

A-57.11 (1) (f) It is the intent of this subsection that each living unit needs only one means of exit from within the unit and that the entire building be provided with no less than 2 exits.

A-59.14 (2) (c) EXIT DISTANCE. See the information and illustration contained in A-54.02 (4).

A-60.19 (4) The standard is available from the National Fire Protection Association, Batterymarch Park, Quincy, Massachusetts 02269.

A-60.35 Class A fires are fires in ordinary combustible materials such as wood, cloth, paper, rubber, and many

plastics. Class B fires are fires in flammable liquids, gases and greases.

A-60.36 (1) (a) See A-60.19 (4).

A-62.25 (1) CLEARANCE LIMITATIONS. The intent is to require the minimum 7 feet 0 inches clearance only in traffic lanes and in all areas normally used by the public to leave from and return to their vehicles.

A-62.50 FIRE EXTINGUISHERS. See A-51.22 for related information.

BUILDING ENVELOPE PLAN CHECK DOCUMENTS

This section describes the forms and procedures for documenting compliance with the envelope energy efficiency requirements of the code. It does not describe the details of the requirements; these are presented in the code. Determination of code compliance will be based on the actual code section. The following discussion is addressed to the designer preparing construction documents and compliance statements and to the plan reviewers who are examining those documents for compliance with the code.

The use of each form is briefly described below. The complete instructions for each form are presented in the following subsections.

E-1: Envelope Summary.

This information is required for every project.

E-2: Fenestration Worksheet.

Used only for the Component Standards and System Standards methods. This worksheet produces area-weighted average values for the Fenestration U-Value and Shading coefficient (SC_x). For the System Standards method of s. ILHR 63.16, one of these worksheets should be completed for each orientation. (It is not necessary to fill this out if there is only one Fenestration U-Value and Shading Coefficient for the entire project.)

E-3: Opaque Surfaces Worksheet.

This worksheet is used only for the Component Standards method and System Standards method. This worksheet produces the area-weighted average values for the U-values of roof, walls (including opaque doors), and floor assemblies. For the System Standards method, one of these worksheets should be completed for each orientation.

E-4: Skylight Exemption Worksheet.

This information will only be required when skylights are to be exempt from the roof area thermal performance calculation.

ENVELOPE SUMMARY E-1

This worksheet is applicable to all projects.

Project Information

This information asks for the project name and address and those people responsible for the building design and compliance forms.

Compliance Approach

Check one of the three boxes:

Component Standards:

If this box is checked, provide the number of the region in which the building is located from Figure 63.15-2 of the code and the Alternate Component Package (ACP) Table letter.

System Standards:

If this box is checked, provide the computer printout or other documentation of envelope compliance and E-1 form.

System Analysis Design:

If the project is demonstrating compliance through the System Analysis Design method, check this box. A complete analysis must be provided.

Basic Requirements

Fill the boxes in this column with either a check mark or "X" to indicate a positive response or "N/A" to indicate a negative response. If the skylight exemption is marked (see "Special Considerations"), attach the Skylight Exemption Worksheet (E-4).

Prescriptive/Performance Requirements

If the project is demonstrating compliance through the Component Standards method, all of these items must be completed. The area-weighted properties such as components U-values and fenestration SC_x are obtained from the Fenestration Worksheet (E-2) and Opaque Surfaces Worksheet (E-3). The items under "Requirements" are obtained from the ACP Table.

If the System Standards method is used (e.g., ASHRAE's ENVSTD Program), only the items in the "Design" column need to be completed. Where there is more than one of a particular assembly, enter all of the values.

If the System Analysis Design method (e.g., ASHRAE's Energy Cost Budget method) is used, the items in the design column should be filled in, where applicable, to speed the plan review.

Worksheets

Indicate which worksheets are attached. None of the specified worksheets should be used if the project is demonstrating compliance through the System Analysis Design method. Additional blanks are provided to indicate attached calculations such as calculation of mass wall heat capacity or interpolations of tables.

FENESTRATION WORKSHEET E-2

This worksheet is applicable to projects that demonstrate compliance through the Component Standards method or the System Standards method. It is not applicable to projects that demonstrate compliance through the System Analysis Design method.

Project Information

A box for basic project information and identification of the document author is provided in the upper part of this form. This should match the information contained in the Basic Project Information section of the Envelope Summary (E-1) form.

Area-Weighted Properties

Assembly ID: Insert a descriptor of the particular assembly. A separate ID must be supplied for each group of assemblies that have unique U-values or shading coefficients.

Area: Enter the Total area (in ft²) for that fenestration assembly (glazing and frame) on a project-wide basis. For the System Standards method, this would be the area for that assembly on an orientation basis. The values from all entries in this column should be summed into the box marked "Total Area" at the bottom of the column.

U-Value (or shading coefficient, SC_x): Enter the appropriate property for each fenestration assembly (glazing and frame).

U (or SC_x) • Area: This column is the product of the assembly area (second column) by the fenestration U-value (or SC_x from the third column). The values from all entries in this column should be summed into the box marked "Total U•A" at the bottom of the column.

The area-weighted U-value (or SC_x) is calculated by dividing the value in "Total U•A" by the value in "Total Area."

OPAQUE SURFACES WORKSHEET E-3

This worksheet is applicable to projects that demonstrate compliance through either the Component Standards method or System Standards method. It is not applicable to projects that demonstrate compliance through the System Analysis Design method.

Project Information

A box for basic project information and identification of the document author is provided in the upper part of this form. This should match the information contained in the Basic Project Information section of the Envelope Summary (E-1) form.

Assembly ID: Insert a descriptor of the particular assembly. This may be a descriptor or number from the appropriate schedule in the plans. A separate item must be supplied for each group of assemblies that have unique U-values.

Area: Enter the Total area (in ft²) for that assembly (wall, roof, or floor) on a project-wide basis. For the System Standards method, this would be the area for that assembly on an orientation basis. The values from all entries in this column should be summed into the box marked "Total Area" at the bottom of the column.

U-Value: Enter the appropriate property for each assembly. Overall thermal transmittance of assemblies must be calculated in accordance with s. ILHR 63.18. The calculation procedure must consider the effect of framing.

If skylights are installed, they must be included in the overall U-value calculation of the roof unless an exemption is obtained under s. ILHR 63.12. A skylight exemption worksheet (E-4) must be included.

U•Area: This column is the product of the assembly area (second column) by the assembly U-value. The values from all entries in this column should be summed into the box marked "Total U•A" by the value in "Total Area."

The area-weighted U-value is calculated by dividing the value in "Total U•A" by the value in "Total Area."

