



City of Phoenix

PLANNING & DEVELOPMENT DEPARTMENT

BUILDING CONSTRUCTION CODE CHANGE PROPOSAL

Proposed Amendments to 2012 International Energy Conservation Code Section C101.2

Submitted by: David Kotin, Kay Kay Realty Corporation

C101.2 Scope. This code applies to *commercial buildings* and the building sites and associated systems and equipment. Group R-2 when defined as a *Commercial Building* by section C202, shall have the option of complying under the Residential Provisions of the code, regardless of height. Once defined as such on the submittal documents, all components of the Residential Provisions shall be followed.

Reasons:

Would allow a multi-family developer to choose between residential and commercial provisions regardless of the height of the building. Aligns the commercial and residential provisions for multi-family construction. This amendment ensures that a three-story and a four-story (e.g. wood-framed) multi-family development have the same guidelines.

Cost Impact: Cost Savings

ACTION TAKEN:

2012 Code Committee Date: 12/7/12
 Approved as submitted Modified and approved Denied No action taken

Development Advisory Board Technical Subcommittee Date: 12/11/12
 Approved as submitted Modified and approved Denied No action taken

Development Advisory Board Date: 12/20/12
 Approved as submitted Modified and approved Denied No action taken

Council Subcommittee Date: 4/16/13
 Approved as submitted Modified and approved Denied No action taken

City Council Action Date: 5/15/13
 Approved as submitted Modified and approved Denied No action taken



BUILDING CONSTRUCTION CODE CHANGE PROPOSAL

Proposed Amendments to 2012 International Energy Conservation Code Commercial Chapter 1, Part 2

Submitted by: Phoenix Planning & Development Department Code Committee

PART 2—ADMINISTRATION AND ENFORCEMENT

SECTION C103 CONSTRUCTION DOCUMENTS

C103.1 General.

Construction documents and other supporting data shall be submitted in one or more sets with each application for a permit. The construction documents shall be prepared by a registered design professional where required by the statutes of the jurisdiction in which the project is to be constructed. Where special conditions exist, the *code official* is authorized to require necessary construction documents to be prepared by a registered design professional.

Exception: The *code official* is authorized to waive the requirements for construction documents or other supporting data if the *code official* determines they are not necessary to confirm compliance with this code.

C103.2 Information on construction documents.

Construction documents shall be drawn to scale upon suitable material. Electronic media documents are permitted to be submitted when *approved* by the *code official*. Construction documents shall be of sufficient clarity to indicate the location, nature and extent of the work proposed, and show in sufficient detail pertinent data and features of the building, systems and equipment as herein governed. Details shall include, but are not limited to, as applicable, insulation materials and their *R*-values; fenestration *U*-factors and SHGCs; area-weighted *U*-factor and SHGC calculations; mechanical system design criteria; mechanical and service water heating system and equipment types, sizes and efficiencies; economizer description; equipment and systems controls; fan motor horsepower (hp) and controls; duct sealing, duct and pipe insulation and location; lighting fixture schedule with wattage and control narrative; and air sealing details.

C103.3 Examination of documents.

~~The *code official* shall examine or cause to be examined the accompanying construction documents and shall ascertain whether the construction indicated and described is in accordance with the requirements of this code and other pertinent laws or ordinances.~~

~~C103.3.1 Approval of construction documents.~~

~~When the *code official* issues a permit where construction documents are required, the construction documents shall be endorsed in writing and stamped "Reviewed for Code Compliance." Such *approved* construction documents shall not be changed, modified or altered without authorization from the *code official*. Work shall be done in accordance with the *approved* construction documents.~~

~~One set of construction documents so reviewed shall be retained by the *code official*. The other set shall be returned to the applicant, kept at the site of work and shall be open to inspection by the *code official* or a duly authorized representative.~~

~~C103.3.2 Previous approvals.~~

~~This code shall not require changes in the construction documents, construction or designated occupancy of a structure for which a lawful permit has been heretofore issued or otherwise lawfully authorized, and the construction of which has been pursued in good faith within 180 days~~

after the effective date of this code and has not been abandoned.

C103.3.3 Phased approval.

The *code official* shall have the authority to issue a permit for the construction of part of an energy conservation system before the construction documents for the entire system have been submitted or *approved*, provided adequate information and detailed statements have been filed complying with all pertinent requirements of this code. The holders of such permit shall proceed at their own risk without assurance that the permit for the entire energy conservation system will be granted.

C103.4 Amended construction documents.

Changes made during construction that are not in compliance with the *approved* construction documents shall be resubmitted for approval as an amended set of construction documents.

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SECTION C104 INSPECTIONS Reserved

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C104.1 General.

Construction or work for which a permit is required shall be subject to inspection by the *code official*.

C104.2 Required approvals.

