ERRATA SHEET FOR THE USER'S MANUAL TO ANSI/ASHRAE/IESNA STANDARD 90.1-2007 ENERGY STANDARD FOR BUILDINGS EXCEPT LOW-RISE RESIDENTIAL BUILDINGS

December 10, 2009

The corrections listed in this errata sheet apply to all copies of the ANSI/ASHRAE/IESNA Standard 90.1-2007 User's Manual. The first printing is identified on the outside back cover as "90353 PC 8/08" and "Product Code: 90353 8/09" for the second printing. The shaded items have been added since the previously published errata sheet dated May 20, 2009 was distributed.

Page(s)	Erratum
4-2	**Alterations (§ 4.1.1.3).** In the middle column under Alterations (§ 4.1.1.3) change "(see § 4.1.2.3)" to "(see § 4.1.1.5)".
4-6	**Normative Appendices (§ 4.1.7) and Informative Appendices (§ 4.1.8).** 1. Under Normative Appendices in the second column delete the last sentence that reads "Appendix G describes the building performance method". 2. Change the section on Informative Appendices in the second column to read as follows: (Note: Additions are shown in underline and deletions are shown in ~~strikethrough~~.) "The Standard also contains three~~two~~ informative appendices. One appendix (Appendix E) provides references and acknowledges source documents. These~~This~~ informative appendices~~x~~ do~~es~~ not contain requirements that are a part of the standard. The second appendix (Appendix F) describes the addenda from *Standard 90.1-2004~~2001~~* that have~~has~~ been incorporated into 90.1-2007. The third appendix (Appendix G) describes the building performance rating method." (Note: Appendix G is an informative appendix.)
5-26	**Floor Insulation.** In the second column under *Steel-Joist Floors* add the units "Btu/ft^2·°F" after 7.0 for the heat capacity of steel-joist floors.
5-28	**Table 5-F, SHGC Multipliers for Permanent Projections.** In the first column titled "Projection Factor" change all of the inequality signs from less than "<" to greater than ">" to coincide with Table 5.5.4.4.1 of Standard 90.1-2007.
5-34	**Example 5-L - Prescriptive Building Envelope Option, Tucson Supermarket.** In the fifth sentence of the second paragraph of answer "A" change "Exception (c) to § 5.4.4.4.1" to Exception (c) to § 5.5.4.4.1".
5-60 and 5-61	**Above-Grade Wall Classes (§ A3).** In the third column on page 5-60 and the bottom of the first column on page 5-61, under *Mass Walls,* add the units "Btu/ft^2·°F" after 7.0 and 5.0 for the heat capacity of mass materials.
6-8 through 6-11	Pages 6-8 through 6-11 are missing from the user's manual. Page numbering subsequent

to page 6-7 is incorrect, there is NO missing content.

6-13, 6-14 and 6-15 Change all references to "Tables 6.8.1H through M" on pages 6-13 through 6-15 to "Tables 6.8.1H through J".

6-16 and 6-17 Change all references to "Tables 6.8.1A to M" on pages 6-16 and 6-17 to "Tables 6.8.1A to J".

6-18 through 6-40 Correct the following section numbering to coincide with Standard 90.1-2007:

Page 6-18 Zone Thermostatic Controls: In the first column change "(§ 6.4.3.1.1)" to "(§ 6.4.3.1)".

Page 6-18 Independent Perimeter Systems: In the third column change "(Exception to § 6.2.3.1)" to "(Exception to §6.4.3.1.1)".

Page 6-22: At the top of the first column change "*Exceptions to § 6.4.3.2a*" to "*Exceptions to § 6.4.3.3*".

Page 6-23: In the second column change "*Setback Controls (§ 6.4.3.2.2)*" to "*Setback Controls (§ 6.4.3.3.2)*".

Page 6-24: At the bottom of the first column change "*Optimum Start Controls (§ 6.4.3.1.3)*" to "*Optimum Start Controls (§ 6.4.3.3.3)*".

Page 6-24: At the bottom of the second column change "*Zone Isolation (§ 6.4.3.1.4)*" to "*Zone Isolation (§ 6.4.3.3.4)*".

Page 6-24: Example 6-R - Time Controls, Equipment Room Cooling Unit: In the answer "A" to Example 6-R change "Exception (b) to § 6.4.3.2" to "Exception (a) to § 6.4.3.3".

Page 6-25: In the first column change "§ 6.4.3.2.1" to "§ 6.4.3.3.1".

