

## SECTION 143 – PRESCRIPTIVE REQUIREMENTS FOR BUILDING ENVELOPES

A building complies with this section by being designed with and having constructed and installed either (1) envelope components that comply with each of the requirements in Subsection (a) for each individual component and the requirements of Subsection (c) where they apply, or (2) an envelope that complies with the overall requirements in Subsection (b) and the requirements of Subsection (c) where they apply. When making calculations under Subsection (a) or (b), all of the rules listed in Section 141 (c) 1, 4, and 5 shall apply.

### (a) Envelope Component Approach.

#### 1. Exterior roofs and ceilings. Exterior roofs and ceilings shall:

- A. **Roofs.** All roofing products shall meet the requirements of 118 and the applicable requirements of Subsection i through iii:
- i. ~~For a~~ Nonresidential buildings with low-sloped roofs, in climate zones 2-15 shall have a minimum 3-year aged solar reflectance of 0.55 and a minimum thermal emittance of 0.75, or a minimum SRI of 64. ~~meet the requirements of either 118 (i) 1 or 118 (i) 2 and for liquid applied roof coatings, Section 118 (i) 3; and~~
- EXCEPTION TO SECTION 143(a)1Ai:**
1. Wood-framed roofs in climate zones 3 and 5 are exempt from the minimum requirements for solar reflectance and thermal emittance or SRI if the roof assembly has a U-factor of 0.039 or lower;
  2. Metal building roofs in climate zones 3 and 5 are exempt from the minimum requirements for solar reflectance and thermal emittance or SRI if the roof assembly has a U-factor of 0.048 or lower
- ii. Nonresidential steep-sloped roofs with roofing products that have a roof weight of less than five pounds per square foot in climate zones 2-16 shall have a minimum 3-year aged solar reflectance of 0.20 and a minimum thermal emittance of 0.75, or a minimum SRI of [CEC1]16. Steep-sloped roofing products that have a roof weight of five pounds per square foot or more in climate zones 1 through 16 shall have a minimum 3-year aged reflectance of 0.15 and a minimum emittance of 0.75, or a minimum SRI of 10
  - iii. High-rise residential buildings and hotels and motels with low-sloped roofs in climate zones 10, 11, 13, 14, and 15 shall have a minimum 3-year aged solar reflectance of 0.55 and a minimum thermal emittance of 0.75, or a minimum SRI of 64.
- EXCEPTION to Section 143 (a) 1 A:** Any roofing product with a minimum initial thermal emittance  $\epsilon_{\text{initial}}$  less than 0.75 when tested in accordance with CRRC 1, including but not limited to roof products with metallic surfaces, if that roofing product has a minimum initial solar reflectance of  $0.70 + 0.34 * (0.75 - \epsilon_{\text{initial}})$  when tested in accordance with CRRC 1
- B. Have insulation placed in direct contact with a continuous roof or drywall ceiling where required by Section 118 (e); and
- C. ~~Either:~~ i. —Have an overall assembly U-factor no greater than the applicable value in TABLE 143-A, TABLE 143-B, or TABLE 143-C<sub>1</sub> or  $R^2$
- ii. If the roof does not have metal framing members or a metal deck, have an installed insulation R-value no less than the applicable value in TABLE 143-A, TABLE 143-B, or TABLE 143-C.
- EXCEPTION to Section 143 (a) 1 C ii:** A roof with metal framing members or a metal deck may comply with Section 143 (a) 1 C. if:
- A. A continuous layer of rigid insulation with a minimum R-value equal to or greater than the applicable value in TABLE 143-A, TABLE 143-B, or TABLE 143-C is installed either above the roof deck or between the roof deck and the structural members supporting the roof deck; or
  - B. A continuous layer of rigid insulation with a minimum R-value of R-10 is installed either above the roof deck or between the roof deck and the structural members supporting the roof deck; and (2) insulation

~~with a minimum R-value equal to or greater than the applicable value in TABLE 143-A, TABLE 143-B, or TABLE 143-C is installed between the structural members.~~

2. **Exterior walls.** Exterior walls shall have either an installed insulation R-value no less than, or an overall assembly U-factor no greater than, the applicable value in TABLE 143-A, TABLE 143-B, or TABLE 143-C.
3. **Demising walls.** Demising walls shall meet the requirements of Section 118 (f).
4. **External floors and soffits.** External floors and soffits shall have either an installed insulation R-value no less than, or an overall assembly U-factor no greater than, the applicable value in TABLE 143-A, TABLE 143-B, or TABLE 143-C.
5. **Windows.** Windows shall:
  - A. Have (1) a west-facing area no greater than 40 percent of the gross west-facing exterior wall area, or six feet times the west-facing display perimeter, whichever is greater; and (2) a total area no greater than 40 percent of the gross exterior wall area, or six feet times the display perimeter, whichever is greater; and  
**EXCEPTION to Section 143 (a) 5 A:** Window area in demising walls is not counted as part of the window area for this requirement. Demising wall area is not counted as part of the gross exterior wall area or display perimeter.
  - B. Have a U-factor no greater than the applicable value in TABLE 143-A, TABLE 143-B, or TABLE 143-C; and
  - C. Have a relative solar heat gain, excluding the effects of interior shading, no greater than the applicable value in TABLE 143-A, TABLE 143-B, or TABLE 143-C. The relative solar heat gain of windows is:
    - i. The solar heat gain coefficient of the windows; or
    - ii. Relative solar heat gain as calculated by EQUATION 143-A), if an overhang extends beyond both sides of the window jamb a distance equal to the overhang projection.  
**EXCEPTION to Section 143 (a) 5 C:** The applicable "north" value for relative solar heat gain in TABLE 143-A, TABLE 143-B, or TABLE 143-C or 0.56, whichever is greater, shall be used for windows:
      - a. That are in the first story of exterior walls that form a display perimeter; and
      - b. For which codes restrict the use of overhangs to shade the windows.

*EQUATION 143-A RELATIVE SOLAR HEAT GAIN*

$$RSHG = SHGC_{win} \times \left[ 1 + \frac{aH}{V} + b \left( \frac{H}{V} \right)^2 \right]$$

**WHERE:**

- RSHG* = Relative solar heat gain.
- SHGC<sub>win</sub>* = Solar heat gain coefficient of the window.
- H* = Horizontal projection of the overhang from the surface of the window in feet, but no greater than *V*.
- V* = Vertical distance from the window sill to the bottom of the overhang, in feet.
- a* = -0.41 for north-facing windows, -1.22 for south-facing windows, and -0.92 for east- and west-facing windows.
- b* = 0.20 for north-facing windows, 0.66 for south-facing windows, and 0.35 for east- and west-facing windows.

6. **Skylights.** Skylights shall:
  - A. Have an area no greater than five percent of the gross exterior roof area; and

**EXCEPTION to Section 143 (a) 6 A:** Atria over 55 feet high shall have a skylight area no greater than 10 percent of the gross exterior roof area.

