

1 Building envelope component incremental costing by climate zone

All costing data, except for windows and skylights, were collected from RSMeans (2023). The incremental material and labour costs were accounted for in the analysis. Costing was converted from USD to CAD using the Bank of Canada's exchange rate from August 2023 (i.e., 1.34).

Costing data for windows were obtained from the Local Energy Efficiency Partnerships (LEEP) database (NRCan, 2018). The unit costs of the fenestration systems were adjusted for inflation from 2019 to 2023 using the Bank of Canada's inflation calculator, which increased costs by 15%.

All costing data was then adjusted for inflation from 2023 to 2026 (Q4 2023 to Q1 2026) using Statistics Canada's Construction Price Index, which increased costs by 11%.

Table 1. Incremental Cost of Components in Buildings > 300 m³ to Achieve Tier 3, Compared to Tier 1 and Tier 2 in Climate Zone 4

Buildings > 300 m ³		Climate Zone 4						
Component	Tier 1 RSI Value	Tier 2 RSI Value	Tier 3 RSI Value (gas/oil/heat pump)	Incremental Cost, \$/m ² Tier 1 to Tier 3 (gas/oil/heat pump)	Incremental Cost, \$/m ² Tier 2 to Tier 3 (gas/oil/ heat pump)	Tier 3 RSI Value (electric resistance)	Incremental Cost, \$/m ² Tier 1 to Tier 3 (electric)	Incremental Cost, \$/m ² Tier 2 to Tier 3 (electric)
Ceilings below attics	6.91	6.91	6.91	0.00	0.00	6.91	0.00	0.00
Cathedral ceilings and flat roofs	4.67	4.67	4.67	0.00	0.00	4.67	0.00	0.00
Walls above grade	2.78	3.08	3.28	-2.47	1.21	4.4	15.54	19.23
Floors over unheated spaces	4.67	4.67	4.67	0.00	0.00	4.67	0.00	0.00
Foundation walls	1.99	2.98	2.98	28.60	0.00	3.46	33.80	5.20
Unheated floors below frost line	0	0	0	0.00	0.00	0	0.00	0.00
Unheated floors above frost line	1.96	1.96	1.96	0.00	0.00	1.96	0.00	0.00
Heated and unheated floors on permafrost	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Heated floors	2.32	2.32	2.32	0.00	0.00	2.32	0.00	0.00
Slabs-on-grade with an integral footing	1.96	1.96	1.96	0.00	0.00	1.96	0.00	0.00
Component	Tier 1 Max. U-Value	Tier 2 Max. U-Value	Tier 3 Max. U-Value (gas/oil/heat pump)	Incremental Cost, \$/m ² Tier 1 to Tier 3 (gas/oil/heat pump)	Incremental Cost, \$/m ² Tier 2 to Tier 3 (gas/oil/heat pump)	Tier 3 Max. U-Value (electric resistance)	Incremental Cost, \$/m ² Tier 1 to Tier 3 (electric)	Incremental Cost, \$/m ² Tier 2 to Tier 3 (electric)
Windows and sliding glass doors	1.84	1.61	1.44	73.20	28.74	1.44	73.20	28.74
Skylights	2.92	2.92	2.92	0.00	0.00	2.92	0.00	0.00

Table 2. Incremental Cost of Components in Buildings $\leq 300 \text{ m}^3$ to Achieve Tier 3, Compared to Tier 1 and Tier 2 in Climate Zone 4

Buildings $\leq 300 \text{ m}^3$	Climate Zone 4				
Component	Tier 1 RSI Value	Tier 2 RSI Value	Tier 3 RSI Value	Incremental Cost, \$/m ² Tier 1 to Tier 3	Incremental Cost, \$/m ² Tier 2 to Tier 3
Ceilings below attics	6.91	6.91	6.91	0.00	0.00
Cathedral ceilings and flat roofs	4.67	4.67	4.67	0.00	0.00
Walls above grade	2.78	2.78	3.08	-3.69	-3.69
Floors over unheated spaces	4.67	4.67	4.67	0.00	0.00
Foundation walls	1.99	1.99	1.99	0.00	0.00
Unheated floors below frost line	0	0	0	0.00	0.00
Unheated floors above frost line	1.96	1.96	1.96	0.00	0.00
Heated and unheated floors on permafrost	N/A	N/A	N/A	N/A	N/A
Heated floors	2.32	2.32	2.32	0.00	0.00
Slabs-on-grade with an integral footing	1.96	1.96	1.96	0.00	0.00
Component	Tier 1 Max. U-Value	Tier 2 Max. U-Value	Tier 3 Max. U-Value	Incremental Cost, \$/m ² Tier 1 to Tier 3	Incremental Cost, \$/m ² Tier 2 to Tier 3
Windows and sliding glass doors	1.84	1.84	1.44	73.20	73.20
Skylights	2.92	2.92	2.92	0.00	0.00

Table 3. Incremental Cost of Components in Buildings > 300 m³ to Achieve Tier 3, Compared to Tier 1 and Tier 2 in Climate Zone 5

