



# Pennsylvania Housing Research/Resource Center

Phone: (814) 865-2341  
Fax: (814) 863-7304  
PHRC@psu.edu  
www.engr.psu.edu/phrc

The Pennsylvania State University  
219 Sackett Building  
University Park, PA 16802

June 12, 2003

Original: 2283

Mr. Charles J. Sludden, Jr.  
Director, Occupational and Industrial Safety  
Department of Labor and Industry  
1613 L and I Building  
Harrisburg, PA 17120

Dear Mr. Sludden:

## ***Uniform Construction Code (Act 45 of 1999) Regulations***

We have been informed that implementation of Pennsylvania's Uniform Construction Code (UCC) is being delayed in order to reconsider some portions of the regulations. We further understand that one, but not the most important, of the reasons for this delay is the *Alternative Residential Energy Provisions ("PA Alternative")*. As you may know, the Pennsylvania Housing Research Center (PHRC) was responsible for drafting the alternative energy provisions.

Until now, we have restricted the PHRC's involvement to the technical and educational aspects of the legislation. The adoption of a new, state-wide, residential building code is very important to the future of the Commonwealth and the house building industry in Pennsylvania. For this reason, we would like to go beyond the technical and educational aspects, and offer you our perspective. This letter restates the objectives of the *PA Alternative* and points out why we think that the citizens, homeowners and homebuilders will benefit from its adoption by the Commonwealth.

The *PA Alternative* was developed to meet the requirements of the UCC, Act 45 of 1999, §301 (c). This section requires that "The department shall...promulgate prescriptive methods to implement the energy-related standards of the Uniform Construction Code which take into account the various climatic conditions through this Commonwealth."

The administrative regulations due to be promulgated by the Pennsylvania Department of Labor and Industry (DLI) **allow for three compliance paths for the energy provisions:**

1. The 2003 International Residential Code (IRC, Chapter 11), §403.21 (a) 6.
2. The 2003 International Energy Conservation Code (IECC), §403.21 (a) 8.
3. The *PA Alternative* §403.21 (e) 1.

**It is up to the "permit applicant" to decide which compliance path to choose.** Each of these three paths yields the same or equivalent energy performance, but the three paths vary in terms of design flexibility, complexity, and room for innovation.

The *PA Alternative* does not in any way inhibit the adoption of the IECC, nor does it replace the IRC provisions. It is simply an additional option for compliance.

RECEIVED  
2003 JUN 16 PM 3:08  
INDUSTRIAL SAFETY  
REVIEW COMMISSION

The *PA Alternative* option provides permit applicants with a means of complying that is:

- simpler,
- more rational,
- more flexible,
- focused on Pennsylvania's climatic conditions, and
- equivalent to the provisions of the IECC and the IRC.

**In short, it provides an approach that is easier to understand, easier to comply with, and easier to enforce.** For example, the IRC provides 10 discontinuous climatic zones across Pennsylvania, with different insulation requirements in each of the 10 zones. The *PA Alternative* reduces this to three zones.

You and your colleagues should be aware that DLI took the precaution of having the federal Department of Energy (DOE), specifically the Pacific Northwest National Laboratory (PNNL), independently check and assess the *PA Alternative*. PNNL found that **the *PA Alternative* is not only equivalent, in energy terms, to the IRC but that the changes it contains are improvements.** In fact, DOE has since developed a draft version of a potential residential energy code that includes a number of the improvements that we have introduced. Since our initial submission to DLI, the need for simplification of the energy code has been confirmed in studies by the states of Massachusetts, New York, and Washington.

We believe that the proposed energy code procedures will, together, provide significant benefits to the citizens of Pennsylvania. Reducing the amount of energy consumed for space conditioning in new housing will bring measurable economic benefits. Having three alternatives rather than a single compliance procedure is a wise strategic move. We are convinced that the *PA Alternative* will enable the benefits to accrue faster and with much less hassle. While we know it is the easiest of the three alternatives to follow and to enforce, **it remains the prerogative of the builder, developer or customer to make the choice.**

Supporting documentation is plentiful. We have enclosed both a copy of the *PA Alternative* and the shortest document we have on the development of the *PA Alternative*.

We trust that these comments will be of value to you in your deliberations. If you have any questions or concerns, please don't hesitate to call me at (814) 863-9788 or Mark Fortney, at (814) 863-2366.

Sincerely,



Eric Burnett

Director of Research, PHRC

Hankin Chair of Residential Construction, Departments of Civil and Environmental Engineering and Architectural Engineering, Pennsylvania State University

cc: Jon Balson, Department of Labor and Industry

# The Development of an Alternative to Chapter 11 of the IRC 2000 for use in Pennsylvania

Eric F. P. Burnett, Ph.D., P. Eng.<sup>1</sup>

Mark R. Fortney<sup>2</sup>

## ABSTRACT

*In late 1999 the Commonwealth of Pennsylvania passed legislation to adopt one or more state-wide building codes. It is likely that the International Residential Code (IRC 2000) will be adopted for low-rise residential construction. The legislation permits the development of an alternative to Chapter 11 Energy Efficiency in the IRC 2000 provided that equivalence, in terms of space conditioning energy, is maintained. The Pennsylvania Housing Research Center (PHRC) was asked to develop this alternative version of Chapter 11.*

*Our terms of reference required the development of an alternative, prescriptive, code chapter that would be simpler, more flexible, and Pennsylvania focused. The PHRC alternative Chapter 11 together with six supplementary reports was submitted in May 2000. The alternative energy code for Pennsylvania is a significant improvement over the IRC 2000.*

*Two studies, one on glazing ratios and the other on climate, permitted major simplifications with regard to the number of relevant climate zones and the need for builders to determine glazing ratios for individual houses.*

*A study of light-gauge, cold-formed, steel-framed wall systems provided the basis for a set of more comprehensive recommendations for the selection and placement of thermal insulation to control both heat and moisture flow.*

*Prescriptive trade-offs for greater airtightness or the use of high efficiency equipment or both are introduced.*

*Equivalence, with regard to space conditioning energy consumption (conservation), is demonstrated in two studies. One study is confined to thermal envelope considerations and the other involves system (house or townhouse) analysis using POWER-DOE.*

*This paper discusses the changes and the reasons for introducing these changes to the IRC 2000 Code.*

## KEY WORDS

building code, energy conservation, space heating, residential, economics

<sup>1</sup>Director of the Pennsylvania Housing Research Center and Bernard and Hentietta Hankin Chair of residential Construction in the Departments of Civil and Environmental Engineering and Architectural Engineering at Penn State

<sup>2</sup> Assitant Director of the PHRC.

# The Development of an Alternative to Chapter 11 in the IRC 2000 for use in Pennsylvania

## ABSTRACT

*In late 1999 the Commonwealth of Pennsylvania passed legislation to adopt one or more state-wide building codes. It is likely that the International Residential Code (IRC 2000) will be adopted for low-rise residential construction. The legislation permits the development of an alternative to Chapter 11 Energy Efficiency in the IRC 2000 provided that equivalence, in terms of space conditioning energy, is maintained. The Pennsylvania Housing Research Center (PHRC) was asked to develop this alternative version of Chapter 11.*

*Our terms of reference required the development of an alternative, prescriptive, code chapter that would be simpler, more flexible, and Pennsylvania focused. The PHRC alternative Chapter 11 together with six supplementary reports was submitted in May 2000. The alternative energy code for Pennsylvania is a significant improvement over the IRC 2000.*

*Two studies, one on glazing ratios and the other on climate, permitted major simplifications with regard to the number of relevant climate zones and the need for builders to determine glazing ratios for individual houses.*

*A study of light-gauge, cold-formed, steel-framed wall systems provided the basis for a set of more comprehensive recommendations for the selection and placement of thermal insulation to control both heat and moisture flow.*

*Prescriptive trade-offs for greater airtightness or the use of high efficiency equipment or both are introduced.*

*Equivalence, with regard to space conditioning energy consumption (conservation), is demonstrated in two studies. One study is confined to thermal envelope considerations and the other involves system (house or townhouse) analysis using POWER-DOE.*

*This paper discusses the changes and the reasons for introducing these changes to the IRC 2000 Code.*

## INTRODUCTION

In November 1999 the Pennsylvania Legislature passed the Uniform Construction Code (UCC) legislation into law mandating a statewide building code across Pennsylvania. The Act requires the Pennsylvania Department of Labor and Industry (DLI) to promulgate regulations to implement the requirements of the legislation and, in addition, to consider the development of alternative, prescriptive methods for energy conservation that account for the various climatic regions in the Commonwealth. In deriving these energy standards the DLI was to seek to balance energy savings with initial construction costs.

It was evident that the International Code Council's International Residential Code (IRC) 2000 is to be adopted as the statewide code for low-rise housing in PA. The energy provisions are covered in Chapter 11, Energy Efficiency. In December 1999, members of the PHRC Advisory Committee asked the Pennsylvania Housing Research Center (PHRC) to develop an alternative version of Chapter 11, *Energy Efficiency*, in the IRC 2000. In addition we were asked to consider and evaluate another prescriptive version of the energy requirements in Chapter 11 of the IRC 2000 that had been developed by the National Association of Home Builders (NAHB). This evaluation was to determine if the NAHB proposed path was equivalent to the IRC 2000 and whether it was appropriate for Pennsylvania's climate and construction practices.

On January 6, 2000, the PHRC initiated work on the development of an alternative prescriptive version of Chapter 11 in the IRC 2000 that would be:

- simpler
- more rational
- more flexible

- focused on Pennsylvania
- equivalent to the provisions of the IRC 2000 in relation to space conditioning energy consumption,
- independent, as far as possible, of other documents, specifically the IECC, NFRC, IBC, and other documents.

A draft of the Pennsylvania alternative to Chapter 11 of the IRC 2000 together with the draft versions of six supplementary reports was submitted to DLI in May 2000. The development and publication of the IRC 2000 was a very important initiative for building codes and for housing in the US. Its state-wide adoption in Pennsylvania is another important step for housing both within and outside the state. The objective of this paper is to identify and discuss some of the technical issues that had to be addressed. These issues and their resolution are important because they will impact the adoption of the IRC 2000 in Pennsylvania and, possibly, some other states with comparable climates.

### STRATEGIES FOR COMPLIANCE

The chart in Figure 1 illustrates how the proposed alternative path fits into the overall regulatory structure for Pennsylvania's UCC. Note that either the IRC 2000 or the PA-Alternative can be chosen while the 2000 IECC code and its options could, if desired or preferred, always be used.

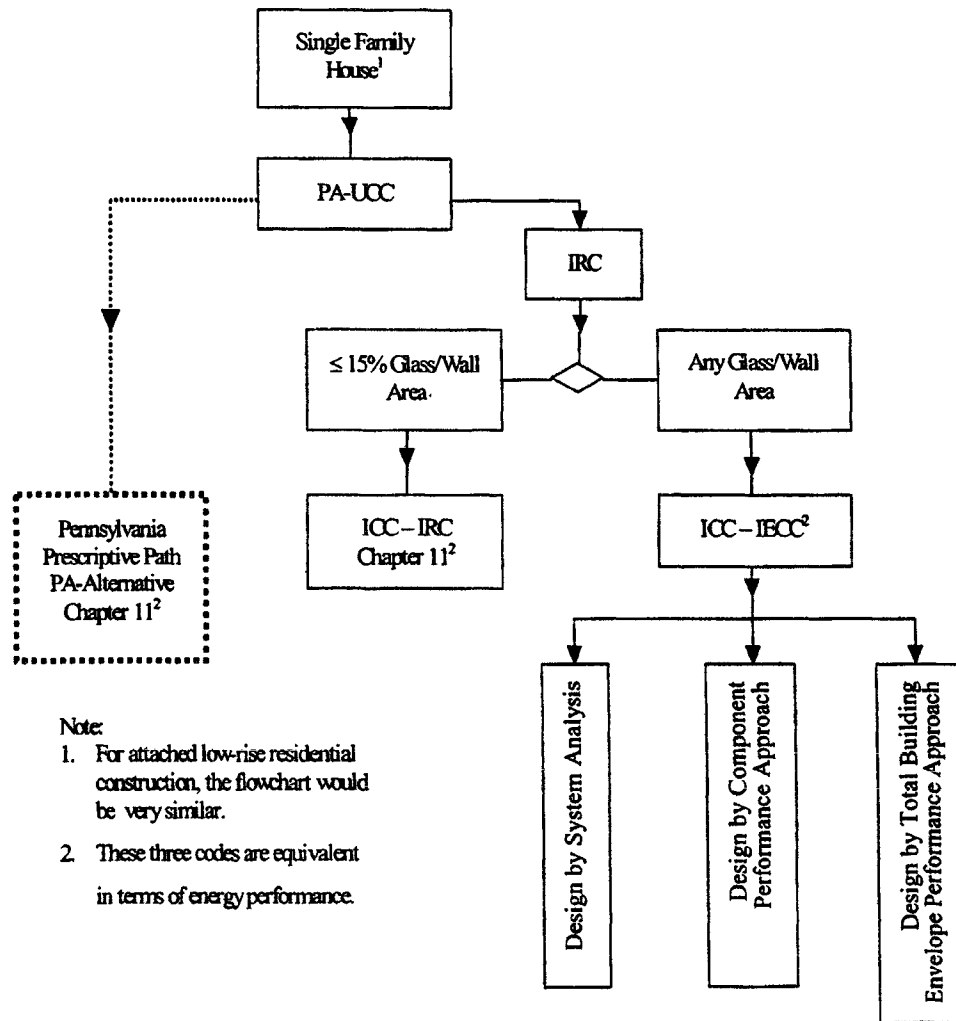


Figure 1: Flowchart Showing the Various Regulatory Paths

## DEVELOPMENT

This project had six distinct parts. The following is a summary of those parts that are of technical interest.

### Part 1 – Glazing Ratio (PHRC Report #68)

Figure 1 shows that the glazing ratio (15% for detached houses, 25% for townhouses) is the major, up-front determinant as to whether the IRC Chapter 11 can be used. If greater than 15% or 25% a much more detailed and complex approach must be used. There are two problems with this: first, the builder has to do this up-front calculation and, second, these “national numbers” may have little relevance for Pennsylvania. This latter concern provided the impetus for a separate project.

The primary objective of this project was to establish representative values for glazing ratios for the different types of housing currently being built in Pennsylvania. A secondary objective was to develop and document any other pertinent glazing-related properties that the data set might yield.

Because of the very short timeframe available for the development and promulgation of the new state-wide building code, there was no time to undertake any sort of physical survey. It was decided to examine a set of Act 222 field data survey forms that were available from The Pennsylvania College of Technology (Penn College), in Williamsport, Pennsylvania. Act 222 of 1980 is the Building Energy Conservation Act that established the energy standards for Pennsylvania. These standards will be superseded by the UCC. Under Act 222 new home owners can request that their home be inspected for compliance with Act 222’s energy provisions. These fairly extensive examinations are conducted by the technical staff at the Weatherization Training Center at Penn College which is associated with the PHRC. All the homes were less than three years old when surveyed.

The appropriate data was collected on January 27, 2000, and scrutinized for applicability. The database was found to be skewed towards the southeast of the state and also skewed towards larger homes. For instance 96% of the houses were located in southeastern Pennsylvania, with some 87.5% being in the greater Philadelphia area. Only 4% of the houses were located in the Pittsburgh area. The southeast is the warmest part of the state and houses in warmer and, thus, sunnier areas tend to have larger glazing areas, especially houses that are larger than the norm. As a result, this data set is likely to produce values for glazing ratios that are on the high side. Thus any average value derived from this data set will be representative of housing that has a greater proportion of fenestration than elsewhere in the state—certainly greater than state medians. Accordingly these values will be conservative for the purposes of developing or checking any strategy for space conditioning energy conservation. Therefore it was decided that, given the constraints on time and cost, the project would be limited to this data set.

The information provided in the completed Act 222 field data forms included, but was not limited to, the basement; first, second, and third floor exposed wall area; heated floor area - both above and below grade; total glazing areas on the north, south, east, and west facing walls; and total exterior door area. Computed information based on this data included the total exposed wall area, total heated floor area, total glazing area, percentages of glazing per elevation and wall area per floor, and ratios of total glazing area to both total exposed wall area and total heated floor area. The data set contained samples of two-story homes with and without heated basements as well as townhouses, both mid-units and end-units.

Table 1 summarizes the values of the ratios of total glazing area (TGA) to total heated floor area (THFA) and theratios of total glazing area to total exposed wall area (TEWA) for the various data sets.

**Table 1: Overall Glazing Area Ratios for Single-Family,  
Detached Homes without Heated Basements**

<b>Data Sets:</b>	<b>TGA TEWA</b>	<b>TGA THFA</b>
<b>All Single-Family, Detached Homes without Heated Basements:</b> <b>Size:</b>	<b>N=47</b>	
<b>Average:</b>	11.90%	12.30%
<b>Standard Deviation:</b>	2.70%	2.90%
<b>Mean + 1*Standard Deviation:</b>	14.60%	15.20%
<b>Single-Family, Detached Homes with Heated Basements:<sup>a</sup></b> <b>Size:</b>	<b>N=13</b>	
<b>Average:</b>	14.28%	10.91%
<b>Standard Deviation:</b>	3.22%	3.41%
<b>Mean + 1*Standard Deviation:</b>	17.50%	14.32%
<b>Townhouses (End-Units)</b>	<b>N=8</b>	
<b>Average:</b>	11.75%	12.11%
<b>Standard Deviation:</b>	1.69%	2.44%
<b>Mean + 1*Standard Deviation:</b>	13.44%	14.55%
<b>Townhouses (Mid-Units)</b>	<b>N=7</b>	
<b>Average:</b>	12.50%	7.62%
<b>Standard Deviation:</b>	5.07%	2.62%
<b>Mean + 1*Standard Deviation:</b>	17.57%	10.24%

TEWA= Total Exposed Wall Area; THFA= Total Heated Floor Area,  
TGA= Total Glazing Area: Includes area of frame edges, is not purely glazing area.

a. A walkout basement with glass doors and / or large windows will tend to increase the glazing to wall ratio.

For the purpose of planning for space conditioning energy conservation, the survey data was more than sufficient to permit the following conclusions to be drawn:

- For new, detached, single-family houses in Pennsylvania the average glazing ratio, irrespective of whether it is based on exposed wall area or heated floor, is significantly less than 15%, which is the target glazing ratio for Chapter 11 in the IRC 2000.
- An average value of about 12% would seem to be appropriate for a state-wide glazing ratio (relative to total exposed wall area) for new housing in Pennsylvania.
- For both mid- and end-unit townhouses, the glazing ratios, both wall and floor-based values, are less than 15% and thus much less than 25%, the target value used for Chapter 11 in the IRC 2000.

This data also produced some interesting findings:

- The determining factor in the decision as to where to place the windows in a house or townhouse is the orientation of the street. Solar advantage does not appear to be of much significance.

- In general, the largest proportion of the glazing is placed on the rear face of the house or town house unit. The front of the house or townhouse unit also has a large proportion of glazing while the sides have much less.
- The colder the climate, the lower the average glazing ratio.
- The smaller and/or less costly the house, the lower the average glazing ratio.

While the data set may have been adequate to meet the primary objective of this project, it is also evident that, statistically, it was not large enough, nor was it representative of new housing across the state. It is also clear that over and above energy conservation planning, some knowledge of actual glazing practices would be of considerable value. After all, the production and sale and remediation of windows is a large business in Pennsylvania. There would be merit in conducting a much more comprehensive and better targeted study of glazing practices.

