underlayment shall comply with ASTM D 226, Type I.

R905.7.3 Underlayment. In areas where the average daily temperature in January is 25EF (-4EC) or less, an ice barrier that consists of at least two layers of underlayment cemented together or of a self-adhering polymer modified bitumen sheet shall extend from the eave's edge to a point at least 24 inches (610 mm) inside the **exterior wall** line of the building. Underlayment shall comply with ASTM D 226, Type I.

R905.8.3 Underlayment. In areas where the average daily temperature in January is 25EF (-4EC) or less, an ice barrier that consists of at least two layers of underlayment cemented together or a self-adhering polymer modified bitumen sheet shall extend from the edge of the eave to a point at least 24 inches (610 mm) inside the **exterior wall** line of the building. Underlayment shall comply with ASTM D 226, Type I.

R1001.15 Chimney clearances. Any portion of a masonry chimney located in the interior of the building or within the **exterior wall** of the building shall have a minimum air space clearance to combustibles of 2 inches (51 mm). Chimneys located entirely outside the **exterior walls** of the building, including chimneys that pass through the soffit or cornice, shall have a minimum air space clearance of 1 inch (25.4 mm). The air space shall not be filled, except to provide fire blocking in accordance with Section R1001.16.

R1003.4 Seismic anchorage. Masonry and concrete chimneys in Seismic Design Categories D1 and D2 shall be anchored at each floor, ceiling or roof line more than 6 feet (1829 mm) above grade, except where constructed completely within the **exterior walls**. Anchorage shall conform to the requirements of Section R1003.4.1.

N1101.2.1 Residential buildings, Type A-1. Compliance shall be demonstrated by either:

1. Meeting the requirements of this chapter for buildings with a glazing area that does not exceed 15 percent of the gross area of **exterior walls**; or

N1101.2.2 Residential buildings, Type A-2. Compliance shall be demonstrated by either:

1. Meeting the requirements of this chapter for buildings with a glazing area that does not exceed 25 percent of the gross area of **exterior walls**; or

N1102.1.6 Slab-on-grade floors. (2nd paragraph)

When installed between the **exterior wall** and the edge of the interior slab, the top edge of the insulation shall be permitted to be cut at a 45-degree (0.79 rad) angle away from the exterior wall. Insulation extending horizontally away from the building shall be protected by pavement or by a minimum of 10 inches (254 mm) of soil.

M1413.1 General. Cooling equipment that utilizes evaporation of water for cooling shall be installed in accordance with the manufacturer's installation instructions. Evaporative coolers shall be installed on a level platform or base not less than 3 inches (76 mm) above the adjoining ground and secured to prevent displacement. Openings in **exterior walls** shall be flashed in accordance with Section R703.8.

G2426.6.7 (503.6.8) Exterior wall penetrations. A gas vent extending through an **exterior wall** shall not terminate adjacent to the wall or below eaves or parapets, except as provided in Sections G2426.2.4 and G2426.3.4.

G2426.10.16 (503.10.16) Single-wall connector penetrations of combustible walls. A vent connector made of a single-wall metal pipe shall not pass through a combustible **exterior wall** unless guarded at the point of passage by a ventilated metal thimble not smaller than the following:

P2603.6 Freezing. In localities having a winter design temperature of 32EF (0EC) or lower as shown in Table R301.2(1) of this code, a water, soil or waste pipe shall not be installed outside of a building, in **exterior walls**, in attics or crawl spaces, or in any other place subjected to freezing temperature unless adequate provision is made to protect it from freezing by insulation or heat or both. Water service pipe shall be installed not less than 12 inches (305 mm) deep or less than 6 inches (152 mm) below the frost line.

P2606.1 General. Roof and **exterior wall** penetrations shall be made water tight. Joints at the roof, around vent pipes, shall be water tight by the use of lead, copper or galvanized iron flashings or an

approved elastomeric material. Counterflashing shall not restrict the required internal cross-sectional area of any vent.

E3801.2.2 Wall space. As used in this section, a wall space shall include the following:

2. The space occupied by fixed panels in **exterior walls**, excluding sliding panels.

Cost impact: None

Committee Action: Approved as Modified

IRC-54

Revision to: Section M1411.3.1

Proponent: Mike Seal, Town of Oro Valley

Proposal: Add text as shown to the 2nd line:

Drain piping shall be a minimum of 3/4 inch (19.1 mm) nominal pipe size, and shall slope to drain a minimum of 1/8 unit vertical, in 12 units horizontal (1%).

Reason: No slope requirement is in place, and to be consistent with the IMC.

Cost impact: None

Committee Action: Approved as Modified

M1411.3.1 Auxiliary and secondary drain systems. In addition to the requirements of Section M1411.3, a secondary drain or auxiliary drain pan shall be required for each cooling or evaporator coil where damage to any building components will occur as a result of overflow from the equipment drain pan or stoppage in the condensate drain piping. Such piping shall maintain a minimum horizontal slope in the direction of discharge of not less than one-eighth unit vertical in 12 units horizontal (1-percent slope). Drain piping shall be a minimum of 3/4-inch (19.1 mm) nominal pipe size. One of the following methods shall be used:

(The remainder of the section to remain unchanged.)

Reason: This inserts the necessary prescriptive language that will provide proper discharge for condensing liquid. It also aligns the IRC with the same requirement shown in the International Mechanical Code Section 307.1.

Cost impact: None

Committee Action: Approved as Modified

IRC-55

Revision to: TABLE R1003.1

Proponent: Autumn Hartsoe, City of Goodyear

Proposal: Revise Table as follows:

TABLE R1003.1

SUMMARY OF REQUIREMENTS FOR MASONRY FIREPLACES AND CHIMNEYS

ITEM	LETTER ^a	REQUIREMENTS	SECTION
Hearth slab thickness	A	4"	R1003.9.1
Hearth extension (each side of opening)	B	8" fireplace opening < 6 sq. ft. 12" fireplace opening ≥ 6 sq. ft.	R1003.10

Hearth extension (front of opening)	C	16" fireplace opening < 6 sq. ft. 20" fireplace opening ≥ 6 sq. ft.	<u>R1003.10</u>
Hearth slab reinforcing	D	Reinforced to carry its own weight and all imposed loads.	<u>R1003.9</u>
Thickness of wall of firebox	E	10" solid brick or 8" where a firebrick lining is used. Joints in firebrick 1/4" max.	<u>R1003.5</u>
Distance from top of opening to throat	F	8"	<u>R1003.11</u>
Smoke chamber wall thickness unlined walls	G	6" <u>for unlined walls</u> 8" <u>for lined walls</u>	<u>R1003.8</u>
Chimney Vertical reinforcing ^b	H	8" Four No. 4 full-length bars for chimney up to 40" wide. Add two No. 4 bars for each additional 40" or fraction of width or each additional flue	<u>R1003.3.1</u>
Horizontal reinforcing ^b	J	Four No. 4 full-length bars for chimney up to 40" wide. Add two No. 4 bars for each additional 40" or fraction of width or each additional flue 1/4-inch ties at each 18 inches and two ties at each bend in vertical steel	<u>R1003.3.2</u>
Bond beams	K	1/4" ties at 18" and two ties at each bend in vertical steel.	<u>R1001.1</u> <u>R1001.5</u>
Fireplace lintel	L	Noncombustible material	<u>R1003.7</u>
Chimney walls with flue lining	M	Solid masonry units or hollow masonry units grouted solid with at least 4 inch nominal thickness.	<u>R1001.7</u>
Walls with unlined flue	N	8" solid masonry.	<u>R1003.8</u>
Distances between adjacent flues	-	See Section R1001.10.	
Effective flue area (based on area of fireplace opening)	P	See Section R1001.12.	
Clearances: Combustible material Mantel and trim Above roof	R	See Sections R1001.15 and R1003.12. See Section R1001.13. 3' at roofline and 2' at 10'.	
Anchorage ^b Strap Number Embedment into chimney Fasten to Bolts	S	3/16" x 1" Two 12" hooked around outer bar with 6" extension 4 joists Two 1/2" diameter.	<u>R1003.4.1</u>
Footing Thickness Width	T	12" min. 6" each side of fireplace wall.	<u>R1003.2</u>

For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm, 1 square foot = 0.0929 m².

NOTE: This table provides a summary of major requirements for the construction of masonry chimneys and fireplaces. Letter references are to Figure R 1003.1, which shows examples of typical construction. This table does not cover all requirements, nor does it cover all aspects of the indicated requirements. For the actual mandatory requirements of the code, see the indicated section of text.

- a. The letters refer to Figure R 1003.1.
a. Not required in Seismic Design Category A, B or C.

Reason: Corrected the following errors to table R1003.1:

Chimney, Vertical reinforcing

Horizontal reinforcing

Bond beam requirement

Add footnote "b" to vertical reinforcing

Add "Section" column to have the same format as IBC Table 2111.1

Cost impact: None

Committee Action: Approved as Modified

IRC-56

Revision to: Section M1305.1

Proponent: Chuck King, Town of Oro Valley

Proposal: Add new sections as follow:

M1305.1.5 Equipment and appliances mounted on roofs or elevated structures. When equipment or appliances are installed on roofs or elevated structures, there shall be a level working area on any side of the appliance or equipment for servicing purposes. This area shall be no less than 30 inches (762 mm) in any dimension and shall not exceed a slope of 3 units vertical in 12 units horizontal.

M1305.1.5.1 Electrical requirements. There shall be a receptacle outlet located within 25 feet (7620 mm) of any appliance or equipment for servicing purposes.

Reason: In nearly all applications (under floors, attics, etc.) there are requirements for access and working spaces for servicing appliances and equipment. Currently there are no parameters in place (in the IRC) for steep sloped roofs; meaning that equipment could be installed on roofs with extreme pitches that would render them virtually un-serviceable. The maximum slope requirement will provide a reasonable level of safety for service personnel, and the 30 inch dimension is consistent with other working space requirements. There are also requirements for service outlets in just about all other applications, and are certainly needed for roof mounted equipment. In addition, this will be more consistent with the requirements of the IMC and ICCEC.

Cost Impact: Increase

Committee Action: Approved as Submitted

IRC-57

Revision to: Section M1305.1

Proponent: Chuck King, Town of Oro Valley

Proposal: Revise sections as follow:

G2406.2 (303.3) Prohibited locations. Fuel-fired appliances shall not be located in, or obtain combustion air from, the following rooms or spaces:

1. Sleeping rooms
2. Bathrooms
3. Toilet rooms
4. ~~Storage closets~~

Reason: Installing a water heater in a storage-type closet is a typical application and has been done for many years. Using the terminology of "storage closets" as a prohibition is very open ended. What constitutes a storage closet? I would say that the primary purpose of **any** closet is for the storage of materials of some kind. If this interpretation were to be used, water heaters could not be installed in a closet of any kind.

Cost Impact: None

Committee Action: Disapproved

IRC-58**Revision to: Section R315.1****Proponent:** Rick Mccracken, Artistic Stairs**Proposal: Revise Exception 2 as follow:****R.315.1 Handrails****Exceptions:**

2. The use of a volute, turnout or starting ~~easing~~newel shall be allowed over the lowest tread.

Reason: in the 2000 I.B.C. Handbook 1003.3.3.11.4 continuity, it states within dwelling units, handrails are permitted to terminate at a starting newel or volute, which is located on the first tread. It goes on to say, these types of terminations have been found in residences for years without a record of accidents or lawsuits for an unsafe practice. We believe this was an oversight in creating the I.R.C. codes because technically the easing is a part attached to the volute or turnout to create a change of pitch in the railing and not a stand alone starting feature. We ask that this be changed to accommodate a long standing practice in stair design without any safety issues.

Cost Impact: None

Committee Action: Withdrawn by Proponent**IRC-59****Revision to: Section P2803.6.1****Proponent:** Mike Seal, Town of Oro Valley**Proposal: Revise as follows:**

P2803.6.1 Requirements of discharge pipe. The outlet of a pressure relief valve, temperature relief valve or combination thereof, shall not be directly connected to the drainage system. The discharge from the relief valve shall be piped full size separately to the outside of the building or to an indirect waste receptor located inside the building. In areas subject to freezing, the relief valve shall discharge through an air gap into an indirect waste receptor located within a heated space, or by other approved means. The discharge shall be installed in a manner that does not cause personal injury or property damage and that is readily observable by the building occupants. The discharge from a relief valve shall not be trapped. The diameter of the discharge piping shall not be less than the diameter of the relief valve outlet. The discharge pipe shall be installed so as to drain by gravity flow and shall terminate atmospherically not ~~more~~ less than 6 inches (152mm) nor more than 24 inches (610 mm) above the floor or finish grade. The end of the discharge pipe shall not be threaded.

Reason: This code section speaks to both interior and exterior discharge of relief valves, but the termination seems to only address what was intended for interior locations. The possibility of the termination to occur "at grade", which is now currently allowed, would have the unintended effect of concealing any discharge that might occur, or of plugging the discharge line. Requiring it to be a "minimum" of 6 inches (152 mm) above grade would resolve this. The 24 inch (610 mm) maximum height will assure that possible scalding water under pressure will not injure individuals in near proximity.

Cost Impact: None**Committee Action: Approved as Submitted**

IRC-60

Revision to: Section R2404.9

Proponent: Chuck King, Town of Oro Valley

Revise as follows: Delete text

Proposal: Delete entire section and relocate text in new section as follows:
(Section Heading) **R324 Rodent Proofing** (Subsection below) R324.1 Rodent proofing. Buildings or structures and the walls enclosing habitable ~~or occupiable~~ rooms and spaces in which persons live, sleep or work, or in which ~~feed~~, food or foodstuffs intended for human consumption are stored, prepared, processed, served or sold, shall be constructed to protect against the entry of rodents.

Reason: This code section was improperly located in the fuel gas section of the code. It needs to be in the general provisions or general planning area that also speaks to other types of protections such as termites. Speaking to the changes; striking "occupiable" simply removes a fabricated word which is found nowhere else in the code or in any dictionary, and is already covered by the previous word "habitable". The second strike out is to remove the word "feed" which is more applicable to livestock or other animals. It would be nearly impossible to protect "feed" which could be located in a variety of accessory structures that are covered by the IRC. Showing what I believe to be the intent, of adding the portion "intended for human consumption", is far more appropriate and compatible with life safety concerns.

Cost Impact: None

Committee Action: Withdrawn by Proponent

2000 INTERNATIONAL PLUMBING CODE

IPC-3

Revision to: Section 312.5

Proponent: Bob Lee, Town of Cave Creek

Proposal: Revise as follow:

312.5 Water supply system test. Upon completion of a section of or the entire water supply system, the system, or portion completed, shall be tested and proved tight under a water pressure not less than the working pressure of the system; or, for piping systems other than plastic, by an air test of not less than 50 psi (344kPa). This test shall be maintained for at least 15 minutes. The water utilized for tests shall be obtained from a potable source of supply. The required tests shall be performed in accordance with this section and Section 107.

Reason: All other tests specified in Section 312, whether Drainage and vent water test under Section 312.2, Drainage and vent air test under Section 312.3, Drainage and vent final test under Section 312.4, Gravity sewer test under Section 312.6 or Forced sewer test under Section 312.7, require 15 minute duration for the respective tests. This is sufficient time to determine that a leak is not present and would provide consistency within the testing section.

Cost Impact: None

Committee Action: Approved as Submitted

IPC-4**Revision to: Section 504.6.1**

Proponent: Mike Seal, Town of Oro Valley

Proposal: Revise as follow:

504.6.1 Discharge. The relief valve shall discharge full size to a safe place of disposal such as the floor, outside the building, or an indirect waste receptor. The discharge pipe shall not have any trapped sections and shall have a visible air gap or air gap fitting located in the same room as the water heater. The outlet end of the discharge pipe shall not be threaded and such discharge pipe shall not have a valve or tee installed. Relief valve piping shall be piped independent of other equipment drains or relief valve discharge piping to the disposal point. ~~Such pipe shall be installed in a manner that does not cause personal injury to occupants in the immediate area or structural damage to the building.~~ The drain shall be constructed so as to discharge in a downward direction, and shall terminate not less than 6 inches (152 mm) and not more than 24 inches (610 mm) above the finish surface or grade.

Reason: This prescriptive language removes the need to interpret what is intended by “shall be installed in a manner that does not cause personal injury to occupants in the immediate area...”. This is wide open for interpretation and discretion. The means and heights of the drain discharge also matches what is currently prescribed for drain pans in P504.7.2. Why should drain pans be specific and relief valve discharges, which relieve under pressure, be left open to interpretation?

Cost Impact: None

Committee Action: Approved as Submitted

AZBO CODE REVIEW AND DEVELOPMENT COMMITTEE

**2000 ICC CODE AMENDMENTS REFORMATTED TO THE 2003
ICC CODES**

DRAFT

AZBO Code Review and Development Committee

AZBO 2000 ICC Codes Amendments recommended for the 2003 ICC Codes

This report is a three year compilation of the AZBO amendments to the 2000 ICC codes that the Code Review and Development Committee have recommended to be included with the 2003 ICC codes to assist those jurisdictions in the adoption of the 2003 ICC codes. In addition, previous amendments that were not successful in the ICC code change process have been deleted, unless the item is scheduled to be resubmitted for inclusion in the 2006 editions of the ICC Codes. The items noted as "AZ only" have been determined by the committee to be items unique to Arizona in accordance with the guidelines approved by the AZBO Board of Directors.

The items are identified by the initials of the affected code, the original number assigned by the committee and the year the item was originally approved by the committee.

2003 INTERNATIONAL BUILDING CODE

IBC-5-01 (AZ Only)

Revision to: Table 1607.1

Committee Action: Approved as Submitted

Revise as follows:

OCCUPANCY OR USE	UNIFORM (psf)	CONCENTRATED (lbs.)
27. Residential		
One- and two-family dwellings		-
Uninhabitable attics with storage	20 40	
Habitable attics and sleeping areas	30 40	
(no other changes in item 27)		

Reason: All habitable areas should be designed using the same design loads. Change is in line with industry standards. Local builders and designers support the change.

Committee Reason: Committee members representing industry indicated the homebuilders and designers preferred to continue with the 40 psf in bed room areas. There was support that this would lessen complaints from buyers.

IBC-10-01 (AZ Only)

Revision to: 3109

Committee Action: Approved as Submitted

Revise as follows:

Section 3109 is hereby REPEALED

Reason: Section does not meet State law for pool enclosures. Local governing statute or code will regulate.

IBC-14-01 (Resubmit to ICC)**Revision to: 406.1.4 Item 1.****Committee Action: Approved as Modified****406.1.4 Separation.** Separations shall comply with the following:

1. The private garage shall be separated from the dwelling unit and its attic area by means of a minimum 1/2-inch (12.7 mm) gypsum board applied to the garage side. Garages beneath habitable rooms shall be separated from all habitable rooms above by not less than 5/8-inch Type X gypsum board or equivalent. Door openings between a private garage and the dwelling unit shall be equipped with either solid wood doors, or solid or honeycomb core steel doors not less than 13/8 inches (34.9 mm) thick, or doors in compliance with Section 715.3.3. Openings from a private garage directly into a room used for sleeping purposes shall not be permitted. Doors shall be self-closing and self-latching.

