

# ADDENDA

**ANSI/ASHRAE/IES Addendum bu to  
ANSI/ASHRAE/IES Standard 90.1-2022**

# Energy Standard for Sites and Buildings Except Low-Rise Residential Buildings

Approved by ASHRAE Standards Committee on October 16, 2025; by the American National Standards Institute on November 28, 2025; and by the Illuminating Engineering Society on December 3, 2025.

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## **FOREWORD**

*Addendum bu updates to the language in Table G3.1 #16 based on the requirement in Section 10.4.3.4 of Standard 90.1-2022 that the energy efficiency class of proposed elevators shall be E or better per ISO 25745-2, Table 7. Since Standard 90.1-2016, the energy efficiency class has been required to be reported on design documents, but until Standard 90.1-2022 there was no requirement to specify a particular class or better.*

*ISO 25745-2, Table 7 includes equations for calculating kWh consumption. There is both an in-operation and standby/idle component to the calculation. Normative Appendix G is updated to help modelers develop model inputs, promote methodological consistency across projects, prevent elevator consumption from being modeled higher than justified, and ensure that the standby/idle component of elevator operation is adequately accounted for in the models. This essentially aligns Appendix G requirements with the kWh calculations in ISO 25745-2 based on the energy efficiency class. Because there was no efficiency class requirement prior to Standard 90.1-2022, the baseline requirements were estimated at class F/G. The proposed model would then be modeled with the as-specified energy efficiency class and the kWh calculated accordingly. The elevator motor schedules would be modeled identically across the baseline and proposed.*

**Informative Note:** In this addendum, changes to the current standard are indicated in the text by underlining (for additions) and ~~striketrough~~ (for deletions) unless the instructions specifically mention some other means of indicating the changes.

## **Addendum bu to Standard 90.1-2022**

**Modify Table G3.1 as shown (I-P and SI).**

**Table G3.1 Modeling Requirements for Calculating Proposed Building Performance and Baseline Building Performance**

Proposed Building Performance	Baseline Building Performance
[ ... ]	
<b>16. Elevators</b>	
<p>Where the <i>proposed design</i> includes elevators, the elevator motor, <u>and ventilation fan, and light load</u> shall be included in the model. The cab <u>ventilation fan and lights</u> shall be modeled with the same schedule as the elevator motor.</p> <p><u>The modeled elevator cab annual energy consumption shall be calculated based on elevator consumption coefficients as follows:</u></p> <p>Annual Operating kWh = OpDays × Coeff<sub>1</sub> × Q × n<sub>d</sub> × s<sub>av</sub> / 1,000,000            Annual Standby/Idle kWh = Coeff<sub>2</sub> × t<sub>nr</sub> × (1/1,000)</p> <p>where            OpDays = number of days annually where the building is occupied            Q = rated load of elevator, lbs (kg). <del>Eq. 16.1</del>            n<sub>d</sub> = number of trips per day from Table G3.2.3.17.            s<sub>av</sub> = one-way average travel distance for the installation, ft (m)            = [Average floor to floor height, ft (m) × (Number of floors – 1)] × % of average travel distance from Table G3.2.3.17</p> <p>Coeff<sub>1</sub>,            Coeff<sub>2</sub> = coefficients from Table G3.2.3.16 based on the energy efficiency class of the <u>proposed design</u>.</p> <p>t<sub>nr</sub> = annual nonrunning idle/standby time =            [24 – n<sub>d</sub> / 3600 × (s<sub>av</sub> / v + v / a + a / j + t<sub>d</sub>)] × OpDays</p> <p>where            v = rated speed, ft/s (m/s)            t<sub>d</sub> = time for the opening, opened, and closing times of the elevator doors at the landings, s. Default from Table G3.2.3.18 can be used where unknown.            a = average acceleration, ft/s<sup>2</sup> (m/s<sup>2</sup>). Default from Table G3.2.3.18 can be used where unknown.            j = average jerk, ft/s<sup>3</sup> (m/s<sup>3</sup>). Default from Table G3.2.3.18 can be used where unknown.</p> <p><b>Exception:</b> Where the daily nonrunning (idle/standby) (E<sub>nr</sub>, kWh) and daily running (E<sub>rd</sub>, kWh) energy consumption, determined according to the ISO 25745-2 testing procedure, are available from the manufacturer the annual modeled elevator cab energy consumption shall be modeled based on the following calculations:</p> <p style="text-align: center;">Annual operating kWh = E<sub>rd</sub> × OpDays            Annual standby/idle kWh = E<sub>nr</sub> × OpDays</p> <p><b>Informative Note:</b> The tables and methodology referenced in this section are ©ISO. This material is reproduced from ISO 125745-2:2015 with permission of the American National Standards Institute (ANSI) on behalf of the International Organization for Standardization. All rights reserved.</p>	<p>Where the <i>proposed design</i> includes elevators, the <i>baseline building design</i> shall be modeled to include the elevator cab <u>and ventilation fans, and lighting power</u>.</p> <p>The elevator cab modeled annual energy consumption shall be calculated the same as the <i>proposed design</i>, with Coeff<sub>1</sub> = 0.756 (5.47) and Coeff<sub>2</sub> = 1600. If the exception is used to calculate <i>proposed design</i> annual energy consumption from E<sub>nr</sub> and E<sub>rd</sub>, the baseline shall be calculated using <i>proposed design</i> parameters, and the elevator coefficient equations in the proposed design column.</p> <p>The elevator peak motor power shall be calculated as follows:-</p> $bhp = \frac{(\text{Weight of Car} + \text{Rated Load} - \text{Counterweight}) \times \text{Speed of Car} (33,000 \times h_{\text{mechanical}})}{P_m = bhp \times 746 / h_{\text{motor}}}$ <p>where            Weight of Car = proposed design elevator car weight, lb            Rated Load = the proposed design elevator load at which to operate, lb (kg)            Counterweight of Car = elevator car counterweight, from Table G3.9.2, lb (kg)            Speed of Car = speed of the proposed elevator, ft/min            h<sub>mechanical</sub> = mechanical efficiency of the elevator from Table G3.9.2            h<sub>motor</sub> = motor efficiency from Table G3.9.2            P<sub>m</sub> = peak elevator motor power, W</p> <p>The elevator motor use shall be modeled with the same schedule as the <i>proposed design</i>.</p> <p>When included in the <i>proposed design</i>, the baseline elevator cab ventilation fan shall be 0.33 W/cfm (0.699 W/L.s) <u>and the lighting power density shall be 3.14 W/ft<sup>2</sup> (33.8 W/m<sup>2</sup>); both operate operated continuously.</u></p>
[ ... ]	

