MARICOPA ASSOCIATION of GOVERNMENTS
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August 8, 2012

TO: Members of the MAG Building Codes Committee

FROM: Michael Williams, Tempe, Chair

SUBJECT: MEETING NOTIFICATION AND TRANSMITTAL OF TENTATIVE AGENDA

Wednesday, August 15, 2012 - 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 Steve Gross 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
August 15, 2012

1.	Call to Order	
2.	Introductions	2. For information.
3.	June 20, 2012 Meeting Minutes	3. Review and approve the minutes of the June 20, 2012 meeting.
4.	Call to the Audience 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.	4. For information and discussion.
5.	Comments From the Committee 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.	5. For information and discussion.
6.	Viega MegaPress Cold Press System John Armstrong of Viega will present information about a new cold press system for schedule 5 to schedule 40 black steel pipe. Please see Attachments One and Two.	6. For information and discussion.

7. MAG Building Code Amendments and Standards Book

Discussion about committee members' review of code amendments and building construction standards not included in national codes, focusing on documents that have previously been tabled for further research, as well as the new block fence details that were presented in June. This discussion will involve which documents should be included in a new MAG publication, which should be updated, which should be included for historical purposes, and which should be excluded, as well as other related issues. Please see **Attachment Three** for the original list of documents. Please see **Attachment Four, Five, and Six** for updated documents.

For copies of the Original Documents – MAG BCC Code Amendments and Standards, please visit the MAG webpage at: http://www.azmag.gov/Events/Event.asp?CMSID=4094

7. For information, discussion and possible action.

8. Updated MAG Building Codes Committee Membership

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

8. For information and discussion.

9. Update Survey of Code Adoption

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

9. For information and discussion.

10. Topics for Future Agendas

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

The next meeting is scheduled for Wednesday September 19, 2012 at 2:00 p.m. in the MAG Ironwood Room.

10. For information and discussion.

11. Adjournment

MINUTES OF THE
MARICOPA ASSOCIATION OF GOVERNMENTS
BUILDING CODES COMMITTEE

June 20, 2012

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
A-Martin Perez, Chandler
Mary Dickson, El Mirage
*Jason Field, Fountain Hills
A-Larry Taylor for Ray Patten, Gilbert
Tom Paradise, Glendale
Ed Kulik, Goodyear
*Chuck Ransom, Litchfield Park
Tom Ewers, Maricopa County
A-Steven Hether, Mesa
Bob Lee, Paradise Valley
*Dennis Marks, Peoria
*Julie Belyeu, Phoenix
*Dean Wise, Queen Creek
Dustin Schroff for Michael Clack, Scottsdale
Dale Crandell, Tolleson
*Rick DeStefano, Wickenburg
A-Jim Fox, Youngtown
*Jackson Moll, Home Builders Association
*Sharon Bonesteel, Salt River Project

OTHERS IN ATTENDANCE

Scott Wilken, MAG
Steve Gross, MAG
Lisa Prichard, Arizona Masonry Guild
Dave Endres, Superlite Block
Mike Summers, Top Quality Masonry
Brian Juedes, Felten Group
Greg Felten, Felten Group
Ed Freyermuth, Arizona Masonry Guild
Tiffany Sprague, Sierra Club
A-Mike DeWys, Chandler

*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 June 20, 2012 meeting of the MAG Building Codes Committee (BCC) at 2:00 p.m.

2. Introductions

Voting members Martin Perez, Larry Taylor, Steven Hether and Jim Fox attended via telephone conference call. All members and guests introduced themselves.

3. May 16, 2012 Meeting Minutes

Bob Lee pointed out an error in the draft minutes, saying the top of page 4 should say "follow the NEC" instead of "follow then NEC" and made a motion to approve the amended minutes. Dale Crandell seconded the motion, and the amended minutes were approved unanimously.

4. Call to the Audience

Ken Kirschmann talked to the committee about recent issue Southwest Gas has had with water heater installation. He said that major contractor in the area has been installing water heaters by eliminating the Temperature Pressure Release (TPR) valve and installing another valve that shuts off the gas. He said that, in the event of a too high temperature being reached, this set-up would prevent additional pressure but not relieve the existing pressure. He asked if any of the members had seen this situation, or knew if there were changes to the code that would allow something like this. Tom Paradise asked if the gas valve is heat sensitive, and Ken Kirschmann said that it is. He said that he wanted to bring it to the group's attention in case they hadn't seen it in the field. He said that Southwest Gas policy is that they will leave the gas turned off for water heaters set up like this and place a hazardous conditions form on the water heater, and have the contractor make the required changes, usually installing the regular TPR valve. Michael Williams asked if the valve has a rating. Ken Kirschmann said that the valve appears to have a rating printed on it, but he's never seen it and isn't sure what the exact rating is.

5. Comments From the Committee

Tom Ewers asked how many jurisdictions require permits for construction storage trailers. He also asked how many require permits for construction offices, and, if so, they require them to be handicapped accessible. Jim Fox said that Youngtown requires permits for construction offices and they have to be handicapped accessible if they include a conference room. Steven Hether said that Mesa requires permits for construction offices, and if they're only going to be used for the construction crews they do not have to be handicapped accessible, but it is required if they will be used for any meetings.

Bob Lee said that the AZBO Annual Business Meeting will take place July 17-19, in Payson at the Best Western. He said there will be a golf tournament the first day, with chapter meetings that evening. He said that the business meeting will be held the morning of the second day. He said that there will be professional development in the afternoon of the second day featuring Dr. Paul Melendez of the University of Arizona. He said the third day will include a roundtable discussion on the changing face of building inspections. He said that after lunch on the third day there will be a demonstration of a blower door test.

Scott Wilken said that staff is trying a new software called Adobe Connect at this meeting for the members attending via audioconference. He said that it allows the members on the phone to see what is being shown on the screen in the meeting room without having to download anything. He said that if it is successful, it will be made available at future meetings.

6. New 4" Interlocking Block Wall with Pilaster Details

Lisa Prichard from the Arizona Masonry Guild and the Arizona Masonry Contractors Association presented new interlocking block wall details. She said that in 2007, the masonry industry had worked with Felten Group to develop a standard detail for 4" masonry block walls that can be offered to residents as a resource when building a new fence. She said that that detail has been updated to reflect recent building code changes. She said that they were going to present the 9.5 course Exposure B and C details with a rating of 200 pounds per square foot (psf) and the 8.5 course Exposure B and C, which are primarily for southern Arizona.

Brian Juedes said that in 2007 the City of Phoenix required that engineering calculations be provided for block fences. He said that the discussions at that time resulted in pilaster spacings that were greatly reduced from the spacing historically used on block fences. He said that as part of the current update, they were able to use reduced wind load to increase the pilaster spacing to what they had been in the past. He said that 8.5 courses and 9.5 courses are the correct number of courses to achieve a 5'8" fence and 6' fence, respectively. He said that the four designs can be used with a presumptive soil value or values from site-specific soils reports.

Tom Ewers said that Maricopa County requires a block on the bottom course to be turned on its side for drainage purposes. He asked if that would affect these designs. Brian Juedes said this procedure would provide the necessary strength and would not adversely affect the designs.

Bob Lee said that his understanding in the past of the Load and Resistance Factor Design (LRFD) was that it put the onus on the engineer to state what the acceptable safety factor is based on the material being used. He asked if that had changed recently. Brian Juedes said the LRFD does not eliminate factor safeties, but is a different approach to how factor safety is managed.

Tom Paradise said that, by code, Glendale would not require a permit for a fence like this. He asked if any jurisdictions would require a permit. Bob Lee said that Paradise Valley has amended their code to require a permit for any fence over 8" high. Tom Ewers said that Maricopa County would require a permit for a drainage review, but not a structural review. Jim Fox said that Youngtown requires a permit for all fences. Tom Paradise said that the 2012 building code has an exemption for fences under 7', but jurisdictions can amend that if they want. He asked what happens to the design if someone builds a 6' fence using this detail and later adds a course or course and a half, staying under 7' and, therefore, not needing a permit. He asked if the designs are only valid for 8.5 course and 9.5 course fences. Greg Felten said that the I-codes dropped the 33% increase with wind loads for masonry, so that adds some safety factor, as well. He said that, as far as the safety calculations are concerned, an extra course or course and a half would not be a problem. Brian Juedes said that beyond 9.5 courses is not in the plans now and would have to be analyzed. He said that the fence is not over designed, and they are not designed for extra courses. Tom Paradise said that his guess is that wouldn't work. Brian Juedes said that they said with older fence design that adding courses wouldn't work.

Bob Lee said that the fence like this at his house has no mortar holding the blocks together. Mike Summers said that for each course the blocks are likely hanging from a horizontal piece of rebar. Brian Juedes said that this design does not cover the mortarless blocks, and that it relies on the bed joint for the vertical spanning. He said that the head joint in the top course is not structural, but is included as a serviceability issue in case anyone climbs over the fence. Tom Paradise pointed out that the top course is still tongue-and-groove, but with mortar. Brian Juedes said that is correct.

Brian Juedes said that there is an allowance in the design for unbalanced lots, in case one lot is higher than the neighboring lot. He said the calculations can accommodate up to 8" of unbalanced fill before being considered a retaining wall.

Bob Lee asked if any jurisdiction is allowed to use these designs even if it is not a guild member building the fence. Lisa Prichard said yes, and that the idea is that these designs are available for the general public. She said that jurisdictions can make copies for people who come into the counter or post the designs on their website.

