



**STATE OF NEW MEXICO  
ENERGY CONSERVATION CODE  
2009-2010 CODE UPDATE**

**~ OVERVIEW OF PROCESS AND RESULTS ~**

**Prepared for:**

**State of New Mexico  
Regulation & Licensing Department  
Construction Industries Division**

**Prepared by:**

**eSolved, Inc.**

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## **PROJECT BACKGROUND**

American Recovery and Reinvestment Act (ARRA) funding requires the adoption of building codes that meet or exceed the 2009 International Energy Conservation Code (IECC). New Mexico's current code is based on the 2006 IECC; therefore a code update was required to be eligible for ARRA funding.

On March 3, 2009 Governor Bill Richardson signed an assurance letter that was addressed to Secretary of Energy Steven Chu. In this letter, Governor Richardson directed the New Mexico Regulation and Licensing Department (RLD), Construction Industries Division (CID) to propose new building codes to the New Mexico Construction Industries Commission (CIC) that meet or exceed the 2009 International Energy Conservation Code.

The New Mexico Energy Efficiency Strategy, prepared for the Energy, Mineral, and Natural Resources Department (EMNRD), documented a strategy to reduce energy use in New Mexico by twenty percent. This document, along with an Executive Order from the Governor calling for increased energy efficiency, was the basis for setting goals for the new building codes. RLD and CID convened the Code Change Committee to review the 2009 IECC and address increasing the efficiency of the New Mexico energy code to a level 20 percent more efficient than the 2006 IECC.

### **Results**

The Code Change Committee developed a package of code change proposals for the administrative, residential and commercial sections of the New Mexico Energy Conservation Code that have been submitted to the CIC for approval. This package of proposals includes measures to increase energy savings beyond those set forth in the 2009 IECC, increase flexibility of the code where needed and provide consistency with other New Mexico codes. The package of codes before the CIC for approval provides the following statewide average savings levels:

**Residential Code: 20.9% above 2006 IECC**

**Commercial Code: 20.62% above 2006 IECC**

This report provides an overview of the process undertaken to develop this package of code proposals, and includes information and data on the energy savings and cost effectiveness of administrative, residential and commercial proposed changes.

## PROJECT PARTICIPANTS

CID is responsible for development and implementation of statewide building codes for New Mexico; the CIC approves the codes before they are implemented. All cities and counties in the state are required to either adopt the statewide building codes set by CID, or develop their own codes that meet or exceed the state codes.

At the beginning of the process, CID assembled a Code Change Committee which included the following members:

- Bob Golden, Golden Associates, LLC
- Derrick Childers, Childers Builders
- Fermin Aragon, Construction Industries Division
- Glenn Fellows, SMPC Architects
- Harry Dempsey, City of Albuquerque
- JB Pruett, Wooten Construction Company
- Jack Milarch, New Mexico Home Builders Association
- Jeff Hanks, Desert Eagle Engineering
- Jim Beverly, Jim Beverly Residential Designs
- Kelly O'Donnell, Regulation and Licensing Department
- Leo Hardie, City of Farmington
- Lisa Martinez, Construction Industries Division
- Martin Romero, Construction Industries Division
- Mike Brogdon, K.L. House, Inc
- Richard Lucero, Construction Industries Division
- Ron Hibner, Construction Industries Division
- Rudy Romero, Construction Industries Division
- Susie Marbury, Energy Mineral & Natural Resources Department
- Tammy Fiebelkorn, Southwest Energy Efficiency Project
- Wayne Dotson, Construction Industries Division

Additionally, members of the public were invited to participate in the code development, energy use modelling and cost analysis processes. Participants in the code update process included representatives from the following organizations as well as numerous individuals:

3CM  
AGC  
AIA New Mexico  
All American Enterprises  
Appreciated Energy  
Bernalillo County  
Build Green NM  
Building Permits New Mexico

Casa De Corrales  
CDRS  
Centex/Pulte  
Chapparral Materials  
Chavez Roofing Company  
Childers Builders  
CID  
City of Albuquerque

City of Farmington  
City of Rio Rancho  
City of Santa Fe  
Cornerstones Community Partnerships  
Desert Eagle Engineering  
DR Horton  
Duran Lath & Plaster  
El Rey Stucco  
EMNRD  
Energy Matters  
GCD  
George Kupprath, PE  
Glass Rite  
GMB Old World  
Harder Custom Builds  
Huston Rammed Earth  
ICF  
JPG Engineering  
Los Alamos Department of Public  
Utility  
NM First  
NMHBA  
NMRCA  
NMSEA

NMSPE  
Northrise Ventures  
PM&D Inc  
PSFA  
QPEC  
Santa Fe County  
Sierra Club  
Sierra Pacific Windows  
SMPC Architects  
Soledad Canyon Earth Builders  
Southwest Adobe Supply  
Southwest Solar Adobe  
Southwest Spray Foam  
Sto Corp  
Sunshine Plumbing  
Taos County  
TARP Lizard King  
TC&I Construction  
The Hensley Engineering Group  
Town of Bernalillo  
Valencia County  
Village of Taos Ski Valley  
Willson & Willson Architects

### **Committee Involvement**

The Code Change Committee began meeting in July 2009 on a weekly basis. The Electrical, General Construction and Mechanical Technical Advisory Committees (TACs) also met throughout the code update process. A sub-committee of the Mechanical TAC was created to review code change proposals and met regularly during the update process. All relevant code change proposals were approved by the Code Change Committee and the appropriate TAC(s) before the final package was forwarded to the CIC for approval.

## **CODE UPDATE METHODOLOGY**

The Code Change Committee was successful in developing a cost-effective package of codes for both residential and commercial buildings that reaches the New Mexico goal of reaching a level of savings that represents a twenty percent increase in efficiency from the 2006 IECC. The package before the CIC for approval is highly efficient, cost-effective and deemed feasible by the various business, governmental and advocacy members of the Code Change Committee.

The Code Change Committee began with a review of Chapters 1 through 5 of the 2009 IECC. The base of the package of codes before the CIC for approval is the 2009 IECC. Proposed changes to the text in the 2009 IECC were presented by various parties via code change forms. These code change forms were reviewed, and often amended, by the group as a whole during the weekly code meetings.

All suggestions for code change proposals were vetted in many ways before being included in the final package of proposal submitted to the Construction Industries Commission for final approval. The first step for each proposal was a discussion of the proposal by the Code Change Committee. Many proposals were reworded or edited by the committee before being voted through to the modelling phase. Numerous proposals were voted down at this stage, and therefore were not modelled at all. Other forms were sent to modelling, which yielded results that required the group to further amend or add provisions to the proposal and resubmit for another round of modelling. Those proposals that were deemed not to have a modellable impact on energy use, but were deemed to be needed to make the code feasible for New Mexico, were voted through to NMAC without the modelling stage.

A description of the Administrative, Residential and Commercial sections of the code update process is presented in the following sections.

## **IECC Chapter 1, 2 & 3 (Administration, Definitions & Climate Zones) Methodology**

The Code Change Committee reviewed Chapters 1, 2 & 3 of the 2009 IECC carefully to determine what sections needed to be edited to be more effective for New Mexico.

These code change proposals center around definition changes needed to make the IECC code provisions compatible with the other codes used by New Mexico, which have slightly different definitions of some of the mechanical terms.

**301.1 – General, Climate zones:** The code change proposal from Chapters 1 – 3 with the largest impact is the inclusion of additional climate zones to the New Mexico code, based on weather conditions rather than geographic location. This is a much more accurate approach for determining the appropriate code provisions for New Mexico because the broad-based climate zones used in the IECC do not take into account the varied elevations in New Mexico within each of the climate zones. The climate zone determination for many New Mexico cities in this proposal are based on specific heating degree days and cooling degree days data researched and analyzed by the New Mexico Energy Minerals and Natural Resources Department.

A list of all the code change forms passed by the Code Change Committee for Chapters 1, 2, & 3 is presented below. These changes, plus the base 2009 IECC for these sections, represent the entire package of codes before the CIC for approval for the administrative, definition and climate zone sections of code. (The actual code change forms are presented in Appendix A.)

### **IECC Chapters 1, 2 and 3 - Administration, Definitions and Climate Zones Code Change Proposals**

Passed by Code Change Committee - Submitted to Construction Industries Commission for Approval

<b>Code Change</b>	<b>Change Name</b>	<b>Action Taken</b>
102.1.1	Above code programs	NMAC/to CIC
202 - C	Conditioned space	NMAC/to CIC
202 - D	Duct Insulation	NMAC/to CIC
202 - I	Indirectly conditioned space	NMAC/to CIC
202 - R	Residential building	NMAC/to CIC
202 - U	Unconditioned space	NMAC/to CIC
202 - V	Vapor retarder class	NMAC/to CIC
301.1	General, climate zones	NMAC/to CIC

## IECC Chapter 4 (Residential Energy Efficiency) Methodology

The Residential Chapter of the 2009 IECC took several months to review. The Code Change Committee developed the residential package of code change proposals currently before the CIC through a series of discussions, analyses and research. The result of this process is a combination of code proposals that reaches the goal of a twenty percent increase in efficiency over the 2006 IECC, is cost-effective and technically feasible.

The final list of residential code change proposals approved by the Code Change Committee and submitted to CIC for approval is shown in the table below. These changes, plus the base 2009 IECC for this section, represent the entire package of codes before the CIC for approval for the residential section of code. (The actual residential code change forms are presented in Appendix B.)

Of the 24 code change proposals in the final list, 19 were passed by the committee directly to NMAC (meaning no modelling), and 6 were sent to the modelling process. The code change proposals that passed straight to NMAC are those that the group felt would either have no impact on energy use, are not modellable or are measures brought forward from the existing NM code. The proposals that do not impact energy use focus mostly on definitional changes needed to make the code workable in New Mexico.