## **Part 2 – Climatic Data (PHRC Report #69)**

The IRC 2000 and the IECC identify climatic zones on the basis of Heating Degree Days (HDD). Accordingly Pennsylvania is covered by six zones. The objective of this brief project was to review weather records and data on housing starts and, within the very tight constraints on time and funds, assess the IRC 2000 climatic criteria.

The issues involved are evident in Table 2 and the following findings are noteworthy:

1. The metropolitan areas of Philadelphia and Pittsburgh are critical in that they account for a significant proportion of all housing starts in Pennsylvania.
2. In the case of both Philadelphia and Pittsburgh, the listed HDD value is very close to a DOE climatic zone threshold value, e.g., 4954 (46 HDD from 5000) and 5957 (43 HDD from 6000) respectively; less than 1% in each case.
3. However, according to 1981 ASHRAE Handbook of Fundamentals data, the HDD values for both cities actually depend on which weather station is used. Further, if another station (e.g., the airport) were to be used, the HDD value would cross the HDD threshold between climatic zones. It is also worth noting that the measured HDD value for a city or urban location is usually lower than that at an airport location.
4. If recent data from the PA Climatologist (web data source) were to be used then, as shown, the HDD values of at least four cities (Reading, Lancaster, Erie and Bradford) would have to be revised and in each case a climatic zone threshold would be crossed.
5. For energy conservation planning purposes, it might also be better to use the sum of HDD and CDD values rather than HDD alone. As shown in Table 2, the climatic zones 10 and 11 would range from a total DD value of 6000 to 6499, zones 12 and 13 from 6500 to 6999 and zones 14 and 15 from 7000 to 8500.

For the purposes of simplicity, brevity and equity, there is every reason to support a reduction in the number of climatic zones in Pennsylvania from six to three “space conditioning energy consumption” zones. For the purposes of the revised, prescriptive, PA-oriented Chapter 11, it is recommended that Table 3 be used. Figure 2 clearly shows the virtues of this climate zone distribution.



Table 2: Climate Related Data for PA

City	Used by DOE **				Proportion of Housing Starts	3 PA Climatic Zones ( $\Delta$ HDD)	www.ems.psu.edu/PAClimatologist						
	HDD (65°F)	Design Temp (°F)	Housing Starts	IRC 2000 Climatic Zones			HDD (Base 65°F)	CDD (Base 3°F)	$\Sigma$ DD = HDD +CDD				
Philadelphia	4,954	14	8,916	10	23%	4,500 – 5,499 with Philadelphia at mid-range	4,954	1,101	6,055				
Phoenixville	5,198	13	0	11	33.5%		56.5%	5,796*	759	6,555* (5,957)			
Reading	5,198	13	1,303	11				5,256	860	6,116			
York	5,207	12	3,252	11				5,347	962	6,309			
Carlisle	5,323	4	1,349	11				5,584*	780	6,364* (6,119)			
Hanover	5,339	8	961	11				28%	41%	5,500 – 6,499 with Pittsburgh at mid-range	5,785	773	6,558
Harrisburg	5,339	11	1,735	11									
Lancaster	5,339	8	2,419	11									
West Chester	5,375	13	2,116	11									
Uniontown	5,393	9	91	11									
Chambersburg	5,600	8	1,397	12									
Coatesville	5,633	11	0	12									
Johnstown	5,772	2	314	12									
Allentown	5,815	9	3,143	12									
New Castle	5,892	7	1,122	12	13%	2.5%	6,500 – 8,000						
Pittsburgh	5,957	5	4,937	12									
Williamsport	6,053	7	316	13									
Indiana	6,164	-1	490	13									
Scranton	6,332	5	1,951	13									
Wilkes-Barre	6,332	5	2,352	13									
Warren	6,634	4	175	14									
Erie	6,768	9	818	14									
Meadville	6,883	4	0	14									
Bradford	7,956	-7	0	15				0%	2.5%	8,067*	136	8,203	
			39,157										

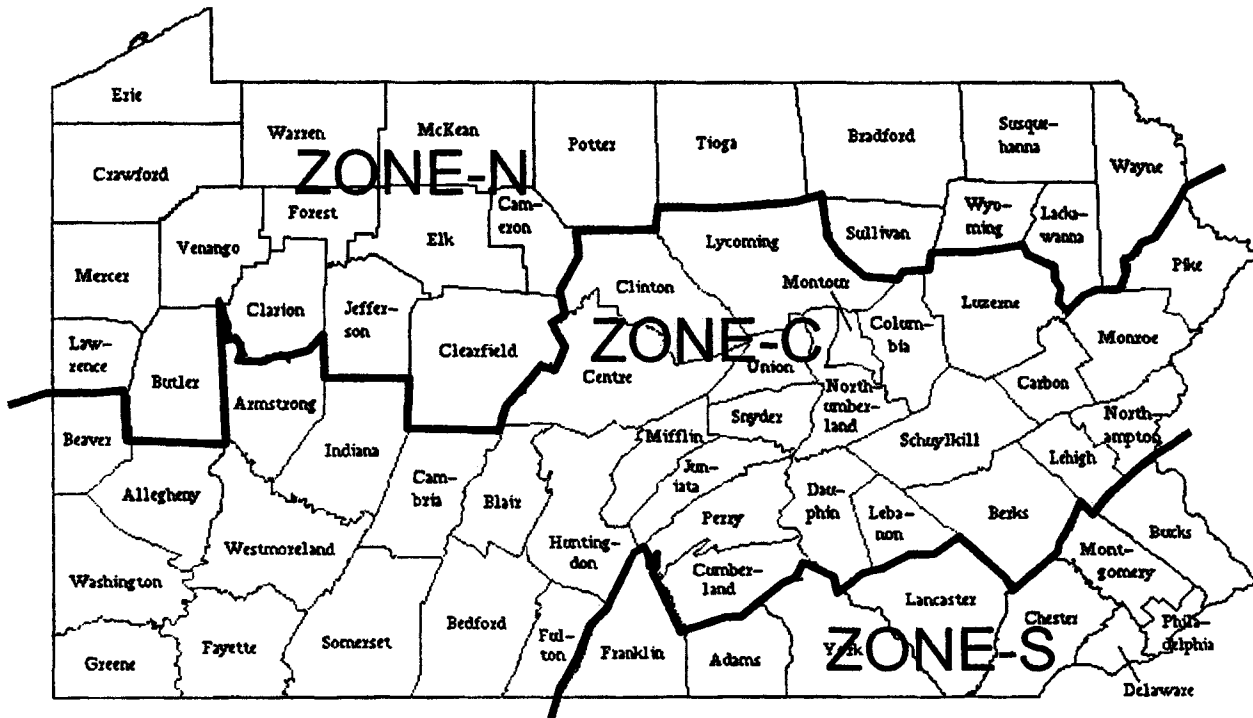
\*\* see Report #69

\*Different climatic range from IRC 2000 HDD value.

Table 3: Table PA 1101.1 Pennsylvania Climatic Zones for Space Conditioning Energy Consumption

Region	HDD Range (65°F)	IRC 2000 Climate Zones	ΣDD Range (65°F)
S – South and South East	4,500 – 5,499	10 and 11	6,000 – 6,499
C – Central and South West	5,500 – 6,499	12 and 13	6,500 – 6,999
N – North and North West	≥ 6,500	14 and 15	≥ 7,000

Figure 2: Climate Map for Pennsylvania



### **Part 3 – Code Development**

This project comprised the drafting of the **PHRC PA-Alternative Chapter 11: Code for the Conservation of Space Conditioning Energy for Housing in Pennsylvania**. This alternative chapter has not yet been formally approved and is not discussed here.

### **Part 4 – Code Comparison**

This project involved the development of a clause-by-clause comparison of the International Residential Code, Chapter 11, Energy Conservation and the PA-Alternative Chapter. This comparison is accompanied by relevant commentary and is a companion document to the PA Alternative Chapter 11.

### **Part 5 – Evaluation and documentation of equivalence**

#### **A. Thermal Envelope ( PHRC Report #70)**

This report documents a study to compare the energy consumed for space conditioning by representative houses designed to meet five different energy codes, namely:

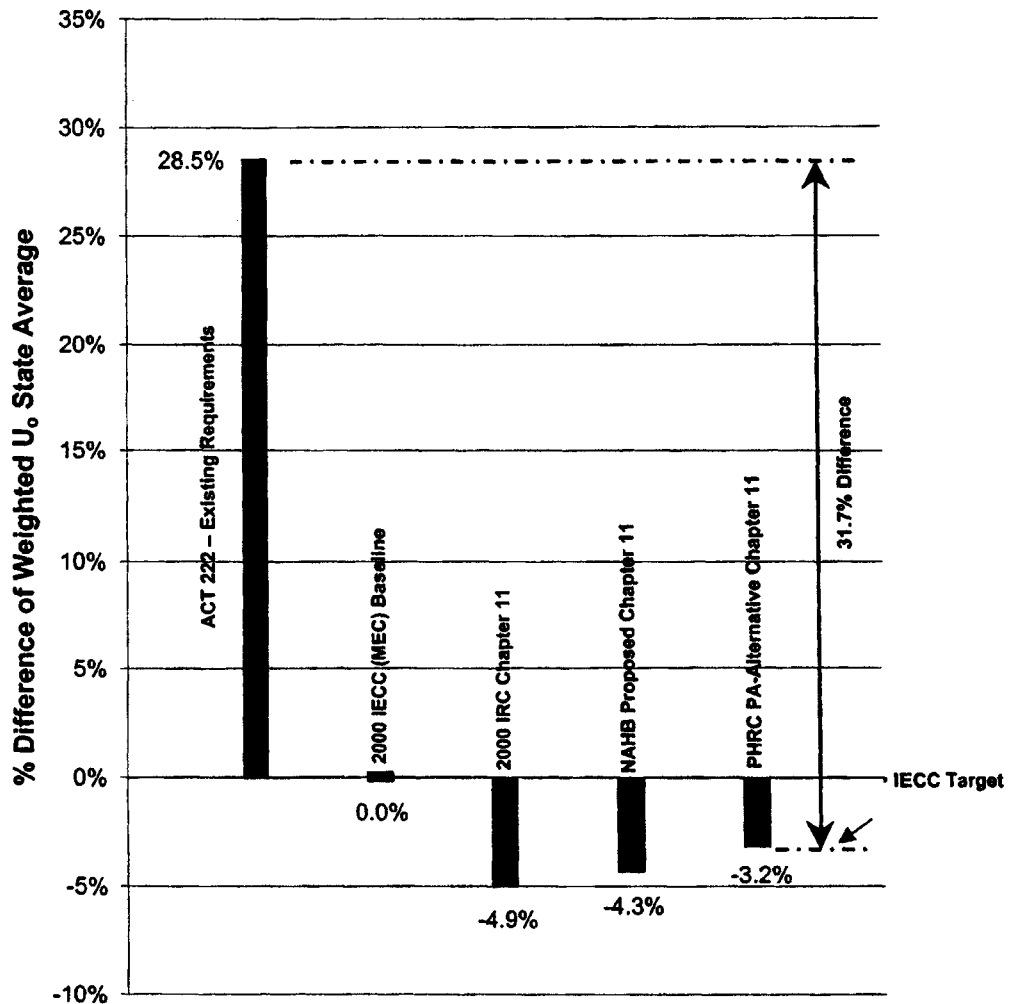
- **Act 222:** The Building Energy Conservation Act (Act 222 of 1980), and corresponding regulations that created the existing energy efficiency requirements for buildings in Pennsylvania.
- **2000 IECC, Chapter 5:** Chapter 5, Residential Building Design by Component Performance Approach, Section 502.2.1. On an individual component basis, the 2000 IECC provides performance requirements for building components (walls, floors, ceiling, etc). These requirements are for the entire component. For example, walls include walls, windows and doors that are weighted by area to determine the combined thermal transmittance value. This section of the code for northern climates has remained basically unchanged since the 1992 Model Energy Code.
- **IRC 2000, Chapter 11:** Chapter 11, Energy Conservation, of the IRC 2000. This code is based on 15% window-to-wall area for detached houses and is essentially the same as *Chapter 6, Simplified Prescriptive Requirements for Residential Buildings, Type A-1 and A-2*, of the 2000 IECC.
- **NAHB Proposed Chapter 11:** The proposed code developed by the National Association of Home Builders (NAHB) as a replacement for the existing Chapter 11 of the IRC 2000.
- **PHRC PA-Alternative Chapter 11:** The PA-Alternative Chapter 11 developed by the PHRC.

The primary purpose of this study was to demonstrate equivalence between the PHRC PA-Alternative and Chapter 5 of the 2000 IECC and thus Chapter 11 of the IRC 2000.

A comprehensive standard thermal envelope comparison was performed using the overall heat loss ( $U_o$ ) calculations and methodology as presented in *Comparison of Current State Residential Energy Codes with the 1992 Model Energy Codes (MEC) for One and Two Family Dwellings: 1994*, developed for DOE by Pacific Northwest Laboratories. This methodology had been used to determine whether the energy codes used in various states met or exceeded the MEC, as required under the Energy Conservation Act (42 USC 6831 et seq.) as amended by Section 101 of the Energy Policy Act of 1992 (EPAct, Public Law 102-486).

The methodology evaluates the overall heat loss coefficient ( $U_o$ -value) for two prescribed model houses. For Pennsylvania the  $U_o$  values were then weighted by housing starts in 24 cities and towns across the Commonwealth, and for three foundation types. In the PHRC evaluation, the PHRC PA-Alternative, the NAHB proposal, and the IRC 2000 Chapter 11 requirements were compared with the 2000 IECC.

In order to physically demonstrate the relative difference in overall thermal envelope performance as a result of applying the various codes, the  $U_o$  values are presented in Figure 3. Since one purpose of this evaluation was to determine whether the three proposed codes were equivalent to the 2000 IECC, (*Chapter 5, Residential Building Design by Component Performance Approach, Section 502.2.1, Compliance by performance on an individual component basis*), the value for  $U_o$  obtained for the 2000 IECC (92 MEC) was used as the baseline, or zero, to establish the percentage difference in each case.



**Figure 3: Thermal Envelope Comparison —  
Window-to-Wall Area Ratio of 14.2% in all cases**

For all practical purposes, the thermal envelope provisions contained within each of the three versions of Chapter 11, namely, the IRC 2000, the NAHB, and the PHRC PA-Alternative, are essentially equivalent and all exceed the IECC provisions for a glazing ratio of 14.2.

Relative to current practice in Pennsylvania, the adoption of the IRC 2000 and thus the 2000 IECC will have a major impact (an energy savings of about 30%) not only on energy conservation and construction practices, but also on builders, regulators, home buyers and owners.

Considering that the average statewide window-to-wall area ratio for new housing in Pennsylvania is significantly lower than 15% (and thus 14.2%), the energy performance of the thermal envelope of new housing could be expected to be even lower than that shown in Figure 3. To assess the significance of the window-to-wall area ratio with regard to space conditioning energy performance, refer to Figure 4.

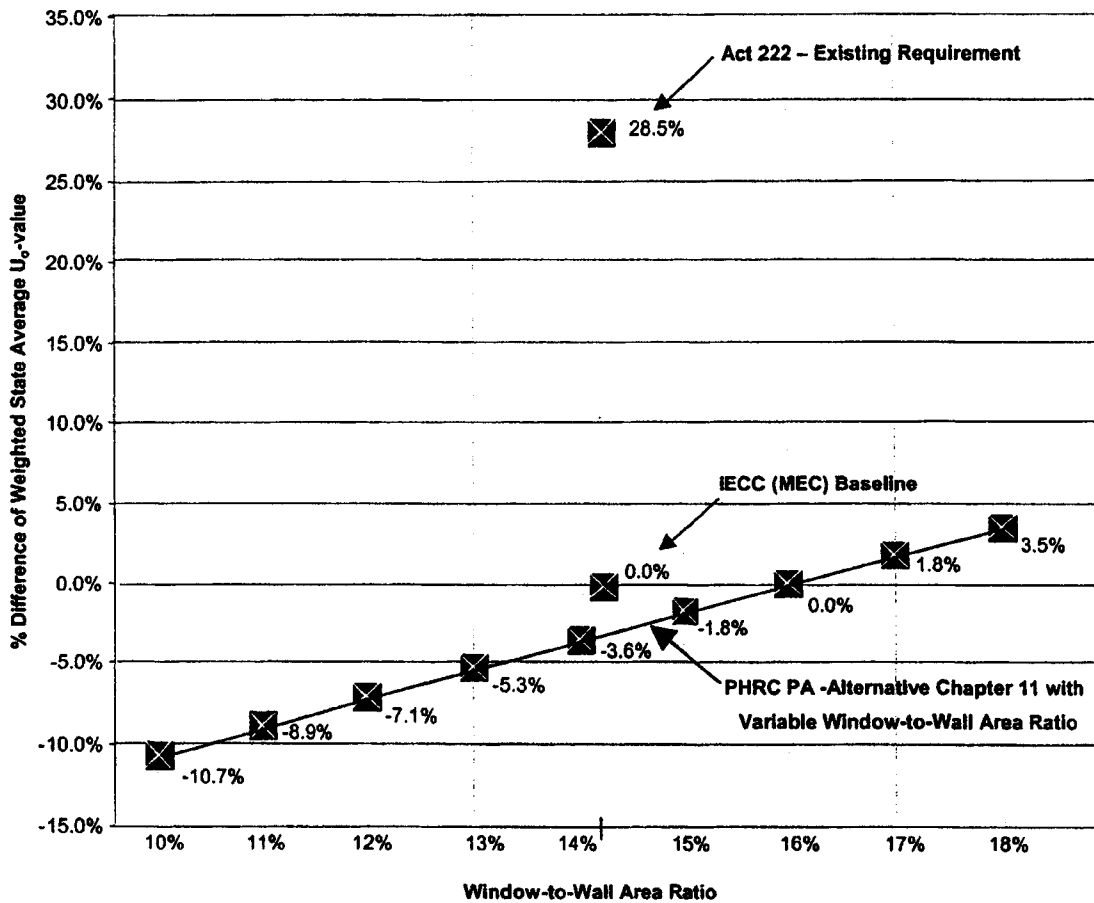


Figure 4: Thermal Envelope Comparison for PA Compressed Climate Zones

For a window-to-wall-area ratio of 14.2%, the PHRC PA-Alternative is 3.2% (see Figure 3.) better than (i.e., less than) the 2000 IECC. For a window-to-wall area ratio of 15% (the IRC 2000 threshold), the difference is 1.8%. In Pennsylvania the average window areas are more likely to be in the 12% range. For a window-to-wall area ratio of 12%, under the PA-Alternative, the difference is -7.1%. These differences indicate that the PA-Alternative would in fact (because the average glazing for the state is probably about 12%) not only be “energy equivalent” to both the IRC 2000 and the 2000 IECC but would, by a not insignificant amount, surpass them. For PA, the extent of space conditioned energy saving is even greater than the 2000 IECC and IRC 2000 requirements would suggest – some 35% relative to the current Act 222 requirements. Clearly, equivalence, at least for the thermal envelope, has been demonstrated.

#### B. Trade-Offs (PHRC Report #71)

A number of trade-off opportunities were introduced in the PA Alternative Chapter 11, largely to encourage innovation and to reward enterprising builders / developers who attempt to provide a tighter enclosure and / or introduce high efficiency appliances and equipment. With each trade-off we had to ensure space conditioning energy equivalence. The introduction of trade-offs is a significant improvement

over the IRC 2000. The objective of this report was to demonstrate space conditioning energy equivalence for each set of trade-offs.