Dustin Schroff asked if it is okay if these details come in on a set of civil plans. Brian Juedes said that they provide the details to the Masonry Guild, so that could result in the details being used on another registrant's plans, but that they would like to be aware that the details are being used in that fashion. He said that jurisdictions would be in the right to ask for a letter of permission from Felten Group if someone else is using the details.

Jim Fox said that he has seen fences with the bottom course 8" tall rather than a half course, and asked how that changes these details. Brian Juedes said that they also have 8 and 9 course details, but they won't be 6' tall fences- the 9 course detail ends up with a wall that is 5'9" tall if the footing is buried as shown. He said that there is no 10 course standard detail. He also said that in these details the half course can be placed anywhere within the wall.

Michael Williams asked how critical the durawire placement at the top of the wall is, and if it is expected to go through the pilasters or just in the panels. Brian Juedes said that it goes just in the panels. He said that it is just a pressure connection in the panel, and the wire goes from pilaster to pilaster.

Michael Williams asked if the committee would be allowed to include these details in the Code Amendments and Standards book. Brian Juedes said that would be no problem.

7. <u>MAG Building Code Amendments and Standards Book</u>

Michael Williams said that at the previous meeting the committee had voted on the first 25 items on the list, and this meeting would discuss the rest of the list, followed by the items that had previously been tabled.

Michael Williams said that Item 26 dealt with post-tension slab construction. Tom Ewers said that the recommendations in this item haven't changed. Randal Westacott said that a lot of work went into the post-tension roundtable committee that produced these recommendations. Tom Ewers made a motion to include Item 26 as written. Ed Kulik seconded the motion, and the motion passed unanimously.

Michael Williams said that Item 27 dealt with dryer installation. Scott Wilken added that there is a tag included with this item that is to be placed on dryers at instillation. Tom Paradise said that Glendale still uses it. Scott Wilken asked if this item were updated to reference the 2012 code, would that preclude any jurisdiction that hasn't adopted the 2012 codes from using it. Bob Lee pointed out that this would be case with a number of items. Randal Westacott suggested updating all the of the code year-specific items to the current code to show that this committee is encouraging the most up-to-date codes. Scott Wilken asked if it would be workable to keep the code year-specific items referencing the current code, but include a statement in the book's introduction that any jurisdiction using any of these standards should feel free to edit the document to reference which ever code year they are using. Bob Lee made a motion to update Item 27 to reference the 2012 codes. Dale Crandell seconded the motion, and the motion passed unanimously.

Scott Wilken said that Item 28 addressed a lot of different topics. Bob Lee said that these topics have been addressed since, and this document belongs in the historic column. He made a motion to include Item 28 as Historic. Randal Westacott seconded the motion, and the motion passed unanimously.

Bob Lee said that Item 29 was similar to the previous item, in that the topics have since been addressed. He made a motion to include Item 29 as Historic. Mary Dickson seconded the motion, and the motion passed unanimously.

Michael Williams said that Item 30 allows the temporary use of Port-A-Johns to meet the ADA requirements if a sales office or model home were sold. Tom Ewers said that he would still use this. Tom Ewers made a motion to include Item 30 as written. Randal Westacott seconded the motion, and the motion passed unanimously.

Michael Williams said that Item 31 requires builders to provide a pad certification report for single family lots. Ed Kulik said that this item is still relevant. He made a motion to update Item 31 to reference the 2012 codes. Dale Crandell seconded the motion and the motion passed unanimously.

Michael Williams said that Item 32 allows the installation of a deco drain directly below the weep screed to allow excess moisture to escape the inside of the wall. Randal Westacott made a motion to update Item 32 to reference the 2012 code. Ed Kulik seconded the motion and the motion passed unanimously.

Michael Williams said that Item 33 was a set of amendments to the 2002 NEC that allows cable attachments outside of an SES. Bob Lee said that it's still being used, and that the text should be updated to reference the 2011 NEC and 2012 IRC. Bob Lee made a motion to update Item 33 to the current codes. Ed Kulik seconded the motion, and the motion passed unanimously.

Michael Williams said that Item 34 established that storage space located under stairs not be considered as underfloor spaces requiring lighting. Bob Lee said that he doesn't think this has been addressed in the code, so it's something that should be updated. He made a motion to update Item 34 to the 2012 IRC and 2011 NEC. Ed Kulik seconded the motion, and the motion passed unanimously.

Michael Williams said that Item 35 recognized the City of Phoenix Approved Structural Steel Fabricators program. Randal Westacott asked if Phoenix still uses this. Bob Lee said that they

do. Bob Lee made a motion to include Item 35 as written. Tom Ewers seconded the motion, and the motion passed unanimously.

Michael Williams said that Item 36 recommended the AZBO proposed amendments to the 2006 ICC codes. Randal Westacott suggested that this item be included as Historic. He made a motion that Item 36 be included as Historic. Ed Kulik seconded the motion, and the motion passed unanimously.

Michael Williams said that Item 37 accepted recommendations of the Arizona Residential Post-Tensioned Round Table to set standards for inspection, evaluation, and acceptance of the concrete pour for residential post-tensioned slabs on ground. Bob Lee asked how this item relates to Item 26. Scott Wilken said that Item 26 doesn't reference inspections. Tom Ewers made a motion to update Item 37 to the 2012 codes. Ed Kulik seconded the motion, and the motion passed unanimously.

Michael Williams said that Item 38 supported the 2007 supplement to the IRC for story height and wall bracing requirements. Michael Williams said that this is probably still needed for the jurisdictions still using the 2006 IRC. Tom Ewers said that this supplement was incorporated into the 2009 IRC. Ed Kulik said that he suggests keeping this item as-is until a majority of jurisdictions have updated past the 2006 codes. He made a motion to include Item 38 as written. Dale Crandell seconded the motion, and the motion passed unanimously.

Michael Williams said that Item 39 recommends that jurisdictions update to the 2009 family of codes. Mary Dickson made a motion to include Item 39 as Historic. Ed Kulik seconded the motion, and the motion passed unanimously.

Scott Wilken said that there were a few items from the May meeting that were updated by the committee members. He said that Sharon Bonesteel was working on Item 7, Item 19, and Item 20, but was not able to attend the June meeting. She will present her findings at the next meeting.

Scott Wilken said that Item 8 was standards for fireplaces. Tom Ewers said that he researched this item, and the standards have not changed. He made a motion to include Item 8 as written. Randal Westacott seconded the motion, and the motion passed unanimously.

Scott Wilken said that Item 9 and Item 11 were researched together. Dustin Schroff said that he conducted a survey to find out how widespread the use of composite tags is. He said that of the 10 respondents, 8 do not enforce the provisions of either Item 9 or Item 11, and the other two enforce one but not the other. He said that some prior codes have truss marking requirements, but the 2006 to 2012 codes do not. He made a motion that Item 9 and Item 11 be included as Historic. Randal Westacott seconded the motion, and the motion passed unanimously.

Scott Wilken said that Item 10 was researched by Mike Baxley, who was unable to attend this meeting. He said that Mike Baxley provided the updated strawbale construction standards from Pima County. He said that the provided document appeared to not discuss strawbale construction, and suggested postponing discussion on this item until the next meeting. Bob Lee made a motion to table Item 10 to the August 2012 meeting. Ed Kulik seconded the motion, and the motion passed unanimously.

Scott Wilken said that Item 24 was regarding foam products for fireblocking. Bob Lee said he researched this item. He made a motion to update the text of Item 24 to refer to Section 302.11 of the 2012 IRC, change “firestop” to “fireblock,” to make it clear that it refers to fireblocking material that is listed or tested in accordance with UL 1479, ASTM E814 or ASTM E136. Tom Ewers seconded the motion.

8. Updated MAG Building Codes Committee Membership

   There were no updates.

9. Update Survey of Code Adoption

   There were no updates.

10. Topics for Future Agendas

    Michael Williams said that the July meeting will be canceled. He said that the next meeting will be held August 15, 2012. He said that the committee will review and vote on the block fence standard details at the August meeting.

11. Adjournment

    Bob Lee made a motion to adjourn and Ed Kulik seconded the motion. The meeting was adjourned at 3:46 PM.


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MegaPress & MegaPress G
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The next innovation in pressing technology
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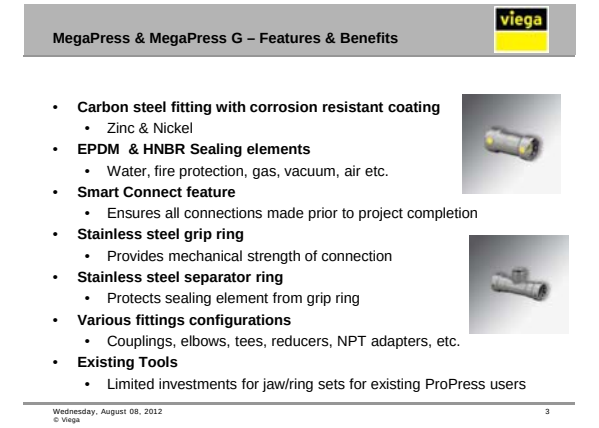
MegaPress & MegaPress G – Features & Benefits
viega
Carbon steel fitting with corrosion resistant coating
Zinc & Nickel
EPDM & HNBR Sealing elements
Water, fire protection, gas, vacuum, air etc.
Smart Connect feature
Ensures all connections made prior to project completion
Stainless steel grip ring
Provides mechanical strength of connection
Stainless steel separator ring
Protects sealing element from grip ring
Various fittings configurations
Couplings, elbows, tees, reducers, NPT adapters, etc.
Existing Tools
Limited investments for jaw/ring sets for existing ProPress users
Wednesday, August 08, 2012
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MegaPress & MegaPress G – Features & Benefits

