PROPOSED CODE CHANGE 12 DCMR I IECC Energy Conservation Code / 2012 Edition ___

PROPONENT: Donald J. Vigneau AIA/Building Energy Code Project
Northeast Energy Efficiency Partnerships, Inc., 91 Hartwell Avenue, Lexington, MA 02421
DATE: January 25, 2013

CODE: IECC ENERGY CONSERVATION CODE COMMERCIAL PROVISIONS [CE], 2012 EDITION

CHAPTER 2[CE] CODE SECTION / TITLE: C202 Definitions

Delete: ~~**BASEMENT WALL.** A wall 50 percent or more below grade and enclosing *conditioned space*~~.

Add: **BELOW-GRADE WALL** A wall 85 percent or more below the average exterior finish grade, enclosing *conditioned space*.

Reason: Basement wall is a term not used in the Commercial portion of the IECC 2012. The percentage is also in error, since there was no 2009 specific code change to modify the Commercial classification of walls. Section **C402.2.2.2 Below-grade walls** requires "…at least 85 percent…."

Cost: There is no construction cost increase for this proposed change.

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CHAPTERS 2[CE] and 4[CE] CODE SECTION / TITLE: C202 Definitions; C402.3.3 Maximum U-factor and SHGC

Amend: FENESTRATION. *Skylights*, ~~roof windows~~ glazed rooftop monitors, vertical windows (fixed or ~~moveable~~ operable), ~~opaque doors, glazed doors,~~ glazed block, glazed and combination opaque/glazed doors. Fenestration includes all glazed products with ~~glass and nonglass glazing~~ their associated assemblies ~~materials~~ intended to transmit visible light.

Add: GLAZING. Glass and other transparent or translucent products that transmit visible light, with associated sash, framing and operating devices.

Add: Rooftop monitor. A roof structure that contains vertical glazing that is not a skylight.

Amend: C402.3.3 Maximum U-factor and SHGC. For vertical fenestration including roof monitors, the maximum *U-factor* and *solar heat gain coefficient* (SHGC) shall be as specified in Table C402.3, based on the window projection factor. For skylights, the maximum *U-factor* and *solar heat gain coefficient* (SHGC) shall be as specified in Table C402.3. (*remainder of section unchanged*)

Reason: 'Rooftop monitors' is used in **Section C402.3.2, Exception 4** to clarify daylighting requirements where they are used to eliminate the use of skylights Additionally, the proposed change coordinates with requirements of ASHRAE 90.1-2010, Section 5.5.4. . The proposed change does not require modification of the definition for 'skylights.'
In the Commercial Requirements 'Fenestration' is not intended to include glass spandrels and other opaque glass products, nor opaque doors. 'Roof windows' and 'nonglass' are undefined terms that are not used in code requirements. 'Moveable' is a vague term, whereas 'operable' has industry-wide usage. Proposed changes to fenestration definition conform to language and requirements in sections **C402.2.7 Opaque doors**, and **C402.3.1.1 Increased vertical fenestration area with daylighting controls**.
'Glazing' is not presently defined in the code, but is an industry term expanding over time to include most transparent and translucent construction materials. It is third of three definitions in Webster's Unabridged Dictionary.

Note: The term 'glazing' should be word-searched and *italicized* in the published editions.

Cost: There is no construction cost increase for this proposed change.

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CODE: IECC ENERGY CONSERVATION CODE RESIDENTIAL PROVISIONS [RE], 2012 EDITION

CHAPTER 4[RE] CODE SECTION / TITLE: Table R402.4.1.1 Air Barrier and Insulation Installation.