- B. Have a U-factor no greater than the applicable value in TABLE 143-A, TABLE 143-B, or TABLE 143-C; and
  - C. Have a solar heat gain coefficient no greater than the applicable value in TABLE 143-A, TABLE 143-B, or TABLE 143-C.
7. **Exterior doors.** ~~Exterior doors have no R value, U factor, or area requirements.~~ All exterior doors for conditioned spaces shall have a U-factor not greater than the applicable value in TABLE 143-A, TABLE 143-B or TABLE 143-C.

8. **Relocatable Public School Buildings.** In complying with Sections 143 (a) 1 to 7, relocatable public school buildings shall comply either with TABLE 143-A, including the non-north window RSHG and skylight SHGC requirements, when the manufacturer/builder certifies that the relocatable building is manufactured only for use in a specific climate zone(s) and that the relocatable building can not be lawfully used in other climate zones or with TABLE 143-C when the manufacturer/builder certifies that the relocatable building is manufactured for use in any climate zone. When the relocatable building complies with TABLE 143-C for use in more than one climate zone, the relocatable building shall meet the most stringent requirements for each building component in all of the climate zones for which the relocatable building is certified.

The manufacturer/builder shall place two metal identification labels on each relocatable building module, one mechanically fastened and visible from the exterior and the other mechanically fastened to the interior frame above the ceiling, at the end of the module. In addition to information required by the Division of the State Architect (DSA), the labels shall state either "Complies with Title 24, Part 6 for all Climate Zones" or "Complies with Title 24, Part 6 for Climate Zones" and then list all of the climate zones for which the manufacturer has manufactured the relocatable building to comply. The location of the identification labels shall be shown on the building plans.

**NOTE:** Section 143 (a) 8 applies to all relocatable buildings for which an application for approval of original construction or for approval of alteration to the building envelope, space conditioning, lighting or water heating components of the relocatable building is submitted after the effective date of the 2004 California Energy Code.

TABLE 143-A – PRESCRIPTIVE ENVELOPE CRITERIA FOR NONRESIDENTIAL BUILDINGS (INCLUDING RELOCATABLE PUBLIC SCHOOL BUILDINGS WHERE MANUFACTURER CERTIFIES USE ONLY IN SPECIFIC CLIMATE ZONE; NOT INCLUDING HIGH-RISE RESIDENTIAL BUILDING AND GUEST ROOMS OF HOTEL/MOTEL BUILDINGS)

		<u>Climate Zones</u>															
		<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>	<u>5</u>	<u>6</u>	<u>7</u>	<u>8</u>	<u>9</u>	<u>10</u>	<u>11</u>	<u>12</u>	<u>13</u>	<u>14</u>	<u>15</u>	<u>16</u>
<b>Roof/Ceiling</b>																	
Metal Building		0.063	0.048	0.063	0.063	0.048	0.078	0.063	0.063	0.063	0.048	0.048	0.048	0.048	0.048	0.048	0.048
Wood-framed and other		0.049	0.039	0.039	0.039	0.049	0.075	0.067	0.067	0.039	0.039	0.039	0.039	0.039	0.039	0.039	0.039
<b>Roofing Products</b>																	
<u>Low-sloped</u>																	
— Aged Reflectance	NR	0.55	0.55	0.55	0.55	0.55	0.55	0.55	0.55	0.55	0.55	0.55	0.55	0.55	0.55	0.55	NR
— Emittance		0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	
<u>Steep-Sloped:</u>																	
<u>Less than 5 lb/ft<sup>2</sup></u>																	
— Aged Reflectance	NR	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20
— Emittance		0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75
<u>5 lb/ft<sup>2</sup> or more</u>																	
— Aged Reflectance	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15
— Emittance	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75
<b>Wall</b>																	
Metal Building		0.113	0.061	0.113	0.061	0.061	0.113	0.113	0.061	0.061	0.061	0.061	0.061	0.061	0.061	0.057	0.061
Metal-framed		0.098	0.062	0.082	0.062	0.062	0.098	0.098	0.062	0.062	0.062	0.062	0.062	0.062	0.062	0.062	0.062
Mass Light		0.196	0.170	0.278	0.227	0.43	0.43	0.43	0.43	0.43	0.170	0.170	0.170	0.170	0.170	0.170	0.170
Mass Heavy		0.253	0.650	0.650	0.650	0.650	0.690	0.690	0.690	0.690	0.650	0.184	0.253	0.211	0.184	0.184	0.160
Wood-framed and Other		0.102	0.059	0.110	0.059	0.102	0.110	0.110	0.102	0.059	0.059	0.059	0.059	0.059	0.059	0.041	0.059
<b>Floor/Soffit</b>																	
Mass		0.090	0.090	0.315	0.315	0.315	0.315	0.315	0.315	0.315	0.315	0.090	0.090	0.090	0.090	0.090	0.055
Other		0.048	0.039	0.071	0.071	0.071	0.071	0.071	0.071	0.071	0.071	0.039	0.071	0.071	0.039	0.039	0.039
Windows																	
U-factor		0.47	0.47	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.47	0.47	0.47	0.47	0.47	0.47	0.47

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<b>RSHG North</b>																	
0-10% WWR	0.72	0.61	0.61	0.61	0.61	0.61	0.61	0.61	0.61	0.61	0.61	0.61	0.61	0.61	0.61	0.61	0.72
10-20% WWR	0.49	0.51	0.61	0.61	0.61	0.61	0.61	0.61	0.61	0.61	0.51	0.51	0.51	0.51	0.51	0.51	0.49
20-30% WWR	0.47	0.47	0.61	0.61	0.61	0.61	0.61	0.61	0.61	0.61	0.47	0.47	0.47	0.47	0.47	0.47	0.47
30-40% WWR	0.47	0.47	0.61	0.61	0.61	0.61	0.61	0.61	0.61	0.61	0.47	0.47	0.47	0.47	0.40	0.40	0.47
<b>RSHG Non-North</b>																	
0-10% WWR	0.49	0.47	0.61	0.61	0.61	0.61	0.61	0.61	0.61	0.61	0.47	0.47	0.47	0.47	0.46	0.46	0.49
10-20% WWR	0.43	0.36	0.55	0.55	0.55	0.61	0.61	0.61	0.61	0.61	0.36	0.36	0.36	0.36	0.36	0.36	0.43
20-30% WWR	0.43	0.36	0.41	0.41	0.41	0.39	0.39	0.39	0.39	0.39	0.36	0.36	0.36	0.36	0.36	0.36	0.43
30-40% WWR	0.43	0.31	0.41	0.41	0.41	0.34	0.34	0.34	0.34	0.34	0.31	0.31	0.31	0.31	0.31	0.31	0.43
<b>Doors, U-factor</b>																	
Non-Swinging	0.50	1.45	1.45	1.45	1.45	1.45	1.45	1.45	1.45	1.45	1.45	1.45	1.45	1.45	1.45	1.45	0.50
Swinging[JWH2]	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70
<b>Skylight U-factor</b>																	
Glass, curb	0.68	0.68	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.68	0.68	0.68	0.68	0.68	0.68	0.68
Glass, no curb	1.04	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.04
Plastic																	
<b>SHGC</b>																	
Glass, 0-2%	NR	0.46	0.57	0.57	0.57	0.57	0.57	0.57	0.57	0.57	0.46	0.46	0.46	0.46	0.46	0.46	NR
Glass, 2.1-5%	NR	0.36	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.36	0.36	0.36	0.36	0.36	0.36	NR
Plastic, 0-2%	0.69	0.69	0.69	0.69	0.69	0.69	0.69	0.69	0.69	0.69	0.69	0.69	0.69	0.69	0.69	0.69	0.69
Plastic, 2.1-5%[JWH3]	0.57	0.57	0.57	0.57	0.57	0.57	0.57	0.57	0.57	0.57	0.57	0.57	0.57	0.57	0.57	0.57	0.57