### IECC Chapter 4 - Residential Energy Efficiency Code Change Proposals

Passed by Code Change Committee - Submitted to Construction Industries Commission for Approval

Code Change	Change Name	Action Taken
401.2	General scope, compliance	NMAC/to CIC
401.3	Certificate	NMAC/to CIC
402.1.1 (Table)	Insulation & fenestration	Model/to CIC
402.2.3	Access hatches and doors	NMAC/to CIC
402.2.8.1	Slab on grade floors	NMAC/to CIC
402.2.8.2	Monolithic foundations	NMAC/to CIC
402.4.2 (Table)	Insulation inspection	NMAC/to CIC
402.4.2.2	Visual inspection option	NMAC/to CIC
402.4.3	Kiva fireplaces	NMAC/to CIC
403.1.1	Programmable thermostats	NMAC/to CIC
403.2.1	Duct insulation	Model/to CIC
403.2.2	Sealing	NMAC/to CIC
403.2.4, 403.2.5	Duct installation	Model/to CIC
403.3	Pipe insulation	Model/to CIC
403.4	Circulating hot water	NMAC/to CIC
403.6	Equipment sizing	NMAC/to CIC
403.7	Multiple dwelling units	NMAC/to CIC
403.1	Fan Performance	Model/to CIC
404.1	Lighting equipment	Model/to CIC
404.2	Outdoor lighting	NMAC/to CIC
404.3	Photovoltaic system	NMAC/to CIC
405	Simulated performance alternative	NMAC/to CIC
405.6.1	Minimum capabilities	NMAC/to CIC
406	Existing buildings	NMAC/to CIC

The code change proposals from the above list that have a measurable impact on energy use and cost are outlined below:

**402.1.1 (Table) – Insulation & Fenestration:** This code proposal sets forth new requirements for the building envelope that are similar to the proposals under consideration for IECC 2012. These more stringent U-factors and R-values dramatically increase the efficiency of the house.

**403.2.1 – Duct Insulation:** The changes in insulation requirements in this proposal provide more specificity than the base IECC code. It brings forward provisions in the existing NM Mechanical Code.

**403.2.4 – 403.2.5 – Duct Installation:** This proposal sets forth standards for the correct installation of ducts for maximum efficiency. It references the NM Mechanical Code and sets a limit on the length of flex duct allowed for supply- and return-air run-outs.

**403.3 – Pipe Insulation:** The change to this section sets forth a consistent level of insulation for all piping systems. It represents an increase in efficiency by requiring R-2 insulation for all hot water pipes, while reducing the stringency (from R-3 to R-2) for piping within the stud wall cavity which may impede the proper installation of wall insulation.

**403.6 – Equipment Sizing:** This proposal will require the proper sizing of HVAC equipment, which will result in significant energy savings. The requirement that the calculations used to determine the appropriate equipment size be submitted along with other construction documents will result in significantly less oversizing of equipment.

**403.10 – Fan Performance:** This proposal will require that ventilating fans meet Energy Star requirements, which will lower energy use in the home.

**404.1 – Lighting equipment:** The change to this section of the code will require higher percentages of high-efficiency bulbs and fixtures be used in homes. The proposal allows flexibility so builders can choose whether to install a higher level of efficient bulbs or a lower level of fixtures, depending on costs, function and customer preferences.

### **Energy Use Modelling**

The code change proposals that were voted through to modelling by the Code Change Committee were sent to the “Energy Use Modelling Group”. This group consisted of representatives from HBA, SWEEP, EMNRD, HR Horton, CID, Electrical TAC, General Construction TAC and the Code Change Committee. The Energy Use Modelling Group and the Code Change Committee agreed upon the following assumptions for the energy use modelling:

- 1) All modelling would be based on a model floor plan provided by DR Horton Homes for a mid-sized house. (These floor plans are included in Appendix C)

- 2) Each code change proposal would be modelled individually for energy use and costs.
- 3) Each code change proposal would be modelled for climate zones 3, 4 and 5 individually
- 4) A state-wide average savings would be calculated for the entire code change package via the use of a weighted average, with the weights based on new housing starts in each of the climate zones for 2009.
- 5) Modelling would be completed in RemRate software, when possible. If needed, measures not modellable in RemRate would be analyzed in a commercial building software and/or via other research and estimations.

The Energy Use Modelling Group was tasked with determining:

- 1) which measures could be modelled in RemRate,
- 2) the appropriate base software assumptions to be made for each measure, and
- 3) what other software tools or modelling assumptions are possible for those measures that are not modellable in RemRate.

The group then met several times to model each of the code change proposals. Two of the major impact code proposals were modelled in RemRate. Three were modelled in commercial modelling software to give an approximate energy savings. One was estimated based on input from various group members, industry experts and published analyses. The results of this energy use modelling are shown below:

Residential Modelling Results  
FINAL

Code Change	Change Name	Model	CZ 3		CZ 4		CZ 5	
			use	% change	use	% change	use	% change
402.1.1 (Table)	Insulation & fenestration	HERS	85.5	15.1%	84.5	12.2%	90.6	11.1%
403.2.1	Duct insulation	Commercial	--	10.6%	--	10.6%	--	10.6%
403.3	Pipe insulation	Commercial	--	10.4%	--	10.4%	--	10.4%
403.10 (Table)	Fan Performance	Commercial	--	7.0%	--	7.0%	--	7.0%
404.1	Lighting equipment	HERS	94.4	6.3%	89.2	7.3%	94.2	7.6%

		CZ 3		CZ 4		CZ 5	
		Use	%	Use	%	Use	%
		2006 IECC	100.7		96.2		101.9
BASELINES	2006 NMAC	103.1	-2.4%	95.5	0.7%	101.3	0.6%
	2009 IECC	95.0	5.7%	89.7	6.8%	94.7	7.1%

		CZ 3		CZ 4		CZ 5	
		Use	%	Use	%	Use	%
Cumulative Runs:	High Range	83.3	17.3%	81.7	15.1%	90.2	11.5%

**Weighted Average High Range 15.9%**

		CZ 3		CZ 4		CZ 5	
		Use	%	Use	%	Use	%
Cumulative Total*	High Range		22.3%		20.1%		16.5%

**Weighted Average\* High Range 20.9%**

Housing Starts**	CZ 3	
	CZ 3	44.97%
	CZ 4	49.58%
	CZ 5	5.45%

\* Assumes 4% increase from commercially modelled measures and measures that cannot be modelled. (list below), and 1% increase from inclusion of additional climate zones in NM.

\*\* US Census Bureau: 2009 housing starts for Dona Ana County (CZ 3), Bernalillo County (CZ 4) and Santa Fe County (CZ 5)

Measures that are not modelled, but assumed to have a positive energy impact.

Code Change	Change Name
402.4.2	Insulation inspection
403.2.2	Sealing
403.2.4, 403.2.5	Duct installation
403.4	Circulating hot water

**Energy Savings** ~ The table above shows the results of the energy use modelling, with the percentage change identified for each measure representing the savings achieved from going from the base (2006 IECC) to the proposed measure.

A cumulative model was also created by the modelling team. This cumulative model is meant to include all the modellable measures, and results in a significantly different result than merely adding up the percentage of savings for each individual measure. This is due to the interaction of the various measures when implemented together in a structure. The cumulative run is presented in the Cumulative Runs area of the results table. The RemRate results for the cumulative model for climate zones 3, 4 and 5 are presented in Appendix D.

A four percent increase in efficiency was then added to each of the climate zones to account for those measures that were not modellable. A one percent increase was also assumed to compensate for the code change proposal that allows climate zone determination to be based on heating degree days, which brings more stringent code requirements to colder areas of the state. The results from this addition are shown in the Cumulative Total area of the results table.

Finally, the results from the three climate zones were combined into a statewide weighted average. The climate zone weights were based on the new housing starts in each climate zone, as reported by the US Census Bureau.

The result of the analysis shows that the statewide average for the residential package of code change proposals is 20.9 percent.

**Energy Cost Savings** ~ The monthly savings in utility payments are shown in the RemRate analysis for each of the code change proposals modelled. For those not modellable in the RemRate software, monthly savings were estimated based on similar energy savings from other code change proposal analyses.

### **Measure Cost Modelling**

**Measure Cost Estimation** ~ The code change proposal that were voted through to modelling were then analyzed for costs. Additionally, costs were gathered for those measures in the NMAC group of measures where possible and/or feasible.

Costs were gathered via submission of “cost analysis forms” from interested parties. Those forms were completed by builders, industry experts, advocates and CID staff. People had the option of providing this cost data and having it remain confidential. Therefore, individual prices were not disclosed to the group – only the results of the overall analysis.

The forms for each code change proposal were analyzed and averaged into one cost per climate zone. The forms were analyzed and the costs were edited to provide as much consistency as possible. For those costs submitted that represented material costs only, a mark-up of twenty percent was added to account for labor and other costs. (Mark-up

calculated as: Total Cost = Material Cost / 0.80) The range of costs for each proposal were presented to the Code Change Committee to verify the plausability of the cost analysis.

Once the range of costs were accepted by the Code Change Committee, a straight average of the costs for each of the code change proposals was taken. That cost was used as the basis for the monthly mortgage payment analysis.

***Mortgage Payment Impact*** ~ The mortgage analysis assumed a 30-year fixed mortgage, with a 6 percent interest rate. The interest rate was based on the current statewide average for 30-year fixed mortgages of 5.15 percent. That percentage was rounded up to 6 percent to take into account insurance requirements and the potential for an increase in mortgage rates in the next several years.

