

Energy Efficiency Design Summary: Prescriptive Method

(Building Code Part 9, Residential)

This form is used by a designer to demonstrate that the energy efficiency design of a house complies with the building code using the prescriptive method described in Subsection 3.1.1. of SB-12. This form is applicable where the ratio of gross area of windows/sidelights/skylights/glazing in doors and sliding glass doors to the gross area of peripheral walls is not more than 22%.

For use by Principal Authority	
Application No:	Model/Certification Number

A. Project Information

Building number, street name 35 Botfield Ave		Unit number	Lot/Con
Municipality Toronto	Postal code	Reg. Plan number / other description	

B. Prescriptive Compliance [indicate the building code compliance package being employed in this house design]

SB-12 Prescriptive (input design package): Package: A1	Table: 3.1.1.2.A (IP)
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C. Project Design Conditions

Climatic Zone (SB-1):	Heating Equipment Efficiency	Space Heating Fuel Source
<input checked="" type="checkbox"/> Zone 1 (< 5000 degree days)	<input checked="" type="checkbox"/> ≥ 92% AFUE	<input checked="" type="checkbox"/> Gas <input type="checkbox"/> Propane <input type="checkbox"/> Solid Fuel
<input type="checkbox"/> Zone 2 (≥ 5000 degree days)	<input type="checkbox"/> ≥ 84% < 92% AFUE	<input type="checkbox"/> Oil <input type="checkbox"/> Electric <input type="checkbox"/> Earth Energy
Ratio of Windows, Skylights & Glass (W, S & G) to Wall Area		Other Building Characteristics
Area of walls = 4810 sqft	W, S & G % = 15.47 %	<input type="checkbox"/> Log/Post&Beam <input type="checkbox"/> ICF Above Grade <input type="checkbox"/> ICF Basement <input type="checkbox"/> Slab-on-ground <input type="checkbox"/> Walkout Basement <input checked="" type="checkbox"/> Air Conditioning <input type="checkbox"/> Combo Unit <input type="checkbox"/> Air Sourced Heat Pump (ASHP) <input type="checkbox"/> Ground Sourced Heat Pump (GSHP)
Area of W, S & G = 744 sqft	Utilize window averaging: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	

D. Building Specifications [provide values and ratings of the energy efficiency components proposed]

Energy Efficiency Substitutions				
<input type="checkbox"/> ICF (3.1.1.2.(5) & (6) / 3.1.1.3.(5) & (6))				
<input type="checkbox"/> Combined space heating and domestic water heating systems (3.1.1.2.(7) / 3.1.1.3.(7))				
<input type="checkbox"/> Airtightness substitution(s) Airtightness test required (Refer to Design Guide Attached)	<input type="checkbox"/> Table 3.1.1.4.B Required: _____ Permitted Substitution: _____			
	<input type="checkbox"/> Table 3.1.1.4.C Required: _____ Permitted Substitution: _____			
	Required: _____ Permitted Substitution: _____			
Building Component	Minimum RSI / R values or Maximum U-Value ⁽¹⁾		Building Component	Efficiency Ratings
Thermal Insulation	Nominal	Effective	Windows & Doors Provide U-Value(1) or ER rating	
Ceiling with Attic Space	R60	R59.22	Windows/Sliding Glass Doors	0.28
Ceiling without Attic Space	R31	R27.65	Skylights/Glazed Roofs	0.49
Exposed Floor	R31	R29.80	Mechanicals	
Walls Above Grade	R22	R17.03	Heating Equip.(AFUE)	96%
Basement Walls	R20 ci	R21.12	HRV Efficiency (SRE% at 0° C)	75%
Slab (all >600mm below grade)	-	-	DHW Heater (EF)	0.80
Slab (edge only ≤600mm below grade)	R10	R10	DWHR (CSA B55.1 (min. 42% efficiency))	# Showers 4
Slab (all ≤600mm below grade, or heated)	R10	R11.13	Combined Heating System	0

(1) U value to be provided in either W/(m²·K) or Btu/(h·ft²·F) but not both.