Buildings > 300 m ³		Climate Zone 5						
Component	Tier 1 RSI Value	Tier 2 RSI Value	Tier 3 RSI Value (gas/oil/heat pump)	Incremental Cost, \$/m ² Tier 1 to Tier 3 (gas/oil/heat pump)	Incremental Cost, \$/m ² Tier 2 to Tier 3 (gas/oil/heat pump)	Tier 3 RSI Value (electric resistance)	Incremental Cost, \$/m ² Tier 1 to Tier 3 (electric)	Incremental Cost, \$/m ² Tier 2 to Tier 3 (electric)
Ceilings below attics	6.91	8.67	8.67	7.94	0.00	10.43	17.65	8.08
Cathedral ceilings and flat roofs	4.67	4.67	4.67	0.00	0.00	4.67	0.00	0.00
Walls above grade	2.97	3.08	3.28	-2.47	1.21	4.4	15.54	19.23
Floors over unheated spaces	4.67	4.67	4.67	0.00	0.00	4.67	0.00	0.00
Foundation walls	2.98	2.98	3.46	5.20	5.20	3.46	5.20	5.20
Unheated floors below frost line	0	0	0	0.00	0.00	0	0.00	0.00
Unheated floors above frost line	1.96	1.96	1.96	0.00	0.00	1.96	0.00	0.00
Heated and unheated floors on permafrost	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Heated floors	2.32	2.32	2.32	0.00	0.00	2.32	0.00	0.00
Slabs-on-grade with an integral footing	1.96	1.96	1.96	0.00	0.00	1.96	0.00	0.00
Component	Tier 1 Max. U- Value	Tier 2 Max. U- Value	Tier 3 Max. U- Value (gas/oil/heat pump)	Incremental Cost, \$/m ² Tier 1 to Tier 3 (gas/oil/heat pump)	Incremental Cost, \$/m ² Tier 2 to Tier 3 (gas/oil/heat pump)	Tier 3 Max. U-Value (electric resistance)	Incremental Cost, \$/m ² Tier 1 to Tier 3 (electric)	Incremental Cost, \$/m ² Tier 2 to Tier 3 (electric)
Windows and sliding glass doors	1.84	1.22	1.22	103.30	0.00	1.22	103.30	0.00
Skylights	2.92	2.92	2.92	0.00	0.00	2.92	0.00	0.00

Table 4. Incremental Cost of Components in Buildings $\leq 300 \text{ m}^3$ to Achieve Tier 3, Compared to Tier 1 and Tier 2 in Climate Zone 5

Buildings $\leq 300 \text{ m}^3$	Climate Zone 5				
Component	Tier 1 RSI Value	Tier 2 RSI Value	Tier 3 RSI Value	Incremental Cost, \$/m² Tier 1 to Tier 3	Incremental Cost, \$/m² Tier 2 to Tier 3
Ceiling below attic	6.91	6.91	8.67	7.94	7.94
Cathedral ceilings and flat roofs	4.67	4.67	4.67	0.00	0.00
Walls above grade	2.97	2.97	3.08	-3.69	-3.69
Floors over unheated spaces	4.67	4.67	4.67	0.00	0.00
Foundation walls	2.98	2.98	2.98	0.00	0.00
Unheated floors below frost line	0	0	0	0.00	0.00
Unheated floors above frost line	1.96	1.96	1.96	0.00	0.00
Heated and unheated floors on permafrost	N/A	N/A	N/A	N/A	N/A
Heated floors	2.32	2.32	2.32	0.00	0.00
Slabs-on-grade with an integral footing	1.96	1.96	1.96	0.00	0.00
Component	Tier 1 Max. U-Value	Tier 2 Max. U-Value	Tier 3 Max. U-Value	Incremental Cost, \$/m² Tier 1 to Tier 3	Incremental Cost, \$/m² Tier 2 to Tier 3
Windows and sliding glass doors	1.84	1.84	1.22	103.30	103.30
Skylights	2.92	2.92	2.92	0.00	0.00

Table 5. Incremental Cost of Components in Buildings > 300 m³ to Achieve Tier 3, Compared to Tier 1 and Tier 2 in Climate Zone 6