Delete: TABLE R402.4.1.1 AIR BARRIER AND INSULATION INSTALLATION

Add: TABLE R402.4.1.1 AIR BARRIER AND INSULATION INSTALLATION as follows:

TABLE R402.4.1.1
AIR BARRIER AND INSULATION INSTALLATION

COMPONENT	AIR BARRIER CRITERIA [a]	INSULATION INSTALLATIONCRITERIA
General Requirements	A continuous air barrier shall be installed in the building envelope. Exterior thermal envelope shall contain a continuous air barrier. Breaks or joints in the air barrier shall be sealed.	Air-permeable insulation shall not be used as a sealing material..
Ceiling / attic	The air barrier in any dropped ceiling/soffit shall be aligned with the insulation and any gaps in the air barrier sealed. Access openings, drop down stair or knee wall doors to unconditioned attic spaces shall be sealed.	The insulation in any dropped ceiling/soffit shall be aligned with the air barrier.
Walls	Junctions of the foundation and sill plate shall be sealed. Junctions of the top plate and top of exterior walls shall be sealed. Knee walls shall be sealed.	Corners and headers shall be insulated. Exterior thermal envelope insulation for framed walls shall be installed in substantial contact and continuous alignment with the air barrier.
Windows, skylights and doors	The space between window/door jambs and framing, and skylights and framing shall be sealed.	
Rim joists	Rim joists shall include the air barrier.	Rim joists shall be insulated.
Floors (including above garage and cantilevered floors)	The air barrier shall be installed at any exposed edge of insulation.	Insulation shall be installed to maintain permanent contact with underside of subfloor decking.
Crawl space walls	Exposed earth in unvented crawl spaces shall be covered with a Class I vapor retarder with overlapping joints taped.	Where provided in lieu of floor insulation, insulation shall be permanently attached to the crawlspace walls.
Shafts, penetrations	Duct shafts, utility penetrations, and flue shafts opening to exterior or unconditioned space shall be sealed.	
Narrow cavities		Batts in narrow cavities shall be cut to fit, or narrow cavities shall be filled by insulation that on installation readily conforms to the available cavity space.
Garage separation	Air sealing shall be provided between the garage and conditioned spaces.	
Recessed lighting	Recessed light fixtures installed in the building thermal envelope shall be sealed to the drywall.	Recessed light fixtures installed in the building thermal envelope shall be air tight, IC rated.

COMPONENT	AIR BARRIER CRITERIA [a]	INSULATION INSTALLATION CRITERIA
Plumbing and wiring		Batt insulation shall be cut neatly to fit around wiring and plumbing in exterior walls, or insulation that on installation readily conforms to available space shall extend behind piping and wiring.
Shower / tub on exterior wall	The air barrier installed at exterior walls adjacent to showers and tubs shall separate them from the showers and tubs.	Exterior walls adjacent to showers and tubs shall be insulated.
Electrical / phone box on exterior walls	The air barrier shall be installed behind electrical or communication boxes, or air sealed boxes shall be installed.	
HVAC register boots	HVAC register boots that penetrate building thermal envelope shall be sealed to the subfloor or drywall.	
Fireplace	An air barrier shall be installed on fireplace walls. Fireplaces shall have gasketed doors	

a. Inspection of log walls shall be in accordance with the provisions of ICC-400

Reason: Table R402.4.1.1 in the 2012 IECC and 2009 IECC includes both air barrier and insulation requirements within a single set of criteria. This creates confusion in the construction of residential housing, as these are different tasks that must be accomplished separately, and the insulation installation accomplished after the visual inspection and testing of thermal envelope air sealing. The proposed change differentiates air barrier criteria and insulation criteria through an additional column to the table to separate the two tasks, and to clarify in which order they must be accomplished to rectify any problems before walls are closed up. Each portion may be performed by separate trades during the construction process. The proposed change clarifies when required envelope air tightness should be tested in the construction process: when corrective actions can most readily be implemented and economically achieved.

No changes were made in the table other than separating the criteria into two narratives; one for air barrier requirements, the other for insulation installation, and renaming the “air barrier and thermal barrier” component (first category) as “general requirements”.

Massachusetts, Rhode Island, Maryland, New York are considering this change for their code updates.