- **For use with Black or Galvanized steel pipe**
- **No threading equipment or accessories**
  - No welding or fire watch
  - Installation under flow conditions
  - Retains structural integrity of pipe
  - Piping systems install using same practices as traditional methods
- **Clean**
  - No oils or debris
- **Reduced installation time**
  - More jobs done in less time
- **Reliable**
  - Consistent connection every time
  - Same proven press technology

MegaPress & MegaPress G – Technical Information

- **Carbon steel construction**
- **304 stainless steel separator ring**
- **420 stainless steel grip ring**
- **EPDM sealing element**
  - Maximum temperature 250°F
- **HNBR sealing element**
  - Temperature range -40°F to 180°F

MegaPress & MegaPress G – Technical Information

MegaPress

- Markings on Viega MegaPress fittings include:
- Green Dot: EPDM sealing element and Smart Connect feature
- Size of fitting
- Manufacturer Name
- Manufacture Date Code

MegaPress & MegaPress G – Technical Information

MegaPress G

- Yellow Dot: HNBR sealing element and Smart Connect feature
- CSA: Indicates certification to ANSI/CSA LC4
- Yellow rectangle: Identifies Viega MegaPressG fitting as a certified gas or fuel oil fitting
- 125G: Identifies the CSA maximum pressure rating of the fitting for fuel oil or gas applications
- Size of fitting
- Manufacturer Name
- Manufacture Date Code

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MegaPress & MegaPress G – Technical Information

- **Smart Connect Feature** - In MegaPress and MegaPressG 1/2" to 2" connections, the Smart Connect feature allows the passage of liquids and/ or gases from inside the system past the sealing element of an **UNPRESSED** fitting.
- **Testing** - All system testing shall be carried out in accordance to the local code or authority having jurisdiction. Viega recommends air testing of gas systems to be a minimum of 1/2 psi.

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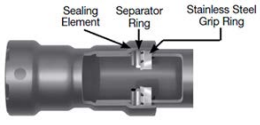
MegaPress & MegaPress G – Technical Information

Grip Ring

- 420 stainless steel ring with bidirectional teeth, which grip the pipe and ensure that the fitting is locked securely to the piping.



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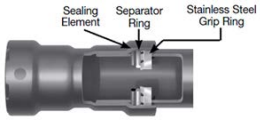
MegaPress & MegaPress G – Technical Information

Separator Ring

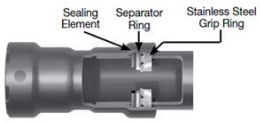
- 304 Stainless Steel separator ring ensures that the sealing element and grip ring perform at maximum capacity by providing a positive physical separation.



MegaPress & MegaPress G – Technical Information

Sealing Elements

- EPDM
- HNBR
- Sealing elements are ribbed and are different from standard ProPress sealing elements because of the rough surface of the black pipe



MegaPress & MegaPress G – Technical Information

- **Available in ½" – 2" sizes**
- **For use on Schedule 5 – Schedule 40 pipe**
  - ASTM A 53
    - Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated Welded and Seamless
  - ASTM A 135
    - Specification for Electric Resistance Welded Steel Pipe
  - ASTM A 795
    - Specification for Black and hot-Dipped, Zinc-Coated (Galvanized), Welded and Seamless Steel Pipe for Fire Protection Use

MegaPress & MegaPress G – Technical Information

- ASTM A 106
  - Standard Specification for Seamless Carbon Steel Pipe for High-Temperature Service
- ASME B 36.10
  - Welded and Seamless Wrought Steel Pipe
    - This Standard covers the standardization of dimension of welded and seamless wrought steel pipe for high or low temperatures and pressures.

MegaPress & MegaPress G – Technical Information

- **Compliance to:**

ANSI LC 4
AMERICAN NATIONAL STANDARD /
CSA STANDARD FOR LC 4

PRESS-CONNECT COPPER AND COPPER ALLOY FITTINGS
FOR USE IN FUEL GAS DISTIBUTION SYSTEMS

MegaPress & MegaPress G


Certificate of Compliance

The products listed below are eligible to bear the CSA Mark shown with adjacent indicator 'US'

US

MegaPress & MegaPress G

MegaPress & MegaPress G

MegaPress & MegaPress G – Technical Information

Viega MegaPress Approved Applications

Types of Service	System Operating Conditions			MegaPress	MegaPressG
	Comments	Pressure	Temperature	EPDM	HNBR
Fluids/Water					
Chilled Water	Ethylene Glycol Propylene Glycol	200 psi	Down to -4°F	√	
Hydronic Heating	Ethylene Glycol Propylene Glycol	200 psi	0°F - 250°F	√	
Fire Sprinkler		175 psi		√	
Low Pressure Steam		Up to 15 psi	max. 248°F	√	
Oil and Lubricant					
Heating Fuel Oil		125 psi	-40°F - 180°F Ambient		√
Diesel Fuel	Compliant with NFPA 30 and 30A	125 psi			√
Gases					
Natural Gas, LP Gas and Fuel Oil	ANSI/CSA LC4 -40°F - 180°F 125 PSI Max.	125 psi max.	-40°F - 180°F Ambient		√
Compressed Air	Oil Concentrate < 25mg/m3	200 psi		√	√
	Oil Concentrate > 25mg/m3	200 psi			√
Vacuum		Max. 29.2in Hg		√	√
Oxygen Non-medical	Keep oil and fat free / non liquid	140 psi (200 psi only HNBR)	Up to 140°F	√	√
1. Consult the Viega Technical Support Department for information on applications not listed and applications outside the temperature and pressure ranges listed above.					
2. All systems are recommended to be clearly labeled with the fluid or gas being conveyed. For further information please see the Viega technical bulletin TB-PIPELABELING.					

MegaPress & MegaPress G – Installation

- **Pressing Tools** - The following RIDGID pressing tools, jaw kits and prep tools are for use on MegaPress and MegaPressG fitting system;
  - RP330 B and C
  - CT400

Ridgid MegaPress Pipe Preparation Tool
RP37993 1/2" - 1"
RP37988 1 1/4" - 2"

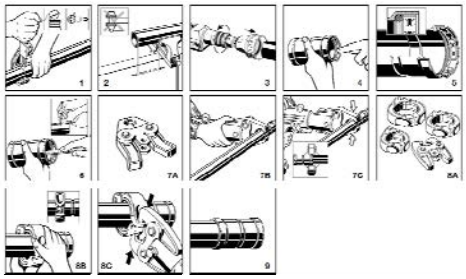
V2 Actuator and MegaPress
jaws 1/2" - 1"
ring set 1-1/4" - 2"

As well as;

- The Hydraulic Hand Press Tool

MegaPress & MegaPress G – Installation

MegaPress and MegaPressG Fitting System 1/2" – 2" Installation



MegaPress & MegaPress G – Warranty

Viega MegaPress® Warranty

MEGAPRESS® VIEGA LIMITED WARRANTY

Subject to the conditions and limitations in this Limited Warranty, Viega LLC (Viega) warrants to end users, installers, and distribution houses that its Viega MEGAPRESS metal press fittings (Viega Product) with application appropriate sealing element when properly installed shall be free from failure caused by manufacturing defects for a period of ten (10) years from date of installation in Viega MEGAPRESS Approved Applications for fluids/water, oil and lubricant, and gases under Viega specified system operating conditions.

ATT TWO

Viega MegaPress®

March 2012

Viega MegaPress - the only press systems for black iron pipe approved for water and gas

The first carbon steel press fitting systems approved for both water and gas applications, Viega MegaPress and Viega MegaPressG help save time and labor on the job site. Viega MegaPress fittings can reduce installation time by as much as 60%, with no need for heavy equipment or messy cutting oils. Make easy, secure, consistent black iron pipe connections in less than seven seconds with Viega MegaPress systems.

Viega MegaPress and MegaPressG features and benefits

- Carbon steel press fittings with corrosion resistant coating
- Makes secure connections in less than seven seconds on sizes ½" to 2"
- Compatible with existing Viega ProPress press tools
- Backed by a 10-year fitting warranty
- Helps reduce installation time 30 to 60%
- Provides consistent reliability
- Reduces cleanup - no oil or metal shavings
- Provides safety - no fire watches or burn permits

ATT TWO

Viega MegaPress and MegaPressG are carbon steel cold press systems designed for use in chilled water, hydronic heating, compressed air, fire sprinkler, fuel gas and heating oil applications.

Viega MegaPress fittings are designed for use in piping systems utilizing ASTM A53, A106, A135 and A795 Schedule 5 to Schedule 40 black iron pipe.

Viega MegaPressG fittings are designed for use in fuel gas or fuel oil systems with ASTM A53 Schedule 40 black iron pipe.

Standards:

- CSA LC4
- TSSA / ASME B31

Compliant with:

- Uniform Plumbing Code
- Uniform Mechanical Code
- International Plumbing Code
- International Mechanical Code
- NFPA 54
- NFPA 58
- International Fuel Gas Code
- ASME B31
- NFPA 13, 13D and 13R

Viega MegaPress and MegaPressG fittings are available in the following fitting configurations in sizes ½" to 2":

- P x P Coupling
- P x P No-stop coupling
- P x IPF NPT adapters
- P x IPF NPT Reducing adapter
- FTG x P Reducer
- P x IPM NPT adapter
- P x P 90° Elbow
- P x P 45° Elbow
- P x P x P Tee
- P x P x P Reducing Tee
- P x P x IPF NPT Tee
- P x P Union

Viega MegaPress fittings are provided with a factory installed EPDM sealing element, a 304 stainless steel separator ring and a 420 stainless steel grip ring approved for use in hydronic heating, compressed air, fire sprinkler and cooling water applications.