Work shall not be done beyond the point indicated in each successive inspection without first obtaining the approval of the *code official*. The *code official*, upon notification, shall make the requested inspections and shall either indicate the portion of the construction that is satisfactory as completed, or notify the permit holder or his or her agent wherein the same fails to comply with this code. Any portions that do not comply shall be corrected and such portion shall not be covered or concealed until authorized by the *code official*.

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The building shall have a final inspection and not be occupied until *approved*.

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A building shall be reinspected when determined necessary by the *code official*.

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The *code official* is authorized to accept reports of *approved* inspection agencies, provided such agencies satisfy the requirements as to qualifications and reliability.

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It shall be the duty of the holder of the permit or their duly authorized agent to notify the *code official* when work is ready for inspection. It shall be the duty of the permit holder to provide access to and means for inspections of such work that are required by this code.

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Where any work or installation does not pass an initial test or inspection, the necessary corrections shall be made so as to achieve compliance with this code. The work or installation shall then be resubmitted to the *code official* for inspection and testing.

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After the prescribed tests and inspections indicate that the work complies in all respects with this code, a notice of approval shall be issued by the *code official*.

C104.8.1 Revocation.

The *code official* is authorized to, in writing, suspend or revoke a notice of approval issued under the provisions of this code wherever the certificate is issued in error, or on the basis of incorrect information supplied, or where it is determined that the building or structure, premise, or portion

~~thereof is in violation of any ordinance or regulation or any of the provisions of this code.~~

SECTION C105 VALIDITY Reserved

~~C105.1 General.~~

~~If a portion of this code is held to be illegal or void, such a decision shall not affect the validity of the remainder of this code.~~

SECTION C106 REFERENCED STANDARDS

C106.1 Referenced codes and standards.

The codes and standards referenced in this code shall be those listed in Chapter 5, and such codes and standards shall be considered as part of the requirements of this code to the prescribed extent of each such reference and as further regulated in Sections C106.1.1 and C106.1.2.

C106.1.1 Conflicts.

Where differences occur between provisions of this code and referenced codes and standards, the provisions of this code shall apply.

C106.1.2 Provisions in referenced codes and standards.

Where the extent of the reference to a referenced code or standard includes subject matter that is within the scope of this code, the provisions of this code, as applicable, shall take precedence over the provisions in the referenced code or standard.

C106.2 Conflicting requirements.

Where the provisions of this code and the referenced standards conflict, the provisions of this code shall take precedence.

C106.3 Application of references.

References to chapter or section numbers, or to provisions not specifically identified by number, shall be construed to refer to such chapter, section or provision of this code.

C106.4 Other laws.

The provisions of this code shall not be deemed to nullify any provisions of local, state or federal law.

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~~C107.1 Fees.~~

~~A permit shall not be issued until the fees prescribed in Section C107.2 have been paid, nor shall an amendment to a permit be released until the additional fee, if any, has been paid.~~

~~C107.2 Schedule of permit fees.~~

~~A fee for each permit shall be paid as required, in accordance with the schedule as established by the applicable governing authority.~~

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~~Any person who commences any work before obtaining the necessary permits shall be subject to an additional fee established by the *code official*, which shall be in addition to the required permit fees.~~

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~~The payment of the fee for the construction, *alteration*, removal or demolition of work done in connection to or concurrently with the work or activity authorized by a permit shall not relieve the applicant or holder of the permit from the payment of other fees that are prescribed by law.~~

~~C107.5 Refunds.~~

~~The *code official* is authorized to establish a refund policy.~~

SECTION C108 STOP WORK ORDERS Reserved

C108.1 Authority.

Whenever the *code official* finds any work regulated by this code being performed in a manner either contrary to the provisions of this code or dangerous or unsafe, the *code official* is authorized to issue a stop work order.

C108.2 Issuance.

The stop work order shall be in writing and shall be given to the owner of the property involved, or to the owner's agent, or to the person doing the work. Upon issuance of a stop work order, the cited work shall immediately cease. The stop work order shall state the reason for the order, and the conditions under which the cited work will be permitted to resume.

C108.3 Emergencies.

Where an emergency exists, the *code official* shall not be required to give a written notice prior to stopping the work.

C108.4 Failure to comply.

Any person who shall continue any work after having been served with a stop work order, except such work as that person is directed to perform to remove a violation or unsafe condition, shall be liable to a fine of not less than [AMOUNT] dollars or more than [AMOUNT] dollars.

SECTION C109 BOARD OF APPEALS Reserved

C109.1 General.

In order to hear and decide appeals of orders, decisions or determinations made by the *code official* relative to the application and interpretation of this code, there shall be and is hereby created a board of appeals. The *code official* shall be an ex-officio member of said board but shall have no vote on any matter before the board. The board of appeals shall be appointed by the governing body and shall hold office at its pleasure. The board shall adopt rules of procedure for conducting its business, and shall render all decisions and findings in writing to the appellant with a duplicate copy to the *code official*.