Buildings > 300 m ³		Climate Zone 6						
Component	Tier 1 RSI Value	Tier 2 RSI Value	Tier 3 RSI Value (gas/oil/heat pump)	Incremental Cost, \$/m ² Tier 1 to Tier 3 (gas/oil/heat pump)	Incremental Cost, \$/m ² Tier 2 to Tier 3 (gas/oil/heat pump)	Tier 3 RSI Value (electric resistance)	Incremental Cost, \$/m ² Tier 1 to Tier 3 (electric)	Incremental Cost, \$/m ² Tier 2 to Tier 3 (electric)
Ceilings below attics	6.91	6.91	10.43	17.65	17.65	12.19	26.47	26.47
Cathedral ceilings and flat roofs	4.67	4.67	5.02	2.59	2.59	5.02	2.59	2.59
Walls above grade	2.78	3.08	3.58	0.08	3.77	4.57	15.54	19.23
Floors over unheated spaces	4.67	4.67	4.67	0.00	0.00	4.67	0.00	0.00
Foundation walls	1.99	2.98	3.46	33.80	5.20	3.9	60.66	32.06
Unheated floors below frost line	0	0	0	0.00	0.00	0	0.00	0.00
Unheated floors above frost line	1.96	1.96	1.96	0.00	0.00	1.96	0.00	0.00
Heated and unheated floors on permafrost	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Heated floors	2.32	2.32	2.32	0.00	0.00	2.32	0.00	0.00
Slabs-on-grade with an integral footing	1.96	1.96	2.84	21.32	21.32	3.72	41.43	41.43
Component	Tier 1 Max. U-Value	Tier 2 Max. U-Value	Tier 3 Max. U-Value (gas/oil/heat pump)	Incremental Cost, \$/m ² Tier 1 to Tier 3 (gas/oil/heat pump)	Incremental Cost, \$/m ² Tier 2 to Tier 3 (gas/oil/heat pump)	Tier 3 Max. U-Value (electric resistance)	Incremental Cost, \$/m ² Tier 1 to Tier 3 (electric)	Incremental Cost, \$/m ² Tier 2 to Tier 3 (electric)
Windows and sliding glass doors	1.84	1.22	1.22	103.30	0.00	1.22	103.30	0.00
Skylights	2.92	2.92	2.92	0.00	0.00	2.92	0.00	0.00

Table 6. Incremental Cost of Components in Buildings $\leq 300 \text{ m}^3$ to Achieve Tier 3 Compared to Tier 1 and to Tier 2 in Climate Zone 6

Buildings $\leq 300 \text{ m}^3$	Climate Zone 6				
Component	Tier 1 RSI Value	Tier 2 RSI Value	Tier 3 RSI Value	Incremental Cost, \$/m² Tier 1 to Tier 3	Incremental Cost, \$/m² Tier 2 to Tier 3
Ceilings below attics	6.91	6.91	8.67	7.94	7.94
Cathedral ceilings and flat roofs	4.67	4.67	4.67	0.00	0.00
Walls above grade	2.78	2.78	3.28	-2.47	-2.47
Floors over unheated spaces	4.67	4.67	4.67	0.00	0.00
Foundation walls	1.99	1.99	2.98	28.60	28.60
Unheated floors below frost line	0	0	0	0.00	0.00
Unheated floors above frost line	1.96	1.96	1.96	0.00	0.00
Heated and unheated floors on permafrost	N/A	N/A	N/A	N/A	N/A
Heated floors	2.32	2.32	2.32	0.00	0.00
Slabs-on-grade with an integral footing	1.96	1.96	1.96	0.00	0.00
Component	Tier 1 Max. U-Value	Tier 2 Max. U-Value	Tier 3 Max. U-Value	Incremental Cost, \$/m² Tier 1 to Tier 3	Incremental Cost, \$/m² Tier 2 to Tier 3
Windows and sliding glass doors	1.84	1.84	1.22	103.30	103.30
Skylights	2.92	2.92	2.92	0.00	0.00

Table 7. Incremental Cost of Components in Buildings > 300 m³ to Achieve Tier 3, Compared to Tier 1 and Tier 2 in Climate Zone 7A

Buildings > 300 m ³		Climate Zone 7A						
Component	Tier 1 RSI Value	Tier 2 RSI Value	Tier 3 RSI Value (gas/oil/heat pump)	Incremental Cost, \$/m ² Tier 1 to Tier 3 (gas/oil/heat pump)	Incremental Cost, \$/m ² Tier 2 to Tier 3 (gas/oil/heat pump)	Tier 3 RSI Value (electric resistance)	Incremental Cost, \$/m ² Tier 1 to Tier 3 (electric)	Incremental Cost, \$/m ² Tier 2 to Tier 3 (electric)
Ceilings below attics	8.67	10.43	10.43	9.71	0.00	12.19	18.53	8.82
Cathedral ceilings and flat roofs	5.02	5.02	5.02	0.00	0.00	5.02	0.00	0.00
Walls above grade	2.97	3.08	3.69	6.09	9.77	4.57	15.54	19.23
Floors over unheated spaces	5.02	5.02	5.02	0.00	0.00	5.02	0.00	0.00
Foundation walls	2.98	3.97	4.78	43.51	11.45	4.78	43.51	11.45
Unheated floors below frost line	0	0	0	0.00	0.00	0	0.00	0.00
Unheated floors above frost line	1.96	1.96	1.96	0.00	0.00	1.96	0.00	0.00
Heated and unheated floors on permafrost	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Heated floors	2.84	2.84	2.84	0.00	0.00	2.84	0.00	0.00
Slabs-on-grade with an integral footing	2.84	2.84	3.72	20.11	20.11	3.72	20.11	20.11
Component	Tier 1 Max. U-Value	Tier 2 Max. U-Value	Tier 3 Max. U-Value (gas/oil/heat pump)	Incremental Cost, \$/m ² Tier 1 to Tier 3 (gas/oil/heat pump)	Incremental Cost, \$/m ² Tier 2 to Tier 3 (gas/oil/heat pump)	Tier 3 Max. U-Value (electric resistance)	Incremental Cost, \$/m ² Tier 1 to Tier 3 (electric)	Incremental Cost, \$/m ² Tier 2 to Tier 3 (electric)
Windows and sliding glass doors	1.61	1.22	1.22	58.84	0.00	1.22	58.84	0.00
Skylights	2.75	2.75	2.75	0.00	0.00	2.75	0.00	0.00