SKYLIGHT EXEMPTION WORKSHEET E-4

This worksheet is applicable when skylights are exempt from the roof area overall U-value calculation per the requirements of ILHR 63.12. It may be used with any method of compliance.

Project Information

A box for basic project information and identification of the document author is provided in the upper part of this form. This should match the information contained in the Basic Project Information section of the Envelope Summary (E-1) form.

Skylight Exemption Worksheet

All of the boxes except the item marked "Special Consideration" (50% shading device credit) must be filled in with a check or "X" to indicate affirmation. The 50% shading device credit box must be filled in with either a check, "X," or "N/A."

All of the "Design" and "Requirement" information must be completed. The skylight-to-roof ratio requirement is the maximum percent of skylight area taken from ASHRAE 90.1, Tables 8-3a and 8-3b of Table A63.12. The maximum area will depend on the visible light transmittance (VLT) and whether or not shading is provided for the skylight.

The lighting power density may be taken from the allowed lighting power density from s. ILHR 63.47, 63.48, or 63.49, or the actual installed lighting power density adjusted for controls under s. ILHR 63.45 (2) may be used.

The design lighting level, in foot-candles, is the judgment of the designer, but should be in general agreement with the recommendations of the Illuminating Engineering Society. (Refer to the IES Lighting Handbook, application volume, 1987.) The designer should choose the lighting level in the table closest to the condition in the proposed building. Interpolation or extrapolation for lighting level is not permitted.

ENVELOPE SUMMARY

E-1



Project Information		Submitter's Name	
Owner's Name		Date	
Building Location (Number & Street)	City	Village	Township of

Compliance Approach Component Standards (See ILHR 63.15) System Standards (See ILHR 63.16) System Analysis Design (See ILHR 63.70-72)

Region _____ ACP Table _____
(See Fig. 63.15-2)

	Basic Requirements	Prescriptive/Performance Requirements	Worksheets																												
Fenestration	<input type="checkbox"/> U-values reported on this form are area-weighted averages. ILHR 63.18 (1) <input type="checkbox"/> Windows and doors meet the air infiltration requirements. ILHR 63.11 <input type="checkbox"/> Fenestration U-values are certified by NFRC or from Table 63.18-3. ILHR 63.18 (2)(b) <input type="checkbox"/> Fenestration shading coefficients are obtained from either the 1989 ASHRAE Handbook of Fundamentals or manufacturer's data. ILHR 63.18 (4) <input type="checkbox"/> Exterior joints, cracks, and holes in the building envelope are caulked, gasketed, weather stripped, or otherwise sealed. ILHR 63.11 <input type="checkbox"/> Double entry vestibule? (Optional—check if provided) <input type="checkbox"/> Windows with reflective glazing? (Optional—check if provided)	<table style="width:100%; border-collapse: collapse;"> <tr> <td style="text-align: center;">Fenestration Properties</td> <td style="text-align: center;">Design</td> <td style="text-align: center;">Requirement</td> <td style="text-align: center;">If using Component Standards, see ACP Table Fig. 63.15-2</td> </tr> <tr> <td>Gross wall area (GWA) ILHR 63.05 (28) ILHR 63.18 (2)(b) & (3)</td> <td style="text-align: center;">_____</td> <td style="text-align: center;">_____</td> <td style="text-align: center;">_____</td> </tr> <tr> <td>Fenestration area (FA) ILHR 63.05 (26)</td> <td style="text-align: center;">_____</td> <td style="text-align: center;">_____</td> <td style="text-align: center;">_____</td> </tr> <tr> <td>Window-wall ratio (FA/GWA) ILHR 63.05 (82)</td> <td style="text-align: center;">_____</td> <td style="text-align: center;">≤ _____</td> <td style="text-align: center;">_____</td> </tr> <tr> <td>Fenestration U-value ILHR 63.18 (2)(b)</td> <td style="text-align: center;">_____</td> <td style="text-align: center;">≤ _____</td> <td style="text-align: center;">_____</td> </tr> <tr> <td>Fenestration SCx ILHR 63.18 (4)</td> <td style="text-align: center;">_____</td> <td style="text-align: center;">_____</td> <td style="text-align: center;">_____</td> </tr> <tr> <td>Skylights installed</td> <td style="text-align: center;">___ Yes</td> <td style="text-align: center;">___ No</td> <td style="text-align: center;">_____</td> </tr> </table>	Fenestration Properties	Design	Requirement	If using Component Standards, see ACP Table Fig. 63.15-2	Gross wall area (GWA) ILHR 63.05 (28) ILHR 63.18 (2)(b) & (3)	_____	_____	_____	Fenestration area (FA) ILHR 63.05 (26)	_____	_____	_____	Window-wall ratio (FA/GWA) ILHR 63.05 (82)	_____	≤ _____	_____	Fenestration U-value ILHR 63.18 (2)(b)	_____	≤ _____	_____	Fenestration SCx ILHR 63.18 (4)	_____	_____	_____	Skylights installed	___ Yes	___ No	_____	<input type="checkbox"/> Fenestration Worksheet (E-2) <input type="checkbox"/> Opaque Surfaces Worksheet (E-3) <input type="checkbox"/> Skylight Exemption Worksheet (E-4) <input type="checkbox"/> Marked Up ACP Table <input type="checkbox"/> ENVSTD Output <input type="checkbox"/> _____ <input type="checkbox"/> _____
Fenestration Properties	Design	Requirement	If using Component Standards, see ACP Table Fig. 63.15-2																												
Gross wall area (GWA) ILHR 63.05 (28) ILHR 63.18 (2)(b) & (3)	_____	_____	_____																												
Fenestration area (FA) ILHR 63.05 (26)	_____	_____	_____																												
Window-wall ratio (FA/GWA) ILHR 63.05 (82)	_____	≤ _____	_____																												
Fenestration U-value ILHR 63.18 (2)(b)	_____	≤ _____	_____																												
Fenestration SCx ILHR 63.18 (4)	_____	_____	_____																												
Skylights installed	___ Yes	___ No	_____																												
Exterior Opaque Surfaces	<input type="checkbox"/> U-values reported on this form are area-weighted averages. ILHR 63.18 (1) <input type="checkbox"/> An approved method which accounts for the thermal bridging of framing is used to calculate U-values for envelope assemblies. ILHR 63.18 (2) <input type="checkbox"/> Exterior joints, cracks, and holes in the building envelope are caulked, gasketed, weather stripped, or otherwise sealed. ILHR 63.11 <input type="checkbox"/> Vapor barriers are installed to prevent deterioration of insulation performance. ILHR 63.11 (4) <input type="checkbox"/> Special Consideration The skylight exemption is applied. ILHR 63.12 (Attach Skylight Exemption Worksheet E-4)	<table style="width:100%; border-collapse: collapse;"> <tr> <td style="text-align: center;">Wall Design</td> <td style="text-align: center;">Design</td> <td style="text-align: center;">Requirement</td> </tr> <tr> <td>U-value ILHR 63.18 (2)(a)</td> <td style="text-align: center;">_____</td> <td style="text-align: center;">≤ _____</td> </tr> <tr> <td>Heat capacity (HC) ILHR 63.05 (35) Appendix A63.15 (3)(b)</td> <td style="text-align: center;">_____</td> <td style="text-align: center;">_____</td> </tr> <tr> <td>Insulation position (interior or exterior) ILHR 63.05 (45)</td> <td style="text-align: center;">_____</td> <td style="text-align: center;">_____</td> </tr> <tr> <td style="text-align: center;">U-Values</td> <td style="text-align: center;">Design</td> <td style="text-align: center;">Requirement</td> </tr> <tr> <td>Roof ILHR 63.18 (2)(a)</td> <td style="text-align: center;">_____</td> <td style="text-align: center;">≤ _____</td> </tr> <tr> <td>Walls adjacent to unconditioned space ILHR 63.18 (2)(a)</td> <td style="text-align: center;">_____</td> <td style="text-align: center;">≤ _____</td> </tr> <tr> <td>Floors over unconditioned space ILHR 63.18 (2)(a)</td> <td style="text-align: center;">_____</td> <td style="text-align: center;">≤ _____</td> </tr> </table>	Wall Design	Design	Requirement	U-value ILHR 63.18 (2)(a)	_____	≤ _____	Heat capacity (HC) ILHR 63.05 (35) Appendix A63.15 (3)(b)	_____	_____	Insulation position (interior or exterior) ILHR 63.05 (45)	_____	_____	U-Values	Design	Requirement	Roof ILHR 63.18 (2)(a)	_____	≤ _____	Walls adjacent to unconditioned space ILHR 63.18 (2)(a)	_____	≤ _____	Floors over unconditioned space ILHR 63.18 (2)(a)	_____	≤ _____	<input type="checkbox"/> _____ <input type="checkbox"/> _____				
Wall Design	Design	Requirement																													
U-value ILHR 63.18 (2)(a)	_____	≤ _____																													
Heat capacity (HC) ILHR 63.05 (35) Appendix A63.15 (3)(b)	_____	_____																													
Insulation position (interior or exterior) ILHR 63.05 (45)	_____	_____																													
U-Values	Design	Requirement																													
Roof ILHR 63.18 (2)(a)	_____	≤ _____																													
Walls adjacent to unconditioned space ILHR 63.18 (2)(a)	_____	≤ _____																													
Floors over unconditioned space ILHR 63.18 (2)(a)	_____	≤ _____																													
Below Grade	<input type="checkbox"/> R-values reported on this form for slab-on-grade floors and walls below grade include only the insulating material. ILHR 63.15 (5) and (6) <input type="checkbox"/> Insulation continuity is maintained. ILHR 63.15 (5)	<table style="width:100%; border-collapse: collapse;"> <tr> <td style="text-align: center;">R-Values</td> <td style="text-align: center;">Design</td> <td style="text-align: center;">Requirement</td> </tr> <tr> <td>Walls below grade ILHR 63.18 (2)(a)</td> <td style="text-align: center;">_____</td> <td style="text-align: center;">≤ _____</td> </tr> <tr> <td>Slab-on-grade ILHR 63.18 (2)(a)</td> <td style="text-align: center;">_____</td> <td style="text-align: center;">≤ _____</td> </tr> </table>	R-Values	Design	Requirement	Walls below grade ILHR 63.18 (2)(a)	_____	≤ _____	Slab-on-grade ILHR 63.18 (2)(a)	_____	≤ _____	<input type="checkbox"/> _____ <input type="checkbox"/> _____																			
R-Values	Design	Requirement																													
Walls below grade ILHR 63.18 (2)(a)	_____	≤ _____																													
Slab-on-grade ILHR 63.18 (2)(a)	_____	≤ _____																													

