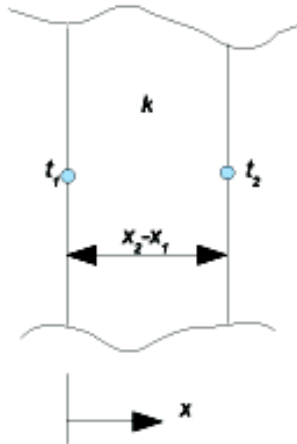
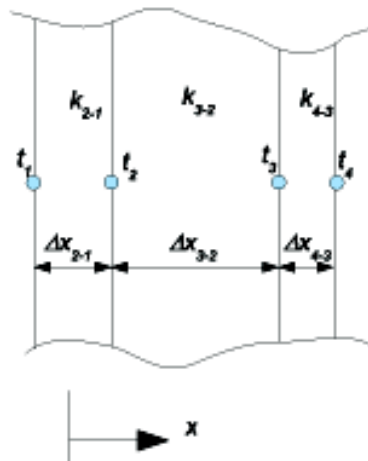


Errata to
Load Calculation Applications Manual (2009)
July 20, 2009

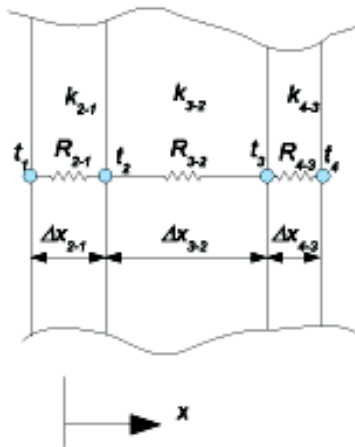
Page 6: Figure 2.1 is difficult to read. Please refer to this:



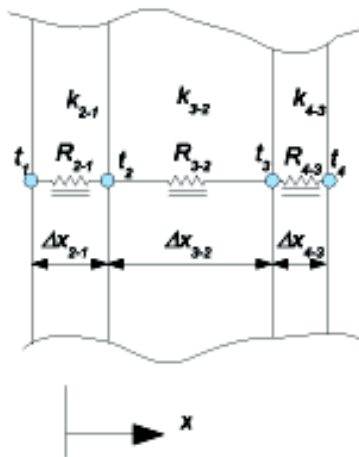
Page 7: Figure 2.2 is difficult to read. Please refer to this:



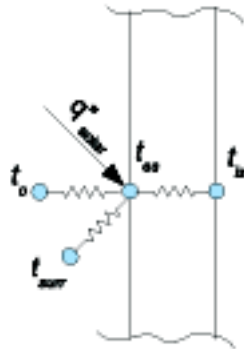
Page 8: Figure 2.3 is difficult to read. Please refer to this:



Page 11: Figure 2.4 is difficult to read. Please refer to this:

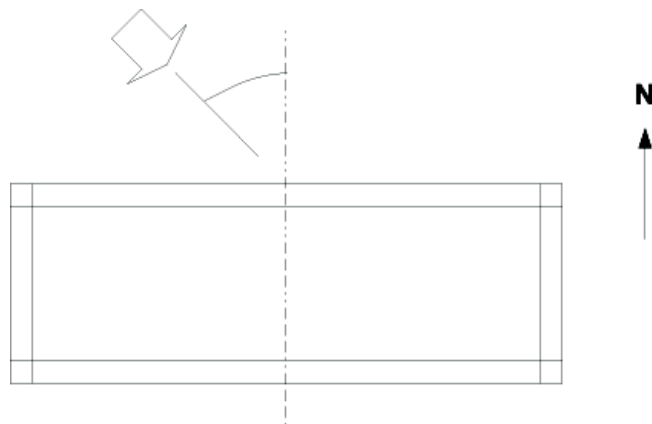


Page 15: Figure 2.6 is difficult to read. Please refer to this:

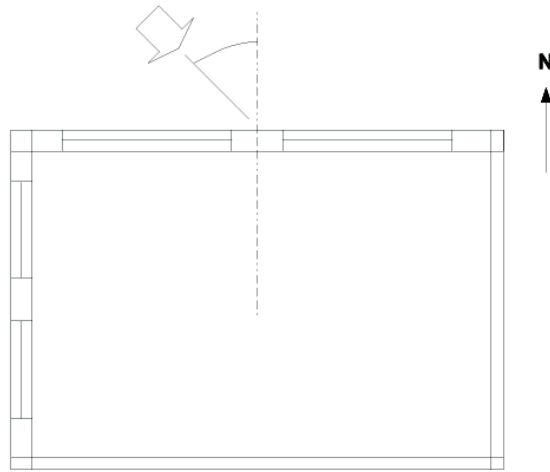


Page 32: In the “Air Space” row of the table, change the column headers to “1.5 in. Air Space^c” and “3.5 in. Air Space^c”.

Page 89: Figure 5.7 is difficult to read. Please refer to this:



Page 102: Figure 5.17 is difficult to read. Please refer to this:



Page 228: In Equation 10.6, change the equation from

$$U_{avg, bf} = \frac{2k_{soil}}{\pi w_b} \times \left[\ln\left(\frac{w_b}{2} + \frac{z_f}{2} + \frac{k_{soil}R_{other}}{\pi}\right) - \ln\left(\frac{z_f}{2} + \frac{2k_{soil}R_{other}}{\pi}\right) \right]$$

to

$$U_{avg, bf} = \frac{2k_{soil}}{\pi w_b} \times \left[\ln\left(\frac{w_b}{2} + \frac{z_f}{2} + \frac{k_{soil}R_{other}}{\pi}\right) - \ln\left(\frac{z_f}{2} + \frac{k_{soil}R_{other}}{\pi}\right) \right]$$

Errata to
Load Calculation Applications Manual
September 2, 2009

Page 73: In the final paragraph of Section 4.2.3 Heating Load Design Conditions, the second sentence should read, “The mean of annual extremes, column 16...” It should not read, “The mean of annual extremes, column 22...”

Errata to
Load Calculation Applications Manual, I-P Edition
June 8, 2010

Chapter/ Appendix	Page	Description
2	11	Example 2.4 should mention that the area is 100 ft ² .
2	11	In the solution equation, there should not be an "=" sign between $\frac{\text{Btu}}{\text{h} \cdot \text{ft}^2 \cdot ^\circ\text{F}}$ and the (100 ft ²).
2	15	In the first full sentence on the page, instead of " δR ," it should be " $\varepsilon \delta R / h_o$."
3	25	The numerical values that correspond with the section labeled "Stone, Lime, or Sand" should be moved down so that the row beginning with 180 lines up with "Quartzitic and Sandstone."
5	84	In the first sentence on the page, delete the "m" after Δp_{st}
5	91	In the "Wind Pressure Difference (Twelfth Floor)" section of the table, under "East Wall, Leeward," $\theta = 140^\circ$, not $\theta = 1340^\circ$.
5	94	In Example 5.2, for "First Floor" and "Equation 5.14," the subscript "n" should be used for "North Wall" (Q/A) and Q, not "w."
5	95	In Example 5.2, for "First Floor" and "Equation 5.14," the subscript "w" should be used for "West Wall" (Q/A) and Q, not "s."
5	95	In Example 5.2, for "Total, First Floor," Q_n is missing from the equation that reads $Q_1 = Q_w + Q_s + Q_1$
5	95	For the "East wall," the subscript for (Q/A) and Q should be "e" not "l."
5	95	The infiltration rate for the "West wall" and "South wall" are given as "cfm ² ." But, in both cases it should read "cfm."
5	96	In Table 5.3, for "Average-Fitting Window," the "Nonweatherstripped Average Gap" should be listed as 1/64 in., not 1/62 in.
7	149	The first full sentence should state "... hourly cooling loads according to Equation 7.5," not Equation 7.4.
8	173	In the section labeled "Incident Solar Radiation and Sol-Air Temperatures," the third bullet should state that 4.0 Btu/h·ft ² ·°F was used, not 3.0 Btu/h·ft ² ·°F.
8	178	There are several errors in Table 8.10a. See pg. 3 of this errata list for the corrected table.
8	179	There are several errors in Table 8.11a. See pg. 3 of this errata list for the corrected table.
8	181	The first sentence should refer to Table 6.2, not Table 6.3.
8	186	The first sentence in Section 8.3.4 should refer to Equation 7.5, not 7.4.
8	190	Table 8.21 is missing the "Hour" column on the left hand side of the table. See pg. 4 of this errata list for the corrected table.
9	202	Mislabeled "h ₂ " and "h ₃ " on Figure 9.2. See pg. 5 of this errata list for the corrected figure.
9	203	In the first full paragraph on the page, the sentence should read, "The data for specific volume v from a proper psychrometric chart or from Table A.2 should be used for elevations above 2500 ft," not Table 9.2.
9	204	In Equation 9.3, it should be " m_{a1} ," not " m_{ai} ."
9	204	Toward the bottom of the page, the sentence should read, "Alternately, the sensible load on the coil could be computed from Equation 9.1a," not Equation 9.16.
9	207	In Example 9.3 in the solution equation, it should read "cfm _m = 300(5)..." not "cfm _m + (5)..."