Viega MegaPressG fittings are provided with a factory installed HNBR sealing element, a 304 stainless steel separator ring and a 420 stainless steel grip ring and are CSA LC4 approved for fuel oil and fuel gas installations.

All Viega MegaPress and MegaPressG fittings offer the patented Smart Connect feature, a quick and easy way for installers to identify unpressed connections. Testing for leaks using the Smart Connect feature is not a replacement for testing to the requirements of local codes or standards.

Operating Temperatures:

Viega MegaPress Max.: 0°F to 250°F
Viega MegaPressG Max.: -40 to 180°F

Viega MegaPress and MegaPressG systems are approved for underground use and must be protected against corrosion in accordance with NFPA 54 section 404.8, NACE Standard RP0169-2002 section 5, 2009 UPC Chapter 6 section 609.3.1, 2009 UMC Chapter 13 section 1312.1.3 and in a manner satisfactory to the local code official.

Recommended Tools:

- RIDGID® RP 330-B
- RIDGID® RP 330-C
- RIDGID® CT-400
- RIDGID® Pipe Prep Tool for MegaPress

Contact a local Viega representative for applications other than listed on this document.

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The global leader in plumbing, heating and pipe joining systems

viega

REF #	MEETING DATE	CODE AFFECTED	CODE YEAR	SECTIONS	BRIEF DESCRIPTION	Have Doc	Include As Is	Needs Update	Historic	Not Needed	Tabled to 8/15
1	4/22/1992	UPC	1991	N/A	A motion was passed to approve amendments to the 1991 UPC that were developed by the MAG Plumbing and Mechanical Working Group.	No			3/21		
2	1/27/1993	N/A	N/A	N/A	A motion was passed to approve a One Coat Stucco Compliance Program For MAG Member Agencies.	Yes			3/21		
3	5/19/1993	UMC	1991	N/A	A motion was passed to approve amendments to the 1991 UMC that were developed by the MAG Plumbing and Mechanical Working Group.	No			3/21		
4	5/24/1995	UBC	1994	N/A	A motion was passed approving the MAG Special Inspections Standards Manual.	Yes		3/21			
5	6/21/1995	N/A	N/A	N/A	A motion was passed stating that the Committee supports uniform reporting of information to the County Assessor as opposed to all member agencies using a uniform permitting process.	Yes			3/21		
6	4/17/1996	UBC	1994	Chapter 12	A motion was passed adopting a Model Sound Attenuation Ordinance for New Residential Construction as a MAG Standard.	Yes	3/21				
7	4/17/1996	NEC	1993	N/A	A motion was passed stating that utility companies installing lighting on private property will be subject to all MAG member agency code requirements including permits, and inspection. Management Committee supported this action on May 15, 1996 and the Regional Council supported the action on May 29, 1996.	Yes					6/20
8	10/22/1997	N/A	N/A	N/A	A motion was passed adopting MAG Model Standards for fireplaces, wood stoves or other solid fuel burning devices.	Yes	6/20				
9	10/21/1998	UBC	1997	2343.6	A motion was passed to approve the plastic tag identified at the meeting for use in marking trusses and that a committee be established to address future markings of tags. It was also noted that the Wood Truss Council of America would make the tags available.	No			6/20		
10	2/17/1999	UBC	1997	N/A	A motion was passed adopting the Pima County Standard on Strawbale Construction as a MAG standard without amending it.	Yes					6/20
11	4/19/2000	UBC	1997	2343.6	A motion was passed to approve a standard for the marking of trusses developed by the MAG Building Inspector/Plan Examiner Group.	Yes			6/20		
12	11/1/2000	UBC	1997	Chapter 11	A motion was passed to recommend compliance with the accessibility standards in the Fair Housing Act or 1997 UBC Chapter 11 either by ordinance or through the alternate design methods section of the Uniform Building Code.	Yes			5/16		
13	5/16/2001	UMC	1997	> 307.5.2	A motion was passed to approve an interpretation of the 1997 UMC that either the use of permanently installed railings on the roof, or one side railing extension would meet the intent of the code for roof access.	Yes			5/16		
14	9/12/2001	UBC	1997	Section 2306.4	A motion was passed to require pressure treated sill plates in both interior and exterior applications as required by UBC Section 2306.4	Yes			5/16		
15	11/14/2001	IRC	2000	Table R301.2 (1)	A motion was passed recommending the use of Table R 301.2 (1) with the following assumed values: Ground Snow Load: 0 psi; Wind Speed: 90 mph; Seismic Design Category: B; Weathering: NEGLIGIBLE; Frost Line Depth: 12"; Termite: Moderate to Heavy; Decay: None to slight; Winter Design Temperature: 34 degrees F; Flood Hazards: Jurisdiction Specific, as a MAG Standard. (The Winter Design Temperature was updated January 16, 2002 from 27 degrees to 34)	Yes		5/16			
16	2/20/2002	N/A	N/A	N/A	A motion was passed to accept standard language of an agreement authorizing Southwest Gas to relocate a gas line without permit or clearance requirement.	Yes		5/16			
17	3/20/2002	IRC	2000	Chapter 11	A motion was passed adopting a proposal that explains alternatives for complying with Chapter 11 of the IRC, the Energy Chapter.	Yes			5/16		

REF #	MEETING DATE	CODE AFFECTED	CODE YEAR	SECTIONS	BRIEF DESCRIPTION	Have Doc	Include As Is	Needs Update	Historic	Not Needed	Tabled to 8/15
18	3/20/2002	IMC	2000	Section 403.3	A motion was passed approving a resolution which stated "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".	Yes			5/16		
19	5/15/2002	NEC	1999	Article 690	A motion was passed to approving the permit requirements for Commercial Solar Photovoltaic (PV) Installations.	Yes					6/20
20	5/15/2002	NEC	1999	Article 690	A motion was passed approving permit requirements for Residential Solar Photovoltaic (PV) Installations.	Yes					6/20
21	10/16/2002	IBC, IRC, IMC	2000	N/A	A motion was passed adopting the AZBO Code Review & Development Committee Report of Final Actions 2001-2002, dated July 15 2002, as MAG amendments.	Yes			5/16		
22	1/15/2003	IBC, IRC	2000	1202.2, R806	A motion was passed accepting the following statement, "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 conversation in mind".	Yes			5/16		
23	4/16/2003			N/A	A motion was passed requiring a permit for Solar Water Heater Systems as a standard.	Yes	5/16				
24	5/21/2003	IRC	2000	R602.8.1.2	A motion was passed to disallow the use of foam products for fireblocking, unless they are listed as firestop material. Field testing found that foam products that were often used for fireblocking were in fact flammable.	Yes		6/20			
25	5/21/2003	I Codes	2003	N/A	A motion was passed stating that all member agencies should strive to use the 2003 International Codes with a goal of an effective date of July 2004.	No			5/16		
26	10/14/2003	N/A	N/A	N/A	A motion was passed adopting recommendations for Post-Tension Slab construction.	Yes	6/20				
27	10/14/2003	N/A	N/A	N/A	A motion was passed adopting a MAG standard that would require the attachment of a label to a dryer that informs consumers of changes or exceptions to the code that have been allowed for the installation of the dryer.	Yes		6/20			
28	11/19/2003	I Codes	2000	N/A	A motion was passed adopting the AZBO Code Review & Development Committee proposed amendments to the 2000 codes updated to the 2003 ICC codes.	Yes			6/20		
29	3/17/2004	NEC	2002	N/A	A motion was passed accepting the AZBO 2002 NEC Amendment Packet.	Yes			6/20		
30	8/18/2004	N/A	N/A	N/A	A motion was passed to adopt an interpretation allowing for the temporary use of Port-A-John, among other things, in order to meet ADA requirements in a case were a sales office or model home in a subdivision would ultimately become sold to a homeowner.	Yes	6/20				
31	12/16/2004	IRC	2003	R401.2	A motion was passed requiring that each builder provide a current pad certification report for all single family lots, in tract subdivisions, at the time of footing inspection.	Yes		6/20			
32	12/16/2004	IRC	2003	R703.6.2.1	A motion was passed to allow the installation of deco drain directly below the weep screed as an alternate method of allowing excess moisture inside the wall to drain to the exterior of the building. If the patio is integral to the post tension slab, this alternative method would not be acceptable.	Yes		6/20			
33	11/19/2005	NEC	2002	312.5; 314.17	A motion was passed that approved amendments to the 2002 National Electric Code that allows cable attachment outside an SES under certain circumstances that are specifically addressed in Exhibit “A.”	Yes		6/20			
34	6/21/2006	IRC & NEC	2003 and 2006; 2002 and 2005	IRC E3803.4	A motion was passed to establish that storage space located under stairs not be considered as underfloor spaces requiring lighting for the sake of consistency throughout Maricopa County.	Yes		6/20			

REF #	MEETING DATE	CODE AFFECTED	CODE YEAR	SECTIONS	BRIEF DESCRIPTION	Have Doc	Include As Is	Needs Update	Historic	Not Needed	Tabled to 8/15
35	6/21/2006	UBC or IBC	1997 UBC or any edition of the IBC	N/A	A motion was passed that member jurisdictions will 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.	Yes	6/20				
36	11/21/2006	IBC, IRC, IGC, IMC, IPC	2006	N/A	A motion was passed recommending the AZBO Code Review & Development Committee proposed amendments to the 2006 ICC codes be forwarded to the MAG member agencies for their consideration.	Yes			6/20		
37	1/16/2008	IBC	2003	1704.4 1905.6	A motion was passed to accept the recommendations made by the Arizona Residential Post-Tensioned Round Table (ARPTRT) so that all MAG member agencies have the same standards for inspection, evaluation and acceptance of the concrete pour for residential post-tensioned slabs-on-ground.	Yes		6/20			
38	6/18/2008	IRC supplement	2007	R301.3 Story height R602.10.4 Wall bracing	A motion was passed that the committee generally supports the 2007 supplement to the IRC for story height and wall bracing requirements.	Yes	6/20				
39	11/19/2008	I-Codes	2009	N/A	A motion was made to recommend that each jurisdiction consider adopting the 2009 family of I-codes as published by the International Code Council (ICC).	No			6/20		

Section R614 - Earthen Wall Structures

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 Section R614.