Notes:

1. Mass, Light walls are defined as having a heat capacity greater than or equal to 7.0 Btu/h-ft<sup>2</sup> and less than 15.0 Btu/h-ft<sup>2</sup>. Heavy mass walls are defined as having a heat capacity greater than or equal to 15.0 Btu/h-ft<sup>2</sup>.
2. No skylight SHGC requirements are defined for climate zones 1 and 16. A climate zone without a requirement is designated as "NR".

**TABLE 143 A - PRESCRIPTIVE ENVELOPE CRITERIA FOR NONRESIDENTIAL BUILDINGS (INCLUDING RELOCATABLE PUBLIC SCHOOL BUILDINGS WHERE MANUFACTURER CERTIFIES USE ONLY IN SPECIFIC CLIMATE ZONE; NOT INCLUDING HIGH RISE RESIDENTIAL BUILDING AND GUEST ROOMS OF HOTEL/MOTEL BUILDINGS)**

	CLIMATE ZONES				
	1, 16	3-5	6-9	2, 10-13	14, 15
<b>Roof/Ceiling</b>					
U-factor	0.051	0.051	0.076	0.051	0.051
R-value <sup>1</sup>	19	19	11	19	19

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<u>For low-sloped roofs</u>		<u>?? see where we land</u>		<u>See where we land</u>		<u>Cool-roof</u>		<u>Cool-roof</u>		<u>See where we land</u>	
<b>Wall</b>											
R-value or											
U-factor		+3		+1		+1		+3		+3	
—Wood frame		0.102		0.110		0.110		0.1024		0.102	
—Metal frame		0.217		0.224		0.224		0.217		0.217	
—Metal building		0.113		0.123		0.123		0.113		0.113	
—Mass/7.0≤HC<15.0		-0.330		0.430		0.430		0.430		0.430	
—Mass/15.0≤HC		0.360		0.650		0.690		0.650		0.410	
—Other		0.102		0.110		0.110		0.102		0.102	
<b>Floor/Soffit</b>											
R-value or											
U-factor		+9		+1		+1		+1		+1	
—Mass/7.0≤HC		0.090		0.139		0.139		0.090		0.139	
—Other		0.048		0.071		0.071		0.071		0.071	
<b>Windows</b>											
U-factor <sup>2</sup>		0.47		0.77		0.77		0.47		0.47	
<b>Relative solar heat gain</b>		Non-North	North	Non-North	North	Non-North	North	Non-North	North	Non-North	North
0-10% WWR		0.49	0.72	0.61	0.61	0.61	0.61	0.47	0.61	0.46	0.61
11-20% WWR		0.43	0.49	0.55	0.61	0.61	0.61	0.36	0.51	0.36	0.51
21-30% WWR		0.43	0.47	0.41	0.61	0.39	0.61	0.36	0.47	0.36	0.47
31-40% WWR		0.43	0.47	0.41	0.61	0.34	0.61	0.31	0.47	0.31	0.40
<b>Skylights</b>											
U-factor <sup>3</sup>											
Glass-w/Curb		1.18		1.42		1.42		1.18		1.18	
Glass-wo/Curb		0.68		0.82		0.82		0.68		0.68	
Plastic-w/Curb		1.04		1.56		1.56		1.32		1.32	
SHGC-Glass											
0-2%		0.68		0.79		0.79		0.46		0.46	
2.1-5%		0.46		0.40		0.40		0.36		0.36	
SHGC-Plastic											
0-2%		0.77		0.79		0.77		0.77		0.71	
2.1-5%		0.58		0.65		0.62		0.62		0.58	
<p>Note: Construction assembly U factors shall be calculated in accordance with Appendix IV.</p> <p><sup>1</sup>R-value cannot be used for compliance when roof has metal framing members or a metal deck unless additional rigid insulation is installed. – See Section 143 (a) 1 C.</p> <p><sup>2</sup>U-factor adjustments are made to make the criteria consistent with revised NFRC rating procedures.</p>											

**TABLE 143-B PRESCRIPTIVE ENVELOPE CRITERIA FOR HIGH-RISE RESIDENTIAL BUILDINGS AND GUEST ROOMS OF HOTEL/MOTEL BUILDINGS**

		CLIMATE ZONES									
		1, 16		3-5		6-9		2, 10-13		14, 15	
<b>Roof/Ceiling</b>											
U-factor		0.036		0.051		0.051		0.036		0.036	
R-value <sup>†</sup>		30		19		19		30		30	
<b>Wall</b>											
R-value or		19		11		11		13		13	
U-factor											
—Wood frame		0.074		0.110		0.110		0.102		0.102	
—Metal frame		0.183		0.224		0.224		0.217		0.217	
—Metal building		0.061		0.123		0.123		0.113		0.113	
—Mass/7.0 ≤ HC < 15.0		0.330		0.430		0.430		0.430		0.430	
—Mass/15.0 ≤ HC		0.360		0.650		0.690		0.650		0.410	
—Other		0.074		0.110		0.110		0.102		0.102	
<b>Floor/Soffit</b>											
R-value or		19		11		11		11		11	
U-factor											
Mass/7.0 ≤ HC		0.090		0.139		0.139		0.090		0.090	
Other		0.048		0.071		0.071		0.071		0.071	
Raised concrete R-value		8		8		8		8		8	
<b>Windows</b>											
U-factor <sup>‡</sup>		0.47		0.47		0.47		0.47		0.47	
<b>Relative solar heat gain</b>		Non-North	North	Non-North	North	Non-North	North	Non-North	North	Non-North	North
0-10% WWR		0.46	0.68	0.41	0.61	0.47	0.61	0.36	0.49	0.36	0.47
11-20% WWR		0.46	0.68	0.40	0.61	0.40	0.61	0.36	0.49	0.31	0.43
21-30% WWR		0.36	0.47	0.31	0.61	0.36	0.61	0.31	0.40	0.26	0.43
31-40% WWR		0.30	0.47	0.26	0.55	0.31	0.61	0.26	0.40	0.26	0.31
<b>Skylights</b>											
U-factor <sup>‡</sup>	Glass w/Curb	1.18		1.42		1.42		1.18		1.18	
	Glass wo/Curb	0.68		0.82		0.82		0.68		0.68	
	Plastic w/Curb	1.04		1.56		1.56		1.32		1.04	
SHGC-Glass	0-2%	0.46		0.58		0.61		0.46		0.46	
	2.1-5%	0.36		0.32		0.40		0.32		0.31	
SHGC-Plastic	0-2%	0.71		0.65		0.65		0.65		0.65	
	2.1-5%	0.55		0.39		0.65		0.34		0.27	
<p>Note: Construction assembly U-factors shall be calculated in accordance with Appendix IV.</p> <p><sup>†</sup>R-value cannot be used for compliance when roof has metal framing members or a metal deck unless additional rigid insulation is installed. See Section 143(a) 1-C.</p> <p>* Required insulation levels for concrete raised floors are R-8 in Climate Zones 2, 11, 13, and 14; R-4 in Climate Zones 12 and 15, and R-0 in Climate Zones 3 through 10.</p> <p><sup>‡</sup>U-factor adjustments are made to make the criteria consistent with revised NFRC rating procedures.</p>											