Table 8. Incremental Cost of Components in Buildings $\leq 300 \text{ m}^3$ to Achieve Tier 3, Compared to Tier 1 and Tier 2 in Climate Zone 7A

Buildings $\leq 300 \text{ m}^3$	Climate Zone 7A				
Component	Tier 1 RSI Value	Tier 2 RSI Value	Tier 3 RSI Value	Incremental Cost, \$/m² Tier 1 to Tier 3	Incremental Cost, \$/m² Tier 2 to Tier 3
Ceiling below attic	8.67	8.67	10.43	9.71	9.71
Cathedral ceilings and flat roofs	5.02	5.02	5.02	0.00	0.00
Walls above grade	2.97	2.97	3.28	-2.47	-2.47
Floors over unheated spaces	5.02	5.02	5.02	0.00	0.00
Foundation walls	2.98	2.98	3.46	5.20	5.20
Unheated floors below frost line	0	0	0	0.00	0.00
Unheated floors above frost line	1.96	1.96	1.96	0.00	0.00
Heated and unheated floors on permafrost	N/A	N/A	N/A	N/A	N/A
Heated floors	2.84	2.84	2.84	0.00	0.00
Slabs-on-grade with an integral footing	2.84	2.84	3.72	20.11	20.11
Component	Tier 1 Max. U-Value	Tier 2 Max. U-Value	Tier 3 Max. U-Value	Incremental Cost, \$/m² Tier 1 to Tier 3	Incremental Cost, \$/m² Tier 2 to Tier 3
Windows and sliding glass doors	1.61	1.61	1.22	58.84	58.84
Skylights	2.75	2.75	2.75	0.00	0.00

Table 9. Incremental Cost of Components in Buildings > 300 m³ to Achieve Tier 3, Compared to Tier 1 and Tier 2 in Climate Zone 7B

Buildings > 300 m ³		Climate Zone 7B						
Component	Tier 1 RSI Value	Tier 2 RSI Value	Tier 3 RSI Value (gas/oil/heat pump)	Incremental Cost, \$/m ² Tier 1 to Tier 3 (gas/oil/heat pump)	Incremental Cost, \$/m ² Tier 2 to Tier 3 (gas/oil/heat pump)	Tier 3 RSI Value (electric resistance)	Incremental Cost, \$/m ² Tier 1 to Tier 3 (electric)	Incremental Cost, \$/m ² Tier 2 to Tier 3 (electric)
Ceilings below attics	10.43	10.43	10.43	0.00	0.00	12.19	8.82	8.82
Cathedral ceilings and flat roofs	5.02	5.02	5.02	0.00	0.00	5.02	0.00	0.00
Walls above grade	3.08	3.85	4.29	15.39	5.62	5.45	42.27	32.50
Floors over unheated spaces	5.02	5.02	5.02	0.00	0.00	5.02	0.00	0.00
Foundation walls	2.98	3.97	4.78	43.51	11.45	4.78	43.51	11.45
Unheated floors below frost line	0	0	0	0.00	0.00	0	0.00	0.00
Unheated floors above frost line	1.96	1.96	1.96	0.00	0.00	1.96	0.00	0.00
Heated and unheated floors on permafrost	4.44	4.44	4.44	0.00	0.00	4.44	0.00	0.00
Heated floors	2.84	2.84	2.84	0.00	0.00	2.84	0.00	0.00
Slabs-on-grade with an integral footing	2.84	2.84	3.72	20.11	20.11	4.59	37.80	37.80
Component	Tier 1 Max. U-Value	Tier 2 Max. U- Value	Tier 3 Max. U-Value (gas/oil/heat pump)	Incremental Cost, \$/m ² Tier 1 to Tier 3 (gas/oil/heat pump)	Incremental Cost, \$/m ² Tier 2 to Tier 3 (gas/oil/heat pump)	Tier 3 Max. U-Value (electric resistance)	Incremental Cost, \$/m ² Tier 1 to Tier 3 (electric)	Incremental Cost, \$/m ² Tier 2 to Tier 3 (electric)
Windows and sliding glass doors	1.44	1.05	1.05	53.37	0.00	1.05	53.37	0.00
Skylights	2.41	2.41	2.41	0.00	0.00	2.41	0.00	0.00

Table 10. Incremental Cost of Components in Buildings $\leq 300 \text{ m}^3$ to Achieve Tier 3, Compared to Tier 1 and Tier 2 in Climate Zone 7B