C109.2 Limitations on authority.

An application for appeal shall be based on a claim that the true intent of this code or the rules legally adopted thereunder have been incorrectly interpreted, the provisions of this code do not fully apply or an equally good or better form of construction is proposed. The board shall have no authority to waive requirements of this code.

C109.3 Qualifications.

The board of appeals shall consist of members who are qualified by experience and training and are not employees of the jurisdiction.

Reasons:

The deleted provisions are contained in the Phoenix Building Construction Code IBC, which is being used as a centralized location, for the administrative provisions. These provisions may conflict with the adopted administrative code sections and retaining them is redundant.

Cost Impact: No cost impact.

ACTION TAKEN:

2012 Code Committee Date: 9/10/12
 Approved as submitted Modified and approved Denied No action taken

Development Advisory Board Technical Subcommittee Date: 12/11/12
 Approved as submitted Modified and approved Denied No action taken

Development Advisory Board Date: 12/20/12
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City Council Action Date: 5/15/13
 Approved as submitted Modified and approved Denied No action taken



BUILDING CONSTRUCTION CODE CHANGE PROPOSAL

Proposed Amendments to 2012 International Energy Conservation Code Section C402.1.3

Submitted by: David McCarthy

Recommendation:

C402.1.3 Component performance alternative. Building envelope values and fenestration areas determined in accordance with Equation 4-1 shall be permitted in lieu of compliance with the *U*-, *F*- and *C*-factors in Tables C402.1.2 and C402.2 and the maximum allowable fenestration areas in Section C402.3.1.

$A + B + C + D + E \leq \text{Zero}$ (Equation 4-1)

where:

A = Sum of the (UA Dif) values for each distinct assembly type of the building thermal envelope, other than slabs on grade and below-grade walls.

UA Dif = UA Proposed - UA Table.

UA Proposed = Proposed U-value • Area.

UA Table = (U-factor from Table C402.1.2 or Table C402.2) • Area.

B = Sum of the (FL Dif) values for each distinct slab-on-grade perimeter condition of the building thermal envelope.

FL Dif = FL Proposed - FL Table.

FL Proposed = Proposed F-value • Perimeter length.

FL Table = (F-factor specified in Table C402.2) • Perimeter length.

C = Sum of the (CA Dif) values for each distinct below-grade wall assembly type of the building thermal envelope.

CA Dif = CA Proposed - CA Table

CA Proposed = Proposed C-value • Area.

CA Table = (Maximum allowable C-factor specified in Table C402.2) • Area.

Where the proposed vertical glazing area is less than or equal to the maximum vertical glazing area allowed by Section C402.3.1, the value of D (Excess Vertical Glazing Value) shall be zero. Otherwise:

D = (DA • UV) - (DA • U_{Wall}), but not less than zero.

DA = (Proposed Vertical Glazing Area) - (Vertical Glazing Area allowed by Section C402.3.1).

UA Wall = Sum of the (UA Proposed) values for each opaque assembly of the exterior wall.

U_{Wall} = Area-weighted average U-value of all above-grade wall assemblies.

UAV = Sum of the (UA Proposed) values for each vertical glazing assembly.

UV = UAV/total vertical glazing area.

Where the proposed skylight area is less than or equal to the skylight area allowed by Section C402.3.1, the value of E (Excess Skylight Value) shall be zero. Otherwise:

E = (EA • US) - (EA • U_{Roof}), but not less than zero.

EA = (Proposed Skylight Area) - (Allowable Skylight Area as specified in Section C402.3.1).

U_{Roof}	= Area-weighted average U-value of all roof assemblies.
UAS	= Sum of the (UA Proposed) values for each skylight assembly.
US	= UAS/total skylight area.

Reasons:
This new compliance path for the building thermal envelope is similar to the one allowed for Residential (R402.1.5) and will allow for trade-offs between walls, roofs, windows and doors. It will also offer an alternative compliance path to buildings that have more than 30% vertical glazing area and/or 3% skylight area. This is a positive change that gives designers more flexibility for code compliance.

Cost Impact:
Cost savings.