**TABLE 143-B – PRESCRIPTIVE ENVELOPE CRITERIA FOR HIGH-RISE RESIDENTIAL BUILDINGS AND GUEST ROOMS OF HOTEL/MOTEL BUILDINGS**

	<u>Climate Zones</u>															
	<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>	<u>5</u>	<u>6</u>	<u>7</u>	<u>8</u>	<u>9</u>	<u>10</u>	<u>11</u>	<u>12</u>	<u>13</u>	<u>14</u>	<u>15</u>	<u>16</u>
<b>Roof/Ceiling</b>																
Metal Building	0.039	0.032	0.048	0.039	0.048	0.048	0.048	0.039	0.039	0.032	0.032	0.032	0.032	0.032	0.032	0.032
Wood-framed and other	0.034	0.028	0.039	0.028	0.039	0.039	0.039	0.028	0.028	0.028	0.028	0.028	0.028	0.028	0.028	0.028
<b>Roofing Products, Low-Sloped</b>																
Aged Reflectance	NR	NR	NR	NR	NR	NR	NR	NR	NR	0.55	0.55	NR	0.55	0.55	0.55	NR
Emittance										0.75	0.75		0.75	0.75	0.75	
<b>Wall</b>																
Metal Building	0.061	0.061	0.061	0.061	0.061	0.061	0.061	0.061	0.061	0.061	0.057	0.057	0.057	0.057	0.057	0.057
Metal-framed	0.062	0.062	0.062	0.062	0.062	0.062	0.062	0.062	0.062	0.062	0.062	0.062	0.062	0.062	0.062	0.062
Mass Light	0.170	0.170	0.170	0.170	0.170	0.227	0.227	0.227	0.196	0.170	0.170	0.170	0.170	0.170	0.170	0.170
Mass Heavy	0.160	0.160	0.160	0.184	0.211	0.690	0.690	0.690	0.690	0.690	0.184	0.253	0.211	0.184	0.184	0.160
Wood-framed and Other	0.059	0.059	0.059	0.059	0.059	0.059	0.059	0.059	0.059	0.059	0.041	0.059	0.059	0.041	0.041	0.041
<b>Floor/Soffit</b>																
Mass	0.043	0.043	0.055	0.055	0.055	0.066	0.090	0.090	0.090	0.066	0.055	0.055	0.055	0.043	0.055	0.035
Other	0.034	0.034	0.039	0.039	0.039	0.039	0.071	0.039	0.039	0.039	0.039	0.039	0.039	0.034	0.039	0.034
<b>Window</b>																
U-factor	0.47	0.47	0.47	0.47	0.47	0.47	0.47	0.47	0.47	0.47	0.47	0.47	0.47	0.47	0.47	0.47
<b>RSHG North</b>																
0-10% WWR	0.68	0.49	0.61	0.61	0.61	0.61	0.61	0.61	0.61	0.49	0.49	0.49	0.49	0.47	0.47	0.68
10-20% WWR	0.68	0.49	0.61	0.61	0.61	0.61	0.61	0.61	0.61	0.49	0.49	0.49	0.49	0.43	0.43	0.68
20-30% WWR	0.47	0.40	0.61	0.61	0.61	0.61	0.61	0.61	0.61	0.40	0.40	0.40	0.40	0.43	0.43	0.47
30-40% WWR	0.47	0.40	0.55	0.55	0.55	0.61	0.61	0.61	0.61	0.40	0.40	0.40	0.40	0.41	0.41	0.47
<b>RSHG Non-North</b>																
0-10% WWR	0.46	0.46	0.41	0.41	0.41	0.47	0.47	0.47	0.47	0.46	0.46	0.46	0.46	0.36	0.36	0.46
10-20% WWR	0.46	0.46	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.46	0.46	0.46	0.46	0.31	0.31	0.46
20-30% WWR	0.36	0.36	0.31	0.31	0.31	0.36	0.36	0.36	0.36	0.36	0.36	0.36	0.36	0.26	0.26	0.36
30-40% WWR	0.30	0.30	0.26	0.26	0.26	0.31	0.31	0.31	0.31	0.30	0.30	0.30	0.30	0.26	0.26	0.30
<b>Door U-factor</b>																
Non-swinging	0.50	1.45	1.45	1.45	1.45	1.45	1.45	1.45	1.45	1.45	1.45	1.45	1.45	1.45	1.45	0.50
Swinging	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70
<b>Skylight U-f</b>																
Glass, curb	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11
Glass, no curb	0.68	0.68	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.68	0.68	0.68	0.68	0.68	0.68	0.68
Plastic	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11	1.11
<b>SHGC</b>																
Glass, 0-2%	0.46	0.46	0.57	0.57	0.57	0.57	0.57	0.57	0.57	0.46	0.46	0.46	0.46	0.46	0.46	0.46
Glass, 2.1-5%	0.36	0.32	0.32	0.32	0.32	0.40	0.40	0.40	0.40	0.32	0.32	0.32	0.32	0.31	0.31	0.36
Plastic, 0-2%	0.69	0.57	0.57	0.57	0.57	0.57	0.57	0.57	0.57	0.57	0.57	0.57	0.57	0.57	0.57	0.57
Plastic, 0-2%	0.55	0.34	0.39	0.39	0.39	0.57	0.57	0.57	0.57	0.34	0.34	0.34	0.34	0.27	0.27	0.55