In buildings protected with an automatic fire sprinkler system, including the private garage, the room finish materials shall be permitted to be a minimum 1/2-inch (12.7 mm) gypsum board applied to the garage side.

Committee Reason: These doors should be maintained self closing and latching at all times.**IBC-20-02 (AZ Only)****Revision to:** Chapter 11 Accessibility**Committee Action: Approved as Modified****Proposal:** Delete Chapter 11, Accessibility, in its entirety and substitute the following:ARIZONANS WITH DISABILITIES ACT

"Arizonans with Disabilities Act" (Arizona Revised Statutes, Title 41, Chapter 9, Article 8), and the "Arizonans with Disabilities Act Implementing Rules" (Arizona Administrative Code, Title 10, Chapter 3, Article 4), which rules incorporate The federal "Americans with Disabilities Act Accessibility Guidelines for Buildings and Facilities," be and the same is hereby adopted as the Arizonans with Disabilities Act of the Town, City or County, and shall apply to new construction and alterations and are not required in buildings or portions of existing buildings that do not meet the standards and specifications and this act is hereby referred to, adopted and made a part hereof as though fully set forth in this section.

Reason: All jurisdictions within the state are required by state law to enforce these provisions so this code change merely brings the International Building Code into compliance.**IBC-22-03 (AZ only)****Revision to: Sections 308.2,308.3, 310.1,310.2, (new) 419, 309.2.9, 1003.3.1.2, 1003.3.1.8.2****Committee Action: Approved as Modified**

308.2 Group I-1. This occupancy shall include buildings, structures or parts thereof housing more than 10 persons, on a 24-hour basis, who because of age, mental disability or other reasons, live in a residential environment that provides supervisory care services. The occupants are capable of responding to an emergency situation without physical assistance from staff. This group shall include, but not be limited to, the following:

- Residential board and care facilities
- Assisted living centers
- Halfway houses
- Group homes
- Congregate care facilities

Social rehabilitation facilities
 Alcohol and drug abuse centers
 Convalescent facilities

A facility such as the above with 10 or fewer persons shall be classified as a Group R-4 Condition 1 or shall comply with the *International Residential Code* in accordance with Section 101.2 where the building is in compliance with Section 419 of this code.

308.3 Group I-2. This occupancy shall include buildings and structures used for medical, surgical, psychiatric, nursing, custodial, personal, or directed care on a 24-hour basis of more than five persons who are not capable of self-preservation by responding to an emergency situation without physical assistance from staff. This group shall include, but not be limited to, the following:

Hospitals

Nursing homes (both intermediate-care facilities and skilled nursing facilities)

Mental hospitals

Detoxification facilities

A facility such as the above with five or fewer persons shall be classified as Group R-3 or shall comply with the *International Residential Code* in accordance with Section 101.2.

This occupancy shall also include buildings and structures used for assisted living homes providing supervisory, personal, or directed care on a 24-hr basis of more than 10 persons who are not capable of self-preservation by responding to an emergency situation without physical assistance from staff. A facility such as the above with ten or fewer persons shall be classified as R-4 Condition 2.

310.1...R-4 Residential occupancies shall include buildings arranged for occupancy as residential care/assisted living homes including not more than 10 occupants, excluding staff.

310.1.1 Condition 1. This occupancy condition shall include facilities licensed to provide supervisory care services, in which occupants are capable of self preservation by responding to an emergency situation without physical assistance from staff. Condition 1 facilities housing more than 10 persons shall be classified as a Group I-1.

310.1.2 Condition 2. This occupancy condition shall include facilities licensed to provide personal or directed care services, in which occupants are incapable of self preservation by responding to an emergency without physical assistance from staff. Condition 2 facilities housing more than 10 persons shall be classified as Group I-2.

R-4 occupancies shall meet the requirements for construction as defined in Group R-3 except as otherwise provided for in this code, and Section 419 or shall comply with the *International Residential Code* in accordance with section 101.2 where the building is in compliance with Section 419 of this code

310.2 Definitions

PERSONAL CARE SERVICE. Assistance with activities of daily living that can be performed by persons without professional skills or professional training and includes the coordination or provision of intermittent nursing services and the administration of medications and treatments.

DIRECTED CARE SERVICE. Care of residents, including personal care services, who are incapable of recognizing danger, summoning assistance, expressing need, or making basic care decisions.

SUPERVISORY CARE SERVICE. General supervision, including daily awareness of resident functioning and continuing needs.

RESIDENTIAL CARE/ASSISTED LIVING HOME. A building or part thereof housing a maximum of 10 persons, excluding staff, on a 24-hour basis, who because of age, mental disability or other reasons, live in a supervised residential environment which provides supervisory, personal, or directed services. This classification shall include, but not be limited to, the following: residential board and care facilities, assisted living homes, halfway houses, group homes, congregate care

facilities, social rehabilitation facilities, alcohol and drug abuse centers and convalescent facilities.

419 RESIDENTIAL CARE/ASSISTED LIVING HOMES

419.1 Applicability. The provisions of this section shall apply to a building or part thereof housing not more than 10 persons, excluding staff, on a 24-hour basis, who because of age, mental disability or other reasons, live in a supervised residential environment which provides licensed care services. Except as specifically required by this division, R-4 occupancies shall meet all applicable provisions of Group R-3.

419.2 General. Buildings or portions of buildings classified as R-4 occupancies shall meet all the applicable provisions of Group R-3, may be constructed of any materials allowed by this code, shall not exceed two stories in height nor be located above the second story in any building, and shall not exceed 2000 square feet above the first story except as provided in Section 506.

419.3 Special Provisions. R-4 occupancies having more than 2000 square feet of floor area above the first floor shall be of not less than one-hour fire-resistive construction throughout.

419.3.1 Mixed Uses. R-4 occupancies shall be separated from other uses as provided in Table 302.3.2.

419.4 Access and Means of Egress Facilities.

419.4.1 Accessibility. R-4 occupancies shall be provided with at least one accessible route per the Arizonans with disabilities act. Sleeping rooms and associated toilets shall be accessible.

Exception: Existing buildings shall comply with Section 3409. Bathing and toilet facilities need not be made accessible, but shall be provided with grab bars in accordance with ICC/ANSI A 117.1.

419.4.2 Exits

419.4.2.1 Number of Exits. Every story, basement, or portion thereof shall have not less than two exits.

Exception: Basements and stories above the first floor containing no sleeping rooms may have one means of egress as provided in Chapter 10.

419.4.2.2 Distance to Exits. The maximum travel distance shall comply with Section 1004, except that the maximum travel distance from the center point of any sleeping room to an exit shall not exceed 75 feet.

419.4.2.3 Emergency Exit Illumination. In the event of a power failure, exit illumination shall be automatically provided from an emergency system powered by storage batteries or an onsite generator set installed in accordance with the ICC Electric Code.

419.4.2.4 Emergency Escape and Rescue. R-4 occupancies shall comply with the requirements of Section 1025, except that Exception 1 to Section 1025.1 does not apply to R-4 occupancies.

419.4.2.5 Delayed egress locks. In R-4 Condition 2 occupancies, delayed egress locks shall be permitted in accordance with Sections 1008.1.3.4 and 1008.1.8.6, items 1, 2, 4, 5 and 6.

419.5 Smoke Detectors and Sprinkler Systems

419.5.1 Smoke Alarms. All habitable rooms and hallways in R-4 occupancies shall be provided with smoke alarms installed in accordance with Section 907.2.10.

419.5.2 Sprinkler Systems. R-4 occupancies shall be provided with a sprinkler system installed in accordance with Section 903.2.9. Sprinkler systems installed under this Section shall be installed throughout, including attached garages, and in Condition 2 facilities shall include attics and concealed spaces of or containing combustible materials. Such systems

may not contain unsupervised valves between the domestic water riser control valve and the sprinklers. In R-4 Condition 2 occupancies, such systems shall contain water-flow switches electrically supervised by an approved supervising station, and shall sound an audible signal at a constantly attended location.

1008.1.2 Door swing. Egress doors shall be side-hinged swinging.

Exceptions:

5. Private garages, office areas, factory and storage areas with an occupant load of 10 or less.
6. Group I-3 occupancies used as a place of detention.
7. Doors within or serving a single dwelling unit in Groups R-2, ~~and~~ R-3 as applicable in Section 101.2, and R-4.
8. (no other changes)

Reason: The purpose of this amendment is to bring the provisions of the code into agreement with the licensing rules of the Arizona Department of Health Services. DHS license categories have a threshold of 10 residents to move from a residential home setting to an institutional setting. DHS rules (R9-10-701) state, "Assisted living home" or "home" means an assisted living facility that provides resident rooms to (10) or fewer residents, as distinct from an "assisted living center", which provides services to more than (10) persons. In addition, the license classifications to provide "personal care services" and "directed care services" to residents allow for residents to be bed-bound. The use of "Condition" distinctions is reflective of similar distinctions in I-occupancies.

Each state has unique agency programs for assisted living occupancies, which establish license categories based on numbers of residents and the familiar ambulatory/non-ambulatory distinction. Uniformity could be accomplished by either trusting health service agencies nationally to agree to uniform thresholds and other licensing characteristics, or by amending building codes to allow each state to adapt to that state's unique rules. If numerical thresholds are provided on a "fill in the blanks" basis, condition categories can be added or deleted, and definitions can be customized to match licensure definitions, the hazards associated with these facilities can be addressed comprehensively on a state-by-state basis.

The most hazardous scenario is a facility in an ordinary, un-rated residential structure, occupied by (10) bed-bound residents, supervised by a single caregiver. Provisions for exiting, smoke detectors, emergency illumination, sprinklers, et al, can substantially increase the chances of survival in a fire or other emergency for these residents.

IBC-1-01 Reason: To bring the Building Code into agreement with Arizona Administrative Code, Title 9 Health Services, Article 7 Assisted Living Facilities. R9-10-701 states, "Assisted living home" or "home" means an assisted living facility that provides resident rooms to ten or fewer residents.' An "Assisted living center" (rooms or residential units for eleven or more residents) is required to have "an individually keyed entry door" and "a kitchen area" by R9-10-720. Since the distinction for the state is between ten and eleven residents, it is felt that the Building Code should reflect the same distinction.

See [http://www.sosaz.com/public services/Title 09/9-10.htm](http://www.sosaz.com/public_services/Title_09/9-10.htm) for the entire rule.

It is felt that the word "abuse" was inadvertently omitted for the definition of Group I-1 Occupancy.

IBC-24-03 (Resubmit to ICC)

Revise 507.2 & 507.3

Committee Action: Approved as Submitted

Revise as follows:

507.2 Sprinklered, one story. The area of a one-story, Group B, F, M or S building or a one-story Group A-4 building of other than Type V construction shall not be limited when the building is provided

with an automatic sprinkler system throughout in accordance with Section 903.3.1.1, and is surrounded and adjoined by public ways or yards not less than 60 feet (18 288 mm) in width.

Exceptions:

1. (No change)
2. (No change)

Such buildings may contain other occupancies, without H fire areas, provided that such occupancies do not occupy more than 10 percent of the area of any floor of a building, nor more than the tabular values permitted in the occupancy by Table 503 for such occupancy.

Exception: Group H fire areas as permitted by Section 507.6.

507.3 Two story. The area of a two-story, Group B, F, M or S building shall not be limited when the building is provided with an automatic sprinkler system in accordance with Section 903.3.1.1 throughout, and is surrounded and adjoined by public ways or yards not less than 60 feet (18 288 mm) in width.

Such buildings may contain other occupancies, without H fire areas, provided that such occupancies do not occupy more than 10 percent of the area of any floor of a building, nor more than the tabular values permitted in the occupancy by Table 503 for such occupancy.

Exception: Group H fire areas as permitted by Section 507.6.

Reason: The purpose of this proposal is to expand minor uses that would be permitted in an unlimited area building constructed in compliance with Sections 507.2 and 507.3. The current text is overly restrictive. As written, these buildings would not be allowed to contain separate tenants such as daycare, dance school, out-patient surgical center, restaurants, etc.. These would be considered different occupancies and no text exists to permit such uses in an unlimited area building of B, F, M or S occupancies.

It makes little sense to restrict other occupancies, while allowing an A-4, certain H's or motion picture theaters to be in unlimited area buildings.

This change will allow other use groups to be located in an unlimited area building of B, F, M or S uses as long as the aggregate area of the occupancies do not exceed 10% of the floor area of the main occupancy and further that the aggregate area of such occupancy does not exceed the tabular area permitted in Table 503.

Communications and interpretations from ICC staff in ICBO and Boca offices have confirmed there is a need for a change to allow these minor occupancies in an unlimited area building. This provision is in at least one other national code.

This change should provide a reduction in costs.

IBC-27-03 (Submit to ICC)**Revision to: Table 2902.1****Committee Action: Approved as Submitted**

Revise Items 2 and 6 of table (remainder of table unchanged):

**TABLE 2902.1
MINIMUM NUMBER OF REQUIRED PLUMBING FACILITIES^a**

No.	CLASSIFICATION	USE GROUP	DESCRIPTION	WATER CLOSETS (SEE SECTION 419.2 OF THE INTERNATIONAL PLUMBING CODE FOR URINALS)		LAVATORIES		BATHTUBS OR SHOWERS	DRINKING FOUNTAINS (SEE SECTION 410.1 OF THE INTERNATIONAL PLUMBING CODE)	OTHER
				MALE	FEMALE	MALE	FEMALE			
2	Business (see Sections 2902.2, 2902.4, 2902.4.1 and 2902.6)	B	Buildings for the transaction of business, professional services, other services involving merchandise, office buildings, banks, light industrial and similar uses	1 per 25 for the first 50 and 1 per 50 for the remainder exceeding 50		1 per 40 for the first 50 and 1 per 80 for the remainder exceeding 50		—	1 per 100	4 service sink
6	Mercantile (see Section 2902.2, 2902.5 and 2902.6)	M	Retail stores, service stations, shops, salesrooms, markets and shopping centers	1 per 500		1 per 750		—	1 per 1,000	4 service sink

REASON: The current requirement for 1 service sink for mercantile and business occupancies is not necessary due to the nature of the occupancy. The majority of business and mercantile occupancies do not warrant the need to clean up spills that often occur in other occupancies. The requirement for a service sink often becomes overly restrictive to small tenant spaces. This revision will not apply if another governing agency, such as The State Health Department, requires a service sink.

IBC-28-03 (Approved w/ ICC)**Revision to: Section 1024.3****Committee Action: Approved as Submitted**

1024.3 Assembly other exits. In addition to having access to a main exit, each level of an occupancy in Group A having an occupant load of greater than 300 shall be provided with additional means of egress that shall provide an egress capacity for at least one-half of the total occupant load served by that level and comply with Section 1014.2.

Reason: The IBC defines 'exit' in 1006 as being exterior doors, vertical exit enclosure, smokeproof enclosure, exit passageway and horizontal exits. ICC staff has interpreted that this section does not mean each 'additional exit' is required to comply solely with Section 1006. But that the code intends that assembly rooms may also be served by exit-access elements. If this interpretation is correct, then the Code should reflect the correct intent. By changing the word 'exit' to 'means of egress' clarifies the purported intent correctly.

IBC-29-03 (Approved w/ ICC)

Revision to: Section 1008.1.9

Committee Action: Approved as Modified

1008.1.9 Panic and fire exit hardware. Where panic and fire exit hardware is installed, it shall comply with the following:

1. The actuating portion of the releasing device shall extend at least one-half of the door leaf width.
2. A maximum unlatching force of 15 pounds (67 N).

Each door in a means of egress from an occupancy of Group A or E having an occupant load of 100 or more and any occupancy of Group H-1, H-2, H-3 or H-5 shall not be provided with a latch or lock unless it is panic hardware or fire exit hardware.

Exception. A main exit, of a Group A use, in compliance with Section 1008.1.8.3
Exception 2.

If balanced doors are used and panic hardware is required, the panic hardware shall be of the push-pad type and the pad shall not extend more than one-half the width of the door measured from the latch side.

Reason: The IBC has a conflict between Section 1008.1.8.3 Exception 2 and the second paragraph of Section 1008.1.9. Section 1008.1.9 requires panic hardware on all egress doors serving a Group A having an occupant load of 100 or more. However, Section 1008.1.8.3 Exception 2 permits the use of key operated locking devices on the egress side of the main exit door where the occupant load is 300 or less. In applying conflict resolution from Section 102.1, it is difficult to determine which of these sections is a general requirement and which is a specific requirement nor can you readily determine which is the more restrictive. By adding this exception to the second paragraph of Section 1008.1.9 the code will be consistent with interpretations found in the IBC Q & A Application Guideline.

IBC-32-03 (Approved w/ ICC)

Revision to: Section 1804.2

Committee Action: Approved as Submitted

1804.2 Presumptive load-bearing values. The maximum allowable foundation pressure, lateral pressure or lateral sliding resistance values for supporting soils near the surface shall not exceed the values specified in Table 1804.2 unless data to substantiate the use of a higher value are submitted and approved.

Presumptive load-bearing values shall apply to materials with similar physical characteristics and dispositions.

Mud, organic silt, organic clays, peat or unprepared fill shall not be assumed to have a presumptive load bearing capacity unless data to substantiate the use of such a value are submitted.

EXCEPTION: A presumptive load-bearing capacity is permitted to be used where the building official deems the load-bearing capacity of mud, organic silt or unprepared fill is adequate for the support of lightweight and temporary structures.

Reason: The wording at or near the surface would lead one to believe that the soil bearing values of Table 1804.2 may be applied at the ground surface. Where as Section 1805.2 states as follows:

1805.2 Depth of footings. The minimum depth of footings below the undisturbed ground surface shall be 12 inches (305 mm). Where applicable, the depth of footings shall also conform to Sections 1805.2.1 through 1805.2.3.

IBC-33-03 (AZ Only)

Revise Section 1503.4

Committee Action: Approved as Submitted

[P] 1503.4 Roof drainage. Design and installation of roof drainage systems shall comply with Section 1503.4 and the *International Plumbing Code*.

1503.4.1 Gutters. Gutters and leaders placed on the outside of buildings, other than Group R-3 as applicable in Section 101.2, private garages and buildings of Type V construction, shall be of noncombustible material or a minimum of Schedule 40 plastic pipe.

1503.4.2 Where required. All roofs, paved areas, yards, courts and courtyards shall drain into a separate storm sewer system, or a combined sewer system, or to an approved place of disposal.

1503.4.3 Roof design. Roofs shall be designed for the maximum possible depth of water that will pond thereon as determined by the relative levels of roof deck and overflow weirs, scuppers, edges or serviceable drains in combination with the deflected structural elements. In determining the maximum possible depth of water, all primary roof drainage means shall be assumed to be blocked.

1503.4.4 Overflow drainage required. Overflow (emergency) roof drains or scuppers shall be provided where the roof perimeter construction extends above the roof in such a manner that water will be entrapped if the primary drains allow buildup for any reason.

1503.4.4.1 Separate systems required. Overflow roof drain systems shall have the end point of discharge separate from the primary system. Discharge shall be above grade, in a location, which would normally be observed by the building occupants or maintenance personnel.