Approved in previous 2012 Code Adoption process: YES NO

ACTION TAKEN:			
2015 Code Committee			Date: 1/14/16
<input checked="" type="checkbox"/> Approved as submitted	<input type="checkbox"/> Modified and approved	<input type="checkbox"/> Denied	<input type="checkbox"/> No action taken
Development Advisory Board Technical Subcommittee			Date: 1/21/16
<input checked="" type="checkbox"/> Approved as submitted	<input type="checkbox"/> Modified and approved	<input type="checkbox"/> Denied	<input type="checkbox"/> No action taken
Development Advisory Board			Date: 5/19/16
<input checked="" type="checkbox"/> Approved as submitted	<input type="checkbox"/> Modified and approved	<input type="checkbox"/> Denied	<input type="checkbox"/> No action taken
Neighborhoods, Housing and Development Subcommittee			Date: 6/21/2016
<input checked="" type="checkbox"/> Approved as submitted	<input type="checkbox"/> Modified and approved	<input type="checkbox"/> Denied	<input type="checkbox"/> No action taken
City Council Action			Date: 9/7/2016
<input type="checkbox"/> Approved as submitted	<input type="checkbox"/> Modified and approved	<input type="checkbox"/> Denied	<input type="checkbox"/> No action taken



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Proposed Amendments to 2012 International Energy Conservation Code Section R101.2

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Reasons:

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Cost Impact: Cost Savings

ACTION TAKEN:

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<input checked="" type="checkbox"/> Approved as submitted <input type="checkbox"/> Modified and approved <input type="checkbox"/> Denied <input type="checkbox"/> No action taken	

Development Advisory Board Technical Subcommittee	Date: 12/11/12
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Development Advisory Board	Date: 12/20/12
<input checked="" type="checkbox"/> Approved as submitted <input type="checkbox"/> Modified and approved <input type="checkbox"/> Denied <input type="checkbox"/> No action taken	

Council Subcommittee	Date: 4/16/13
<input checked="" type="checkbox"/> Approved as submitted <input type="checkbox"/> Modified and approved <input type="checkbox"/> Denied <input type="checkbox"/> No action taken	

City Council Action	Date: 5/15/13
<input checked="" type="checkbox"/> Approved as submitted <input type="checkbox"/> Modified and approved <input type="checkbox"/> Denied <input type="checkbox"/> No action taken	



CODE ADOPTION PROPOSAL

Proposal for 2012	IECC	CODE
Select from the drop down options only		
Section R102.1.2		

Submitted by: Sharon <small>FIRST NAME (REQUIRED)</small>	Bonesteel <small>LAST NAME (REQUIRED)</small>
Company/Entity Information: on behalf of MAG Building Codes Comm.– Testing Protocol Ad Hoc Comm.	
<small>COMPANY/ENTITY (REQUIRED)</small>	
602-236-4498 <small>PHONE NUMBER (REQUIRED)</small>	Sharon.Bonesteel@SRPnet.com <small>E-MAIL ADDRESS (REQUIRED)</small>

Proposed Language: (Insert current language of code section. Use ~~strikeouts for deletions~~; underline text to be added.)

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

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

Reasons: (must provide rationale for proposal)

- 1) Maricopa Association of Governments Building Code Committee has reviewed the Third Party Testing and Inspection procedures of the Residential Energy Services Network (RESNET) with the intent to promote and present uniform guidelines for the acceptance of the RESNET Mortgage Industry National Home Energy Rating System Standards (Standards) as an “Above Code Program” for the jurisdictions within Maricopa County; and
- 2) The inspection and testing required under the 2012 International Residential Code (IRC) and the 2012 International Energy Conservation Code (IECC) is currently being performed under the RESNET Standards for home builders participating in the Environmental Protection Agency’s ENERGY STAR for Homes Program; and
- 3) The RESNET Standards (Chapters 3,6, and 8) are in the process of being certified as ANSI Standards; and
- 4) The utilization of the RESNET Standards would assure home builders of the ability to continue a testing and inspection process that has been proven to be successful in saving energy while protecting the health, safety and welfare of the public in the building code sections covered by the program; and
- 5) The committee has researched and discussed this issue and determined that the intent of the code is being met by the acceptance of the testing and inspection protocols of the RESNET Standards; and
- 6) The committee will hear the final form and draft requested of the Ad Hoc committee (as proposed above) at their meeting scheduled for January 16, 2013, and will be voting on this item (after full committee review) as a new MAG standard.

Cost Impact: (must estimate cost additions or savings for implementing proposed language)

- 1) There will be no cost additions to Cities and Towns.

- 2) There will be significant cost savings for the large production home builders.
- 3) There will be significant energy savings for the future homeowners.

ACTION TAKEN (Staff Use Only):

2012 Code Committee			Date:01/04/2013
<input type="checkbox"/> Approved as submitted	<input checked="" type="checkbox"/> Modified and approved	<input type="checkbox"/> Denied	<input type="checkbox"/> No action taken
Development Advisory Board Technical Subcommittee			Date: 01/17/2013
<input checked="" type="checkbox"/> Approved as submitted	<input type="checkbox"/> Modified and approved	<input type="checkbox"/> Denied	<input type="checkbox"/> No action taken
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Submitted by: Phoenix Planning & Development Department Code Committee

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Where an emergency exists, the *code official* shall not be required to give a written notice prior to stopping the work.

R108.4 Failure to comply.