SAMPLE

Personal information you provide may be used for secondary purposes [Privacy Law, s. 15.04 (1)(m)].

FENESTRATION WORKSHEET

E-2



Project Information		Submitter's Name	
Owner's Name		Date	
Building Location (Number & Street)		City	Village Township of

Fenestration Orientation: _____
For System Standards Method

Area-Weighted Properties - ILHR 63.18

Fenestration U-Value (U_{op}) see ILHR 63.18 (2)(b)

Assembly ID	Area	U-Value	U•Area
		X	=
		X	=
		X	=
		X	=
		X	=
		X	=
		X	=
		X	=
Total Area→		Total U•A→	

Total U•A
 Total Area =

Fenestration Shading Coefficient (SC_x) see ILHR 63.18 (4)

Assembly ID	Area	SC_x	$SC_x \cdot Area$
		X	=
		X	=
		X	=
		X	=
		X	=
		X	=
		X	=
		X	=
Total Area→		Total $SC_x \cdot A$ →	

SAMPLE

Total $SC_x \cdot A$
 Total Area =

Personal information you provide may be used for secondary purposes [Privacy Law, s. 15.04 (1)(m)].

OPAQUE SURFACES WORKSHEET

E-3



Project Information		Submitter's Name	
Owner's Name		Date	
Building Location (Number & Street)		<input type="checkbox"/> City	<input type="checkbox"/> Village <input type="checkbox"/> Township of

Exterior Wall Orientation: _____
For System Standards Method

Area-Weighted Properties - ILHR 63.18

Roofs see ILHR 63.18 (2)(a)

Assembly ID	Area	U-Value	U•Area
		X	=
		X	=
		X	=
		X	=
Total Area→		Total U•A→	

SAMPLE

Total U•A
Total Area =

Walls Adjacent to Unconditioned Spaces see ILHR 63.18 (2)(a)

Assembly ID	Area	U-Value	U•Area
		X	=
		X	=
		X	=
		X	=
Total Area→		Total U•A→	

Total U•A
Total Area =

Above Grade Exterior Walls see ILHR 63.18 (2)(a)

Assembly ID	Area	U-Value	U•Area
		X	=
		X	=
Aboveground foundation		X	=
		X	=
Total Area→		Total U•A→	

Total U•A
Total Area =

Floors Over Unconditioned Spaces see ILHR 63.18 (2)(a)

Assembly ID	Area	U-Value	U•Area
		X	=
		X	=
		X	=
		X	=
Total Area→		Total U•A→	

Total U•A
Total Area =

Personal information you provide may be used for secondary purposes [Privacy Law, s. 15.04 (1)(m)].

