

# **TABLE N1105.4.2(1)-SHAPIRO (590)**

IRC: TABLE N1105.4.2(1)

Proponents:

**2021 International Residential Code**

Revise as follows:

## TABLE N1105.4.2(1) SPECIFICATIONS FOR THE STANDARD REFERENCE AND PROPOSED DESIGNS

Portions of table not shown remain unchanged.

For SI: 1 square foot = 0.93 m<sup>2</sup>, 1 British thermal unit = 1055 J, 1 pound per square foot = 4.88 kg/m<sup>2</sup>, 1 gallon (US) = 3.785 L, °C = (°F – 32)/1.8, 1 degree = 0.79 rad.

- a. Where required by the code official, testing shall be conducted by an approved party. Hourly calculations as specified in the ASHRAE *Handbook of Fundamentals*, or the equivalent, shall be used to determine the energy loads resulting from infiltration.
- b. The combined air exchange rate for infiltration and mechanical ventilation shall be determined in accordance with Equation 43 of 2001 ASHRAE *Handbook of Fundamentals*, page 26.24 and the “Whole-house Ventilation” provisions of 2001 ASHRAE *Handbook of Fundamentals*, page 26.19 for intermittent mechanical ventilation.
- c. Thermal storage element shall mean a component that is not part of the floors, walls or ceilings that is part of a passive solar system, and that provides thermal storage such as enclosed water columns, rock beds, or phase-change containers. A thermal storage element shall be in the same room as fenestration that faces within 15 degrees (0.26 rad) of true south, or shall be connected to such a room with pipes or ducts that allow the element to be actively charged.
- d. For a proposed design with multiple heating, cooling or water heating systems using different fuel types, the applicable standard reference design system capacities and fuel types shall be weighted in accordance with their respective loads as calculated by accepted engineering practice for each equipment and fuel type present.
- e. For a proposed design without a proposed heating system, a heating system having the prevailing federal minimum efficiency shall be assumed for both the standard reference design and proposed design.
- f. For a proposed design home without a proposed cooling system, an electric air conditioner having the prevailing federal minimum efficiency shall be assumed for both the standard reference design and the proposed design.
- g. For a proposed design with a nonstorage-type water heater, a 40-gallon storage-type water heater having the prevailing federal minimum energy factor for the same fuel as the predominant heating fuel type shall be assumed. For a proposed design without a proposed water heater, a 40-gallon storage-type water heater having the prevailing federal minimum efficiency for the same fuel as the predominant heating fuel type shall be assumed for both the proposed design and standard reference design.
- h. For residences with conditioned basements, R-2 and R-4 residences, and for ~~townhouses~~ townhouse units, the following formula shall be used to determine glazing area:

.  $AF = A_s \times FA \times F$

. where:

.  $AF$  = Total glazing area.

.  $A_s$  = Standard reference design 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 points of termination of all hot water fixture supply piping.
  3. The hot water rectangle shall be shown on the floor plans and the area shall be computed to the nearest square foot.
  4. Where there is more than one water heater and each water heater serves different plumbing fixtures and appliances, it is permissible to establish a separate hot water rectangle for each hot water distribution system and add the area of these rectangles together to determine the compactness ratio.
  5. The basement or attic shall be counted as a story when it contains the water heater.
  6. Compliance shall be demonstrated by providing a drawing on the plans that shows the hot water distribution system rectangle(s), comparing the area of the rectangle(s) to the area of the dwelling and identifying the appropriate compactness ratio and *HWDS* factor.

**Reason:** Last cycle, ADM5-19 Part 2 revised the IRC by dividing the term "townhouse" into either "townhouse" for the entire building, or "townhouse unit" for individual dwelling units in a townhouse. Although I had previously reviewed each occurrence of the term "townhouse" in the IRC at that time to make changes that appeared necessary to fully execute the terminology improvement under ADM5-19, I committed to repeat this review when the committee discussed that change. Initially, it was my intent to list each occurrence in the IRC in a public comment last cycle and explain the basis for using one term vs. the other. That time consuming exercise no longer seems necessary, given that the 2021 IRC has since been published with ADM5-19 included based on membership action on a public comment submitted by the Washington Association of Building Officials that overturned the committee recommendation.

Given that the term "townhouse" applies to a structure containing three or more "townhouse units," and by extension, it therefore applies to each individual townhouse unit in a townhouse building, I found only this one section in the IRC requiring further action in my opinion. This review and proposal fulfills my commitment to revisit this issue, and anyone with additional concerns is welcome to contact me to discuss drafting a floor amendment for consideration at the committee action hearing if any other changes are considered necessary.

**Cost Impact:** The code change proposal will neither increase nor decrease the cost of construction. The change is considered to be editorial to update terminology without changing intent or application of the code.