Any person who shall continue any work after having been served with a stop work order, except such work as that person is directed to perform to remove a violation or unsafe condition, shall be liable to a fine of not less than [AMOUNT] dollars or more than [AMOUNT] dollars.

SECTION R109 BOARD OF APPEALS Reserved

R109.1 General.

In order to hear and decide appeals of orders, decisions or determinations made by the *code official* relative to the application and interpretation of this code, there shall be and is hereby created a board of appeals. The *code official* shall be an ex officio member of said board but shall have no vote on any matter before the board. The board of appeals shall be appointed by the governing body and shall hold office at its pleasure. The board shall adopt rules of procedure for conducting its business, and shall render all decisions and findings in writing to the appellant with a duplicate copy to the *code official*.

R109.2 Limitations on authority.

An application for appeal shall be based on a claim that the true intent of this code or the rules legally adopted thereunder have been incorrectly interpreted, the provisions of this code do not fully apply or an equally good or better form of construction is proposed. The board shall have no authority to waive requirements of this code.

R109.3 Qualifications.

The board of appeals shall consist of members who are qualified by experience and training and are not employees of the jurisdiction.

Reasons:

The deleted provisions are contained in the Phoenix Building Construction Code IBC, which is being used as a centralized location, for the administrative provisions. These provisions may conflict with the adopted administrative code sections and retaining them is redundant.

Cost Impact: No cost impact.

ACTION TAKEN:

2012 Code Committee	Date: 9/10/12
<input checked="" type="checkbox"/> Approved as submitted <input type="checkbox"/> Modified and approved <input type="checkbox"/> Denied	<input type="checkbox"/> No action taken
Development Advisory Board Technical Subcommittee	Date: 12/11/12
<input checked="" type="checkbox"/> Approved as submitted <input type="checkbox"/> Modified and approved <input type="checkbox"/> Denied	<input type="checkbox"/> No action taken
Development Advisory Board	Date: 12/20/12
<input checked="" type="checkbox"/> Approved as submitted <input type="checkbox"/> Modified and approved <input type="checkbox"/> Denied	<input type="checkbox"/> No action taken
Council Subcommittee	Date: 4/16/13
<input checked="" type="checkbox"/> Approved as submitted <input type="checkbox"/> Modified and approved <input type="checkbox"/> Denied	<input type="checkbox"/> No action taken
City Council Action	Date: 5/15/13
<input checked="" type="checkbox"/> Approved as submitted <input type="checkbox"/> Modified and approved <input type="checkbox"/> Denied	<input type="checkbox"/> No action taken



City of Phoenix

PLANNING & DEVELOPMENT DEPARTMENT

BUILDING CONSTRUCTION CODE CHANGE PROPOSAL

Proposed Amendments to 2012 International Energy Conservation Code Section R401.2

Submitted by: David McCarthy

Recommendation:

R401.2 Compliance. Projects shall comply with Sections identified as “mandatory” and with either sections identified as “prescriptive” or the performance approach in Section R405. one of the following:

1. Sections R401 through R404.
2. Section R405 and the provisions of Sections R401 through R404 labeled “Mandatory.”
3. An energy rating index (ERI) approach in Section R406.

R401.2.1 Alternative approach for compliance. A Home Energy Rating System (“HERS”) Index of 73 or less, confirmed in writing by a Residential Energy Services Network certified energy rater may be used in place of the approach described in section 401.2 above. Compliance may be demonstrated by sampling in accordance with Chapter 6 of the Mortgage Industry National Home Energy Rating Systems Standard as adopted by the Residential Energy Services Network.

Reasons:

This amendment adds a second performance path to energy code compliance. It allows an approach that utilizes an Energy Rating Index (ERI) found in new Section R406. One of the most popular ERI programs is known as the Home Energy Rating System (HERS) program. The HERS Index was developed as a way to quantify energy efficiency and standardize the results. The Index considers the entire building system when calculating the score. Allowing a HERS Index as a means for complying with the IECC promotes additional innovation in energy efficiency in new residential construction, while at the same time ensuring the city meets its energy conservation goals. Moreover, it would allow builders to engage in a cost benefit analysis with different construction methods and materials in order to achieve a home which meets the energy efficiency goals

Cost Impact:

Cost decrease.

