Outside Corners



2x6 Stud Wall (Typ.)





2x6 Stud Wall (Outside Corner)





BC + U-Factor 'TAGS'

















Calculate Losses_{2D}





Calculate Losses_{1D}





Calculating Psi (Ψ)

Psi Value = $Losses_{2D} - \sum Losses_{1D}$

$\Delta \mathsf{T}$

 $Losses_{2D} = U-factor_{2D} \times L_{EXTERIOR LENGTH} \times \Delta T$

 $Losses_{1D} = (U-factor_1 \times L_1 \times \Delta T) + (U-factor_2 \times L_2 \times \Delta T)$

INPUTS		
U-factor _{2D}	=	0.0537 Btu/hr·ft ² ·F
U-factor ₁	=	0.0570 Btu/hr·ft ² ·F
U-factor ₂	=	0.0570 Btu/hr·ft ² ·F
L ₁	=	3'
L ₂	=	3'
L EXTERIOR LENGTH	=	6' (From THERM)
ΔT	=	70°F



Calculating Psi (Ψ)

Losses _{2D}	Losses _{1D}
U-factor _{2D} × L _{EXTERIOR LENGTH} × Δ T	$(U-factor_1 \times L_1 \times \Delta T)$ + $(U-factor_2 \times L_2 \times \Delta T)$
0.0537 × 6' × 70°	(0.0570 × 3' × 70°) + (0.0570 × 3' × 70°)
= 22.554 BTU/hr·ft	= 23.940 BTU/hr·ft

 $\Psi = (Losses_{2D} - Losses_{1D}) \div \Delta T$

 $\Psi = (22.554 - 23.940) \div 70F$

 Ψ = -0.0198 BTU/hr·ft·F



Calculating Losses via Linear Thermal Bridges

$\begin{array}{c} \mathbf{Q}_{\mathsf{T-tb}} = \mathsf{L} \times \Psi \times \mathbf{f}_{\mathsf{t}} \times \mathbf{G}_{\mathsf{t}} \\ \texttt{kBtu/yr} = & \texttt{ft} \times \underline{\mathsf{Btu}}_{(\mathsf{hr} - \mathsf{ft}^{\circ}\mathsf{F})} \times \texttt{unitless} \times \underline{(\mathsf{k}^{\circ}\mathsf{F}\text{-}\mathsf{hr})}_{\mathsf{yr}} \end{array}$

(Transmission Losses) Q_{T-tb} =

Length of the Thermal Bridge (ft) × PSI-Value (Btu/hr-ft-°F) × Temp. Correction Factor (if needed) × Yearly Heating Degree Hours (k°F-hr/yr) =kBtu/yr



Calculating Losses via Linear Thermal Bridges

$Q_{T-tb} = L \times \Psi \times f_t \times G_t$

EXAMPLE: NYC, $G_t = 117 \text{ kFh/yr}$ $\Psi = -0.0198 \text{ BTU/hr} \cdot \text{ft} \cdot \text{F}$ Length = 4 outside corners @ 10' each

 $Q_{T-tb} = (4 \times 10^{\circ}) \times -0.0198 \text{ Btu/hr} \cdot \text{ft} \cdot \text{F} \times 1.0 \times 117 \text{ kFh/yr}$

Q_{T-tb}= 40 ft × -0.0198 Btu/hr·ft·F × 1.0 × 117 kFh/yr

Q_{T-tb}= -92.65 kBtu/yr Our model originally <u>over</u>counted our losses at the corners, so now we 'correct' that with our negative PSI Value