1503.4.4.2 Overflow drains and scuppers. Where roof drains are required, overflow drains having the same size as the roof drains shall be installed with the inlet flow line located 2 inches (51 mm) above the low point of the roof, or overflow scuppers having three times the size of the roof drains may be installed in the adjacent parapet walls. Scuppers shall be sized to prevent the depth of ponding water from exceeding that for which the roof was designed as determined by the plumbing code. Scuppers shall not have an opening dimension of less than 4 inches (102 mm). The flow through the primary system shall not be considered when sizing the secondary roof drain system.

REASON: This is proposed as an Arizona only amendment to resolve the problem of using the UPC rather than the IPC. The I codes place roof drainage in the plumbing code. The U codes have drainage required in the UBC and piping system design is per the UPC and scuppers per the UBC. When the IBC is used with the UPC, there is a gaping hole in having sufficient requirements to obtain a safe roof drainage system.

New Section 1503.4.2 is from IPC 1101.2. Section 1503.4.3 is from IPC 1101.7. Section 1503.4.4 is from IPC 1107.1. Section 1503.4.4.1 is from IPC 1107.2. Section 1503.4.4.2 is a combination of IRC R903.4.1 and IPC 1107.3.

The text from the IRC provides the three times scupper sizing that existed in the UBC. Note that jurisdictions that have adopted the 2000 IPC without amendments will require overflow piping to be two times the size of the main piping but have no over sizing requirement for the scuppers. The 2003 no longer requires the overflow piping size to be doubled but still does not have the three times size for the scuppers.

Structural 2-02 (Resubmit to ICC)

Revision to: Table 1607.1 by adding new footnote I to item 27.

Committee Action: Approved as modified.

Proposal:

OCCUPANCY OR USE	UNIFORM (psf)	CONCENTRATED (lbs.)
27. Residential Uninhabitable attics without storage ⁱ (no other changes in item 27)		

i. For trussed systems, this live load need not be considered as acting simultaneously with other live loads imposed upon the ceiling framing or its supporting structure.

Reason: For temporary safety and construction load, not for the life of the structure. This issue has been addressed in a previous nationally recognized model code; therefore, setting a precedence on this issue.

Structural 5-02 (AZ only)

Revision to: Section 1704.5

Committee Action: Approved as submitted.

Proposal:

3. Masonry fences six feet or less in height above grade.
4. Masonry retaining walls four feet or less in height from bottom of footing to top of wall unless supporting a surcharge or impounding flammable liquids.

Reason: Exception 3 – No previous codes ever required special inspection for masonry fences 6 feet in height or less.

Exception 4 – Retaining walls 4 feet or less in height from bottom of footing to top of wall and not supporting a surcharge or flammable liquids are exempt from building permit requirement.

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IRC-3-01 (AZ only)

Revision to: TABLE R 301.4

Committee Action: Approved as Modified

USE	LIVE LOAD
Attics with storage ^{b,e}	20 40
Sleeping rooms	30 40

(No other changes to Table)

Reason: All habitable areas should be designed using the same design loads. Change is in line with industry standards. Local builders and designers support the change.

IRC-7-01 (Resubmit to ICC)**Revision to: R309.1****Committee Action: Approved as Modified**

R309.1 Opening protection. Openings from a private garage directly into a room used for sleeping purposes shall not be permitted. Other openings between the garage and residence shall be equipped with solid wood doors not less than 13/8 inch (35 mm) in thickness, solid or honeycomb core steel doors not less than 13/8 inches (35 mm) thick, or 20-minute fire-rated doors. Doors providing opening protection shall be self-closing and self-latching.

Committee Reason: These doors should be maintained self closing and latching at all times.

IRC-9-01 (AZ only)**Revision to: APPENDIX****Committee Action: Approved as Modified**

102.5 Appendices. Provisions in the appendices shall not apply unless specifically adopted. The following appendices are adopted:
 Appendix A SIZING AND CAPACITIES OF GAS PIPING
 Appendix B SIZING OF VENTING SYSTEMS SERVING APPLIANCES EQUIPPED WITH DRAFT HOODS, CATEGORY I APPLIANCES, AND APPLIANCES LISTED FOR USE AND TYPE B VENTS
 Appendix C EXIT TERMINALS OF MECHANICAL DRAFT AND DIRECT-VENT VENTING SYSTEMS
 Appendix D RECOMMENDED PROCEDURE FOR SAFETY INSPECTION OF AN EXISTING APPLIANCE INSTALLATION
 Appendix H PATIO COVERS
 Appendix J EXISTING BUILDINGS AND STRUCTURES
 Appendix K SOUND TRANSMISSION

Reason: Comply with State and Federal laws.

IRC-11-01 (AZ only)**Revision to: M1307.6****Committee Action: Approved as Submitted**

Add new text as follows:

M1307.5 Liquefied Petroleum Appliances. LPG appliances shall not be installed in an attic, pit or other location that would cause a ponding or retention of gas.

Reason: Due to the nature of LP gas, being heavier than air, it should be a function of design to eliminate the hazard of gas being trapped. The attic location is a hazard due to the gas settling in insulated frame bays and the probability of an ignition source igniting the gas fuel. Any pit will hold LP gas until an appliance or other ignition source causes a fire or explosion.

Related sections include G2406.2 and M1703.2
 This also provides consistency with the State plumbing code.

IRC-12-01 (AZ only)**Revision to: G2406.2****Committee Action: Approved as Modified**

Add new item 5 text after the exceptions as follows:

5. Liquefied Petroleum Appliances. LPG appliances shall not be installed in an attic, pit or other location that would cause a ponding or retention of gas.

Reason: To make text compatible with change to Section M1307.5 and to clarify that the exceptions do not apply to this text. This also provides consistency with the State plumbing code.

IRC-27-02 (Approved w/ ICC for 2004 Supplement)

Revision to: Section R320.1

Committee Action: Approved as Modified

Proposal: R320.1 Subterranean termite control. In areas designated as “slight to moderate”, “moderate to heavy” and “very heavy”, as established by Table R301.2(1), methods of protection shall be by chemical soil treatment, pressure preservative treated wood in accordance with the AWPA standards listed in Section R319.1, naturally termite-resistant wood, or physical barriers (such as metal or plastic termite shields), or any combination of these methods.

Reason: The first revision is due to the fact that “favorable to termite damage” is not defined. The table number revision is editorial. The final revision delete the last part of the sentence, is due to the fact that it just isn’t necessary. These specified treatments stand alone as acceptable, and are not intended to work in combination with one another to become effective.

IRC-35-02 (Approved w/ ICC for 2004 Supplement)

Revision to: Section M1403.2

Committee Action: Approved as Modified

Proposal: M1403.2 Foundations and supports. Supports and foundations for the outdoor mechanical systems shall be raised at least 3 inches (76 mm) above the finished grade, and shall conform to the manufacturer’s installation instructions.

Reason: It is necessary to protect all outdoor equipment from problems associated with grade level installations, not just heat pumps.

IRC-41-02 (AZ only)

Revision to: Section G2415.9

Committee Action: Approved as Modified

Proposal: G2415.9 (404.9) Minimum burial depth. Underground piping systems shall be installed a minimum depth of 12 inches (305 mm) below grade for metal piping and 18 inches (457mm) for plastic piping.

Reason: The distinction between metal piping and plastic piping in regards to burial depth is because the plastic piping is more susceptible to damage and needs the increased depth for protection.

The elimination of the section addressing individual outside appliances is because the risks are the same whether the line serves multiple appliances or a single appliance. With similar risks, similar depths should be required.

IRC-42-02 (Approved w/ ICC for 2004 Supplement)

Revision to: R310.1 Emergency escape and rescue openings

Committee Action: Approved as submitted.

Proposal: Add another sentence at the end of the paragraph to read as follows:

Such openings shall open directly into a public street, public alley, yard or court.

Reason: This is the same language that is in IBC Section 1025.1. Without this requirement the emergency escape and rescue window could open into a carport or enclosed patio.

IRC-44-02 (Approved w/ ICC for 2004 Supplement)

Revision to: P2503.6 Water supply system testing

Committee Action: Approved as submitted.

Water-supply system testing. Upon completion of a section of or the entire water supply system, the system, or portion completed, shall be tested and proved tight under a water pressure not less than the working pressure of the system; or, for piping systems other than plastic, by an air test of not less than 50 psi (344kPa). This pressure shall be held for at least 15 minutes. The water utilized for tests shall be obtained from a potable source of supply.

Reason: A specific length of time has been an industry standard practice and 15 minutes would allow sufficient time to determine that there are no leaks.

IRC-45-02 (Resubmit to ICC)

Revision to: P3103.1 Plumbing vent termination

Committee Action: Approved as submitted.

Proposal: P3103.1 Roof Extension. All open vent pipes which extend through a roof shall be terminated at least 6 inches above the roof or 6 inches above the anticipated snow accumulation, whichever is greater, except that where a roof is to be used for any purpose other than weather protection, the vent extensions shall be run at least 7 feet (2134 mm) above the roof.

Reason: For the sake of uniformity and continuity, a single number should be used by all jurisdictions. The 6" number comes from Section 906.1 of the 1994 Uniform Plumbing Code and would not constitute a change from the existing rules. The 7 feet above roofs used for other than weather protection comes from Section 906.3 of the 1994 Uniform Plumbing Code and indicates that this section is a logical one from which to select a number.

Structural 1-02 (Approved w/ ICC)

Revision to: Sections R401.5 & R401.4.2

Committee Action: Approved as modified.

Proposal: Add a new section.

R401.4.2 Compressible or shifting soil. In lieu of a complete geotechnical evaluation, when top or subsoils are compressible or shifting, such soils shall be removed to a depth and width sufficient to

assure stable moisture content in each active zone and shall not be used as fill or nor stabilized within each active zone by chemical, dewatering, or presaturation.

Reason: Section renumbered for clarity. The reason for rewording R401.5 is that many soils investigation reports classify bearing soils as compressible and design procedures exist for designing foundations on compressible soils (e.g., PTI Design and Construction of Post Tensioned Slabs-On-Ground). Thus, it is not necessary for all compressible soils to be removed; rather, it is the decision of the geotechnical engineer as to the best course of action to deal with any compressible soils. Also, it appears that the intent of this section is to avoid construction on unstable, shifting, and/or collapsible soils, such as quicksand, hydro-collapsible soils, landslides, etc.

Structural 3-02 (Approved w/ ICC)

Revision to: Table R301.5

Committee Action: Approved as modified.

Proposal: Revise Table by adding footnote "g":

USE	LIVE LOAD
Attics without storage ^{b, e, g}	10

(No other changes to Table)

g. For trussed systems, this load need not be considered as acting simultaneously with other live loads imposed upon the ceiling framing or its supporting structure.

Reason: For temporary construction and service load, not for the life of the structure. This issue has been addressed in a previous nationally recognized model code: therefore, setting a precedence on this issue.

IRC-53-03 (Approved w/ ICC for 2004 Supplement)

Revision to: Section R202

Committee Action: Approved as Modified

R202 DEFINITIONS

EXTERIOR WALL. An above-grade wall that defines the exterior boundaries of a building. Includes between floor spandrels, peripheral edges of floors, roofs and basement knee walls, dormer walls, gable end walls, walls enclosing a mansard roof, and basement walls with an average below grade wall area that is less than 50 percent of the total opaque and non-opaque area of that enclosing side.

Reason: Section R302 provides for the fire protection of exterior walls. If walls are defined as only enclosing conditioned space, garage walls or dwelling walls that do not enclose conditioned space would be exempt from fire protection requirements.

IRC-54-02 (Approved w/ ICC for 2004 Supplement)

Revision to: Section M1411.3.1

Committee Action: Approved as Modified

M1411.3.1 Auxiliary and secondary drain systems. In addition to the requirements of Section M1411.3, a secondary drain or auxiliary drain pan shall be required for each cooling or evaporator coil where damage to any building components will occur as a result of overflow from the equipment drain pan or stoppage in the condensate drain piping. Such piping shall maintain a minimum horizontal slope in the direction of discharge of not less than one-eighth unit vertical in 12 units horizontal (1-percent slope). Drain piping shall be a minimum of 3/4-inch (19.1 mm) nominal pipe size. One of the following methods shall be used:

(The remainder of the section to remain unchanged.)

Reason: This inserts the necessary prescriptive language that will provide proper discharge for condensing liquid. It also aligns the IRC with the same requirement shown in the International Mechanical Code Section 307.1.

IRC –55-03 (Resubmit to ICC)

Revision to Table R1003.1

Committee Action: Approved as Modified

TABLE R1003.1
SUMMARY OF REQUIREMENTS FOR MASONRY FIREPLACES AND CHIMNEYS

ITEM	LETTER ^a	REQUIREMENTS	SECTION
Hearth slab thickness	A	4"	R1003.9.1
Hearth extension (each side of opening)	B	8" fireplace opening < 6 sq. ft. 12" fireplace opening ≥ 6 sq. ft. R1003.10	
Hearth extension (front of opening)	C	16" fireplace opening < 6 sq. ft. R1003.10 20" fireplace opening ≥ 6 sq. ft.	
Hearth slab reinforcing	D	Reinforced to carry its own weight and all R1003.9 imposed loads.	
Thickness of wall of firebox	E	10" solid brick or 8" where a firebrick lining is used. Joints in firebrick 1/4" max.	R1003.5
Distance from top of opening to throat	F	8"	R1003.7
Smoke chamber wall thickness unlined walls	G	6" for lined walls 8" for unlined walls	R1003.8
Chimney Vertical reinforcing ^b	H	Four No. 4 full-length bars for chimney up to R1003.3.1 40" wide. Add two No. 4 bars for each additional 40" or fraction of width or each additional flue	
Horizontal reinforcing ^b	J	¼-inch ties at each 18 inches and two ties at R1003.3.2 each bend in vertical steel	
Bond beams	K	No specified requirement	
Fireplace lintel	L	Noncombustible material.	R1003.7
Chimney walls with flue lining	M	Solid masonry units or hollow masonry units grouted solid with at least 4 inch nominal thickness.	R1001.7
Walls with unlined flue	N	8" solid masonry.	
Distances between adjacent flues	-	See Section R1001.10.	
Effective flue area (based on area of fireplace opening)	p	See Section R1001.12.	
Clearances: Combustible material Mantel and trim Above roof	R	See Sections R1001.15 and R003.12. See Section R1001.13. 3' at roofline and 2' at 10'.	
Anchorage ^b Strap Number Embedment into chimney Fasten to Bolts	S	3/16" x 1" R1003.4.1 Two 12" hooked around outer bar with 6" extension 4 joists Two 1/2" diameter.	

Footing Thickness Width	T	12" min. 6" each side of fireplace wall.	<u>R1003.2</u>
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For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm, 1 square foot = 0.0929 m².

NOTE: This table provides a summary of major requirements for the construction of masonry chimneys and fireplaces. Letter references are to Figure R 1003.1, which shows examples of typical construction. This table does not cover all requirements, nor does it cover all aspects of the indicated requirements. For the actual mandatory requirements of the code, see the indicated section of text.

- b. The letters refer to Figure R 1003.1.
- c. Not required in Seismic Design Category A, B or C.

Reason: This proposal will create uniformity and will delete conflicts between IRC Table R1003.1 and IBC Table 2111.1 In addition, the following errors to table R1003.1 have been corrected:

**Chimney, Vertical reinforcing
Horizontal reinforcing
Bond beam requirement
Add footnote "b" to horizontal reinforcing**

Add "Section" column to have the same format as IBC Table 2111.1

IRC-59-03 (Resubmit to ICC)

Revision to Section P2803.6.1

Committee Action: Approved as Submitted

Proposal: Revise as follows:

P2803.6.1 Requirements of discharge pipe. The outlet of a pressure relief valve, temperature relief valve or combination thereof, shall not be directly connected to the drainage system. The discharge from the relief valve shall be piped full size separately to the floor, to the outside of the building or to an indirect waste receptor located inside the building. In areas subject to freezing, the relief valve shall discharge through an air gap into an indirect waste receptor located within a heated space, or by other approved means. The discharge shall be installed in a manner that does not cause personal injury or property damage and that is readily observable by the building occupants. The discharge from a relief valve shall not be trapped. The diameter of the discharge piping shall not be less than the diameter of the relief valve outlet. The discharge pipe shall be installed so as to drain by gravity flow and shall terminate atmospherically not less than 6 inches (152mm) nor more than 24 inches (610 mm) above the floor or finish grade. The outlet end of the discharge pipe shall not be threaded or have a valve installed.

Reason: This code section speaks to both interior and exterior discharge of relief valves, but the termination seems to only address what was intended for interior locations. The possibility of the termination to occur "at grade", which is now currently allowed, would have the unintended effect of concealing any discharge that might occur, or of plugging the discharge line. Requiring it to be a "minimum" of 6 inches (152 mm) above grade would resolve this. The 24 inch (610 mm) maximum height will assure that possible scalding water under pressure will not injure individuals in near proximity.

2003 INTERNATIONAL FUEL GAS CODE**No Changes****2003 INTERNATIONAL MECHANICAL CODE****No Changes****2003 International Plumbing Code**

IPC-1-01 (AZ only)

Revision to: 101**Committee Action: Approved as Submitted****Add a new section 101.5 to read as follows:****101.5 Appendices.** Provisions in the appendices shall not apply unless specifically adopted.**Reason:** This provision is included in all the other International codes and needs to be included in the International Plumbing Code to maintain uniformity among the codes.

IPC-3-03 (Approved w/ ICC)

Revision to Section 312.5**Committee Action: Approved as Submitted****Proposal: Revise Section 312.5 as follow:****312.5 Water-supply system test.** Upon completion of a section of or the entire water supply system, the system, or portion completed, shall be tested and proved tight under a water pressure not less than the working pressure of the system; or, for piping systems other than plastic, by an air test of not less than 50 psi (344kPa). This pressure shall be held for at least 15 minutes. The water utilized for tests shall be obtained from a potable source of supply. The required tests shall be performed in accordance with this section and Section 107.**Reason:** All other tests specified in Section 312, whether Drainage and vent water test under Section 312.2, Drainage and vent air test under Section 312.3, Drainage and vent final test under Section 312.4, Gravity sewer test under Section 312.6 or Forced sewer test under Section 312.7, require 15 minute duration for the respective tests. This is sufficient time to determine that a leak is not present and would provide consistency within the testing section.

IPC-4-03 (Resubmit to ICC)

Revision to Section 504.6.1**Committee Action: Approved as Submitted****Proposal: Revise Section 504.6.1 as follow:**

504.6.1 Discharge. The relief valve shall discharge full size to a safe place of disposal such as the floor, outside the building, or an indirect waste receptor. The discharge pipe shall not have any trapped sections and shall have a visible air gap or air gap fitting located in the same room as the water heater. The outlet end of the discharge pipe shall not be threaded and such discharge pipe shall not have a valve or tee installed. Relief valve piping shall be piped independent of other equipment drains or relief valve discharge piping to the disposal point. Such pipe shall be constructed so as to discharge in a downward direction, and shall terminate not less than 6 inches (152 mm) and not more than 24 inches (610 mm) above the finish surface or grade.