The results of the measure cost and mortgage payment impact analysis is presented below:

**Residential Code Change Proposals  
Mortgage Payment Impacts**

Code Change	Change Name	Notes	Measure Cost	House Cost	Down Pymt	Mortgage Amt	Monthly Pymt	Pymt Change
2006 Base house	2006 Base house		0.00	200000	40000	160000	(\$959.28)	~
2009 Base house	2009 Base house		1650.00	201650	40330	161320	(\$967.19)	\$7.91
2009 Additional Measures:								
402.1.1 (Table)	Insulation & fenestration	CZ 3	1022.50	202673	40535	162138	(\$972.10)	\$4.90
402.1.1 (Table)	Insulation & fenestration	CZ 4	425.00	202075	40415	161660	(\$969.23)	\$2.04
402.1.1 (Table)	Insulation & fenestration	CZ 5	790.00	202440	40488	161952	(\$970.98)	\$3.79
404.1	Lighting equipment		200.00	201850	40370	161480	(\$968.15)	\$0.96
403.2.1	Duct insulation		-259.67	201390	40278	161112	(\$965.95)	(\$1.25)
403.2.4, 403.2.5	Duct installation		26.67	201677	40335	161341	(\$967.32)	\$0.13
403.3	Pipe insulation		-50.00	201600	40320	161280	(\$966.96)	(\$0.24)
403.10 (Table)	Fan Performance		241.67	201892	40378	161513	(\$968.35)	\$1.16
Cumulative (Post 09) - CZ 3		CZ 3	1181.17	202831	40566	162265	(\$972.86)	\$5.67
Cumulative (Post 09) - CZ 4		CZ 4	583.67	202234	40447	161787	(\$969.99)	\$2.80
Cumulative (Post 09) - CZ 5		CZ 5	948.67	202599	40520	162079	(\$971.75)	\$4.55

Base Inputs:

2006 Base House Cost	\$	200,000
Interest Rate		6.00%

### **Energy Savings Vs. Cost Impact**

The cost determined in the cost modelling process was used to calculate the impact on the monthly mortgage payment for each climate zone. That change in mortgage payment was then compared to the decrease in the monthly energy costs, as determined by the energy use modelling process.

***Results - The package of cost change proposals before the Commission for approval result in an overall benefit of \$13.93 (on average, statewide) per month to the homeowner. The base 2009 IECC code results in an overall savings of well under \$1.00. Therefore, the additional measures before the Commission for approval had a dramatic positive effect on the monthly savings.***

The results of this comparison is shown below:

**Residential Code Change Proposals  
Monthly Cost/Benefit Analysis**

Code Change	Change Name	Notes	Energy Use Impact			Mortgage Cost Impact			Cost Benefit per Month		
			CZ 3	CZ 4	CZ 5	CZ 3	CZ 4	CZ 5	CZ 3	CZ 4	CZ 5
2006 Base to 2009 Base			\$ 8.00	\$ 8.00	\$ 9.00	\$ 7.91	\$7.91	\$7.91	\$0.09	\$0.09	\$1.09
2009 Additional Measures:											
402.1.1 (Table)	Insulation & fenestration	modelled	\$ 7.00	\$ 4.00	\$ 4.00	\$ 4.90	\$2.04	\$3.79	\$2.10	\$1.96	\$0.21
404.1	Lighting equipment	modelled	\$ 2.00	\$ 1.00	\$ 2.00	\$ 0.96	\$0.96	\$0.96	\$1.04	\$0.04	\$1.04
403.2.1	Duct insulation	estimated	\$ 2.10	\$ 2.10	\$ 4.20	\$ (1.25)	(\$1.25)	(\$1.25)	\$3.35	\$3.35	\$5.45
403.2.4, 403.2.5	Duct installation	estimated	\$ 3.78	\$ 3.78	\$ 2.84	\$ 0.13	\$0.13	\$0.13	\$3.66	\$3.66	\$2.71
403.3	Pipe insulation	estimated	\$ 2.06	\$ 2.06	\$ 4.12	\$ (0.24)	(\$0.24)	(\$0.24)	\$2.30	\$2.30	\$4.36
403.10 (Table)	Fan Performance	estimated	\$ 1.92	\$ 0.96	\$ 1.92	\$ 1.16	\$1.16	\$1.16	\$0.76	(\$0.20)	\$0.76
<b>Cumulative Model (Post 2009)</b>			\$ 18.72	\$ 17.68	\$ 14.56	\$ 5.67	\$2.80	\$4.55	\$13.05	\$14.88	\$10.01
<b>TOTAL</b>			\$ 26.72	\$ 25.68	\$ 23.56	\$ 13.58	\$10.71	\$12.46	\$13.14	\$14.97	\$11.10

**Statewide Weighted Average Monthly Benefit: \$13.93**

## IECC Chapter 5 (Commercial Energy Efficiency) Methodology

The Commercial Chapter of the 2009 IECC took several months to review. The Code Change Committee developed the commercial package of code change proposals currently before the CIC for approval through a series of discussions, analyses and research. The result of this process is a combination of code proposals that reaches the goal of a twenty percent increase in efficiency over the 2006 IECC, is cost-effective and is technically feasible.

The majority of commercial code change proposals in the final package before the CIC are based on the proposals by the New Buildings Institute (NBI) that are currently under consideration for the 2012 IECC codes. Code Change Committee and TAC members worked with staff of NBI to amend the proposals to fit the needs of New Mexico and ensure that the twenty percent increase in efficiency for commercial buildings was achieved.

The final list of commercial code change proposals approved by the Code Change Committee and submitted to CIC for approval is shown in the table below. These changes, plus the base 2009 IECC for these sections, represent the entire package of codes before the CIC for approval for the commercial section of code. (The actual commercial code change forms are presented in Appendix E.)

### IECC Chapter 5 - Commercial Energy Efficiency Code Change Proposals

Passed by Code Change Committee - Submitted to Construction Industries Commission for Approval

Code Change	Change Name	Action Taken
501.1, 501.2	Scope, Application	NMAC/to CIC
502.1.2, 502.2(1), 502.2(2) (Tables)	Building envelope	Model/to CIC
502.3 Table	Fenestration	Model/to CIC
502.4.5	Outdoor air intakes & exhaust	Model/to CIC
503.2.1	Calculation of heating & cooling loads	Model/to CIC
503.2.2	Equipment and system sizing	Model/to CIC
503.2.4	Controls	Model/to CIC
503.2.4.3.3	Automatic start capabilities	Model/to CIC
503.2.4.4	Shutoff damper controls, exception	Model/to CIC
503.2.4.6	Freeze protection	Model/to CIC
503.2.5.1	Demand controlled ventilation	Model/to CIC
503.2.5.2	Kitchen hoods	Model/to CIC
503.2.6	Energy recovery ventilation systems	Model/to CIC
503.2.9.1 - 503.2.9.3	Air system balancing	Model/to CIC
503.3 - 503.4.1	Economizers	Model/to CIC
503.4.2	VAV fan control	Model/to CIC
505.1	Lighting requirements	Model/to CIC
505.2.2.1	Light reduction controls	Model/to CIC
505.2.2.2-505.2.4	Controls	Model/to CIC
505.2.4	Functional Testing	Model/to CIC
505.5.2 (Table)	Lighting power density	Model/to CIC
506	Efficiency package options	Model/to CIC

Of the 22 code change proposals in the final list, one went straight to NMAC (meaning no modelling), and 21 were sent to the modelling process. The proposals with significant impact in energy use and/or project costs are explained below:

**502.1.2, 502.2(1), 502.2(2) – Building Envelope and 502.3 - Fenestration:** These code proposals set forth new requirements for the building envelope that are similar to the proposals under consideration for the 2012 IECC. These more stringent insulation and fenestration requirements will dramatically increase the efficiency of the buildings.

**503.2.1 – Calculation of Heating & Cooling Loads:** This proposal will require the proper sizing of HVAC equipment, which will result in significant energy savings. A requirement that the calculations used to determine the appropriate equipment size be submitted along with other construction documents will result in significantly fewer instances of equipment oversizing.

**503.2.9.1-503.2.9.3 – Air System Balancing:** This code proposal requires that mechanical systems are tested to ensure they are installed and operating properly. A plan for the installation and testing of the system is required at the beginning of the project under this proposal.

**503.3 – 503.4.1 – Economizers:** The purpose of this proposal is to clarify requirements for air and water economizers to make the code more easily understood. The existing 2009 IECC text was unclear on the differences for these types of systems, and edits similar to those in this proposal are under consideration for the 2012 IECC.

**505.1 – Lighting Requirements:** The change to this section of the code will require higher percentages of high-efficiency bulbs and fixtures be used in buildings. The proposal allows flexibility so builders can choose whether to install a higher level of efficient bulbs or a lower level of fixtures, depending on costs, function and customer preferences.

**505.5.2.(Table) – Lighting Power Density:** The changes set forth in this proposal provide more detailed specifications for lighting density in various commercial space types. It expands the lighting power density table to include space by space requirements instead of the existing entire building requirements. This allows flexibility needed for specific area types to be more efficient in areas where lighting is less important and more dense in areas where lighting is more important

**506 – Efficiency Package Options:** This new section of code provides a set of three efficiency options for commercial buildings. Builders must choose one of the three, based on the needs of each project. The options are efficient HVAC systems, efficient lighting systems or on-site renewable energy.