E. Designer(s) [name(s) & BCIN(s), if applicable, of person(s) providing information herein to substantiate that design meets the building

Qualified Designer Declaration of designer to have reviewed and take responsibility for the design work.		
Name Murat KARADAG	BCIN 110207	Signature

RESIDENTIAL MECHANICAL VENTILATION DESIGN SUMMARY

for design and performance of residential ventilation systems to OBC 2012 - 9.32

1. Location Municipality: <u>Toronto</u> Civic Address: <u>35 Botfield Ave</u>	10. TVC System <input checked="" type="checkbox"/> HRV/ERV <input type="checkbox"/> Central Exhaust <input type="checkbox"/> Multiple Fans
2. Builder Name: _____ Address: _____ City: _____ Postal Code: _____ Ph: _____ Fax: _____	11. Principal Ventilation Capacity (PVC) Master Bedroom <u>1</u> @ 30 CFM (15 L/s) <u>31.77</u> CFM Other Bedrooms <u>3</u> @ 15 CFM (7.5 L/s) <u>47.66</u> CFM Total Principal Ventilation Capacity (PVC) <u>79.425</u> CFM
3. Designer Name: <u>MURAT KARADAG</u> Address: <u>2099 BATES COMMON</u> City: <u>BURLINGTON</u> Postal Code: <u>L7R 0A5</u> Ph: <u>905-818-9523</u> Fax: _____ Designer BCIN: <u>110207</u> HRAI #: _____ Firm BCIN: <u>123326</u> E-mail: <u>info@hvacdsgn.ca</u>	12. Principal Ventilation Fan Location: <u>MECH X2</u> Manufacturer: <u>Vane</u> Model: <u>HRV 150 CFM 75 SRE</u> <input checked="" type="checkbox"/> HVI Rated Rated Airflow: Low: <u>50</u> CFM High: <u>150</u> CFM Sones: <u>0.6</u> ESP: _____ " w.c. <u>75</u> % Sensible Efficiency @ 0 C° _____ CFM <u> </u> % Sensible Efficiency @ -25 C° _____ CFM (If HRV/ERV was used, the system must also comply with SB-12)
4. Heating Systems <input checked="" type="checkbox"/> Forced Air <input type="checkbox"/> Non-Forced Air <hr/> <input checked="" type="checkbox"/> Gas <input type="checkbox"/> Propane <input type="checkbox"/> Other <input type="checkbox"/> Oil <input type="checkbox"/> Electricity	13. Supplemental Exhaust Fan Capacity (SEF) Required Total Ventilation Capacity <u>169.44</u> CFM Less Rated Principal Ventilation Capacity <u>150.00</u> CFM Required Supplemental Ventilation Capacity <u>19.44</u> CFM
5. House Style <input type="checkbox"/> One Dwelling Unit <input checked="" type="checkbox"/> House with Two Dwelling Units <hr/> Ventilation System: <input type="checkbox"/> Shared <input checked="" type="checkbox"/> Dedicated	14. Additional Equipment Location: <u>MASTER ENSUITE</u> Sones: <u>0.3</u> Manufacturer: <u>Broan</u> <input checked="" type="checkbox"/> HVI Rated Model: <u>XB80</u> <input checked="" type="checkbox"/> TVC Rated Airflow: <u>80</u> CFM ESP: <u>0.1</u> " w.c. <hr/> Location: <u>ENSUITE</u> Sones: <u>0.3</u> Manufacturer: <u>Broan</u> <input checked="" type="checkbox"/> HVI Rated Model: <u>XB80</u> <input type="checkbox"/> TVC Rated Airflow: <u>80</u> CFM ESP: <u>0.1</u> " w.c. <hr/> Location: <u>BATH - BATH/SAUNA</u> Sones: <u>0.3</u> Manufacturer: <u>Broan</u> <input checked="" type="checkbox"/> HVI Rated Model: <u>XB80</u> <input type="checkbox"/> TVC Rated Airflow: <u>80</u> CFM ESP: <u>0.1</u> " w.c. <hr/> Location: <u>POWDER</u> Sones: <u>0.3</u> Manufacturer: <u>Broan</u> <input checked="" type="checkbox"/> HVI Rated Model: <u>XB50</u> <input type="checkbox"/> TVC Rated Airflow: <u>80</u> CFM ESP: <u>0.1</u> " w.c.
6. Combustion Appliances <input checked="" type="checkbox"/> a) Direct Vent <input type="checkbox"/> b) Induced Draft <input type="checkbox"/> c) Natural Draft <input type="checkbox"/> d) Solid Fuel Appliances <input type="checkbox"/> e) No Combustion Appliances	15. Designer Consent I <u>Murat KARADAG</u> certify this ventilation system is designed to be in accordance with OBC-2012 9.32 Date: <u>Sep 7, 2023</u> Signature: _____
7. Type of House <input checked="" type="checkbox"/> Type 1: a) or b) type appliances only <input type="checkbox"/> Type 2: a) or b) type appliances with a d) type appliance <input type="checkbox"/> Type 3: any type c) appliance = part 6 design <input type="checkbox"/> Type 4: electric space heat (same as Type 1)	8. System Design Option <input type="checkbox"/> Exhaust only forced air system (coupled to forced air) <input checked="" type="checkbox"/> HRV/ERV with extended exhaust or simplified (coupled to forced air) <input type="checkbox"/> HRV/ERV full ducting (not coupled to forced air)
9. Total Ventilation Capacity (TVC) Bsmt & Master Bedroom <u>1</u> @ 20 CFM (10 L/s) <u>21.18</u> CFM Other Bedrooms <u>3</u> @ 10 CFM (5 L/s) <u>31.77</u> CFM Bathrooms & Kitchen <u>6</u> @ 10 CFM (5 L/s) <u>63.54</u> CFM Other Habitable Rooms <u>5</u> @ 10 CFM (5 L/s) <u>52.95</u> CFM Total Ventilation Capacity (TVC) <u>169.44</u> CFM	_____