This Section shall supersede the limitations of Section R301.2.2 and structures complying with the provisions of Section R614 shall have complied with the seismic requirements of this code.

Exception: Structures with any site conditions may be designed with accepted engineering practice for earthen wall structures and the provisions of the IBC Section 2114 as amended.

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.

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, unless otherwise required by the state law of the jurisdiction having authority or as required by Section R614.1.3.

R614.1.3 Professional registration required. When the earthen structure is over 12 feet (3638 mm) in height, as measured by Table R602.3.1, or is over 1 story, the plans and specifications shall be prepared by a registered professional architect or engineer licensed in the state for which the project is to be constructed. All such projects shall be designed in accordance with accepted engineering practice for earthen wall structures and in accordance the International Building Code Section 2114 as amended.

R614.2 Dimensions of earth walls. The actual measured thickness of earthen walls shall conform to the requirements of Section R614.

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 Sds value for the site of the project. 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 ½ that allowed by Tables R614.2.1 (1 to 6).

Table R614.2.1 (1)

Seismic Sites with Sds **0.00 TO 0.25**

Assuming zero tension out-of-plane

	Acutal Wall Thickness (in)										
	10	11	12	13	14	15	16	18	20	22	24
				Maximum Wall Heights (inches)							
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							
EXTERIOR WALL				All Bond Beams 8" Minimum Height							
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											
with 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 not permitted.

Table R614.2.1 (2)

Seismic Sites with Sds 0.25 TO 0.30

Assuming zero tension out-of-plane

	Acutal Wall Thickness (in)										
	10	11	12	13	14	15	16	18	20	22	24
	Maximum Wall Heights (inches)										
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										
EXTERIOR WALL	All Bond Beams 8" Minimum Height										
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											
with 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- #4	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

NP = This wall not permitted.

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

Table R614.2.1 (3)

Seismic Sites with Sds **0.30 TO 0.35**

Assuming zero tension out-of-plane

	Acutal Wall Thickness (in)										
	10	11	12	13	14	15	16	18	20	22	24
				Maximum Wall Heights (inches)							
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							
EXTERIOR WALL				All Bond Beams 8" Minimum Height							
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											
with FULL PARAPET											
TYPE "A"	2- #5	2- #5	2- #5	4- #4	4- #4	4- #4	2- #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 not permitted.

Table R614.2.1 (4)

Seismic Sites with Sds 0.35 TO 0.40

Assuming zero tension out-of-plane

	Acutal Wall Thickness (in)										
	10	11	12	13	14	15	16	18	20	22	24
	Maximum Wall Heights (inches)										
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										
EXTERIOR WALL	All Bond Beams 8" Minimum Height										
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											
with 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

NP = This wall not permitted.

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

Table R614.2.1 (5)

Seismic Sites with Sds 0.40 TO 0.45

Assuming zero tension out-of-plane

	Acutal Wall Thickness (in)										
	10	11	12	13	14	15	16	18	20	22	24
	Maximum Wall Heights (inches)										
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										
EXTERIOR WALL	All Bond Beams 8" Minimum Height										
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											
with 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

NP = This wall not permitted.

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

Table R614.2.1 (6)

Seismic Sites with Sds 0.45 TO 0.50

Assuming zero tension out-of-plane

	Acutal Wall Thickness (in)										
	10	11	12	13	14	15	16	18	20	22	24
	Maximum Wall Heights (inches)										
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	127	36	40	44	48
	Bond Beam Size and Steel Requirements										
EXTERIOR WALL	All Bond Beams 8" Minimum Height										
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-#5
TYPE"C"	NP	NP	NP	NP	NP	4-#6	4-#6	4-#6	4-#6	4-#6	4-#6
EXTERIOR WALL											
with 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-#5
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-#5
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 not permitted.

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 amended IBC as noted in Section R614.1 above, (See Section R614.7 for required lengths of solid shear panels in walls.), or braced by a roof diaphragm roof system as required by Section R614.5.2.3.

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.

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

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 IBC Table 2109.8.3.1.

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 CROSS-SECTIONAL AREA	NOTE 1
Compression	300 psi	Normal Loading Concentrated Loading	30 psi 30 psi
Modulus of rupture	55 psi	Allowable Tension without tensile reinforcing	0 psi
Shear	N/A	With Special Inspection Without Special Inspection	8 psi 4 psi
Modulus of Elasticity	60, 000 psi	Allowable deflection	Less than 1/2%

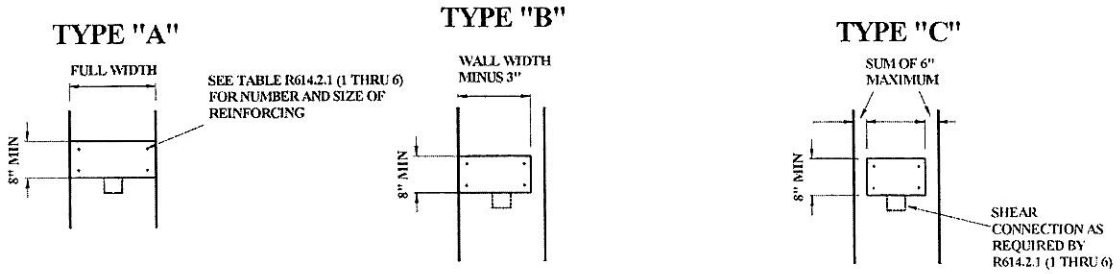
For SI: 1 pound per square inch = 6.895 kPa.

Notes:
1. Gross cross-sectional area shall be calculated on the actual rather than the nominal dimensions.

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.

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



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.

R614.5.3 Roof diaphragm. A roof diaphragm complying with other provisions of this 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.

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 as required by other provisions in this code 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.

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.

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.

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 formula 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 Section 1615 of the International Building Code.

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.

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 or attachments shall be provided to the earthen wall system to laterally secure it as required by Section R614.11.

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.

R614.10 Chases. Chases and recesses in earthen walls shall not be deeper than one-half 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 (203.2 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.

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.

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.

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.

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.

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 as required by Section R703.2 shall be provided except when veneer is applied over concrete masonry or concrete backing.

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.

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.

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 the Section R703.6.1.

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.

R614.15 Gable end walls. Gable end walls shall be constructed using veneer construction as required by Section R703.7 or shall be provided with lateral bracing to prevent overturn designed in accordance with the IBC as modified.

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

R614.17 Construction documents. In addition to the provisions of Section R106 all plans 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.

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.

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 of fraction thereof produced. Mass wall systems such as rammed earth shall provide five tests for each required standard test series.

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.

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.

R614.19.3 Categories of earthen materials. Type I, II, III, and IV earthen materials are approved for use in construction of projects designed in accordance with the IBC and Table R614.19.3.2.

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.

R614.19.3.1 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 (101.6 mm) 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.

R614.19.3.2 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 R614.19.3.2

Material Type	Dry Compression R614.19.3.2.1	Wet Compression R614.19.3.2.2	Modulus of Rupture R614.19.3.1.3	Absorption <2.5% R614.19.3.2.4	Absorption <5.0% R614.19.3.2.5	Moisture Content R614.19.3.2.6
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.

R614.19.3.2.1 Dry compression strength. Determine the compressive strength of the required number of samples as required by Section R614.19. in accordance with the following procedures.

R614.19.3.2.1.1 Dry the Specimen. Dry the specimen at a temperature of 85° F.+-15° F. (29° C. +- 9°) in an atmosphere having relative humidity of not more than 50 percent. Weigh the specimen at one-day intervals until constant weight is attained.

R614.19.3.2.1.2 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.

R614.19.3.2.1.3 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 (3.2mm) or more than ¼ inch (6.4 mm) in thickness.

R614.19.3.2.1.4 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 (1.27 mm) per minute.

R614.19.3.1.5 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).

R614.19.3.2.2 Wet compression strength. Determine the compressive strength of the required number of specimen as required by Section R614.19. in accordance with the following procedures.

R614.19.3.2.2.1 Cap the Specimen. The specimens may be suitably capped with a capping material compatible with water saturation or the bearing surfaces may be rubbed smooth and true.

R614.19.3.2.2.2 Wetting the Specimen. Submerge the specimen under water for not less than 8 hours or longer as required until fully saturated.

R614.19.3.2.2.3 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 (3.2 mm) or more than ¼ inch (6.4 mm) in thickness.

R614.19.3.2.2.4 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 (1.27 mm) per minute.

R614.19.3.2.2.5. 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).

R614.19.3.2.3 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).

R614.19.3.2.3.1 Support conditions. A cured unit shall be simply supported by 2-inch-diameter (50.8 mm) cylindrical supports located 2 inches (50.8 mm) in from each end and extending the full width of the unit.