### **Energy Use Modelling**

The code change proposals that were voted through to modelling by the Code Change Committee were modelled by The Hensley Engineering Group, a local engineering firm that was active in the code change process, using commercial energy use analysis

software. This analysis was led by Raymond Hensley, owner of The Hensley Engineering Group. The Code Change Committee agreed upon the following assumptions for the energy use modelling:

- 1) Four business types would be included:
  - a. 80,000 sq ft office building
  - b. 80,000 sq ft public school
  - c. 16,000 sq ft medical clinic
  - d. 25,000 sq ft medical building
- 2) Each building is assumed to be a “metal framed building” as defined and used in the 2009 IECC.
- 3) Air conditioning equipment is assumed to be packaged roof mount units having cooling capacities between 65,000 BTU and 135,000 BTU.
- 4) Each unit is assumed to have a natural gas fired furnace.
- 5) Hot water is assumed to be gas fired.
- 6) Detailed assumptions for each building type were agreed upon and are outlined in Appendix F.

The package of code change proposals were modelled together to determine the estimated savings per climate zone, for each building type. An weighted average savings level was calculated for each climate zone based on 2008-2009 Bureau of Business and Economic Research (BBER) data which provides the number of buildings in each climate zone. (This BBER data is a compilation of information provided by CID and some municipalities in New Mexico. The data was analyzed and matched, where possible, to the four building types used in the energy use analysis.)

The climate zone weighted averages were then combined to develop a statewide average, using the same weights as those used in the residential analysis. (The Code Change Committee agreed that housing starts in each climate zone is a relatively reliable indicator of new commercial building starts. In the absense of commercial building start data, the group decided to use the housing start data as an approximation.) A four percent increase was added to that average to account for those measures that were not modellable. This brings the statewide weighted average savings to 20.62 percent.

The full results of this energy use modelling are shown below:

Commercial Modelling Results

	CZ 3				CZ 4				CZ 5			
	Office	School	Medical	Retail	Office	School	Medical	Retail	Office	School	Medical	Retail
% Savings	22.06%	12.21%	18.71%	33.21%	13.83%	10.35%	17.44%	39.27%	9.30%	12.90%	16.69%	30.59%
Avg Savings - per CZ	18.19%				15.46%				14.29%			

Avg Savings - statewide 16.62%

\*\* Assume additional 3-4% savings from measures that were not modellable.

**Total Avg Savings - NM 20.62%**

Weights:

Office	School	Medical	Retail
29.59%	50.51%	7.65%	12.24%

CZ 3	CZ 4	CZ 5
44.97%	49.58%	5.45%

Building Type Weights: based on data provided by BBER

Climate Zone Weights: based on housing starts statewide, US Census Bureau data.

### **Cost Analysis**

The Hensley Engineering Group also completed a cost analysis for each of the building types. The level of cost increase is 1 – 2 percent to comply with the proposed set of codes recommended by the Code Change Committee. Approximately one-half of this incremental cost, 0.5 – 1 percent, represents the incremental cost of going from the 2006 IECC to the 2009 IECC. The remaining 0.5 – 1 percent is the result of the additional measures proposed by the Code Change Committee.

The cost analysis completed by The Hensley Engineering Group is in keeping with the cost data collected from various industry experts throughout the process of reviewing the proposed code changes. For most of the measures included in the final commercial code change packet before the CIC, costs are extremely close to zero because of flexibility and options built into the code change proposals. The small 1-2 percent increase in costs comes predominantly from those measures with the largest increase in energy savings: testing & balancing, functional testing and efficiency package options.

The Hensley Engineering Group's report is included in Appendix F.

### **Energy Savings Vs. Cost Impact**

***Results - The package of proposed commercial codes results in a statewide weighted average increase in efficiency of 20.62 percent. Based on The Hensley Engineering Group's analysis, this equates to a reduction in utility costs for buildings of \$1,000 - \$6,000 per year, depending on building type and size. Using a life-cycle-cost analysis, the average payback for each building type is less than 10 years.***

## **IMPLEMENTATION PLANS**

Regulation and Licensing Department (RLD), Construction Industries Division (CID) and Energy, Minerals and Natural Resources Department (EMNRD) staff, with input from stake holders in the building community, have developed the following plan in order to move forward with the implementation of the 2009 New Mexico Energy Conservation Code.

The three state agencies, are currently developing check lists and compliance tools that will be incorporated in training sessions they provide to achieve 90 percent code compliance. The checklists and tools help in bridging conservation code concepts to real-time field applications.

One- and two-day trainings, which will be free of charge, will be offered in Farmington, Santa Fe, Albuquerque, Roswell and Las Cruces and are tailored to the three major audiences that have been identified. The first audience consists of state, municipal and county building officials, authorities having jurisdiction, and plan reviewers. The second audience includes design professionals, members of the construction industries, and product suppliers. The third group includes real estate and mortgage finance professionals, members of state, county and city governing bodies, and other interested community members.

Each training will be audience and trade specific. Concepts of Green Building practices, with an emphasis on the integrated design/build process will be included. In Addition, participants who successfully complete the training are eligible to obtain continuing education units applicable to their field of expertise.

**APPENDIX A**

**~ ADMINISTRATIVE, DEFINITIONS & CLIMATE ZONE  
CODE CHANGE FORMS – IECC CHAPTERS 1, 2 AND 3 ~**

# 2009 NM CODE CHANGE

NM Code Development Committee Attn: Fermin Aragon 2550 Cerrillos Road Santa Fe, NM 87505 Tele (505) 476-4672/Fax (505) 476-4685	Item _____ (for staff use only)
---	------------------------------------

APPLICABLE SECTION/TABLE/FIGURE NUMBER(S) 102.1.1

PROPONENT New Mexico Home Builders Association

ADDRESS 5931 Office Blvd. Albuquerque, NM 87109 PHONE (505) 344-7072

CHECK ONE: |  | Change section to read as follows FAX \_\_\_\_\_

|  | Add new section to read as follows EMAIL \_\_\_\_\_

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|  | Delete section without substitution

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USE SEPARATE SHEETS FOR SEPARATE TOPICS

~~**102.1.1 Above code programs.** The *code official* or other authority having jurisdiction shall be permitted to deem a national, state or local energy efficiency program to exceed the energy efficiency required by this code. Buildings approved in writing by such an energy efficiency program shall be considered in compliance with this code. The requirements identified as “mandatory” in Chapters 4 and 5 of this code, as applicable, shall be met.~~

## REASON(s):

Compliance requirements are already located in Chapters 4 and 5 of the code; this section is redundant.

# 2009 NM CODE CHANGE

<b>NM Code Development Committee</b> Attn: Jerome Baca 2550 Cerrillos Road Santa Fe, NM 87505 Tele (505) 476-4672/Fax (505) 476-4685	Item _____ (for staff use only)
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APPLICABLE SECTION/TABLE/FIGURE NUMBER(S) 2009 IECC Section 202

PROPOSER Jerome T Baca

ADDRESS \_\_\_\_\_

PHONE \_\_\_\_\_

CHECK ONE:  Change section to read as follows

FAX \_\_\_\_\_

Add new section to read as follows

EMAIL \_\_\_\_\_

Delete section and substitute as follows

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---

**Conditioned Space** – ~~An area or room within a building being heated or cooled, containing uninsulated ducts, or with a fixed opening directly into an adjacent conditioned space.~~ An area, room or space within a building that is provided with heating and/or cooling by equipment or systems capable of maintaining, through design or heat loss/gain, 50F (10C) during the heating season and 85F (29C) during the cooling season, or an area, room or space that communicates directly with a conditioned space.

---

**REASON(s):** To define the definition of conditioned space as there exists conflicts between the IRC 2009 and the IECC 2009 and the Uniform Mechanical Code 2009. This change accomodates the backloaded or cathedralized ceiling(s) in residential construction to allow for attic space to be considered within the thermal envelope.

passed

# 2009 NM CODE CHANGE

<b>NM Code Development Committee</b> <i>Attn: Jerome Baca</i> 2550 Cerrillos Road Santa Fe, NM 87505 Tele (505) 476-4672/Fax (505) 476-4685	Item _____ (for staff use only)
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APPLICABLE SECTION/TABLE/FIGURE NUMBER(S) 2009 IECC Section 202

PROPONENT Jerome T Baca

ADDRESS \_\_\_\_\_

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USE SEPARATE SHEETS FOR SEPARATE TOPICS

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**Duct Installation** – Ducts shall be installed in accordance with Chapter 6 and Chapter 17 of the Uniform Mechanical Code and current applicable standards.

---

**REASON(s):** To define the requirements of duct installation in the IECC.

# 2009 NM CODE CHANGE

<b>NM Code Development Committee</b> Attn: Jerome Baca 2550 Cerrillos Road Santa Fe, NM 87505 Tele (505) 476-4672/Fax (505) 476-4685	Item _____ (for staff use only)
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APPLICABLE SECTION/TABLE/FIGURE NUMBER(S) 2009 IECC Section 202

PROPONENT Jerome T Baca

ADDRESS \_\_\_\_\_

PHONE \_\_\_\_\_

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**Indirectly Conditioned Space** – Enclosed space within a building **thermal envelope** that is not **mechanically** heated or cooled space, whose area weighted heat transfer coefficient to heated or cooled space exceeds that to the outdoors or to unconditioned space, or through which air from heated or cooled spaces is transferred at a rate exceeding the air changes per hour.

---

**REASON(s):** To define the definition of indirectly conditioned space as there exists conflicts between the IRC 2009 and the IECC 2009 and the Uniform Mechanical Code 2009. This change accomodates the backloaded or cathedralized ceiling(s) in residential construction to allow for attic space to be considered within the thermal envelope.