The two sets of trade-offs to be evaluated were the following:

- (i) **Low infiltration** houses, with less than 0.35 air changes per hour, are permitted one of the following two options:
  - a. Reduced window and wall thermal resistance requirements
  - b. Reduced slab-on-grade foundation insulation requirements
- (ii) The installation of **High Efficiency HVAC equipment** permits one of the following three options:
  - a. Reduced window and wall thermal resistance requirements
  - b. Reduced foundation insulation requirements
  - c. Elimination of basement insulation if basement walls have, on average, fewer than 12 inches exposed wall height above finished grade. This evaluation will apply to the basement regardless of whether the space is conditioned space or unconditioned.

The evaluation of each set of trade-offs for equivalency to the 2000 IECC was accomplished using the DOE-2 (PowerDOE®) building performance modeling software which permits system or whole house assessment. A detailed comparison of the effect of the various trade-offs in the PHRC PA-Alternative was made. The effect of these regulatory trade-offs was assessed for five locations in Pennsylvania including Erie, Philadelphia, and Pittsburgh. In all cases the trade-offs proposed in Section PA1103.8 of the PA-Alternative, result in a reduction in annual energy use relative to the base case constructed to meet IRC 2000 prescriptive standards. These savings range between 0.5 and 23.1 percent. On this basis, therefore, the trade-offs investigated are justified and acceptable.

#### **Part 6 – Steel Stud Framing (PHRC Report #72)**

Given the climatic and other conditions that currently prevail in Pennsylvania, it was considered that the design provisions of the IRC 2000 would yield steel-framed wall assemblies with a relatively high probability of a moisture problem. The problem would largely be due to air exfiltration and the accumulation of condensate within the stud space.

#### **CONCLUSIONS**

The PHRC was offered the rare opportunity to critique and improve one very important chapter in a new national building code, the IRC 2000. In spite of being constrained by time and money and the singular responsibility of impartially and jointly serving the energy consumer, and the Commonwealth of Pennsylvania as well as the home building industry, most of the objectives listed in the introduction have been met. The energy provisions contained in the PA – Alternative Chapter 11 are simpler, more rational, and more flexible and thus better for Pennsylvania. Moreover space conditioning energy equivalence with Federal (DOE) strategic policy has been maintained.

Original: 2283

**IRRC**

---

**From:** Wilmarth, Fiona E.  
**Sent:** Tuesday, June 10, 2003 7:51 AM  
**To:** IRRC  
**Cc:** Harris, Mary Lou; Jewett, John H.; Markham, Christopher L.; Nyce, Robert E.; Wyatte, Mary S.; Gelnett, Wanda B.  
**Subject:** FW: Pennsylvania Builders Association: Administrative and Enforcement Final-Form Regulations Comments

FYI - These comments were sent to me yesterday afternoon. They should be recorded as comments on #2283. I will contact Melanie to let her know that any future official comments should be sent to the IRRC mailbox.

-----Original Message-----

**From:** Melanie Cook [mailto:mcook@pahomes.org]  
**Sent:** Monday, June 09, 2003 2:37 PM  
**To:** Wilmarth, Fiona E.  
**Cc:** zghomes@comcast.net  
**Subject:** Pennsylvania Builders Association: Administrative and Enforcement Final-Form Regulations Comments

**PENNSYLVANIA BUILDERS ASSOCIATION COMMENTS: ADMINISTRATION AND ENFORCEMENT REGULATIONS OF THE UNIFORM CONSTRUCTION CODE**

The Pennsylvania Builders Association supports the adoption of the administration and enforcement regulations of the Uniform Construction Code, Act 45 of 1999 (Act). As the principal interest group advocating for more than 12 years for the passage of this important consumer protection legislation, we are pleased that these regulations have finally been presented for adoption and we strongly urge no further delay. I am sure we do not need to remind you that when Act 45 was signed into law on November 10, 1999 it gave the Department 180 days to promulgate these regulations.

We understand that some organizations and individuals have expressed objections to various provisions. It is our understanding that the majority of these objections raise policy issues with the Act that the regulations cannot address. We are specifically referring to the following objections:

The Pennsylvania Manufactured Housing Association believes they have a total exclusion, including site work and foundations, from this Act. There was never any intent during the legislative process or within the language of the Act to give this exclusion.

Some individuals have raised objections regarding minor repair work. The Act gives the Department no flexibility to make changes to what construction activities are covered by the International Residential Code (IRC). Minor repairs are identified by the IRC and that code must be followed.

The Hospital and Health System of Pennsylvania objects to the manner in which health care facilities are inspected. The Act is specific in this regard.

During the June 5th 2003 public hearing one individual objected to the Pennsylvania Alternative Residential Energy Provision of the regulation. Despite this objection the Act is specific in requiring the Department to adopt an alternative residential energy standard that is prescriptive and cost effective.

It must be said, that the Pennsylvania Builders Association has some criticism of the final-

form regulations and would propose that they be modified. These minor revisions include the following:

1. The terms "Building Code Official" and "Construction Code Official" are used interchangeably throughout the proposed regulatory package. PBA would request that both terms be defined if they have different meanings, and if there is no distinction that only one of the terms be used throughout and the other deleted.
2. PBA would request that the last sentence of Section 403.63 (a) on page 29 be deleted.
3. PBA would request that Section 403.66 (Public utility connections) be changed to read as follows: "A building code official [may] shall authorize the temporary connection of a building or system under construction to a utility source of energy, fuel or power provided it has passed any necessary electrical and/or gas inspections. Connection to a public electric or gas utility for the completed construction may not occur unless the permit holder provides written proof to the utility company that the building or structure passed any required electric and/or gas inspections under this chapter."
4. For the sake of consistency Section 403.81 (b) on page 33 should delete the terms "Owner" and "Agent" and replace them with the term "Permit Holder". This revision has already occurred in Sections 403.82 (1) and (2). PBA would also recommend that a signature line be added to the permit application that would specifically identify the "Permit Holder". This will allow for clarity when the "Permit Holder" and the applicant are not the same entity.
5. Section 403.102 is missing a paragraph (j). Additionally, PBA would request that language be added that requires a municipality seeking to adopt an ordinance containing standards that equal or exceed the Uniform Construction Code to provide clear and convincing evidence why the proposed change(s) are necessary. This provision could be added as Section 403.102(i) (4).

On behalf of 2003 PBA President Roger Zimmer and the 12,000 members of our association we would like to thank you for your review and consideration of the concerns that have been raised herein. Please feel free to contact me at the telephone number or e-mail address listed below with any questions that you may have.

Melanie Cook  
Asst. Director Governmental Affairs/Regulatory Specialist  
Phone: (717) 730 - 4380 x. 3013  
Fax: (717) 730 - 4396  
e-mail: mcook@pahomes.org





**PENNSYLVANIA MUNICIPAL AUTHORITIES ASSOCIATION**  
 1000 North Front Street, Suite 401, Wormleysburg, Pennsylvania 17043  
 (717) 737-7655 • Fax (717) 737-8431  
 info@municipalauthorities.org • www.municipalauthorities.org

Original: 2283

June 9, 2003

Mr. John R. McGinley, Jr., Esq.  
 Chairman, Independent Regulatory Review Committee  
 333 Market Street  
 Harrisburg, PA

RECEIVED  
 2003 JUN -9 PM 3:45  
 INDEPENDENT REGULATORY  
 REVIEW COMMISSION

Dear Chairman McGinley:

I am writing on behalf of the Pennsylvania Municipal Authorities Association (PMAA). We represent 650 authorities across the state serving over 6 million citizens. Most of our members are sewer and water authorities managing the environmental infrastructure that is necessary for sewage collection and treatment and water filtration and distribution. We are concerned with the proposed regulations being promulgated to the Uniform Construction Code (UCC).

We understand that the International Plumbing Code (IPC) is incorporated by reference under the UCC. In discussion with representatives from the Department of Labor and Industry, it appears that provisions in the IPC govern the installation and repair of water and sewer lines or laterals. We have also been informed that these lines must now be constructed, installed and repaired to the IPC standard and inspected by a certified UCC inspector.

Most authorities currently require installation of water or sewer lines to standards and specifications adopted by the authority. In some instances, the authority installs the line from the street main to the house foundation. In most cases, they install the connecting line in the street from the main to the lateral installed at the edge of the owner's property (usually in the area of the curb or sidewalk). **Under the proposed regulations, a separate inspector (UCC certified) is required to verify the work done on private property (the house lateral) but work done in the public right-of-way (the connector between the lateral and the street main) appears to be exempt (see below).**

Section 403.62 Permit Requirements and Exemptions, subsection 5(ii)(d) states that a permit is not required for the installation, alteration or repair of generation, transmission, distribution, metering or other related equipment that is under the ownership and control of a *public service utility* by established right. **If we assume that water and sewer authorities are public service utilities (a term not defined in the regulations), it appears they are exempt from the proposed regulations (IPC standards and UCC inspections) because this section of line is owned by the authority who is also responsible for the repair and maintenance of it. We feel this exemption is absolutely necessary yet should be clarified through defining public service utility and ensure it includes public water and sewer providers.**

*Authorities: "Service Beyond Compliance"*

Certification of the inspector under the proposed regulation requires a significant degree of knowledge and expertise about internal plumbing. For those authorities and municipalities that have adopted standards and specifications and also may install lines to the house foundation (house laterals), requiring knowledge and certification of internal plumbing systems is an onerous requirement for inspectors that inspect portions of sewer and water systems outside of the house structure. Their vast knowledge and expertise is pipe connections, pressure and gravity flow systems, depth of trenches, underlay and cover material, alignment, backflow devices, pressure testing, meter installation, etc. **Current inspectors for this "large pipe" part of the system will have to be re-certified to standards that include indoor plumbing specifications, a requirement that is not applicable to the work being performed.**

Given the possibility that installers and inspectors from an authority may no longer conduct this type of inspection, **we foresee complications and delays in the timing and coordination of hook-ups, inspections and occupancy of dwellings.** Currently, most municipalities rely on the construction expertise and inspection of the authority to conduct this work. It is not a responsibility that most municipalities are involved in, although under the UCC and IPC it appears they now will be responsible for this. A related issue to this is the cost of permits and/or inspection of this work by a certified inspector. Will this cost be part of the building permit fee or a separate fee paid by the authority to the municipality for this inspection?

**At this time, given the uncertainty of sections of the proposed regulations we would recommend that the regulations be postponed until further clarification of these areas is included.**

**We would also recommend that authorities that have adopted specifications and standards that are equal to or exceed any similar standards in the IPC for house laterals, be exempt from the permitting and certified inspector validation. This would alleviate any permitting, inspection and coordination issues and retain the system of installation that occurs between most authorities and municipalities today.**

Thank you for the opportunity to comment on these proposed regulations. Please contact us if you have any questions or require any additional information.

Sincerely,



John W. Brosious  
Deputy Director

cc: House Labor Relations Committee  
House Local Government Committee  
Senate Labor & Industry Committee



600 N. Twelfth Street • Lemoyne, Pennsylvania 17043  
717-730-4380 • 800-692-7339 • 717-730-4396 (Fax) • Internet—www.pahomes.org

**President**  
Roger B. Zimmer  
HBA of Metro Harrisburg

**Vice President**  
Scott H. Cannon  
HBA of Chester/Delaware Cos.

**Associate Vice President**  
Paul R. Graham  
Lebanon County BA

**Treasurer**  
Richard A. Clawson  
Indiana-Armstrong BA

**Secretary**  
James L. Conner  
Lawrence County BA

RECEIVED  
2003 JUN 10 AM 11:54  
INDEPENDENT REGULATORY  
REVIEW COMMISSION  
June 9, 2003

Independent Regulatory Review Commission  
333 Market Street, 14<sup>th</sup> Floor  
Harrisburg, PA 17101

**PENNSYLVANIA BUILDERS ASSOCIATION COMMENTS: ADMINISTRATION AND ENFORCEMENT REGULATIONS OF THE UNIFORM CONSTRUCTION CODE**

The Pennsylvania Builders Association supports the adoption of the administration and enforcement regulations of the Uniform Construction Code, Act 45 of 1999 (Act). As the principal interest group advocating for more than 12 years for the passage of this important consumer protection legislation, we are pleased that these regulations have finally been presented for adoption, and we strongly urge no further delay. I am sure we do not need to remind you that when Act 45 was signed into law on November 10, 1999 it gave the Department of Labor & Industry 180 days to promulgate these regulations.

We understand that some organizations and individuals have expressed objections to various provisions. It is our understanding that the majority of these objections raise policy issues with the Act that the regulations cannot address. We are specifically referring to the following objections:

The Pennsylvania Manufactured Housing Association believes they have a total exclusion, including site work and foundations, from this Act. There was never any intent during the legislative process or within the language of the Act to give this exclusion.

Some individuals have raised objections regarding minor repair work. The Act gives the Department no flexibility to make changes to what construction activities are covered by the International Residential Code (IRC). Minor repairs are identified by the IRC and that code must be followed.

The Hospital and Health System of Pennsylvania objects to the manner in which health care facilities are inspected. The Act is specific in this regard.



*Building Today For A Better Tomorrow*



During the June 5th 2003 public hearing one individual objected to the Pennsylvania Alternative Residential Energy Provision of the regulation. Despite this objection the Act is specific in requiring the Department to adopt an alternative residential energy standard that is prescriptive and cost effective.

It must be said, that the Pennsylvania Builders Association has some criticism of the final-form regulations and would propose that they be modified as follows: These minor revisions include the following:

1. The terms "Building Code Official" and "Construction Code Official" are used interchangeably throughout the proposed regulatory package. PBA would request that both terms be defined if they have different meanings, and if there is no distinction that only one of the terms be used throughout and the other deleted.
2. PBA would request that the last sentence of Section 403.63 (a) on page 29 be deleted.
3. PBA would request that Section 403.66 (Public utility connections) be changed to read as follows: "A building code official [may] shall authorize the temporary connection of a building or system under construction to a utility source of energy, fuel or power provided it has passed any necessary electrical and/or gas inspections. Connection to a public electric or gas utility for the completed construction may not occur unless the permit holder provides written proof to the utility company that the building or structure passed any required electric and/or gas inspections under this chapter."
4. For the sake of consistency Section 403.81 (b) on page 33 should delete the terms "Owner" and "Agent" and replace them with the term "Permit Holder". This revision has already occurred in Sections 403.82 (1) and (2). PBA would also recommend that a signature line be added to the permit application that would specifically identify the "Permit Holder". This will allow for clarity when the "Permit Holder" and the applicant are not the same entity.
5. Section 403.102 is missing a paragraph (j). Additionally, PBA would request that language be added that requires a municipality seeking to adopt an ordinance containing standards that equal or exceed the Uniform Construction Code to provide clear and convincing evidence why the proposed change(s) are necessary. This provision could be added as Section 403.102(i) (4).

On behalf of the 12,000 members of our association we would like to thank you for your review and consideration of the concerns that have been raised herein. Please feel free to contact me at the telephone number or e-mail address listed above with any questions that you may have.

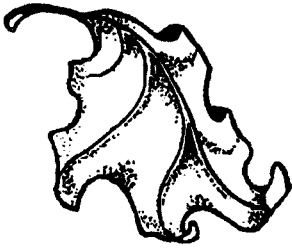
Sincerely,



Roger Zimmer  
2003 President  
Pennsylvania Builders Association

Cc: Fiona Wilmarth, IRRC

Original: 2283



# Clarion

Administrative and Police Offices

Office (814) 226-7707  
FAX (814) 226-9040

1400 East Main Street  
Clarion, Pennsylvania 16214

Police  
(814) 226-9140

June 9, 2003

Independent Regulatory Review Commission  
Mr. John R. McGinley, Jr., Esq., Chairman  
333 Market St., 14<sup>th</sup> Floor  
Harrisburg, PA 17101

RECEIVED  
2003 JUN 12 AM 9:42  
INDEPENDENT REGULATORY  
REVIEW COMMISSION

RE: Docket #2283  
Labor and Industry Submission #12-60, Uniform Construction Code

Dear Mr. McGinley:

I am the Code Enforcement Officer for Clarion Borough, Clarion, Pennsylvania. Clarion Borough is the home of Clarion University of Pennsylvania, a state-owned institution. The University has a student population of 6,500 and some 300 faculty and staff. I am writing in regard to Pa. Act 45, the Uniformed Construction Code, which is now before your Committee for review. Specifically, I wish to address the provisions of Chapter 1, Section 105 (b) (1) and (3) which, purportedly, removes responsibility for plan review and inspection of state-owned buildings from the local municipality and places this responsibility solely on the Department of Labor and Industry. Because the University is located within the Borough, I am particularly concerned with the health and safety of the students and faculty of this institution. In the past, my office has worked in conjunction with the Department as to plan review and construction inspections with emphasis not only on the building construction but with particular focus on the provisions of the BOCA National Fire Prevention Code regarding sprinkler systems and egress requirements. To eliminate the Borough from direct participation in the plan review and inspection process would be a tremendous oversight on the part of the governing body.

I strongly urge the Commission to closely review this particular section of the Act and recommend to the Department amending this section to include the local municipalities, particularly those that host state-owned universities, in the plan review

June 9, 2003

and inspection process with jurisdiction in conjunction with the Department of Labor and Industry. This dual oversight will undoubtedly insure safer and sustainable building construction.

Sincerely,



Robert J. Ragon  
Zoning Officer

RJR/lml

Copy: State Representative Fred McIlhattan  
State Senator Mary Jo White

Original: 2283

**IRRC**

**From:** John Brosious [brosious@municipalauthorities.org]  
**Sent:** Monday, June 09, 2003 12:27 PM  
**To:** IRRC  
**Subject:** Uniform Construction Code Proposed Regulations

Attached please find a letter from PMAA to Chairman McGinley of IRRC. Hard copy to follow. Please call if any questions. Thank you.

John W. Brosious  
The Pennsylvania Municipal Authorities Association  
1000 N. Front Street, Suite 401  
Wormleysburg, PA 17043  
717-737-7655 717-737-8431 (Fax)  
[brosious@municipalauthorities.org](mailto:brosious@municipalauthorities.org)  
[www.municipalauthorities.org](http://www.municipalauthorities.org)

RECEIVED  
2003 JUN -9 PM 12:37  
INDEPENDENT REGULATORY  
REVIEW COMMISSION

6/9/2003

June 9, 2003

Mr. John R. McGinley, Jr., Esq.  
Chairman, Independent Regulatory Review Committee  
333 Market Street  
Harrisburg, PA

Dear Chairman McGinley:

I am writing on behalf of the Pennsylvania Municipal Authorities Association (PMAA). We represent 650 authorities across the state serving over 6 million citizens. Most of our members are sewer and water authorities managing the environmental infrastructure that is necessary for sewage collection and treatment and water filtration and distribution. We are concerned with the proposed regulations being promulgated to the Uniform Construction Code (UCC).

We understand that the International Plumbing Code (IPC) is incorporated by reference under the UCC. In discussion with representatives from the Department of Labor and Industry, it appears that provisions in the IPC govern the installation and repair of water and sewer lines or laterals. We have also been informed that these lines must now be constructed, installed and repaired to the IPC standard and inspected by a certified UCC inspector.