Chapter/ Appendix	Page	Description
9	211	In the solution for Example 9.4, in the second to last equation, it should be q_{cs} , not q_{es} .
9	214	The Example 9.5 bubble is too high and the grey shading started too soon. It should start with the paragraph starting with "A space ...," and the example bubble should be level with this paragraph.
9	219	In last paragraph of Example 9.6, it should be 58° F DB, not 62°F.
A	246	The first bullet point should be 32.174 ft/s ² , not 32.174 ft ² .
D	310	In the last paragraph, the values 0.026 and 0.052 should be replaced with 0.15 and 0.3, respectively.
E	319	In Equation E.5, the units for k_{Hom} should be Btu-in./h-ft ² ·°F, not ft ² ·°F·h/Btu-in.
E	320	Correct value for weighting parameter, p , is: $p = 0.449$, not 0.278. Revised equations for this entire example can be found on pg. 5 of this errata list.
E	322	In the text description of Step 3 of Example E.1, it should say that the thermal conductivity is calculated using Equation E.5, not E.4.
E	322	In second equation in Step 4 of Example E.1, it should be $y_{insulation}$, not y_{steel} .
E	322	In Example E.1, the values for resistances listed in the paragraph at toward the bottom of the page beginning with "The astute reader..." are modified as follows (resulting from the weighting factor error): Was: 15.949 Change to: 17.707 Was: 15.912 Change to: 17.696 Was: 0.65 Change to: 0.49 Was: 0.6544 Change to: 0.4908
E	323	In Table E.4, the values for EHL conductivity should be changed from 0.65 to 0.49, and for resistance from 5.385 to 7.143, corresponding to revised values based on weighting factor error.
E	323	In Table E.4, the values for the outside and inside air films are reversed. Outside should be 0.25 and Inside should be 0.688.
F	326	The third bullet in Example F.1 should refer to Table 10.3, not Table 10.6.
F	327	The second bullet at top of this page mislabels the specific heat units. They should be Btu/lb _m ·°F, not Btu/lb _m .
F	328	In the nomenclature in the middle of the page, in the line explaining Fp the reference should be to Table 10.3, not Table 10.6.
G	332	In Example G.1, in the second bullet point under the bullet point beginning with "The window U-factor," it should be "1.46 Btu/h·ft ² ·°F," not "1.46 /h·ft ² ·°F."
G	333	Change text for first bullet at the top of the page to read, "The total interior surface area, including exterior walls, interior partitions, windows, ceiling, floor, and furniture, at or below the level of the dropped ceiling is approximately 1262 ft ² ."
G	334	In Figure G.2, the vertical axis is mislabeled with wrong units. They should be "Btu/h," not "Btu/h·ft ² ."

