

**INTERPRETATION IC 90.1-2019-7 OF  
ANSI/ASHRAE/IES STANDARD 90.1-2019  
Energy Standard for Buildings Except Low-Rise Residential Buildings**

**Date Approved:** October 13, 2021

**Request from:** Maria Karpman, Karpman Consulting, 78 Eastern Blvd., Glastonbury, CT 06033.

**Reference:** This request for interpretation refers to the requirements presented in ANSI/ASHRAE/IES Standard 90.1-2019, Section 5.5.4.1, regarding the determination of WWR for use with Tables 5.5-0 to 5.5-8.

**Background:** Section 5.5.4.1 General, states that “*Gross wall areas and gross roof areas* shall be calculated separately for each *space conditioning category* for the purposes of determining compliance.” The interpretation questions seek to clarify whether this statement is applicable to Section 5.5.4.2. The ASHRAE 90.1 User Manual for the 2001 and 2004 versions of the Standard explicitly state that when selecting U-factors and SHGC properties of fenestration the fenestration area percentage of each space conditioning category must be considered. Since the language in these sections has remained unchanged it is assumed that this intent has remained unchanged despite the language no longer being in the User Manual. What is unclear is whether the fenestration area limit requirements in Section 5.5.4.2 are also intended to be calculated by space conditioning category or for the entire building. This question is relevant to the interpretation of Appendix G.

Questions 1 and 2 consider a *proposed design* with the following *building envelope*.

<b>Space Conditioning Category</b>	<b>Gross Wall Area</b>	<b>vertical fenestration area</b>	<b>WWR</b>
<i>Nonresidential</i>	10,000 sq.ft.	5,000 sq.ft.	50.0%
<i>Residential</i>	20,000 sq.ft.	6,000 sq.ft.	30.0%
<i>Semiheated</i>	4,000 sq.ft.	0 sq.ft.	0.00%
<i>Total building</i>	34,000 sq.ft.	11,000 sq.ft.	32.4%

**Interpretation No.1:** Section 5.5.4.2 includes requirements that *vertical fenestration* not exceed 40% of *wall* and *skylights* not exceed 3% of *roof* as shown in Tables 5.5-0 to 5.5-8. The second sentence of Section 5.5.4.1 requiring the *gross wall area* and *gross roof area* be calculated separately for each *conditioned space category* is applicable when determining whether *vertical fenestration* or *skylight* limits have been exceeded. The *proposed design building envelope* as described above does not meet the prescriptive requirements of the standard because the *non-residential vertical fenestration area* is > 40% of the *nonresidential wall*.

**Question No.1:** Is this interpretation correct?

**Answer No.1:** Yes

**Comments No.1:** See 5.5.4.1 for clarification, please note however, if the nonresidential space is complying using the Exception to 5.5.4.2.1 (increased street-level fenestration area under a continuous overhang), the window area may be increased.

**Interpretation No.2:** The requirement in Section 5.5.4.2 that “total *vertical fenestration area*” comply with the limits in Tables 5.5-0 to 5.5-8 refers to the sum of the *vertical fenestration area* of each *space conditioning category*. This supersedes the requirements in the second sentence of Section 5.5.4.1. The *proposed design building envelope* as described above meets the prescriptive requirements of the standard because the total *vertical fenestration area* is < 40% of the total *building wall*.

**Question No.2:** Is this interpretation correct?

**Answer No.2:** No

**Comments No.2:** See 5.5.4.1 for clarification, please note however, if the nonresidential space is complying using the Exception to 5.5.4.2.1 (increased street-level fenestration area under a continuous overhang), the window area may be increased.