Most authorities currently require installation of water or sewer lines to standards and specifications adopted by the authority. In some instances, the authority installs the line from the street main to the house foundation. In most cases, they install the connecting line in the street from the main to the lateral installed at the edge of the owner's property (usually in the area of the curb or sidewalk). **Under the proposed regulations, a separate inspector (UCC certified) is required to verify the work done on private property (the house lateral) but work done in the public right-of-way (the connector between the lateral and the street main) appears to be exempt (*see below*).**

Section 403.62 Permit Requirements and Exemptions, subsection 5(ii)(d) states that a permit is not required for the installation, alteration or repair of generation, transmission, distribution, metering or other related equipment that is under the ownership and control of a *public service utility* by established right. **If we assume that water and sewer authorities are public service utilities (a term not defined in the regulations), it appears they are exempt from the proposed regulations (IPC standards and UCC inspections) because this section of line is owned by the authority who is also responsible for the repair and maintenance of it. We feel this exemption is absolutely necessary yet should be clarified through defining public service utility and ensure it includes public water and sewer providers.**



Certification of the inspector under the proposed regulation requires a significant degree of knowledge and expertise about internal plumbing. For those authorities and municipalities that have adopted standards and specifications and also may install lines *to the house foundation (house laterals)*, requiring knowledge and certification of internal plumbing systems is an **onerous requirement for inspectors that inspect portions of sewer and water systems outside of the house structure**. Their vast knowledge and expertise is pipe connections, pressure and gravity flow systems, depth of trenches, underlay and cover material, alignment, backflow devices, pressure testing, meter installation, etc. **Current inspectors for this “large pipe” part of the system will have to be re-certified to standards that include indoor plumbing specifications, a requirement that is not applicable to the work being performed.**

Given the possibility that installers and inspectors from an authority may no longer conduct this type of inspection, **we foresee complications and delays in the timing and coordination of hook-ups, inspections and occupancy of dwellings**. Currently, most municipalities rely on the construction expertise and inspection of the authority to conduct this work. It is not a responsibility that most municipalities are involved in, although under the UCC and IPC it appears they now will be responsible for this. A related issue to this is the cost of permits and/or inspection of this work by a certified inspector. Will this cost be part of the building permit fee or a separate fee paid by the authority to the municipality for this inspection?

At this time, given the uncertainty of sections of the proposed regulations **we would recommend that the regulations be postponed until further clarification of these areas is included.**

**We would also recommend that authorities that have adopted specifications and standards that are equal to or exceed any similar standards in the IPC for house laterals, be exempt from the permitting and certified inspector validation. This would alleviate any permitting, inspection and coordination issues and retain the system of installation that occurs between most authorities and municipalities today.**

Thank you for the opportunity to comment on these proposed regulations. Please contact us if you have any questions or require any additional information.

Sincerely,

John W. Brosious  
Deputy Director

cc: House Labor Relations Committee  
House Local Government Committee  
Senate Labor Relations Committee

Hand Delivered  
to RBG 10:45 a.m.  
by ELUM HCS



Original: 2283

PENNSYLVANIA STATE ASSOCIATION OF TOWNSHIP SUPERVISORS

June 5, 2003

Mr. Robert Nyce, Executive Director  
Independent Regulatory Review Commission  
33 Market Street, 14<sup>th</sup> Floor  
Harrisburg, PA 17101

Dear Mr. Nyce:

On behalf of Pennsylvania's 1,457 townships, we are pleased to offer comments on final form Regulation No. #12-60 (#2283), the administrative and enforcement regulations for Act 45 of 1999, the Uniform Construction Code *UCC*.

Thank you for the opportunity to comment on these regulations. PSATS has worked consistently to facilitate the implementation of Act 45 of 1999, including the development of the enabling regulations. We have dedicated a great deal of time and significant resources to help familiarize our members with their responsibilities and opportunities under Act 45. We remain committed to ensuring an efficient and responsive implementation of the act.

We applaud the Department of Labor and Industry for its efforts to develop the corresponding regulations needed for the final implementation of the act. Certainly, it had to be a monumental undertaking, especially given the many and diverse stakeholders who have had an interest in or been part of the development of the new statewide building code.

The eventual success of Act 45 is, will in many ways, be directly attributable to ease of application as provided for by the enabling regulations. It is important, therefore, that these regulations -- as with any -- provide a clear and consistent direction for those, which will be expected to administer the program.

In offering these comments, we wish to preface that in their present form, the regulations accomplish much of the legislative intent of Act 45. There are, however, several areas, which we believe, require additional consideration by the department before they are promulgated in final form.

Specifically . . .

In Section 503(a) of Act 45, municipalities are empowered to adopt ordinances that equal or exceed the minimum requirements of Chapter 1 of the International Building Code (IBC) 2003. In the proposed regulations, most of Chapter 1 of the IBC has been incorporated. The changes appear to place the regulations in contradiction with the act whereby municipalities may

4855 Woodland Drive ■ Enola, PA 17025-1291 ■ Internet: [www.psats.org](http://www.psats.org)

PSATS ■ Pennsylvania Township News ■ Telephone: (717) 763-0930 ■ Fax: (717) 763-9732

Trustees Insurance Fund ■ Unemployment Compensation Group Trust ■ Telephone: (800) 382-1268 ■ Fax: (717) 730-0209

Mr. Robert Nyce, Executive Director  
June 5, 2003  
Page 2

not be able to exceed the minimum requirements of the act, except in areas specified in Section 403.102(m) of the regulations. The solution, we believe, might simply be achieved by amending current language with the following, "a municipality may enact an ordinance relating to the administration and enforcement of the uniform construction code that meets or exceeds these regulations".

In Section 403.42 and Section 403.62 of the regulations, it appears that certain minor repairs -- not intended by the legislature to be subjected to the provisions of Act 45 -- may now require a permit. For example, using a plumber to replace a damaged or clogged pipe or an electrician to fix a short or dimmer switch. We do not feel it was the intention of the legislature to require a permit or inspection for these minor repairs but, in their present form, the regulations may well subject these repairs to the requirements of Act 45.

The International Building Code, Section 101.4, states that the associated codes referenced in the IBC are, by reference, considered part of the IBC for the express purpose that they are referenced. The regulations, conversely, would propose to adopt the referenced codes in their entirety. We suggest that Section 403.21 of the regulations, which adopts the referenced codes, should be reviewed to ensure that this section does not adopt provisions that could conflict with Act 45 or the IBC.

In Section 403.21 of the regulations, we question the need to include the International Performance Code, International Urban-Wildland Interface Code, and Appendix H of the International Building Code in the regulations. Act 45 adopts the International Building Code as the state's Uniform Construction Code and IBC includes a number of other codes by reference both in Chapter 1 and throughout the code, and as such, there would be no reason to include any further references in the regulations.

Section 403.85 of the regulations provide for the retention and sharing of records. Sections 403.85(e) and (f) may be in conflict with Act 100 of 2003, the Open Records Law. Under the regulations, construction documents are confidential and the department, a municipality, or a third-party agency may prohibit access to these documents. Under Act 100, these documents would appear to be in the public arena. We recommend that these sections be reviewed to ensure consistency with the Open Records Law.

Under Section 501(b)(5) of the act, a municipality may choose to administer only the residential portion of the code and leave the enforcement of commercial construction with the department. However, the regulations state that if a municipality opts to enforce the code, it must administer both residential and commercial construction projects. Of equal concern is the department's statement in the preamble of the regulations that it will only do the commercial inspections if it has the resources to perform the plan review and inspection work. I think we can all agree that most municipalities will not have the wherewithal to administer the commercial inspections and if the department does not have the resources to do the work there would be a

Mr. Robert Nyce, Executive Director  
June 5, 2003  
Page 3

considerable void in the effectiveness and application of the act. We urge the legislature to ensure that the department is given the necessary resources to administer the commercial construction inspections.

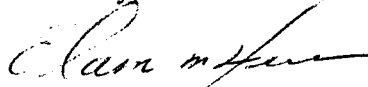
In Section 403.1(b)(6) of the regulations, the installation of LPG appliances and piping would be exempt from the provisions of the UCC based on a presumption that Act 61 of 2002, the Liquid Petroleum Gas Act, provides the authority for such inspections. However, Act 61 provides standards only for bulk plants, distributors, and industrial users of LPG. It does not regulate appliances, wiring, or installation of residential LPG units and appliances. As a result, municipalities would not have the ability to enforce piping and appliance installation under the UCC to ensure that these installations are performed correctly. We recommend that Section 403.1(b)(6) be deleted to eliminate this potential loophole.

Finally, throughout the regulations, there is an inconsistency in the way the terms "building code official" and "construction code administrator" are interchangeably used. These terms have different responsibilities in the training and certification regulations. We are concerned that this inconsistency may lead to confusion regarding the authority granted to the different categories of building inspector certifications. Specific examples are in Sections 403.43(b) and 403.63(b). In the previous version of the regulations there was included a reference that allowed a building code official to delegate plan reviews to a code administrator. This provision has been deleted from the current version, which creates an inconsistency between the training and certification regulations and the administrative regulations in that the building code official certification does not include the authorization to perform plan reviews or inspections. We would ask that the previous language empowering the building code official to delegate plan review to a code administrator be restored.

We have also enclosed for your review an addendum that contains specific citations that illustrate much of the issues we expressed here, as well as several technical concerns.

Thank you for the opportunity to present our concerns. We respectfully urge the committee and the department to consider our comments as you move forward with the regulations. In doing so, we pledge our willingness to assist the committees and the department in whatever manner you might deem beneficial. We wish only to ensure that these regulations facilitate an efficient and responsive implementation of the UCC.

Sincerely,



Elam M. Herr  
Assistant Executive Director

EMH:ls

Enclosure

## **PSATS Comments on the Administration and Enforcement Regulations for Act 45 of 1999**

Following are comments on specific sections of the regulations that illustrate some of the issues addressed in our letter, as well as a number of technical problems that need to be addressed.

Under the definitions section of the regulations, the term "building code official's designee" should be deleted from the definition of building code official because this authority is granted in Section 403.3(b) and it is confusing to include the term being defined in the definition of that term.

The terms, "permit holder", "permit applicant", "owner or owner's agent" in Section 403.62(a) and "authorized agent" in Section 403.64(b), are used interchangeably throughout the regulations. We recommend that a single term be defined and used throughout the regulations to eliminate confusion.

The terms "building code official" and "construction code administrator" are also used interchangeably throughout Chapter 403. And as with the previous comment, these terms prescribe different responsibilities in the training and certification regulations. For example, in Section 403.1(e) "code administrator" is used but the correct term should be "building code official". Section 403.1(e) states that a "code administrator" grants an exemption to the electrical provisions of the UCC. Since the law allows an electrical exemption for recognized religious sects from the building permit and regulation requirements, should it not be the "building code official" that grants the exemption, since the building code official issues the permit under the definition of "permit"? The regulations should be reviewed to correct these potential problems and ensure that the correct term is used in each location.

Section 401.2a(b). Fee schedules. Delete the phrase "The building code official for" because the statement that the "building code official" must make the fee schedule available implies that if the official is not present, the schedule will not be available. The administering entity should be responsible for establishing and providing the fee schedule to the public, whether it is a municipality or a third-party agency.

Section 403.41. Municipal administration. This section seems to imply that if a municipality elects to enforce the UCC under 403.101, they will have to enforce both the residential and commercial provisions. If our reading is correct, this creates a problem since the statute does not require a municipality to do both unless they so choose. This section should be amended to read "...and municipalities electing to administer and enforce commercial construction under the UCC..."

Section 403.42a(e). Permit applications. Delete "building code official" and replace with "Department or municipality". It is the municipality that adopts policies concerning the format of construction documents, not the building code official.

Section 403.43(g). Permits. We feel that five years is too long for a UCC permit to be automatically valid and should be left to the municipality to establish, especially when the IBC changes every three years.

Section 403.62(a). Residential permit requirements. This section requires applicants to apply to the "building code official" for a permit. We suggest that this section be amended to read "... apply to the municipality or third party agency."

Section 403.62a(d). Floodplain requirements. Why are the floodplain requirements for residential construction significantly different from the floodplain requirements for commercial construction in Section 403.42a(i). The floodplain requirements should be the same for both residential and commercial.

Section 403.64(g). This section eliminates the requirement for third parties to file a final inspection report with the municipality when the municipality is not enforcing the act. However, Section 403.103(f) continues to require the third party agency to file this report with the municipality and Section 501(e)(4) of Act 45 requires a third party to file a copy of the final inspection report with the municipality when the municipality is not administering the UCC. Section 403.64(g) needs to be corrected.

In addition, it is questionable whether a third party agency should be issuing a certificate of occupancy in addition to a final inspection report. Section 501(e)(4) of Act 45 only requires the third party agency to file a final inspection report. Conflicts may result if an independent third party agency issues a certificate of occupancy for a structure in a rural area and the structure is occupied but the structure's on-lot septic system was not built in accordance with the municipality's sewage facilities ordinance (*or state law*). If it is determined that the structure was occupied illegally, even though the structure is in compliance with the UCC, the municipality may need to order the property to be vacated. This potential problem could be easily remedied if the regulations are amended to only authorize a municipality or the Department to issue certificates of occupancy. Third party agencies could issue final inspection reports, which would be sufficient to prove that a structure is in compliance with the UCC.

Section 403.65(b). Certificates of occupancy. Why is this section, which deals with information required to be on a certificate of occupancy for residential construction, different from Section 403.46(b), which deals with certificates of occupancy for commercial construction? In particular, there are no sections in Section 403.46(b) (*commercial*) that equate to Section 403.65(b)(4), which requires the certificate of occupancy to include a statement that the described portion of the building was inspected for compliance with the UCC or Section 403.65(b)(7), which requires the certificate of occupancy to state if an automatic sprinkler system is provided.

Section 403.85(a) and (b). Retaining records. The term "building code official" should be replaced with "municipality or third-party agency" because the enforcing entity, NOT the building code official, must be responsible for maintaining records. Under present law, the municipality is responsible for the preservation and retention of public documents, not a particular individual.

Also, every single construction record should not need to be retained for the life of a commercial or industrial building because of the sheer volume of these records. Permits, orders, and plans should be maintained, but not every piece of paper in the file, such as fees collected.

Section 403.122(c). Appeals. This section states that an appeal automatically suspends an order to correct a violation until the matter is resolved. The second sentence then states that an action requiring the vacating of a property due to unsafe conditions also is suspended if an appeal is made. For public safety purposes, an action to vacate a property because of unsafe conditions should not be suspended pending appeal. We believe this section should be reviewed and recommend that the word "not" be deleted from the second sentence.

Original: 2283

**LAWRENCE G. SPIELVOGEL, INC.**

203 HUGHES ROAD KING OF PRUSSIA, PA 19406-3785 TELEPHONE 610-687-5900 FAX 610-687-5370 EMAIL [spielvogel@comcast.net](mailto:spielvogel@comcast.net)

CONSULTING ENGINEERS

**STATEMENT OF LAWRENCE G. SPIELVOGEL, PE**

Before the Pennsylvania House of Representatives  
Labor Relations Committee and  
Local Government Committee  
Hearing on Statewide Building Code Regulations  
Thursday, June 5, 2003

RECEIVED  
2003 JUN -5 AM 9:58  
NEW JERSEY ARCHITECTURAL  
REGULATORY COMMISSION

I am Larry Spielvogel, an independent consulting engineer from King of Prussia and I appreciate the opportunity to assist you in your hearing on the Pennsylvania Building Codes. For most of the last 30 years I have served as a volunteer on and have chaired the 60-person committee that sets the national energy standards for buildings. These standards are referenced in the 1992 Federal Energy Policy Act and serve as the basis for energy codes adopted by most state and local governments in this country. They are also used by the Federal Government for their buildings.

Thus, I am intimately familiar with the issues and economics in energy codes and standards. I have nothing to gain or lose by what L&I does in their rulemaking. Rather, my purpose here is to try to help you do the right thing for your constituents. I am here to both praise and criticize the manner in which the Department of Labor and Industry (L&I) has proposed implementing the building code Law you passed in 1999.

I commend L&I for proposing the major change to their rules by adopting the 2003 set of International Code Council (ICC) Codes, in lieu of the 2000 versions. While the Law requires adoption of the BOCA Codes, they have been superseded by the International Codes or the I Codes for short. These include the International Building Code (IBC), the International Residential Code (IRC), and the International Energy Conservation Code (IECC).

The National Fire Protection Association (NFPA) has recently published a comparable set of national consensus building codes. I suggested that L&I compare them with the I Codes to see if they may be more appropriate for Pennsylvania, even though it might require amending the Law. I have seen no evidence that this was done. It should be done.

There is a very serious problem in the L&I proposal. We have the law of unintended consequences at work here. What should have provided energy benefits and savings to homeowners will now result in greater energy use. Section 301 (c) of Act 1999-45 provides:

"Prescriptive methods for energy-related standards. - The department shall, within 180 days of the effective date of this section, by regulation promulgate prescriptive methods to implement the energy-related standards of the Uniform Construction Code which take into account the various climatic conditions through this Commonwealth. In deriving these standards the department shall seek to balance energy savings with initial construction costs."

The IRC and IECC already provide nationally accepted "prescriptive methods for energy-related standards" and take "into account the various climatic conditions" in Pennsylvania. The IRC and IECC "balance energy savings with initial construction costs."



L&I has proposed implementing the prescriptive method provision by the highly unusual practice of adopting a proprietary alternative to the I Codes, with additional options. Unlike almost every other building code or standard, this proposal makes no provisions for regular changes, revisions, interpretations, public hearings and comments, or reviews of the basis for the requirements. This violates due process.

L&I proposes to adopt the PHRC Alternative, prepared by the Pennsylvania Housing Research Center (PHRC) at Penn State University as an option in lieu of the energy-related requirements in the I Codes. This is shown in Section 403.21 (e) (1) on page 13 of the L&I proposal. Nothing like this is adopted or required in any major jurisdiction in the United States.

The preface to the PHRC Alternative says it is simpler than Chapter 11 of the IRC. Yet, the PHRC Alternative consists of 13 pages of provisions, while the IRC has only 7 pages of energy-related provisions that apply to Pennsylvania.

The PHRC Alternative has three climate zones, while Chapter 11 of the IRC has six climate zones in Pennsylvania. For example, Erie and New Castle are 5 to 10% colder than Pittsburgh. Yet, for these two locations the PHRC Alternative requires almost 30% more ceiling insulation and 17 to 23% more wall insulation than in Pittsburgh. I ask you: Do those requirements make common or economic sense and "take into account the various climatic conditions?"

Despite my repeated requests for the technical and economic information behind the derivation of the PHRC Alternative, none have been forthcoming. Indeed, the current version of the PHRC Alternative is not even shown as available for sale on the PHRC website, as late as yesterday. Thus, citizens subject to these requirements cannot readily obtain copies.

The IRC and IECC energy-related provisions are adopted almost without modification in most states in the country. The IRC and IECC do a much better job than what L&I proposes, making any other standards or alternatives unnecessary and confusing.

While the PHRC Alternative claims it is "equivalent to the provisions of the International Energy Conservation Code (IECC)," I can tell you authoritatively that it is not equivalent. The statement by L&I in the preamble that greater savings will be achieved is also not technically accurate or correct.