Plastic, 2.1-5%																	
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**TABLE 143-C PRESCRIPTIVE ENVELOPE CRITERIA FOR RELOCATABLE PUBLIC SCHOOL BUILDINGS WHERE MANUFACTURER CERTIFIES USE IN ALL CLIMATE ZONES**

		ALL CLIMATE ZONES
<b>Roof/Ceiling U-factor</b>		
U-factor <sup>1</sup> Metal Building		0.054/0.048
R-value <sup>1</sup> Wood-framed and other		19/0.039
<b>Roofing Products – Aged Reflectance/Emittance</b>		
Low-Sloped		0.55/0.75
Steep-Sloped – Less than 5 lb/ft <sup>2</sup>		0.20/0.75
5 lb/ft <sup>2</sup> or more		0.15/0.75
<b>Wall U-factor</b>		
R-value <sup>1</sup> or U-factor		13
Wood frame		0.102/0.059
Metal frame		0.264/0.062
Metal building		0.064/0.057
Mass/7.0 ≤ HC		0.330/0.170
Other		0.102/0.059
<b>Floor/Soffit U-factor</b>		
R-value <sup>1</sup> or U-factor		19
Wood-Framed and Other		0.048
<b>Windows</b>		
U-factor		0.49/0.47
<b>Relative solar heat gain</b>		
0-10% WWR		0.46/0.36
11-20% WWR		0.36/0.31
21-30% WWR		0.36/0.26
31-40% WWR		0.31/0.26
<b>Skylights</b>		
U-factor	Glass w/Curb	0.99
	Glass wo/Curb	0.57
	Plastic w/Curb	0.87
SHGC Glass	0-2%	0.46
	2.1-5%	0.36
SHGC Plastic	0-2%	0.74/0.69
	2.1-5%	0.58/0.57

Note: Construction assembly U-factors shall be calculated in accordance with Appendix IV.

<sup>1</sup> R-value cannot be used for compliance when roof has metal framing members or a metal deck unless additional rigid insulation is installed. See Section 143 (a) 1 C.

**(b) Overall Envelope Approach**

1. **Overall TDV Energy.** The total TDV Energy of the overall envelope of the proposed building, TDV<sub>prop</sub>, shall be no greater than the total TDV Energy of the overall envelope of a standard building, TDV<sub>std</sub>, as calculated in Standards Nonresidential Appendix NA5 “Envelope Tradeoff Procedure”. In making the calculations, it shall be assumed that the orientation and area of each envelope component of the standard building are the same as in the proposed building. If the proposed building has Window-Wall-Ratio greater than 40% or Skylight-Roof-Ratio greater than 5%, the area of walls and windows or roofs and skylights will be adjusted accordingly in the standard building to cap the WWR at 40% and SRR at 5%. **Overall heat loss.** The overall heat loss (HL) of the overall envelope of the

proposed building,  $HL_{prop}$ , as calculated with EQUATION 143-C, shall be no greater than the overall heat loss of a standard building,  $HL_{std}$ , as calculated with EQUATION 143-B. In making the calculations, it shall be assumed that the orientation and area of each envelope component is the same as in the proposed building.

**EQUATION 143-B STANDARD BUILDING HEAT LOSS**

$$HL_{std} = \sum_{i=1}^{nW} (A_{Wi} \times U_{Wi_{std}}) + \sum_{i=1}^{nF} (A_{Fi} \times U_{Fi_{std}}) + \sum_{i=1}^{nR} (A_{Ri} \times U_{Ri_{std}}) + \sum_{i=1}^{nG} (A_{Gi} \times U_{Gi_{std}}) + \sum_{i=1}^{nS} (A_{Si} \times U_{Si_{std}})$$

**WHERE:**

- $HL_{std}$  = Overall heat loss of the standard building (in Btu/h °F).
- $i$  = Each wall type and orientation, floor/soffit type, roof/ceiling type, window (glazing) type and orientation, or skylight type for the standard building.
- $nW, nR,$  = Number of components of the applicable envelope feature.
- $nG, nF$
- $nS$
- $A_{Wi}$  = Exterior wall area on the north, east, south, and west orientations of the proposed building (in ft<sup>2</sup>) including the window area on that orientation of the proposed building, minus  $A_{Gi}$ . The standard building has as many walls in each orientation as there are HC categories in that orientation of the proposed building.
- $A_{Fi}$  = Exterior floor/soffit area of the proposed building (in ft<sup>2</sup>). The standard building has as many floors/soffits as there are HC categories in the floors/soffits of the proposed building.
- $A_{Ri}$  = Exterior roof/ceiling area of the proposed building (in ft<sup>2</sup>) plus the skylight area of the proposed building, less  $A_{Si}$ .
- $A_{Gi}$  = Window (glazing) area of each type on the north, east, south, and west orientations of the standard building (in ft<sup>2</sup>). If the window wall ratio of the west orientation of the proposed building is less than 40 percent, and the total window wall ratio of the proposed building is more than 40 percent, the total window area is the greater of (a) 40 percent of the gross exterior wall area, or (b) six feet times the display perimeter. The window area of each type and on each orientation of the standard design shall be decreased in proportion to the area in the proposed design according to one of the following formulas as applicable:

$$A_{Gi-adj} = \left( \frac{A_{Gi-prop}}{A_{Gtotal-prop}} \right) \times 0.40 \times A_{Wtotal-prop}$$

$$A_{Gi-adj} = \left( \frac{A_{Gi-prop}}{A_{Gtotal-prop}} \right) \times (6 \times \text{Display Perimeter}_{total})$$

**WHERE:**

- $A_{Gi-adj}$  = Adjusted window area of each type on the north, east, south, and west orientations (in ft<sup>2</sup>).
- $A_{Gi-prop}$  = Actual proposed window area of each type in the respective orientation (in ft<sup>2</sup>).
- $A_{Gtotal-prop}$  = Total actual proposed window area of the proposed building (in ft<sup>2</sup>).
- $A_{Wtotal-prop}$  = Total actual proposed gross exterior wall area of the proposed building (in ft<sup>2</sup>).

$A_{ci}(cont.)$  = If the window wall ratio of the west orientation of the proposed building is greater than 40 percent, (1) the west facing window area is the greater of (a) 40 percent of the west facing gross exterior wall area, or (b) six feet times the west facing display perimeter; and (2) if the combined window wall ratio of the north, east and south orientations of the proposed building is more than 40 percent, the north, east and south facing window area is the greater of (a) 40 percent of the north, east and south facing gross exterior wall area, or (b) six feet times the north, east and south facing display perimeter. The window area of each type and on each orientation of the standard design shall be decreased in proportion to the area in the proposed design according to one of the following formulas as applicable:

$$A_{Gw-adj} = 0.40 \times A_{Ww-prop}$$

$$A_{Gw-adj} = (6 \times \text{Display Perimeter}_w)$$

$$A_{Gi-adj} = \left( \frac{A_{Gi-prop}}{A_{Gnes-prop}} \right) \times 0.40 \times A_{Wnes-prop}$$

$$A_{Gi-adj} = \left( \frac{A_{Gi-prop}}{A_{Gnes-prop}} \right) \times (6 \times \text{Display Perimeter}_{nes})$$

**WHERE:**

$A_{Gw-adj}$  = Adjusted window area of each type on the west orientation (in ft<sup>2</sup>).