Conversion note: 1 L/s = 2 CFM (For hard conversion, use 1 L/s = 2.118 CFM)



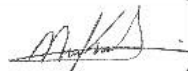
Project Information

For: 35 Botfield Ave, Toronto, ON

Notes:

The undersigned has reviewed and takes responsibility for this design, and has all qualifications and meets the requirements set out in the Ontario Building Code to be a designer. This design is valid for one year from date of stamp

Ontario BCIN 110207
HVAC Design BCIN 123326



Design Information

Weather: Toronto City Centre, ON, CA

Winter Design Conditions

Outside db -4 °F
Inside db 72 °F
Design TD 76 °F

Summer Design Conditions

Outside db 80 °F
Inside db 75 °F
Design TD 5 °F
Daily range L
Relative humidity 50 %
Moisture difference 32 gr/lb

Heating Summary

Structure 65970 Btuh
Ducts 198 Btuh
Central vent (300 cfm) 6156 Btuh

Humidification 0 Btuh
Piping 0 Btuh
Equipment load 72324 Btuh

Sensible Cooling Equipment Load Sizing

Structure 29916 Btuh
Ducts 139 Btuh
Central vent (300 cfm) 421 Btuh

Blower 0 Btuh

Use manufacturer's data y
Rate/swing multiplier 1.00
Equipment sensible load 30476 Btuh

Infiltration

Method F280-12
Expos. categ Very heavy shielding
Const. categ Present (1961-) (ACH=3.57)
Number of stories 2.0

	Heating	Cooling
Area (ft ²)	4891	4891
Volume (ft ³)	45376	45376
Air changes/hour	0.34	0.06
Equiv. AVF (cfm)	257	43

Latent Cooling Equipment Load Sizing

Structure 9017 Btuh
Ducts 0 Btuh
Central vent (300 cfm) 7070 Btuh

Equipment latent load 9017 Btuh

Equipment Total Load (Sen+Lat) 39493 Btuh
Req. total capacity at 0.70 SHR 3.6 ton

Heating Equipment Summary

Make n/a
Trade n/a
Model n/a
AHRI ref. n/a

Efficiency n/a
Heating input
Heating output 0 Btuh
Temperature rise 0 °F
Actual air flow 0 cfm
Air flow factor 0 cfm/Btuh
Static pressure 0 in H2O
Space thermostat n/a