The most egregious provisions in the PHRC Alternative are the Trade-offs. If one uses what they consider to be "high efficiency heating and air conditioning equipment," you are allowed to use less insulation in the walls and less efficient windows. They define high efficiency equipment as the least efficient air conditioning units available in the market and any gas or oil heating equipment with a 90% Annual Fuel Utilization Efficiency (AFUE). This is easy to do with gas furnaces, at a net cost saving in construction, because a chimney is not needed.

There are also substantial construction cost savings from lower quality windows and less insulation. Windows can be 16 to 20% less efficient, and wall insulation can be reduced by 7 to 11%. Thus, builders could save thousands of dollars by using this trade-off, and the homeowners will likely end up with higher utility bills than had the house complied with the minimum requirements of the IRC or IECC. This is not what you envisioned when the Law was passed.

To heap insult upon injury, this trade-off will have a negative impact on many Pennsylvania businesses. Should a homeowner desire a hot water heating system, or a radiant heating system, there are virtually no manufacturers of either gas or oil hot water boilers that can meet the efficiency required for the trade-off. Also, there are no oil furnaces made that meet the required efficiency. Thus, Pennsylvania oil dealers and

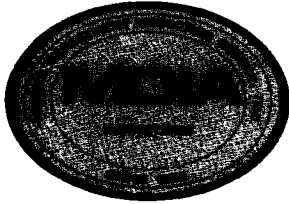
boiler manufacturers will not be able to compete, since builders will obviously choose gas warm air furnaces. This will have a major impact on Pennsylvania based companies like Burnham, Columbia, Crown, Patterson-Kelley, Peerless, Pennco, and New Yorker Boiler.

While I am not a lawyer, I understand the Federal Government preempts the states from adopting minimum equipment efficiency standards any higher than those they adopt. Thus, the PHRC Alternative violates this requirement for heating equipment in their trade-offs. There may also be anti-trust and restraint of trade issues with the PHRC Alternative.

The 1992 Federal Energy Policy Act, 42 USCA 6833, and the implementing Federal Regulations, 66 FR 1964, January 10, 2001, require that Pennsylvania certify to the U.S. Department of Energy that its residential energy codes are no less stringent than those in the IECC, and that they were developed in a consensus process. By adopting the PHRC Alternative, Pennsylvania will not be able to make that certification.

When L&I first proposed these regulations last year, I provided 21 pages of detailed comments, most of which still apply to the proposal before you. I will give the staff an electronic copy of my comments for anyone who may be interested in more details.

The provisions in the PHRC Alternative provide large construction cost savings to builders and a disservice for Pennsylvania homeowners for the life of their homes. Please direct L&I to delete the PHRC Alternative from their proposal. The way to avoid these issues and problems is to do what almost every other state has done by adopting the I Codes alone. This can be done by simply deleting the definitions for PHRC and Pennsylvania's Alternative Residential Energy Provisions on page 4 and deleting the words "or 'Pennsylvania's Alternative Residential Energy Provisions'" in Section 421.1 (e) (1) on page 13 of the proposed rule. In the alternative, direct L&I to publish the basis for the PHRC Alternative and subject it to public hearings and public comment, just like every other regulation they issue.



## **Middle Department Inspection Agency, Inc.**

P.O. Box 1356  
Wexford, PA 15090  
(412) 931-3028

Original: 2283  
TIMOTHY A. PALASKI  
Manager, Codes & Standards Division

June 2, 2003

John R. McGinley Jr.  
Chairperson IRRC  
14th Floor  
333 Market Street  
Harrisburg, PA 17101

Re: Proposed Regulations, Title 34, Part XIV, Chapters 401, 403 and 405.

I write to you today as not only the Manager of Codes and Standards, Middle Department Inspection Agency, Inc. an independent Third Party Inspection Agency and Stakeholder but also as a Pennsylvanian. I am grateful for a commission such as yours that is looking out for the best interests of all of Pennsylvania and as the "Regulatory Review Process in Pennsylvania" booklet states:

### **Mission Statement**

**To promote the most effective and least intrusive regulations possible while maintaining independence and full compliance with the Regulatory Review Act.**

#### **Preface:**

"The regulatory review criteria set forth in the RRA include two primary considerations: whether the promulgating agency has the statutory authority to enact the regulation; and whether the regulation is consistent with legislative intent. The Commission then considers a list of other criteria such as economic impact, public health and safety, reasonableness, and clarity."

With these goals in mind I would like to comment on the proposed regulations and Preamble before the committee.

In the Preamble issued with the proposed rulemaking document Annex A, the department of Labor and Industry states:

**Statutory Authority**

“This rulemaking is adopted under the authority provided in sections 301 and 304 of the Act (Act 45)(35 P.S. §§ 7210.301, 7210.304), which requires the Department to promulgate regulations adopting the 1999 BOCA National Building Code and successor codes and allows the Department to make changes to Chapter 1 of the 1999 BOCA Code. The Department must also adopt the *International Fuel Gas Code* and prescriptive methods for energy related standards under section 301.”

The Act (Act 45) Section 301(a)(1) only allows for the adoption of the 1999 BOCA National Building Code. Section 301(a)(2) allows for the adoption of the 1998 ICC International One and Two Family Dwelling Code. And Section 301(b) allows for the adoption of the International Fuel Gas Code (note: no edition is listed.)

Further Section 304(a)(1) & (2) does give the Department the authority to update the BOCA and ICC One and Two Family Dwelling Code to the successor codes by December 31, of the year they are issued. Section 304(b) gives the Department this same authority for the International Fuel Gas Code.

The problem with the proposed regulation is that under Standards § 403.21 *Uniform Construction Code*, the Department fails to list all of the standards recognized in the 1999 BOCA code. The Department has chosen to list only ICC codes and has even added additional codes that were not in existence at the time of passage of the Act. No reason is offered for the Department's decision. Shouldn't the Department provide substantiation for this action? The Department has stated in § 403.21(a) that “these codes are adopted and incorporated by REFERENCE as the Uniform Construction Code.” In order for the Act to be uniform, ALL referenced standards must be recognized. The Department was not given the authority to change the intent of the Act or the definition of the Uniform Construction Code. It is hoped that all referenced standards listed in Chapter 35 of the 1999 BOCA National Building Code are included in the regulations, as was clearly the intent of the Act.

And furthermore the **Preamble page 7** states: The IRRC and numerous other commentators questioned the adoption of the IEC as part of the UCC in section 403.21(a)(2).

The Department gives no explanation as to why they ignored these comments. The NEC is clearly a listed standard in the 1999 BOCA code that the General Assembly intended as the UCC.

The regulations have also failed to define the Uniform Construction Code in § 401.1. *Definitions*, of this cycle of submission. In the original submittal of the proposed regulations § 401.1 gave the definition of *Uniform Construction Code* as - “The International Building Code First Edition 2000, the International Residential Code for One- and Two-Family Dwellings 2000 and any standards adopted by the Department in this part under section 301 of the act (35 P.S. § 7210.301).”

It is understood that this original definition needs to be modified to allow for the authority of the Department to adopt the new Code when it is issued, this authority is granted by virtue of Section 304 of the act. But the definition and its meaning are needed in the regulations for a thorough understanding of what Act 45 intends.

In Annex A Chapter 401.1 of the proposed regulations numerous definitions are listed that are not part of the original § 401.1 published with the Training and Certification of Code Administrators regulations. Are these additional definitions to be added to the previously adopted regulations? Are the definitions in Section 103 of the Act still in effect?

The Act under section 102(b) and under the heading **“Background”** of the Preamble for the proposed regulations state the intent and purpose of the UCC. The regulations are severely lacking in meeting this intent and purpose. Residential construction throughout the State will be ignored by the regulations. The code is being adopted but only limited enforcement is being mandated for one and two family dwellings in municipalities that choose to **“Opt Out”** of enforcement. The intent is to **“provide standards for the protection of life, health, property and environment and for the safety and welfare of the consumer, general public and the owners and occupants of building and structures”**. This does not limit the intent to just commercial occupancies.

**§ 401.2a (c)** states: **“A municipality or third party agency may establish a fee refund policy.”**

The Department needs to establish a refund policy just as a municipality or a third-party agency is permitted to do in §401.2a(c). We propose the Department adds their refund policy/amount in §401.2(b) as a new line item (6).

**§ 403.1 (b)(2)** states: (The UCC does not apply to) **“New buildings or renovations to existing buildings on which a contract for design or construction was signed before** *(Editor’s Note: The blank refers to the effective date of adoption of THESE REGULATIONS.)***”**

Section 104 (b)(2) of the Act only covers these instances **“on projects requiring department approval.”** With the current wording it can be misunderstood that any project (New or Renovation) that had a design contract signed prior to the effective date of the UCC would be exempt from the UCC. The words are clear - to cover only projects that have been submitted to the Department for approval and were not yet returned to the applicants so that they could apply for a local permit. This oversight in writing the proposed regulations paves the way for unscrupulous individuals to circumvent the clear intent of the legislators.

**§ 403.42 (c)(1)(xiii)** states for commercial construction : (A permit is not required for) **“WINDOW REPLACEMENT WITHOUT STRUCTURAL CHANGE.”**

In the last paragraph on Page 10 of the Preamble the Department stated that they do **“not**

have the authority to modify" certain standards under section 301(a)(1) of Act 45. They proceed to state that to be "Consistent with fairly widespread code administration," the Department decided to modify the regulations to exempt window replacement from the UCC requirements as long as no structural changes were being made.

Three very important considerations are being overlooked by this action.

1. Public safety (in numerous locations throughout buildings safety glazing is required)
2. Energy efficiency (the U-value of the window is part of the over-all envelope of the building)
3. Widespread improper code administration only compounds the problem and should not be used as an excuse.

Without a permit and inspection safety glazing and energy efficiency cannot be verified for code compliance.

**§ 403.42 (c)(5)(i)** states: (A permit is not required for) "Stopping leaks in a drain and a water, soil, waste or vent pipe. The UCC applies if a **concealed** trap, drainpipe, water, soil, waste or vent pipe becomes defective and is removed and replaced with new material."

The wording in this first sentence leads the reader to believe that if only a water, soil, waste or vent pipe is leaking and no drain is involved that they would be exempt. Removing "and a" between "drain" and "water" would clarify this sentence. Stating "CONCEALED" in the second sentence leads the reader to believe that they could in fact remove and replace all exposed faulty plumbing with new material and not have the work inspected under the UCC. Removing the word "concealed" would correct this misunderstanding.

**§ 403.43(c)** states: "A building code official shall stamp or place a notation on EACH PAGE OF the set of reviewed construction documents that the documents were reviewed and approved for UCC compliance before the permit is issued. The building code official shall clearly mark any required NON-DESIGN changes on the construction documents. The building code official shall return a set of the construction documents with this notation and any required changes to the applicant. The permit holder shall keep a copy of the construction documents at the work site open to inspection by the construction code official or authorized representative."

Paragraph (c) of this section as well as paragraph (f) of this section seem to indicate that a permit will be issued if the construction documents are not fully in compliance with the UCC.

The first sentence uses the term "approved" to be marked on each page of the Construction documents. If there are NON-DESIGN items marked on a page, how can this page be marked "approved"? What are NON-DESIGN items?

Suggested wording for this paragraph (c): A building code official shall stamp or place a notation on each page of the set of reviewed construction documents that the documents were reviewed for UCC compliance. The building code official shall notify, in writing,

the permit applicant of any items that are not code compliant. The permit applicant shall make all necessary changes and return the construction documents for re-review of code compliance before a permit is issued. The permit holder shall keep a copy of the final reviewed construction documents at the work site open to inspection by the construction code official or an authorized representative.

**§ 403.62 (c)(1)(ix) (for residential construction) states: (A permit is not required for) "WINDOW REPLACEMENT WITHOUT STRUCTURAL CHANGE."**

In the last paragraph on Page 10 of the Preamble the Department stated that they do "not have the authority to modify" certain standards under section 301(a)(1) of Act 45. They proceed to state that to be "Consistent with fairly widespread code administration" that the Department decided to modify the regulations to exempt window replacement from the UCC requirements as long as no structural changes were being made.

Three very important considerations are being overlooked by this action.

1. Public safety (in numerous locations throughout buildings safety glazing is required)
2. Energy efficiency (the U-value of the window is part of the over-all envelope of the building)
3. Widespread improper code administration only compounds the problem and should not be used as an excuse.

Without a permit and inspection safety glazing and energy efficiency cannot be verified for code compliance.

**§ 403.62 (c)(4)(v) states: (A permit is not required for) "Replacement of any minor part that does not alter approval of equipment or make the equipment unsafe."**

Paragraph (3)(ii) of this section was modified to remove the word "any" between "of" and "minor" and replace it with the word "a". Making this same wording change in this section would help standardize these regulations.

**§ 403.62 (c)(5)(i) states: (A permit is not required for) Stopping leaks in a drain and a water, soil, waste or vent pipe. The UCC applies if a concealed trap, drainpipe, water, soil, waste or vent pipe becomes defective and is removed and replaced with new material.**

The wording in this first sentence leads the reader to believe that if only a water, soil, waste or vent pipe is leaking and no drain is involved that they would be exempt. Removing "and a" between "drain" and "water" would clarify this sentence. Stating "CONCEALED" in the second sentence leads the reader to believe that they could in fact remove and replace all exposed faulty plumbing with new material and not have the work inspected under the UCC. Removing the word "concealed" would correct this misunderstanding.

**§ 403.63 (a) states: "... The building code official and the applicant may agree in writing to extend the deadline by a specific number of days."**

Section 502 (a)(3) of the Act only allows for this extension of time for one family and two family dwellings in historic districts.

**§ 403.63 (c)** states: “A building code official shall stamp or place a notation on EACH PAGE OF the set of reviewed construction documents that the documents were reviewed and approved for UCC compliance before the permit is issued. The building code official shall clearly mark any required NON-DESIGN changes on the construction documents. The building code official shall return a set of the construction documents with this notation and any required changes to the applicant. The permit holder shall keep a copy of the construction documents at the work site open to inspection by the construction code official or authorized representative.”

Paragraph (c) of this section as well as paragraph (f) of this section seem to indicate that a permit will be issued if the construction documents are not fully in compliance with the UCC.

The first sentence uses the term “approved” to be marked on each page of the Construction documents. If there are NON-DESIGN items marked on a page, how can this page be marked “approved”? What are NON-DESIGN items?

Suggested wording for this paragraph (c): A building code official shall stamp or place a notation on each page of the set of reviewed construction documents that the documents were reviewed for UCC compliance. The building code official shall notify, in writing, the permit applicant of any items that are not code compliant. The permit applicant shall make all necessary changes and return the construction documents for re-review of code compliance before a permit is issued. The permit holder shall keep a copy of the final reviewed construction documents at the work site open to inspection by the construction code official or an authorized representative.

**§ 403.64 (g)** states: “A third-party agency under contract with a permit holder shall submit a copy of the final inspection report to the property owner, builder and the lender designated by the builder.”

The property owner, builder and the lender may not be known to the third-party agency. Suggested wording: A third-party agency under contract with a permit holder shall submit 3 copies of the final inspection report to the permit holder.

**§ 403.81, § 403.82, § 403.83 and § 403.84** are a few of the proposed regulations for “*Department, Municipal and Third-Party Enforcement For Noncompliance*”. These regulations cover the procedures that are to be followed to issue Stop Work Orders, Notices of Violation, Orders to Show Cause/Order to Vacate and how to deal with Unsafe Buildings, Structures or Equipment for all buildings in our State. Section 104 (a) of the Act states: “This act shall apply to the construction, alteration, repair and occupancy of all buildings in this Commonwealth.”

It might appear that the regulations meet the intent of the Act, but what is being



overlooked are residential properties in "opt-out" areas of the state. There are no appeal boards in "opt-out" municipalities (§ 403.103). § 403.83 (c) states: "The building code official shall forward all requests for variance, extensions of time or appeals regarding interpretations of the UCC to the board of appeals within 5 business days."

Another key issue that is missing from the regulations for "opt-out" municipalities is what to do when it is discovered that an Unlawful Act is being committed. The 2003 IBC and IRC cover Unlawful Acts in section 113.1 of each book. Sections 113.1 and R113.1 state: "It shall be unlawful for any person, firm or corporation to erect, construct, alter, extend, repair, move, remove, demolish or occupy any building, structure or equipment regulated by this code, or cause the same to be done, in conflict with or in violation of any of the provisions of this code." To whom does a building code official report an Unlawful Act (swimming pool, room addition, new dwelling, etc.) discovered in "opt-out" municipalities?

It is understood that by virtue of Sections 301(a)(1) and 304(a)(1) of the Act that the Department has the authority to promulgate separate regulations which may make changes to Chapter 1 of the 1999 BOCA NBC and its successor codes, relating to administration. Nothing in the Act or the proposed regulations allows for the deletion of Chapter 1 of the 1998 ICC International One and Two Family Dwelling Code or its revised or successor codes.

§ 403.86 (e) states: "This section shall be used in conjunction with the Fire and Panic Act."

Some sections of the Fire and Panic Act are being repealed by Act 45.

Suggested wording: This section shall be used in conjunction with the saved portions of the Fire and Panic Act covered in Section 1101 of the Act.

§ 403.101 (a) states: "The Fire and Panic Act and a locally enacted building code shall remain in effect until the date that one of the following has transpired:"

Suggested wording: The **complete** Fire and Panic Act and **all** enacted building codes shall remain in effect until...

§ 403.102 (g)(1) states: "Employ at least one construction code official and designating an employee to serve as a building code official."

Section 501 (b) (1)-(5) of the Act covers how a municipality may elect to administer and enforce the UCC. Nowhere does it state in the Act that a municipality shall **EMPLOY** a construction code official. What is stated is that they may **RETAIN** one or more construction code officials. The wording should change "Employ" back to "Retain" to correctly state the law.

§ 403.102 (i)(2) could be clarified by adding "of 403.102" at the end of the sentence.

§ 403.103 (d) states: "A building code official shall determine the climactic and

geographic design criteria contained in table R301.2 (1) of the IRC for residential construction.”

Building Code Officials are not design professionals. Guidelines are needed from the Department to complete this important table. Current statistics gathered by the Department are indicating that a large portion of municipalities in our state will be “opting out” of enforcement of the UCC. Table R301.2 (1) of the IRC is (by code section 301.2) to be completed by the local jurisdiction. If this is left to the discretion of any BCO, then it is certain to have numerous different calculations from one project to the next. As an example, we could have neighbors building to different frost depths. One at 36” and the next at 42”, when in fact the true depth may need to be 48”. If in this same example one of the projects is a commercial building being inspected by the Department, the Department will be required by section 1805.2.1 of the IBC to know the local frost depth for the commercial project. Since the Department must develop standards for every geographical area of the state for their purposes, they should distribute this information to all BCOs for insertion in Table R301.2(1) of the IRC. The intent of the General Assembly (Section 102 (b)(1), (2), (3) and (8) of Act 45) is not being met if blank tables are made part of the regulations.

**§ 403.103 (f)** states: “A third-party agency shall send a copy of the final inspection report to the property owner, builder, municipality and a lender designated by the builder.”

All that may be known to the third-party agency at the time of the final inspection is the municipality and the permit holder. The Department of Labor & Industry has stated in numerous public meetings that if a municipality “opts-out”, they could not issue Certificates of Occupancy or a Building Permit.

Section 501 (e)(4) of the Act states: “In municipalities which require a building permit or a certificate of occupancy but do not conduct inspections, the code administrator shall also be required to submit a copy of the report to the municipality.”

The legislature recognized some municipalities would issue permits and certificates of occupancy but not conduct inspections, and the lawmakers did not prohibit this.