SKYLIGHT EXEMPTION WORKSHEET

E-4



Project Information		Submitter's Name	
Owner's Name		Date	
Building Location (Number & Street)	City	Village	Township of

Skylight Exemption Requirements see ILHR 63.12			Documentation
<input type="checkbox"/> U-values of skylight curbs are less than 0.21 Btu/hr•ft ² •°F.	Skylight Design U-value	Design Requirement _____	<input type="checkbox"/> ENVSTD output
<input type="checkbox"/> Overall thermal transmittance of skylight assemblies is less than 0.70 Btu/hr•ft ² •°F.	Gross roof area (GRA)	_____	<input type="checkbox"/> Calculation of allowed skylight percent.
	Skylight area (SA)	_____	
	Skylight-to-roof ratio (SA/GRA)	_____ ≤ _____	
<input type="checkbox"/> Air leakage is less than 0.5 cfm/ft ² of skylight.			<input type="checkbox"/> Sketch of shading devices.
<input type="checkbox"/> Automatic daylighting controls installed to reduce electric lighting to 50%.	Skylight U-value	_____	
	Skylight VLT	_____	
<input type="checkbox"/> Special Consideration Shading devices used to block 50% of the solar gain during peak cooling conditions.	Lighting power density (LPD)(ft ²)	_____	
	Design lighting level (fc)	_____	

SAMPLE

Personal information you provide may be used for secondary purposes [Privacy Law, s. 15.04 (1)(m)].

HVAC SYSTEMS PLAN CHECK DOCUMENTS

This section describes the forms and procedures for documenting compliance of Heating, Ventilation and Air Conditioning (HVAC) system with the energy efficiency requirements of the code. It does not describe the details of the requirements; these are presented in the code. Determination of compliance will be based on the actual code section. The following discussion is addressed to the designer preparing construction documents and compliance statements, and to the plan reviewers who examine those documents for compliance with the code.

Note: These forms cannot be used to demonstrate compliance with the Ch. ILHR 64 ventilation requirements. That information must be provided separately.

The use of each form is briefly described below. The complete instructions for each form are presented in the following subsections.

H-1: HVAC Systems Summary.

This information is required for every project.

H-2: HVAC Prescriptive Worksheet.

This information is applicable to projects that demonstrate compliance through a prescriptive means by following the requirements of Subchapter IV. It is not applicable to projects that demonstrate compliance through the System Analysis Design method of ss. ILHR 63.70-72.

H-3: HVAC Equipment Summary.

This information is required for every project.

HVAC SYSTEMS SUMMARY H-1

This worksheet is applicable to all projects

Project Information

This information asks for the project name and address and those people responsible for the HVAC design and compliance forms. The project name and address must match the information given on the building envelope forms. Check the box as indicated if the System Analysis Design method will be used to show compliance.

Basic Requirements Check List

All of the boxes in this column must be filled with either a check or "X" to indicate affirmation or "N/A" to indicate that the item or issue is not applicable.

Worksheet

If using the System Analysis Design method, the HVAC Prescriptive worksheet (H-2) does not need to be completed. Fill in the box with a check or "X" if it is included.

Special Considerations

Fill in these boxes with a check or "X" where applicable.

HVAC PRESCRIPTIVE WORKSHEET H-2

This worksheet provides detailed information on zone controls and economizer controls. It is not required if the System Analysis Design method is used.

Project Information

A box for basic project information and identification of the document author is provided in the upper part of this form. This should match the information contained in the Basic Project Information section of the HVAC Systems Summary (H-1) form.

Prescriptive Requirements

Each of the requirements is organized in a similar fashion. A major check box certifies compliance with each requirement. Each one of these is followed by a series of minor check boxes that are used to identify exceptions to that requirement. All of the major check boxes must be filled in with either a check, "X," or "N/A." In addition, a check or "X" should be placed in each applicable exception box. On the line adjacent to these exception descriptions, identify the systems or equipment to which the exception applies.

HVAC EQUIPMENT SUMMARY H-3

Project Information

A box for basic project information and identification of the document author is provided in the upper part of this form. This should match the information contained in the Basic Project Information section of the HVAC Equipment Summary (H-1) form.

Equipment Efficiency Information

Each piece of HVAC equipment that has efficiency requirements under ASHARE 90.1 should be listed here. See Code Appendix A63.20 for reprinted standards.

- System ID Number: List the system identification number or zone identification number or other descriptor.
- Unit Type and Category: List the unit type and category from the appropriate table.
- Table Number: Give the table number, Table A63.20-1 through A63.20-15 of the Code Appendix, on which the equipment and its required efficiency are listed.
- Rated Output (Btu/h): This is the unit capacity (heating or cooling as appropriate) at rated conditions. The rating conditions should match those from the reference column of the corresponding table.
- Unit Efficiency: For each unit, list the efficiency of the selected unit at rated conditions on the left and the required minimum efficiency from the corresponding table on the right. Under "Rating Units" place "EER," "IPLV," "ET," etc., as applicable.

HVAC SYSTEMS SUMMARY

H-1



Project Information		Submitter's Name	
Owner's Name		Date	
Building Location (Number & Street)	City	Village	Township of

Check here if using System Analysis Design (see ILHR 63.70-72)