# 2009 NM CODE CHANGE

<b>NM Code Development Committee</b> <i>Attn: Fermin Aragon</i> 2550 Cerrillos Road Santa Fe, NM 87505 Tele (505) 476-4672/Fax (505) 476-4685	Item _____ (for staff use only)
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APPLICABLE SECTION/TABLE/FIGURE NUMBER(S) \_\_\_\_\_

IECC Chapter 2 Definitions (R) \_\_\_\_\_

PROPONENT \_\_\_\_\_

ADDRESS \_\_\_\_\_

PHONE \_\_\_\_\_

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**RESIDENTIAL BUILDING.** For this code, includes detached one- and two-family dwellings and townhouses not more than three stories above grade plane in height with a separate means of egress and their accessory structures and R-3 buildings, as well as R-2 and R-4 buildings three stories or less in height above grade.

---

**REASON(s):**

Brings the definitions in line with the IRC and the IBC.

# 2009 NM CODE CHANGE

<b>NM Code Development Committee</b> Attn: <i>Jerome Baca</i> 2550 Cerrillos Road Santa Fe, NM 87505 Tele (505) 476-4672/Fax (505) 476-4685	Item _____ (for staff use only)
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APPLICABLE SECTION/TABLE/FIGURE NUMBER(S) 2009 IECC Section 202

PROPONENT Jerome T Baca

ADDRESS \_\_\_\_\_

PHONE \_\_\_\_\_

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USE SEPARATE SHEETS FOR SEPARATE TOPICS

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**Unconditioned Space** – ~~Space within a building that is not mechanically heated or cooled and is conditioned space outside the thermal envelope.~~

---

**REASON(s):** To define the definition of indirectly conditioned space as there exists conflicts between the IRC 2009 and the IECC 2009 and the Uniform Mechanical Code 2009. This change accomodates the backloaded or cathedralized ceiling(s) in residential construction to allow for attic space to be considered within the thermal envelope.

# 2007 NM CODE CHANGE

<b>NM Code Development Committee</b> <i>Attn: Fermin Aragon, Jerome T. Baca, Rem Pacheco</i> 2550 Cerrillos Road Santa Fe, NM 87505 Tele (505) 476-4672/Fax (505) 476-4685	Item _____ (for staff use only)
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APPLICABLE SECTION/TABLE/FIGURE NUMBER(S) \_\_\_\_\_ **IECC Definition (V)**

PROPONENT \_\_\_\_\_ New Mexico Home Builders Association

ADDRESS \_\_\_\_\_ 5931 Office Blvd. Albuquerque, NM 87109 PHONE \_\_\_\_\_ (505) 344-7072

CHECK ONE: |  | Change section to read as follows FAX \_\_\_\_\_

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**VAPOR RETARDER CLASS.** A measure of a material or assembly's ability to limit the amount of moisture that passethrough that material or assembly. Vapor retarder class shall be defined using the desiccant method ofASTME96 as follows:

**Class I:** 0.1 perm or less.

**Class II:**  $0.1 < \text{perm} \leq 1.0$  perm.

**Class III:**  $1.0 < \text{perm} \leq 10$  perm.

---

**REASON(s):**

Class I Vapor Retarder is referenced in several places in the residential chapter of the IECC, but the definition only appears in the International Building Code.



Clovis	Curry	4268	4033	4252	4B
Corona	Valencia	6690	5389	3631	4B
Cuba	Sandoval	7035	7122		5B
Deming	Luna	4305	3347	5292	3B
Dulce	Rio Arriba	6793	7979		6B
Eagle Nest	Colfax	8262	9254		7B
Edgewood	Santa Fe	6649	6146		5B
Espanola	Rio Arriba	5643	5641		5B
Farmington	San Juan	5395	5747		5B
Fence Lake	Cibola	7055	6396		5B
Fort Sumner	De Baca	4032	3799	4616	3B
Gallup	McKinley	6465	6207		5B
Glenwood	Catron	4725	3632	4427	4B
Grants	Cibola	6460	6143		5B
Hatch	Dona Ana	4052	3270	5904	3B
Hobbs	Lea	3622	2954	5181	3B
Jemez Springs	Sandoval	6198	5260	2059	4B
Las Cruces	Dona Ana	4000	3223	5904	3B
Las Vegas	San Miguel	6424	5738		5B
Lordsburg	Hidalgo	4250	3213	5210	3B
Los Alamos	Los Alamos	7320	6381		5B
Los Lunas	Valencia	4856	4725	4462	4B
Magdalena	Socorro	6572	5074	2093	4B
Mescalero	Otero	6611	5540		5B
Moriarty	Torrance	6220	4735	3786	4B
Mosquero	Harding	5485	5209	3631	4B
Mountainair	Torrance	6520	5558		5B
Organ	Dona Ana	5245	3215	4919	3B
Placitas	Sandoval	5955	4917	3701	4B
Portales	Roosevelt	4006	3845	4347	4B
Raton	Colfax	6680	6001		5B
Reserve	Catron	5847	5483		5B
Rio Rancho	Sandoval	5282	4880	3949	4B
Roswell	Chaves	3573	3565	5505	3B
Ruidoso	Lincoln	6920	6309		5B
Sandia Crest	Bernalillo	10680	10034		7B
Sandia Park	Bernalillo	7077	7510		6B
Santa Fe	Santa Fe	7260	6001		5B
Santa Rosa	Guadalupe	4620	3749	4714	3B
Shiprock	San Juan	4892	5475		5B
Silver City	Grant	5895	4438	3975	4B
Socorro	Socorro	4603	3984	5147	3B
Springer	Colfax	5797	5653		5B
Taos	Taos	6967	6827		5B
Taos Ski Valley	Taos	9321	9769		7B
Tatum	Lea	3999	3680	4721	3B
Thoreau	McKinley	7200	5789		5B
Tierra Amarilla	Rio Arriba	7425	7901		6B
Tijeras	Bernalillo	6322	6338		5B

---

Submit an original and one copy. Use separate sheets for separate topics. If required, start proposal on this sheet which will act as your cover and attach any additional sheets. If voluminous supporting data is submitted, it will be maintained on file in the NM Construction Industries Division office for review between the hours of 9:00 am and 5:00 pm, Monday through Friday, except holidays.

Tohatchi	McKinley	6447	5418		5B
Truth or Consequences	Sierra	4245	3394	5103	3B
Tucumcari	Quay	4096	3767	4429	4B
Tularosa	Otero	4508	3056	5130	3B
Zuni	McKinley	6293	5742		5B

---

**REASON(s):**

Substitutes the climate zone information from the NM Energy, Minerals and Natural Resources for the less accurate county information in the IECC, but allows the county information to be used when there is no specific data for a particular community.

**APPENDIX B**

**~ RESIDENTIAL (IECC CHAPTER 4) CODE CHANGE FORMS ~**



---

**REASON(s):**

Option #2 is from the 2006 NM Energy Conservation Code.

Option #3 is modified from Section 102.1.1. It is appropriate to include all paths to compliance in one section.

It also allows performance that exceeds the 2009 IECC by at least 10% to be deemed to meet the intent of the 2009 NM Energy Code. Builders will not be able to achieve this goal without acquiring the services of a HERS rater as an energy consultant/sub-contractor. The “building science” part of performance-based compliance contains a lot of “art” where the energy sub-contractor can work with the builder to make trade-offs and slight modifications from prescriptive requirements to conclude with a house that is built better and more energy efficient.

During the process of give-and-take with the energy consultant/sub-contractor the builder will effectively receive one-on-one education on how to build a better house. Currently the state tax credits incentivize the efforts of those choosing the performance path, but with the current economic climate they may not remain for more than a couple of years at the most. The changes proposed in Option #3 will help provide an incentive for builders to attempt the performance path even when the higher HERS level does not qualify for the state tax credits.

Relieving the builder and sub-contractor of the burden of compliance with mandatory prescriptive requirements also relieves the building inspection department of the burden to inspect every detail. The building official may inspect the thermal bypass and insulation installation, but even if that inspection is waived, the HERS rater must verify the workmanship. A builder or energy sub-contractor can't “cheat” on the process as they go along or they won't meet the HERS rating score of 90 at the end of construction, and won't be able to acquire the Certificate of Occupancy necessary for a buyer to take possession of the house.

# 2009 NM CODE CHANGE

<b>NM Code Development Committee</b> <i>Attn: Fermin Aragon</i> 2550 Cerrillos Road Santa Fe, NM 87505 Tele (505) 476-4672/Fax (505) 476-4685	Item _____ (for staff use only)
---	------------------------------------

APPLICABLE SECTION/TABLE/FIGURE NUMBER(S): IECC 401.3  
PROPOSER: Southwest Energy Efficiency Project (SWEEP) Date: October 5, 2009  
ADDRESS: 1445 Adams St NE, Albuquerque NM 87110 PHONE: 505.410.3884  
FAX: 505.212.0116  
EMAIL: tfielkorn@swenergy.org

**CHECK ONE:**

- :  Change section to read as follows  
 Add new section to read as follows  
 Delete section and substitute as follows  
 Delete section without substitution

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Underline material to be added

USE SEPARATE SHEETS FOR SEPARATE TOPICS

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401.3 Certificate. A permanent certificate shall be posted on, ~~or~~ in, or near the electrical distribution panel, or near the mechanical equipment. The certificate shall not cover or obstruct the visibility of the circuit directory label, service disconnect label or other required labels. The certificate shall be completed by the builder or registered design professional. The certificate shall list the predominant R-values of insulation installed in or on ceiling/roof, walls, foundation (slab, basement wall, crawlspace all and/or floor) and ducts outside conditioned spaces; U-factors for fenestration and the solar heat gain coefficient (SHGC) of fenestration. Where there is more than one value for each component, the certificate shall list the value covering the largest area. The certificate shall list the types and efficiencies of heating, cooling and service water heating equipment. Where a gas-fired unvented room heater, electric furnace, or baseboard electric heater is installed in the residence, the certificate shall list "gas-fired unvented room heater", "electric furnace" or "baseboard electric heater" as appropriate. An efficiency shall not be listed for gas-fired unvented room heaters, electric furnaces or electric baseboard heaters.