Cost: There is no construction cost increase for this proposed change.

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CODE: IECC ENERGY CONSERVATION CODE PROVISIONS [CE Part I and RE Part II], 2012 EDITION

Part I CHAPTER 4[CE] Part I CODE SECTION / TITLE: C402.2.8 Slabs on grade.

Amend: C402.2.8 as follows:

C403.2.8. Slabs on grade. Where the slab-on-grade is in contact with the ground, the minimum thermal resistance (R-value) of the insulation around the perimeter of unheated or heated slab-on-grade floors, and the minimum thermal resistance of the insulation under heated slab-on-grade floors, shall be as specified in Table C402.2.2. The under-slab insulation shall be placed immediately below required vapor retarders. The perimeter insulation shall be placed on the outside of the foundation or on the inside of the foundation wall. The perimeter insulation shall extend downward from the top of the slab surface for a minimum distance as shown in the table or to the top of the footing, whichever is less, or downward to at least the bottom of the slab and then horizontally to the interior or exterior for the total distance show in the table. Perimeter insulation extending away from the building foundation shall be protected by pavement or by a minimum of 10 inches (254 mm) of soil cover.

Exception: Where the unheated slab-on-grade floor is greater than 24 inches (~~61~~ 610 mm) below the finished exterior grade, perimeter insulation is not required.

Reason: This is a long-neglected source of energy loss in buildings where heated slab-on-grade surface temperatures are maintained at or above 80 degrees Fahrenheit during the heating season. Such slabs may also be used for chilled water to condition spaces in mixed and hot climates where humidity is controlled. Both have significant temperature differences between the heated slab and the ground on which it rests, even as much as the average perimeter foundation differentials. There are no changes to the perimeter foundation insulation requirements for unheated slabs on grade. . The building science information for the location of the vapor retarder layer beneath the slab is included.

Cost: The proposed change will increase the cost of construction.

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Part II CHAPTER 4[RE] Part II CODE SECTION / TITLE: R402.2.9 Slab on-grade floors.

Amend: R402.2.9 as follows:

R403.2.9.Slab-on-grade floors. Slab-on-grade floors ~~with a floor surface less than 12 inches (305 mm) below grade~~ shall be insulated in accordance with Table R402.1.1. Under-slab insulation is required for heated slabs on grade and shall be placed immediately below required vapor retarders. The perimeter insulation shall extend downward from the top of the slab surface on the outside or inside of the foundation wall. Perimeter insulation located below grade shall be extended the distance provided in Table R402.1.1 by any combination of vertical insulation, insulation extending under the slab or insulation extending out from the building foundation. Perimeter insulation extending away from the building foundation shall be protected by pavement or by a minimum of 10 inches (254 mm) of soil cover. The top edge of the insulation installed between the exterior wall and the edge of the interior slab-on-grade shall be permitted to be cut at a 45-degree (0.79 rad) angle away from the exterior wall. Slab-edge insulation is not required in jurisdictions designated by the ~~code official~~ authority having jurisdiction as having a very heavy risk of termite infection.

> **Exception:** Where the unheated slab-on-grade floor is greater than 12 inches (305 mm) below the finished exterior grade, perimeter insulation is not required.

Reason: This is a long-neglected source of energy loss in dwellings where heated slab-on-grade surface temperatures are maintained at or above 80 degrees Fahrenheit during the heating season. Such slabs may also be used for chilled water to condition spaces in mixed and hot climates where humidity is controlled. Both have significant temperature differences between the heated slab and the ground on which it rests, even as much as the average perimeter foundation differentials. There are no changes to the perimeter foundation insulation requirements for unheated slabs on grade. The building science information for the proper location of the vapor retarder layer below the slab is included.

Cost: The proposed change will increase the cost of construction.

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CHAPTER 4[RE] CODE SECTION / TITLE: R402.2.12 Sunroom Insulation.