Basic Requirements Checklist		Worksheet
Design	<input type="checkbox"/> Load calculations using hg/clg outside design temperatures given in code or no lower/greater than ASHRAE's 99%/2.5% values or annualized 0.2%/0.5% values. II.HR 63.23 (3)	<input type="checkbox"/> HVAC Prescriptive Worksheet (II-2)
	<input type="checkbox"/> Cooling pull-down/heating pick-up loads were either calculated or did not exceed 10%/30% of design load. II.HR 63.23 (7)	
	<input type="checkbox"/> Equipment is properly sized. II.HR 63.24	
	<input type="checkbox"/> Process loads are served by separate systems from comfort conditioning loads. II.HR 63.25	
	<input type="checkbox"/> HVAC fan and pumping system motors meet efficiency standards. II.HR 63.32	
Controls	<input type="checkbox"/> Temperature controls are provided as required: one for each HVAC system and individual controls for each thermal zone. II.HR 63.26	
	<input type="checkbox"/> Thermostatic controls meet the setpoint adjustment requirements: heating down to 55°F, cooling setpoints up to 85°F, and deadbands of 5°F minimum. II.HR 63.26	
	<input type="checkbox"/> Systems do not reheat, recool or mix air. II.HR 63.27*	
	<input type="checkbox"/> Variable volume systems have minimum stops adjusted as required. II.HR 63.27*	
	<input type="checkbox"/> Each system that does not need to operate continuously is provided with either automatic time or setback/setup controls. II.HR 63.27 (3)	
	<input type="checkbox"/> Ventilation supply systems and exhaust systems are provided with either gravity or motorized dampers as required to limit infiltration during off hours. II.HR 64.19 (5)	
	<input type="checkbox"/> Combustion air dampers provided per s. II.HR 64.09 (2)	
	<input type="checkbox"/> Humidity controls for comfort are adjustable to limits of 30% maximum for humidification and 60% minimum for dehumidification. II.HR 63.28	
Completion & Construction	<input type="checkbox"/> Fan cooling systems employ air or water economizer controls. II.HR 63.31*	
	<input type="checkbox"/> Heat pumps with supplementary heaters have controls to prevent heater operation when heating load can be met by heat pump. II.HR 63.22	
	<input type="checkbox"/> Pipe insulation meets the requirements of II.HR Table 63.29-1. Duct insulation meets the requirements of Table 63.29-2. II.HR 63.29	
	<input type="checkbox"/> The plans or specifications spell out the requirements for leakage testing ductwork. II.HR 64.34	
	<input type="checkbox"/> Low and medium pressure supply ductwork which is located outside of the conditioned space is sealed in accordance with SMACNA Seal Class C. II.HR 64.34	
	<input type="checkbox"/> Complying air and water system balancing procedures are spelled out on the plans or in the specifications. II.HR 64.53	
	<input type="checkbox"/> Testing, adjusting and calibration of control systems is spelled out on the plans or in the specifications. II.HR 64.43 and II.HR 64.53	
<input type="checkbox"/> Plans or specifications require that equipment is provided with operation and maintenance manuals and system schematics. II.HR 64.52		

SAMPLE

Special Considerations:

- Heat recovery utilized
- Continuous system operation required

* If the ASHRAE 90.1 Energy Cost Budget method is used for system analysis design, these items do not have to be met prescriptively. Complete documentation must be provided.

Personal information you provide may be used for secondary purposes [Privacy Law, s. 15.04 (1)(m)]

HVAC PRESCRIPTIVE WORKSHEET **H-2**



Project Information		Submitter's Name	
Owner's Name		Date	
Building Location (Number & Street)	City	Village	Township of

Zone Controls - Constant Volume Systems ILHR 63.27

Systems have controls which prevent simultaneous heating and cooling including: reheat, recool, mixing of heated and cooled airstreams, and simultaneous heating and cooling by separate systems within a zone.

SAMPLE

System or Zone Number or ID

Exceptions

75% of reheat energy is from site-recovered or solar energy (provide documentation).

System serves zones with process-driven humidity requirements.

Multiple reheat systems serving multiple zones with controls or dual duct and multizone systems with controls to reset supply temperatures per Paragraphs (f), (g), or (n).

Zones with a peak supply of 150 cfm or less or multizone systems with reheating or recooling limited to 5,000 cfm or 20%, whichever is less.

Zone Controls - Variable Volume Systems ILHR 63.27

Before reheating or mixing of airstreams, zone controls reduce air supply to a minimum which is no larger than all of the following: 30% of the peak zone airflow, 0.4 cfm/ft², or minimum ventilation flow requirements of ILHR 64.05

System or Zone Number or ID

Exceptions

There is no reheating or mixing of airstreams in these zones.

Pressurization requirements prevent such reduction of airflow (provide documentation).

75% of reheat energy is from site-recovered or solar energy (provide documentation).

System serves zones with process-driven humidity requirements.

Zones with a peak supply of 150 cfm or less or multizone systems with reheating or recooling limited to 5,000 cfm or 20%, whichever is less.

Economizer Controls ILHR 63.31

Fan-cooling systems are equipped with complying air or water economizers.

System Number or ID

Exceptions

System capacity is less than either 2,000 cfm or 62,000 Btuh total cooling for a split system or less than 55,000 Btuh for all other types.

Economizers would not save energy (provide documentation).

Benefit of air economizer would be offset by increased energy use for humidity control.

LIGHTING PLAN CHECK DOCUMENTS

This section describes the forms and procedures for documenting compliance with the lighting energy efficiency requirements of the code. It does not describe the details of the requirements; these are presented in the code. The following discussion is addressed to the designer preparing construction documents and compliance statements and to the plan reviewers who are examining those documents for compliance with the code.

The use of each form is briefly described below. The complete instructions for each form are presented in the following subsections.

L-1: Lighting Summary.

This information is required for every project.

L-2: Exterior Lighting Power Worksheet.

This information is also required for every project.

L-3: Installed Interior Lighting Power Worksheet.

This information is also required for every project.

L-4: Complete Building/Area Category Methods Worksheet

This information will only be required when calculating the Interior Lighting Power Allowance using either the Complete Building Method or the Area Category Method.

L-5: Activity Method Worksheet.

This information will only be required when calculating the Interior Lighting Power Allowance using the activity method.

LIGHTING SUMMARY L-1

The Lighting Summary (L-1) form is in four parts. A copy of these forms must be submitted to the Division along with the rest of the compliance submittal at the time of building plan review.

A. Lighting Summary (L-1) Part 1

Project Information

Part 1 of the Lighting Summary form asks for the project name and address and those people responsible for the lighting design and compliance forms. The project name and address should be the same as on the Building Envelope forms for the project.

Method of Interior Lighting Compliance

Check one of the four boxes:

Complete Building: If this box is checked, the Complete Building/Area Category Methods Worksheet (L-4) must be provided.

Area Category: If this box is checked, the Complete Building/Area Category Methods Worksheet (L-4) must be provided.

Activity: If this box is checked, the Activity Method Worksheet (L-5) must be provided.

Other: If compliance for the project is demonstrated through the System Analysis Design method of ss. ILHR 63.70-72 where all energy-using systems are considered together, check this box. A complete analysis must be provided.

Basic Requirements

All of the boxes in this column must be filled with either a check or "X" to indicate affirmation or "N/A" to indicate not applicable. For exterior lighting, enter the Exterior Lighting Power (ELP) and the Exterior Lighting Power Allowance (ELPA). These are obtained from the Exterior Lighting Power Worksheet (L-2).

Prescriptive/Performance Requirements

Enter the Installed Interior Lighting Power (ILP) and the Interior Lighting Power Allowance (ILPA). The ILP is obtained from the Interior Lighting Power Allowance Worksheet (L-3). The ILPA is obtained from the Complete Building/Area Category Methods Worksheet (L-4) if either the Complete Building Method or the Area Category Method is used. The ILPA is obtained from the Activity Method Worksheet (L-5) if the Activity Method is used. The lighting power control credits box is filled with a check or "X" when control credits are taken, otherwise enter "N/A."