Cooling Equipment Summary

Make n/a
Trade n/a
Cond n/a
Coil n/a
AHRI ref. n/a
Efficiency n/a
Sensible cooling 0 Btuh
Latent cooling 0 Btuh
Total cooling 0 Btuh
Actual air flow 0 cfm
Air flow factor 0 cfm/Btuh
Static pressure 0 in H2O
Load sensible heat ratio 0

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Outside db -4 °F
Inside db 72 °F
Design TD 76 °F

Summer Design Conditions

Outside db 80 °F
Inside db 75 °F
Design TD 5 °F
Daily range L
Relative humidity 50 %
Moisture difference 32 gr/lb

Heating Summary

Structure 45438 Btuh
Ducts 0 Btuh
Central vent (SER=75% 150 cfm) 3078 Btuh
Heat recovery
Humidification 0 Btuh
Piping 0 Btuh
Equipment load 48516 Btuh

Sensible Cooling Equipment Load Sizing

Structure 14606 Btuh
Ducts 0 Btuh
Central vent (SER=75% 150 cfm) 211 Btuh
Heat recovery
Blower 0 Btuh
Use manufacturer's data y
Rate/swing multiplier 1.00
Equipment sensible load 14817 Btuh

Infiltration

Method F280-12
Expos. categ Very heavy shielding
Const. categ Present (1961-) (ACH=3.57)
Number of stories 2.0

	Heating	Cooling
Area (ft ²)	3074	3074
Volume (ft ³)	29198	29198
Air changes/hour	0.42	0.05
Equiv. AVF (cfm)	206	22

Latent Cooling Equipment Load Sizing

Structure 763 Btuh
Ducts 0 Btuh
Central vent (150 cfm) 3682 Btuh
Heat recovery
Equipment latent load 4445 Btuh
Equipment Total Load (Sen+Lat) 19262 Btuh
Req. total capacity at 0.70 SHR 1.8 ton

Heating Equipment Summary

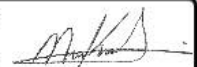
Make Carrier
Trade Carrier Comfort 95 Single-Stag...
Model 59SC5B060E17--14
AHRI ref 0
Efficiency 96.5 AFUE
Heating input 60000 Btuh
Heating output 58000 Btuh
Temperature rise 50 °F
Actual air flow 1074 cfm
Air flow factor 0.024 cfm/Btuh
Static pressure 0.50 in H2O
Space thermostat

Cooling Equipment Summary

Make Carrier
Trade Carrier
Cond 24VNA925A0030
Coil CNPVP3117ALA+58CTW045-12
AHRI ref 7153413
Efficiency 12.0 EER, 19 SEER
Sensible cooling 15820 Btuh
Latent cooling 6780 Btuh
Total cooling 22600 Btuh
Actual air flow 1074 cfm
Air flow factor 0.074 cfm/Btuh
Static pressure 0.50 in H2O
Load sensible heat ratio 0.77

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Project Information

For: 35 Botfield Ave, Toronto, ON

Notes:

Design Information

Weather: Toronto City Centre, ON, CA

Winter Design Conditions

Outside db -4 °F
Inside db 72 °F
Design TD 76 °F

Summer Design Conditions

Outside db 80 °F
Inside db 75 °F
Design TD 5 °F
Daily range L
Relative humidity 50 %
Moisture difference 32 gr/lb

Heating Summary

Structure 20532 Btuh
Ducts 198 Btuh
Central vent (SER=75% 150 cfm) 3078 Btuh
Heat recovery
Humidification 0 Btuh
Piping 0 Btuh
Equipment load 23808 Btuh

Sensible Cooling Equipment Load Sizing

Structure 15310 Btuh
Ducts 139 Btuh
Central vent (SER=75% 150 cfm) 211 Btuh
Heat recovery
Blower 0 Btuh
Use manufacturer's data y
Rate/swing multiplier 1.00
Equipment sensible load 15660 Btuh