Table 8.10a Solar Heat Gain Calculations for the Southwest-Facing Windows, Part 1

Local Time	Apparent Solar Time [Eqn. D.2]	Hour Angle, ° [Eqn. D.3]	Solar Altitude Angle, ° [Eqn. D.4]	Solar Azimuth Angle, ° [Eqn. D.5b]	Surface Solar Azimuth Angle, ° [Eqn. D.6]	Incident Angle, ° [Eqn. D.7]	Incident Beam Radiation Btu/(h·ft ²) [Eqn. D.9]	Incident Diffuse Radiation Btu/(h·ft ²) [Eqns. D.10 and D.13]
7	5.27	-101.0	2.7	66.9	-173.1	172.6	0.0	0.5
8	6.27	-86.0	14.4	74.6	-165.4	159.6	0.0	15.4
9	7.27	-71.0	26.7	82.0	-158.0	146.0	0.0	25.7
10	8.27	-56.0	39.1	89.7	-150.3	132.4	0.0	33.3
11	9.27	-41.0	51.6	99.1	-140.9	118.9	0.0	39.2
12	10.27	-26.0	63.6	112.8	-127.2	105.6	0.0	43.3
13	11.27	-11.0	73.7	140.4	-99.6	92.7	0.0	48.6
14	12.27	4.0	76.5	196.2	-43.8	80.3	44.8	52.8
15	13.27	19.0	68.7	237.1	-2.9	68.8	95.6	55.5
16	14.27	34.0	57.3	255.4	15.4	58.6	134.6	56.0
17	15.27	49.0	44.9	266.2	26.2	50.6	157.2	53.5
18	16.27	64.0	32.5	274.5	34.5	45.9	158.4	47.0
19	17.27	79.0	20.1	281.9	41.9	45.7	131.0	35.1
20	18.27	94.0	8.1	289.4	49.4	49.9	55.5	13.8

Table 8.11a Solar Heat Gain Calculations for the Southeast-Facing Windows, Part 1

Local Time	Apparent Solar Time [Eqn. D.2]	Hour Angle, ° [Eqn. D.3]	Solar Altitude Angle, ° [Eqn. D.4]	Solar Azimuth Angle, ° [Eqn. D.5b]	Surface Solar Azimuth Angle, ° [Eqn. D.6]	Incident Angle, ° [Eqn. D.7]	Incident Beam Radiation Btu/(h·ft ²) [Eqn. D.9]	Incident Diffuse Radiation Btu/(h·ft ²) [Eqns. D.10 and D.13]
7	5.27	-101.0	2.7	66.9	-83.1	83.1	0.7	0.6
8	6.27	-86.0	14.4	74.6	-75.4	75.9	37.3	20.2
9	7.27	-71.0	26.7	82.0	-68.0	70.5	71.2	34.0
10	8.27	-56.0	39.1	89.7	-60.3	67.4	92.3	43.8
11	9.27	-41.0	51.6	99.1	-50.9	66.9	99.5	50.4
12	10.27	-26.0	63.6	112.8	-37.2	69.2	92.8	53.9
13	11.27	-11.0	73.7	140.4	-9.6	74.0	73.3	54.6
14	12.27	4.0	76.5	196.2	46.2	80.7	42.9	52.6
15	13.27	19.0	68.7	237.1	87.1	89.0	4.8	48.6
16	14.27	34.0	57.3	255.4	105.4	98.2	0.0	42.9
17	15.27	49.0	44.9	266.2	116.2	108.2	0.0	36.3
18	16.27	64.0	32.5	274.5	124.5	118.5	0.0	29.5
19	17.27	79.0	20.1	281.9	131.9	128.9	0.0	20.7
20	18.27	94.0	8.1	289.4	139.4	138.8	0.0	7.8

Table 8.21 Return Air Cooling Load and System Cooling Load, Btu/h (Without Interior Shading)

Hour	Lighting to Return Air	Roof Heat Gain to Return Air	Total Heat Gain to Return Air	System Sensible Cooling Load
1	67	-12	55	1177
2	67	-20	47	1010
3	67	-26	41	867
4	67	-31	36	735
5	67	-36	31	618
6	67	-39	27	522
7	67	-42	25	483
8	334	-32	302	2815
9	668	22	690	5707
10	668	101	769	6669
11	668	182	851	7383
12	668	257	926	8035
13	668	320	988	8659
14	668	365	1033	9167
15	668	389	1057	9521
16	668	389	1057	10170
17	668	365	1033	10967
18	334	318	653	9341
19	67	252	318	6934
20	67	170	237	4924
21	67	87	153	2939
22	67	34	101	2145
23	67	10	77	1697
24	67	-2	64	1399