Reason: This prescriptive language removes the need to interpret what is intended by “shall be installed in a manner that does not cause personal injury to occupants in the immediate area...”. This is wide open for interpretation and discretion. The means and heights of the drain discharge also matches what is currently prescribed for drain pans in P504.7.2. Why should drain pans be specific and relief valve discharges, which relieve under pressure, be left open to interpretation?

DRAFT

Maricopa Association of Governments Building Code Amendments and Standards Manual BCAS #H15	
Title: 2002 AZBO NEC Amendment Package	 MARICOPA ASSOCIATION of GOVERNMENTS BCAS Manual Historical Archive
Originally Reviewed by MAG Building Codes Committee: 3/17/2004	
Archived to Historical Section by MAG Building Codes Committee: 6/20/2012	

At the March 17, 2004, Building Codes Committee meeting, the Committee reviewed the AZBO Amendment Package to the 2002 NEC.

At the June 20, 2012 Building Codes Committee meeting, the Committee reviewed the original document. The Committee determined that the topics covered in the amendment package have been addressed in recent codes. The Committee voted unanimously to move this document to the Historical Archive.

DRAFT

Resolution

WHEREAS The Maricopa Association of Governments Building Codes Committee (heretofore referred to as the "Committee") approved the amendments to the 2002 edition of the National Electrical Code (heretofore referred to as the "Code") with the intent to promote and present a uniform set of electrical codes and amendments for jurisdictions within Maricopa County AND;

WHEREAS Sections 312.5 and 314.17 of the 2002 NEC (E3807.7 and E3806.1.1 of the 2003 IRC), that addresses cabinets, boxes and conduit bodies and the entry of said cabinets, boxes and conduit bodies by cables and conduit, have been in existence for at least two code cycles and requires the enclosure of openings through which cables enter a cabinet, box or conduit body, requires that nonmetallic cables be permitted to enter the top of a surface mounted enclosure only and that the nonmetallic cable be protected at points of entry into a cabinet, box, or conduit body from damage and abrasion, where cables are used, each cable shall be secured to the cabinet, cutout box or meter socket enclosure and has been largely ignored by installers and enforcers in the State of Arizona to this point in time AND;

WHEREAS a code change proposal has been submitted to the Code Making Panel of NFPA to validate the method of installation traditionally occurring in this region AND;

WHEREAS that code change proposal, 9-12 Log #463, was rejected by the Code Making Panel; AND

WHEREAS the immediate and strict adherence to and enforcement of in their entirety Sections 312.5 and 314.17 of the 2002 NEC (E3807.7 and E3806.1.1 of the 2003 IRC) would pose a change in standard practice in this region and both industry and the enforcement community would benefit from a "phase-in" or transition period;

BE IT SO RESOLVED by the Committee that Sections 312.5 and 314.17 of the 2002 NEC (E3807.7 and E3806.1.1 of the 2003 IRC) shall be enforced in their entirety so that each cable will be secured to the cabinet, cutout box or meter socket enclosure where it enters. This resolution shall have an effective date of April 1, 2005.

2002 National Electrical Code & 2003 International Residential Codes (Electrical Section)

NEC-1-04 (AZ Only)

Revision to NEC Article 250.118

250.118. Types of Equipment Grounding Conductors

The equipment grounding conductor run with or enclosing the circuit conductors shall be one or more or a combination of the following:

1. A copper, aluminum, or copper-clad aluminum conductor. This conductor shall be solid or stranded; insulated, covered, or bare; and in the form of a wire or a busbar of any shape.
2. Threaded Rigid metal conduit and fittings.
3. Threaded Intermediate metal conduit and fittings.
4. Electrical metallic tubing.
5. Flexible metal conduit with an individual equipment grounding conductor and where both the conduit and fittings are listed for grounding.
6. Listed flexible metal conduit that is not listed for grounding and meeting all the following conditions.
 - a. The conduit is terminated in fittings listed for grounding.
 - b. The circuit conductors contained in the conduit are protected by overcurrent devices rated at 20 amperes or less.
 - c. The combined length of flexible metal conduit and flexible metallic tubing and liquidtight flexible metal conduit in the same ground return path does not exceed 6 ft (1.83 m).
 - d. The conduit is not installed for flexibility.
7. Listed liquidtight flexible metal conduit meeting all the following conditions.
 - a. The conduit is terminated in fittings listed for grounding.
 - b. For trade sizes 3/8 in. through 1/2 in., the circuit conductors contained in the conduit are protected by overcurrent devices rated at 20 amperes or less.
 - c. For trade sizes 3/4 in. through 1 1/4 in., the circuit conductors contained in the conduit are protected by overcurrent devices rated not more than 60 amperes and there is no flexible metal conduit, flexible metallic tubing, or liquidtight flexible metal conduit in trade sizes 3/8 in. or 1/2 in. in the grounding path.
 - d. The combined length of flexible metal conduit and flexible metallic tubing and liquidtight flexible metal conduit in the same ground return path does not exceed 6 ft (1.83 m).
 - e. The conduit is not installed for flexibility.
8. Flexible metallic tubing where the tubing is terminated in fittings listed for grounding and meeting all the following conditions.
 - a. The circuit conductors contained in the tubing are protected by overcurrent devices rated at 20 amperes or less.
 - b. The combined length of flexible metal conduit and flexible metallic tubing and liquidtight flexible metal conduit in the same ground return path does not exceed 6 ft (1.83 m).
9. Armor of Type AC cable as provided in Section 333-21.
10. The copper sheath of mineral-insulated, metal-sheathed cable.
11. The metallic sheath or the combined metallic sheath and grounding conductors of Type MC cable with an individual equipment grounding conductor.
12. Cable trays as permitted in Sections 318-3(c) and 318-7.
13. Cablebus framework as permitted in Section 365-2(a).
14. Other electrically continuous metal raceways listed for grounding.

Reason: For reasons of extreme temperature fluctuations found throughout the State causing expansion and contraction of the metal conduit separating the non-threaded type fittings. This will eliminate the equipment grounding connection and therefore preventing a low impedance path to clear a ground fault. This situation would either set up a shock hazard or a fire hazard.

Additional Supporting Information:

SUBJECT: Technician Electrocuted While Performing
Maintenance on a Walk-In Cooler in Virginia
CAUSE: Electrocution

SUMMARY: On August 20, 1991, a 33-year-old male employed as a heating, ventilating, air-conditioning, and refrigeration (HVACR) technician, was electrocuted while performing refrigeration maintenance on a walk-in cooler at a restaurant.

The flexible metal conduit housing the power conductors to the refrigeration unit (RU) of the cooler had been designed to serve as the mechanical ground. The insulation on one of the three power conductors in the flexible conduit was damaged and allowed electrical arcing to a conduit connector on the RU starter box. The conduit connection from the RU to the RU starter box was loose, and effectively disconnected the mechanical ground from the RU. As the victim was servicing the RU, the temperature in the walk-in cooler must have caused the thermostat to close the starter, energizing the surfaces of the RU, and fatally shocking the technician when he touched it. NIOSH investigators concluded that to prevent similar occurrences, employers should:

- o require that all electrical equipment be de-energized before any electrical repairs are performed
- o provide a mechanical grounding conductor as part of the power feed to an appliance whenever possible
- o provide ground-fault protection as part of the power feed to an appliance whenever possible
- o provide employees with education and training in the recognition, avoidance, and prevention of unsafe work conditions.

NEC-2-04 (AZ Only)**Revision to IRC Section E3808.8**

E3808.8 Types of equipment grounding conductors. The equipment grounding conductor run with of enclosing the circuit conductors shall be one or more or a combination of the following:

(No changes to Section with the exception of the following deletions):

2. Threaded rigid metal conduit and fittings.
3. Threaded intermediate metal conduit and fittings.
4. ~~Electrical metallic tubing.~~
5. ~~Flexible metal conduit, where both the conduit and fittings are listed for grounding.~~

Reason: For reasons of temperature fluctuations found throughout the State causing expansion and contraction of the metal conduit. See amended Section 250.118 coordination of NEC to IRC.

NEC-3-04 (Directive)**Revision NEC Article 210.8 (a) & (b)**

210.8. Ground-Fault Circuit-Interrupter Protection for Personnel

FPN: See Section 215.9 for ground-fault circuit-interrupter protection for personnel on feeders.

(No changes to Article with the exception of the following revisions):

(A) Dwelling Units. All 125-volt, single-phase, 15- and 20-ampere receptacles installed in the locations specified in (1) through (8) shall have ground-fault circuit-interrupter protection for personnel.

~~(7) Wet bar sinks. Where the receptacles are installed to serve the countertop surfaces and are located within 1.8 m (6 ft) of the outside edge of the wet bar sink.~~ Convenience receptacles located within 1.8 m (6 ft) of any sink, wash basin, tub, or shower.

(B) Other than Dwelling Units. All 125-volt, single-phase, 15- and 20-ampere receptacles installed in the locations specified in (1) ~~, (2), and (3)~~ through (5) shall have ground-fault circuit-interrupter protection for personnel.

(4) Convenience receptacles located within 1.8 m (6 ft) of any sink, wash basin, tub, or shower.

(5) Outdoors.

Reason: Possibility of personnel coming in contact with electrical appliances that are in contact with wet conditions creating the possibility for electrocution.

Additional supporting information:

These are NIOSH reports:
FACE: 84WV17

SUBJECT: Electrocution in a Fast Food Restaurant
CAUSE: Electrocution

SUMMARY: On June 30, 1984, at about 1:05 A.M., an 18-year-old male employee with 15 months experience at a fast food restaurant was electrocuted while plugging a portable electric toaster into a 110 volt/20 amp receptacle.

A the time of the incident, employees had closed the restaurant and damp-mopped the floors. About 5 to 10 minutes after mopping, the victim was in the process of plugging the toaster into a floor outlet when he received the shock. The assistant manager and other employees were elsewhere and did not see the victim. The assistant manager heard a scream and investigated. The assistant manager and the other workers then found the victim with one hand on the plug, the other hand wrapped around the receptacle box, and with his face on top of the outlet. An employee tried to take the victim's pulse but was shocked. The assistant manager went to the breaker box to open the breaker for that circuit, but could not find the specific breaker. He then called the emergency squad, returned to the box and found the right breaker. The victim had by then been in contact with the current for 3 to 8 minutes. An employee checked the victim's pulse and found a very rapid radial pulse. The employee and assistant manager then unlocked the front door and placed another call to the rescue squad. The employee checked the victim's pulse again and found none. An employee living nearby arrived and started CPR, which was continued by the rescue squad upon its arrival. CPR was administered for 1.5 hours. The victim was DOA at the local hospital. Two different electricians later evaluated the circuit and found no serious problems. It is surmised that while holding the plug, the victim's right hand slipped forward to make contact through the index finger to the energized prong. With his left hand holding the spring-loaded cover open, a current path through the arms, chest, and heart would be established from the prong to the ground. After the accident the employer required employees to open circuits at the breaker box before plugging and unplugging equipment. This strategy is not recommended because it relies on positive human action and places excessive wear on the breakers. Recommendations:

o Ground Fault Circuit Interrupter Breakers (GFCI's) would have interrupted the circuit before sufficient current had passed to cause physical damage to the body. They are recommended as the best solution.

- o The location and design of the receptacle, the design of the plug, and the recent mopping contributed to the incident.
- o CPR should be initiated when an unstable pulse is detected, rather than later when no pulse is found.

FACE: 86NC43

SUBJECT: 25-Year-Old Restaurant Manager |
Electrocuted in North Carolina
CAUSE: Electrocution

SUMMARY: On August 3, 1986, a 25-year-old male restaurant manager was cleaning the floor of the kitchen when he came in contact with a refrigerator that had a ground fault. The manager was electrocuted.

The restaurant was closed and the manager's wife and 2-year-old daughter were in the dining area waiting for him to finish. The victim, who was wearing tennis shoes, put soap and water on the floor. He slipped and grabbed the handle of a commercial refrigerator. The refrigerator had a ground fault and was not grounded -- the cord did not have a ground prong. The ground fault was apparently caused by excessive wear on the insulation of the conductors (wires) supplying power to the compressor. The conductors were exposed at a cut-out hole in the case of the refrigerator, were not protected from abrasion, and were not protected by strain relief. The victim's wife heard a noise in the kitchen. She successfully pulled the victim from the refrigerator into the dining area, though she was shocked in the process. She summoned help and began CPR, but to no avail. Recommendations:

- o All electrical equipment (such a refrigerators) should be designed and maintained to comply with all applicable requirements of the National Electrical Code. In this case the defects in the refrigerator apparently developed over time and were not recognized as hazardous. The refrigerator was bought used and the owner had no owner's manual.
- o Restaurant owners and managers should be encouraged to conduct formalized safety training for all restaurant employees.
- o All electrical receptacles (outlets) in restaurant kitchens should be protected by ground fault circuit interrupters. See NIOSH ALERT (85-104).

NEC-4-04 (Directive)

Revision to IRC Section E3802.7

E3807.2 ~~Bar sink receptacles~~ Sink, wash basin, tub, or shower receptacles. All 125-volt, single-phase, 15- and 20-ampere convenience receptacles that ~~serve a countertop surface, and~~ are located within 6 feet (1829 mm) of the outside edge of ~~a wet bar~~ any sink, wash basin, tub, or shower shall have ground-fault circuit-interrupter protection for personnel.

Reason: Possibility of personnel coming in contact with appliances that are in contact with wet conditions creating the possibility for electrocution. See amended Section 210.8, this will coordinate the NEC and IRC.

NEC-5-04 (AZ Only)

Revision to NEC Article 310.15 (b)(6) & NEC Table 310.15 (b)(6)

- (6) 120/240-Volt and 120/208-Volt, 3-Wire, Single-Phase Dwelling Services and Feeders. For dwelling units, conductors, as listed in Table 310-15(b)(6), shall be permitted as 120/240-volt and 120/208 volt, 3-wire, single-phase-service-entrance conductors, service lateral conductors, and feeder conductors that serve as the main power feeder to a dwelling unit and are installed in raceway or cable with or without an equipment grounding conductor. For application of this section, the main power feeder shall be the feeder(s) between the main disconnect and the lighting and appliance branch-circuit panelboard(s). The feeder conductors to a dwelling unit shall not be required to be larger than their service-entrance conductors. The grounded conductor shall be permitted to be smaller than the ungrounded conductors, provided the requirements of Sections 215-2, 220-22, and 230-42 are met.

Table 310-15(b)(6). Conductor Types and Sizes for 120/240-Volt and 120/208-Volt, 3-Wire, Single-Phase Dwelling Services and Feeders.

Copper	Aluminum or Copper-Clad Aluminum	Service or Feeder Rating (Ampere)	Service or Feeder Rating (Amperes)	
			≤ 30°C (86°F)	> 30°C 86°F)
4	2	400	100	
3	1	110	110	
2	1/0	125	125	100
1	2/0	150	150	125
1/0	3/0	175	175	150
2/0	4/0	200	200	175
3/0	250	225	225	200
4/0	300	250	250	225
250	350	300	300	250
350	500	350	350	300
400	600	400	400	350
500	750			400

FPN: for single-phase panels feed from a 3-phase system, the grounded conductor cannot be reduced in size for a 120/208-volt system, see 220.22

Reason: Clarification to include 120/208-volt Single-Phase systems and ambient correction to Table for temperature conditions found throughout the State. These correction factors are already in the NEC at the bottom of Table 310.16.

NEC-6-04 (AZ Only)

Add New Article to NEC:

230.63. Location. All service equipment rated 1000 amperes or more located inside a building shall be enclosed within a room or space separated from the rest of the building by not less than one-hour fire-resistive occupancy separation or fire barrier installed in compliance with the building code.

Reason: For coordination with Utility company requirements. This will be proactive to the customer, catching this at plan review will prevent the customer from being refused Utility Service at final if they have Service Equipment 1000 amperes and larger inside of the building and not enclosed in a one-hour room.

NEC-7-04 (Directive)

Revision to NEC Articles 334.10 & 334.12

334.10 Uses Permitted. Type NM, Type NMC, and Type NMS cables shall be permitted to be used in the following:

1. One- and two-family dwellings, multifamily dwellings, and other residential accessory structures
- (b) 2. ~~Multifamily dwellings permitted to be Types III, IV, And V construction except as prohibited in 334.~~

(Items 3 & 4 to remain the same)

334.12. Uses Not Permitted.

(A) Types NM, NMC, and NMS. Types NM, NMC, and NMS cables shall not be used as follows:

(Item 1 remains the same)

- ~~2. As service entrance cable~~
- ~~3. In commercial garages having hazardous (classified) locations as provided in Section 511-3~~
- ~~4. In theaters and similar locations, except as provided in Article 518.4.~~
- ~~5. In motion picture studios~~
- ~~6. In storage battery rooms~~
- ~~7. In hoistways or on elevators or escalators.~~
- ~~8. Embedded in poured cement, concrete, or aggregate~~
9. In hazardous (classified) locations, except as permitted in the following:
 - a. 501.4(B) Exception
 - b. 502.4(B) Exception No.1
 - e. 504.20

(Item 10 to remain the same)

Reason: For clarification; Items deleted seem to identify occupancies other than Dwelling type structures would not be allowed to use this type of wiring method. This will clarify that this type of wiring method shall only be used in Dwelling type occupancies.

NEC-8-04 (Directive)

Revision to NEC Articles 358.10 & 358.12

358.10 Uses Permitted

(B) Corrosion Protection. Ferrous or nonferrous EMT, elbows, couplings, and fittings shall be permitted to be installed in concrete ~~;~~ that is not in direct contact with the earth ~~;~~ or in areas subject to severe corrosive influences where protected by corrosion protection and judged suitable for the condition.

358.12 Uses Not Permitted. EMT shall not be used under the following conditions:

(Items 1 through 6 to remain the same)

(7) On or below grade.

Reason: For clarification, EMT fittings are not approved to be installed on or below grade. 110.3(B) requires listed and labeled equipment to be installed per the manufacturer's installation instructions, there is currently no EMT fittings listed for direct burial. Table 300.5 identifies minimum cover for buried wiring methods, this table does not identify depth requirements for EMT.