Worksheets

Indicate which worksheets are attached.

B. Lighting Summary (L-1) Parts 2 to 4

Parts 2 to 4 of the Lighting Summary should be used to describe the lighting fixtures and control devices designed to be installed in the building. If necessary, make extra copies of the forms. Use as many sheets as needed for the project. The information on the L-1 parts 2 to 4 forms may be incorporated into equipment schedules on the plans, rather than presented on the forms. If this is done, however, the same information should be included in one schedule and in a similar format as the forms.

Installed Lighting Schedule (L-1) Part 2

- Luminaire Name:** Record the description by name or type as shown on the plans.
- Lamp Type:** Check the type of lamp (Incandescent, Fluorescent or High-Intensity discharge).
- Number of Lamps:** Record the number of lamps per fixture. If track lighting is used and the fixtures are not shown on the plans, the length of track is entered in this column.
- Watts/Lamp:** Record the listed watts per lamp. For track and incandescent medium base socket fixtures, see s. ILHR 63.45 (4) for how to determine the watts of these types of luminaires. If track lighting is used and the fixtures are not shown on the plans, 45 watts per foot of track is entered in this column.
- Ballasts Type:** Record the ballast type—Standard Energy-Saving Magnetic (S), Electronic High Frequency* (E) or Other* (O). If Electronic High Frequency or Other ballast types are used, the exact ballast type and model number should be specified on the plans.
- Number/Luminaire:** Record the number of ballasts installed in each Luminaire.

Mandatory Automatic Controls (L-1) Part 3

The Mandatory Automatic Controls portion is where those devices to meet the mandatory control requirements are listed. This would include devices for building shut-off, individual room control, and control of exterior lights. If some mandatory controls meet the requirements of s. ILHR 63.45 (2), the information should also be recorded on Part 4, Controls for Credit, if control credits are taken in the ILP calculation.

- Control Location:** Record the location of the control on the plans.
- Control Identification:** Record the symbol of the control on the plans.
- Control Type:** Record the type of certified control device used to meet the mandatory automatic control requirement.
- Space Controlled:** Record the location of controlled lights.
Typical controls may be covered by general notation.

Controls for Credit (L-1) Part 4

The Control for Credit portion is similar to the Mandatory Automatic Controls portion. The only difference is the last column.

- Luminaires Controlled:** Record the luminaire type and quantity controlled for credit.
- Type:** Record the same name as on the plans.
- Number of Luminaires:** Record the number of luminaires of that type that are controlled by the control type.
Typical controls may be covered by general notation.

Notes to Field

This space is used by the building department plans examiner to alert the field inspector to look for important inspection items.

EXTERIOR LIGHTING POWER WORKSHEET L-2

This worksheet is applicable to all projects.

Project Information

A box for basic project information and identification of the document author is provided in the upper part of this form. This should match the information contained in the Project Information section of the Lighting Summary (L-1) form.

Exterior Lighting Power Allowance -- ELPA

- Area Description: This is a descriptor of each line. These descriptors match those in ILHR Table 63.43.
- Allowance: This is the allowance in either W/ft² or watts of lineal feet. These allowances match those in ILHR Table 63.43.
- Area or Lineal Feet in Proposed Design: Record the area (ft²) or lineal footage (lf) as appropriate. These values should be project-wide values.
- ELPA: Multiply the allowance from Column B by the area (or lineal footage) from Column C. Record the resultant ELPA in Column D. The values should be summed into the box marked "Total ELPA" at the bottom of the column.

Installed Exterior Lighting Power

Do not include luminaires that are exempted under s. ILHR 63.42.

- Fixture Type: Record the description of the luminaires that are included.
- Number of Luminaires: Record the total number of similar luminaires in the project.
- Watts per Luminaire: Record the input wattage for each luminaire, including the ballast.
- Installed Wattage: Multiply the number of luminaires from Column B by the wattage per luminaire from Column C. Enter the resultant installed wattage in Column D. The values from all entries in the column should be summed into the box marked "Total ELP" at the bottom of the column.

INSTALLED INTERIOR LIGHTING POWER WORKSHEET L-3

The Installed Interior Lighting Power Worksheet (L-3) will be completed and submitted with all applications. Either the Complete Building/Area Category Method Worksheet (L-4), the Activity Method Worksheet (L-5), or System Analysis Design documentation will be included with L-3, depending on the ILPA calculation method chosen.

Project Information

A box for basic project information and identification of the document author is provided in the upper part of this form. This should match the information contained in the Project Information section of the Lighting Summary (L-1) form.

Installed Interior Lighting Power

The calculated interior lighting power to be installed is determined by completing this form. Do not include luminaires that are exempted under s. ILHR 63.45. If necessary, make extra copies of this form. Use as many sheets as needed for the project.

Luminaire Name or ID No.: Record the name or symbol. It should be consistent with what is used in the lighting schedule.

Description: Record a short list of the technical features (i.e., luminaire size and type, lamp type and number, ballast type, lens/louver type).

Number of Luminaires: Record the quantity of each fixture type in the building. If track lighting is used and the fixtures are not shown on the plans, the length of the track is entered in this column.

(Tip: If control credits are to be used and all of any type of luminaires are not controlled or used with the same control, split the luminaries up over several lines, one for each control type.)

Watts per Luminaire: Record the total wattage of each luminaire type (including ballasts for fluorescent or high intensity discharge fixtures). For track and incandescent medium base socket fixtures, see s. ILHR 63.45 (4) for how to determine the watts of these types of luminaires. If track lighting is used and the fixtures are not shown on the plans, 45 watts per foot of track is entered in this column. The wattage may be a standard value from the data in Table A63.45. Nonstandard values not from Table A63.45 must be substantiated with manufacturer's data sheets.

Total Watts: Record the product of the quantity of each luminaire listed times its watts per luminaire. If credit for automatic lighting controls is not sought, the interior lighting power is the sum of this Column E.

LPAF for Automatic Controls: If lighting power control credits are used, enter the appropriate lighting power adjustment factor from Table 63.45. If this credit is not used, leave Columns F, G, and H blank.

Control Credit: Multiply the total watts of luminaires associated with the control of Column E by the LPAF of Column F. Record the resultant control credit in Column G.

Adjusted Watts: Subtract the control credit of Column G from the total watts of Column E. Record the remainder in Column H.

The sum of Column E (or Column H if control credits are used) is the calculated interior lighting power for the building. If more than one sheet is used, enter the total for all sheets. This total cannot be greater than the Interior Lighting Power Allowance calculated on worksheet L-4 or L-5.