---

**REASON(s):**

This change would require the certificate to be posted somewhere in the house, while providing the needed flexibility as to exact placement needed to allow for variances in electrical distribution panel size & placement within homes.



- g.** Or insulation sufficient to fill the framing cavity, R-19 minimum.
- h.** First value is cavity insulation, second is continuous insulation, so “13+5” means R-13 cavity insulation plus R-5 insulated sheathing. If structural sheathing covers 25 percent or less of the exterior, insulating sheathing is not required in the locations where structural sheathing is used. If structural sheathing covers more than 25 percent of exterior, structural sheathing shall be supplemented with insulated sheathing of at least R-2.
- i.** The second R-value applies when more than half the insulation is on the interior of the mass wall.
- j.** For impact rated fenestration in wind-borne debris regions ~~complying with Section R301.2.1.2 of the IRC or Section 1608.1.2 of the IBC~~, the maximum U-factor shall be 0.75 in Zone 2 and 0.65 in Zone 3.
- k.** The SHGC may be waived when the glazing orientation is part of a passive solar glazing application.
- l.** A fenestration U-factor of 0.37 shall be equivalent to the 0.35 requirement for glazing in all climate zones above 5,000 ft. elevation
- m.** When air impermeable insulation is used to create an un-vented attic assembly in accordance with Sec. R806.4, at least R-23 cavity insulation and R-10 continuous insulation surrounding all framing members shall be deemed to satisfy the requirement for R-38 ceilings.
- n.** In all locations with heating degree days (HDD) exceeding 6000: When air impermeable insulation is used to create an un-vented attic assembly in accordance with Sec. R806.4, at least R-30 cavity insulation and R-17 continuous insulation surrounding all framing members shall be deemed to satisfy the requirement for R-49 ceilings.
- o.** In locations with HDD less than 6000, R-38 shall be deemed to satisfy this requirement.
- 

**REASON(s):**

Reflects all changes approved by IECC Review Committee through January 13, 2010 and amendments on February 24<sup>th</sup> and March 3, 2010.



# 2009 NM CODE CHANGE

<b>NM Code Development Committee</b> <i>Attn: Fermin Aragon</i> 2550 Cerrillos Road Santa Fe, NM 87505 Tele (505) 476-4672/Fax (505) 476-4685	Item _____ (for staff use only)
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APPLICABLE SECTION/TABLE/FIGURE NUMBER(S) IECC 402.2.8.1

PROPONENT New Mexico Home Builders Association

ADDRESS 5931 Office Blvd. Albuquerque, NM 87109 PHONE (505) 344-7072

CHECK ONE: |  | Change section to read as follows  
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USE SEPARATE SHEETS FOR SEPARATE TOPICS

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**402.2.8.1 Slab-on-grade floors.** See this section of the IECC and add the following exception: For slab-on-grade installations, the placement of vertical perimeter insulation shall not be required to penetrate the top four (4) inches of the slab at door thresholds or between unheated garages, storage or mechanical areas, and heated living spaces. The required depth and placement of perimeter insulation shall not be required to a depth that exceeds that of the top of the spread footing or the bottom of the monolithically-poured footing as determined for frost protection.

---

## REASON(s):

Carry forward code change from 2006 IECC.

# 2009 NM CODE CHANGE

<b>NM Code Development Committee</b> <i>Attn: Fermin Aragon</i> 2550 Cerrillos Road Santa Fe, NM 87505 Tele (505) 476-4672/Fax (505) 476-4685	Item _____ (for staff use only)
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APPLICABLE SECTION/TABLE/FIGURE NUMBER(S) IEC- 402.2.8.2

PROPONENT Martin Romero (CID)

ADDRESS \_\_\_\_\_ PHONE \_\_\_\_\_

CHECK ONE: |  | Change section to read as follows FAX \_\_\_\_\_

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USE SEPARATE SHEETS FOR SEPARATE TOPICS

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**IECC 402.2.8.2 Slabs-on-ground with turned-down footings.** Slabs on ground with turned down footings shall have a minimum of one No. 4 bar at the top and the bottom of the footing. Monolithic foundations shall be formed in place or insulation used as a forming material shall be adequately supported to resist movement.

---

**REASON(s):** To ensure code compliance of the the foundations and perimeter insulation .



Shower/tub on exterior wall	Showers and tubs on exterior walls have insulation and an air barrier separating them from the exterior wall.
Electrical/phone box on exterior walls	Air barrier extends behind boxes or air sealed-type boxes are installed.
Common wall	Air barrier is installed in common wall between dwelling units.
HVAC register boots	HVAC register boots that penetrate building envelope are sealed to subfloor or drywall.
Fireplace	Fireplace walls include an air barrier.

---

**REASON(s):**

In adobe-look wood frame construction it is common to build a 12” deep wall, but fill it only with the prescribed amount of batt insulation. This practice leaves one side of the insulation not in contact along its face, and creates an air pocket where heating and cooling may produce condensation within the wall cavity. In addition to creating conditions where mold may grow, this greatly reduces the energy efficiency of the wall insulation.

The only way to get batt insulation in contact on all 6 sides within a wall cavity is to fill the cavity. It is possible builders may choose to build a “double wall” with furred-out drywall that would be in contact with the batt insulation in order to meet this requirement.

# 2007 NM CODE CHANGE

<b>NM Code Development Committee</b> <i>Attn: Fermin Aragon, Jerome T. Baca, Rem Pacheco</i> 2550 Cerrillos Road Santa Fe, NM 87505 Tele (505) 476-4672/Fax (505) 476-4685	Item _____ (for staff use only)
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APPLICABLE SECTION/TABLE/FIGURE NUMBER(S)                **IECC 402.4.2.2**          

PROPONENT                New Mexico Home Builders Association          

ADDRESS                5931 Office Blvd.      Albuquerque, NM 87109                PHONE                (505) 344-7072          

CHECK ONE:    |  | Change section to read as follows      FAX      \_\_\_\_\_

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USE SEPARATE SHEETS FOR SEPARATE TOPICS

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**402.4.2.2 Visual inspection option.** Building envelope tightness and insulation installation shall be considered acceptable when the items listed in Table 402.4.2, applicable to the method of construction, are field verified. Where required by the *code official*, an *approved* party independent from the installer of the insulation shall inspect the air barrier and insulation. Reference: latest version of the Energy Star Thermal Bypass Checklist Guide.

---

**REASON(s):**

Standardizes visual inspection process with nationally-accepted checklists.

# 2009 NM CODE CHANGE

<b>NM Code Development Committee</b> <i>Attn: Fermin Aragon</i> 2550 Cerrillos Road Santa Fe, NM 87505 Tele (505) 476-4672/Fax (505) 476-4685	Item _____ (for staff use only)
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APPLICABLE SECTION/TABLE/FIGURE NUMBER(S) IECC 402.4.3

PROPOSER CID

ADDRESS 2550 Cerrillos Road PHONE (505) 476-4672

CHECK ONE:     Change section to read as follows                      FAX \_\_\_\_\_

Add new section to read as follows                              EMAIL \_\_\_\_\_

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Delete section without substitution

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USE SEPARATE SHEETS FOR SEPARATE TOPICS

**402.4.3 Fireplaces.** New wood-burning fireplaces shall have gasketed doors and outdoor combustion air.  
**Exception** Wood burning masonry fireplaces without a gas log igniter are allowed without gasketed doors providing:

- 1.) the residence being constructed exceeds compliance of the energy code by 20% or better, and
- 2.) the fireplaces have outdoor combustion air supplied directly to the fireboxes.

**REASON(s):**

Custom gasketed doors with curved tempered glass on traditional Kiva-style fireplaces would be cost-prohibitive, and eliminate this historical design element.

# 2009 NM CODE CHANGE

<b>NM Code Development Committee</b> <i>Attn: Jerome Baca</i> 2550 Cerrillos Road Santa Fe, NM 87505 Tele (505) 476-4672/Fax (505) 476-4685	Item _____ (for staff use only)
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APPLICABLE SECTION/TABLE/FIGURE NUMBER(S)      IECC 403.1.1

PROPONENT      EMNRD

ADDRESS \_\_\_\_\_ PHONE \_\_\_\_\_

CHECK ONE:    |  | Change section to read as follows      FAX \_\_\_\_\_

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USE SEPARATE SHEETS FOR SEPARATE TOPICS

## PROPOSAL:

**403.1.1 Programmable thermostat.** Where the primary heating system is a forced-air furnace, at least one thermostat per dwelling unit shall be capable of controlling the heating and cooling system on a daily schedule to maintain different temperature set points at different times of the day. This thermostat shall include the capability to set back or temporarily operate the system to maintain zone temperatures down to 55F (13C) or up to 85F (29C). The thermostat shall initially be programmed with a heating temperature set point no higher than 70F (21C) and a cooling temperature set point no lower than 78F (26C).

## Exception:

- 1) Where the home is registered through a recognized performance-based certification program.
- 2) Where approved alternative methods of construction and/or materials may be used, programmable thermostats may be omitted.

## REASON(s):

Homes registered with performance-based certification programs may have their mechanical systems engineered, and all components designed to work most efficiently as a system. This may include having the programmable features of the system residing not on the thermostat, but on the heating unit. Also, alternative methods and materials may be recognized as equivalent measures meeting the intent of the code.