$A_{Ww-prop}$  = Total actual proposed gross exterior wall area of the west orientations of the proposed building (in ft<sup>2</sup>).

$\text{Display Perimeter}_w$  = Display Perimeter of the west orientation of the proposed building.

$A_{Gi-adj}$  = Adjusted window area of each type on the north, east, and south orientations (in ft<sup>2</sup>).

$A_{Gi-prop}$  = Actual proposed window area of each type in the respective orientation (in ft<sup>2</sup>).

$A_{Gnes-prop}$  = Total actual proposed window area of the north, east and south orientations of the proposed building (in ft<sup>2</sup>).

$A_{Wnes-prop}$  = Total actual proposed gross exterior wall area of the north, east and south orientations of the proposed building (in ft<sup>2</sup>).

$\text{Display Perimeter}_{nes}$  = Display Perimeter of the north, east and south orientations of the proposed building.

$A_{si}$  = Skylight area of the standard building for each skylight type (in ft<sup>2</sup>). The total skylight area in the standard building is equal to the total skylight area of the proposed building or five percent of the gross exterior roof area (or, for atria over 55 feet high, 10 percent of the gross exterior roof area), whichever is less. If the total skylight area of the proposed building is more than five percent of the gross exterior roof area or more than 10 percent of the gross exterior roof area for atria over 55 feet high, the skylight area of each type of the standard building shall be decreased in proportion to the area in the proposed design according to the following formula:

$$A_{Si-adj} = \left( \frac{A_{Si-prop}}{A_{Stotal-prop}} \right) \times 0.10 \times A_{Rtotal-prop}$$

for atria over 55 feet high, and

$$A_{Si-adj} = \left( \frac{A_{Si-prop}}{A_{Stotal-prop}} \right) \times 0.05 \times A_{Rtotal-prop}$$

for others;

**WHERE:**

- $A_{Si-adj}$  = Adjusted skylight area of each type (in ft<sup>2</sup>).
- $A_{Si-prop}$  = Actual proposed skylight area of each type (in ft<sup>2</sup>).
- $A_{Stotal-prop}$  = Total actual proposed skylight area of the proposed building (in ft<sup>2</sup>).
- $A_{Rtotal-prop}$  = Total actual proposed gross exterior roof area of the proposed building (in ft<sup>2</sup>).
- $U_{Wintd}$  = The applicable wall U factor for the corresponding  $A_{Wt}$  from TABLE 143-A, TABLE 143-B, or TABLE 143-C.
- $U_{Fintd}$  = The applicable floor/soffit U factor for the corresponding  $A_{Et}$  from TABLE 143-A, TABLE 143-B, or TABLE 143-C.
- $U_{Rintd}$  = The applicable roof/ceiling U factor for the corresponding  $A_{Rt}$  from TABLE 143-A, TABLE 143-B, or TABLE 143-C.
- $U_{Gintd}$  = The applicable window U factor for the corresponding  $A_{Gt}$  from TABLE 143-A, TABLE 143-B, or TABLE 143-C.
- $U_{Sintd}$  = The applicable skylight U factor for the corresponding  $A_{St}$  from TABLE 143-A, TABLE 143-B, or TABLE 143-C.

**EQUATION 143-C PROPOSED BUILDING HEAT LOSS EQUATION**

$$HL_{prop} = \sum_{j=1}^{nW} (A_{Wj} \times U_{Wj_{prop}}) + \sum_{j=1}^{nF} (A_{Fj} \times U_{Fj_{prop}}) + \sum_{j=1}^{nR} (A_{Rj} \times U_{Rj_{prop}}) + \sum_{j=1}^{nG} (A_{Gj} \times U_{Gj_{prop}}) + \sum_{j=1}^{nS} (A_{Sj} \times U_{Sj_{prop}})$$

**WHERE:**

- $HL_{prop}$  = Overall heat loss of the proposed building (in Btu/h °F).
- $j$  = Each wall type and orientation, floor/soffit type, roof/ceiling type, window type and orientation, or skylight type for the proposed building.
- $nW, nR,$   
 $nG, nF,$   
 $nS$  = As determined in EQUATION 143-A.
- $A_{Wj}$  = Exterior wall area on the north, east, south, and west orientations of the proposed building (in ft<sup>2</sup>). Each orientation has as many walls as there are HC categories.
- $A_{Fj}$  = Exterior floor/soffit area of the proposed building (in ft<sup>2</sup>). There are as many floors/soffits as there are HC categories.
- $A_{Rj}$  = Exterior roof/ceiling area of the proposed building (in ft<sup>2</sup>).
- $A_{Gj}$  = Window (glazing) area for each window type and orientation of the proposed building (in ft<sup>2</sup>).
- $A_{Sj}$  = Skylight area for each skylight type of the proposed building (in ft<sup>2</sup>).
- $U_{Wj_{prop}}$  = The wall U factor for the corresponding  $A_{Wj}$ .
- $U_{Fj_{prop}}$  = The floor/soffit U factor for the corresponding  $A_{Fj}$ .
- $U_{Rj_{prop}}$  = The roof/ceiling U factor for the corresponding  $A_{Rj}$ .
- $U_{Gj_{prop}}$  = The window U factor for the corresponding  $A_{Gj}$ .
- $U_{Sj_{prop}}$  = The skylight U factor for the corresponding  $A_{Sj}$ .

2. **Overall heat gain.** The overall heat gain of the overall envelope of the proposed building,  $HG_{prop}$ , as calculated with EQUATION 143-E, shall be no greater than the overall heat gain of the overall envelope of a standard building,  $HG_{std}$ , as calculated with EQUATION 143-D. In making the calculations, it shall be assumed that the orientation and area of each envelope component of the standard building are the same as in the proposed building.

