Heat loss and gain calculation summary sheet

CSA-F280-M12
Standard Form No. 1

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Project no.
001-26

Building location			
Model:	Height Land	Site:	STR54
Address:	123 Alex St, Ottawa, ON	Lot:	145LT5
City and Province:	Ottawa (Orleans), ON	Postal code:	A1A 1A1
Calculations based on			
Dimensional information based on:	User-entered building geometry and room takeoff	Front facing:	North Assumed? No
Attachment:	Detached, Full Basement	Air tightness:	Custom (1.5 ACH50) Assumed? Yes
No. of stories:	2 storeys plus basement	Wind exposure:	LowCrops / LightLocal
Weather location:	Ottawa (Orleans), ON	Internal shading:	None Occupants: 3
Ventilated?	Included	Units:	Imperial
HRV?	Yes — HRV/ERV — no dedicated ducts to rooms	Ventilation flow:	Supply 110 cfm / Exhaust 110 cfm
Recovery %:	76%	ATRE:	0%
Heating design conditions		**Cooling design conditions**	
Outdoor temp:	-14.8 °F Indoor temp: 71.6 °F Mean soil temp: 46.4 °F	Outdoor temp:	86.0 °F Indoor temp: 75.2 °F Latitude: 45.48
Above grade walls		**Below grade walls**	
Style A:	Wall — Interior finish: Gypsum 1/2" | Framing/insulation: 2x6, 400 mm o/c, nominal R-22.0 | Sheathing: Sheathing 3/8" ply/OSB | Air cavity R-0.97 | Siding/cladding: Brick veneer (R-19.4)	Style A:	Slab & Foundation — Foundation type: basement | Wall construction: Concrete | Configuration: Concrete - interior wall insulation - cfg 1 | Wall insulation R-15.2 (Wall R-15.2)
Style B:	Garage Wall — Interior finish: Gypsum 1/2" | Framing/insulation: 2x6, 400 mm o/c, nominal R-22.0 | Siding/cladding: Gypsum 1/2" (R-18.4)	Style B:	
Style C:		Style C:	
Style D:		Style D:	
Floors on soil		**Ceilings**	
Style A:	Slab & Foundation — Foundation type: basement | Slab / foundation configuration: Concrete - interior wall insulation - cfg 1 | Wall/slab material: Concrete | Slab / floor insulation: none entered | Foundation wall insulation R-15.2 | Soil k 1 | Water table 8 ft	Style A:	Ceiling — Interior finish: Gypsum 1/2" | Framing/insulation: 2x4, 400 mm o/c, nominal R-51.0 | Air cavity R-0.85 (R-50.9)
Style B:		Style B:	
Style C:		Style C:	
Exposed floors		**Doors**	
Style A:	Exposed Floor — Interior finish: Gypsum 1/2" | Framing/insulation: 2x10, 600 mm o/c, nominal R-31.0 (R-30.2)	Style A:	Door — (R-6.2)
Style B:		Style B:	
Windows		**Skylights**	
Style A:	Window — Glazing layers: Double glazed | Frame material: Operable — Wood/Vinyl | Spacer: Insulating | Coating: Low-E | Glazing spacing: 13 mm | Fill type: Argon | SHGC 0.47 (R-2.9)	Style A:	
Style B:		Style B:	
Style C:		Style C:	
Style D:		Style D:	
Attached documents:	Room-by-room results summary, room dimension summary, building element breakdown, assembly details, input assumptions		
Notes:			

Calculations performed by	
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Registration no.:	N/A

Designer logo / certification / signature

CSA F280 Heat Loss & Heat Gain Report

Total Heating and Cooling Load

TOTAL HEAT LOSS
25,279 BTU/hr (7,408 W)

TOTAL HEAT GAIN
18,472 BTU/hr (5,414 W)

Project, Weather, Geometry & Systems

Item	Value
Project name/address	123 Alex St, Ottawa, ON
Weather location	Ottawa (Orleans), ON
Design temperatures	-26°C heating / 30°C cooling
Stories / floor area / volume	2 storeys plus basement / 2,350 ft^2 / 20,666 ft^3
Front House Facing Direction	North
Front facing assumed?	No
Building height	20 ft
Air leakage @ 50 Pa	1.5 ACH50; ELA10 301.81 cm^2; LRairh 0.1465; LRairc 0.0545
Ventilation	HRV/ERV — no dedicated ducts to rooms; supply 110 cfm; exhaust 110 cfm; ASE 76%; ATRE 0%
Heating system	ForcedAir