Page 6-26: In the second column change "*Exceptions to § 6.4.3.1.4*" to "*Exceptions to § 6.4.3.3.4*".

Page 6-27: In the first column change "6.4.3.3" to "6.4.3.4" in two places.

Page 6-27: In the second column change

- "Stair and Shaft Vents (§ 6.4.3.3.1);
- Gravity Hoods Vents and Ventilators (§ 6.4.3.3.2);
- Shutoff Damper Controls (§ 6.4.3.3.3); and
- Dampers (§ 6.4.3.3.4)"

to

- "Stair and Shaft Vents (§ 6.4.3.4.1);
- Gravity Hoods Vents and Ventilators (§ 6.4.3.4.2);
- Shutoff Damper Controls (§ 6.4.3.4.3); and
- Dampers (§ 6.4.3.4.4)"

"*Stair and Shaft Vents (§ 6.4.3.3.1)*" to "*Stair and Shaft Vents (§ 6.4.3.4.1)*"

"*Gravity Hoods Vents and Ventilators (§ 6.4.3.3.2)*" to "*Gravity Hoods Vents and Ventilators (§ 6.4.3.4.2)*"

Page 6-27: In the third column change

Top of third column - change "*Shutoff Damper Controls (§ 6.2.3.3.3)*" to "*Shutoff Damper Controls (§ 6.4.3.4.3)*".

Bottom of third column - change "*Dampers (§6.4.3.3.4)*" to "Dampers (§ 6.4.3.4.4)" and "§ 6.4.3.3.3" to "§ 6.4.3.4.3".

Page 6-28: At the top of the first column change "(Table 6.4.3.3.4 in the Standard)" to "(Table 6.4.3.4.4 in the Standard)".

Page 6-28: In the second column change

"*Ventilation Fan Controls (§ 6.4.3.3.5)*" to "*Ventilation Fan Controls (§ 6.4.3.4.5)*"

""Section 6.4.3.2.1" to "Section 6.4.3.3.1"

"**Heat Pump Auxiliary Heat (§ 6.4.3.4)**" to "**Heat Pump Auxiliary Heat (§ 6.4.3.5)".**

Page 6-29: In the second column change

Humidifier Preheat - "§ 6.4.3.5" to "§ 6.4.3.6", two place.

Humidification and Dehumidification - "(§ 6.4.3.6)" to "(§ 6.4.3.7)".

Page 6-29: In the third column, Example 6-U - Off-Hour Isolation Controls, WLHP System, change "§ 6.4.3.1.4" to "§ 6.4.3.3.4".

Page 6-30: At the bottom of the first column change "(§ 6.4.3.7)" to "(§ 6.4.3.8)".

Page 6-30: In the question "Q" of Example 6-V - Heat Pump Auxiliary Heat Control, Two Stage Thermostat, change "§ 6.4.3.4" to "§ 6.4.3.5".

Page 6-31: In the second column under Ventilation Controls for High-Occupancy Areas change "(§ 6.4.3.8)" to "(§ 6.4.3.9)".

Page 6-39: in the second column change

Completion Requirements (§ 6.4.5) - In the second paragraph change "Section 6.2.5" to "Section 6.4.5".

Record Drawings (§ 6.2.5.1) - Change "**Record Drawings (§ 6.2.5.1)**" to "**Drawings (§ 6.7.2.1)**".

Page 6-40: In the first column under **O&M Manuals** change "**O & M Manuals (§ 6.2.5.2)**" to "**Manuals (§ 6.7.2.2)**".

Page 6-42: At the top of the first column under **System Balancing** change "**(§ 6.7.5.3)**" to "**(§ 6.7.2.3)**".

6-21 **Setpoint Overlap Restriction (§ 6.4.3.2).** In the 3rd bullet under Setpoint Overlap Restriction change "§ 6.4.3.1" to "§ 6.4.3.1.1".

6-23 **Example 6-Q - Off-Hour Controls for Radiant Heating and Cooling Systems.** Change Example 6-Q as follows:
(Note: Additions are shown in underline and deletions are shown in ~~strikethrough~~.)

Q
A space is heated or cooled by running hot or chilled water through the radiant ceiling tiles. A 5-hp ventilation fan provides pre-heated and pre-cooled ventilation air to the space from a system with a 2,000,000 – Btu / h heating capacity. Are off-hour controls required for this system?
A
There are really three systems in this example: a radiant heating system, a radiant cooling system, and a ventilation pre-conditioning system. ~~The~~ No setback is required in the radiant heating mode ~~and cooling systems do~~ as the system does not require any off-hour controls per the exception to 6.4.3.3.2. The radiant cooling mode is not excepted in 6.4.3.3.2 and requires the capability to be cycled. The ventilation system would have to comply with 6.4.3.3 since it has sufficient heating / cooling capacity to qualify.