NEC-9-04 (AZ Only)

Revision to NEC Article 501.16 (B)

501.16 (B) Types of Equipment Grounding Conductors.
(Article remains the same, delete exception):

~~Exception: In class I, Division 2 locations, the bonding jumper shall be permitted to be deleted where all the following conditions are met.~~

- ~~(a) Listed liquidtight flexible metal conduit 1.8 m (6 ft) or less in length, with fittings listed for grounding, is used.~~
- ~~(b) Overcurrent protection in the circuit is limited to 10 amperes or less.~~
- ~~(c) The load is not a power utilization load.~~

Reason: For coordination with Amendment to NEC Article 250.118

NEC-10-04 (AZ Only)

Revision to NEC Article 502.16

502.16 (B) Types of Equipment Grounding Conductors.
(Article remains the same, delete exception):

~~Exception: In class II, Division 2 locations, the bonding jumper shall be permitted to be deleted where all the following conditions are met.~~

- ~~(a) Listed liquidtight flexible metal conduit 1.8 m (6 ft) or less in length, with fittings listed for grounding, is used.~~
- ~~(b) Overcurrent protection in the circuit is limited to 10 amperes or less.~~
- ~~(c) The load is not a power utilization load.~~

Reason: For coordination with Amendment to NEC Article 250.118

NEC-11-04 (AZ Only)

Revision to NEC Article 503.16 (B)

503.16 (B) Types of Equipment Grounding Conductors.
(Article remains the same, delete exception):

~~Exception: In class III, Division 1 and 2 locations, the bonding jumper shall be permitted to be deleted where all the following conditions are met.~~

- ~~(a) Listed liquidtight flexible metal conduit 1.8 m (6 ft) or less in length, with fittings listed for grounding, is used.~~
- ~~(b) Overcurrent protection in the circuit is limited to 10 amperes or less.~~
- ~~(c) The load is not a power utilization load.~~

Reason: For coordination with Amendment to NEC Article 250.118

NEC-12-04 (AZ Only)**Revision to IRC Table E3503.1**

Revise Table as Follows (Minimum Grounding Electrode Conductor Size to remain the same)

CONDUCTOR TYPES AND SIZES-THHW, THW, THWN, USE, XHHW (Parallel sets of 1/0 and larger conductors are permitted in either a single raceway or in separate raceways)		Allowable Ampacity	Service or Feeder Rating (Amperes)	
Copper (AWG)	Aluminum and copper-clad aluminum (AWG)	Maximum Load (Amps)	≤30°C (86°F)	> 30°C (86°F)
4	2	100	100	
3	1	110	110	
2	1/0	125	125	100
1	2/0	150	150	125
1/0	3/0	175	175	150
2/0	4/0	200	200	175
	or two sets of 1/0			
3/0	250 kcmil or two sets of 2/0	225	225	200
4/0	300 kcmil or two sets of 3/0	250	250	225
250 kcmil or two sets of 2/0	350 kcmil or two sets of 4/0	300	300	250
350 kcmil or two sets of 3/0	500 or two sets of 250 kcmil	350	350	300
400 kcmil or two sets of 4/0	600 or two sets of 300 kcmil	400	400	350
500 kcmil	750 kcmil			400

Reason: Coordination with Amendment to NEC table 310.15 (b)(6).

Maricopa Association of Governments Building Code Amendments and Standards Manual BCAS #H16	
Title: AZBO Code Review and Development Committee amendments to the 2006 ICC Codes	 MARICOPA ASSOCIATION of GOVERNMENTS BCAS Manual Historical Archive
Originally Reviewed by MAG Building Codes Committee: 11/21/2006	
Archived to Historical Section by MAG Building Codes Committee: 6/20/2012	

At the November 21, 2006, Building Codes Committee meeting, the Committee reviewed the AZBO Code Review and Development Committee amendments to the 2006 codes.

At the June 20, 2012, Building Codes Committee meeting, the Committee reviewed the original document. The Committee voted unanimously to move this document to the Historical Archive.

DRAFT

AZBO Code Review and Development Committee

AZBO ICC Code Committee Amendments recommended for the 2006 I - Codes

This report is a two year compilation of the AZBO amendments to the 2006 ICC codes that the Code Review and Development Committee have recommended to be included with the 2006 ICC codes to assist those jurisdictions in the adoption of the 2006 ICC codes. In addition, previous amendments that were not successful in the ICC code change process have been deleted. The items noted as "AZ only" have been determined by the committee to be items unique to Arizona in accordance with the guidelines approved by the AZBO Board of Directors.

The items are identified by the initials of the affected code, the original number assigned by the committee and the year the item was originally approved by the committee.

2006 INTERNATIONAL BUILDING CODE

IBC-1-06 (AZ Only)

Revision to: Table 1607.1

Committee Action: Approved as Submitted

Revise as follows:

OCCUPANCY OR USE	UNIFORM (psf)	CONCENTRATED (lbs.)
28. Residential		-
One- and two-family dwellings		
Uninhabitable attics with limited storage		
Habitable attics and sleeping areas	<u>20 40</u>	
(no other changes in item 28)	<u>30 40</u>	

Reason: Industry standards in Arizona indicate designers based their calculations on the 40 psf for all second floor areas.

Committee Reason: Although this does exceed the minimum requirements set forth by the code, the committee members representing the building industry indicated the homebuilders and designers preferred to continue with the 40 psf in bed room areas. The increased design would lessen deflection in floor systems, provide a uniform design for headers and lessen complaints from buyers.

IBC-2-06 (AZ Only)

Revision to: 3109

Committee Action: Approved as Submitted

Revise as follows:

Section 3109 is hereby REPEALED

Reason: The requirements of this section do not comply with Arizona state law governing pool enclosure requirements.

IBC-3-06 (AZ Only)

Revision to: Chapter 11 Accessibility

Committee Action: Approved as Submitted

Proposal: Delete Chapter 11, Accessibility, in its entirety and substitute the following:

ARIZONANS WITH DISABILITIES ACT

"Arizonans with Disabilities Act" (Arizona Revised Statutes, Title 41, Chapter 9, Article 8), and the "Arizonans with Disabilities Act Implementing Rules" (Arizona Administrative Code, Title 10, Chapter 3, Article 4), which rules incorporate The federal "Americans with Disabilities Act Accessibility Guidelines for Buildings and Facilities," be and the same is hereby adopted as the Arizonans with Disabilities Act of the Town, City or County, and shall apply to new construction and alterations and are not required in buildings or portions of existing buildings that do not meet the standards and specifications and this act is hereby referred to, adopted and made a part hereof as though fully set forth in this section.

Reason: The requirements of this chapter are superceded by Arizona state law which requires all jurisdictions within the state of Arizona to enforce the ARIZONAN'S WITH DISABILITIES ACT. his code change merely brings the International Building Code into compliance.

IBC-4-06 (AZ only)

Revision to: Sections 308.2,308.3,(new) 310.1(new), 310.2, (new) 419, (new) 309.2.9, 1003.3.1.2, 1003.3.1.8.2

Committee Action: Approved as Submitted

308.2 Group I-1. This occupancy shall include buildings, structures or parts thereof housing more than 10 persons, on a 24-hour basis, who because of age, mental disability or other reasons, live in a residential environment that provides supervisory care services. The occupants are capable of responding to an emergency situation without physical assistance from staff. This group shall include, but not be limited to, the following:

- Residential board and care facilities
- Assisted living centers
- Halfway houses
- Group homes
- Congregate care facilities
- Social rehabilitation facilities
- Alcohol and drug abuse centers
- Convalescent facilities

A facility such as the above with 10 or fewer persons shall be classified as a Group R-4 Condition 1 or shall comply with the *International Residential Code* in accordance with Section 101.2 where the building is in compliance with Section 419 of this code.

308.3 Group I-2. This occupancy shall include buildings and structures used for medical,

surgical, psychiatric, nursing, custodial, personal, or directed care on a 24-hour basis of more than five persons who are not capable of self-preservation by responding to an emergency situation without physical assistance from staff. This group shall include, but not be limited to, the following:

Hospitals

Nursing homes (both intermediate-care facilities and skilled nursing facilities)

Mental hospitals

Detoxification facilities

A facility such as the above with five or fewer persons shall be classified as Group R-3 or shall comply with the *International Residential Code* in accordance with Section 101.2.

This occupancy shall also include buildings and structures used for assisted living homes providing supervisory, personal, or directed care on a 24-hr basis of more than 10 persons who are not capable of self-preservation by responding to an emergency situation without physical assistance from staff. A facility such as the above with ten or fewer persons shall be classified as R-4 Condition 2.

310.1...R-4 Residential occupancies shall include buildings arranged for occupancy as residential care/assisted living homes including not more than 10 occupants, excluding staff.

310.1.1 Condition 1. This occupancy condition shall include facilities licensed to provide supervisory care services, in which occupants are capable of self preservation by responding to an emergency situation without physical assistance from staff. Condition 1 facilities housing more than 10 persons shall be classified as a Group I-1.

310.1.2 Condition 2. This occupancy condition shall include facilities licensed to provide personal or directed care services, in which occupants are incapable of self preservation by responding to an emergency without physical assistance from staff. Condition 2 facilities housing more than 10 persons shall be classified as Group I-2.

R-4 occupancies shall meet the requirements for construction as defined in Group R-3 except as otherwise provided for in this code, and Section 419 or shall comply with the *International Residential Code* in accordance with section 101.2 where the building is in compliance with Section 419 of this code

310.2 Definitions

PERSONAL CARE SERVICE. Assistance with activities of daily living that can be performed by persons without professional skills or professional training and includes the coordination or provision of intermittent nursing services and the administration of medications and treatments.

DIRECTED CARE SERVICE. Care of residents, including personal care services, who are incapable of recognizing danger, summoning assistance, expressing need, or making basic care decisions.

SUPERVISORY CARE SERVICE. General supervision, including daily awareness of resident functioning and continuing needs.

RESIDENTIAL CARE/ASSISTED LIVING HOME. A building or part thereof housing a maximum of 10 persons, excluding staff, on a 24-hour basis, who because of age, mental disability or other reasons, live in a supervised residential environment which provides supervisory, personal, or directed services. This classification shall include, but not be limited to, the following: residential board and care facilities, assisted living

homes, halfway houses, group homes, congregate care facilities, social rehabilitation facilities, alcohol and drug abuse centers and convalescent facilities.

419 RESIDENTIAL CARE/ASSISTED LIVING HOMES

419.1 Applicability. The provisions of this section shall apply to a building or part thereof housing not more than 10 persons, excluding staff, on a 24-hour basis, who because of age, mental disability or other reasons, live in a supervised residential environment which provides licensed care services. Except as specifically required by this division, R-4 occupancies shall meet all applicable provisions of Group R-3.

419.2 General. Buildings or portions of buildings classified as R-4 occupancies shall meet all the applicable provisions of Group R-3, may be constructed of any materials allowed by this code, shall not exceed two stories in height nor be located above the second story in any building, and shall not exceed 2000 square feet above the first story except as provided in Section 506.

419.3 Special Provisions. R-4 occupancies having more than 2000 square feet of floor area above the first floor shall be of not less than one-hour fire-resistive construction throughout.

419.3.1 Mixed Uses. R-4 occupancies shall be separated from other uses as provided in Table 302.3.2.

419.4 Access and Means of Egress Facilities.

419.4.1 Accessibility. R-4 occupancies shall be provided with at least one accessible route per the Arizonans with disabilities act. Sleeping rooms and associated toilets shall be accessible.

Exception: Existing buildings shall comply with Section 3409. Bathing and toilet facilities need not be made accessible, but shall be provided with grab bars in accordance with ICC/ANSI A 117.1.

419.4.2 Exits

419.4.2.1 Number of Exits. Every story, basement, or portion thereof shall have not less than two exits.

Exception: Basements and stories above the first floor containing no sleeping rooms may have one means of egress as provided in Chapter 10.

419.4.2.2 Distance to Exits. The maximum travel distance shall comply with Section 1004, except that the maximum travel distance from the center point of any sleeping room to an exit shall not exceed 75 feet.

419.4.2.3 Emergency Exit Illumination. In the event of a power failure, exit illumination shall be automatically provided from an emergency system powered by storage batteries or an onsite generator set installed in accordance with the ICC Electric Code.

419.4.2.4 Emergency Escape and Rescue. R-4 occupancies shall comply with the requirements of Section 1025, except that Exception 1 to Section 1025.1 does not apply to R-4 occupancies.

419.4.2.5 Delayed egress locks. In R-4 Condition 2 occupancies, delayed egress

locks shall be permitted in accordance with Sections 1008.1.3.4 and 1008.1.8.6, items 1, 2, 4, 5 and 6.

419.5 Smoke Detectors and Sprinkler Systems

419.5.1 Smoke Alarms. All habitable rooms and hallways in R-4 occupancies shall be provided with smoke alarms installed in accordance with Section 907.2.10.

419.5.2 Sprinkler Systems. R-4 occupancies shall be provided with a sprinkler system installed in accordance with Section 903.2.9. Sprinkler systems installed under this Section shall be installed throughout, including attached garages, and in Condition 2 facilities shall include attics and concealed spaces of or containing combustible materials. Such systems may not contain unsupervised valves between the domestic water riser control valve and the sprinklers. In R-4 Condition 2 occupancies, such systems shall contain water-flow switches electrically supervised by an approved supervising station, and shall sound an audible signal at a constantly attended location.

1008.1.2 Door swing. Egress doors shall be side-hinged swinging.

Exceptions:

- 1.Private garages, office areas, factory and storage areas with an occupant load of 10 or less.
- 2.Group I-3 occupancies used as a place of detention.
- 3.Doors within or serving a single dwelling unit in Groups R-2, and R-3 as applicable in Section 101.2, and R-4.
- 4.(no other changes)

Reason: The purpose of this amendment is to bring the provisions of the code into agreement with the licensing rules of the Arizona Department of Health Services. DHS license categories have a threshold of 10 residents to move from a residential home setting to an institutional setting. DHS rules (R9-10-701) state, "Assisted living home" or "home" means an assisted living facility that provides resident rooms to (10) or fewer residents, as distinct from an "assisted living center", which provides services to more than (10) persons. In addition, the license classifications to provide "personal care services" and "directed care services" to residents allow for residents to be bed-bound. The use of "Condition" distinctions is reflective of similar distinctions in I-occupancies.

Each state has unique agency programs for assisted living occupancies, which establish license categories based on numbers of residents and the familiar ambulatory/non-ambulatory distinction. Uniformity could be accomplished by either trusting health service agencies nationally to agree to uniform thresholds and other licensing characteristics, or by amending building codes to allow each state to adapt to that state's unique rules. If numerical thresholds are provided on a "fill in the blanks" basis, condition categories can be added or deleted, and definitions can be customized to match licensure definitions, the hazards associated with these facilities can be addressed comprehensively on a state-by-state basis.

The most hazardous scenario is a facility in an ordinary, un-rated residential structure, occupied by (10) bed-bound residents, supervised by a single caregiver. Provisions for exiting, smoke detectors, emergency illumination, sprinklers, et al, can substantially increase the chances of survival in a fire or other emergency for these residents.

IBC-1-01 Reason: To bring the Building Code into agreement with Arizona Administrative Code, Title 9 Health Services, Article 7 Assisted Living Facilities. R9-10-701 states, "Assisted living home" or "home" means an assisted living facility that provides resident

rooms to ten or fewer residents.' An "Assisted living center" (rooms or residential units for eleven or more residents) is required to have "an individually keyed entry door" and "a kitchen area" by R9-10-720. Since the distinction for the state is between ten and eleven residents, it is felt that the Building Code should reflect the same distinction. See [http://www.sosaz.com/public_services/Title 09/9-10.htm](http://www.sosaz.com/public_services/Title_09/9-10.htm) for the entire rule.

It is felt that the word "abuse" was inadvertently omitted for the definition of Group I-1 Occupancy.

IBC-5-06 (AZ Only)

Revise Section 1503.4

Committee Action: Approved as Submitted

[P] **1503.4 Roof drainage.** Design and installation of roof drainage systems shall comply with Section 1503.4 and the *International Arizona State Plumbing Code (1994 UPC)*.

1503.4.1 Gutters. Gutters and leaders placed on the outside of buildings, other than Group R-3 as applicable in Section 101.2, private garages and buildings of Type V construction, shall be of noncombustible material or a minimum of Schedule 40 plastic pipe.

1503.4.2 Where required. All roofs, paved areas, yards, courts and courtyards shall drain into a separate storm sewer system, or a combined sewer system, or to an approved place of disposal.

1503.4.3 Roof design. Roofs shall be designed for the maximum possible depth of water that will pond thereon as determined by the relative levels of roof deck and overflow weirs, scuppers, edges or serviceable drains in combination with the deflected structural elements. In determining the maximum possible depth of water, all primary roof drainage means shall be assumed to be blocked.

1503.4.4 Overflow drainage required. Overflow (emergency) roof drains or scuppers shall be provided where the roof perimeter construction extends above the roof in such a manner that water will be entrapped if the primary drains allow buildup for any reason.

1503.4.4.1 Separate systems required. Overflow roof drain systems shall have the end point of discharge separate from the primary system. Discharge shall be above grade, in a location, which would normally be observed by the building occupants or maintenance personnel.

1503.4.4.2 Overflow drains and scuppers. Where roof drains are required, overflow drains having the same size as the roof drains shall be installed with the inlet flow line located 2 inches (51 mm) above the low point of the roof, or overflow scuppers having three times the size of the roof drains may be installed in the adjacent parapet walls. Scuppers shall be sized to prevent the depth of ponding water from exceeding that for which the roof was designed as determined by the plumbing code. Scuppers shall not have an opening dimension of less than 4 inches (102 mm). The flow through the primary system shall not be considered when sizing the secondary roof drain system.

REASON: This is proposed as an Arizona only amendment to resolve the problem of using the UPC rather than the IPC. The I codes place roof drainage in the plumbing code. The U codes have drainage required in the UBC and piping system design is per the UPC and scuppers per the UBC. When the IBC is used with the UPC, there is a gaping hole in having sufficient requirements to obtain a safe roof drainage system.

New Section 1503.4.2 is from IPC 1101.2. Section 1503.4.3 is from IPC 1101.7. Section 1503.4.4 is from IPC 1107.1. Section 1503.4.4.1 is from IPC 1107.2. Section 1503.4.4.2 is a combination of IRC R903.4.1 and IPC 1107.3.

The text from the IRC provides the three times scupper sizing that existed in the UBC. Note that jurisdictions that have adopted the 2000 IPC without amendments will require overflow piping to be two times the size of the main piping but have no over sizing requirement for the scuppers. The 2003 no longer requires the overflow piping size to be doubled but still does not have the three times size for the scuppers.

IBC-6-06 (Submitted for 09 proposal)

Revise Section 2902.7

Committee Action: Approved as Submitted

IBC 2902.7 DRINKING FOUNTAINS

2902.7.1 Approval. Drinking fountains shall conform to ASME A112.19.1M ASME A11219.2M or ASME A112.19.19M and water coolers shall conform to ARI 1010. Drinking fountains and water coolers shall conform to nsf61, section 9. Where water is served in restaurants, drinking fountains shall not be required. In other occupancies, where drinking fountains are required, bottled water dispensers or water coolers shall be permitted to be substituted.

2902.7.2 Prohibited locations. Drinking fountains, water coolers and dispensers shall not be installed in public restrooms.

IBC-6-06 (Submitted for 09 proposal)

Revise Section 1503.6

Committee Action: Approved as Submitted

1503.6 Crickets and saddles. A cricket or saddle shall be installed on the ridge side of any chimney greater than 30 inches (762 mm) wide. Cricket or saddle coverings shall be sheet metal of the same material as the roof covering.

2003 INTERNATIONAL RESIDENTIAL CODE

IRC-1-06 (AZ only)

Revision to: TABLE R 301.4

Committee Action: Approved as Modified

USE	LIVE LOAD
Attics with storage ^{b,e}	20 <u>40</u>
Sleeping rooms	30 <u>40</u>

(No other changes to Table)

Reason: Industry standards in Arizona indicate designers based their calculations on the 40 psf for all second floor areas.