**Suggested wording:** A third-party agency under contract with a permit holder shall submit 3 copies of the final inspection report to the permit holder and one copy to the local municipality.

**§ 403.121 (a)** states: “A municipality which has adopted an ordinance for the administration and enforcement of the UCC or is a party to an agreement for the joint administration and enforcement of the UCC shall establish and appoint members to serve on a board of appeals under section 501(c) of the act.”

501(c) of the Act refers the municipality to Chapter 1 of the 1999 BOCA NBC for direction in establishing their appeals board. Section 121.2 in Chapter 1 of the 1999 BOCA NBC states: “The board of appeals shall consist of five members...”

There is no mention in the regulations as to how many people are needed to make up the appeals board. To meet the intent of the Act, I propose a new sentence at the end of

§403.121(c)(1) stating: The board of appeals shall consist of **five** members appointed by the municipality's governing body.

§ 403.121 (c) 3 states: "Members of a municipality's governing body and its code administrators may not serve on a board of appeals."

Section 112.3 of the IBC 2003 states: "The board of appeals shall consist of members who are qualified by experience and training to pass on matters pertaining to building construction and **are not employees of the jurisdiction.**"

To meet the intent of the act the wording "municipal employees" should be added to this list of non-approved members of the appeals board.

**Preamble Fiscal Impact page 4:** The Department states that it "will augment its plan review staff and may have to increase its inspection staff to review and approve plans and perform required inspections under the UCC."

What is lacking in the proposed regulations is any language pertaining to how a third-party agency with appropriate categories of certification, may contract with the Department to conduct the plan review and inspections required by this act.

The Department has been given the authority in Section 501(e)(2) of the act to contract with a third-party agency. With the combined efforts of the Department and Registered Third-Party Agencies, the Fiscal Impact may be controlled, but a regulation is needed to allow for the contracting with the third-party agencies.

The comments and suggestions that are offered are, to the best of my knowledge and understanding, based on portions of the law and are within the power of the Department to develop proper and suitable regulations.

If the commission requires any clarification, or has any questions regarding these comments and suggestions, please feel free to contact me.

Sincerely



Timothy A. Palaski

Original: 2283

**IRRC**

**From:** Larry Spielvogel [spielvogel@comcast.net]  
**Sent:** Wednesday, May 28, 2003 11:55 AM  
**To:** IRRC  
**Subject:** PA UCC

Gentlemen:

Attached please find a copy of my one page of comments on your proposed UCC rules, and 21 pages of my final written comments on the Proposed Rulemaking on the new Uniform Construction Code from last September. Hard copies have been sent by mail.

Larry Spielvogel, PE  
L. G. Spielvogel, Inc.  
203 Hughes Road  
King of Prussia, PA 19406  
Tel: 610-687-5900; Fax: 610-687-5370; Email: [spielvogel@comcast.net](mailto:spielvogel@comcast.net)

RECEIVED  
MAY 28 11:12:34  
CONSTRUCTION  
REVIEW COMMISSION

5/28/2003

COMMENTS OF LAWRENCE G. SPIELVOGEL, PE  
ON PENNSYLVANIA L&I PROPOSED UCC IMPLEMENTATION  
May 28, 2003

JULY 28 11:12:34

REVIEW OF SUBMISSION

My name is Larry Spielvogel, and I am an independent Registered Professional Engineer practicing in Pennsylvania, with offices in King of Prussia. Thus, I will be subject to these rules. I am commenting on my own behalf and at my own expense. I am not being supported or paid for these comments by anyone. For the last 30 years I have participated in building code development and adoption hearings, served on, commented on, and chaired the national committees that write, maintain, and revise the codes and standards used for buildings, including those being proposed for adoption in Pennsylvania. These comments are in response to the Preamble and Annex A posted on the L&I website on May 8, 2003. See [www.state.pa.us](http://www.state.pa.us), and type Uniform Construction Code in the Keyword window.

Paragraph 403.21 (e) (1) allows compliance by using "Pennsylvania's Alternative Residential Energy Provisions" (PHRC) dated February 2003 and published by the Pennsylvania Housing Research/Resource Center at Pennsylvania State University, as an alternative to the 2003 Codes of the International Code Council, including the International Energy Conservation Code (IECC).

PHRC is essentially identical to the December 2001 version, which made reference to the 2000 International Residential Code (IRC), except that the February 2003 version deletes all references to the year of the IRC. While it is clear that the 2001 PHRC version referred to and is based on the 2000 IRC and the 2000 IECC, the 2003 PHRC version has the identical requirements and references to the 2003 IRC. However, the energy-related requirements in the 2003 IRC and 2003 IECC are not identical to the 2000 IRC and IECC.

Every other code and standard referenced and adopted by L&I for the Uniform Construction Code in this rulemaking is consensus based, and has readily available procedures for proposing changes, conducting public hearings, and getting both formal and informal interpretations. None of these procedures and provisions are available for PHRC. No public notice was ever provided, nor were any public hearings held to receive public comment. Since it was and is not possible to comment or testify in the development of the PHRC, due process has been denied.

Most of the standards and references in the 2003 PHRC have since been superseded, revised, and updated. Yet, the requirements in the 2003 PHRC are based on the obsolete and out of print standards and references. Thus, in many instances, it is not possible to purchase products meeting the standards in PHRC, because manufacturers are testing and rating their products to the requirements in the current standards.

In the Preamble, L&I states that the US Department of Energy Pacific Northwest National Laboratory reviewed the PHRC. That statement is simply not true. What they did review was an early draft of the 2001 version. They did not review either the final 2001 version or the 2003 version. Thus, any of their comments or conclusions cannot be relied upon without their review of the final versions.

The provisions of PHRC are not as stringent or as energy efficient as the IRC or the IECC. Therefore, by allowing PHRC as an option, Pennsylvania will not be in compliance with the requirements of the 1992 Federal Energy Policy Act, and the subsequent Federal Regulations. Besides not complying with Federal Law, allowing the use of PHRC does a disservice to the citizens of Pennsylvania, and intentionally wastes our precious energy and money, compared with the provisions of the International Codes and Federal Law.

The trade-offs allowed by PHRC make a bad situation even worse. Besides encouraging additional energy waste, they preclude the use of the most energy efficient coal, oil, and propane heating equipment and even gas fired boilers.

The Department of L&I has not considered or responded to most of the substantive and technical comments on their August 2002 Proposed Rule submitted on September 19, 2002. A copy of those detailed comments on the August 2002 Proposed Rule is attached. The PHRC Alternative must be deleted from the UCC.

Email: spielvogel@comcast.net

COMMENTS OF LAWRENCE G. SPIELVOGEL, PE  
ON PENNSYLVANIA L&I PROPOSED UCC IMPLEMENTATION  
September 19, 2002

1. My name is Larry Spielvogel, and I am an independent Registered Professional Engineer practicing in Pennsylvania, with offices in King of Prussia. Thus, I will be subject to these rules. I am here on my own behalf and at my own expense. I am not being supported or paid for these comments by anyone. For the last 30 years I have participated in building code development and adoption hearings, served on, commented on, and chaired the national committees that write, maintain, and revise the codes and standards used for buildings, including those being proposed for adoption in Pennsylvania. These comments are in response to the page 4127 August 24, 2002 PA Bulletin notice.

### PROPOSED RULE

#### Introduction

2. In adopting the Uniform Construction Code (UCC or Code) for Pennsylvania, the Pennsylvania Department of Labor and Industry (Department or L&I) incorrectly assumes that the current successor code to the "1999 BOCA National Building Code" set forth in the statute is the First Printing of the 2000 International Building Code (IBC). The current successor is the 2000 IBC with the 2002 Supplement. The 2000 IBC was the first version of the IBC ever published, and the 2002 Supplement contains many corrections, clarifications, changes, updated references, and improvements.

3. In Paragraph 401.1 of the proposed rule, the Department does intentionally propose to adopt the errata to the Electrical and Accessibility Codes, and the supplement for IBC accessibility, but not for all other International Code Council (ICC) Codes. The 2001 and 2002 Supplements for all of the ICC Codes should be adopted.

4. The documents proposed for adoption and reference must be available for public viewing at locations around the State. With the short time allowed for comments and the public hearings, it is not possible for most people to get copies of the referenced publications in time for them to responsibly and thoroughly prepare testimony and written comments. The referenced documents and publications are probably not available for public viewing at any location other than L&I, and even that has not been publicized. More time should be allowed for public comment for such an important issue that affects so many citizens, local governments, and businesses in Pennsylvania.

5. Since there are many interested and affected parties who will have to learn the Code for the first time, it is important that they learn from the most up-to-date and most correct version available. The First Printing of the 2000 ICC Codes is not the most up-to-date or state-of-the art readily available today. In later years when newer versions of these Codes are adopted, fewer changes will have to be made, and users can concentrate on implementing and enforcing the most current requirements. Therefore, the use of the 2000 ICC Codes now proposed by the Department directly contradicts the statement by the Department in the *Background* that requires state-of-the art techniques and cost-effectiveness.

6. By July 15, 2004, the Commonwealth of Pennsylvania is required to certify to the Secretary of the United States Department of Energy that their energy provisions for commercial buildings equal or exceed those set forth in the American Society of Heating, Refrigerating, and Air Conditioning Engineers and Illuminating Engineering Society of North America ANSI/ASHRAE/IESNA Standard 90.1-1999. See Docket EE-DET-02-001 on page 46464 in the July 15, 2002 Federal Register. If Pennsylvania were to adopt the 2001 or 2002 Supplement to the ICC Codes, they would likely be in compliance with Federal Statutes and Rules. The Codes now being proposed by the Department will not and do not comply with either the existing or proposed Federal Rules.

7. The proposal by the Department to use the 2000 International Energy Conservation Code (IECC), with its reference to the 1989 version of ANSI/ASHRAE/IESNA 90.1, will inhibit interstate commerce and will complicate and increase the cost of buildings built in Pennsylvania. Adopting the 2000 IECC is contrary to the provisions of Section 102 (b) of Act 45, which encourages standardization and economy in construction that is consistent with nationally recognized standards. It will also result in higher energy use and less economically efficient buildings in Pennsylvania than those being built in neighboring states. This will put Pennsylvania businesses at a competitive disadvantage compared to those in neighboring states. Also, see the extensive comments in paragraphs 124 to 140 below on the 2000 IECC.

8. Both New York and New Jersey are now using and enforcing energy codes that use ANSI/ASHRAE/IESNA Standard 90.1-1999, which is specifically referenced in the 2001 and 2002 Supplements to the ICC Codes. Thus, designers, owners, and contractors who also work in those other states will be forced to use the out-of-date, obsolete, and a superseded version of the building energy code just now being proposed by the Department for Pennsylvania.

9. In the preamble, emphasis is placed on the extensive outreach by the Department. They claimed to have communicated with interested groups and stakeholders and got their input and suggestions. However, from the comments below and those at the public hearings, it is clear that considerably more outreach, communication, and suggestions must be sought to make this proposed rule complete, correct, usable, and enforceable.

10. It will be necessary to revise or repeal 52 PA Code Section 69.101 et seq., which contains regulations that utilities must follow before starting service. This must be coordinated with Paragraphs 403.47 and 403.65 in the proposal.

11. Public comments received electronically should be posted on the L&I website for all to see, like other agencies do.

#### Definitions

12. In Paragraph 401.1 of the proposed rule, the Department proposes to use the U. S. Department of Energy (DOE) COMcheckEZ software to determine compliance with IECC for commercial buildings as they are defined in the L&I proposal. However, COMcheckEZ is not capable of determining compliance with all buildings designed under the provisions of Chapters 7 and 8 of the 2000 IECC. Thus, a user of Chapters 7 or 8 cannot follow these requirements of the Department. Provide a means for users of Chapters 7 and 8 to show or prove compliance.

13. The definition requires the use of COMcheckEZ Version 2.1, dated April 2000. Version 2.1 was superseded and abandoned a long time ago. A new Version 2.4, which corrects many bugs, errors, and inconsistencies is now available and in use. However, Version 2.1 was not even available any longer on the DOE website. Since Version 2.1 is required by L&I, I made a special request to the Department of Energy to restore Version 2.1 to their website, which has now been done, with its known bugs and errors. However, the latest version of COMcheckEZ should be used in the definitions.

14. In 401.1, the Department proposes to use the DOE MECcheck software to determine compliance with IECC for residential buildings. However, MECcheck is not capable of determining compliance with buildings designed under the provisions of the Pennsylvania Housing Research Center (PHRC) Alternative or the ICC International Residential Code (IRC). Thus, a user of the PHRC Alternative or the IRC cannot use the DOE compliance guide. Provide means for demonstrating compliance for the energy provisions of both IRC and PHRC.

15. The April 2000 Version 3.2 of MECcheck shown in 401.1 of the proposal does not exist. In April 2000, the latest version available was 3.0. A situation similar to COMcheck exists for MECcheck. The latest published version 3.2, dated January 2001, should be referenced.

16. Since neither of the L&I required versions of COMcheckEZ or MECcheck were available, it was not possible to use and verify that they met and matched the other requirements in the L&I proposed rules. The public must be given the opportunity to get, use, and comment on the specific criteria for compliance with the L&I proposal.

17. In 401.1 the definitions of commercial and residential buildings must be expanded to show which definition applies to (1) high rise residential, (2) low rise multifamily residential, (3) convents, (4) monasteries, (5) rectories, (6) fraternities and sororities, and (7) rooming houses. The current definition for residential building does not include these. These building types are not covered by the IRC or by the provisions for commercial buildings in IECC. Therefore, you must provide comprehensive definitions and energy conservation provisions for these building types, as is done comprehensively in the ICC Codes.

#### Standards

18. In Paragraph 403.21 (e) (1), the Department proposes to allow the optional use of the Pennsylvania Housing Research Center (PHRC) Alternative to Chapter 11. Please see the extensive discussion in paragraphs 45 to 123 in the separate section below on the PHRC Alternative. Also, the proposal does not say which Chapter 11 the PHRC can be the alternative for. No evidence or documentation has been presented or referenced to show that PHRC is equal to or more stringent than Chapter 11 of IRC. The opposite is true, as shown by the extensive comments below in paragraphs 45 to 123. The option for the PHRC Alternative must be dropped, since it will result in higher energy use if followed, contrary to the unsupported statements on page 4129 of the Pennsylvania Bulletin.

19. The PHRC Alternative should not be included in the section on Standards, since it is not a standard.

20. In 403.21 (e) (2), COMcheckEZ is not capable of determining compliance for low rise residential buildings such as garden apartments, townhouses, and apartment buildings. Simplified or computerized prescriptive means such as MECcheck must be specifically referenced and provided for demonstrating compliance for these building types, like those for all other building types.

21. There are differences between 403.21 (a) and 403.26 (a) (2). The ICC Electrical Code and the International Electrical Code are the same. However, there may be a copyright or trademark dispute over the title of the latter. Correct the titles.

22. Also, 403.21 lists ten Codes, while 403.26 lists only five Codes. This is confusing and contradictory, and should be made consistent.

23. In 403.26 (d), it is necessary to specifically describe all those provisions of the International Mechanical Code (IMC) that are not being adopted and that are superseded by the Law. The provisions of the Law must be set forth in conjunction with the adoption of the Codes. Otherwise, how are designers, contractors, and code officials to know which provisions of IMC do and do not apply?

#### Permit and Inspection Process for Commercial Construction

24. The provisions of 403.41 are called a subchapter, while the almost identical provisions in 403.61 are called a section. Since both deal with the permit and inspection process, they should be called the same thing. Otherwise, the Uniform Construction Code is not uniform.

25. In 403.42 there are many requirements for permit applications that apply to the construction of new buildings. However, those same requirements also apply to permit applications for renovations and repairs, even though most of those requirements are not relevant or needed in connection with covered renovations and repairs. For example, information about the site and parking that will not change or be impacted by the work described in the permit application should not have to be provided. This requirement will impose a very substantial and unnecessary burden on those building owners who wish



to make investments and improvements in their buildings. Clarify the permit application requirements.

26. In 403.42 (b) there is no reason why L&I or the municipality cannot provide the application forms, since the forms must be submitted to them. There is no statutory or regulatory reason why the applicant for a permit must go to the Department of Community and Economic Development for forms that must be submitted to another agency. It is reasonable to have the forms available from the agency that will issue the permit.

27. In 403.42 (g), the Department is not requiring that design documents stamped by a Pennsylvania licensed design professional be prepared for commercial and multifamily construction, repair, and renovation, when there are no additions or changes to the structure or egress to get a permit. This endangers the public health and safety, since there are many other changes, repairs, and replacements that require licensed professionals to be involved. Require stamped design documents for commercial and multifamily construction, repair, and renovation.

28. It is often not possible to know if or when there has been explicit compensation for the design documents, which could be included as a "no cost" item in a large construction contract or agreement. As a practical matter, there is always compensation for the preparation of design documents, which may not necessarily be itemized or charged for separately. Drop the provision about no compensation.

29. With the public health and safety at risk, it does not matter whether there has been compensation or not for the design documents. When the design documents have resulted in, caused, or contributed to injury or damages, the entity or person preparing those documents must be held accountable. Pennsylvania Laws and Regulations governing the practices of architecture and engineering control who can prepare construction documents. Those Laws cannot be altered by this rulemaking.

30. In 403.42 (h) there is no definition or description of what "special circumstances" consist of. Unless the terms can be precisely defined or described, they should not be used in rulemaking. The applicant can always request a variance, if justified.

31. In 403.42 (j) it does not say who approves the fire protection shop drawings. The rule must state either the code official or the licensed design professional, or both.

32. In 403.44 (b) add the phrase "Design or" at the beginning of the paragraph.

33. In 403.45 inspections are required for energy conservation in commercial buildings, but inspections for energy conservation in residential buildings in 403.63 are not required. Since the energy intensity of residential buildings tends to be higher than the energy intensity for most commercial buildings, for similar purposes, this omission does not make sense, is not in the public interest, and discriminates in favor of residential buildings. Residential buildings should be inspected for energy conservation, especially since more options for compliance exist and many energy conservation features are hidden upon completion of construction.

34. In 403.48 it is not clear which Chapter 3 is being referenced. Is it Chapter 3 of the IBC, IMC, the International Plumbing Code (IPC), or some other document?

#### Permit and Inspection Process for Residential Buildings

35. Many of the provisions for commercial buildings in 403.41 through 403.47 should apply equally to residential buildings in 403.61 through 403.65, but are not required for residential buildings by the Department. The public health and safety in residential buildings are every bit as important as they are in commercial buildings. The current proposal for residential buildings also does not include the requirement for preparation of construction documents by licensed design professionals, thus making it even more important to have provisions to insure that the permit application and construction work comply in every respect with the UCC.

36. For example, in 403.42 (d) (2) for repairs to commercial buildings, "The removal or cutting of any structural beam or load-bearing support" requires a permit, while the identical repairs to residential buildings do not require a permit. The public health and safety risks are the same or greater in residential buildings, yet the proposal by the Department is silent on whether a permit is required for this common type of repair in residential buildings. Require permits for repairs to residential buildings for the same types of repairs that require permits in commercial construction.

37. In 403.61 through 403.65 there is no reference or requirement for the use of boilers and unfired pressure vessels, like there is in 403.48 for commercial buildings. Boilers and unfired pressure vessels of the same types and sizes used in commercial buildings are also used in residential buildings. Therefore, the provisions of 403.48 should be also included for residential buildings.