6-38 **Example 6-Z - Insulation, Chilled Water Return Piping.** Change the first full sentence in the answer as follows:
(Note: Additions are shown in underline and deletions are shown in ~~strikethrough~~.)

Chilled water return temperature will be 60˚F at design conditions, so this piping would fall under 6.4.4.1.3 Exception (b)…

6-51 ***Damper Leakage (§ 6.5.1.1.4).*** In the first sentence change "§ 6.4.3.3.4 (Table 6-B)" to "§ 6.4.3.4.4 (Table 6.4.3.4.4)".

6-52 ***Barometric Relief.*** In the first column of page 6-52 under the heading *Barometric Relief* change "§ 6.4.3.3.3" to "§ 6.4.3.4.3".

6-53 In the second column of page 6-53 change "(See Example 6-**Error! Reference source not found.**)" to "(See Example 6-PP)".

6-53 through 6-55 **Figure 6-N.** Figure 6-N is missing. It is referenced at the bottom of the third column on page 6-53, in the second column of page 6-54, and in the first column of page 6-55. Insert Figure 6-N below (also attached).

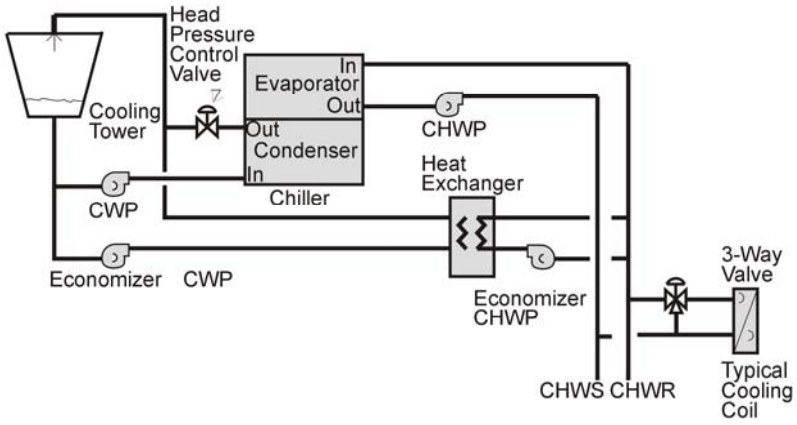

Figure 6-N - Water-Precooling Water Economizer with Three-Way Valves

6-58 ***Exception (a) to § 6.5.2.1.*** In the third column change the first bullet in *Exception (a) to § 6.5.2.1* as follows:
(Note: Additions are shown in underline and deletions are shown in ~~strikethrough~~.)

The volume of outdoor air required to meet the ventilation requirements of ~~6.1.3 of~~ ASHRAE Standard ~~62-1999~~ 62.1-2004 for the zone.

6-59 In the bullet in the first column change the three references to "*Standard 62-1999*" to "*Standard 62.1-2004*" and remove the two references to "Example 6-1" of that standard.

6-59 **Example 6-RR - Economizer Controls with Packaged AC Units.** In the first paragraph of the answer to Example 6-RR change "10.6 EER" to "10.3 EER".

6-60 **Example 6-UU - Simultaneous Heating and Cooling, Exception 5 to 6.3.2.1.** In Example 6-UU change the reference to "*Standard 62-1999*" to "*Standard 62.1-2004*" and delete the reference to "(Equation 6-1)" of that standard.

6-63 **Simultaneous Heating and Cooling in Dehumidification Systems (§ 6.5.2.3).** Change the first bullet under Simultaneous Heating and Cooling in Dehumidification Systems as follows:
(Note: Additions are shown in underline and deletions are shown in ~~strikethrough~~.)

- The system is capable reducing supply air volume to 50% or less of the design flow rate, or to the minimum ventilation rate specified in ~~6.1.3 of~~ ASHRAE *Standard 62.1-2004~~62-1999~~*, whichever is larger, before simultaneous heating and cooling takes place.