Committee Reason: Although this does exceed the minimum requirements set forth by the code, the committee members representing the building industry indicated the homebuilders and designers preferred to continue with the 40 psf in bed room areas. The increased design would lessen deflection in floor systems, provide a uniform design for headers and lessen complaints from buyers.

IRC-2-06 (AZ only)

Revision to: APPENDIX

Committee Action: Approved as Modified

102.5 Appendices. Provisions in the appendices shall not apply unless specifically adopted. The following appendices are adopted:

Appendix A SIZING AND CAPACITIES OF GAS PIPING

Appendix B SIZING OF VENTING SYSTEMS SERVING APPLIANCES EQUIPPED WITH DRAFT HOODS, CATEGORY I APPLIANCES, AND APPLIANCES LISTED FOR USE AND TYPE B VENTS

Appendix C EXIT TERMINALS OF MECHANICAL DRAFT AND DIRECT-VENT VENTING SYSTEMS

Appendix D RECOMMENDED PROCEDURE FOR SAFETY INSPECTION OF AN EXISTING APPLIANCE INSTALLATION

Appendix H PATIO COVERS

Appendix J EXISTING BUILDINGS AND STRUCTURES

Appendix K SOUND TRANSMISSION

Reason: Comply with State and Federal laws.

IRC-3-06 (AZ only)

Revision to: M1307.6

Committee Action: Approved as Submitted

Add new text as follows:

M1307.6 Liquefied Petroleum Appliances. LPG appliances shall not be installed in an attic, pit or other location that would cause a ponding or retention of gas.

Reason: Due to the nature of LP gas, being heavier than air, it should be a function of design to eliminate the hazard of gas being trapped. The attic location is a hazard due to the gas settling in insulated frame bays and the probability of an ignition source igniting the gas fuel. Any pit will hold LP gas until an appliance or other ignition source causes a fire or explosion.

Related sections include G2406.2 and M1703.2

This also provides consistency with the State plumbing code.

IRC-4-06 (AZ only)

Revision to: G2406.4**Committee Action: Approved as Modified**

Add new section text as follows:

G2406.4 Liquefied Petroleum Appliances. LPG appliances shall not be installed in an attic, pit or other location that would cause a ponding or retention of gas.

Reason: To make text compatible with change to Section M1307.5 and to clarify that the exceptions do not apply to this text. This also provides consistency with the State plumbing code.

IRC-5-06 (AZ only)**Revision to: Section G2415.9 & G2415.9.1****Committee Action: Approved as Modified**

Proposal: G2415.9 (404.9) Minimum burial depth. Underground piping systems shall be installed a minimum depth of 12 inches (305 mm) below grade for metal piping and 18 inches (457mm) for plastic piping.

Reason: The distinction between metal piping and plastic piping in regards to burial depth is because the plastic piping is more susceptible to damage and needs the increased depth for protection.

The elimination of the section addressing individual outside appliances is because the risks are the same whether the line serves multiple appliances or a single appliance. With similar risks, similar depths should be required.

IRC-6-06 (Submitted for 09 proposal)**Revise Section 903.2.2****Committee Action: Approved as Submitted**

R903.2.2 Crickets and saddles. A cricket or saddle shall be installed on the ridge side of any chimney greater than 30 inches (762 mm) wide. Cricket or saddle coverings shall be sheet metal or of the same material as the roof covering.

IRC-7-06 (Submitted for 09 proposal)**Revise Section 905.2.8.6****Committee Action: Approved as Submitted**

R905.2.8.6 Drip edge. Provide drip edge at eaves and gables of shingle roofs. Overlap to be a minimum of 2 inches (51 mm). Eave drip edges shall extend 0.25 (6.4 mm) below the sheathing and extend back on the roof a minimum of 2 inches (51 mm). Drip edge shall be mechanically fastened a maximum of 12 inches (305 mm) o.c.

2006 INTERNATIONAL FUEL GAS CODE

IGC-1-06 (Submitted for 09 proposal)

Revise Section 2406.2

Committee Action: Approved as Submitted

G2406.2 (303.3) Prohibited locations. Appliances shall not be located in, or obtain combustion air from, any of the following rooms or spaces:

- 1) Sleeping rooms
- 2) Bathrooms
- 3) Toilet rooms
- 4) Storage Clothes closets

2006 INTERNATIONAL MECHANICAL CODE

IMC-1-06 (Submitted for 09 proposal)

Revise Section 307.2.2

Committee Action: Approved as Submitted

307.2.2 Drain pipe material and sizes.

Components of the condensate disposal system shall be.....size shall not be less than ¾" internal diameter and shall not decrease in size from the drain pan connection to the place of condensate disposal. Where the drain pipes for more than one unit are manifolded together for condensate drainage, the pipe or tubing shall be sized in accordance with an approved method the following:

EQUIPMENT CAPACITY**MINIMUM CONDENSATE
PIPE DIAMETER**

Up to 20 tons (70.3 kw) of refrigeration
Over 20 tons (70.3 kw) to 40 tons (141 kw) of refrigeration
Over 40 tons (141 kw) to 90 tons (317 kw) of refrigeration
Over 90 tons (317 kw) to 125 tons (440 kw) of refrigeration
Over 125 tons (440 kw) to 250 tons (879 kw) of refrigeration

¾ inch (19 mm)
1 inch (25 mm)
1 ¼ inch (32 mm)
1 ½ inc (38 mm)
2 inch (51 mm)

Such piping shall maintain a minimum horizontal slope in the direction of discharge of not less than one-eighth unit vertical in 12 units horizontal (1-perceant slope)

IMC-2-06 (Submitted for 09 proposal)

Revise Section 307.2.2

Committee Action: Approved as Submitted

M1305.1.1 Central Furnaces and air handlers. ~~Central Furnaces and air handlers~~ within compartments or alcoves shall have a minimum working space clearance of 3 inches (76 mm)

along the sides, back, and top, with a total width of the enclosing space being at least 12 inches (305 mm) wider than the furnace or air handler. Furnaces having a firebox open to the atmosphere shall have at least a 6 inch (152 mm) working space along the front combustion chamber side. Combustion air openings at the rear and side of the compartment shall comply with the requirements of chapter 17.

Exception: This section shall not apply to replacement appliances installed in existing compartments and alcoves where the working space clearances are in accordance with the equipment or appliance manufacturer's installation instructions.

M1305.1.5 Heating, Air Conditioning, and Refrigeration Equipment Outlet. A 125-volt, single phase, 15 or 20 ampere rated receptacle outlet shall be installed in an accessible location for the servicing of heating, air conditioning, and refrigeration equipment. The receptacle shall be located on the same level and within 25 feet (7.5 meters) of the heating and air conditioning, and refrigeration equipment. The receptacle outlet shall not be connected to the load side of the equipment disconnecting means.

IMC-3-06 (Submitted for 09 proposal)

Revise Section 2005.2

Committee Action: Approved as Submitted

M2005.2 Prohibited locations. Fuel-fired water heaters shall not be installed in a ~~room used as a storage clothes~~ closet. Water heaters installed in a bedroom or bathroom shall be installed in a sealed enclosure so that the combustion air will not be taken from the living space. Direct-vent water heaters are not required to be installed within an enclosure.

2006 International Plumbing Code

IPC-1-06 AZ only

Revision to: 101

Committee Action: Approved as Submitted

Add a new section 101.5 to read as follows:

101.5 Appendices. Provisions in the appendices shall not apply unless specifically adopted.

Reason: This provision is included in all the other International codes and needs to be included in the International Plumbing Code to maintain uniformity among the codes.

IPC-2-06 (Submitted for 09 proposal)

Revise Section 3005.2.10

Committee Action: Approved as Submitted

P3005.2.10 Cleanout equivalent. A ~~fixture trap or a fixture with an integral trap~~, readily removable without disturbing concealed piping shall be acceptable as a cleanout equivalent.

Maricopa Association of Governments Building Code Amendments and Standards Manual BCAS #H17	
Title: Recommendations of the Arizona Residential Post-Tensioned Round Table for Special Inspections, Evaluation, and Acceptance	 MARICOPA ASSOCIATION of GOVERNMENTS BCAS Manual Historical Archive
Originally Reviewed by MAG Building Codes Committee: 1/16/2008	
Archived to Historical Section by MAG Building Codes Committee: 1/16/2013	

At the January 16, 2008, Building Codes Committee meeting, the Committee reviewed the recommendations of the Arizona Residential Post-Tensioned Round Table.

At the January 16, 2013 Building Codes Committee meeting, the Committee reviewed the original document. The Committee determined that the items in the document are covered by the current codes. The Committee voted unanimously to move this document to the Historical Archive.

DRAFT

Arizona Residential Post-Tensioned Round Table Recommendations for Standards of Construction and Design #1

1/16/2008

Special Inspection

The requirements for special inspection of concrete construction are provided in the 2012 International Building Code (IBC), Section 1705.3. Table 1705.3 lists 12 different inspection items for concrete construction. Six of the items (numbers 1, 5, 6, 7, 9, 11) could be applied to post-tensioned slabs on ground. The Arizona Residential Post-Tensioned Round Table makes the following recommendations for special inspections of residential post-tensioned slabs-on-ground:

1. Inspection of reinforcing steel, including pre-stressing tendons and placement, shall occur prior to slab pour.
5. Verifying use of required design mix shall occur periodically.
6. At the time fresh concrete is sampled to fabricate specimens for strength tests, perform slump tests, and determine the temperature of the concrete.
7. Inspection of concrete placement for property application and techniques shall occur for the full duration of concrete placement.
9. Verification of pre-stressing forces shall occur at the time of pre-stress application.
11. Prior to stressing of tendons in post-tensioned concrete, periodic verification of in-situ strength shall be performed per ACI 228.

The recommendations listed above satisfy the intent of the code.

Please see Appendix A for Table 1705.3

Table 1705.3 (to be updated)
Required Verification and Inspection of Concrete Construction

Verification and Inspection	Continuous	Periodic	Referenced Standard	IBC Reference
1. Inspection of reinforcing steel, including pre-stressing tendons, and placement	-	X	ACI 318: 3.5, 7.1-7.7	1903.5, 1907.1, 1907.7, 1914.4
2. Inspection of reinforcing steel welding in accordance with Table 1704.3 Item 5B	-	-	AWS D1.4 ACI 318: 3.5.2	1903.5.2
3. Inspect bolts to be installed in concrete prior to and during placement of concrete where allowable loads have been increased	X	-	-	1912.5
4. Verifying use of required design mix	-	X	ACI 318: Ch. 4, 5.2 – 5.4	1904, 1905.2-1905.4, 1914.2, 1914.3
5. At the time fresh concrete is sampled to fabricate specimens for strength tests, perform slump and air content tests, and determine the temperature of the concrete	X	-	ASTM C 172 ASTM C 31 ACI 318: 5.6, 5.8	1905.6, 1914.10
6. Inspection of concrete and shotcrete placement for proper application techniques	X	-	ACI 318: 5.9, 5.10	1905.9, 1905.10, 1914.6, 1914.7, 1914.8
7. Inspection for maintenance of specified curing temperature and techniques	-	X	ACI 318: 5.11 – 5.13	1905.11, 1905.13, 1914.9
8. Inspection of pre-stressed concrete: a. Application of pre-stressing forces b. Grouting of bonded pre-stressing tendons in the seismic-force-resisting system	X X	-	ACI 318: 18.20 ACI 318: 18.18.4	-
9. Erection of precast concrete members	-	X	ACI 318: Ch. 16	-
10. Verification of in-situ concrete strength, prior to stressing of tendons in post-tensioned concrete and prior to removal of shores and forms from beams and structural slabs	-	X	ACI 318: 6.2	1906.2

Arizona Residential Post-Tensioned Round Table Recommendations for Standards of Construction and Design #2

1/16/2008

Evaluation and Acceptance of Concrete

The requirements for evaluation and acceptance of concrete are provided in the 2003 International Building Code (IBC) Section 1905.6. There are no exceptions to these provisions. The Arizona Residential Post-Tensioned Round Table makes the following recommendations for evaluation and acceptance of concrete for residential post-tensioned slabs on ground.

Because of the large variations in slab thickness, slab size, and scheduling of pours, the Arizona Residential Post-Tensioned Round Table recommends that cylinders be taken on every lot. This would satisfy the intent of the code and provide consistent documentation for the structural engineers and building officials.

It is recommended that a minimum of four cylinders be cast as a strength sampling for each lot: one cylinder for early strength testing, two cylinders to verify f'_c (1905.2.4), one cylinder for a 56 day strength break if required.

Please see Appendix A for further information.

Code Reference: IBC 2003 Section 1905.6.2 Frequency of Testing

The frequency of conducting strength tests of concrete shall be as specified in Section 1905.6.2.1 through 1905.6.2.4

1905.6.2.1 Minimum Frequency

Samples for strength tests of each class of concrete placed each day shall be taken not less than once a day, nor less than once for each 150 cubic yards of concrete, nor less than once for each 5,000 square feet of surface area for slabs or walls.

1905.6.2.2 Minimum Number

On a given project, if the total volume of concrete is such that the frequency of testing required by Section 1905.6.2.1 would provide less than 5 strength tests for a given class of concrete, tests shall be made from at least five randomly selected batches or from each batch if fewer than five batches are used.

1905.2.3 Small Volume

When the total volume of a given class of concrete is less than 50 cubic yards, strength tests are not required when evidence of satisfactory strength is submitted to and approved by the building official.

1905.2.4 Strength Test

A strength test shall be the average of the strength of two cylinders made from the same sample of concrete and tested at 28 days or at the test age designated for the determination of $f'c$.

The parameters stated in 1905.6.2.1 are very specific. We have observed that PT slabs vary in thickness from 6" to 10". For an average 1,800 square foot house, the concrete yardage could vary from 34 cubic yards for a 6" thick slab to 56 cubic yards for a 10" thick slab. In the large home communities with an average 2,500 square foot house, the range could be between 46 and 78 cubic yards. It is not uncommon to see houses on the same tract with different slab thicknesses as well as large variations in square footage. There are larger slabs that require over 120 cubic yards of concrete due to size and thickness.

The requirement states in 1905.6.2.1 that cylinders must be taken at least once a day, or every 150 yards or every 5,000 square feet. Collecting all of the information to meet these three criteria with the wide variety of design specifications, variety of sizes of slabs in a given subdivision and the imprecise nature of pour schedules creates considerable tracking issues. It is the position of the Arizona Residential Post-Tensioned Round Table that cylinders are taken on every lot. This procedure ensures that a record of concrete strength is provided for each post-tensioned slab and satisfies the intent of the code.

Revisions to the amendments

The following is an itemized list:

Changed all references from 09 to 12

[IBC 01-04](#) IBC Table 1607.1, live loads

[IBC 02-04](#) IBC 3109, pool enclosures

[IBC 04-12](#) revision and addition to IBC sections [202](#), [308.3](#), [308.3.2](#), 308.4, 308.4.1, [310.2](#), [310.5.1](#), 310.6, [310.6.1](#) (new), [310.6.2](#) (new), [425](#) (new), [1008.1.2](#) ex 4, dealing with R-4 occupancies

[IRC 09-01](#) IRC 102.5 Appendices

[IRC 01-04](#) IRC Table 301.5, modifying live loads

[IRC-08-12](#) revision to: IRC N1101.7.1, testing and inspections protocol

[IRC-03-12](#) revision to: IRC N1103.9.3, pool motors

[IRC-02-12](#) revision to: IRC 1503.1, transition fittings

[IRC 41-02](#) revision to: IRC G2415.12, G2415.12.1 burial depth PE pipe

[IRC-05-12](#) revision to: Appendix E, ARS requirements

[IRC-06-12](#) revision to: Appendix I AI101.1, ARS requirements

[IPC 01-12](#) revision to: IPC 405.1, side clearance water closet

[IFGC-41-02](#) revision to: IFGC 404.12, 404.12.1 burial depth for PE pipe

[IMC-02-12](#) revision to: Section 505.1, transition fittings

[IMC-07-12](#) revision to: Section 1004.1, boilers

[IECC-08-12](#) revision to: IECC R102.1.2, testing and inspections protocol

[IECC-03-12](#) revision to: Section R403.9.3, pool motors

AZBO Code Review and Development Committee

AZBO 2012 ICC Codes Amendments recommended for the 2012 ICC Codes

This report is a compilation of the AZBO amendments to the 2012 ICC codes that the Code Review and Development Committee have recommended to be included with the 2012 ICC codes to assist those jurisdictions in the adoption of the 2012 ICC codes. In addition, previous amendments that were not successful in the ICC code change process have been deleted. The items noted as "AZ only"

have been determined by the committee to be items unique to Arizona in accordance with the guidelines approved by the AZBO Board of Directors.

The items are identified by the initials of the affected code, the original number assigned by the committee and the year the item was originally approved by the committee.

2012 INTERNATIONAL BUILDING CODE

IBC-01-04 (AZ Only)

Revision to: Table 1607.1

Revise as follows:

OCCUPANCY OR USE	UNIFORM (psf)	CONCENTRATED (lbs.)
25. Residential One- and two-family dwellings Uninhabitable attics with storage ^{i,j,k} Habitable attics and sleeping areas ^k (no other changes in item 25)	 20 <u>40</u> 30 <u>40</u>	 -

Reason: Industry standards in Arizona indicate designers based their calculations on the 40 psf for all second floor areas. Although this does exceed the minimum requirements set forth by the code, the committee members representing the building industry indicated the homebuilders and designers preferred to continue with the 40 psf in bed room areas. The increased design would lessen deflection in floor systems, provide a uniform design for headers and lessen complaints from buyers.

IBC-02-04 (AZ Only)

Revision to: 3109

Revise as follows:

Section 3109 is hereby REPEALED

Reason: The requirements of this section do not comply with Arizona state law governing swimming pool enclosure requirements.

[Return to top of document](#)

IBC-04-12 (AZ only)

Revision to: Sections 202, 308.3, 308.3.2, 308.4, 308.4.1, 310.5.1, 310.6, 310.6.1 (new), 310.6.2 (new), 425 (new), 1008.1.2 ex 4

Revise as follows:

SECTION 202

DEFINITIONS

PERSONAL CARE SERVICE ~~The care of persons who do not require medical care. Personal care involves responsibility for the safety of persons while inside the building. Assistance with activities of daily living that can be performed by persons without professional skills or professional training and includes the coordination or provision of intermittent nursing services and administration of medications or treatments.~~

SUPERVISORY CARE SERVICE General supervision, including daily awareness of resident functioning and continuing needs.

DIRECTED CARE SERVICE Care of residents, including personal care services, who are incapable of recognizing danger, summoning assistance, expressing need, or making basic care decisions.

ASSISTED LIVING FACILITY A residential care institution, including adult foster care, that provides or contracts to provide supervisory care services, personal care services or directed care services on a continuing basis.

ASSISTED LIVING CENTER An assisted living facility that provides resident rooms or residential units to eleven or more residents.

ASSISTED LIVING HOME An assisted living facility that provides resident rooms to ten or fewer residents.