Approved in previous 2012 Code Adoption process: **YES** **NO**

ACTION TAKEN:

2015 Code Committee	Date: 1/14/16
<input checked="" type="checkbox"/> Approved as submitted <input type="checkbox"/> Modified and approved <input type="checkbox"/> Denied <input type="checkbox"/> No action taken	

Development Advisory Board Technical Subcommittee	Date: 1/21/16
<input checked="" type="checkbox"/> Approved as submitted <input type="checkbox"/> Modified and approved <input type="checkbox"/> Denied <input type="checkbox"/> No action taken	

Development Advisory Board	Date: 5/19/16
<input checked="" type="checkbox"/> Approved as submitted <input type="checkbox"/> Modified and approved <input type="checkbox"/> Denied <input type="checkbox"/> No action taken	

Neighborhoods, Housing and Development Subcommittee	Date: 6/21/2016
<input checked="" type="checkbox"/> Approved as submitted <input type="checkbox"/> Modified and approved <input type="checkbox"/> Denied <input type="checkbox"/> No action taken	

City Council Action	Date: 9/7/2016
<input type="checkbox"/> Approved as submitted <input type="checkbox"/> Modified and approved <input type="checkbox"/> Denied <input type="checkbox"/> No action taken	



BUILDING CONSTRUCTION CODE CHANGE PROPOSAL

Proposed Amendments to 2012 International Energy Conservation Code Section R401.2.1

Submitted by: Connie Wilhelm, Home Builders Association of Central Arizona

R401.2.1 Alternative approach for compliance. A Home Energy Rating System (“HERS”) Index of 73 or less, confirmed in writing by a Residential Energy Services Network certified energy rater may be used in place of the approach described in section 401.2 above. Compliance may be demonstrated by sampling in accordance with Chapter 6 of the Mortgage Industry National Home Energy Rating Systems Standard as adopted by the Residential Energy Services Network.

Reasons:

With Energy Conservation the end result is all that matters and it should not matter to the City how that result is achieved. The HERS Index was developed as a way to quantify energy efficiency and standardize the results. The Index considers the entire building system when calculating the score. Allowing a HERS Index as a means for complying with the IECC would allow for additional innovation in energy efficiency in new residential construction, while at the same time ensuring the city meets its energy conservation goals. Moreover, it would allow builders to engage in a cost benefit analysis with different construction methods and materials in order to achieve a home which meets the energy efficiency goals.

Cost Impact: HERS Index Testing is done by private Raters and must be certified under the RESNET Standards. Therefore, there would be no additional cost to the city. By utilizing a HERS Index, builders are required to achieve a required level of energy efficiency, however, that are also provided increased flexibility to utilize a cost-benefit analysis on the methods used to achieve that efficiency.

ACTION TAKEN:

2012 Code Committee			Date: 11/27/12
<input type="checkbox"/> Approved as submitted	<input checked="" type="checkbox"/> Modified and approved	<input type="checkbox"/> Denied	<input type="checkbox"/> No action taken
Development Advisory Board Technical Subcommittee			Date: 12/11/12
<input type="checkbox"/> Approved as submitted	<input checked="" type="checkbox"/> Modified and approved	<input type="checkbox"/> Denied	<input type="checkbox"/> No action taken
Development Advisory Board			Date: 1/17/13
<input type="checkbox"/> Approved as submitted	<input checked="" type="checkbox"/> Modified and approved	<input type="checkbox"/> Denied	<input type="checkbox"/> No action taken
Council Subcommittee			Date: 4/16/13
<input checked="" type="checkbox"/> Approved as submitted	<input type="checkbox"/> Modified and approved	<input type="checkbox"/> Denied	<input type="checkbox"/> No action taken
City Council Action			Date: 5/15/13
<input type="checkbox"/> Approved as submitted	<input checked="" type="checkbox"/> Modified and approved	<input type="checkbox"/> Denied	<input type="checkbox"/> No action taken



BUILDING CONSTRUCTION CODE CHANGE PROPOSAL

Proposed Amendments to the 2012 International Energy Conservation Code Section R403.2.1

Submitted by: Forrest Fielder, Private Individual

R403.2 Ducts. Ducts and air handlers shall be in accordance with Sections R403.2.1 through R403.2.3.

R403.2.1 Insulation (Prescriptive). Supply ducts in attics shall be insulated to a minimum of R-8. Ducts in floor trusses shall be insulated to a minimum of R-6.

Exceptions: ~~Ducts or portions thereof located completely inside the building thermal envelope.~~

1. Ducts or portions thereof located completely inside the building thermal envelope.
2. Supply ducts may be insulated to a minimum of R-6 when one or more of the following conditions are met;

- 2.1 Minimum SEER rating of space heating/cooling system is increased to 15.
- 2.2 Maximum U-factor is decreased to 0.35 and maximum SHGC is decreased to 0.22 for all fenestration products.
- 2.3 Wall cavity insulation minimum R-value is increased to R-19.
- 2.4 Residential buildings that meet the requirements of sections R102.1.1 or R405.
- 2.5 Residential buildings with attic radiant barriers in accordance with ASTM C1313, installed in accordance with ASTM C1743.