6-68 **Fan Power Limitation (§ 6.5.3.1).** Completely replace page 6-68 with the attached. Example 6-BBB (Fan System Design Requirements, Laboratory Fume Hoods, Local

	Exhaust) was inadvertently omitted from the user's manual. In addition, some text was omitted and other text was incorrectly inserted in Example 6-CCC (Fan System Design Requirements, Laboratory Fume Hoods, Central Exhaust). There were a few other problems but they have been corrected with the complete replacement of page 6-68. **Note that the "∑" should be located in front of the "PD x CFM/4131" term rather than in front of the "0.0013".**
6-73	**Example 6-III - Calculation of Fan Power Energy, Floor-by-Floor System.** In the last sentence of the answer in Example 6-III delete "; see also Example 6-**Error! Reference source not found."**
6-79	In the third paragraph of the second column change "§ 6.3.5" to "§ 6.5.5.2".
6-88	In the first column under **Systems Worksheet** change "(§ 6.4.3.2.1)" to "(§ 6.4.3.3.1)".
HVAC Simplified Approach Option (Compliance Form)	**HVAC Simplified Approach Option Part I.** Change item (b) under **Requirements** in the first column as follows: (Note: Additions are shown in underline and deletions are shown in ~~strikethrough~~.) (b) Cooling (if any) is provided by a unitary packaged or split-system heat pump or air-conditioner that is either air-cooled or evaporatively cooled and meets the efficiency requirements shown in Table 6.8.1 A, B or D. List equipment in the table below.
HVAC Mandatory Provision (Compliance Form)	**HVAC Mandatory Provision Part II, Page 1.** Change the reference under **Special Mandatory Requirements**, first bullet, from "(§ 6.4.3.7)" to "(§ 6.4.3.8)".
HVAC Mandatory Provisions (Compliance Form)	**HVAC Mandatory Provision Part II, Page 2.** Change the **Systems Worksheet (§ 6.4)** references in column one of the table as follows: Automatic Shutdown (§ 6.4.3.2.1) to (§ 6.4.3.3.1) Setback Controls (§ 6.4.3.2.2) to (§ 6.4.3.3.2) Setup Controls (§ 6.4.3.2.2) to (§ 6.4.3.3.2) Optimum Start (§ 6.4.3.1.3) to (§ 6.4.3.3.3) Zone Isolation (§ 6.4.3.1.4) to (§ 6.4.3.3.4) Shutoff Dampers (§ 6.4.3.3.3) to (§ 6.4.3.4.3) Heat Pump Aux heat (§ 6.4.3.4) to (§ 6.4.3.5) Humidifier Preheat (§ 6.4.3.5) to (§ 6.4.3.6) Humidification / Dehumidification Deadband (§ 6.4.3.6) to (§ 6.4.3.7) Ventilation Control (§ 6.4.3.8) to (§ 6.4.3.9) Duct / Plenum Insulation (§ 6.4.4.2.1) to (§ 6.4.4.1.2)
HVAC Prescriptive Requirements (Compliance Form)	**HVAC Prescriptive Requirements Part III, Page 1.** In the first bullet in the second column under **Prescriptive Air-System Requirements** change "(§ 6.5.2.3)" to "(§ 6.5.2)".
HVAC	**HVAC Prescriptive Requirements Part III, Page 1.** In the last bullet under

Prescriptive Requirements (Compliance Form)

Prescriptive Water-System Requirements (third column) change "System pumps greater than 10 hp..." to "System pumps greater than 50 hp...".

7-17

Service Water Heating Compliance Documentation (Compliance Form). In the Combination Space and Water Heating Worksheet (§7.5.1), third and fourth columns, change "≤" (less than or equal) to "<" (less than) in five places in each of the two columns column.

9-2

Changes in Lighting Requirements. Change the first bullet as follows:
(Note: Additions are shown in underline and deletions are shown in ~~strikethrough~~.)

- The additional power allowance for spaces with ~~for~~ video display terminals was deleted.

9-2

Scope (§ 9.1.1). In the third paragraph add a new sentence as follows:
(Note: Additions are shown in underline and deletions are shown in ~~strikethrough~~.)

After that, either the building area or space-by-space method may be used to determine the interior lighting power allowance. Alternatively, the Energy Cost Budget method in Section 11 can be used to show whole building compliance including lighting.

9-2

Applying the Standard. Add the following after the third sentence in the first bullet and revise the next sentence as shown:
(Note: Additions are shown in underline and deletions are shown in ~~strikethrough~~.)

Interior lighting trade-offs are allowed among all space types as long as the total building connected lighting load does not exceed the total building LPD allowance. Exterior lighting ~~T~~trade-offs are allowed only among the exterior lighting applications listed in the Tradable Surfaces section of Table 9.4.5.