Buildings $\leq 300 \text{ m}^3$	Climate Zone 7B				
Component	Tier 1 RSI Value	Tier 2 RSI Value	Tier 3 RSI Value	Incremental Cost, \$/m² Tier 1 to Tier 3	Incremental Cost, \$/m² Tier 2 to Tier 3
Ceilings below attics	10.43	10.43	10.43	0.00	0.00
Cathedral ceilings and flat roofs	5.02	5.02	5.02	0.00	0.00
Walls above grade	3.08	3.08	3.85	9.77	9.77
Floors over unheated spaces	5.02	5.02	5.02	0.00	0.00
Foundation walls	2.98	2.98	3.46	5.20	5.20
Unheated floors below frost line	0	0	0	0.00	0.00
Unheated floors above frost line	1.96	1.96	1.96	0.00	0.00
Heated and unheated floors on permafrost	4.44	4.44	4.44	0.00	0.00
Heated floors	2.84	2.84	2.84	0.00	0.00
Slabs-on-grade with an integral footing	2.84	2.84	3.72	20.11	20.11
Component	Tier 1 Max. U-Value	Tier 2 Max. U-Value	Tier 3 Max. U-Value	Incremental Cost, \$/m² Tier 1 to Tier 3	Incremental Cost, \$/m² Tier 2 to Tier 3
Windows and sliding glass doors	1.44	1.44	1.05	53.37	53.37
Skylights	2.41	2.41	2.41	0.00	0.00

Table 11. Incremental Cost of Components in Buildings > 300 m³ to Achieve Tier 3, Compared to Tier 1 and Tier 2 in Climate Zone 8

Buildings > 300 m ³		Climate Zone 8						
Component	Tier 1 RSI Value	Tier 2 RSI Value	Tier 3 RSI Value (gas/oil/heat pump)	Incremental Cost, \$/m ² Tier 1 to Tier 3 (gas/oil/heat pump)	Incremental Cost, \$/m ² Tier 2 to Tier 3 (gas/oil/heat pump)	Tier 3 RSI Value (electric resistance)	Incremental Cost, \$/m ² Tier 1 to Tier 3 (electric)	Incremental Cost, \$/m ² Tier 2 to Tier 3 (electric)
Ceilings below attics	10.43	10.43	10.43	0.00	0.00	12.19	8.82	8.82
Cathedral ceilings and flat roofs	5.02	5.02	5.02	0.00	0.00	5.02	0.00	0.00
Walls above grade	3.08	3.85	4.57	19.23	9.45	5.45	42.27	32.50
Floors over unheated spaces	5.02	5.02	5.02	0.00	0.00	5.02	0.00	0.00
Foundation walls	2.98	3.97	4.78	43.51	11.45	5.22	49.40	17.34
Unheated floors below frost line	0	0	0	0.00	0.00	0	0.00	0.00
Unheated floors above frost line	1.96	1.96	1.96	0.00	0.00	1.96	0.00	0.00
Heated and unheated floors on permafrost	4.44	4.44	4.44	0.00	0.00	4.44	0.00	0.00
Heated floors	2.84	2.84	2.84	0.00	0.00	2.84	0.00	0.00
Slabs-on-grade with an integral footing	3.72	3.72	4.59	20.10	20.10	4.59	20.10	20.10
Component	Tier 1 Max. U- Value	Tier 2 Max. U- Value	Tier 3 Max. U-Value (gas/oil/heat pump)	Incremental Cost, \$/m ² Tier 1 to Tier 3 (gas/oil/heat pump)	Incremental Cost, \$/m ² Tier 2 to Tier 3 (gas/oil/heat pump)	Tier 3 Max. U-Value (electric resistance)	Incremental Cost, \$/m ² Tier 1 to Tier 3 (electric)	Incremental Cost, \$/m ² Tier 2 to Tier 3 (electric)
Windows and sliding glass doors	1.44	1.05	1.05	53.37	0.00	1.05	53.37	0.00
Skylights	2.41	2.41	2.41	0.00	0.00	2.41	0.00	0.00

Table 10. Incremental Cost of Components in Buildings $\leq 300 \text{ m}^3$ to Achieve Tier 3, Compared to Tier 1 and Tier 2 in Climate Zone 8

Buildings $\leq 300 \text{ m}^3$	Climate Zone 8				
Component	Tier 1 RSI Value	Tier 2 RSI Value	Tier 3 RSI Value	Incremental Cost, \$/m² Tier 1 to Tier 3	Incremental Cost, \$/m² Tier 2 to Tier 3
Ceilings below attics	10.43	10.43	10.43	0.00	0.00
Cathedral ceilings and flat roofs	5.02	5.02	5.02	0.00	0.00
Walls above grade	3.08	3.08	3.85	9.77	9.77
Floors over unheated spaces	5.02	5.02	5.02	0.00	0.00
Foundation walls	2.98	2.98	3.97	32.06	32.06
Unheated floors below frost line	0	0	0	0.00	0.00
Unheated floors above frost line	1.96	1.96	1.96	0.00	0.00
Heated and unheated floors on permafrost	4.44	4.44	4.44	0.00	0.00
Heated floors	2.84	2.84	2.84	0.00	0.00
Slabs-on-grade with an integral footing	3.72	3.72	4.59	20.10	20.10
Component	Tier 1 Max. U-Value	Tier 2 Max. U-Value	Tier 3 Max. U-Value	Incremental Cost, \$/m² Tier 1 to Tier 3	Incremental Cost, \$/m² Tier 2 to Tier 3
Windows and sliding glass doors	1.44	1.44	1.05	53.37	53.37
Skylights	2.41	2.41	2.41	0.00	0.00