**EQUATION 143-D STANDARD BUILDING HEAT GAIN**

$$HG_{std} = \sum_{i=1}^{nW} (A_{Wi} \times U_{Wi_{std}} \times TF_i) + \sum_{i=1}^{nF} (A_{Fi} \times U_{Fi_{std}} \times TF_i) + \sum_{i=1}^{nR} (A_{Ri} \times U_{Ri_{std}} \times TF_i) + \sum_{i=1}^{nG} (A_{Gi} \times U_{Gi_{std}} \times TF_i) + \sum_{i=1}^{nS} (A_{Si} \times U_{Si_{std}} \times TF_i) + \sum_{i=1}^{nG} (WF_{Gi} \times A_{Gi} \times RSHG_{Gi_{std}}) \times SF + \sum_{i=1}^{nS} (WF_{Si} \times A_{Si} \times SHGC_{Si_{std}}) \times SF + \sum_{i=1}^{nR} (WF_{Ri} \times A_{Ri} \times U_{Ri_{std}} \times [1 - (0.2 + 0.7[\rho_{Ri_{std}} - 0.2])]) \times SF$$

**WHERE:**

- $HG_{std}$  = Overall heat gain of the standard building (Btu/h).
- $i$  = As determined in EQUATION 143-B.
- $nW, nR,$

$nG, nF,$		
$nS$	=	As determined in EQUATION 143-B.
$A_{Wj}$	=	As determined in EQUATION 143-B.
$A_{Fj}$	=	As determined in EQUATION 143-B.
$A_{Rj}$	=	As determined in EQUATION 143-B.
$A_{Gj}$	=	As determined in EQUATION 143-B.
$A_{Sj}$	=	As determined in EQUATION 143-B.
$U_{Wj,prop}$	=	As determined in EQUATION 143-B.
$U_{Fj,prop}$	=	As determined in EQUATION 143-B.
$U_{Rj,prop}$	=	As determined in EQUATION 143-B.
$U_{Gj,prop}$	=	As determined in EQUATION 143-B.
$U_{Sj,prop}$	=	As determined in EQUATION 143-B.
$RSHG_{Gj,prop}$	=	The applicable relative solar heat gain for the corresponding $A_{Gj}$ , from TABLE 143-A, TABLE 143-B, or TABLE 143-C (unitless).
$WF_{Gj}$	=	The applicable weighting factor for glazing for each orientation of the standard building, from TABLE 143-E (unitless).
$WF_{Sj}$	=	The applicable weighting factor for skylight of the standard building, from TABLE 143-E (unitless).
$WF_{Rj}$	=	The applicable weighting factor for roof of the standard building, from TABLE 143-E (unitless).
$\rho_{Ri,std}$	=	Initial solar reflectance of the roofing product for the corresponding $A_{Ri}$ . The standard building has an initial solar reflectance of 0.70 for nonresidential buildings with low-sloped roofs and an initial solar reflectance of 0.30 for nonresidential buildings with high-sloped roofs, for high-rise residential buildings, and for guest rooms of hotel/motel buildings.
$SHGC_{Gj,prop}$	=	The applicable solar heat gain coefficient for the corresponding $A_{Gj}$ , from TABLE 143-A, TABLE 143-B, or TABLE 143-C (unitless).
$SF$	=	The solar factor from TABLE 143-D.
$TF_j$	=	The temperature factor from TABLE 143-D.

**EQUATION 143-E PROPOSED BUILDING HEAT GAIN**

$$\begin{aligned}
 HG_{prop} = & \sum_{j=1}^{nW} (A_{Wj} \times U_{Wj,prop} \times TF_j) + \sum_{j=1}^{nF} (A_{Fj} \times U_{Fj,prop} \times TF_j) + \sum_{j=1}^{nR} (A_{Rj} \times U_{Rj,prop} \times TF_j) \\
 & + \sum_{j=1}^{nG} (A_{Gj} \times U_{Gj,prop} \times TF_j) + \sum_{j=1}^{nS} (A_{Sj} \times U_{Sj,prop} \times TF_j) + \sum_{j=1}^{nG} (WF_{Gj} \times A_{Gj} \times SHGC_{Gj,prop} \times OHF_j) \times SF \\
 & + \sum_{j=1}^{nS} (WF_{Sj} \times A_{Sj} \times SHGC_{Sj,prop}) \times SF + \sum_{j=1}^{nR} (WF_{Rj} \times A_{Rj} \times U_{Rj,prop} \times [1 - (0.2 + 0.7[\rho_{Ri,prop} - 0.2])]) \times SF
 \end{aligned}$$

**WHERE:**

- $HG_{prop}$  = Overall heat gain of the proposed building (Btu/h).
- $j$  = As determined in EQUATION 143-C.
- $nW, nR,$   
 $nG, nF,$   
 $nS$  = As determined in EQUATION 143-C.
- $A_{Wj}$  = As determined in EQUATION 143-C.
- $A_{Rj}$  = As determined in EQUATION 143-C.
- $A_{Gj}$  = As determined in EQUATION 143-C.
- $A_{Fj}$  = As determined in EQUATION 143-C.
- $A_{Sj}$  = As determined in EQUATION 143-C.
- $U_{Wjprop}$  = As determined in EQUATION 143-C.
- $U_{Rjprop}$  = As determined in EQUATION 143-C.
- $U_{Gjprop}$  = As determined in EQUATION 143-C.
- $U_{Fjprop}$  = As determined in EQUATION 143-C.
- $U_{Sjprop}$  = As determined in EQUATION 143-C.
- $SHGC_{Gj}$  = The solar heat gain coefficient for the corresponding  $A_{Gj}$  (unitless).
- $SHGC_{Sj}$  = The solar heat gain coefficient for the corresponding  $A_{Sj}$  (unitless).
- $OHF_{Gj}$  = The overhang factor for the corresponding  $A_{Gj}$  (unitless).
- $OHF_{Gj}$  =  $1 + aH/V + b(H/V)^2$

**WHERE:**

- $H$  = Horizontal projection of an overhang from the surface of the window, no greater than  $V$ , in feet.
- $V$  = Vertical distance from the window sill to the bottom of the overhang, in feet.
- $a$  = -0.41 for north-facing windows, -1.22 for south-facing windows, and -0.92 for east and west-facing windows.
- $b$  = 0.20 for north-facing windows, 0.66 for south-facing windows, and 0.35 for east and west-facing windows.

- $WF_{Gj}$  = The applicable weighting factor for each orientation of the building, from TABLE 143-E (unitless).
- $WF_{skyj}$  = The applicable weighting factor for skylight of the proposed building, from TABLE 143-E (unitless).
- $WF_{Rj}$  = The applicable weighting factor for roof of the proposed building, from TABLE 143-E (unitless).

- $\rho_{Ri,prop}$  = The initial solar reflectance of the proposed design roofing product for the corresponding  $A_{Rj}$ , as certified and labeled according to the requirements of Section 10-113. If the roofing product has an emittance less than 0.75 the value shall be calculated by the following equation:

$$\rho_{Ri_{prop}} = -0.448 + 1.121 * R + 0.524 * E$$

Where

R = reflectance of the roofing product

E = emittance of the roofing product

The calculated value of  $\rho_{Ri_{prop}}$  from the above equation shall not be larger than R or less than 0.10.

If the proposed design roofing product used has not been certified and labeled according to the requirements of 10-113 and/or does not meet the requirements of Section 118 (i) 3, the proposed design initial solar reflectance shall be 0.10 for nonresidential buildings with low-sloped roofs, or 0.30 for nonresidential buildings with high-sloped roofs, high-rise residential buildings, and guest rooms in hotel/motel buildings.