Amend: R402.2.12 SUNROOM INSULATION as follows:

R402.2.12 Sunroom insulation. All sunrooms enclosing conditioned space shall meet the insulation requirements of this code.

Exceptions: The following exceptions to the insulation requirements of this code for thermally isolated sunrooms shall apply to all building envelope components that do not separate the sunroom from other conditioned space or spaces:

1. The minimum ceiling insulation R-values shall be R-19 in Climate Zones 1 through 4 and R-24 in Climate Zones 5 through 8; ~~and~~
2. The minimum wall R-value shall be R-13 in all climate zones;~~. Wall(s) separating a sunroom with a thermal isolation from conditioned space shall meet the building thermal envelope requirements of this code.~~
3. The minimum floor R-value shall be R-13 in all climate zones.

Reason: There is no separate code requirement for insulating sunroom floors over crawl spaces or open to the outside air. Code officials are either applying the tabular floor insulation requirements in Table 402.1.1 as a default, or not applying any requirement as the condition is not stipulated. R-13 insulation for the floor is proposed to coincide with the wall requirement. It represents better thermal performance for the floor than for the wall condition allowed by these exceptions.
The existing second sentence in Exception #2 is a provision that belongs in R402.2.12 as a limitation on the exceptions. It also needs to include other building components containing conditioned space, such as floor overhangs above or conditioned basement spaces below the sunroom floor, and not just walls.

Cost: There is no construction cost increase for this proposed change.

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CHAPTER 4[RE] CODE SECTION / TITLE: R403.4.2 / Table R403.4.2 Hot water pipe insulation.

Amend: R403.4.2. HOT WATER PIPE INSULATION as follows:

R403.4.2. Hot water pipe insulation (Prescriptive). Insulation for hot water ~~pipe~~ piping with a minimum thermal resistance (R-value) of R-3 shall be applied to the following:

1. – 8. (no changes to these listed conditions)
9. All hot water piping with run lengths greater than ~~the maximum run lengths for the nominal pipe diameter given~~ those allowed in Table 403.4.2.

~~All remaining piping runs shall be insulated to at least R-3 or meet the run lengths of Table R403.4.2~~. Insulation can be interrupted at penetrations through building materials where the annular space is caulked or sealed, but shall be continuous within cavities and inspected prior to being concealed.

Amend: Table R403.4.2 as follows:

TABLE R403.4.2

MAXIMUM UNINSULATED RUN LENGTH (feet)[a]

Nominal ~~Pipe~~ Diameter, in inches, of Largest ~~Diameter~~ Pipe in the Total Run ~~(inches)~~	3/8	1/2	3/4	~~>3/4~~
Maximum Uninsulated Piping Run Length, in ~~(~~feet~~)~~	30	20	10	~~5~~

For SI: 1 inch = 25.4 mm; 1 foot = 304.8 mm

~~a. Total length of all piping from the distribution manifold or the recirculation loop to a point of use.~~

Reason: Section 403.4.2 and its corresponding Table 403.4.2 are internally inconsistent, since Item #1 of the listed conditions requires insulation on all piping greater than ¾ inch diameter, while Table 403.4.2 allows 5-foot uninsulated runs for piping greater than ¾ inch diameter. It has been consistent code interpretation to rely first upon the specific code text as set forth. Since the table does not reflect the same specific requirement approved through code action, the inconsistency needs to be corrected and the last table column deleted.
The last sentence duplicates information set forth in the section, both initially and in Item #9. It is redundant, unnecessary, and the information can be deleted. The proposal adds specific language to insulate piping runs within concealed spaces where not exempted above, which are not addressed in Table 402.4.1.1.
Elimination of Table Note 'a' is proposed because it sets measurements not from a single, readily definable point, but from two points that are not necessarily coincident; either of which may be some distance from the service hot water appliance location. It is subjective, essentially unenforceable, and should be deleted.

Cost: There is no construction cost for this proposed change, as the code requirement in the specific text overrules information contained in the table.