**Delete Tables G3.9.2 and G3.9.3 as shown (I-P and SI)**

**Table G3.9.2 Performance Rating Method Baseline Elevator Motor**

Number of Stories (Including Basement)	Motor Type	Counterweight	Mechanical Efficiency	Motor Efficiency <sup>a</sup>
≤4	Hydraulic	None	58%	
>4	Traction	Proposed design counterweight, if not specified use weight of the car plus 40% of the rated load	64%	

a: Use the efficiency for the next motor size greater than the calculated bhp (input kW).

**Table G3.9.3 Performance Rating Method Hydraulic Elevator Motor Efficiency**

Shaft Input Power	Full Load Motor Efficiency for Modeling, %
10 (7.5)	72%
20 (15)	75%
30 (22)	78%
40 (30)	78%
100 (75)	80%

**Add new Tables G3.2.3.16, G3.2.3.17, and G3.2.3.18 as shown (I-P and SI).**

**Table G3.2.3.16 Coefficients for Elevator Consumption Calculations**

Energy Efficiency Class	Coeff <sub>1</sub>	Coeff <sub>2</sub>
A	0.100 (0.72)	50
B	0.149 (1.08)	100
C	0.224 (1.62)	200
D	0.336 (2.43)	400
E	0.505 (3.65)	800
F/G	0.756 (5.47)	1600

**Table G3.2.3.17 Inputs for Elevator Consumption Calculations**

Usage Category	Very Low	Low	Medium	High	Very High	Extremely High
<b>Trips per day (<math>n_d</math>)</b>	50	125	300	750	1500	2500
<b>Number of Stopping Floors</b>	<b>Percentage of Average Travel Distance</b>					
2	1	1	1	1	1	1
3	0.67	0.67	0.67	0.67	0.67	0.67
≥3	0.49	0.49	0.49	0.44	0.39	0.32

**Informative Note:** Below are the buildings typically associated with each usage category in Table G3.2.3.17. Projects should pick the usage category that best aligns with expected building operation.

Usage Category	Very Low	Low	Medium	High	Very High	Extremely High
Typical buildings	<ul style="list-style-type: none"> <li>• Residential building up to six dwellings</li> <li>• Residential care home</li> <li>• Small office or administrative building with few operations</li> <li>• Suburban rail-way stations</li> </ul>	<ul style="list-style-type: none"> <li>• Residential building up to 20 dwellings</li> <li>• Small office or administrative building with two to five floors</li> <li>• Small hotels</li> <li>• Office parking lots</li> <li>• General parking lots</li> <li>• Library</li> <li>• Entertainment centers</li> <li>• Mainline rail-way stations</li> <li>• Stadia</li> </ul>	<ul style="list-style-type: none"> <li>• Residential building with up to 50 dwellings</li> <li>• Medium-sized office or administrative building with up to ten floors</li> <li>• Medium-sized hotel</li> <li>• Airports</li> <li>• University</li> <li>• Small hospital</li> <li>• Shopping center</li> </ul>	<ul style="list-style-type: none"> <li>• Residential building with more than 50 dwellings</li> <li>• Large office or administrative building with more than ten floors</li> <li>• Large hotel</li> </ul>	<ul style="list-style-type: none"> <li>• Very large office or administrative building over 328 ft (100 m) height</li> </ul>	<ul style="list-style-type: none"> <li>• Very large office or administrative building over 328 ft (100 m) height</li> </ul>

**Table G3.2.3.18 Defaults for Elevator Consumption Calculations**

Variable	Description	Default Value	Units
$a$	Acceleration	3.28 (1.0)	ft/s <sup>2</sup> (m/s <sup>2</sup> )
$j$	Jerk	4.1 (1.25)	ft/s <sup>3</sup> (m/s <sup>3</sup> )
$t_d$	Door operation time	8	s

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ASHRAE's short-range goal is to ensure that the systems and components within its scope do not impact the indoor and outdoor environment to a greater extent than specified by the Standards and Guidelines as established by itself and other responsible bodies.

As an ongoing goal, ASHRAE will, through its Standards Committee and extensive Technical Committee structure, continue to generate up-to-date Standards and Guidelines where appropriate and adopt, recommend, and promote those new and revised Standards developed by other responsible organizations.

Through its *Handbook*, appropriate chapters will contain up-to-date Standards and design considerations as the material is systematically revised.

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The effects of the design and selection of equipment and systems will be considered within the scope of the system's intended use and expected misuse. The disposal of hazardous materials, if any, will also be considered.

ASHRAE's primary concern for environmental impact will be at the site where equipment within ASHRAE's scope operates. However, energy source selection and the possible environmental impact due to the energy source and energy transportation will be considered where possible. Recommendations concerning energy source selection should be made by its members.

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