*single-family* = The solar factor from TABLE 143-D.

*TF<sub>i</sub>* = The temperature factor from TABLE 143-D.

(c) **Minimum Skylight Area for Large Enclosed Spaces in Low-Rise Buildings with Three or Fewer Stories.** In climate zones 2 through 15, ~~Low-low~~ rise conditioned or unconditioned enclosed spaces that are greater than ~~25,000~~ 8,000 ft<sup>2</sup> directly under a roof with ceiling heights greater than 15 ft and have a lighting power density for general lighting equal to or greater than 0.5 W/ft<sup>2</sup> shall meet sections 143 (c) 1-4 below. ~~All S-1 and S-2 (storage) occupancies and all F-1 and F-2 (factory) occupancies with roof heights greater than 15 feet will be deemed to have ceiling heights greater than 15 feet when a ceiling plan is not provided and have a general lighting power density greater than 0.5 W/ft<sup>2</sup> when a completed general lighting plan for the entire space is not provided:~~

1. **Daylit Area.** At least one half of the floor area shall be in the daylit skylit area under skylights and the skylit area shall be shown on the building plans. Skylit area is defined in Section 101.
2. **Minimum Skylight Area or Effective Aperture.** Areas that are daylit skylit shall have a minimum skylight area to daylit skylit area ratio of at least 3.3% or minimum skylight effective aperture of at least 1.1% as shown in TABLE 143-F. Skylight effective aperture shall be determined as specified in Equation 146-AC.
3. **Skylight Characteristics.** Skylights shall:
  - A. Have a glazing material or diffuser that has a measured haze value greater than 90%, tested according to ASTM D1003 (notwithstanding its scope) or other test method approved by the Commission; and
  - B. If the space is conditioned, meet the requirements in Section 143-(a)-6 or 143-(b).
4. **Controls.** Electric lighting in the daylit area shall be controlled as described in Section 131-(c)-2.

~~EXCEPTION 1 to Section 143 (c): Buildings in climate zones 1 or 16.~~

**EXCEPTION 2 to Section 143 (c):** Auditoriums, churches, movie theaters, museums, permanent structure above roof and refrigerated warehouses.

TABLE 143-D TEMPERATURE AND SOLAR FACTORS

CLIMATE ZONE	TEMPERATURE FACTOR (TF)			SOLAR FACTOR (SF) (Btu/hr. x ft <sup>2</sup> )
	Envelope Construction			
	Light Mass	Medium Mass	Heavy Mass	
1	14	3	1	128
2	40	30	28	126
3	28	18	16	126
4	32	22	20	125
5	27	17	15	124
6	28	18	16	123
7	27	17	15	123
8	33	23	21	123
9	42	31	29	123
10	45	35	33	123
11	49	38	36	127
12	45	34	32	126
13	45	35	33	125
14	52	42	40	125
15	55	45	43	123
16	34	23	21	128
Light Mass: Heat Capacity < 7 Btu/ft. <sup>2</sup> °F				
Medium Mass: Heat Capacity >= 7 and < 15 Btu/ft. <sup>2</sup> °F				
Heavy Mass: Heat Capacity >= 15 Btu/ft. <sup>2</sup> °F				

~~TABLE 143 E-GLAZING ORIENTATION WEIGHTING FACTORS ( $WF_G$ ), ( $WF_R$ ) & ( $WF_S$ )~~

Climate Zone	$WF_{north}$	$WF_{south}$	$WF_{west}$	$WF_{east}$	$WF_{sky}$	$WF_{roof}$
<del>NON-RESIDENTIAL</del>						
1	0.56	1.25	1.16	1.03	1.48	0.93
2	0.56	1.30	1.18	0.96	2.34	1.12
3	0.51	1.28	1.24	0.97	2.42	0.84
4	0.55	1.20	1.24	1.01	2.53	0.96
5	0.58	1.25	1.18	0.98	2.48	0.80
6	0.56	1.23	1.21	1.00	2.40	0.84
7	0.57	1.30	1.17	0.97	2.36	0.87
8	0.60	1.26	1.14	1.00	2.47	0.98
9	0.56	1.36	1.11	0.97	2.29	0.97
10	0.60	1.38	1.07	0.95	2.19	1.02
11	0.55	1.19	1.17	1.10	2.37	0.89
12	0.55	1.17	1.21	1.07	2.40	0.92
13	0.58	1.15	1.17	1.10	2.39	1.04
14	0.57	1.17	1.20	1.07	2.46	1.13
15	0.61	1.27	1.05	1.07	2.29	0.92
16	0.51	1.27	1.15	1.07	2.20	1.03
<del>HIGH RISE RESIDENTIAL</del>						
1	0.50	1.24	1.23	1.03	1.36	0.82
2	0.55	1.29	1.23	0.94	2.30	1.08
3	0.47	1.28	1.29	0.96	2.42	0.80
4	0.54	1.17	1.33	0.96	2.53	0.96
5	0.49	1.28	1.25	0.97	2.48	0.77
6	0.55	1.20	1.26	0.99	2.37	0.79
7	0.55	1.28	1.21	0.96	2.37	0.88
8	0.57	1.26	1.20	0.97	2.44	0.96
9	0.53	1.39	1.14	0.94	2.24	0.93
10	0.59	1.34	1.12	0.94	1.92	1.00
11	0.53	1.14	1.27	1.06	2.23	0.88
12	0.55	1.14	1.29	1.03	2.31	0.91
13	0.57	1.12	1.27	1.05	2.27	1.02
14	0.57	1.13	1.28	1.02	2.38	1.08
15	0.59	1.26	1.12	1.03	2.26	0.90
16	0.49	1.24	1.25	1.01	2.02	0.95

~~TABLE 143 – F MINIMUM SKYLIGHT AREA TO DAYLIT FLOOR AREA OR MINIMUM SKYLIGHT EFFECTIVE APERTURE IN LOW RISE ENCLOSED SPACES >25,000 FT<sup>2</sup> DIRECTLY UNDER A ROOF~~

<del>GENERAL LIGHTING POWER DENSITY IN DAYLIT AREAS (W/FT<sup>2</sup>)</del>	<del>MINIMUM SKYLIGHT AREA TO DAYLIT AREA RATIO</del>	<del>MINIMUM SKYLIGHT EFFECTIVE APERTURE</del>
<del>1.4 W/FT<sup>2</sup> ≤ LPD</del>	<del>3.6%</del>	<del>1.2%</del>
<del>1.0 W/FT<sup>2</sup> ≤ LPD &lt; 1.4 W/FT<sup>2</sup></del>	<del>3.3%</del>	<del>1.1%</del>
<del>0.5 W/FT<sup>2</sup> ≤ LPD &lt; 1.0 W/FT<sup>2</sup></del>	<del>3.0%</del>	<del>1.0%</del>