38. In 403.62 there is no requirement for construction documents to be submitted with a permit application. Thus, it is not possible for the code official to determine compliance with the Codes and protection of the public health and safety. Complete and detailed construction documents must be submitted with permit applications for residential buildings, so the code official can determine compliance with all aspects of the Codes. By not adopting the provisions of Chapter one of the IBC, essential provisions such as these have been omitted, to the detriment of code officials and the public. Construction documents should be submitted for residential buildings with the application for a building permit.

39. In 403.62 the permit applicant should be required to designate which energy options are being selected on the building permit application, so the code officials and later owners will know what options were used and what they can expect to find in the building. Require irrevocable election of energy options on the building permit application.

40. In 403.63 (d) there is no inspection requirement for energy conservation, even though many required elements are enclosed and covered during construction, and cannot be reasonably inspected upon completion. It is not reasonable to expect the code official to be able to properly prepare the final inspection report required by 403.63 (f) (5) unless inspections are conducted during construction and inspection reports filed by the code official. Inspection for energy conservation is required for commercial buildings, and must also be required for residential buildings.

41. In 403.63 (h) (which was mislabeled as f) and in many other locations in the proposal by the Department it is not reasonable or necessary for the code official (or third party agencies) to send copies of anything to anyone other than the permit applicant or permit owner and any other government officials and agencies required by Law or rule. The permit applicant or permit owner is perfectly capable of and should be responsible for distributing copies of documents sent by the code official. For example, the owner often pays for the construction, and there is no lender, so requiring that copies be sent to the lender is superfluous. In many other cases, the property owner is the builder, who is often the permit applicant. In other cases, the owner or lender change during construction. Code officials and third party agencies should not have to keep track of or communicate with anyone other than the permit applicant or permit owner.

#### Department, Municipal, and Third-Party Enforcement for Noncompliance

42. In 403.85 and 403.101, the building code official should maintain copies of residential construction documents, just the same as for commercial construction documents and for the same reasons. Subsequent residential owners and building and fire safety officials can have just as much need for these documents as for commercial buildings.

#### Board of Appeals

43. Minimum requirements for qualifications for members of appeals boards in 403.121 must be set forth to adequately protect the health and safety of the public.

Department Enforcement

44. In 403.141 local governments, fire, and emergency units must have the ability to review and comment on plans for State-owned buildings, if the State expects these units to respond promptly and efficiently in time of need.

**PHRC ALTERNATIVE TO CHAPTER 11 (PHRC)**

45. In the notice of public hearings on page 4210 of the August 24, 2002 Pennsylvania Bulletin, it says the Department intends to use the energy requirements of the International Residential Code (IRC) as one means for determining compliance. However, the United States Department of Energy (DOE) has not determined and does not intend to determine that the energy provisions in the IRC comport with or equal or exceed the requirements in the 2000 International Energy Conservation Code (IECC).

46. Further, the Department has defined only a very limited subset of residential buildings that can use either the IRC or the PHRC. Thus, the Department is segregating only some types of residential buildings for preferred treatment. Then there is the even more dubious question of whether PHRC equals or exceeds the minimum energy requirements set forth in the DOE rules in the Code of Federal Regulations (CFR).

47. As the Department is certainly learning, writing or adopting a building or energy code can be a daunting task. Having long experience developing, writing, administering, and using codes is an important requirement, especially when writing a new set of requirements. I could not find any other building or energy codes, or portions thereof, developed, written, or administered by PHRC, or any staff members, in Pennsylvania, or anywhere else. Nor is there any evidence that PHRC or its staff has ever regularly served on or participated in the national codes or standards committees or development process.

48. If the Department allowed the Pennsylvania Builders Association to sponsor the development and adoption of the PHRC alternative, so too should any other trade association or organization be allowed to sponsor the development and adoption of alternatives. The UCC should make provisions for these alternatives to be considered and adopted, but only after the due process of public review and comment.

49. The preamble on page 4129 says, "New residential construction in this Commonwealth will meet the window glazing requirements of the 'International Code 2000,' in the aggregate." However, no assumptions, analyses, or details are provided to allow independent confirmation of that conclusion. Since both IRC and IECC have limits on the amount of glazing, and PHRC does not, there is serious doubt that this statement can be supported.

50. My requests to the Department and PHRC for copies of the supporting analyses and documentation or for publication of that material on the L&I website or in the Pennsylvania Bulletin have gone unanswered.

51. There are no references in PHRC, so it is not possible to determine the source of the information presented. The technical and economic basis for the requirements in PHRC is not shown or described, nor can they be independently verified. Thus, it is not possible to check PHRC for errors and inconsistencies in the requirements.

52. While MECcheck software from DOE can be used to evaluate and determine compliance with IECC, it cannot be used to evaluate or determine compliance with PHRC. There is no indication that any software for PHRC is being prepared or will be available. Thus, homeowners, designers, builders, and code officials will not be able to use MECcheck or any other software to determine compliance with PHRC.

53. I am inclined to believe that the assumptions that were made favored the conclusions that were reached, without the opportunity for critical review or comment, or the possibility that another

reasonable set of assumptions would have reached a different, less favorable conclusion. I also suspect that the basis for the conclusion was developed by PHRC, without competent responsible independent unbiased peer review. The statement in the preamble also does not say which specific International Code requirements are supposed to be met.

54. The statement on page 4129 that "This alternative... will yield overall energy savings similar to the savings that would be obtained by using other prescriptive methods" does not say that PHRC will equal or exceed the minimum requirements in IECC 2000, as required by DOE in the CFR, or that PHRC will equal or exceed the minimum requirements in IRC. Nor is there any reference or analysis to support that statement. "Similar to" does not necessarily mean "equal to."

55. The citation on page 4210 to the operative Federal Law is not correct. The proper citation is the Energy Policy Act of 1992, 42 USCA 6833.

56. The Federal Law also requires that any building energy code be "developed and updated through a consensus process among interested persons..." which was not done for the PHRC Alternative. Therefore, the PHRC Alternative does not meet the requirements of the Federal Law.

57. The justification for PHRC is also stated on the same page as "Residential builders will not be required to calculate the window-to-wall ratio in new home construction." Giving up energy conservation because builders can't do ten minutes of fifth grade arithmetic for a new house does not support or justify PHRC. Most builders throughout the United States follow the requirements of IECC and/or IRC every day. Not wanting to or being able to do simple arithmetic is not a good reason for builders in Pennsylvania to avoid following the exact same Codes that builders in most states across the country follow every day.

58. On page 4129 it says that the U. S. Department of Energy Pacific Northwest National Laboratory (PNNL) "found that the PHRC alternative had slightly more stringent standards for some building designs and slightly less stringent standards for other buildings." The PNNL report number PNNL-13439, dated February 2001 looked at an early draft version of PHRC, and not the final version proposed here for adoption. Some quotes from the PNNL report say:

"If equivalency must be achieved on a house-by-house basis, then the PHRC proposal should be rejected because it clearly falls short of the IECC for some house designs."

"Does every new house have to use equal or less energy than would result from compliance with the IECC?" "If the answer to this question is yes, then the PHRC proposal clearly does not comply with the IECC."

"If builders use this compliance path this way, (when less stringent than IECC) the IECC plus the PHRC alternative would not meet the IECC on a statewide average."

"The PHRC proposal does not ensure that houses will be built with a reasonably good level of energy efficiency."

59. The PHRC Alternative and options apply to the IRC. However, the IECC applies to all covered buildings, including residential. Thus, the PHRC options do not comply with the minimum requirements of the IECC, nor do they comply with the minimum requirements of the Federal Rules adopted in the CFR under the 1992 Federal Energy Policy Act, 42 USCA 6833.

60. Every other code or standard proposed for adoption or reference by the Department have regular and routine provisions and means for the public to get interpretations, to review, propose changes, comment on proposals by others, and appeal to higher authority. There are no means available to the public for updating, interpreting, changing, challenging, or appealing the PHRC Alternative. Therefore, PHRC is not comparable to the ICC Codes or other standards, which provide the public with the opportunity and ability to propose changes and deletions, and to appeal the content and requirements

before they are adopted and enforced. There are also no provisions for interpretations by the PHRC developer after adoption, such as those available from ICC. The Department has usurped the ability of the public to ever have any opportunity to change the PHRC document, or even to correct obvious errors and inconsistencies. The public has been denied due process.

61. Even the ICC has a requirement, with good reason, that they will not reference another standard unless it achieves consensus, and follows ANSI procedures for balance of interests, openness, and due process. The National Fire Protection Association (NFPA) has almost the same requirement. The PHRC Alternative would never even be considered for adoption or reference by ICC or NFPA or any other responsible code writing body. PHRC does not provide any balance of interests, openness, or due process in the development of their Alternative. The Department must reject and completely delete the PHRC Alternative on these grounds alone.

62. It is not possible to independently verify the analyses and conclusions used in the PHRC. While there may be some obscure PHRC reports and studies, they have not been subjected to peer or public review like those in IRC, IECC, and ANSI/ASHRAE/IESNA Standard 90.1 that serve as the basis for the requirements in the ICC Codes. The technical basis used by PHRC has not been published in any authoritative technical journal or presented at a recognized peer reviewed symposium. Therefore, due process was not provided for PHRC.

#### Code for the Conservation of Space Conditioning Energy for Housing in Pennsylvania (PHRC)

63. Despite the unsupported claim to the contrary in the Preface, the minimum requirements for energy conservation in residential buildings in PHRC do not equal or exceed those in either IRC or IECC 2000. The detailed reasons follow.

#### Scope and Compliance

64. The alternative compliance described in Paragraph 1101.5 of PHRC does not have enough detail and information to permit technically accurate and correct alternatives to be demonstrated. For example, overall performance is not defined or described. Does that mean performance for heating, cooling, or both? The PHRC requirement is less stringent than both IRC and IECC.

65. In fact, there are no definitions for any of the terms in the entire document. Without precise definitions it is not possible to determine compliance. For example, what is a mass wall? The PHRC requirement is less stringent than both IRC and IECC.

#### General Considerations

66. In 1102.3 there are requirements for certifications by installers. Only permit applicants and/or owners are responsible to the code official for compliance. If certifications are to be required, they must be made by or through the permit applicant and/or the owner, and should be in writing, signed and dated, to be enforceable.

67. In 1102.3 there are no requirements for markers every 300 square feet showing blown or sprayed insulation thickness for compliance, as are required by both the IRC and IECC. The PHRC requirement is less stringent than both IRC and IECC.

68. In 1102.4.1, compliance with the National Fenestration Rating Council (NFRC) Standard 100 is required. Please see the discussion about NFRC Standards below under IECC 2000. The U factor values for fenestration (glazing and/or windows) in PHRC, IRC, and IECC are based on the methods in NFRC 100-97. Products in the marketplace are no longer rated to that Standard and to the criteria in that Standard. Thus, it will not be possible to buy and install complying fenestration unless separate tests are paid for and conducted using the 1997 Standard.

69. The default U factors in 1102.4.1.1 and Tables 1102.1 (a) and 1102.1 (b) are no longer current

for the same reasons.

### Building Thermal Envelope

70. Both the IECC and IRC have glazing area limits when using the minimum requirements for envelope components using the simplified method of compliance. For one and two family houses the limit is 15% glass, and in townhouses it is 25% glass. If those limits are exceeded, more stringent envelope requirements are required. In IRC, if those limits are exceeded, the IECC requirements must be met. In IECC, if those limits are exceeded, the simplified methods can no longer be used, and either the component performance method or the systems analysis method must be used.

71. Even with the component performance method in IECC the glazing limits are 25% and 30%. However, PHRC has no limits on glazing area when using the minimum envelope requirements. Thus, PHRC allows a 100% glass house to comply. This provision alone disqualifies PHRC from even coming close to equaling the IRC or IECC. The PHRC requirement is less stringent than both IRC and IECC.

72. In 1103.1.1 of PHRC the heat transmission requirements are set forth in Table 1103.1, with separate requirements for one and two family houses and for townhouses. The requirements for one and two family houses are similar to, but not the same as the requirements in IRC and IECC. However, the requirements for townhouses are considerably less stringent than those in IRC and IECC. The requirements for townhouses should at least be the same as those for one and two family houses, just like they are in IRC and IECC. The PHRC requirement is less stringent than both IRC and IECC.

73. The same is true for steel framed walls in 1103.2.4. The PHRC requirement is less stringent than both IRC and IECC.

74. In Exception 1 to 1103.2.1, insulation in walls exposed to unconditioned areas can be reduced to R-13, which is not allowed in either IRC or IECC. Thus, PHRC is less stringent than IRC or IECC.

75. In 1103.2.8 the insulating materials "shall be protected" without any means or methods described or required. The same provision in IECC requires "a rigid, opaque and weather resistant protective covering." The PHRC requirement is less stringent than IECC.

76. In 1103.3, the maximum U factor allowed is 0.39, while the maximum allowed by IRC and IECC is a 0.35 U factor. The PHRC requirement is less stringent than both IRC and IECC.

77. In Tables 1103.3.1 and 1103.3.2 there are many requirements for insulation R-values for which there are no products available in the marketplace. For example, it is not possible to buy R-6.5 insulation board. Insulation products required by the UCC should be readily available in the marketplace.

78. In 1103.4 a reduction to R-30 from R-38 or R-49 is allowed for cathedral ceilings, while not allowed in both IRC and IECC. The PHRC requirement is less stringent than both IRC and IECC.

79. In 1103.5.1, the insulation requirements for floors over a non conditioned space are considerably lower and not nearly the same as in IRC and IECC. The PHRC requirements are much less stringent than both IRC and IECC.

80. For floors with other than wood structural members, the manufacturer's instructions must be followed, even if they have none. The PHRC requirements are much less stringent than both IRC and IECC.

81. In the exception to 1103.6, up to 4 square feet of glazing can be exempted from the minimum requirements. In both IRC and IECC only up to 1 percent of glazing can be exempted. Thus, in most cases, the PHRC requirement is less stringent than both IRC and IECC.

Trade-offs

82. In 1103.7, tradeoffs are allowed for air infiltration and high efficiency equipment. Thus, in addition to users of the UCC having the ability to use PHRC instead of the comparable provisions in IRC or IECC, there are further options available in 1103.7.

83. In 1103.7.1, the ASTM E 779-87 Standard is discontinued and no longer available. Thus, it is not possible to determine compliance to be able to use this tradeoff.

84. If the low air infiltration tradeoff in 1103.7.1 is selected, and the blower door test shows less than 0.35 air changes due to infiltration, the applicant is then allowed to substantially reduce the energy conservation of the windows and walls, or foundations. The window U factors can be increased by 16 to 20%, and the wall insulation requirements can be reduced by 7 to 11%. Neither IRC nor IECC has any comparable provisions for whole house air infiltration or for reductions in window, wall, or foundation thermal requirements. The PHRC requirements are much less stringent than both IRC and IECC.

85. I understand that Federal Law preempts any other efficiency standards for covered equipment, so states cannot set higher efficiencies than those in NAECA for covered equipment without a specific exemption from the Secretary of DOE. Thus, Pennsylvania may be in violation of Federal Law by setting the requirements in Table 1103.6.

86. If the high efficiency equipment tradeoff in 1103.7.2 and Table 1103.6 is selected, the applicant is then allowed to substantially reduce the energy conservation of the windows and walls, or foundations, or basements. Thus, the window U factors can be increased by 16 to 20%, and the wall insulation requirements can be reduced by 7 to 11%. Neither IRC nor IECC has any comparable provisions for high efficiency equipment or for reductions in window, wall, or foundation thermal requirements. The PHRC requirements are much less stringent than both IRC and IECC. This option in PHRC encourages wasting large quantities of energy efficiently with high efficiency equipment.

87. In Table 1103.6, there are no tests or measurement standards included or referenced, against which the efficiency requirements are to be measured. Thus, a manufacturer or contractor could use any set of criteria they wanted to meet these efficiency requirements. Without providing industry standards in this Table, the efficiency requirements are not meaningful.

88. If the option of using Table 1103.6 is chosen with a gas or oil furnace or boiler, there is no minimum cooling efficiency required. Thus, it is possible to use air conditioning equipment with the lowest possible efficiency and still comply. This is hardly the "High Efficiency Equipment Trade-off" that the title of the Table implies.

89. Table 1103.6 discriminates against certain types of fuels and heating systems. By requiring gas and oil fired furnaces and boilers to have 90% AFUE, tilts the fuel and heating system selection toward gas furnaces. However, gas is not available at all locations in Pennsylvania, so other fuels must be used.

90. Gas furnaces at 90% AFUE are readily available at reasonable premium prices. However, gas boilers and oil furnaces and boilers at 90% AFUE are scarce and have significantly higher prices. There are no gas steam boilers available in the marketplace that will meet the 90% AFUE requirement.

91. Only one Pennsylvania gas boiler manufacturer is even able to offer boilers that qualify. All other Pennsylvania gas boiler manufacturers cannot. Few gas boilers made anywhere, except foreign imports, can meet the required AFUE.

92. There are many gas boilers with AFUE's in the mid to upper 80's available, but that will likely not be used due to their higher prices, and the lowest price lowest efficiency boilers available will be selected. Thus, this provision will tend to discourage the use of gas boilers with efficiencies close to

the 90% AFUE required by this option. That does not make common sense.

93. The situation for oil boilers is even worse. Oil boilers meeting the 90% AFUE requirement are only available in two capacities from only one manufacturer. No other boiler manufacturer anywhere in the country makes oil boilers, either hot water or steam, of any capacity with AFUE of 90% or higher. Thus, a house with a requirement for more or less capacity will not be able to get a qualifying oil boiler from any manufacturer.

94. The situation for oil furnaces is impossible. There are not any oil furnaces on the market that meet the minimum requirement to qualify for this option.

95. Many Pennsylvania houses are heated with propane. Yet, those houses will never be able to qualify for this option, since propane furnaces and boilers are not allowed.

96. In the Note for Table 1103.6, it is possible to average the efficiencies of gas furnaces or heat pumps, but not gas or oil boilers or oil furnaces or conventional air conditioners. This is discriminatory and does not even make common sense.

97. Worse still, just the ratings of the equipment in the marketplace will allow lesser efficient equipment to be used, when it would not ordinarily be used. To meet the requirements of any minimum standard with the capacity required, it is usually necessary to select equipment with ratings that are above the minimums, because equipment with ratings exactly matching the minimums is often not made or available. By allowing the averaging, the permit applicant can offset the premium cost of the units that exceed the minimum by using units that are below the minimum required efficiency.

98. The averaging allowed in Table 1103.6 is also not fair or equitable, since it does not consider the size or capacity of the units being averaged. For example, if there are 10 units that are required to meet a SEER of 12, then five of those units could be SEER 14 and five could be SEER 10. However, the five at SEER 14 could be one ton units, and the five at SEER 10 could be five ton units. But the weighted or overall average SEER of all ten units would be below the minimum required. Thus, what may have been well intentioned can be easily and readily be subverted.

99. The tradeoff provision ignores other types of high efficiency HVAC equipment that should be encouraged and allowed for tradeoffs. Geothermal and ground source heat pumps are examples that should be included, since they are far more energy efficient than the equipment in Table 1103.6. High efficiency water heaters and solar water heaters are also readily available. With well insulated and tight houses, the energy used for water heating can equal or exceed that used for space heating. By not including these more efficient types of equipment, you are further and intentionally discouraging their use, since there are no benefits or tradeoffs available. Therefore, the tradeoff provision deliberately puts some of the most efficient HVAC and water heating equipment that should be encouraged, at a distinct disadvantage.