INSTITUTIONAL GROUP I

308.3 Institutional Group I-1. This occupancy shall include buildings, structures or portions thereof for more than 16 persons who reside on a 24 hour basis in a supervised environment, ~~and receive custodial care, and~~ The persons receiving care are capable of self-preservation, except as provided for assisted living centers. This group shall include, but not be limited to, the following:

Alcohol and drug centers

~~Assisted living facilities~~ centers

Congregate care facilities

Convalescent facilities

Group homes

Halfway houses

Residential board and *custodial care* facilities

Social rehabilitation facilities

308.3.2 Six to sixteen persons receiving care. A facility such as above, housing not fewer than six and not more than 16 persons receiving such care, shall be classified as Group R-4, except as provided for assisted living homes.

308.4 Institutional Group I-2. This occupancy shall include buildings and structures used for *medical care* on a 24-hour basis for more than five persons who are *incapable of self-preservation*. This group shall include, but not be limited to, the following:

Foster care facilities

Detoxification facilities

Hospitals

Nursing homes Assisted Living Centers (Ed. Note: In AZ, this term is used within the licensing program as a general descriptor. However, since the licensing scheme includes both small (max 10), and larger (>10) facilities, including under I-2 is misleading, I suggest we replace with ALC. Retaining the nursing home definition in Ch 2 does no harm.)

Psychiatric hospitals

~~**308.4.1 Five or fewer persons receiving care.** A facility such as the above with five or fewer persons receiving such care shall be classified as Group R-3 or shall comply with the *International Residential Code* provided an *automatic sprinkler system* is installed in accordance with Section 903.3.1.3 or with Section P2904 of the *International Residential Code*.~~

SECTION 310

310.2 Definitions The following terms are defined in Chapter 2:

ASSISTED LIVING FACILITY

ASSISTED LIVING CENTER

ASSISTED LIVING HOME

BOARDING HOUSE

CONGREGATE LIVING FACILITIES.

DIRECTED CARE SERVICES

DORMITORY

GROUP HOME

PERSONAL CARE SERVICE

SUPERVISORY CARE SERVICES

TRANSIENT

310.5.1 Care facilities within a dwelling. ~~Licensed care facilities for five 10 or fewer persons receiving care that are within a single-family dwelling are permitted, to comply with the *International Residential Code* provided an *automatic sprinkler system* is installed in accordance with Section 903.1.3 or Section P2904 of the *International Residential Code* provided that the requirements of Section 425 of this code are met.~~

310.6 Residential Group R-4. This occupancy shall include buildings, structures or portions thereof for more than five but not more than 16 persons, excluding staff, who reside on a 24-hour basis in a supervised residential environment and receive *custodial care*. The persons receiving care are capable of self-preservation, except as provided for *assisted living homes*. This group shall include, but not be limited to, the following:

Alcohol and drug centers

Assisted living facilities-homes

Congregate care facilities

Convalescent facilities

Group homes

Halfway houses

Residential board and *custodial care* facilities

Social rehabilitation facilities

Group R-4 occupancies shall meet the requirements for construction as defined for Group R-3, except as otherwise provided for in this code and Section 425.

310.6.1. Condition 1. This occupancy condition shall include facilities licensed to provide supervisory care services, in which occupants are capable of self-preservation by responding to an emergency situation without physical assistance from staff. Condition facilities housing more than 10 persons shall be classified as Group I-2

310.6.2 Condition 2. This occupancy condition shall include facilities licensed to provide personal or directed care services , in which occupants are incapable of self-preservation by responding to an emergency situation without physical assistance from staff. Condition 2 facilities housing more than 10 persons shall be classified as Group I-2.

SECTION 425 ASSISTED LIVING HOMES

425.1 Applicability. The provisions of this section shall apply to a building or part thereof housing not more than 10 persons, excluding staff, on a 24-hour basis, who because of age, mental disability or other reasons, live in a supervised residential environment, which provides licensed care services. Except as specifically required by this division, R-4 occupancies shall meet all the applicable provisions of Group R-3.

425.2 General. Building or portions of buildings classified as R-4 may be constructed of any materials allowed by this code, shall not exceed two stories in height nor be located above the second story in any building and shall not exceed two thousand square feet above the first story, except as provided in Section 506.

425.3 Special Provisions. R-4 occupancies having more than 2000 square feet above the first story shall be of not less than one-hour fire-resistive construction throughout.

425.3.1 Mixed Uses. R-4 occupancies shall be separated from other occupancies as provided in Table 508.4.

425.4 Access and Means of Egress Facilities

425.4.1 Accessibility. R-4 occupancies shall be provided with at least one accessible route as provided in Section 1104.1.

425.4.2 Exits

425.4.2.1 Number of Exits. Every story, basement, or portion thereof shall have not less than two exits.

Exception: Basements and stories above the first floor containing no sleeping rooms used by residents may have only one means of egress as provided in Chapter 10.

425.4.2.2 Distance to Exits. The maximum travel distance shall comply with Section 1016, except that the maximum travel distance from the center point of any sleeping room to an exit shall not exceed 75 feet.

425.4.2.3 Emergency Exit Illumination. In event of a power failure, exit illumination shall be automatically provided from an emergency system powered by storage batteries or an onsite generator set installed in accordance with the International Electric Code.

425.4.2.4 Emergency Escape and Rescue. R-4 occupancies shall comply with the requirements of Section 1029, except that Exception #1 to 1029 does not apply to R-4 occupancies.

425.4.2.5 Delayed Egress Locks. In R-4 Condition 2 occupancies, delayed egress locks shall be permitted in accordance with 1008.1.9.7, Items 1, 2, 4, 5, and 6.

425.5 Smoke Alarms and Sprinkler Systems.

425.5.1 Smoke Alarms. R-4 occupancies shall be provided with smoke alarms installed in accordance with 907.2.1.1.2, and such alarms shall be installed in all habitable rooms.

425.5.2 Sprinkler Systems. R-4 occupancies shall be provided with a sprinkler system installed in accordance with 903.3.1.3. Sprinkler systems installed under this section shall be installed throughout, including attached garages, and in Condition 2 facilities, shall include concealed spaces (?) of or containing combustibles. Such systems may not contain unsupervised valves between the domestic water riser control valve and the sprinklers. In Condition 2 occupancies, such systems shall contain water flow switches electrically supervised by an approved supervising station, and shall sound an audible signal at a constantly attended location.

1008.1.2, Door Swing, delete the text of exception #4, and replace with the following:

4. Doors within or serving a single dwelling unit in Groups R-2 and R-3, as applicable in 101.2, and R-4.

Reason: The purpose of this amendment is to bring the provisions of the code into agreement with the licensing rules of the Arizona Department of Health Services. DHS license categories have a threshold of 10 residents to move from a residential home setting to an institutional setting. DHS rules (R9-10-701) state, "Assisted living home" or "home" means an assisted living facility that provides resident rooms to (10) or fewer residents, as distinct from an "assisted living center", which provides services to more than (10) persons. In addition, the license classifications to provide "personal care services" and "directed care services" to residents allow for residents to be bed-bound. The use of "Condition" distinctions is reflective of similar distinctions in I-occupancies.

Each state has unique agency programs for assisted living occupancies, which establish license categories based on numbers of residents and the familiar ambulatory/non-ambulatory distinction. Uniformity could be accomplished by either trusting health service agencies nationally to agree to uniform thresholds and other licensing characteristics, or by amending building codes to allow each state to adapt to that state's unique rules. If numerical thresholds are provided on a "fill in the blanks" basis, condition categories can be added or deleted, and definitions can be customized to match licensure definitions, the hazards associated with these facilities can be addressed comprehensively on a state-by-state basis.

The most hazardous scenario is a facility in an ordinary, un-rated residential structure, occupied by (10) bed-bound residents, supervised by a single caregiver. Provisions for exiting, smoke detectors, emergency

illumination, sprinklers, et al, can substantially increase the chances of survival in a fire or other emergency for these residents.

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2012 INTERNATIONAL RESIDENTIAL CODE

IRC-01-04 (AZ only)

Revision to: TABLE R 301.5

Revise as follows:

USE	LIVE LOAD
Attics with storage ^{b,g}	20 <u>40</u>
Sleeping rooms	30 <u>40</u>

(No other changes to Table)

Reason: Industry standards in Arizona indicate designers based their calculations on the 40 psf for all second floor areas. Although this does exceed the minimum requirements set forth by the code, the committee members representing the building industry indicated the homebuilders and designers preferred to continue with the 40 psf in bed room areas. The increased design would lessen deflection in floor systems, provide a uniform design for headers and lessen complaints from buyers.

IRC-09-01 (AZ only)

Revision to: IRC 102.5

Revise as follows:

102.5 Appendices. Provisions in the appendices shall not apply unless specifically adopted. The following appendices are adopted:

Appendix A SIZING AND CAPACITIES OF GAS PIPING

Appendix B SIZING OF VENTING SYSTEMS SERVING APPLIANCES EQUIPPED WITH DRAFT HOODS, CATEGORY I APPLIANCES, AND APPLIANCES LISTED FOR USE AND TYPE B VENTS

Appendix C EXIT TERMINALS OF MECHANICAL DRAFT AND DIRECT-VENT VENTING SYSTEMS

Appendix D RECOMMENDED PROCEDURE FOR SAFETY INSPECTION OF AN EXISTING APPLIANCE INSTALLATION

Appendix E MANUFACTURED HOUSING USED AS DWELLINGS

Appendix H PATIO COVERS

Appendix I PRIVATE SEWAGE DISPOSAL

Appendix J EXISTING BUILDINGS AND STRUCTURES

Appendix K SOUND TRANSMISSION

Reason: Comply with State and Federal laws.

IRC-08-12

Revision to: Section N1102.1

Revise as follows:

RESNET Testing & Inspection Protocol. The Residential Energy Services Network (RESNET) Mortgage Industry National Home Energy Rating System Standards Protocol for third party testing and inspections, shall be deemed to meet the requirements of sections N1102.4.1.1, N1102.4.1.2 and N1103.2.2, and shall meet the following conditions:

1. Third Party Testing and Inspections shall be completed by RESNET certified Raters or Rating Field Inspectors and shall be subject to RESNET Quality Assurance Field Review procedures.
2. Sampling in accordance with Chapter 6 of the RESNET Standards shall be performed by Raters or Rating Field Inspectors working under a RESNET Accredited Sampling Provider.
3. Third Party Testing is required for the following items:
 - a. 402.4.1.1 –Building Envelope – Thermal and Air Barrier Checklist
 - b. R402.4.1.2 –Testing – Air Leakage Rate
 - c. R403.2.2 – Sealing – Duct Tightness
4. The other requirements identified as “mandatory” in Chapter 4 shall be met.
5. Alternate testing and inspection programs and protocols shall be allowed when approved by the Code Official.

Reason: Maricopa Association of Governments Building Code Committee has reviewed the Third Party Testing and Inspection procedures of the Residential Energy Services Network (RESNET) with the intent to promote and present uniform guidelines for the acceptance of the RESNET Mortgage Industry National Home Energy Rating System Standards (Standards) as an “Above Code Program” for the jurisdictions within Maricopa County.

The inspection and testing required under the 2012 International Residential Code (IRC) and the 2012 International Energy Conservation Code (IECC) is currently being performed under the RESNET Standards for home builders participating in the Environmental Protection Agency’s ENERGY STAR for Homes Program.

The RESNET Standards (Chapters 3, 6, and 8) are in the process of being certified as ANSI Standards; and The utilization of the RESNET Standards would assure home builders of the ability to continue a testing and inspection process that has been proven to be successful in saving energy while protecting the health, safety and welfare of the public in the building code sections covered by the program.

The committee has researched and discussed this issue and determined that the intent of the code is being met by the acceptance of the testing and inspection protocols of the RESNET Standards.

The committee will hear the final form and draft requested of the Ad Hoc committee (as proposed above) at their meeting scheduled for January 16, 2013, and will be voting on this item (after full committee review) as a new MAG standard.

IRC-03-12

Revision to: Section N1103.9.3

Revise as follows:

~~N1103.9.3. Heated pools and in-ground permanently installed spas shall be provided with a vapor-resistant cover.~~

~~Exception: Pools deriving over 70% of the energy for heating from site recovered energy, such as a heat pump or solar energy source computed over an operating season.~~

(New) N1103.9.3 Motors-Motors with a total horsepower of one or more for pools and in-ground permanently installed spas shall have the capability of operating at two or more speeds with a low speed having a rotation rate that is no more than one-half of the motor's maximum rotation rate and shall be operated with a pump control with the capability of operating the pump at two or more speeds. Residential pool pump motor controls that are sold for use with a two or more speed motor shall have a default circulation speed setting no more than one-half of the motor's maximum rotation rate. Any high speed override capability shall be for a temporary period not to exceed one twenty-four hour cycle without resetting to the default setting.

Reason: Swimming pools are the second largest electrical load for most single-family residential buildings with pools, and multi-speed pumps can perform satisfactorily using 1/3 less energy than traditional single-speed pumps. These savings will be achieved continuously and require no effort by the homeowner. Pool covers can be shown to conserve water and energy, but may not be used consistently by homeowners, and are problematic for many pool designs.

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IRC-02-12

Revision to: Section 1503.1

Revise as follows:

1503.1 **General.** Range hoods shall discharge to the outdoors through a single wall duct. The duct serving the hood shall have a smooth interior surface, shall be airtight, shall be equipped with a backdraft damper, and shall be independent of all other exhaust systems. Changes in size or direction shall be accomplished with an approved transition fitting. Ducts serving range hoods shall not terminate in an attic or crawl space or in areas inside the building.

Reason: The taped connections allowed by the code fail quickly in the event of a grease fire occurring when the exhaust is operating, and taped connections are recognized as non-durable. Without mechanical connections to keep the exhaust system intact, flame can be fan-forced into unprotected attics in the event of a fire. Under normal (non-emergency) circumstances, taped connections will fail, and allow exhaust directly into attics. This change clarifies the Code's intent, that these connections be made permanently, reliably intact.

IRC-41-02 (AZ only)

Revision to: Section G2415.12

Revise as follows:

G2415.12 (IFGC404.12) Minimum burial depth. Underground piping systems shall be installed a minimum depth of 12 inches (305 mm) below grade ~~except as provided for in section G2415.12.1 for metal piping and 18 inches (457mm) for plastic piping.~~

~~**G2415.12.1 (IFGC 404.12.1) Individual outside appliances.** Individual lines to outside lights, grills or other appliances shall be installed a minimum of 8 inches (203 mm) below finished grade, provided that such installation is approved and is installed in locations not susceptible to physical damage.~~

Reason: The distinction between metal piping and plastic piping in regards to burial depth is because the plastic piping is more susceptible to damage and needs the increased depth for protection.

The elimination of the section addressing individual outside appliances is because the risks are the same whether the line serves multiple appliances or a single appliance. With similar risks, similar depths should be required.

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IRC-05-12

Revision to: Appendix E

DELETE this portion in its entirety and REPLACE as follows:

See State office of Manufactured Housing Regulations.

Reason: Changes to coordinate with ARS

IRC-06-12

Revision to: Appendix I A1101.1

DELETE this portion in its entirety and REPLACE as follows:

See State Department of Environmental Quality Regulations.

Reason: Changes to coordinate with ARS

2012 INTERNATIONAL PLUMBING CODE

IPC-01-12

Revision to: Section 405.3.1

Revise as follows:

Exception. Side Clearances for accessible or ambulatory water closets shall comply with ICC/ANSI A117.1.

Reason: Side clearances for water closets range from 10" to 18" in ANSI A117.1 and in the 2010 ADA Standards. The IPC needs to acknowledge these requirements.

2012 INTERNATIONAL FUEL GAS CODE

IFGC-41-02

Revision to: Section 404.12 and 404.12.1

Revise as follows:

404.12 Minimum burial depth. Underground piping systems shall be installed a minimum depth of 12 inches (305 mm) below grade, ~~except as provided for in Section 404.12.1 for metal piping and 18 inches (457mm) for plastic piping.~~

~~**404.12.1 Individual outside appliances.** Individual lines to outside lights, grills or other *appliances* shall be installed a minimum of 8 inches (203 mm) below finished grade, provided that such installation is *approved* and is installed in locations not susceptible to physical damage.~~

Reason: The distinction between metal piping and plastic piping in regards to burial depth is because the plastic piping is more susceptible to damage and needs the increased depth for protection.

The elimination of the section addressing individual outside appliances is because the risks are the same whether the line serves multiple appliances or a single appliance. With similar risks, similar depths should be required.

2012 INTERNATIONAL MECHANICAL CODE

IMC-02-12

Revision to: Section 505.1

Revise as follows:

505.1 Domestic Systems. Where domestic range hoods and domestic appliances equipped with downdraft exhaust are located within dwelling units, such hoods and appliances shall discharge to the outdoors through sheet metal ducts constructed of galvanized steel, stainless steel, aluminum, or copper. Such ducts shall have smooth inner walls, shall be air tight, shall be equipped with a backdraft damper, and shall be independent of all other exhaust systems. Changes in size or direction shall be accomplished with an approved transition fitting.

Reason: The taped connections allowed by the code fail quickly in the event of a grease fire occurring when the exhaust is operating, and taped connections are recognized as non-durable. Without mechanical connections to keep the exhaust system intact, flame can be fan-forced into unprotected attics in the event of a fire. Under normal (non-emergency) circumstances, taped connections will fail, and allow exhaust directly into attics. This change clarifies the Code's intent, that these connections be made permanently, reliably intact.

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IMC-07-12

Revision to: Section 1004.1

Revise as follows:

1004.1 Standards. Oil-fired boilers and their control systems shall be listed and labeled in accordance with UL 726. Electric boilers and their control systems shall be listed and labeled in accordance with UL 834. ~~Solid fuel fired boilers shall be listed and labeled in accordance with UL 2523. Boilers shall be designed and constructed in accordance with the requirements of ASME CSD 1 and as applicable, the ASME Boiler and Pressure Vessel Code, Section I or IV; NFPA 8501; NFPA 8502 or NFPA 8504.~~ Boilers shall be designed and constructed in accordance with the ASME Boiler and Pressure Vessel Code, and Arizona Boiler Rules, Title 20 Chapter 5.

Reason: Changes to coordinate with ARS.

2012 INTERNATIONAL ENERGY CONSERVATION CODE

IECC-08-12

Revision to: Section R102.1

Revise as follows:

RESNET Testing & Inspection Protocol. The Residential Energy Services Network (RESNET) Mortgage Industry National Home Energy Rating System Standards Protocol for third party testing and inspections, shall be deemed to meet the requirements of sections R402.4.1.1, R402.4.1.2 and R403.2.2. and shall meet the following conditions:

1. Third Party Testing and Inspections shall be completed by RESNET certified Raters or Rating Field Inspectors and shall be subject to RESNET Quality Assurance Field Review procedures.
2. Sampling in accordance with Chapter 6 of the RESNET Standards shall be performed by Raters or Rating Field Inspectors working under a RESNET Accredited Sampling Provider.
3. Third Party Testing is required for the following items:
 - d. 402.4.1.1 –Building Envelope – Thermal and Air Barrier Checklist
 - e. R402.4.1.2 –Testing – Air Leakage Rate
 - f. R403.2.2 – Sealing – Duct Tightness
4. The other requirements identified as “mandatory” in Chapter 4 shall be met.
5. Alternate testing and inspection programs and protocols shall be allowed when approved by the Code Official.