COMPLETE BUILDING/AREA CATEGORY METHODS WORKSEET L-4

This worksheet will be attached to L-3 whenever the Complete Building Method or the Area Category Method is used to calculate the Interior Lighting Power Allowance.

Project Information

A box for basic project information and identification of the document author is provided in the upper part of this form. This should match the information contained in the Project Information section of the Lighting Summary (L-1) form.

Interior Lighting Power Allowance

The Interior Lighting Power Allowance (ILPA) is determined by calculating the maximum total watts of lighting that may be installed. As noted on the Lighting Summary, L-1, there are four different methods that may be used. These methods may not be mixed in the same building permit application. This form is used when the ILPA is calculated by the Complete Building or Area Category Method.

Complete Building Method

This method may only be used when plans and specifications for the entire building are included in the application.

Building Type of Use: This is taken from Table 63.47 for the type of use of the building. If the building has a mixture of uses, the major use must be at least 80 percent of the conditioned floor area. If there is no major use, this method may not be used.

Watts per Square Foot: Record the allowed lighting power density in watts per square foot for this building type taken from ILHR Table 63.47.

Complete Building Area: Record the conditioned floor area of the entire building, including the conditioned floor area of minor occupancies. See 63.05 (6) for the definition of conditioned floor area.

Allowed Watts: Record the product of the watts per square foot times the complete building area. This becomes the Interior Lighting Power Allowance for the building.

Area Category Method

This method may be used when different primary function areas of a building are included in the application.

- Primary Function: This is taken from ILHR Table 63.48 for the primary function of the area. If the building has a mixture of functions, each function area must be listed separately.
- Watts per Square Foot: Record the allowed lighting power density watts per square foot for this building type taken from ILHR Table 63.48.
- Area: Record the conditioned floor area (in square feet) of the primary function area measured from the inside of partitions.
- Allowed Watts: Record the product of the watts per square foot times the primary function area. This becomes the allowed lighting power for the area.

The sum of the allowed lighting power for each primary function area is the Interior Lighting Power Allowance for the building.

ACTIVITY METHOD WORKSHEET L-5

This worksheet is applicable to all projects including those that use the Activity Method of s. ILHR 63.49. If necessary, make extra copies of this form. Use as many sheets as needed for the project.

Project Information

A box for basic project information and identification of the document author is provided in the upper part of this form. This should match the information contained in the Project Information section of the Lighting Summary (L-1) form.

Interior Lighting Power Allowance -- ILPA

- Column A: Record the room number or room name. A range of similar rooms may also be entered.
- Column B: Record the average ceiling height of the room in feet.
- Column C: Record a description of each line item. The description shall match the appropriate description from Table 63.49.
- Column D: Record the appropriate unit lighting power density (UPD) from Table 63.49.
- Column E: Record the floor area of the room (inside wall to inside wall, ft²). Where multiple rooms are included in single line, this is the average area of each type of room and not the total area of all rooms.
- Column F: Record the area factor from either s. ILHR 63.49, Figure 63.49, or an applicable footnote from Table 63.49.
- Column G: Record the number of similar spaces.
- Column H: Multiply the UPD from Column D by the floor area from Column E by the area factor from Column F by the number of similar rooms from Column G. Record the resultant lighting power budget in Column H. The values from all entries in this column should be summed into the box marked "ILPA" at the bottom of the column.

LIGHTING SUMMARY Part 1 of 4 L-1

Project Information		Submitter's Name	
Owner's Name		Date	
Building Location (Number & Street)		<input type="checkbox"/> City <input type="checkbox"/> Village <input type="checkbox"/> Township of	

Method of Interior Lighting Compliance

- Complete Building s. ILHR 63.47
- Area Category s. ILHR 63.48
- Activity s. ILHR 63.49
- Other s. ILHR 63.70-72

SARAH E

	Basic Requirements	Prescriptive/Performance	Worksheets
Exterior Lighting	<input type="checkbox"/> Exterior lighting not intended for 24-hour use controlled by photocell. ILHR 63.50 (6) $\frac{\text{Installed ELP}}{\text{ELPA ILHR 63.43}} \leq$		<input type="checkbox"/> Exterior Lighting Power Worksheet (L-2)
Mandatory Interior Controls	<input type="checkbox"/> Shut-off control in each space enclosed by ceiling-high partitions. ILHR 63.50 (1) <input type="checkbox"/> Controls to reduce lighting by 50%. ILHR 63.50 (2) <input type="checkbox"/> Controls to reduce lighting in daylight areas. ILHR 63.50 (3) <input type="checkbox"/> Shut-off controls. ILHR 63.50 (4) <input type="checkbox"/> Display lighting separately switched on circuits ≤ 20 amps. ILHR 63.50 (5) <input type="checkbox"/> Hotel/motel guest rooms have master switches at the main door to turn off lights and receptacles. ILHR 63.50 (7)		
Interior Lighting	<input type="checkbox"/> Exit signs have installed wattage of 20 watts or less. ILHR 63.52 <input type="checkbox"/> Fluorescent lamps use multiple lamp ballasts with tandem wiring as required. ILHR 63.53	$\frac{\text{ILP}}{\text{ILPA ILHR 67.47, 48 or 49}} \leq$ <input type="checkbox"/> Lighting Power Control Credits Applied. ILHR 63.45 <ul style="list-style-type: none"> <input type="checkbox"/> Daylight Sensing Controls <input type="checkbox"/> Occupancy Sensors <input type="checkbox"/> Programmable Timing Controls <input type="checkbox"/> Lumen Maintenance Controls 	<input type="checkbox"/> Interior Lighting Power Worksheet (L-3) <input type="checkbox"/> Interior Lighting Power Allowance Worksheet (L-4) <input type="checkbox"/> Activity Method Worksheet (L-5)

The information you provide may be used by other agency programs [Privacy Law, s. 15.04 (1)(m)].