Total Heating and Cooling Load

Total Heat Loss BTU/hr	Total Heat Gain BTU/hr
25,279 BTU/hr (7,408 W)	18,472 BTU/hr (5,414 W)

Defined Assembly Details

Assembly ID	Type	Layers	Total R / Value
Wall	Wall	Interior finish: Gypsum 1/2" | Framing/insulation: 2x6, 400 mm o/c, nominal R-22.0 | Sheathing: Sheathing 3/8" ply/OSB | Air cavity R-0.97 | Siding/cladding: Brick veneer	R-19.4
Garage Wall	Wall	Interior finish: Gypsum 1/2" | Framing/insulation: 2x6, 400 mm o/c, nominal R-22.0 | Siding/cladding: Gypsum 1/2"	R-18.4
Ceiling	Ceiling / roof	Interior finish: Gypsum 1/2" | Framing/insulation: 2x4, 400 mm o/c, nominal R-51.0 | Air cavity R-0.85	R-50.9
Exposed Floor	Floor	Interior finish: Gypsum 1/2" | Framing/insulation: 2x10, 600 mm o/c, nominal R-31.0	R-30.2
Header	Header	Framing/insulation: 2x10, 400 mm o/c, nominal R-20.0 | Sheathing: Sheathing 3/8" ply/OSB | Air cavity R-0.97 | Siding/cladding: Brick veneer	R-20.3
Garage Header	Header	Interior finish: Gypsum 1/2" | Framing/insulation: 2x10, 400 mm o/c, nominal R-20.0 | Sheathing: Sheathing 3/8" ply/OSB	R-19.3
Window	Window	Glazing layers: Double glazed | Frame material: Operable — Wood/Vinyl | Spacer: Insulating | Coating: Low-E | Glazing spacing: 13 mm | Fill type: Argon | SHGC 0.47	R-2.9
Door	Door		R-6.2

Assembly ID	Type	Layers	Total R / Value
Slab & Foundation	Below grade / foundation	Foundation type: basement | Wall construction: Concrete | Configuration: Concrete - interior wall insulation - cfg 1 | Wall insulation R-15.2	Wall R-15.2

Construction Summary

Doors Assembly Summary

Assembly	Description	R-Value	Area ft²	Heating BTU/hr	Cooling BTU/hr
Door	Door	R-6.2	40.2	556	75

Walls Assembly Summary

Assembly	Description	R-Value	Area ft²	Heating BTU/hr	Cooling BTU/hr
Wall	Interior finish: Gypsum 1/2" | Framing/insulation: 2x6, 400 mm o/c, nominal R-22.0 | Sheathing: Sheathing 3/8" ply/OSB | Air cavity R-0.97 | Siding/cladding: Brick veneer	R-19.4	1008.8	4,481	622
Garage Wall	Interior finish: Gypsum 1/2" | Framing/insulation: 2x6, 400 mm o/c, nominal R-22.0 | Siding/cladding: Gypsum 1/2"	R-18.4	294.1	1,384	192

Headers Assembly Summary

Assembly	Description	R-Value	Area ft²	Heating BTU/hr	Cooling BTU/hr
Header	Framing/insulation: 2x10, 400 mm o/c, nominal R-20.0 | Sheathing: Sheathing 3/8" ply/OSB | Air cavity R-0.97 | Siding/cladding: Brick veneer	R-20.3	94.9	404	0
Garage Header	Interior finish: Gypsum 1/2" | Framing/insulation: 2x10, 400 mm o/c, nominal R-20.0 | Sheathing: Sheathing 3/8" ply/OSB	R-19.3	53.0	237	0

Ceilings Assembly Summary

Assembly	Description	R-Value	Area ft²	Heating BTU/hr	Cooling BTU/hr
Ceiling	Interior finish: Gypsum 1/2" | Framing/insulation: 2x4, 400 mm o/c, nominal R-51.0 | Air cavity R-0.85	R-50.9	859.4	1,460	830

Floors on Soil / Below Grade Assembly Summary

Assembly	Description	R-Value	Area ft²	Heating BTU/hr	Cooling BTU/hr
Slab & Foundation	Foundation type: basement | Wall construction: Concrete | Configuration: Concrete - interior wall insulation - cfg 1 | Wall insulation R-15.2	R-15.2	731.7	0	0

