

	C (Btu /(hr •°F • sq ft))	K ((Btu∘in.) /(hr∘°F∘sqft))	х (in.)	C _x (Btu /(hr•°F•sq ft))	Zone A			Zone B		
Section					A (sq ft)	C _x • A (Btu /(hr •°F))	$\frac{1}{C_x \cdot A} = \frac{R}{A}$ $((hr \cdot F) / Btu)$	A (sq ft)	C _x • A (Btu Ahr • °F))	$\frac{1}{C_x \cdot A} = \frac{R}{A}$ ((hr \cdot \cdot F) /8tu)
Outside air surface	6.000			6.000	0.07416	0.445	2.25	4.42584	26.555	0.04
4-in. nominal face brick		9.000	3.75	2.400				4,42584	10.622	0.09
Brick		9.000	1.75	5.143	0.07416	0.381	2.62			
Brick		9.000	2.00	4.500	0.07397	0.333				
Steel		314.000	2.00	157.000	0.00019	0.030				
					Subtotal	0.363	2.75			
1-in. airspace	1.030			1.030	0.07397	0.076		4.42584	4.559	0.22
Steel		314.000	1.00	314.000	0.00019	0.060				
					Subtotal	0.136	7.35			
2-in poly- styrene rigid board insu- lation		0.250	2.00	0.125	0.07397	0.009		4.42584	0.553	1.81
Steel		314.000	2.00	157.000	0.00019	0.030				
					Subtotal	0.039	25.64			
Brick		9.000	2.00	4.500	0.07397	0.333				
Steel		314.000	2.00	157.000	0.00019	0.030				
					Subtotal	0.363	2.75			
Brick		9.000	1.75	5.143	0.07416	0.381	2.62			
4-in. nominal face brick		9.000	3.75	2.400				4.42584	10.622	0.09
Inside air sur- face	1.470			1.470	0.07416	0.109	9.17	4.42584	6.506	0.15
					$R_A/A_A = 55.15$ $1/(R_A/A_A) = 0.018$			$R_B/A_B = 2.40$ $1/(R_B/A_B) = 0.417$		

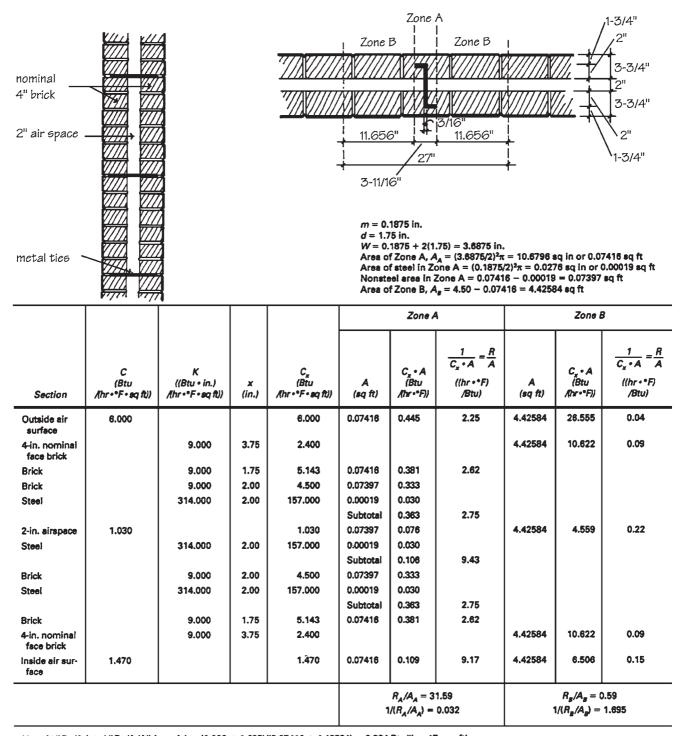
$$U_{\text{evg}} = [1/(R_s/A_s) + 1/(R_g/A_g)]/(A_A + A_g) = (0.018 + 0.417)/(0.07416 + 4.42584) = 0.097 \text{ Btu/(hr } \circ \text{F} \circ \text{sq ft})$$

$$U_g = [1/(R_g/A_g)]/A_g = 0.417/4.42584 = 0.094 \text{ Btu/(hr } \circ \text{F} \circ \text{sq ft})$$

$$\frac{U_{\text{evg}} - U_g}{U_g} \times 100\% = \frac{0.097 - 0.094}{0.094} \times 100\% = 3.19\%$$

 $\textbf{Figure 8-22} \quad \text{Thermal calculations for insulated brick masonry cavity wall.} \ (\textit{From BIA Technical Note 4 Rev.})$

Chapter 8 Wall Types and Properties



$$\begin{aligned} U_{\text{avg}} &= [1/(R_{\text{A}}/A_{\text{A}}) + 1/(R_{\text{g}}/A_{\text{g}})]/(A_{\text{A}} + A_{\text{g}}) = (0.032 + 1.695)/(0.07416 + 4.42584) = 0.384 \text{ Btu/(hr} \circ \text{F} \circ \text{sq ft)} \\ U_{\text{g}} &= [1/(R_{\text{g}}/A_{\text{g}})]/A_{\text{g}} = 1.695/4.42584 = 0.383 \text{ Btu/(hr} \circ \text{F} \circ \text{sq ft)} \\ &\frac{U_{\text{evg}} - U_{\text{g}}}{U_{\text{g}}} \times 100\% = \frac{0.384 - 0.383}{0.383} \times 100\% = 0.26\% \end{aligned}$$

Figure 8-23 Thermal calculations for uninsulated brick masonry cavity wall. (From BIA Technical Note 7 Rev.)