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Orig. 08/05

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Kentucky Energy Conservation Workbook
For Residential and Commercial Buildings

Signature of Applicant: _____

Facility Name: _____

Building Name: _____

Project Address: _____

City: _____ County: _____

Project Owner: _____

Address: _____

Phone: _____

Project Architect: _____

Address: _____

Phone: _____

Project Engineer: _____

Address: _____

Phone: _____

Project Coordinator: _____

Address: _____

Phone: _____

Introduction:
This workbook is set up to demonstrate compliance with the 2003 International Energy Conservation Code (IECC). The 2003 IECC can be obtained by calling ICC @ 1-800-786-4452 or try your local library. There are 3 ways to demonstrate compliance for residential buildings and 2 ways to demonstrate compliance for commercial buildings.

The following information is the climate zones and Heating Degree Days (HDD). Please reference this booklet page 7 or page 163 of the 2003 IECC to determine what climate zone (by county) the proposed project is located. The zones and HDD are relevant to the completion of the Tables in this workbook.

Zone 9 (HDD is 4000-4499)
Zone 10 (HDD is 4500 – 4999)
Zone 11 (HDD is 5000 – 5499)

Note* Residential Buildings Greater than 3 Stories shall comply with one of the Commercial Methods

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Method 1 (residential & commercial buildings)

Method 1 is through the World Wide Web. The website is www.energycodes.gov
Upon entering the site please download the 3.0 Versions of Res check (residential compliance) or COM Check-Ez (commercial compliance). Please select from the menu bar "Code" and select the 2003 IECC or ASHREA 90.1, 2001. Go through the program entering all appropriate values under the **Envelope, Lighting and Mechanical** tabs. At the end of this exercise the program will give a pass or fail and percent thereof assessment. Please note that questions can be asked by e-mail under the "Technical support" on the left side of web page.
Compliance Results – The bottom right corner of the screen displays color-coded compliance results as a percentage by which performance is better or worse than the minimum required by the code. For example, a +10.0% in green on white would indicate the proposed design passes the envelope requirements with heating plus cooling loads 10% below the maximum allowed. A -5.0% in red on white would indicate the loads exceed those allowed and must be reduced by roughly 5% to achieve compliance. **Upon the compliance assessment, print out a compliance report which includes Envelope, Mechanical and Lighting requirements and submit to the Planning and Development Department.**

Method 2 (residential only, 3 stories or less)

This method is known as the Prescriptive Method and can be located on pages 7 – 14 of this booklet. The prescriptive method is based on climate zone and subdivided into 1) Single-Family Dwellings, 2) Multi-Family Dwellings. Please select the climate zones (by county) select the appropriate table based on single or multi-family building. Select one of the packages listed. Footnotes for tables are listed on page 8. Packages are determined by the type of heating/cooling equipment and the amount of glazing proposed. **Indicate what package based on zone and type of building is going to be utilized (Multi-Family Dwellings only) and send to the Planning and Development Department.**

Method 3 (residential only, 3 stories or less)

Method 3 is derived from completing Table 502.2.
The following are 4 steps to complete Table 502.2 on page 4 of this workbook.

The purpose of Table 502.2 is to determine what the allowable U-Factors (Heat Loss) is allowed for different components of construction. The actual U-factors that are used in your proposed building shall be equal to or less than the U-factors allowed from Table 502.2.

1) Please indicate the Heating Degree Days in the box provided below (HDD).
2) Select the appropriate column from the table based on the type of structure proposed. 1 & 2 Family Dwelling or R-2, R-4 Occupancies.
3) Walls (refer to Table 502.2(1)) pg. 19, 2003 IECC, based on the heating degree days select the appropriate U-Value. This U-value is determined when the Heating Degree Days (horizontal numbers expressed in thousands at the bottom of graph) intersect the bold line at 1 & 2 Family Dwelling or R-2, R-4 Occupancies.
4) The U-value is the vertical number on the graph at that intersection. Enter that U-value in the appropriate column and box provided on Table 502.2. The formula within this table will give the exact U-factor.
5) Using this same method of determining U-Factors complete the table for all aspects of construction that are applicable to your proposed building using the Tables referenced in Table 502.2 below each element of construction.

1) Turn to page 5 of the workbook (Envelope Design Worksheet for Residential Buildings) and indicate all the U values from Table 502.2 and enter them into the "Required U-factor" under the **Allowable** side of page.
2) Under the **Actual** side of this page indicate the R-value, U-factors, and Area and total the UA for the proposed building for each element of construction. Please note that the ceiling, wall are net areas and do not include doors, windows, skylights etc. **Please note that the R-Values and U-Values for the Actual side of worksheet can be determined by referencing the Appendix pgs. 201-207 of the 2003 IECC.**
3) On the **Actual** side of page for each element of construction (Ceilings, Walls & Floors) take the U-factor and multiply by the area to determine the "UA".
4) Total the area and put this number under the "Total Area" box for each element of construction.
5) Take the Total Area for each element of construction and indicate in the "area" boxes under the **Allowable** side of page.
6) On the **Allowable** side of page multiply the Required U-Factor to determine the "UA" value of each element of construction.
7) Total all UA values from the **Actual** side of page and enter them into the box under "Total Actual UA" at the bottom of page.
8) Total the "UA" from the **allowable** side of page and enter in the box below "Total Allowable UA" at the bottom of page.
9) If the **Actual UA** is equal to or less than the **Allowable UA** then compliance with the 2003 IECC envelope requirements has been achieved. If Actual is greater then adjust the U-values to lower values until the value is less than or equal to the Allowable UA.
10) Fill out cover sheet of workbook. Copy the completed tables on pages 4 & 5.

Method 4 (Commercial Only)

1) Turn to page 6 Envelope Design Worksheet for Commercial Buildings Design by Acceptable Practice.
2) Enter the Proposed Glazing Area in the box provided. The proposed glazing area is computed by the formula provided on top of this page.
3) Enter the table number in which the information will be taken in the box provided at the top of page.
4) Enter the climate zone in the box provided at the top of this page.
5) Turn to the appropriate table to complete this page. The tables utilized to fill out this page will be either 802.2(22) for Zone 9, 802.2(24) for Zone 10, and 802.2(26) for Zone 11.
6) Each of the Tables, 802.2(22), 802.2(24), 802.2(26), are subdivided based on the amount of glazed area. Select the appropriate Table based on climate zone and glazed area.
7) Enter all appropriate R-values and U-values throughout the Table. Note: The PF can be determined by referencing Section 802.2.3, 2003 IECC.
8) Fill out cover sheet and the completed Table on page 6 and complete workbook pages 15 through 17 and submit to the Division of Building Code Enforcement.