Infiltration

Method F280-12
Expos. categ Heavy shielding
Const. categ Present (1961-) (ACH=3.57)
Number of stories 2.0

Latent Cooling Equipment Load Sizing

Structure 1310 Btuh
Ducts 0 Btuh
Central vent (150 cfm) 3388 Btuh
Heat recovery
Equipment latent load 4698 Btuh

	Heating	Cooling
Area (ft ²)	1817	1817
Volume (ft ³)	16178	16178
Air changes/hour	0.19	0.08
Equiv. AVF (cfm)	51	21

Equipment Total Load (Sen+Lat) 20358 Btuh
Req. total capacity at 0.70 SHR 1.9 ton

Heating Equipment Summary

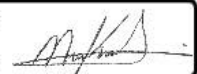
Make Carrier
Trade Carrier Performance 96 Two-Sta...
Model 59TP6A040E171112
AHRI ref 7126205
Efficiency 96 AFUE
Heating input 40000 Btuh
Heating output 39000 Btuh
Temperature rise 50 °F
Actual air flow 722 cfm
Air flow factor 0.035 cfm/Btuh
Static pressure 0.50 in H2O
Space thermostat

Cooling Equipment Summary

Make Carrier
Trade Carrier
Cond 24VNA624A0030050
Coil FE4ANB005L++UI+UI
AHRI ref 0
Efficiency 16.5 EER, 26 SEER
Sensible cooling 16240 Btuh
Latent cooling 6960 Btuh
Total cooling 23200 Btuh
Actual air flow 722 cfm
Air flow factor 0.047 cfm/Btuh
Static pressure 0.50 in H2O
Load sensible heat ratio 0.77

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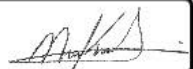


Cert.#: (RHLG, RASD)
2099 BATES COMMON, BURLINGTON, ON L7R 0A5 Phone: 905-818-9523 Email: info@hvacadesign.ca Web: www.hvacadesign.ca License: 110207

1 Room name				Entire House 558.0 ft				SECOND F. 182.0 ft				BASEMENT/FIRST F 376.0 ft						
2 Exposed wall				9.3 ft				8.9 ft				9.5 ft						
3 Room dimensions				d				d				d						
4 Room height				d				d				d						
Ty	CST	R-value	Or	TD/R (Btuh/ft²)		Area (ft²) or perim (ft)		Load (Btuh)		Area (ft²) or perim (ft)		Load (Btuh)		Area (ft²) or perim (ft)		Load (Btuh)		
				Heat	Cool	Gross	N/P/S	Heat	Cool	Gross	N/P/S	Heat	Cool	Gross	N/P/S	Heat	Cool	
5	W	W-R22	17.03	n	4.5	0.0	1497	1431	6384	0	452	443	1978	0	1045	987	4407	0
	G	Nw28	3.55	n	21.4	10.6	66	0	1412	699	8	0	179	88	58	0	1233	610
	W	W-R22	17.03	e	4.5	0.5	1019	754	3365	366	351	212	948	103	668	542	2417	263
	G	Nw28	3.55	e	21.4	29.5	216	0	4620	6353	139	0	2970	4084	77	0	1650	2269
	G	Nw28	3.55	e	21.4	29.5	28	0	600	825	0	0	0	0	28	0	600	825
	D	23B0	5.03	e	15.1	1.6	21	21	317	34	0	0	0	0	21	21	317	34
	W	W-R22	17.03	s	4.5	0.1	1307	1239	5528	90	468	444	1983	32	839	794	3545	58
	G	Nw28	3.55	s	21.4	19.3	44	0	940	848	24	0	506	456	20	0	434	391
	D	23B0	5.03	s	15.1	0.2	24	24	363	6	0	0	0	0	24	24	363	6
	W	W-R22	17.03	w	4.5	0.5	987	597	2663	289	351	178	793	86	636	419	1870	203
	G	Nw28	3.55	w	21.4	29.5	390	0	8365	11504	173	0	3713	5106	217	0	4652	6398
	C	R60	59.21	-	1.3	0.5	1892	1892	2428	1029	1817	1817	2333	988	74	74	95	40
	F	BCIB 1	n/a	-	n/a	0.0	294	294	3783	0	0	0	0	0	294	294	3783	0
	F	R31 Exp	29.80	-	2.6	0.2	1243	1243	3171	217	0	0	0	0	1243	1243	3171	217
	F	R31 Exp	29.80	-	2.6	0.2	355	355	905	62	355	355	905	62	0	0	0	0
6	Total conductive loss/gain								44844	22322			16307	11007			28537	11315
7	a)	Infiltration							21126	243			4225	120			16901	123
	b)	Ventilation							0	0			0	0			0	0
8	Internal gains:		People@	230			5		1150		4		920		1		230	
			Electric/Appliances						6201				3264				2938	
	Subtotal (lines 6 to 8)								65970	29916			20532	15310			45438	14606
9	Less external load								0	0			0	0			0	0
10	Less transfer								0	0			0	0			0	0
11	Subtotal								65970	29916			20532	15310			45438	14606
12	Distribution losses								198	139	1%	1%	198	139	0%	0%	0	0
	Redistribution								0	0	0%	0%	0	0	0%	0%	0	0
13	Total room load								66168	30055			20730	15449			45438	14606
14	Air required (cfm)								1796	1796			722	722			1074	1074