Reason:

The Arizona Homebuilders Association proposed efficiency improvements in heating/cooling equipment, glazing product performance, and increased thermal envelope insulation as an alternative to providing R-8 duct insulation required by the IECC. A Code Modification was approved in July 2006 to allow a trade-off to the use of R-6 insulation on HVAC ducts in residential attics. Energy simulation software was used to compare cost savings for each of the proposed areas of concentration. The benefits from improving the efficiency of the air conditioning system, window thermal resistance to heat gain, and wall cavity insulation were shown to surpass cost savings from increasing HVAC duct insulation. Based on these findings, staff recommendation is that this amendment be adopted for use in the 2012 IECC and the 2012 IRC Chapter 11.

** A public proposal was submitted to include attic radiant barriers in the list of trade-offs for the R-8 duct insulation. Simulation software was used to demonstrate cost savings when radiant barriers and R-6 insulation was incorporated, as compared to no radiant barriers and R-8 duct insulation. Based on these positive savings results and the requirement for listed products, staff recommends that this previously approved proposal be modified to include radiant barriers in the list of exceptions.

Cost Impact: Savings from reconfiguration of attic truss openings.

ACTION TAKEN:

2012 Code Committee	Date: 02/01/2013
<input type="checkbox"/> Approved as submitted <input checked="" type="checkbox"/> Modified and approved <input type="checkbox"/> Denied	<input type="checkbox"/> No action taken
Development Advisory Board Technical Subcommittee	Date: 02/12/2013
<input checked="" type="checkbox"/> Approved as submitted <input type="checkbox"/> Modified and approved <input type="checkbox"/> Denied	<input type="checkbox"/> No action taken
Development Advisory Board	Date: 2/21/13
<input checked="" type="checkbox"/> Approved as submitted <input type="checkbox"/> Modified and approved <input type="checkbox"/> Denied	<input type="checkbox"/> No action taken
Council Subcommittee	Date: 4/16/13
<input checked="" type="checkbox"/> Approved as submitted <input type="checkbox"/> Modified and approved <input type="checkbox"/> Denied	<input type="checkbox"/> No action taken
City Council Action	Date: 5/15/13
<input checked="" type="checkbox"/> Approved as submitted <input type="checkbox"/> Modified and approved <input type="checkbox"/> Denied	<input type="checkbox"/> No action taken



City of Phoenix

PLANNING & DEVELOPMENT DEPARTMENT

BUILDING CONSTRUCTION CODE CHANGE PROPOSAL

Proposed Amendments to 2012 International Residential Code Section R403.2.2.1

Submitted by: Connie Wilhelm, Home Builders Association of Central Arizona

R403.2.2.1. Sealed air handler. ~~Air Handlers shall have a manufacturer's designation for an air leakage of no more than 2 percent of the design air flow rate when tested in accordance with ASHRAE 193.~~

Reasons:

Air handler manufacturers are having difficulty manufacturing air handlers that are capable of meeting this requirement. Therefore, this equipment is not readily available on the marketplace for purchase and this requirement should be deleted. There is already a requirement for a duct leakage testing in the Code which will incorporate the measurement of leakage at the air handler. As long as the duct leakage requirements are met, the leakage from the air handler will have been accounted for making this requirement unnecessary.

Cost Impact: No additional cost to the city.

ACTION TAKEN:

2012 Code Committee

Approved as submitted Modified and approved Denied No action taken

Date: 12/7/12

Development Advisory Board Technical Subcommittee

Approved as submitted Modified and approved Denied No action taken

Date: 12/11/12

Development Advisory Board

Approved as submitted Modified and approved Denied No action taken

Date: 12/20/12

Council Subcommittee

Approved as submitted Modified and approved Denied No action taken

Date: 4/16/13

City Council Action

Approved as submitted Modified and approved Denied No action taken

Date: 5/15/13



BUILDING CONSTRUCTION CODE CHANGE PROPOSAL

Proposed Amendments to 2012 International Energy Conservation Code Section R406

Submitted by: David McCarthy

SECTION R406

ENERGY RATING INDEX

COMPLIANCE ALTERNATIVE

R406.1 Scope. This section establishes criteria for compliance using an Energy Rating Index (ERI) analysis.

R406.2 Mandatory requirements. Compliance with this section requires that the mandatory provisions identified in [Sections R401 through R404](#) be met. The building thermal envelope shall be greater than or equal to levels of efficiency and Solar Heat Gain Coefficient in Table 402.1.1 or 402.1.3 of the 2009 *International Energy Conservation Code*.

Exception: Supply and return ducts not completely inside the building thermal envelope shall be insulated to a minimum of R-6.

R406.3 Energy rating index. The Energy Rating Index (ERI) shall be a numerical integer value that is based on a linear scale constructed such that the *ERI reference design* has an Index value of 100 and a *residential building* that uses no net purchased energy has an Index value of 0. Each integer value on the scale shall represent a 1 percent change in the total energy use of the rated design relative to the total energy use of the *ERI reference design*. The ERI shall consider all energy used in the *residential building*.