2 Building envelope component incremental costing by region

Table 11. Climate Zones by Region

Degree-Days Below 18°C	BC	Alberta	Saskatchewan and Manitoba	Ontario	Quebec	Atlantic Canada	Northern Canada
Zone 4: HDD < 3000	Yes	No	No	No	No	No	No
Zone 5: HDD 3000 to 3999	Yes	No	No	Yes	No	Yes	No
Zone 6: HDD 4000 to 4999	Yes	Yes	Yes	Yes	Yes	Yes	No
Zone 7A: HDD 5000 to 5999	Yes	Yes	Yes	Yes	Yes	Yes	No
Zone 7B: HDD 6000 to 6999	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Zone 8: HDD ≥ 7000	Yes	Yes	Yes	Yes	Yes	Yes	Yes

3 Building envelope components

3.1 Ceilings below attics

Typical trusses were assumed to have a spacing of 610 mm on centre (o.c.) and RSI 2.11 (R12) insulation in the cavity between the bottom chords (38 mm × 89 mm). Additional insulation is then assumed to be layered above to achieve higher thermal insulation performance. Interior finish was assumed to be 12.7 mm gypsum board. Insulation was assumed to be blown fibreglass.

Table 9. Incremental Cost of Ceiling Below Attic Assemblies by Thermal Insulation Performance Level

Nominal Insulation RSI, (m ² ·K)/W	Assembly Effective RSI, (m ² ·K)/W	Incremental Cost, \$/m ²
7.04 (R40)	6.91	0.00
8.81 (R50)	8.67	7.35
10.57 (R60)	10.43	16.34
12.33 (R70)	12.19	24.51
14.09 (R80)	13.96	32.68

3.2 Cathedral ceilings and flat roofs

Roof joists were assumed to be 38 mm × 235 mm at 610 mm o.c. It was also assumed that 19 mm strapping was installed between the joists and the 12.7 mm gypsum board interior finish. For flat roofs, both the joists and cavity insulation were assumed to vary with varying effective thermal resistance; as more insulation is added to the cavity, the joist depth may need to increase to maintain a vented air space. Therefore, incremental costing of cathedral and flat roofs considered both nominal cavity insulation and joist framing. All joists were assumed to be spaced at 610 mm o.c., and all assemblies were assumed to have the addition of 19 mm strapping. Cavity insulation was assumed to be batt insulation.

Table 10. Incremental Cost of Cathedral Ceiling and Flat Roof Assemblies by Thermal Insulation Performance Level

Nominal Cavity RSI, (m ² ·K)/W	Joist Lumber Dimensions	Assembly Effective RSI, (m ² ·K)/W	Incremental Cost, \$/m ²
4.93 (R28)	38 mm × 235 mm	4.67	0.00
5.46 (R31)	38 mm × 235 mm	5.02	2.40
6.16 (R35)	38 mm × 286 mm	5.80	27.12
7.04 (R40)	38 mm × 286 mm	6.49	29.85

3.3 Floors over unheated spaces

The interior finish was assumed to be linoleum flooring for all exposed floor assemblies, and all assemblies are assumed to have a joist spacing of 610 mm o.c. Sheathing, wood joist depth and cavity were costed for all assemblies. Cavity insulation was assumed to be fibreglass batt.

Table 11. Incremental Cost of Floors Over Unheated Spaces by Thermal Insulation Performance Level

Nominal Cavity RSI, (m ² ·K)/W	Joist Lumber Dimensions	Sheathing	Assembly Effective RSI, (m ² ·K)/W	Incremental Cost, \$/m ²
3.52 (R20)	38 mm × 124 mm	0.88 RSI	4.71	0.00
4.93 (R28)	38 mm × 124 mm	None	5.02	-2.84
5.46 (R31)	38 mm × 235 mm	None	5.42	50.75
7.04 (R40)	38 mm × 286 mm	None	6.77	78.08

3.4 Wall assemblies

Reference and higher performance wall assemblies were selected from the Canadian Wood Council's (CWC, 2023) Effective R Calculator. Since material and labour costs for double stud systems were not readily available, only single stud systems were considered. Assemblies were also filtered for those with interior ½ in. gypsum board, exterior vinyl siding, no exterior air space, house wrap sheathing membrane and polyethylene vapour barriers (the latter two wall assembly components do not impact thermal performance).