9-6

Space Control (§ 9.4.1.2). In the first column on page 9-6 change the first sentence in the first full paragraph as follows:
(Note: Additions are shown in underline and deletions are shown in ~~strikethrough~~.)

In certain types of classrooms, conference/meeting rooms, and employee...

9-6

Exterior Lighting Control (§ 9.4.1.3). Change the first sentence in the third paragraph as follows:
(Note: Additions are shown in underline and deletions are shown in ~~strikethrough~~.)

~~For l~~Lighting systems intended...

Change the fourth paragraph as follows:

All timeswitches used to meet this requirement shall have battery backup, flash memory or other means to retain time settings and programming information for at least 10 hours during a loss of power.

9-7 **Tandem Wiring (§ 9.4.2).** In the second column add the following sentence to the first paragraph under Tandem Wiring so it reads as follows:
(Note: Additions are shown in underline and deletions are shown in ~~strikethrough~~.)

Tandem Wiring (§ 9.4.2)

This section applies to luminaires with lamps greater that 30 Watts. A single conventional two-lamp fluorescent ballast (electromagnetic) is more efficient than two separate one-lamp ballasts. The Standard limits the use of one-lamp electromagnetic ballasts by requiring that adjacent fluorescent luminaires use a technique called tandem wiring.

9-16 **Space-by Space Method (§ 9.6).** Change the first sentence in the third column as follows:
(Note: Additions are shown in underline and deletions are shown in ~~strikethrough~~.)

Space types are eligible for additional power allowances for decorative lighting~~,~~ and retail display lighting~~, and areas with visual display terminals~~.

9-17 **Example 9-J - Interior Lighting Power Allowance, Space-by-Space Method.** In the list at the bottom of Example 9-J, under Retail building type, change the last two values in the LPD column as follows:

Total/Weighted Average *1.53~~1.85~~*
Whole Building Total *1.22~~1.33~~*

9-18 **Additional Interior Lighting Power (§ 9.6.2).** In the first sentence of the first full paragraph of the third column change "timeclock" to "time switch".

9-18 **Decorative Lighting.** In the third column under Decorative Lighting change "howevervzp" to "however" in the third sentence.

9-19 **Retail Display Lighting.** Change the second paragraph as follows:
(Note: Additions are shown in underline and deletions are shown in ~~strikethrough~~.)

~~The additional allowance~~Any additional allowance over the base allowance of 1,000 watts depends on the type of retail display area, as described below.

9-25 **Example 9-U - Interior Lighting Power Allowance, Tenant Improvement.** At the bottom of Example 9-U change "otals" to "Totals".

9-36 **Additional Interior Connected Lighting Power.** In the first full sentence at the top of the third column change "§ 9.6.3" to "§ 9.6.2".

9-36 Prior to the **Exterior Building Lighting Power Allowance (Tradable Lighting Applications)** instructions in the third column add the following instructions:

Interior Lighting Compliance Test
Each of the conditions in this table must be met for interior lighting systems to comply. The interior lighting power complies if the total interior connected lighting power plus

	the total additional interior connected lighting power allowance is less than or equal to the total interior lighting power allowance plus the total additional interior lighting power allowance. All or a portion (or none) of the additional interior lighting power allowance can be used to achieve compliance. However, the additional allowances calculated for both decorative and (retail) display applications cannot exceed the lighting wattage to which it would apply.
Pages 1-4 of Lighting Compliance Documentation	**Lighting Compliance Documentation.** Replace the Lighting Compliance Documentation forms at the end of Section 9 with the attached. See also Interactive 90.1-2007 Compliance Forms in PDF format at http://www.ashrae.org/technology/page/97.
11-6	**Simulation General Requirements.** In the first column of page 11-6 replace "**Error! Hyperlink reference not valid..**" with the following link: http://www.eere.doe.gov/buildings/tools_directory
11-34	**Mechanical.** Change the last full paragraph at the bottom of the third column as follows: (Note: Additions are shown in underline and deletions are shown in ~~strikethrough~~.) To define the air-handling system for the budget building, answer these four questions and consult Figure 11-F (Figure 11.3.2 in the Standard) and Table 11-C ~~**Error! Reference source not found.**~~ (Table 11.3.2A in the Standard).
11-34	**Tables 11-I and 11-J.** Table 11-I and Table 11-J are superimposed on one another. Replace with Tables 11-I and 11-J attached.
G-28	**Example G-J – Baseline Building Peak Fan Power.** In the first sentence in the answer, **A,** change "136.5 hp" to "156 hp".
G-30	*Type and Number of Chillers (§ G3.1.3.7).* Change the last sentence as follows: (Note: Additions are shown in underline and deletions are shown in ~~strikethrough~~.) In this case at least two equally sized centrifugal chillers are always modeled, but additional equally sized chillers are added as necessary so that all chillers are 800 tons or~~are~~ smaller, and after complying with this size limit, using the fewest number of chillers possible.
G-38	**Building Performance Rating Method Case Study.** In the first column under *Cooling and Heating Equipment Efficiency* change Table 6.2.1A and Table 6.2.1D to Table 6.8.1A and Table 6.8.1D, respectively.

cleaning device at fan system design conditions.