R406.3.1 ERI reference design. The *ERI reference design* shall be configured such that it meets the minimum requirements of the 2006 *International Energy Conservation Code* prescriptive requirements. The proposed *residential building* shall be shown to have an annual total normalized modified load less than or equal to the annual total loads of the *ERI reference design*.

R406.4 ERI-based compliance. Compliance based on an ERI analysis requires that the *rated design* be shown to have an ERI less than or equal to **64** when compared to the *ERI reference design*.

R406.5 Verification by approved agency. Verification of compliance with Section R406 shall be completed by an *approved* third party. [Compliance may be demonstrated by sampling in accordance with Chapter 6 of the Mortgage Industry National Home Energy rating Systems Standard as adopted by the Residential Energy Services Network \(RESNET\).](#)

R406.6 Documentation. Documentation of the software used to determine the ERI and the parameters for the residential building shall be in accordance with Sections R406.6.1 through R406.6.3.

R406.6.1 Compliance software tools. Documentation verifying that the methods and accuracy of the compliance software tools conform to the provisions of this section shall be provided to the *code official*.

R406.6.2 Compliance report. Compliance software tools shall generate a report that documents that the ERI of the *rated design* complies with Sections R406.3 and R406.4. The compliance documentation shall include the following information:

1. Address or other identification of the residential building.

2. An inspection checklist documenting the building component characteristics of the *rated design*. The inspection checklist shall show results for both the *ERI reference design* and the *rated design*, and shall document all inputs entered by the user necessary to reproduce the results.

3. Name of individual completing the compliance report.

4. Name and version of the compliance software tool.

Exception: Multiple orientations. Where an otherwise identical building model is offered in multiple orientations, compliance for any orientation shall be permitted by documenting that the building meets the performance requirements in each of the four (north, east, south and west) cardinal orientations.

R406.6.3 Additional documentation. The *code official* shall be permitted to require the following documents:

1. Documentation of the building component characteristics of the *ERI reference design*.

2. A certification signed by the builder providing the building component characteristics of the *rated design*.

3. Documentation of the actual values used in the software calculations for the *rated design*.

R406.7 Calculation software tools. Calculation software, where used, shall be in accordance with Sections R406.7.1 through R406.7.3.

R406.7.1 Minimum capabilities. Calculation procedures used to comply with this section shall be software tools capable of calculating the ERI as described in Section R406.3, and shall include the following capabilities:

1. Computer generation of the *ERI reference design* using only the input for the *rated design*.

The calculation procedure shall not allow the user to directly modify the building component characteristics of the *ERI reference design*.

2. Calculation of whole-building, as a single *zone*, sizing for the heating and cooling equipment in the *ERI reference design* residence in accordance with Section R403.7.

3. Calculations that account for the effects of indoor and outdoor temperatures and part-load ratios on the performance of heating, ventilating and air-conditioning equipment based on climate and equipment sizing.

4. Printed *code official* inspection checklist listing each of the *rated design* component characteristics determined by the analysis to provide compliance, along with their respective performance ratings.

R406.7.2 Specific approval. Performance analysis tools meeting the applicable sections of Section R406 shall be *approved*. Tools are permitted to be *approved* based on meeting a specified threshold for a jurisdiction. The *code official* shall approve tools for a specified application or limited scope.

R406.7.3 Input values. When calculations require input values not specified by Sections R402, R403, R404 and R405, those input values shall be taken from an approved source.

Reasons:

This amendment adds a second performance path to energy code compliance. It allows an approach that utilizes an Energy Rating Index (ERI) found in new Section R406. One of the most popular ERI programs is known as the Home Energy Rating System (HERS) program. The HERS Index was developed as a way to quantify energy efficiency and standardize the results. The Index considers the entire building system when calculating the score. Allowing a HERS Index as a means for complying with the IECC promotes additional innovation in energy efficiency in new residential construction, while at the same time ensuring the city meets its energy conservation goals. Moreover, it would allow builders to engage in a cost benefit analysis with different construction methods and materials in order to achieve a home which meets the energy efficiency goals.

Cost Impact:

Cost decrease.

Approved in previous 2012 Code Adoption process: YES NO

ACTION TAKEN:

2015 Code Committee Date: 1/14/16
 Approved as submitted Modified and approved Denied No action taken

Development Advisory Board Technical Subcommittee Date: 1/21/16
 Approved as submitted Modified and approved Denied No action taken

Development Advisory Board Date: 5/19/16
 Approved as submitted Modified and approved Denied No action taken

Neighborhoods, Housing and Development Subcommittee Date: 6/21/2016
 Approved as submitted Modified and approved Denied No action taken

City Council Action Date: 9/7/2016
 Approved as submitted Modified and approved Denied No action taken