# 2009 NM CODE CHANGE

<b>NM Code Development Committee</b> Attn: Jerome Baca 2550 Cerrillos Road Santa Fe, NM 87505 Tele (505) 476-4672/Fax (505) 476-4685	Item _____ (for staff use only)
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APPLICABLE SECTION/TABLE/FIGURE NUMBER(S) 2009 IECC 403.2.1

PROPOSER Jerome T Baca

ADDRESS \_\_\_\_\_ PHONE \_\_\_\_\_

CHECK ONE:     Change section to read as follows                      FAX \_\_\_\_\_

Add new section to read as follows                              EMAIL \_\_\_\_\_

Delete section and substitute as follows

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USE SEPARATE SHEETS FOR SEPARATE TOPICS

**PROPOSAL:**

**403.2.1 Insulation (Prescriptive).** ~~Supply ducts in attics shall be insulated to a minimum of R-8. All other ducts shall be insulated to a minimum of R-6.~~ Ducts shall be insulated to the following levels:

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

**(1) Minimum duct insulation R value cooling only - and heating only- supply ducts and return ducts.**

**(a) Heating only ducts:**

- (i) exterior: R-8;
- (ii) ventilated Attic: R-6;
- (iii) unvented attic w/ backloaded ceiling: R-6;
- (iv) unvented attic w/ roof insulation: R-6;
- (v) unconditioned space: R-6;
- (vi) indirectly conditioned space: R3.5
- (vii) buried: none.

**(b) Cooling only ducts :**

- (i) exterior: R-8 or the R-factor of insulation in the exterior wall on which the duct is located;
- (ii) ventilated Attic: R-6;
- (iii) unvented attic w/ backloaded ceiling: R-6;
- (iv) unvented attic w/ roof insulation: R-6;
- (v) unconditioned space: R-6;
- (vi) indirectly conditioned space: R3.5
- (vii) buried: none.

**(c) Combined heating and cooling ducts.**

- (i) exterior: R-6;
- (ii) ventilated Attic: R-6;
- (iii) unvented attic w/ backloaded ceiling: R-6;
- (iv) unvented attic w/ roof insulation: R-6;

Submit an original and one copy. Use separate sheets for separate topics. If required, start proposal on this sheet which will act as your cover and attach any additional sheets. If voluminous supporting data is submitted, it will be maintained on file in the NM Construction Industries Division office for review between the hours of 9:00 am and 5:00 pm, Monday through Friday, except holidays.

(v) unconditioned space: R-6;

(vi) indirectly conditioned space: none;

(vii) buried: R-3.5.

---

**REASON(s):**

To provide consistency for the duct insulation requirements as per NMAC section 14.9.2.14 and Chapter 6 of the Uniform Mechanical Code.

# 2009 NM CODE CHANGE

<b>NM Code Development Committee</b> <i>Attn: Fermin Aragon</i> 2550 Cerrillos Road Santa Fe, NM 87505 Tele (505) 476-4672/Fax (505) 476-4685	Item _____ (for staff use only)
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APPLICABLE SECTION/TABLE/FIGURE NUMBER(S)	<u>IECC 403.2.2</u>		
PROPONENT	<u>NM EMNRD</u>		
ADDRESS	<u>1220 S. St. Francis Dr., Santa Fe, NM</u>	PHONE	<u>505.476.3254</u>
CHECK ONE:	<input type="checkbox"/> Change section to read as follows	FAX	<u>505.476.3322</u>
	<input type="checkbox"/> Add new section to read as follows	EMAIL	_____
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	<input type="checkbox"/> Delete section without substitution		

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USE SEPARATE SHEETS FOR SEPARATE TOPICS

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**403.2.2 Sealing (Mandatory).** All ducts, air handlers, filter boxes and building cavities used as ducts shall be sealed. ~~Joints and seam shall comply with Section M1601.4.1 of the International Residential Code. Joints, seams and penetrations of duct systems shall be made air-tight by means of mastics, gasketing, or other means in accordance with the mechanical code. Register penetrations shall be sealed to the wall or floor assemblies. Where HVAC duct penetrates a conditioned space, the duct penetration shall be sealed to the wall or floor assembly to prevent leakage into an unconditioned space.~~

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**REASON(s):**

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Submit an original and one copy. Use separate sheets for separate topics. If required, start proposal on this sheet which will act as your cover and attach any additional sheets. If voluminous supporting data is submitted, it will be maintained on file in the NM Construction Industries Division office for review between the hours of 9:00 am and 5:00 pm, Monday through Friday, except holidays.

# 2009 NM CODE CHANGE

<b>NM Code Development Committee</b> Attn: Jerome Baca 2550 Cerrillos Road Santa Fe, NM 87505 Tele (505) 476-4672/Fax (505) 476-4685	Item _____ (for staff use only)
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APPLICABLE SECTION/TABLE/FIGURE NUMBER(S) 2009 IECC Section 403.2.4, 403.2.5

PROPOSER Jerome T Baca

ADDRESS \_\_\_\_\_

PHONE \_\_\_\_\_

- CHECK ONE: |  | Change section to read as follows  
|  | Add new section to read as follows  
|  | Delete section and substitute as follows  
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EMAIL \_\_\_\_\_

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USE SEPARATE SHEETS FOR SEPARATE TOPICS

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**403.2.4 Installation of Ducts** – All HVAC ducts or duct systems shall be installed in accordance with the Uniform Mechanical Code Chapter 6 and 17, and nationally recognized standards.

**403.2.5 Materials** – Materials for HVAC ducts or duct systems shall comply with the provisions set forth in Chapter 6 of the Uniform Mechanical Code. Factory made ducts shall be installed in accordance with Chapter 6 of the Uniform Mechanical Code and UMC Standard 6-5. The use of flexible duct shall be limited to supply- and return-air run-outs of not more than 12 feet in length. Flexible duct shall not be used for the principle supply- and return-air plenum.

---

**REASON(s):** This code proposal defines the requirements for the installation of ducts as set forth in the UMC and UMC Standard 6-5 and Chapter 17 Mandatory Referenced Standards. This proposal also limits the amount of flexible duct work that can be used for HVAC duct systems, providing for improved design, performance and efficiencies. Research suggests the result of this code proposal may be an approximate increased efficiency of upto 12 %.



# 2009 NM CODE CHANGE

<b>NM Code Development Committee</b> <i>Attn: Jerome Baca</i> 2550 Cerrillos Road Santa Fe, NM 87505 Tele (505) 476-4672/Fax (505) 476-4685	Item _____ (for staff use only)
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APPLICABLE SECTION/TABLE/FIGURE NUMBER(S)

2009 IECC 403.4

PROPOSER

Jerome Baca

ADDRESS \_\_\_\_\_

PHONE \_\_\_\_\_

CHECK ONE:

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USE SEPARATE SHEETS FOR SEPARATE TOPICS

## PROPOSAL:

~~403.4 Circulating hot water systems (Mandatory) All circulating service hot water piping shall be insulated to at least R-2. Circulating hot water systems shall include an automatic or readily accessible manual switch that can turn off the hot water circulating pump when the system is not in use.~~

**REASON(s):** Circulating hot water systems are included in the code change proposal for Section 403.3, therefore this section can be deleted from the code.





# 2009 NM CODE CHANGE

<b>NM Code Development Committee</b> <i>Attn: Fermin Aragon</i> 2550 Cerrillos Road Santa Fe, NM 87505 Tele (505) 476-4672/Fax (505) 476-4685	Item _____ (for staff use only)
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APPLICABLE SECTION/TABLE/FIGURE NUMBER(S)

IECC 403.10

PROPONENT

NM EMNRD

ADDRESS 1220 S. St. Francis Dr., Santa Fe, NM

PHONE

505.476.3254

CHECK ONE: |  | Change section to read as follows

FAX

505.476.3322

|  | Add new section to read as follows

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USE SEPARATE SHEETS FOR SEPARATE TOPICS

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**403.10 Fans.** Ventilating fans shall meet ENERGY STAR requirements.

**Exception:**

Ventilating fans in half bathrooms that do not contain a bathtub, shower, spa, or similar source of moisture are exempt from the ENERGY STAR requirement.

---

**REASON(s):**

It's a good idea.

Specifying ENERGY STAR fans helps the builder purchase the right equipment for the home.

# bn2009 NM CODE CHANGE

<p><b>NM Code Development Committee</b> <i>Attn: Fermin Aragon</i> 2550 Cerrillos Road Santa Fe, NM 87505 Tele (505) 476-4672/Fax (505) 476-4685</p>	<p>Item _____ (for staff use only)</p>
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APPLICABLE SECTION/TABLE/FIGURE NUMBER(S): 2009 IECC 404.1  
PROPONENT: Electrical Bureau Date: November 18, 2009  
ADDRESS: 2550 Cerrillos RD. Santa Fe, NM 87505 PHONE: 505.476.4679  
FAX: 505.476.4685  
EMAIL: rem.pacheco@state.nm.us

CHECK ONE:

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USE SEPARATE SHEETS FOR SEPARATE TOPICS

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## 404.1 Lighting equipment (~~Prescriptive~~) (Mandatory)

A minimum of ~~50~~75 percent of the lamps in permanently installed lighting fixtures shall be high- efficacy lamps or 50 percent of the permanently installed luminaires (lighting fixtures) shall be ENERGY STAR qualified.

---

### REASON(s):

This code change proposal will amend the language from the 2008 NMEC to require that a minimum of 50 % luminaires will be ENERGY STAR qualified or that at least 75% of all lamps installed in permanent fixtures will be high efficacy. It also changes this code provision from "Prescriptive" to "Mandatory".