100. There is a good chance that DOE may soon adopt mandatory higher minimum energy efficiency standards for HVAC equipment that could equal or exceed those in Table 1103.6. When and if that happens, builders will automatically have to comply. Thus, the option to reduce the performance of windows and walls, or foundations will be a giveaway, and become the new lower minimum standard to meet. Do not allow that to happen.

101. Therefore, the PHRC tradeoff provisions must be deleted or completely revised, since they do not provide equivalent or better energy efficiency than even the other minimum requirements in PHRC, much less the minimum requirements of either IRC or IECC.

#### Service Systems

102. In 1104.1 of PHRC, any equipment covered by the National Appliance Energy Conservation Act (NAECA) under Federal Law is acceptable. However, there are other types of equipment not covered



by NAECA that are used in residential construction. Some examples of equipment not covered by NAECA are duct furnaces, large oil, gas, and propane fired boilers and furnaces, three phase air conditioning units and heat pumps, packaged terminal air conditioners, and ground and water source heat pumps. In IRC and IECC 2000, these other types of equipment must meet the minimum requirements of the ASHRAE/IES Energy Code. But in PHRC there are no requirements whatsoever. The PHRC requirement is less stringent than both IRC and IECC.

103. There are also some types and sizes of water heating systems that are not covered by NAECA, but that are covered in IRC and IECC. Thus, anyone who opts to use PHRC can avoid meeting minimum efficiency requirements for some types and sizes of electric water heaters, all types of instantaneous water heaters, and all types of pool heaters. The PHRC requirement is less stringent than both IRC and IECC.

104. Where hot water is stored in an unfired tank, such as with gas or oil or propane boilers with summer-winter hookups, there are no requirements for insulating the tanks, as in IRC and IECC. These are also becoming more common, with increasing use of radiant heating systems. The PHRC requirement is less stringent than both IRC and IECC.

105. In 1104 there are no provisions for properly determining the size of the HVAC systems, as in IECC. As a result, it is likely that most HVAC systems will be oversized, and therefore operate less efficiently and more wastefully than properly sized equipment required by IECC. The PHRC requirement is less stringent than IECC.

106. In 1104 there are no provisions for swimming pool heater and pump controls and pool covers, as in IECC. The PHRC requirement is less stringent than IECC.

107. In 1104 there are no provisions for shower water flow limits or for heat traps on water heaters, as in IECC. The PHRC requirement is less stringent than IECC.

108. In 1104 there are no provisions or requirements for electric metering or for efficient lighting, as in IECC. The PHRC requirement is less stringent than IECC.

109. In 1104.2 there are no provisions for the range of temperature settings and deadbands on thermostats, as in IECC. Thus, homeowners can be restricted in how high or low they can set their thermostats when heating or cooling is not needed, and how far apart the heating and cooling settings can be. Not requiring and having these capabilities will restrict the ability of homeowners to conserve heating and cooling energy. The PHRC requirement is less stringent than IECC.

110. Strictly following the requirements of 1104.2 will prevent heat pumps from operating electric heat during the defrost cycles, which will usually occur when the heating load can be met by the heat pump alone. This will cause frequent complaints and great discomfort in the house, as the heat pump will supply very cold air to the house when heat is required, commonly when the outdoor temperature is around freezing. While it is possible to accomplish this requirement, builders will likely not install heat pumps to avoid comfort complaints. Thus, electric resistance heat will likely be installed, which is not usually cost effective.

111. Indeed, the National Association of Home Builders "Residential Construction Performance Guidelines" published in 2000, requires heating systems to be capable of providing 70 degrees at all times, except when superseded by state or local codes. Operation of heat pumps in the defrost cycle without electric heat will almost certainly result in temperatures lower than 70 for at least some periods of time in the winter. There is not another building energy code in the world, even IRC, that prohibits the use of electric heat in the defrost cycle of heat pumps.

112. No limits are placed on humidification and dehumidification systems and humidistats, as in IECC. The PHRC requirement is less stringent than IECC.

113. While duct insulation is in 1104.3, there are no provisions for plenum insulation, as in IECC. The PHRC requirement is less stringent than IECC.
114. There are no provisions for duct construction and air leakage testing, as in IECC. Only the sealing of duct joints is covered in 1104.4. The PHRC requirement is less stringent than IECC.
115. In 1104.5 and Table 1104.5 the pipe insulation thicknesses are greater than IECC for some pipe sizes (and thus uneconomical) and less than IECC for other pipe sizes (and thus inefficient).
116. Also, 1104.5 covers pipe insulation for all mechanical systems, including domestic hot water, and places those requirements in Table 1104.5. However, Table 1104.5 only covers HVAC piping insulation and not domestic hot water pipe insulation. Domestic hot water pipe insulation requirements, equal to those in IECC, must be added.
117. There are no provisions for mechanical ventilation systems and/or means for controlling their operation, as in IECC. The PHRC requirement is less stringent than IECC.
118. Since these provisions in PHRC also can be applied for repairs and replacements, when the type of equipment or system being repaired or replaced is not covered by PHRC, or there are no required industry standards against which performance and efficiency is to be measured, then there are no requirements to be complied with, contrary to IECC. Water heaters and HVAC systems are frequently repaired or replaced. Thus, very substantial energy savings will not be achieved with the PHRC Alternative. The PHRC requirement is less stringent than IECC.

#### PHRC Conclusions

119. If PHRC is the attempt to implement Section 301 (c) of Act 45, which requires "prescriptive methods to implement the energy-related standards of the Uniform Construction Code" it has failed miserably, due to the almost universal disregard for the minimum energy conservation requirements of the UCC, IRC, and IECC, Federal Law, and Federal Rules.
120. PHRC is an invitation to encourage lower quality and less energy efficient construction than in most surrounding states and across the country. For those Pennsylvania municipalities who are now using IECC or IRC or their predecessors, adoption of PHRC is a big step backwards.
121. Under Federal Law and regulations, the residential energy code adopted and enforced in Pennsylvania must equal or exceed the requirements of IECC 2000. PHRC does not even come close. If these PHRC provisions are submitted to the Department of Energy for approval, it is a virtual certainty they will be rejected.
122. I am not aware of any other modern state energy code in the country that allows minimum requirements as low as those are in PHRC.
123. Therefore, since it can and probably will be used for most of the building permits in Pennsylvania, the PHRC Alternative must be either completely deleted or completely rewritten and published again for public comment and public hearings. The PHRC Alternative is not equivalent to the IRC or IECC by any method of measurement or comparison. How anyone can claim the provisions are "equivalent to the provisions of the International Energy Conservation Code (IECC 2000)," as stated in the Preface of PHRC is simply unbelievable. Virtually every requirement in PHRC is less stringent and less energy conserving than those in both the IRC and IECC. With this many deviations from the minimum requirements in the IRC and IECC, the PHRC Alternative appears to be a deliberate and intentional subversion of nationally accepted energy conservation codes and standards.

#### **INTERNATIONAL ENERGY CONSERVATION CODE (IECC)**

124. In Paragraph 403.21 (a) (8) the Department proposes to adopt the 2000 IECC. The proposed

rule requires that all commercial buildings and all residential buildings except detached one and two family homes and townhouses comply with either COMcheckEZ or Chapters 7 or 8 of the 2000 IECC. There are some very serious problems with this proposal.

125. The minimum requirements for energy conservation in the 2000 IECC are taken from or based on those in ANSI/ASHRAE/IES Standard 90.1-1989, which were established in the mid 1980's, almost 20 years ago. Besides being woefully out of date, those requirements are not economically consistent today. Indeed, some requirements in the 1999 and 2001 Standards are less stringent than those in the 1989 Standard are, while most requirements are more stringent. Most importantly, the later Standards use consistent economic criteria across all products, climates, and components of buildings.

126. For economic consistency, ease of use, and improved energy conservation, ANSI/ASHRAE/IESNA Standard 90.1-1999 should be adopted in Pennsylvania, as has already been done by ICC in the 2001 and 2002 Supplements to the ICC Codes. The 1999 Standard has also been adopted and is now being enforced statewide in New York and New Jersey. This can be done by simply adopting the 2001 or 2002 Supplement to the 2000 IECC.

127. The just published NFPA 5000 Building Code has adopted ANSI/ASHRAE/IESNA Standard 90.1-2001.

128. There are still some additional serious problems with the way the Department has proposed adopting IECC.

#### Noncompliance With Federal Laws and Rules

129. First, Paragraph 401.1 defines residential building as:

"Construction that relates to detached on-family and two-family dwellings and multiple single-family dwellings (townhouses) that are not more than three stories in height with a separate means of egress..."

130. Then, 401.1 defines commercial construction as:

"A building, structure or facility that is not a residential building."

131. However, IECC defines residential buildings as:

"Detached one-and two-family dwellings. A building containing multiple (i.e., three or more) dwelling units where the occupants are primarily permanent in nature, such as townhouses, row houses, apartment houses, convents, monasteries, rectories, fraternities and sororities, dormitories, and rooming houses, all of which are three stories or less in height above grade."

132. And IECC defines commercial buildings as:

"All buildings over three stories in height above grade or buildings, other than residential buildings, that are three stories or less in height above grade."

133. Therefore, there are some very basic and fundamental differences in the definitions between the UCC proposed by the Department and the very ICC Codes they propose to adopt. Section 101.3.2 of IECC requires commercial buildings to comply with Chapters 7 or 8 of IECC, which were never intended to include requirements for most types of residential buildings defined by IECC. Yet, the UCC requires those buildings to comply with Chapters 7 or 8 of IECC. This will impose very substantial cost and complexity burdens on all low rise residential buildings that were never intended. For example, the insulation and equipment efficiency requirements for these commercial buildings are not the same as those for residential buildings. In some instances they are more stringent, and in other cases, less

stringent.

134. By requiring these types of residential buildings to comply with the commercial building energy provisions of IECC will disqualify Pennsylvania from complying with the requirements of the 1992 Federal Energy Policy Act and the United States Department of Energy rules in the CFR.

#### Referenced Standards

135. The 2000 IECC requires compliance with the Referenced Standards in Chapter 9. However, some of those standards are obsolete and are no longer used or are not consistent with the values shown in the other chapters in IECC. For example, the Air Conditioning and Refrigeration Institute (ARI) Standards 325-93, 325-93, 340/360-93, and 550/590-98 that are referenced in Chapter 9 of the 2000 IECC have either been superseded by later versions or the values in the Tables that refer to these standards are based on different or prior versions. Thus, it is not possible to buy products today that have been tested and rated to meet the requirements of these obsolete and superseded standards and the values in the Tables.

136. Most of the minimum requirements in the 2000 IECC are based on standards that existed in the early to mid 1980's, most of which have been superseded, or revised or changed in some material way. While IECC has updated most of the referenced standards when the 2000 IECC and Supplements were issued, most of the minimum requirements in the chapters of IECC have remained unchanged since originally established in the late 1980's.

137. When ARI or most standards setting organizations publish new standards, most product manufacturers test and rate their products to the new standards. Thus, one cannot likely buy a piece of equipment today that meets the requirements of a standard like ARI 325-93. Products sold today are tested and rated to meet ARI 325-98.

138. Manufacturers are not going to readily test and rate today's products to obsolete and different standards that existed 15 or 20 years ago, unless paid specially and additionally. Then, there is also the chance that today's products might not meet some provisions or requirements of the earlier standards. To impose these additional and unnecessary burdens and costs on Pennsylvania consumers is simply not reasonable or justified.

139. ASHRAE Standard 62-89 has had dozens of addenda added since 1989 that are not referenced by IECC 2000, and has also been superseded by ASHRAE Standard 62-2001. NFRC Standards 100-97 and 200-95 have been replaced by Standards 100-2001 and 200-2001, both of which use entirely different methods of measurement than their predecessors. Thus, it is not possible to buy products any longer that comply with the NFRC Standards referenced in IECC 2000, unless the manufacturers provide two sets of ratings based on two sets of tests. Besides the resulting confusion, most manufacturers are not likely to spend the money to provide a second set of tests and values for every type and size product they make and sell. Thus, consumers will not readily be able to determine if the products on the market today meet yesterday's standards.

140. Therefore, it will be difficult or impossible or very expensive to properly and completely comply with the rules as proposed by the Department. Designers, contractors, and building officials will put themselves at great risk when designing, furnishing, or approving some products, should noncompliance be found. To responsibly deal with these problems in the IECC will require changing or amending the L&I proposed rules, the standards or the values, or adding provisions exempting or changing some requirements.

#### **ADDITIONAL COMMENTS NOT IN ORDER**

141. In the preamble on page 4129 of the Pennsylvania Bulletin, the Department claims that the PHRC Alternative "provides additional prescriptive methods to demonstrate compliance with 'International Energy Conservation Code' requirements." (Emphasis added) As described in my

numerous comments above, the PHRC is not as stringent as IECC or IRC. Therefore, it is not possible to use PHRC to demonstrate compliance with either IECC or IRC.

142. In that same paragraph in the preamble it implies that MECcheck can be used to demonstrate compliance with PHRC. That is also not correct. MECcheck also cannot be used to demonstrate compliance with IRC. Therefore, methods for demonstrating compliance with both PHRC and IRC must be provided in the rules by the Department.

143. In that same paragraph it also says "the additional prescriptive method for **all other buildings and structures** is found in ... COMcheck." (Emphasis added) However, COMcheck was never intended to and is not capable of providing a prescriptive method of compliance for many covered building types, such as, but not limited to garden apartments, rectories, convents, and dormitories. Therefore, under the provisions of Section 301 (c) of Act 45 that requires prescriptive methods, the Department must provide prescriptive methods for these buildings and structures.

144. Section 301 (c) of Act 45 requires prescriptive methods that "take into account the various climatic conditions throughout this Commonwealth." The Statute does not require **additional** prescriptive methods, contrary to what is stated in the preamble. Delete the PHRC Alternative.

145. Pennsylvania climates range from less than 5,000 heating degree days to more than 7,000 heating degree days, a variation of more than 40%. The PHRC Alternative provides only three climatic zones in Pennsylvania. Three zones are not sufficient to take into account climate variations this wide. Every national or regional building code, standard, and recommended practice for building design and energy conservation includes more than three zones for Pennsylvania. No explanation or justification for having only three zones is provided. More climatic zones must be provided.

146. Using the PHRC climate zones, two houses built almost across the street from each other will be required to have substantially different windows, walls, and ceiling insulation. For example, a house in the northern suburbs of Wilkes Barre requires a ceiling with R-38, while a house in the southern suburbs of Scranton, across the street, requires a ceiling with R-49 insulation, or 29% more insulation. Either the R-49 is economically justified and R-38 wastes energy, or the R-49 is not economically justified. There is no common or economic sense to such a wide difference in requirements. Therefore, if PHRC is to remain, more climate zones must be added to make common sense, economic sense, and to follow nationally accepted practices.

147. Paragraph 1103.7.2 and Table 1103.6 do not allow propane, Pennsylvania coal, or wood heating equipment to be used, the same as gas and oil. These omissions are discriminatory, anti competitive, and illegal, and must be rectified.

148. Paragraph 1103.7.2 and Table 1103.6 do not allow electric convective, electric radiant, or electric storage heating equipment to be used, the same as high efficiency heat pumps. Room by room electric heat, radiant electric heat, or electric heat storage systems can be just as energy efficient and economically efficient as a heat pump, and more so in many instances. For example, most electric heating systems can be operated in only those rooms that are being occupied, while a heat pump must heat the entire house, even though it is not fully occupied. These omissions are discriminatory, anti competitive, and illegal, and must be rectified.

149. In addition, those types of electric heating do not automatically include cooling systems, like heat pumps do, so it is possible that cooling may not even be installed in many houses, saving even more energy and money. While heat pumps may be more theoretically efficient than other types of electric heat, they can end up using more energy than other types of electric heat. Thus, high efficiency electric heat pumps will waste energy efficiently.

150. Paragraph 1103.7.2 and Table 1103.6 do not allow hot water radiant heating systems to be used, except with high efficiency heating equipment. Hot water radiant heating systems with lower efficiency heating equipment can be just as energy efficient as heating systems with the high efficiency equipment

now shown in Table 1103.6. Hot water radiant heating systems usually have multiple zones and also allow comfort to be achieved at lower room temperatures than forced air heat, and thus use measurably less energy. However, builders will not likely install more expensive radiant heating systems if they also must install much more expensive high efficiency boilers as well to be able to use the option in 1103.7.2. Add hot water radiant heat to the allowable high efficiency heating systems, without having the 90% AFUE requirement.

151. Builders who elect to use the option in PHRC paragraph 1103.7.1 are likely to build houses that will threaten the health of the occupants. These houses may not have enough ventilation or infiltration to meet industry minimum standards. By having very low air infiltration, and no ventilation, there very well may not be sufficient outdoor air to dilute contaminants. Low air infiltration can also contribute to and aggravate higher indoor humidity conditions and the growth of mold and mildew, which further compromises the health of the occupants. Since there are no minimum ventilation requirements and no requirements for heat recovery ventilation systems in the proposed rules or referenced documents, no requirements are imposed to mitigate or minimize these potential health problems. Do not promulgate rules that threaten the health of building occupants.

152. Many insurance companies that offer homeowners insurance in Pennsylvania, including mine, are now drastically limiting coverage for mold, or are no longer providing any mold coverage at all. Do not allow building code requirements to increase the potential for the growth of mold, while at the same time insurance coverage for mold is being reduced or eliminated and/or the insurance premiums are being increased if mold coverage is available at all.

153. The description of the options in both PHRC 1103.7.1 and 1103.7.2 allow "The above-grade portions of the building's thermal envelope..." to comply with Table 1103.4. The building thermal envelope means all elements of the exterior of the building, including walls, roofs, ceilings, and floors exposed to exterior weather. However, the heading in that Table for thermal insulation limits the trade off only to the walls. Therefore, it is quite likely that people will not read the Table carefully enough, and they will use the R-values in the Table for all parts of the building thermal envelope, exactly as stated in the text of 1103.7.1 and 1103.7.2. The options must be more clearly described and made consistent with the Table.

154. L&I should propose to adopt the 2003 International Codes, which should be approved two weeks from today and will be available shortly thereafter. We have waited three years for L&I to publish this proposed rule, so waiting another few weeks or months should not be a problem. The 2003 Codes will give us the most refined, up-to-date, state-of-the-art International Codes available. The errors in the First Printing of the First Edition have been fixed.

155. In the alternative, the National Fire Protection Association (NFPA) has just published a new American National Standards Institute approved Building Code, which can be used in lieu of all of the International Code Council Codes. Most building code and fire safety officials in Pennsylvania are already familiar with many of these requirements. This would require action by the Legislature, since the current Law requires adoption of the BOCA Codes, or their successors. Therefore, L&I should evaluate and compare the two sets of Codes, seek public comment, and advise the Legislature if changes in the Law should be made.

156. L&I should delete the PHRC Alternative. Both the NFPA and the International Codes already contain prescriptive methods that account for Pennsylvania climatic conditions and that balance energy savings with construction costs, as required by the Law. My comments above contain extensive details and reasons why the PHRC Alternative should be dropped.

157. With such major changes in the building codes for the design and construction industry about to take place in Pennsylvania, it is more important than ever for our Government to provide us with the most up-to-date comprehensive requirements that can be implemented and enforced to achieve the desired public health and safety. Please do not begin enforcing a statewide building code with antiquated requirements.