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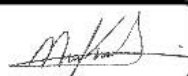
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1 Room name				BASEMENT/FIRST F				KIT/DIN/FAM				UTILITY/STORAGE					
2 Exposed wall				376.0 ft				133.0 ft				24.5 ft					
3 Room dimensions				9.5 ft d				1.0 x 1216.8 ft				10.5 x 11.0 ft					
4 Room height								heat/cool				heat/cool					
Ty	CST	R-value	Or	TD/R (Btuh/ft²)		Area (ft²) or perim (ft)		Load (Btuh)		Area (ft²) or perim (ft)		Load (Btuh)		Area (ft²) or perim (ft)		Load (Btuh)	
				Heat	Cool	Gross	N/P/S	Heat	Cool	Gross	N/P/S	Heat	Cool	Gross	N/P/S	Heat	Cool
5	W	W-R22	17.03	n	4.5	0.0	1045	987	4407	0	340	320	1428	0	0	0	0
	G	Nw28	3.55	n	21.4	10.6	58	0	1233	610	20	0	429	212	0	0	0
	W	W-R22	17.03	e	4.5	0.5	668	542	2417	263	220	171	763	83	21	21	94
	G	Nw28	3.55	e	21.4	29.5	77	0	1650	2269	0	0	0	0	0	0	0
	G	Nw28	3.55	e	21.4	29.5	28	0	600	825	28	0	600	825	0	0	0
	D	23B0	5.03	e	15.1	1.6	21	21	317	34	21	21	317	34	0	0	0
	W	W-R22	17.03	s	4.5	0.1	839	794	3545	58	410	386	1723	28	22	22	98
	G	Nw28	3.55	s	21.4	19.3	20	0	434	391	0	0	0	0	0	0	0
	D	23B0	5.03	s	15.1	0.2	24	24	363	6	24	24	363	6	0	0	0
	W	W-R22	17.03	w	4.5	0.5	636	419	1870	203	360	143	638	69	6	6	27
	G	Nw28	3.55	w	21.4	29.5	217	0	4652	6398	217	0	4652	6398	0	0	0
	C	R60	59.21	-	1.3	0.5	74	74	95	40	74	74	95	40	0	0	0
	F	BCIB 1	n/a	-	n/a	0.0	294	294	3783	0	0	0	0	0	116	116	1685
	F	R31 Exp	29.80	-	2.6	0.2	1243	1243	3171	217	0	0	0	0	0	0	0
	F	R31 Exp	29.80	-	0.0	0.0	0	0	0	0	0	0	0	0	0	0	0
6	Total conductive loss/gain								28537	11315			11008	7696			1904
7	a) Infiltration								16901	123			4610	84			1501
	b) Ventilation								0	0			0	0			0
8	Internal gains:		People@	230				1	230	2938		0	0	326		0	326
			Electric/Appliances														
	Subtotal (lines 6 to 8)								45438	14606			15618	8106			3405
9	Less external load								0	0			0	0			0
10	Less transfer								0	0			0	0			0
11	Subtotal								45438	14606			15618	8106			3405
12	Distribution losses								0	0			0	0			0
			Ducts			0%	0%		0	0			0	0			0
			Hydronic			0%	0%		0	0			0	0			0
	Redistribution								0	0			0	0			0
13	Total room load								45438	14606			15618	8106			3405
14	Air required (cfm)								1074	1074			369	596			80