R614.19.3.2.3.2 Loading conditions. A 2-inch-diameter (50.8 mm) cylinder shall be placed at mid-span parallel to the supports.

R614.19.3.2.3.3 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.

R614.19.3.2.3.4 Modulus of rupture determination. The modulus of rupture shall be determined by the formula:

Equation 2116.3.2.3.4-1 $Fr = 3WLs/2bt2$

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 text specimen measured parallel to the direction of load, inches (mm).
W = The applied load at failure, pounds (N).

R614.19.3.2.4 Absorption less than 2.5%. A 4-inch (101.6 mm) cube, cut from an adobe unit fried 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.

R614.19.3.2.5 Absorption less than 5.0%. A 4-inch (101.6 mm) cube, cut from an adobe unit fried 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.

R614.19.3.2.6 Additional Requirements. All earthen units shall meet the following requirements.

R614.19.3.2.6.1 Moisture content requirements. Earthen units shall have a moisture content not exceeding 4 percent by weight at the time of use.

R614.19.3.2.6.2 Shrinkage cracks. All earthen units shall not contain more than three shrinkage cracks and any single shrinkage crack shall not exceed 3 inches (76.2 mm) in length or 1/8 inch (3.2 mm) in width.

R614.19.3.2.6.3 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.

R614.19.3.3 Cement Stabilized Rammed Earth. Cement stabilized Rammed Earth shall meet the following standards. The installer of the wall system shall comply with the requirements of Section 2114.14.2 for frequency of testing.

R614.19.3.3.1 Testing before Construction. The installer of cement stabilized Rammed Earth shall provide the following testing before issuance of a building permit.

R614.19.3.3.2 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.

R614.19.3.3.3 Material Mined and Mixed on Site. A copy of ASTM D 698, ASTM C 117, ASTM C 136, and ASTM D 4318 shall be provide 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.

R614.19.3.3.4 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.

Appendix M - Straw-Bale Structures

Section AM101 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 AM102 Scope. The provisions of this chapter shall apply to all structures utilizing straw-bales in the construction of wall systems. Load bearing structures shall be limited to Occupancy Groups R, Division 3 and U.

Section AM103 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 AM104 MATERIALS

AM104.1 Specifications for Bales.

AM104.1.1 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.

AM104.1.2 Shape. Bales shall be rectangular in shape.

AM104.1.3 Dimensions. Bales used within a continuous wall shall be of consistent height and width to ensure even distribution of loads within wall systems.

AM104.1.4 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.

AM104.1.5 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:

AM104.1.5.1 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.

AM104.1.5.2 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.

AM104.1.6 Density. Bales in load-bearing structures shall have a minimum calculated dry density of 7.0 pounds per cubic foot. The calculated dry density shall be determined after reducing the actual bale weight by the weight of the moisture content, as determined in Section 7204.1.5. The calculated dry density shall be determined by dividing the calculated dry weight of the bale by the volume of the bale.

AM104.1.7 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 AM105 - Construction and General Requirements

AM105.1 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.

AM105.2 Wall Thickness. Nominal minimum bale wall thickness shall be 14 inches.

AM105.3 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 engineer or architect licensed by the State to practice as such, and approved by the Building Official.

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.

AM105.4 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 engineer or architect licensed by the State to practice as such, and approved by the Building Official.

AM105.5 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) 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 Chapter 16.

AM105.6 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 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 to accommodate rigid perimeter insulation. Footings shall extend a minimum of 12 inches below natural, undisturbed soil, or to frost line, whichever is lower.

Section AM105.7 Wall and Roof Bearing Assembly Anchorage

AM105.7.1 General. Vertical reinforcing bars with a minimum diameter of 1/2", shall be embedded in the foundation a minimum depth of 6 inches, and shall extend above foundation a minimum of 12 inches. These vertical bars shall be located along the centerline of the bale wall, spaced not more than 2 feet apart. A vertical bar shall also be located within 1 foot of any opening or corner, except at locations occupied by anchor bolts.

AM105.7.2 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" in diameter of sufficient length to provide 12 inches 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 in length and 1-1/2" by 3-1/2" 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 square and a minimum thickness of 3/16" for steel and 1/2" for plywood, in at least three locations.

AM105.7.3 Anchor Bolts. Load bearing bale walls shall be anchored to the foundation by 1/2" diameter steel anchor bolts embedded at least 7 inches in the foundation at intervals of 6 feet or less. A minimum of two anchor bolts per wall shall be provided with one bolt located within 36 inches of each end of each wall. Sections of 1/2" 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 apart, with one located within 36 inches 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.

AM105.7.4 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.

AM105.7.5 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. For non-load bearing walls, bales may be laid either flat or on-edge. Bales in load bearing walls shall be laid flat and stacked in a running bond, where possible, with each bale overlapping the two bales beneath it. Overlaps shall be a minimum of 12 inches. Gaps between the ends of bales which are less than 6 inches 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 six inches 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 engineer or architect licensed by the State to practice as such, and approved by the Building Official.

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 long with two 6 inch 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.

AM105.7.5.1 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

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.

AM105.7.6 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", 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" cross members spaced no more than 72 inches 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" top plates shall be face nailed with 16d nails staggered at 16 inches 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 by 4 top plate.

The connection of roof framing members to the roof bearing assembly shall comply with the appropriate sections of the UBC.

AM105.7.7 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 engineer or architect licensed by the State to practice as such, and approved by the Building Official.

AM105.7.7.1 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 engineer or architect licensed by the State to practice as such, and approved by the Building Official.

AM105.7.7.2 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" beyond either side of the opening. Lintels shall be centered over openings, and shall not exceed the load limitations of Section 7205.5 by more than 25 percent.

AM105.7.8 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 into the horizontal joint between two courses of bales, and shall extend at least 3 inches 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.

AM105.7.9 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 horizontally and 16 inches vertically, using a method approved by the Building Official.

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 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 using a method approved by the building official.

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

AM105.7.10 Electrical. All wiring within or on bale walls shall meet all provisions of the National Electrical Code adopted by this jurisdiction. 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.

AM105.7.11 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 AM106 Privacy/Landscape Walls

AM106.1 General. This section covers freestanding or attached bale privacy or landscape walls, not exceeding 6 feet 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.

AM106.2 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 minimum lap at splices.

AM106.2.1 Reinforcement. Vertical reinforcing bars, a minimum 3/8" in diameter, shall be placed in the center of the stem wall, two per bale, and extend up a minimum of 24 inches, and be embedded a minimum of 4 inches into the concrete stem wall. Bales shall be pinned, using two 3/8" 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 below the top of the stem wall, with the heads embedded a minimum of 2 inches into the concrete, and the points extending a minimum of 3/4" from the face of the stem wall, and spaced a minimum of 6" on center on both sides of the wall.

AM106.2.2 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 down on either side of the wall.

AM106.2.3 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.

AM106.2.4 Wall Finish. Walls shall be finished with cement stucco, or stabilized mud plaster, with a minimum thickness of 7/8".

ATT SIX

DETAIL DRAWN BY:

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

ARIZONA MASONRY GUILD

EXP. B WIND
9 1/2 COURSE FENCE STANDARD

REVISIONS	ENGINEERED BY / DATE
1	G.FELTEN / BMJ
2	06/05/12

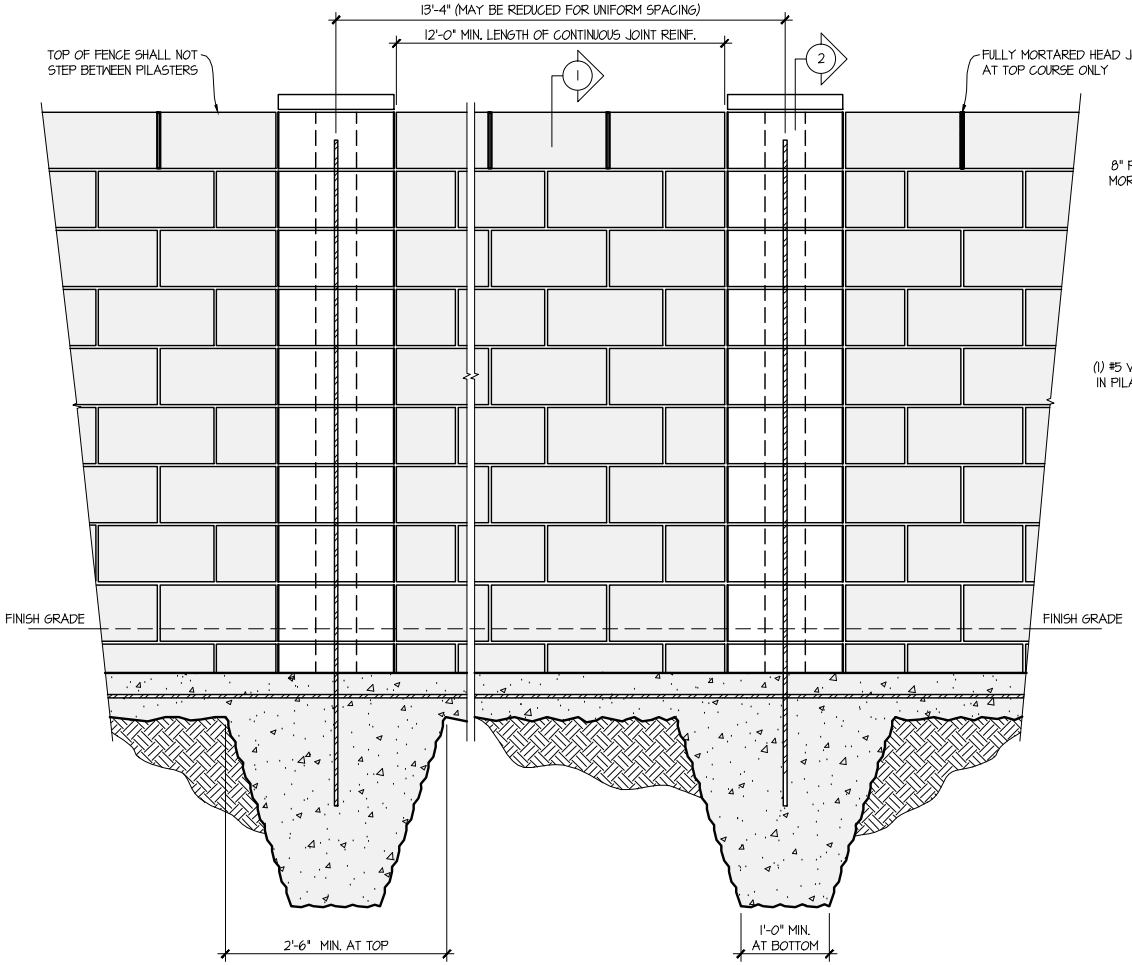
PRESUMPTIVE SOIL

LATERAL SOIL PASSIVE PRESSURE OF 200 PSF/FT

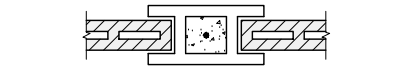
SHEET S1.1

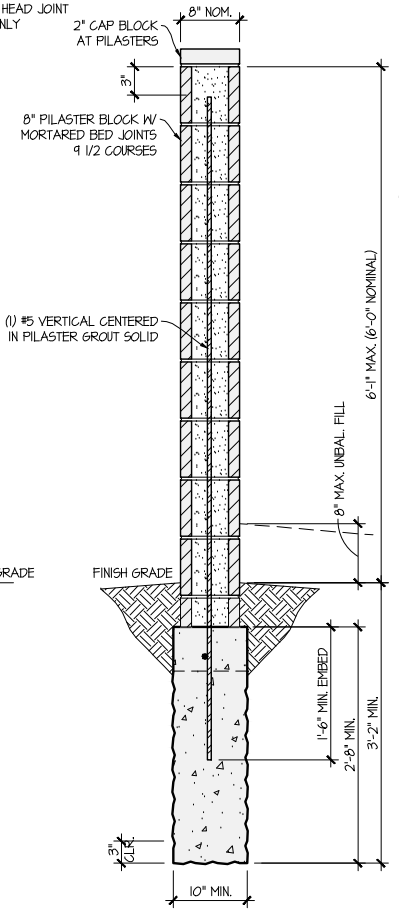
Registered Professional Engineer (Structural)
CERTIFICATE NO.
34052
BRIAN M. JUEDES
Date Signed 6/5/2012
ARIZONA, U.S.A.
EXPIRES 09/30/14

* SEE SHEET GSN FOR GENERAL STRUCTURAL NOTES

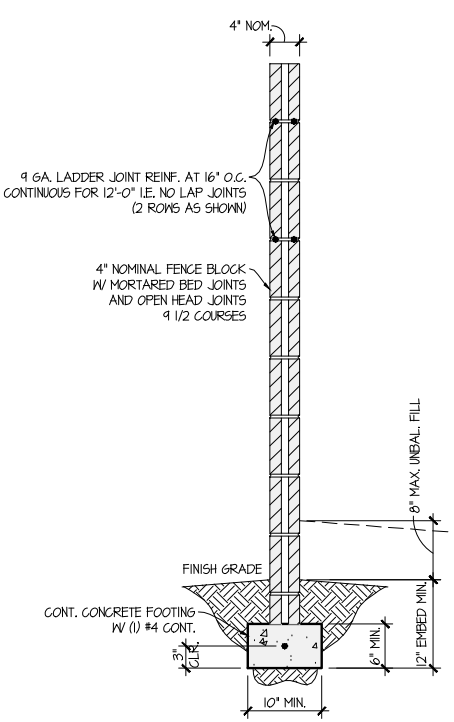


TOP VIEW
AT PILASTERS SHOWING
4" INTERSECTING WALL





2 SECTION



1 SECTION

4" INTERLOCKING BLOCK WALL W/ PILASTERS

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

ATT SIX

DETAIL DRAWN BY:

FELTEN GROUP
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SUITE 200
PHOENIX, AZ 85054

ARIZONA MASONRY GUILD

EXP. C WIND
9 1/2 COURSE FENCE STANDARD

REVISIONS	ENGINEERED BY / DATE
1	G.FELTEN / BMJ
2	06/05/12

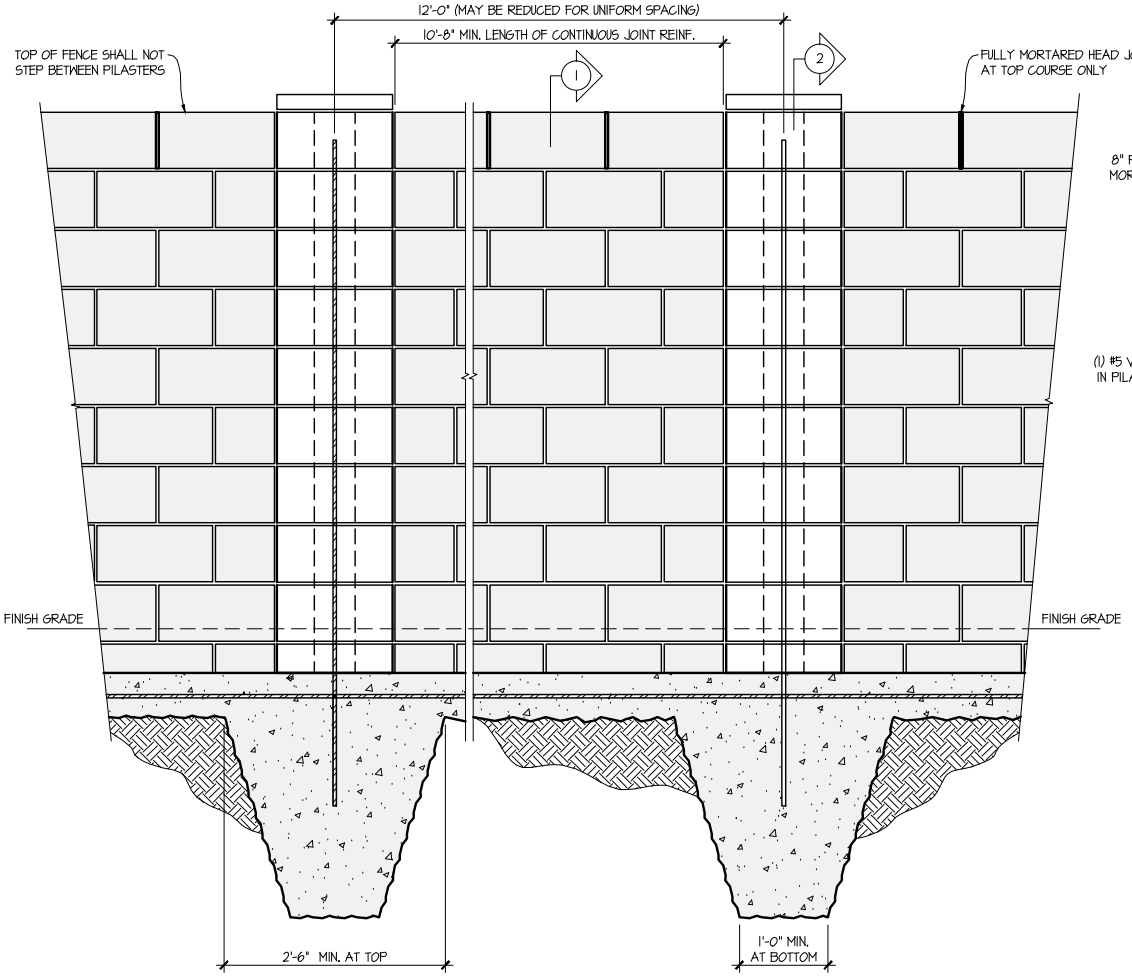
PRESUMPTIVE SOIL

LATERAL SOIL PASSIVE PRESSURE OF 200 PSF/FT

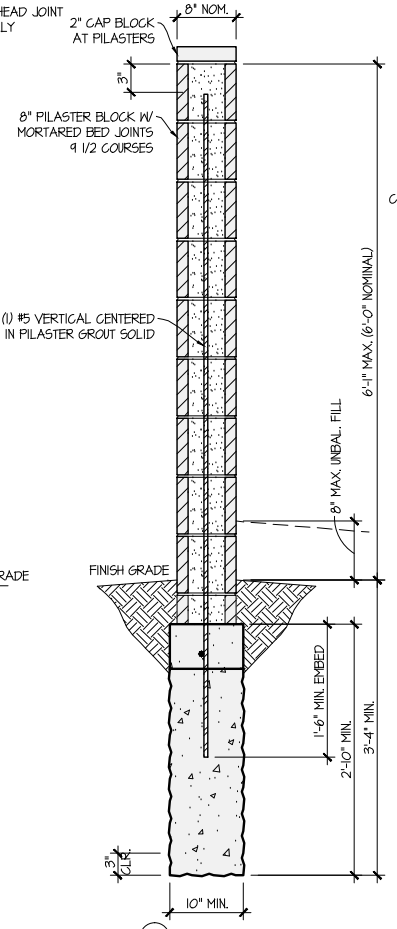
SHEET
S1.1

Registered Professional Engineer (Structural)
CERTIFICATE NO.
34052
BRIAN M. JUEDES
Date Signed 6/5/2012
ARIZONA, U.S.A.
EXPIRES 09/30/14