Heat Recovery Device. Heat recovery devices exchange heat between the outside air intake stream and the exhaust air stream. They are common for 100% outside air systems and in colder climates. There are two common types of heat recovery devices: heat wheels and run-around coils. Both increase the pressure and require a system with a larger brake horsepower.

Additional brake horsepower is based on the rated pressure drop of the air cleaning device at fan system design conditions.

Evaporative humidifier/cooler in series with another cooling coil. Additional pressure drop is allowed for systems that provide humidification or evaporative cooling in addition to conventional cooling coils.

Additional brake horsepower is based on the rated pressure drop of the air cleaning device at fan system design conditions.

Sound Attenuation Sections. Sound attenuation is needed to help isolate fan noise in many applications. The type of sound attenuation section that is credited by the standard is a passive system. A section of the duct is lined with sound attenuation materials that absorb noise, but increase friction. Active sound attenuation sections (noise cancelling devices) do not qualify for this section.

A credit equivalent to 0.15 in. w.c. is allowed for qualifying sound attenuation sections.

Example 6-BBB—Fan System Design Requirements, Laboratory Fume Hoods, Local Exhaust

Q

Four laboratories each contain three exhaust fume hoods, and each hood is capable of exhausting air at the rate of 400 CFM. Supply air is introduced to each laboratory at the rate of 1600 CFM and a general exhaust of 400 cfm serves each room. The total supply fan volume is 6,400 CFM and the total general exhaust volume is 1,600 CFM. Each exhaust hood has a one-half horsepower motor operating at a brake horsepower of 0.30 bhp. The constant volume air handler serving the laboratories uses a 5 hp supply fan that operates at 3.2 bhp and a 1 hp exhaust fan serves the space and operates at 0.6 bhp. The system has fully ducted exhaust and an exhaust air control device is installed to maintain a constant negative pressure in the laboratories. Does this system comply with the fan power requirements of §6.5.3.1?

A

Exception 6.5.3.1.1 c. allows exhaust air fume hoods to be excluded from the fan power calculations, however, in order to exclude the fume hoods, no pressure drop adjustment may be taken for this volume of air. The allowed bhp for the system is 7.35 bhp as calculated below:

$$\text{bhp} = \text{CFM}_S \times \sum 0.0013 + \frac{\text{PD} \times \text{CFM}}{4131}$$

$$= 6{,}400 \times 0.0013 + \left(\frac{-1.0 \times 4{,}800}{4131} + \frac{0.5 \times 1{,}600}{4131} \right) = 7.35 \text{ bhp}$$

Example 6-CCC—Fan System Design Requirements, Laboratory Fume Hoods, Central Exhaust

Q

If the building in the previous example were served by a common exhaust fan instead of individual exhaust fans for each laboratory, would the system still comply with the standard?

A

Yes, Exception 6.5.3.1.1c still applies, except in this case, it can be applied to the entire exhaust, not just the individual exhaust from each laboratory.

$$\text{bhp} = \text{CFM}_S \times \sum 0.0013 + \frac{\text{PD} \times \text{CFM}}{4131}$$

$$= 6{,}400 \times 0.0013 + \left(\frac{-1.0 \times 6{,}400}{4131} \right) = 6.77 \text{ bhp}$$

Since the design brake horsepower is 3.2 + 0.6 = 3.8, which is lower than the allowed 6.77 bhp, this system would comply with the fan power requirements of the standard.

Lighting Compliance Documentation

Project Name:	
Project Address:	Date:
Designer of Record:	Telephone:
Contact Person:	Telephone:
City:	

Mandatory Provisions Checklist

Automatic lighting shutoff controls are provided based on either a scheduling device or an occupant sensor.

- ❑ Exception: Space is intended for 24-hour operation.
- ❑ Exception: Space is smaller than 5,000 ft².
- ❑ Exception: Space for patient care.
- ❑ Exception: Space where automatic lighting shutoff would endanger safety or security.

