REC2D-4-23

IECC RE: TABLE R405.4.2(1)

Proponents:

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2024 International Energy Code [RE] [RE Project] R3

Revise as follows:

TABLE R405.4.2(1) SPECIFICATIONS FOR THE STANDARD REFERENCE AND PROPOSED DESIGNS
Portions of table not shown remain unchanged.

BUILDING COMPONENT	STANDARD REFERENCE DESIGN	PROPOSED DESIGN
Above-grade walls	Type: mass where the proposed wall is a mass wall; otherwise wood frame.	As proposed
	Gross area: same as proposed.	As proposed
	-factor: as specified in Table R402.1.2.	As proposed
	Solar reflectance = 0.25.	As proposed
	Emittance = 0.90.	As proposed
Basement and crawl space walls	Type: same as proposed.	As proposed
	Gross area: same as proposed.	As proposed
	-factor: as specified in Table R402.1.2 , with the insulation layer on the interior side of the walls.	As proposed
Above-grade floors	Type: wood frame.	As proposed
	Gross area: same as proposed.	As proposed
	-factor: as specified in Table R402.1.2.	As proposed
Ceilings	Type: wood frame.	As proposed
	Gross area: same as proposed.	As proposed
	-factor: as specified in Table R402.1.2.	As proposed
Roofs	Type: composition shingle on wood sheathing.	As proposed
	Gross area: same as proposed.	As proposed
	Solar reflectance = 0.25.	As proposed
	Emittance = 0.90.	As proposed
Attics	Type: vented with an aperture of 1 ft^2 per 300 ft^2 of ceiling area.	As proposed
Foundations	Type: same as proposed.	As proposed

	Foundation wall ~~or slab~~ extenstion above and below grade: same as proposed ~~1 foot (30 cm)~~ ~~Foundation wall or slab extension below grade: same as proposed~~ Foundation wall or slab perimeter length: same as proposed Soil characteristics: same as proposed.	Ala ngth [illegible] Ĉ l’

BUILDING COMPONENT	STANDARD REFERENCE DESIGN	PROPOSED DESIGN
	The mechanical ventilation rate shall be in addition to the air leakage rate and shall be the same as in the proposed design, but not greater than B x M where: B = 0.01 × CFA + 7.5 × (Nbr + 1), cfm. M = 1.0 where the measured air leakage rate is > = 3.0 air changes per hour at 50 Pascals, and otherwise, M = minimum (1.7, Q/B) Q = the proposed mechanical ventilation rate, cfm. CFA = conditioned floor area, ft2. Nbr = number of bedrooms.	The measured mechanical ventilation rate[b], Q, shall be in addition to the measured air leakage rate .
Mechanical ventilation fan energy	The mechanical ventilation system type shall be the same as in the . Heat recovery or energy recovery shall be modeled for mechanical ventilation where required by Section R403.6.1. Heat recovery or energy recovery shall not be modeled for mechanical ventilation where not required by Section R403.6.1.Where mechanical ventilation is not specified in the : None Where mechanical ventilation is specified in the proposed design, the annual vent fan energy use, in units of kWh/yr, shall equal (8.76 × B × M)/ef where: B and M are determined in accordance with the Mechanical Ventilation Rate row of this table. e_f = the minimum fan efficacy, as specified in Table 403.6.2, corresponding to the system type at a flow rate of B × M. = conditioned floor area, ft^2. = number of bedrooms.	As proposed
Internal gains	IGain, in units of Btu/day per dwelling unit, shall equal 17,900 + 23.8 × + 4,104 × where: = conditioned floor area, ft^2. = number of bedrooms.	Same as .
Internal mass	Internal mass for furniture and contents: 8 pounds per square foot of floor area.	Same as , plus any additional mass specifically designed as a thermal storage element[c] but not integral to the or structure.
Structural mass	For masonry floor slabs: 80 percent of floor area covered by R-2 carpet and pad, and 20 percent of floor directly exposed to room air.	As proposed
	For masonry basement walls: as proposed, but with insulation as specified in Table R402.1.3, located on the interior side of the walls.	As proposed

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	For other walls, ceilings, floors, and interior walls: wood frame construction.	As proposedion.
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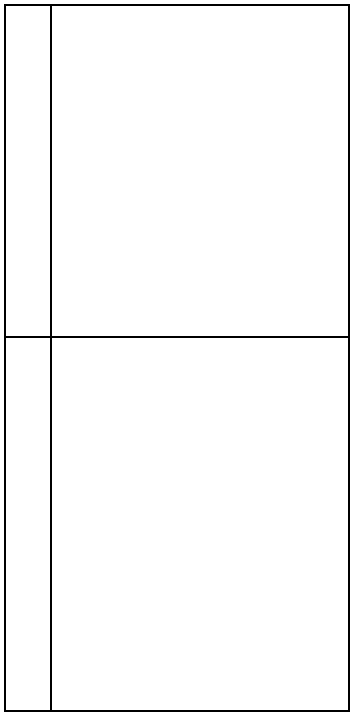

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h.	For residences with conditioned basements, R-2 and R-4 residences, and for townhouse units, the following formula shall be used to determine glazing area:

AF	= × ×
where:	
AF	= Total glazing area.
A_S	= total glazing area.
FA	= (Above-grade thermal boundary gross wall area)/(above-grade boundary wall area + 0.5 × below-grade boundary wall area).
F	= (above-grade thermal boundary wall area)/(above-grade thermal boundary wall area + common wall area) or 0.56, whichever is greater.
and where:	
-	Thermal boundary wall is any wall that separates conditioned space from unconditioned space or ambient conditions.
-	Above-grade thermal boundary wall is any thermal boundary wall component not in contact with soil.
-	Below-grade boundary wall is any thermal boundary wall in soil contact.
-	Common wall area is the area of walls shared with an adjoining dwelling unit.

i.	The factor for the compactness of the hot water distribution system is the ratio of the area of the rectangle that bounds the source of hot water and the fixtures that it serves (the “hot water rectangle”) divided by the floor area of the dwelling. 1. Sources of hot water include water heaters, or in multiple-family buildings with central water heating systems, circulation loops or electric heat traced pipes. 2. The hot water rectangle shall include the source of hot water and the l estr in n

shown by the changes made in this proposal. Please note that while the term “slab” is used in describing the nature of foundation elements in the table, the term “slab-on-grade” is purposefully used when referencing the F-factors in Table R402.1.2. This is because F-factors are only applicable to slabs-on-grade, not slabs below grade (such as a conditioned basement slab or condition crawlspace ground area). In fact, the F-factors for slabs-on-grade are specifically based on a 6” slab edge extension above grade. Slabs that are some distance below grade are addressed in various rating and modeling software, but are not specifically addressed within the minimum criteria in Table R402.1.2. Consequently, if greater specificity in a standard reference design is to be addressed for a slab or foundation wall geometry relative to exterior grade, more work will be needed to properly coordinate this with the prescriptive requirements as well as how these foundation elements are modeled in various software.

Cost Impact:

The code change proposal will neither increase nor decrease the cost of construction.

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The proposal corrects an error by restoring the reference design foundation wall description related to extension above or below grade to the approach currently in the 2021 IECC. Therefore, there is no cost increase or decrease. Although, this could have soft cost benefits by avoiding confusion in modeling and code compliance.