Table 12. Incremental Cost of Wall Assemblies by Thermal Insulation Performance Level

Assembly Effective RSI, (m ² ·K)/W	Description	Incremental Cost, \$/m ²	CWC Wall ID
2.79	2 × 6 at 16 in. o.c. framing, R19 cavity insulation, 3/8 in. OSB sheathing, vinyl siding	0.00	9733
3.10	2 × 6 at 24 in. o.c. framing, R22 cavity insulation, 3/8 in. OSB sheathing, vinyl siding	-3.69	9740
3.23	2 × 6 at 24 in. o.c. framing, R24 cavity insulation, 3/8 in. OSB sheathing, vinyl siding	-2.47	9745
3.46	2 × 4 at 24 in. o.c. framing, R14 cavity insulation, 3/8 in. OSB sheathing, 1.5 in. XPS, vinyl siding	0.07	10045
3.85	2 × 6 at 24 in. o.c. framing, R19 cavity insulation, 3/8 in. OSB sheathing, 1 in. foil-faced polyiso, vinyl siding	5.64	10155

4.07	2 × 6 at 24 in. o.c. framing, R22 cavity insulation, 3/8 in. OSB sheathing, 1 in. foil-faced polyiso, vinyl siding	9.17	10160
4.20	2 × 6 at 24 in. o.c. framing, R24 cavity insulation, 3/8 in. OSB sheathing, 1 in. foil-faced polyiso, vinyl siding	10.84	10165
4.35	2 × 4 at 24 in. o.c. framing, R14 cavity insulation, 3/8 in. OSB sheathing, 2.5 in. XPS, vinyl siding	14.39	12272
4.80	2 × 4 at 24 in. o.c. framing, R14 cavity insulation, 3/8 in. OSB sheathing, 3 in. XPS, vinyl siding	23.54	12352
4.88	2 × 6 at 24 in. o.c. framing, R22 cavity insulation, 3/8 in. OSB sheathing, 2 in. XPS, vinyl siding	26.58	10005
5.01	2 × 6 at 24 in. o.c. framing, R24 cavity insulation, 3/8 in. OSB sheathing, 2 in. XPS, vinyl siding	28.24	10010
5.32	2 × 6 at 24 in. o.c. framing, R22 cavity insulation, 3/8 in. OSB sheathing, 2.5 in. XPS, vinyl siding	35.72	12512
5.69	2 × 4 at 24 in. o.c. framing, R14 cavity insulation, 3/8 in. OSB sheathing, 4 in. XPS, vinyl siding	41.84	12432
5.77	2 × 6 at 24 in. o.c. framing, R22 cavity insulation, 3/8 in. OSB sheathing, 3 in. XPS, vinyl siding	44.88	12592
6.66	2 × 6 at 24 in. o.c. framing, R22 cavity insulation, 3/8 in. OSB sheathing, 4 in. XPS, vinyl siding	63.17	12672

The RSI 3.10 assembly costs less than the reference RSI 2.79 assembly. This is due to the RSI 2.79 assembly having 16 in. o.c. studs, whereas the RSI 3.10 assembly has 24 in. o.c. studs. There are fewer studs per m² and, as reported by RSMeans, the material and labour costs are therefore reduced.

3.5 Foundation walls

All foundation wall assemblies were assumed to have 200 mm concrete walls and interior 12.7 mm gypsum board finishes. The interior framing and cavity insulation and the exterior insulation (assumed to be extruded polystyrene, XPS) were the only elements assumed to vary between the different foundation wall assemblies considered. All interior framing was assumed to be spaced at 610 mm o.c.

Table 13. Incremental Cost of Foundation Walls by Thermal Insulation Performance Level

Framing Studs Lumber Dimensions	Nominal Cavity RSI, (m ² ·K)/W	XPS RSI, (m ² ·K)/W	Assembly Effective RSI, (m ² ·K)/W	Incremental Cost, \$/m ²
38 × 89 mm	2.11 (R12)	None	1.98	0.00
38 × 140 mm	3.52 (R20)	None	2.98	26.48
38 × 140 mm	4.23 (R24)	None	3.46	31.30
38 × 140 mm	3.52 (R20)	0.88 (R5)	3.97	56.17
38 × 140 mm	4.23 (R24)	0.88 (R5)	4.34	60.98
38 × 140 mm	4.23 (R24)	1.32 (R7.5)	4.78	66.77
38 × 140 mm	4.23 (R24)	1.76 (R10)	5.22	72.22

3.6 Slabs-on-grade and below grade

Only under-slab rigid insulation was assumed to vary between the different effective thermal resistance performance levels.

Table 14. Incremental Cost of Slabs-on-Grade and Below Grade Assemblies by Thermal Insulation Performance Level

XPS RSI, (m ² ·K)/W	Assembly Effective RSI, (m ² ·K)/W	Incremental Cost, \$/m ²
1.76 (R10)	1.96	0.00
2.64 (R15)	2.84	19.74
3.52 (R20)	3.72	38.36
4.42 (R25)	4.62	56.97

3.7 Windows

Table 15. Incremental Cost of Windows by Thermal Transmittance Value

U-Value, W/(m ² ·K)	Solar Heat Gain Coefficient	Incremental Cost, \$/m ²	LEEP Database Reference
1.84	0.40	0.00	LEEP-MB-Winnipeg - window:double_glaze:vinyl:glass:double_lo f_lowe: insulating_spacers:air_fill:shgc_0.5:u- value_1.82
1.61		41.17	LEEP-MB-Winnipeg - window:shgc_0.51:u- value_1.65
1.44		67.78	Interpolated
1.22		95.65	Interpolated
1.05		117.19	LEEP-MB-Winnipeg - window:shgc_0.44:u- value_1.08
0.94		131.12	Extrapolated
0.82		146.33	Extrapolated

4 HVAC and service water heating system

4.1 Heat-recovery ventilator/energy-recovery ventilator

A heat-recovery ventilator (HRV) or an energy-recovery ventilator (ERV) with a minimum 60% sensible recovery efficiency (SRE) for climate zones 4 and 5 and minimum 70% SRE for climate zones 6 to 8 is required by the Tier 2 Prescriptive Path.