- ❑ Each space enclosed by ceiling-height partitions has an independent, accessible control that operates general lighting in the space.
  - ❑ Exception: The control is located in a remote location for safety or security reasons.
- ❑ For spaces less than or equal to 10,000 ft², a separate space control is provided for each 2,500 ft² of area.
- ❑ For spaces more than 10,000 ft², a separate space control is provided for each 10,000 ft² of area.
- ❑ Either a photosensor or an astronomical time switch controls exterior lighting applications.
  - ❑ Exception: Lights must remain on for safety, security or eye adaptation reasons.

- ❑ Two-lamp tandem-wired ballasts.
- ❑ Display lighting has a separate control.
- ❑ Case lighting has a separate control.
- ❑ Hotel/motel guest rooms have a master switch at the main entry.
- ❑ Task lighting has a separate control.
- ❑ Nonvisual lighting has a separate control.
- ❑ Demonstration lighting has a separate control.
- ❑ Exit signs do not exceed 5 W per face.
- ❑ Exterior building grounds luminaires greater than 100 W have lamps with minimum efficacy of 60 lumens/W.
  - ❑ Exception: Luminaire is activated with a motion sensor.

Interior Lighting Power Allowance (Building Area Method)

Building Type	Lighting Power Density (W/ft²)	Building Area (ft²)	Lighting Power Allowance (W)
		Total	

Interior Lighting Power Allowance (Space-by-Space Method)

Space Type	Common/Specific Space Type	Lighting Power Density (W/ft²)	Space Area (ft²)	Lighting Power Allowance (W)
			Total	

Lighting Compliance Documentation

Project Name:	
Contact Person:	Telephone:

Interior Connected Lighting Power

ID	Luminaire Description (including number of lamps per fixture, watts per lamp, type of ballast, type of fixture)	Type						Number of Luminaires	Watts/ Luminaire	Total Watts
		Incandescent	Fluorescent	HID	Line-Voltage Track	Low-Voltage Track	Other			
		❍	❍	❍	❍	❍	❍			
		❍	❍	❍	❍	❍	❍			
		❍	❍	❍	❍	❍	❍			
		❍	❍	❍	❍	❍	❍			
		❍	❍	❍	❍	❍	❍			
		❍	❍	❍	❍	❍	❍			
		❍	❍	❍	❍	❍	❍			
		❍	❍	❍	❍	❍	❍			
		❍	❍	❍	❍	❍	❍			
		❍	❍	❍	❍	❍	❍			
									Total	

Additional Interior Lighting Power Allowance

Space ID	Space Name (include merchandise type for retail sales areas)	Type		Area (ft²)	Unit Allowance (W/ft²)	Allowance (W)	Luminaire ID's	Installed Power (W)
		Decorative	Display Lighting					
		❍	❍					
		❍	❍					
		❍	❍					
		❍	❍					
		❍	❍					
		❍	❍					
		❍	❍					
		❍	❍					
			(Add 1000 (W) if any additional retail display allowance is claimed)					
							Total	

Project Name:	
Contact Person:	Telephone:

Additional Interior Connected Lighting Power

ID	Luminaire Description (including number of lamps per fixture, watts per lamp, type of ballast, type of fixture)	Type: Incandescent	Fluorescent	HID	Line-Voltage Track	Low-Voltage Track	Other	Number of Luminaires	Watts/ Luminaire	Total Watts
		❍	❍	❍	❍	❍	❍			
		❍	❍	❍	❍	❍	❍			
		❍	❍	❍	❍	❍	❍			
		❍	❍	❍	❍	❍	❍			
		❍	❍	❍	❍	❍	❍			
		❍	❍	❍	❍	❍	❍			
		❍	❍	❍	❍	❍	❍			
		❍	❍	❍	❍	❍	❍			
		❍	❍	❍	❍	❍	❍			
									Total	

Interior Lighting Compliance Test

Total Interior Lighting Allowance (building or space method) (Watts)		Total Additional Interior Lighting Power Allowance (Watts)		Total Interior Connected Lighting Power (Watts)		Total Additional Interior Connected Lighting Power Allowance (Watts)
	+		≥		+	

Additional Interior Lighting Power Application (decorative or display)	Total Additional Interior Lighting Power Allowance (Watts)		Total Additional Interior Connected Lighting Power Allowance (Watts)
		≤	
		≤	
		≤	
		≤	

Lighting Compliance Documentation

Exterior Building Lighting Power Allowance (Tradable Lighting Applications)