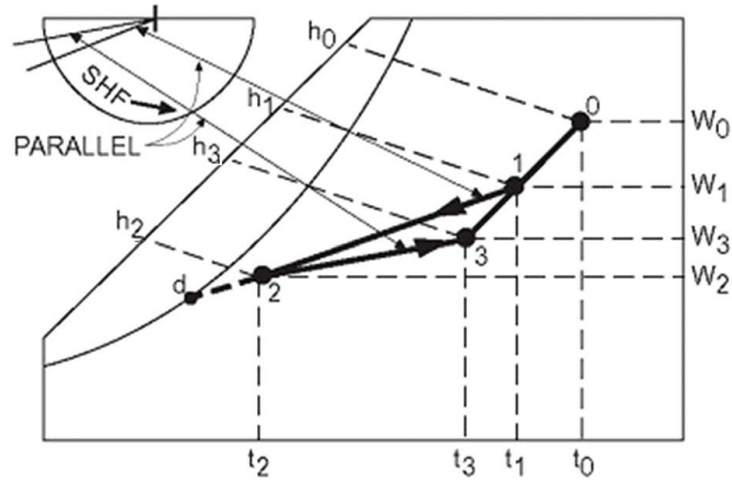


Figure 9.2 Psychrometric processes for Example 9.1.

Equations for Appendix E, Example E.1:

$$R_{CL} = \frac{1}{\frac{A_{f,metal}}{R_{metal}} + \frac{A_{f,insulation}}{R_{insulation}}} = 2.451 \text{ ft}^2 \cdot \text{h} \cdot \text{°F}/\text{Btu} \quad (\text{E.8})$$

$$R_{max} = \frac{1}{\frac{A_{f,metal}}{R_{mp}} + \frac{A_{f,insulation}}{R_{ip}}} = 23.428 \text{ ft}^2 \cdot \text{h} \cdot \text{°F}/\text{Btu} \quad (\text{E.9})$$

$$p = 0.8(13.016/23.428) + 0.44 - 0.1(1.5/1.5) - 0.2(24/16) - 0.04(3.5/4) = 0.449$$

$$R_T = 0.449 \cdot 23.428 + (1 - 0.449)13.016 = 17.696 \text{ ft}^2 \cdot \text{h} \cdot \text{°F}/\text{Btu}$$

$$R_{Hom} = R_T - \sum_{i=1}^N R_i \quad (\text{E.3})$$

$$R_{Hom} = 17.696 - 10.564 = 7.132 \text{ ft}^2 \cdot \text{h} \cdot \text{°F}/\text{Btu}$$

$$k_{Hom} = \frac{3.5}{7.132} = 0.49 \text{ Btu} \cdot \text{in.}/\text{°F} \cdot \text{ft}^2 \cdot \text{h}$$

$$y_{steel} = \frac{(3.5 + 2 \times 1.5) \times 0.059}{3.5 \times 16} = 0.007$$

$$y_{insulation} = 1 - \frac{(3.5 + 2 \times 1.5) \times 0.059}{3.5 \times 16} = 0.993$$

$$\rho_H = 474.5 \times 0.007 + 0.905 \times 0.993 = 4.15 \text{ lb}_m/\text{ft}^3$$

$$c_p = \frac{(474.5 \times 0.120 \times 0.007 + 0.905 \times 0.170 \times 0.993)}{4.15} = 0.13 \text{ Btu}/\text{lb}_m \cdot \text{°F}$$

Errata to
Load Calculation Applications Manual (I-P and SI Editions)
May 17, 2011

Page 83: Equation 5.6b should be changed from

$$\Delta p_{st} = \rho_o \left(\frac{T_o - T_i}{T_i} \right) g (H_{NPL} - H)$$

to

$$\Delta p_{st} = \rho_o \left(\frac{T_i - T_o}{T_i} \right) g (H_{NPL} - H) \quad .$$