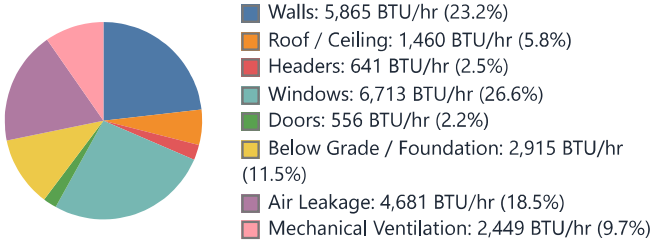
Windows Assembly Summary

Assembly	Description	Exposure	R-Value	SHGC	Area ft²	Heating BTU/hr	Cooling BTU/hr
Window	Glazing layers: Double glazed | Frame material: Operable — Wood/Vinyl | Spacer: Insulating | Coating: Low-E | Glazing spacing: 13 mm | Fill type: Argon | SHGC 0.47	South	R-2.9	0.47	66.0	1,969	2,538

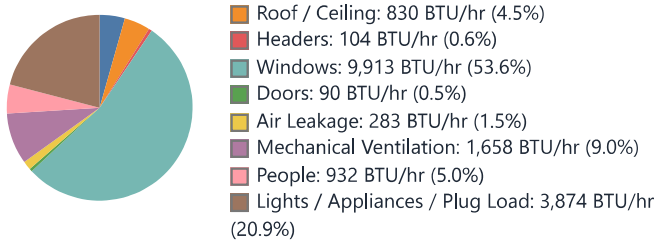
Assembly	Description	Exposure	R-Value	SHGC	Area ft²	Heating BTU/hr	Cooling BTU/hr
Window	Glazing layers: Double glazed | Frame material: Operable — Wood/Vinyl | Spacer: Insulating | Coating: Low-E | Glazing spacing: 13 mm | Fill type: Argon | SHGC 0.47	West	R-2.9	0.47	100.8	3,007	6,045
Window	Glazing layers: Double glazed | Frame material: Operable — Wood/Vinyl | Spacer: Insulating | Coating: Low-E | Glazing spacing: 13 mm | Fill type: Argon | SHGC 0.47	North	R-2.9	0.47	58.2	1,736	1,331

Heat Loss and Heat Gain Contribution Charts

Heat Loss Contribution (BTU/hr)



Heat Gain Contribution (BTU/hr)



Room Dimension Summary

Room	Level	Floor area ft²	Ceiling area ft²	Exposed floor area ft²	Foundation perimeter ft
1- base 1	Basement	846.8	0.0	0.0	95.4
2-kitchen	F1	355.9	0.0	0.0	0.0
3-living	F1	355.9	67.1	0.0	0.0
4-foyer	F1	132.4	132.4	0.0	0.0
5-powder	F1	26.0	26.0	0.0	0.0
6-hall	F2	260.9	260.9	0.0	0.0
7-BR1	F2	186.5	186.5	0.0	0.0
8-BR2	F2	186.5	186.5	0.0	0.0
Total		**2350.9**	**859.4**	**0.0**	**95.4**

Room-by-Room Results

Room / Zone	Level	Heat Loss BTU/hr	Heat Gain BTU/hr
1- base 1	Basement	6,798	55
2-kitchen	F1	4,032	5,710
3-living	F1	3,654	6,198
4-foyer	F1	2,786	804
5-powder	F1	55	29
6-hall	F2	2,159	1,191
7-BR1	F2	2,533	2,077
8-BR2	F2	3,261	2,407

Building Element Breakdown

Element Type	Heat Loss BTU/hr	Heat Gain BTU/hr
Walls	5,865 BTU/hr (1,719 W)	814 BTU/hr (239 W)
Roof / Ceiling	1,460 BTU/hr (428 W)	830 BTU/hr (243 W)
Floors	0 BTU/hr (0 W)	0 BTU/hr (0 W)
Headers	641 BTU/hr (188 W)	104 BTU/hr (31 W)
Windows	6,713 BTU/hr (1,967 W)	9,913 BTU/hr (2,905 W)
Doors	556 BTU/hr (163 W)	90 BTU/hr (26 W)
Below Grade / Foundation	2,915 BTU/hr (854 W)	0 BTU/hr (0 W)
Air Leakage	4,681 BTU/hr (1,372 W)	283 BTU/hr (83 W)
Mechanical Ventilation	2,449 BTU/hr (718 W)	1,658 BTU/hr (486 W)
People	0 BTU/hr (0 W)	932 BTU/hr (273 W)
Lights / Appliances / Plug Load	0 BTU/hr (0 W)	3,874 BTU/hr (1,135 W)
Duct	0 BTU/hr (0 W)	0 BTU/hr (0 W)
Pipe	0 BTU/hr (0 W)	0 BTU/hr (0 W)
BUILDING TOTAL	**25,279 BTU/hr (7,408 W)**	**18,472 BTU/hr (5,414 W)**