# 2009 NM CODE CHANGE

<b>NM Code Development Committee</b> <i>Attn: Rem Pacheco</i> 2550 Cerrillos Road Santa Fe, NM 87505 Tele (505) 476-4679/Fax (505) 476-4685	<u>Item</u> (for staff use only)
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APPLICABLE SECTION/TABLE/FIGURE NUMBER(S): 2009 IECC 404.2 Lighting equipment  
PROPOSER: Electrical TAC, Rem Pacheco & CCC Date: November 25, 2009  
ADDRESS: 2550 Cerrillos RD Santa Fe, NM 87505 PHONE: 505.476.4679  
FAX: 505.476.4685  
EMAIL: rem.pacheco@state.nm.us

**CHECK ONE:**

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USE SEPARATE SHEETS FOR SEPARATE TOPICS

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On one and two family dwelling units, in addition to a wall switch, motion sensors, daylight sensors, and/or timers shall be installed on at least 33% of the outdoor luminaires (light fixtures).

---

**REASON(s):**

Requiring outdoor luminaire motion sensors, daylight sensors, and/or timers for at least 1/3 of outdoor luminaires ensures lights will not be left on during daylight hours and conserves energy.

# 2009 NM CODE CHANGE

<b>NM Code Development Committee</b> <i>Attn: Rem Pacheco</i> 2550 Cerrillos Road Santa Fe, NM 87505 Tele (505) 476-4679/Fax (505) 476-4685	<u>Item</u> (for staff use only)
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APPLICABLE SECTION/TABLE/FIGURE NUMBER(S): 2009 IECC 404.3 Photovoltaic raceway  
PROPOSER: Electrical Bureau Date: November 18, 2009  
ADDRESS: 2550 Cerrillos RD Santa Fe, NM 87505 PHONE: 505.476.4679  
FAX: 505.476.4685  
CHECK ONE: EMAIL: rem.pacheco@state.nm.us

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## 404.3 Photovoltaic raceway.

On new construction in one and two family dwelling units a listed non-flexible 3/4 inch minimum metallic electrical raceway shall be installed during rough-in from an accessible point in the garage or indoor designated solar photovoltaic equipment location to: (A) the roof for roof mounted photovoltaic equipment, or (B) an outside wall for remote mounted photovoltaic equipment. The conduit shall be sealed with a listed fitting or box at each end.

---

## REASON(s):

Photovoltaic roof or remote equipment wiring raceway will be available without disturbing the building finish. This will facilitate renewable energy options.

# 2009 NM CODE CHANGE

<b>NM Code Development Committee</b> <i>Attn: Fermin Aragon</i> 2550 Cerrillos Road Santa Fe, NM 87505 Tele (505) 476-4672/Fax (505) 476-4685	Item _____ (for staff use only)
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APPLICABLE SECTION/TABLE/FIGURE NUMBER(S) IECC 405  
PROPONENT New Mexico Home Builders Association  
ADDRESS 5931 Office Blvd. Albuquerque, NM 87109 PHONE (505) 344-7072

CHECK ONE: |  | Change section to read as follows FAX \_\_\_\_\_  
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USE SEPARATE SHEETS FOR SEPARATE TOPICS

**SECTION 405**  
**~~SIMULATED PERFORMANCE ALTERNATIVE~~**  
**(Performance)**

**REASON(s):**

Section 401.2 has been modified to include the important part of this section – performance that exceeds the 2009 IECC by at least 10%. Builders will not be able to achieve this goal without acquiring the services of a HERS rater as an energy consultant/sub-contractor. The “building science” part of performance-based compliance contains a lot of “art” where the energy sub-contractor can work with the builder to make trade-offs and slight modifications from prescriptive requirements to conclude with a house that is built better and more energy efficient. Relieving the builder and sub-contractor of the burden of compliance with mandatory prescriptive requirements also relieves the building inspection department of the burden to inspect every detail. A builder or energy sub-contractor can’t “cheat” on the process as they go along or they won’t meet the HERS rating score of 90 at the end of construction, and won’t be able to acquire the Certificate of Occupancy necessary for a buyer to take possession of the house.

Leaving the verbage in Section 405 intact infers that a builder (or owner/builder) could accomplish the performance compliance as a Do-It-Yourself project. Reality has proven this is not the case, and CID inspectors and plan-checkers would become bogged down in countless hours of explanation of building science concepts to owner/builder applicants who may insist on this compliance path.

# 2009 NM CODE CHANGE

<b>NM Code Development Committee</b> <i>Attn: Jerome Baca</i> 2550 Cerrillos Road Santa Fe, NM 87505 Tele (505) 476-4672/Fax (505) 476-4685	Item _____ (for staff use only)
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APPLICABLE SECTION/TABLE/FIGURE NUMBER(S)	<u>2009 IECC Section 405.6.1</u>
PROPONENT	<u>Jerome Baca</u>
ADDRESS	PHONE _____
CHECK ONE:	FAX _____
<input checked="" type="checkbox"/> Change section to read as follows	EMAIL _____
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USE SEPARATE SHEETS FOR SEPARATE TOPICS

**PROPOSAL:**

**405.6.1 Minimum capabilities.** The calculations used to determine the equipment size for the residence must be submitted to and approved by the Authority Having Jurisdiction. Calculation procedures used to comply with this section shall be software tools capable of calculating the annual energy consumption of all building elements that differ between the *standard reference design* and the *proposed design* and shall include the following capabilities:

1. Computer generation of the *standard reference design* using only the input for the *proposed design*. The calculation procedure shall not allow the user to directly modify the building component characteristics of the *standard reference design*.
2. Calculation of whole-building (as a single zone) sizing for the heating and cooling equipment in the *standard reference design* residence in accordance with ~~Section M1401.3 of the *International Residential Code*~~ with sections 403.6 or 403.7 of this code.
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.

**REASON(s):**

Instead of referring to a section in another code book, this inserts the relevant language from Section 403.6 and 406.7 of the IECC. This proposal requires residential equipment sizing be in accordance with mandatory recognized standards. This also requires submittal of the calculations, size and type of equipment with the construction documents to Authority Having Jurisdiction. This provides the AHJ a preview of the system and prevents oversizing.

# 2009 NM GREEN BUILDING CODE CHANGE

<p>NM Code Development Committee Attn: Fermin Aragon, Jerome T. Baca, Rem Pacheco 2550 Cerrillos Road Santa Fe, NM 87505 Tele (505) 476-4672/Fax (505) 476-4685</p>	<p>Item _____ (for staff use only)</p>
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APPLICABLE SECTION/TABLE/FIGURE NUMBER(S)

(IECC) Section 406

PROPONENT New Mexico Home Builders Association

ADDRESS 5931 Office Blvd. NE #1 Albuquerque, NM 87109 PHONE 505-344-7072

CHECK ONE: |  | Change section to read as follows FAX \_\_\_\_\_  
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USE SEPARATE SHEETS FOR SEPARATE TOPICS

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**406 Existing Residential Buildings.** The following shall apply in residences where additions or alterations are made and any of the following are encountered:

- 1.) The reconfiguration of space;
- 2.) The addition or elimination of any door or window; or
- 3.) The work area in the existing building exceeds 50% of the original aggregate floor space.

**406.1 Thermal Envelope.** Exposed openings to conditioned space in the existing building shall be fully sealed and insulated and any remaining gaps sealed with caulk or foam. Where required, fire rated material shall be used.

**406.1.1 Openings.** Exposed openings in the existing building between conditioned and unconditioned spaces, including those in cabinets or closets, shall be fully sealed and insulated, and any remaining gaps shall be sealed with approved materials. Where required, fire rated material shall be used.

**406.1.2 Doors and Windows.** Openings between all exterior door and window assemblies and their respective jambs and framing shall be caulked, gasketed, weather-stripped or otherwise sealed with an approved material.

**406.1.3 Skylight Shaft Insulation.** Where access exists, all skylights shall be caulked, gasketed, or weather-stripped with an approved material. Knee walls shall be insulated to comply with Table 402.1.1.

**406.2 Under Floor Insulation.** Where access exists, insulate existing un-insulated floors (including floors above garages and cantilevered floors) in accordance with the following:

1. Insulation shall be installed to maintain permanent contact with the underside of the sub-floor decking;

---

Submit an original and one copy. Use separate sheets for separate topics. If required, start proposal on this sheet which will act as your cover and attach any additional sheets. If voluminous supporting data is submitted, it will be maintained on file in the NM Construction Industries Division office for review between the hours of 9:00 am and 5:00 pm, Monday through Friday, except holidays.

2. Batt and blown insulation shall be held in place by mechanical attachment;
3. Batt insulation shall be installed in accordance with requirements of Table 402.4.2 “Air Barrier and Insulation Inspection Component Criteria”;
4. Manufacturers’ published installation instructions for in-floor heating shall be followed.

**406.3 Duct Sealing and Insulation.** Where access exists, compliance with applicable sections of 403.2 through 403.4 is required.

**Programmable thermostat.** Reasonable measures shall be taken for retrofitting all existing non-programmable thermostats. Where the primary heating system is a forced-air furnace, at least one thermostat per dwelling unit shall be capable of controlling the heating and cooling system on a daily schedule to maintain different temperature set points at different times of the day. This thermostat shall include the capability to set back or temporarily operate the system to maintain zone temperatures down to 55°F (13°C) or up to 85°F (29°C). The thermostat shall initially be programmed with a heating temperature set point no higher than 70°F (21°C) and a cooling temperature set point no lower than 78°F (26°C).

**Exceptions:** 1.) Where the home is registered in a performance-based certification program the requirement for a programmable thermostat shall be waived;

2.) Where approved alternative methods of construction and/or materials are being used, programmable thermostats may be omitted.

---

**REASON(s):**

This requires residences undergoing major remodeling or any addition that increases the amount of conditioned space to undertake weatherization improvements.