Table 16. Incremental Cost of HRVs/ERVs to Achieve **Tier 3 Compared to Tier 1**

Climate Zone	Tier 1 SRE	Tier 3 SRE	Incremental Costs for HRV/ERVs in Various Regions, \$						
			ON	BC	QC	SK and MB	Atlantic Canada	AB	Northern Canada
4	60%	70%	200	200	200	200	200	200	200
5	60%	70%	200	200	200	200	200	200	200
6	60%	70%	200	200	200	200	200	200	200
7A	60%	70%	200	200	200	200	200	200	200
7B	60%	70%	200	200	200	200	200	200	200
8	60%	70%	200	200	200	200	200	200	200

Table 17. Incremental Cost of HRVs/ERVs to Achieve **Tier 3 Compared to Tier 2**

Climate Zone	Tier 2 SRE	Tier 3 SRE	Incremental Costs for HRV/ERVs in Various Regions, \$						
			ON	BC	QC	SK and MB	Atlantic Canada	AB	Northern Canada
4	60%	70%	200	200	200	200	200	200	200
5	60%	70%	200	200	200	200	200	200	200
6	70%	70%	0	0	0	0	0	0	0
7A	70%	70%	0	0	0	0	0	0	0
7B	70%	70%	0	0	0	0	0	0	0
8	70%	70%	0	0	0	0	0	0	0

Source: buildwithrise.ca (includes profit and Canada-wide free shipping)

Notes to Tables 16 and 17:

Products:

- Greentek Premiere Series PRS 0.7H
- Aldes H95-TRG

4.2 Space heating

Four different space heating options are available in Tier 3: gas-fired furnace, oil-fired furnace, heat pump and electric resistance heating.

Tier 3 buildings with a conditioned volume of $\leq 300\text{m}^3$ do not have an increased performance requirement for space heating equipment compared to Tier 1, and as such have an incremental cost of \$0.00.

Tier 1 and Tier 2 have the same space heating requirements (Code minimum) for buildings with a conditioned volume of $> 300\text{m}^3$.

Table 18. Incremental Cost of Space Heating Equipment to Achieve Tier 3, Compared to Tier 1 and Tier 2 (buildings $> 300\text{m}^3$)

Equipment	Tier 1 and Tier 2	Tier 3	Incremental Costs for Space Heating Equipment in Various Regions, \$						
			ON	BC	QC	SK and MB	Atlantic Canada	AB	Northern Canada
Gas furnace	95% AFUE	98% AFUE	2,300	2,300	2,300	2,300	2,300	2,300	2,300
Oil furnace	85% AFUE	87% AFUE	1,510	1,510	1,510	1,510	1,510	1,510	1,510
Heat pump	7.1 HSPF V	7.1 HSPF V	0	0	0	0	0	0	0
Electric resistance	Code min.	Code min.	0	0	0	0	0	0	0

Sources: hvactrust.ca, valuesales.ca

Notes to Table 18:

Products:

- Lennox / ML196E070 / 70,000 BTU
- Lennox / SLP99V070 / 70,000 BTU
- Oil Fired Granby Oil Furnace Klr-140 Rear Breech with Riello Burner
- Oil Fired Granby Conforto Oil Furnace Klr-200 Rear Breech with Riello Burner F5

4.3 Service water heating

Three different space heating options are available in Tier 3: gas-fired, oil-fired and electric resistance.

Tier 3 buildings with a conditioned volume of $\leq 300\text{m}^3$ do not have an increased performance requirement for service water heating equipment compared to Tier 1, and as such have an incremental cost of \$0.00.

Tier 1 and Tier 2 have the same service water heating requirements (Code minimum) for buildings with a conditioned volume of $> 300\text{m}^3$.

Table 19. Incremental Cost of Service Water Heating Equipment to Achieve Tier 3, Compared to Tier 1 and Tier 2 (buildings $> 300\text{m}^3$)

Equipment	Tier 1 and Tier 2	Tier 3	Incremental Costs for Service Water Heating Equipment in Various Regions, \$						
			ON	BC	QC	SK and MB	Atlantic Canada	AB	Northern Canada
Gas storage tank	0.61 UEF	0.83 UEF	2,523	2,523	2,523	2,523	2,523	2,523	2,523
Oil storage tank	0.59 EF	0.8 EF	371	371	371	371	371	371	371
Electric resistance	Code min.	Code min.	0	0	0	0	0	0	0

Sources: homedepot.ca, hvacrpartsdepot.com, www.bartlegibson.com

Notes to Table 19:

Products:

- Rheem Performance Plus Tank Natural Gas Water Heater
- Rheem Cnrhe50 Prestige Natural Gas Power Direct Vent Water Heater Residential
- DETTSON CMO32-11 Oil Fired Hot Water Tank
- DETTSON CMO50-11 Oil Fired Hot Water Tank