IECC-03-12

Revision to: Section R403.9.3

Revise as follows:

~~R403.9.3. Heated pools and in-ground permanently installed spas shall be provided with a vapor-resistant cover.~~

~~Exception: Pools deriving over 70% of the energy for heating from site recovered energy, such as a heat pump or solar energy source computed over an operating season.~~

(New) R403.9.3. Motors with a total horsepower of one or more for pools and in-ground permanently installed spas shall have the capability of operating at two or more speeds with a low speed having a rotation rate that is no more than one-half of the motor's maximum rotation rate and shall be operated with a pump control with the capability of operating the pump at two or more speeds. Residential pool pump motor controls that are sold for use with a two or more speed motor shall have a default circulation speed setting no more than one-half of the motor's maximum rotation rate. Any high speed override capability shall be for a temporary period not to exceed one twenty-four hour cycle without resetting to the default setting.

Reason:

Swimming pools are the second largest electrical load for most single-family residential buildings with pools, and multi-speed pumps can perform satisfactorily using 1/3 less energy than traditional single-speed pumps. These savings will be achieved continuously and require no effort by the homeowner. Pool covers can be shown to conserve water and energy, but may not be used consistently by homeowners, and are problematic for many pool designs.

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MAG Member Agency Permissible Construction Times

Jurisdiction	Time of Year/Location	Monday - Friday		Saturday		Sunday		Notes	Local Jurisdiction Code Citation
		Start	Stop	Start	Stop	Start	Stop		
Apache Junction	4/15 to 10/15	5am	6:30pm	7am	5pm	7am	5pm		10-1-12-(D)
	10/16 to 4/14	6am	6:30pm	7am	5pm	7am	5pm		
Avondale	5/1 to 10/31	5am	7pm	7am	7pm	7am	7pm		4-164 to 4-165
	11/1 to 4/30	6am	7pm	7am	7pm	7am	7pm		
Buckeye	Year-round	1hr before sunrise	sunset	1hr before sunrise	sunset	No Work			10-1-2-C-7
Carefree	Year-round	6am	7pm	6am	7pm	10am	7pm		6-2-4-C
Cave Creek	Year-round	30 min before sunrise	30 min after sunset	30 min before sunrise	30 min after sunset	7am	10pm	Sunrise/Sunset as recorded by National Weather Service	130.07 (E) (4)
Chandler	W/in 500' of residential	5am	10pm	7am	7pm	7am	7pm	When more than 500' from residential, city works w/ contractors to minimize noise effects on neighbors	11-10.2
	500'+ of residential	No Time Restrictions		No Time Restrictions		No Time Restrictions			
El Mirage	10/1 to 4/30	7am	7pm	7am	7pm	No Work			150.115
	5/1 to 9/30	6am	7pm	6am	7pm	No Work			
Fort McDowell	Year-round	7am Mon-Thur	5pm Mon-Thur	no construction				Construction only allowed when inspections can be conducted: Monday - Thursday 7-5	
Fountain Hills	5/15 to 9/15	5:30am	6:30pm	7am	5pm	No Work			7-6-1-B
	9/16 to 5/14	6am	6:30pm	7am	5pm	No Work			
Gila Bend	Gila Bend currently has no construction time restrictions								n/a
Gila River	The Gila River Indian Community currently has no construction time restrictions, but anticipates the creation of allowed construction times by Spring 2013								n/a
Gilbert	Year-round	5am	7pm	7am	7pm	7am	7pm		42-63
		Concrete 6am		Concrete 6am		Concrete 6am			
Glendale	4/15 to 10/15: w/in 500' of residential	6am	7pm	7am	7pm	7am	7pm		25-68 (b)
		Concrete 5am		Concrete 6am		Concrete 6am			
	10/16 to 4/14 w/in 500' of residential	7am	7pm	7am	7pm	7am	7pm		
		Concrete 6am		Concrete 6am		Concrete 6am			
Non-residential and 500'+ of residential	5am	7pm	5am	7pm	5am	7pm			
Goodyear	4/15 to 10/15	7am	7pm	7am	7pm	7am	7pm		11-1-8-(D)
		Concrete 5am							
	10/16 to 4/14	7am	7pm	7am	7pm	7am	7pm		
Guadalupe	Year-round	7am	5pm	7am	5pm	7am	5pm		
Litchfield Park	5/1 to 9/30	5am	7pm	5am	7pm	7am	7pm		10-1-3-C
	10/1 to 4/30	6am	6pm	6am	6pm	7am	6pm		
Maricopa County	4/15 to 10/15	5am	7pm	6am	7pm	6am	7pm		P-22
	10/16 to 4/14	6am	7pm	6am	7pm	6am	7pm		
	Non-residential, Year Round	5am	10pm	5am	10pm	5am	10pm		
Mesa	10/1 to 4/30: w/in 500' of residential	6am	8pm	6am	8pm	No Work		5/1 to 9/30 roof covering installation may begin at 4am	6-12-6 (G)
	5/1 to 9/30: w/in 500' of residential	5am	8pm	5am	8pm	No Work			
		Concrete 4am		Concrete 4am					
Paradise Valley	Flatland	sunrise	sunset	No Heavy Equipment		No Work			10-7-5
	Hillside	7am	sunset			No Work			
Peoria	4/2 to 9/29: w/in 500' of residential	6am	7pm	6am	7pm	6am	7pm		13-91
	4/2 to 9/29: 500'+ of residential	5am	7pm	5am	7pm	5am	7pm		
	4/2 to 9/29: concrete work	5am	7pm	5am	7pm	5am	7pm		
	9/30 to 4/1: w/in 500' of residential	7am	7pm	7am	7pm	7am	7pm		
	9/30 to 4/1: 500'+ of residential	5am	7pm	5am	7pm	5am	7pm		
	9/30 to 4/1: concrete work	6am	7pm	6am	7pm	6am	7pm		

MAG Member Agency Permissible Construction Times

Jurisdiction	Time of Year/Location	Monday - Friday		Saturday		Sunday		Notes	Local Jurisdiction Code Citation
		Start	Stop	Start	Stop	Start	Stop		
Phoenix	10/1 to 4/30	7am	7pm	Extended Hours Permit Required		Extended Hours Permit Required		Extended Hours Permit applications may be submitted for weekdays	23-14 (h)
	5/1 to 9/30	6am	7pm						
Queen Creek	9/16 to 5/14	6am	7pm	7am	5pm	No Work		Restrictions only apply if construction results in noise generated w/in 500' of an occupied home	9-1-7-B
	5/15 to 9/15	5am	7pm	7am	5pm	No Work			
Salt River	5/1 to 9/30	6am	7pm	6am	7pm	Max 67 dBA 24 hours a day on Sunday		Sound level measured at "any right-of-way line abutting a residential area"	
		Max 90 dBA		Max 90 dBA					
	7pm	6am	7pm	6am					
	Max 67 dBA		Max 67 dBA						
10/1 to 4/30	7am	7pm	7am	7pm					
	Max 90 dBA		Max 90 dBA						
7am	7pm	7am	7pm						
	Max 67 dBA		Max 67 dBA						
Scottsdale	4/1 to 10/31	6am	7pm	7am	7pm	7am	7pm	Sunday work only allowed when applicant demonstrates in writing justifiable cause	116.1
	11/1 to 3/31	7am	5pm	8am	5pm	8am	5pm		
Surprise	Within residential zones	5am	9pm	5am	9pm	5am	9pm		34-105(d)
	In non-residential zones	No Time Restrictions		No Time Restrictions		No Time Restrictions			
Tempe	4/15 to 10/15	6am	7pm	7am	7pm	7am	7pm		20-8 (b)
	10/16 to 4/14	7am	7pm	7am	7pm	7am	7pm		
		Concrete 6am	7pm	7am	7pm	7am	7pm		
Non-Residential, Year Round	5am	7pm	7am	7pm	7am	7pm			
Tolleson	Tolleson has no published construction time restrictions. Police will investigate noise levels above 50dB and other complaints.								n/a
Wickenburg	Year-round	5am	10pm	5am	10pm	5am	10pm		10-1-11-D
Youngtown	5/1 to 9/30	6am	7pm	6am	7pm	6am	7pm	Can be altered in the case of emergency in the interest of public health and safety AND only with a permit for a 30 day period	8.16.030.G
	10/1 to 4/30	7am	7pm	7am	7pm	7am	7pm		

NOTE: locations that stipulate "w/in 500' of residential" include residential areas, as well

This is intended to be a guide for the times in which construction activities are permitted to occur.

Every effort has been made to ensure these times and restrictions are current and accurate. When in doubt, consult the local jurisdiction

Last updated May 7, 2013 by Scott Wilken, MAG

Source: MAG Building Codes Committee members and representatives of other member agencies

MAG BUILDING CODES COMMITTEE MEMBERSHIP AS OF
5/9/2013

Voting Members				
Name	Representing	Telephone #	Fax #	E-mail Address
Michael Williams (Chair)	Queen Creek	480-358-3009	480-358-3001	michael.williams@queencreek.org
Mary Dickson (Vice Chair)	El Mirage	623-876-2932	623-876-4607	mdickson@cityofelmirage.org
Randal Westacott	Avondale	623-333-4026	623-333-0400	rwestacott@avondale.org
Phil Marcotte	Buckeye	623-349-6200	623-349-6221	pmarcotte@buckeyeaz.gov
Mike Tibbett	Carefree	480-488-1471	480-488-3845	mike@carefree.org
Mike Baxley	Cave Creek	480-488-6637	480-488-2263	mbaxley@cavecreek.org
Martin Perez	Chandler	480-782-3109	480-782-3110	martin.perez@chandleraz.gov
Jason Field	Fountain Hills	480-816-5127	480-837-3145	jfield@fh.az.gov
Larry Taylor	Gilbert	480-503-6958	480-497-4923	larry.taylor@gilbertaz.gov
Tom Paradise	Glendale	623-930-3143	623-915-2695	tparadise@glendaleaz.com
Ed Kulik	Goodyear	623-882-7932	623-882-7114	ekulik@goodyearaz.gov
Chuck Ransom	Litchfield Park	623-935-1066	623-535-9754	cransom@litchfield-park.org
Tom Ewers	Maricopa County	602-506-7145	602-506-3282	tomewers@mail.maricopa.gov
Steven Hether	Mesa	480-644-2039	480-644-4900	steve.hether@mesaaz.gov
Bob Lee	Paradise Valley	480-348-3631	480-951-3751	rlee@paradisevalleyaz.gov
Dennis Marks	Peoria	623-773-7232	623-773-7233	dennis.marks@peoriaaz.gov
Julie Belyeu	Phoenix	602-495-0821	602-495-5430	julie.belyeu@phoenix.gov
Michael Clack	Scottsdale	480-312-7629	480-312-9029	mclack@scottsdaleaz.gov
<i>Appointment Pending</i>	Surprise			
<i>Appointment Pending</i>	Tempe			
Dale Crandell	Tolleson	623-936-7111	623-936-7117	dcrandell@tollesonaz.org
Kevin Bruce	Wickenburg	928-684-5451 x513	602-506-1580	kbruce@wickenburgaz.org
Gregory Arrington	Youngtown	623-933-8286	623-209-3026	garrington@youngtownaz.org
Non-Voting Members				
Name	Representing	Telephone #	Fax #	E-mail Address
Jackson Moll	Home Builders Assn.	602-274-6545	480-556-5478	mollj@hbaca.org
Sharon Bonesteel	Salt River Project	602-236-4498	602-236-2791	sharon.bonesteel@srpnet.com
Jim Ricker	Town of Guadalupe	480-505-5380	480-730-3097	jim@guadalupeaz.org
Alfonso Rodriguez	Fort McDowell Yavapai Nation	480-789-7740	480-789-7798	arodriguez@ftmcdowell.org
Michael McMillan	Brown and Associates	480-991-3751	480-596-5065	mac@brown-and-associates.net
Dennis Dixon (T)	Apache Junction	480-671-5156	480-982-7010	dennisdixon@ajcity.net
Scott Wilken	MAG	602-254-6300	602-452-5098	swilken@azmag.gov

(T) Temporary

Survey of Code Adoption

Jurisdiction	Building	Mechanical	Plumbing	Electric	Residential	Fire	Energy	Existing Building Code	Fuel Gas	Performance	Green Construction	Notes	URL	Anticipated Adopted Date by Council	Anticipated Effective Date for 2009 or 2012 ICC Codes (Month and Year)
Apache Junction	2006 IBC	2006 IMC	1994 UPC	2005 NEC	2006 IRC	2006 IFC							Apache Junction		
Avondale	2009 IBC	2009 IMC	2009 IPC	2008 NEC	2009 IRC	2003 IFC	2009 IECC		2009 IFGC				Avondale	January 2013	Plan to adopt 2012 codes effective 7/1/13
Buckeye	2006 IBC	2006 IMC	2006 IPC	2005 NEC	2006 IRC	2006 IFC	2006 IECC		2006 IFGC				Buckeye		No plans to adopt 2009 codes.
Carefree	2003 IBC	2003 IMC	1994 UPC	2002 NEC	2003 IRC	2003 IFC						Effective July 1, 2006	Carefree		Not going to adopt, staying with 2003.
Cave Creek	2009 IBC	2009 IMC	2009 IPC	2008 NEC	2009 IRC	2009 IFC	2009 IECC	2009 IEBC	2009 IFGC			Effective January 1, 2012	Cave Creek	11/21/2011	
Chandler	2009 IBC	2009 IMC	2009 IPC	2008 NEC	2009 IRC	2006 IFC	2009 IECC	2009 IEBC	2009 IFGC			Effective July 1, 2011	Chandler		
El Mirage	2012 IBC	2012 IMC	2012 IPC	2011 NEC	2012 IRC	2012 IFC	2012 IECC	2012 IEBC	2012 IFGC		IGCC Public Version 2		El Mirage	January 2013	July 1, 2013
Fountain Hills	2006 IBC	2006 IMC	2006 IPC	2005 NEC	2006 IRC	2006 IFC	2006 IECC					Codes adopted April 17, 2008 with town amendments available on Web site.	Fountain Hills		No plans to adopt 2009 codes.
Gila Bend	2006 IBC	2006 IMC	2006 IPC	2005 NEC	2006 IRC	2006 IFC							Gila Bend		
Gila River	2006 IBC	2006 IMC	2006 IPC	2005 NEC	2006 IRC	2003 IFC	None						Gila River		
Gilbert	2006 IBC	2006 IMC	2006 IPC	2005 NEC	2006 IRC	2006 IFC	2006 IECC		2006 IFGC			ADAAG per state requirements	Gilbert	No date	No plans to adopt 2009 codes.
Glendale	2012 IBC	2012 IMC	2012 UPC	2011 NEC	2012 IRC	2012 IFC	2012 IECC	2012 IEBC	2012 IFGC			With city amendments. Effective December 1, 2012	Glendale		December 1, 2012
Goodyear	2006 IBC	2006 IMC	1994 UPC	2005 NEC	2006 IRC	2006 IFC	2006 IECC					Adopted 5-14-2007.	Goodyear		
Guadalupe	1997 UBC	1997 UMC	1994 UPC	1999 NEC	1997 UBC	1997 UFC							Guadalupe		
Litchfield Park	2006 IBC	2006 IMC	2006 IPC	2005 NEC	2006 IRC	2003 IFC	2006 IECC		2006 IFGC			Codes effective July 1, 2008	Litchfield Park		
Maricopa County	2009 IBC	2009 IMC	2009 IPC	2008 NEC	2009 IRC				2009 IFGC			WITH MAG/AZBO AMENDMENTS	Maricopa County	Adopted August 18, 2010	Effective date of 10-1-10, w/ grace period to 1-1-11.
Mesa	2006 IBC	2006 IMC	2006 IPC	2005 NEC	2006 IRC	2006 IFC	2009 IECC (Effective 1/3/12)	2006 IEBC	2006 IFGC				Mesa		
Paradise Valley	2012 IBC	2012 IMC	2012 IPC	2011 NEC	2012 IRC	2012 IFC	2012 IECC		2012 IFGC				Paradise Valley		January 1, 2013
Peoria	2006 IBC	2006 IMC	2006 IPC	2005 NEC	2006 IRC	2006 IFC			2006 IFGC			Adopted 2012 IPMC, 2012 IECC, effective 5/1/13, not IFC	Peoria	Adopted 5/1/2012	Adopted 2012 codes, effective 5/1/13
Phoenix	2006 IBC	2006 IMC	2006 UPC	2008 NEC	2006 IRC	2006 IFC w/ Amendments	2006 IECC	2006 IEBC	2006 IFGC	2006 ICCP for Buildings and Facilities	IGCC Public Version 2	Effective July 2, 2008	Phoenix		Discussing 2012 ICC, anticipated July 2013
Queen Creek	2006 IBC	2006 IMC	2006 UPC	2005 NEC	2006 IRC	2006 IFC	2006 IECC	2006 IEBC				Effective Aug. 7, 2008	Queen Creek		No plans to adopt 2009 codes.
Salt River	2003 IBC	2003 IMC	2003 UPC	2002 NEC	2003 IRC	2003 IFC	None						Salt River		
Scottsdale	2012 IBC	2012 IMC	2012 IPC	2011 NEC	2012 IRC	2012 IFC	2012 IECC	2012 IEBC	2012 IFGC		2012 IGCC	Effective January 7, 2013 Also 2012 IPMC	Scottsdale		January 2013
Surprise	2006 IBC	2006 IMC	2006 IPC	2006 IEC w/ 2005 NEC	2006 IRC	2006 IFC	2006 IECC	2006 IEBC	2006 IFGC				Surprise		January 1, 2014

Survey of Code Adoption

Jurisdiction	Building	Mechanical	Plumbing	Electric	Residential	Fire	Energy	Existing Building Code	Fuel Gas	Performance	Green Construction	Notes	URL	Anticipated Adopted Date by Council	Anticipated Effective Date for 2009 or 2012 ICC Codes (Month and Year)
Tempe	2009 IBC	2009 IMC	2009 IPC	2008 NEC	2009 IRC	2006 IFC	2009 IECC	2009 IEBC	2009 IFGC				Tempe		October 24, 2011
Tolleson	2006 IBC	2006 IMC	2006 IPC	2005 NEC w/ 2006 IEC	2006 IRC	2006 IFC	2006 IECC					2006 Fuel Gas Code, 2006 IPMC, 2006 NEAC. Adopted 2/20/07, effective 7/1/07.	Tolleson	January/February 2010	July 2010
Wickenburg	2006 IBC	2006 IMC	2006 IPC	2005 NEC	2006 IRC	2003 IFC	2006 IECC	2006 IEBC	2006 IFGC				Wickenburg		No plans to adopt 2009 codes.
Youngtown	2006 IBC	2006 IMC	2006 IPC	2005 NEC	2006 IRC	2006 IFC			2006 IFGC				Youngtown	November 2010	January 2011

This is intended to be used as a guide for the selected codes, as to what member agencies have adopted or intend to adopt.

Last updated January 17, 2013 by Scott Wilken, MAG

Source: MAG Building Codes Committee Members