* SEE SHEET GSN FOR GENERAL STRUCTURAL NOTES



TOP VIEW
AT PILASTERS SHOWING
4" INTERSECTING WALL



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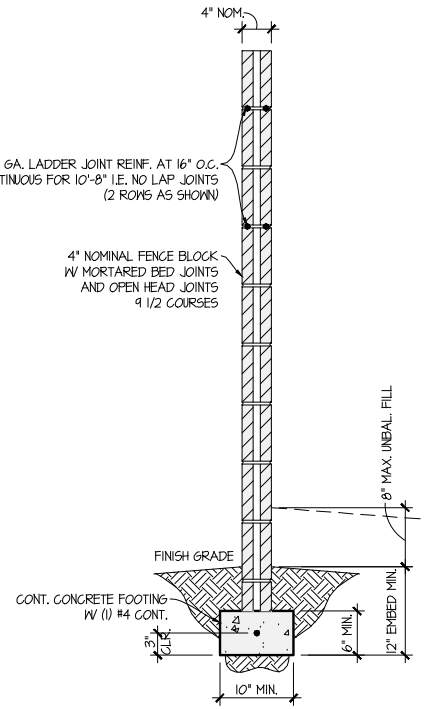

1 SECTION

4" INTERLOCKING BLOCK WALL W/ PILASTERS

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

ATT SIX

DETAIL DRAWN BY:

FELTEN GROUP
ENGINEERS · ARCHITECTS · DESIGNERS

18325 N. ALLIED WAY
SUITE 200
PHOENIX, AZ 85054

ARIZONA MASONRY GUILD

GENERAL STRUCTURAL NOTES FOR MASONRY FENCES

REVISIONS	ENGINEERED BY / DATE
1	G.FELTEN / BMJ
2	06/21/12

SHEET

GSN

* SEE SHEET S1.1 FOR MASONRY FENCE DESIGN

CONCRETE

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 CEMENT U.N.O. MINIMUM STRENGTHS AT 28 DAYS SHALL BE AS FOLLOWS, U.N.O.:
   CONVENTIONAL FOUNDATIONS - 2500 PSI
3. MAXIMUM SIZE OF AGGREGATE SHALL BE 1 INCH. AGGREGATE PER ASTM C57 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 ENSURE 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 0.1% BUT LESS THAN 0.2% BY WEIGHT CONCRETE SHALL BE MADE WITH ASTM C 150 TYPE II CEMENT, OR AN ASTM C 595 OR C 1157 HYDRAULIC CEMENT MEETING MODERATE SULFATE-RESISTANT HYDRAULIC CEMENT (MS) DESIGNATION. FOR SULFATE CONCENTRATIONS EQUAL TO OR GREATER THAN 0.2% BY WEIGHT, CONCRETE SHALL BE MADE WITH ASTM C 150 TYPE V CEMENT OR AN ASTM C 595 OR C 1157 HYDRAULIC CEMENT MEETING HIGH SULFATE-RESISTANT HYDRAULIC CEMENT (HS) DESIGNATION AND SHALL HAVE A MINIMUM COMPRESSIVE STRENGTH OF 3000 PSI AT 28 DAYS.

MASONRY

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, F'm = 1500 PSI
3. GROUT - 2000 PSI CONFORMING TO ASTM C476.
4. MORTAR - TYPE S - 2000 PSI PORTLAND CEMENT / LIME OR MORTAR CEMENT CONFORMING TO ASTM C270. MORTAR MAY BE USED IN LIEU OF GROUT IN THE PILASTER CELL PROVIDED THAT THE MORTAR IS PLACED IN 8 INCH LIFTS AS THE FENCE IS BUILT
5. JOINT REINFORCING fy = 70000 PSI CONFORMING TO ASTM A951.
6. 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 FORTH 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 PILASTERS SHALL BE SOLID GROUTED.
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.

STEEL REINFORCEMENT

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 MATCH AND LAP WITH HORIZONTAL BARS AT CORNERS AND INTERSECTIONS OF FOOTINGS AND WALLS.
5. SECURELY TIE ALL BARS IN LOCATION BEFORE PLACING CONCRETE.

GRADING AND DRAINAGE

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.

SOIL

1. SEE SHEET S1.1 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 ASSUMED NON-EXPANCIVE, NON-COLLAPSABLE AND NON-CORROSIVE SOIL PROPERTIES
3. PRESUMPTIVE SOIL DESIGN VALUES ARE: ALLOWABLE SOIL BEARING = 1000 P.S.F. 12" BELOW GRADE, EQUIVALENT FLUID PRESSURE =35 psf/FT, PASSIVE PRESSURE =200 psf/ft, COEFFICIENT OF FRICTION =.35
4. SOIL IS ASSUMED TO BE NON-EXPANSIVE NON-COLLAPSABLE, AND NON-CORROSIVE.
5. ALL EXCAVATION, FILL (INCLUDING RETAINING COMPACTION, AND SOIL RELATED OPERATIONS SHALL BE PERFORMED ACCORDING TO THE GEOTECHNICAL REPORT.

WIND

1. 10 PSF LATERAL WIND PRESSURE. 2006/2009 IBC, 90 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 A AN ACCEPTED PRACTICE FOR MANY JURISDICTIONS IN ARIZONA. (FOR EXAMPLE THE CITY OF PHOENIX ADDED EXCEPTION 5 TO 2006 IBC SECTION 1609.1.1 "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")

2. 12.5 PSF LATERAL WIND PRESSURE. 2006/2009 IBC, 90 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 A AN ACCEPTED PRACTICE FOR MANY JURISDICTIONS IN ARIZONA. (FOR EXAMPLE THE CITY OF PHOENIX ADDED EXCEPTION 5 TO 2006 IBC SECTION 1609.1.1 "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")

DISCREPANCIES

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.

DAMPPROOFING

1. DAMPPROOFING 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 DAMPPROOFING, INTEGRAL WATER REPELLANT UNITS AND WATER REPELLANT MORTAR MAY BE USED.

METHOD OF CONSTRUCTION

1. THE CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR CONSTRUCTION MEANS, METHODS, TECHNIQUES, SEQUENCES, AND PROCEDURE.
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 PREGEDING WITH THE WORK AFFECTED.

GENERAL

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 OF 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; OR 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 CONTRACTORS WORK
8. 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.
9. 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 WORK OF THE PROJECT SINCE THESE ARE THE SOLE RESPONSIBILITY OF THE CONTRACTOR.
10. WALL HEIGHT SHOWN BASED ON ACTUAL 8" TALL BLOCK HEIGHT
11. TOP OF FENCE SHALL NOT STEP BETWEEN PILASTERS

SUBSTITUTIONS

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.

SPECIAL INSPECTION

1. SPECIAL INSPECTION SHALL BE PROVIDED AS REQUIRED BY THE LOCAL BUILDING OFFICIAL

MAG BUILDING CODES COMMITTEE MEMBERSHIP AS OF 8/8/2012

Voting Members

Name	Representing	Telephone #	Fax #	E-mail Address
Michael Williams (Chair)	Tempe	480-350-8670	480-350-8677	michael_williams@tempe.gov
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
Ray Patten	Gilbert	480-503-6820	480-497-4923	ray.patten@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
VACANT	Queen Creek			
Michael Clack	Scottsdale	480-312-7629	480-312-9029	mclack@scottsdaleaz.gov
VACANT	Surprise			
Dale Crandell	Tolleson	623-936-7111	623-936-7117	dcrandell@tollesonaz.org
Rick DeStefano	Wickenburg	928-684-5451 x513	602-506-1580	rdestefano@ci.wickenburg.az.us
Jim Fox	Youngtown	623-933-8286 x117	623-209-3026	jfox@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	dennisdixion@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			July 1, 2011	Avondale		Plan to adopt 2012 codes mid to late 2013
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	2006 IBC	2006 IMC	2006 IPC	2005 NEC	2006 IRC	2006 IFC	2006 IECC	2006 IEBC	2006 IFGC			1997 ICC/ANSI Accessibility Code with Arizonans with Disabilities Act.	El Mirage	January/February 2010	
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	2006 IBC	2006 IMC	2006 UPC	2005 NEC	2006 IRC	2009 IFC		2006 IEBC				With city amendments. Effective Sept. 1, 2007	Glendale	No date	No date
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	2006 IBC	2006 IMC	2006 IPC	2005 NEC	2006 IRC	2006 IFC	2006 IECC		2006 IFGC				Paradise Valley		Will update to 2012 codes effective October 1, 2012
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	Jan 2013	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	2006 IBC	2006 IMC	2006 IPC	2005 NEC	2006 IRC	2006 IFC	2006 IECC				IGCC Public Version 2	Effective Sep. 1, 2007, except IPC June 30, 2008	Scottsdale	January/February 2010	July 2010

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)
Surprise	2006 IBC	2006 IMC	2006 IPC	2006 IEC w/ 2005 NEC	2006 IRC	2006 IFC	2006 IECC	2006 IEBC	2006 IFGC			Adopted June 28, 2007	Surprise	January 2010	July 2010
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 June 11, 2012 by Scott Wilken, MAG
Source: MAG Building Codes Committee Members