Application	Allowance	Area or Length (ft² or ft)	Tradable Power Allowance
		Tradable Power Allowance	

Exterior Building Lighting Power Allowance (Non-Tradable Lighting Applications)

ID	Application	Allowance per Unit	Area or Length or Quantity	Non-Tradable Power Allowance
			Non-Tradable Power Allowance	

Additional Unrestricted Exterior Lighting Power Allowance

Tradable Power Allowance (Watts)		Non-Tradable Power Allowance (Watts)			Additional Unrestricted Lighting Power Allowance (Watts)
(	+	)	X 0.05	=	

Exterior Connected Lighting Power (Tradable Applications)

ID	Luminaire Description (including number of lamps per fixture, watts per lamp, type of ballast, type of fixture)	Number of Luminaires	Watts/ Luminaire	Total Watts
			Total	

Exterior Connected Lighting Power (Non-Tradable Applications)

ID	Non-Tradable Application	Luminaire Description (including number of lamps per fixture, watts per lamp, type of ballast, type of fixture)	Number of Luminaires	Watts/ Luminaire	Total Watts

Exterior Lighting Compliance Test

	Tradable Power Allowance (Watts)		Additional Unrestricted Lighting Allowance to be Applied (Watts)		Tradable Connected Lighting Power (Watts)
		+		≥	

Non-Tradable Application	Non-Tradable Power Allowance (Watts)				Non-Tradable Connected Lighting Power (Watts)
		+		≥	
		+		≥	
		+		≥	

	Total Additional Allowance Applied (sum of above) (Watts)		Additional Unrestricted Lighting Power Allowance (Watts)
		≤	

Table 11-I—Comparison of Proposed and Budget Window Solar Heat Gain Coefficients

Space Category	*Orientation*	*Wall Area*	*Window Area*	*Window-Wall-Ratio*	*Proposed U-Value/SHGC*	*Budget U-Value/SHGC*
Residential	North	6,600	1,202		1.22/0.82	0.65/0.25
	Non-North	30,360	5,389		1.22/0.82	0.65/0.25
Residential total		36,960	6,591	18%		
Nonresidential						
Retail	North	1,600	534		1.22/0.82	0.65/0.25
Office	North	3,200	1,000		1.22/0.43	0.65/0.25
Retail	Non-North	4,293	2,920		1.22/0.82	0.65/0.25
Office	Non-North	8,587	2,054		1.22/0.43	0.65/0.25
Nonresidential total		17,680	6,508	37%		

Table 11-J—Comparison of Proposed and Budget Lighting Power

		PROPOSED		BUDGET	
Area Description	*Area*	*Watts*	*LPD*	*Watts*	*LPD*
Parking	15,700	3,925	0.25	4,710	0.30
Retail	11,300	15,594	1.38	16,950	1.50
Office	27,000	31,320	1.16	27,000	1.00
Apartment units	43,600	71,940	1.65	71,940	1.65
Multi-family hallway	5,600	4,480	0.80	3,920	0.70
Totals	103,200	127,259	1.23	124,520	1.21

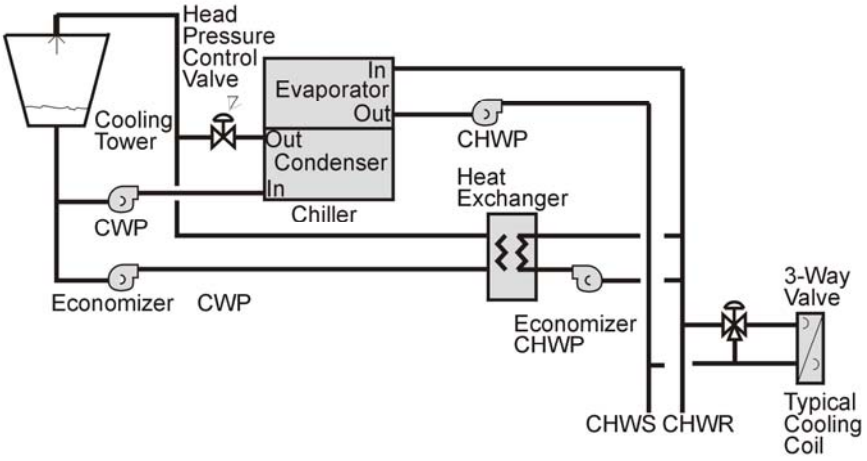

Figure 6-N - Water-Precooling Water Economizer with Three-Way Valves