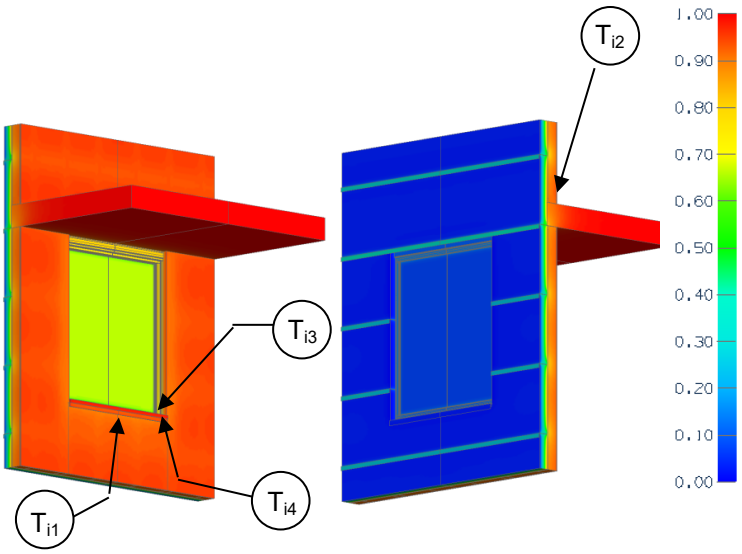
Detail 5.3.5

Exterior Insulated 3 5/8″ x 1 5/8″ Steel Stud (16″ o.c.) Wall Assembly with Horizontal Z-Girts (24″ o.c.) Supporting Metal Cladding – Window & Slab Intersection



View from Interior View from Exterior

Thermal Performance Indicators

Assembly 1D (Nominal) R-Value	R_{1D}	R-3.2 (0.56 RSI) + horizontal exterior insulation
Transmittance / Resistance without Anomaly	U_o, R_o	“clear wall” U- and R-value, without slab and window
Transmittance / Resistance	U_s, R_s, U_g	U and R-values for s = wall + slab g = glazing
Transmittance / Resistance	U, R	U- and R-values for overall assembly
Surface Temperature Index[1]	T_i	0 = exterior temperature 1 = interior temperature
Linear Transmittance	ψ_s, ψ_g	Incremental increase in transmittance per linear length of s = slab g = glazing transition

[1]Assumptions and limitations for surface temperatures identified in ASHRAE 1365-RP

Nominal (1D) vs. Assembly Performance Indicators

Base Assembly – Wall

Exterior Insulation 1D R-Value (RSI)	R_{1D} ft²·hr·°F / Btu (m² K / W)	R_o ft²·hr·°F / Btu (m² K / W)	U_o Btu/ft² ·hr ·°F (W/m² K)
R-5 (0.88)	R-8.2 (1.44)	R-6.8 (1.21)	0.146 (0.83)
R-15 (2.64)	R-18.2 (3.20)	R-11.3 (1.99)	0.088 (0.50)
R-25 (4.40)	R-28.2 (4.96)	R-14.5 (2.56)	0.069 (0.39)

Base Assembly - Glazing

$U_{centre\ of\ glazing}$ Btu/ft² ·hr ·°F (W/m² K)	U_g Btu/ft² ·hr ·°F (W/m² K)
0.321 (1.82)	0.400 (2.27)

Window Transition Linear Transmittance

Exterior Insulation 1D R-Value (RSI)	R ft²·hr·°F / Btu (m² K / W)	U Btu/ft² ·hr ·°F (W/m² K)	ψ_g[2] Btu/ft hr °F (W/m K)
R-5 (0.88)	R-6.0 (1.05)	0.168 (0.95)	0.044 (0.077)
R-15 (2.64)	R-9.0 (1.59)	0.111 (0.63)	0.062 (0.108)
R-25 (4.40)	R-10.9 (1.91)	0.092 (0.52)	0.069 (0.120)

Slab Linear Transmittance

R_s ft²·hr·°F / Btu (m² K / W)	U_s Btu/ft² ·hr ·°F (W/m² K)	ψ_s Btu/ft² ·hr ·°F (W/m² K)
R-6.4 (1.13)	1.56 (0.89)	0.061 (0.106)
R-10.8 (1.90)	0.093 (0.53)	0.025 (0.044)
R-13.9 (2.45)	0.072 (0.41)	0.019 (0.034)

Temperature Indices

	R5	R15	R25	
T_{i1}	0.39	0.39	0.39	Min T on sheathing, interior surface at window sill, centre of cavity
T_{i2}	0.79	0.88	0.91	Max T on sheathing, at slab floor, at studs, away from window
T_{i3}	0.61	0.62	0.63	Min T on window frame, at bottom corner
T_{i4}	0.58	0.58	0.59	Min T on window glass, at bottom corner

[2]For the linear transmittance, use the window perimeter