EXTERIOR LIGHTING POWER WORKSHEET L-2

Project Information		Submitter's Name	
Owner's Name	Date		
Building Location (Number & Street)	City	Village	Township of

SAMPLE

EXTERIOR LIGHTING POWER ALLOWANCE - ELPA (s. ILHR 63.43)

	A	B	C	D
Area Description	Allowance (Table 6-1)		Area or Lineal Feet in Proposed Design	ELPA (B•C)
Exit (with or without canopy)	25 W/lf of door opening			
Entrance (without canopy)	30 W/lf of door opening			
High Traffic Entrance (with canopy)	10 W/ft ² of canopied area			
Light Traffic Entrance (with canopy)	4 W/ft ² of canopied area			
Loading Area	0.40 W/ft ²			
Loading door	20 W/lf of door opening			
Building Exterior Surfaces or Facades	0.25 W/ft ² of illuminated surface			
Storage and Nonmanufacturing Work Areas	0.20 W/ft ²			
Casual Use Areas (gardens, etc.)	0.10 W/ft ²			
Private Driveways or Walkways	0.10 W/ft ²			
Public Driveways or Walkways	0.15 W/ft ²			
Private Parking Lots	0.12 W/ft ²			
Public Parking Lots	0.18 W/ft ²			
Total ELPA→				

INSTALLED EXTERIOR LIGHTING POWER (s. ILHR 63.42)

	A	B	C	D
Fixture Type	# of Luminaires Installed		Watts per Luminaire (including ballast)	Installed Watts (B•C)
Total Installed ELP→				

The information you provide may be used by other agency programs [Privacy Law, s. 15.04 (1)(m)].

Table A63.45-6

Typical Lighting Power for High-Intensity Discharge Lamps

Lamp Watts	Ballast Watts	Fixture Input Watts
Mercury Vapor Lamps		
75	15	90
100	18	118
175	25	200
250	35	285
400	50	450
1,000	75	1,075
Metal Halide Lamps		
32	6	38
50	13	63
70	18	88
100	25	125
175	35	210
250	42	292
400	55	455
1,000	70	1,070
High Pressure Sodium Lamps		
35	8	43
50	13	63
70	18	88
100	30	130
150	38	188
250	50	300
400	65	465
1,000	90	1,090

Notes: Source: Pacific Gas & Electric

Figures listed represent average values taken from Osram-Sylvania, Philips, and General Electric lamp catalogs.

A64.06 (1) This paragraph gives three options for determining the minimum amount of outside air that must be provided to occupants of buildings or spaces that fall within the (a) or (b) ventilation classification.

1. The first option allows the amount of outside air to be delivered to each room to be based on the area of the room and determined using Table 64.05.
2. The second option allows the minimum amount of outside air for each room to be calculated by multiplying the number of occupants by 15 cfm per person. One acceptable way of achieving this goal is to have a constant volume air outside air supply to meet the outside air requirement and a separate variable air volume system for thermal comfort.
3. In the third option, credit is given for the recirculation of relatively "clean" air from spaces that receive more than the minimum amount of outside air. The procedure for calculating this credit, the corrected fraction of outdoor air is adopted from ASHRAE Standard 62, Ventilation for Acceptable Indoor Air Quality:

$$Y = X/[1 + X - Z] \quad (\text{Equation A})$$

where

$Y = V_{ot}/V_{st}$ = corrected fraction of outdoor air in system supply

$X = V_{on}/V_{st}$ = uncorrected fraction of outdoor air in system supply

$Z = V_{oc}/V_{sc}$ = fraction of outdoor air in the critical room. The critical room is that room with the greatest required fraction of outdoor air in the supply to the room.

V_{ot} = Corrected total outdoor air flow rate

V_{st} = total supply flow rate, i.e., the sum of all supply for all branches of the system

V_{on} = sum of outdoor air flow rates for all branches of the system

V_{oc} = outdoor air flow rate required in the critical room based on 15 cfm per occupant

V_{sc} = supply flow rate in the critical room

To determine which room is the "critical room," divide the uncorrected outdoor air for each space (15 cfm/person x # occupants = the minimum uncorrected outdoor air requirement) by the maximum supply flow rate in each space. The room which has the largest ratio of outside air to supply air is the critical room. That ratio is the critical ratio.

The calculation procedure is as follows:

1. Calculate the uncorrected outdoor air fraction by dividing the sum of all the branch outdoor air requirements by the sum of all the branch supply flow rates ($X = V_{on}/V_{st}$).
2. Calculate the critical room outdoor air fraction by dividing the critical room outdoor air requirement by the critical room supply flow rate ($Z = V_{oc}/V_{sc}$).
3. Evaluate Equation A to find the corrected fraction of outdoor air to be provided in the system supply (Y).
4. The air minimum movement must be the greater of either the air movement required by s. ILHR 64.06(2) or the minimum individual space ventilation rate for any room determined by dividing the uncorrected outside air requirement for each room by the system supply (Y).

The corrected fraction of outside air Y, or more, must always be provided in the system supply. If the amount of outside air varies, Y must also vary.

In a supply system where the number of occupants, system flow rates or individual room ventilation flow rates vary, such as a variable air volume system with occupancy sensors, the corrected fraction of outdoor air may vary. The corrected fraction of outdoor air determined in accordance with Equation A, or more, shall be supplied at all times the room is occupied.

As given in 64.06 (1)(intro.), where the amount of outside air is based on the number of occupants, as in options 2 or 3, the system designer may use an average occupancy value when determining the required outside air flow for variable occupancies to prevent over ventilating, provided the average used is not less than one-half the anticipated peak occupancy load and the duration of the peak occupancy does not exceed three hours. The average occupancy must be calculated over the entire period of system operation and more than one peak period may occur.

This provision applies to occupancy profiles that permit pollution reduction through over ventilation (on a per-person basis) during intervening periods of reduced occupancy between peaks.

For example, in an airport terminal building with 24-hour daily operation, the occupancy is as follows:

100 people for 6 hours
500 people for 2 hours
200 people for 6 hours
500 people for 2 hours
100 people for 4 hours
10 people for 4 hours

Because the periods of peak occupancy occur for less than three hours, this provision may be used. The average occupancy would be calculated as:

$$((100 \times 6) + (500 \times 2) + (200 \times 6) + (500 \times 2) + (100 \times 4) + (10 \times 4))/24 = 176$$

In this case, the average occupancy (176) is less than half the peak occupancy ($500/2 = 250$). The outdoor air flow rate is determined on the basis of one-half the peak occupancy (250 people) for the full 24-hour operation period.

Note that the number of occupants is averaged over the "duration of the system operation," which in this case is 24 hours. If it was determined that for 4 hours at night the occupancy would be less than one person per 5,000 cubic feet and the outside air would be eliminated as allowed in s. ILHR 64.05 (5), then the period of system operation would be 20 hours and the calculation of the average occupancy would be based on that 20-hour period.

Based on 20 hours of operation, the average occupancy would be calculated as:

$$((100 \times 6) + (500 \times 2) + (200 \times 6) + (500 \times 2) + (100 \times 4))/20 = 210$$

Since the average occupancy is still less than half the peak occupancy, the outdoor air flow rate is determined on the basis on one-half the peak occupancy (250 people) for the 20-hour operation period.