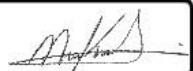
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Ontario HVAC Design BCIN 110207 BCIN 123326 

Cert.#: (RHLG, RASD)
2099 BATES COMMON, BURLINGTON, ON L7R 0A5 Phone: 905-818-9523 Email: info@hvacdsgn.ca Web: www.hvacdsgn.ca License: 110207

1	Room name				NANNY SUITE 30.5 ft				PANTRY 8.0 ft				STUDY 27.5 ft					
	Exposed wall				1.0 x 178.0 ft				10.0 x 8.0 ft				11.5 x 13.0 ft					
	Room dimensions				9.0 ft				10.0 ft				10.0 ft					
4	Room height				heat/cool				heat/cool				heat/cool					
	Ty	CST	R-value	Or	TD/R (Btuh/ft²)		Area (ft²) or perim (ft)		Load (Btuh)		Area (ft²) or perim (ft)		Load (Btuh)		Area (ft²) or perim (ft)		Load (Btuh)	
					Heat	Cool	Gross	N/P/S	Heat	Cool	Gross	N/P/S	Heat	Cool	Gross	N/P/S	Heat	Cool
5	W	W-R22	17.03	n	4.5	0.0	0	0	0	0	80	69	310	0	130	130	580	0
	G	Nw28	3.55	n	21.4	10.6	0	0	0	0	11	0	226	112	0	0	0	0
	W	W-R22	17.03	e	4.5	0.5	0	0	0	0	0	0	0	0	115	38	170	18
	G	Nw28	3.55	e	21.4	29.5	0	0	0	0	0	0	0	0	77	0	1650	2269
	G	Nw28	3.55	e	21.4	29.5	0	0	0	0	0	0	0	0	0	0	0	0
	D	23B0	5.03	e	15.1	1.6	0	0	0	0	0	0	0	0	0	0	0	0
	W	W-R22	17.03	s	4.5	0.1	37	28	124	2	0	0	0	0	30	30	134	2
	G	Nw28	3.55	s	21.4	19.3	9	0	198	179	0	0	0	0	0	0	0	0
	D	23B0	5.03	s	15.1	0.2	0	0	0	0	0	0	0	0	0	0	0	0
	W	W-R22	17.03	w	4.5	0.5	24	24	107	12	0	0	0	0	0	0	0	0
	G	Nw28	3.55	w	21.4	29.5	0	0	0	0	0	0	0	0	0	0	0	0
	C	R60	59.21	-	1.3	0.5	0	0	0	0	0	0	0	0	0	0	0	0
	F	BCIB 1	n/a	-	n/a	0.0	178	178	2098	0	0	0	0	0	0	0	0	0
	F	R31 Exp	29.80	-	2.6	0.2	0	0	0	0	0	0	0	0	0	0	0	0
	F	R31 Exp	29.80	-	0.0	0.0	0	0	0	0	0	0	0	0	0	0	0	0
6	Total conductive loss/gain								2527	192			536	112			2534	2290
7	a) Infiltration								1992	2			224	1			1061	25
	b) Ventilation								0	0			0	0			0	0
8	Internal gains:		People@	230			1		230		0		0		0		0	0
			Electric/Appliances						326				326				326	326
	Subtotal (lines 6 to 8)								4519	751			760	439			3595	2641
9	Less external load								0	0			0	0			0	0
10	Less transfer								0	0			0	0			0	0
11	Subtotal								4519	751			760	439			3595	2641
12	Distribution losses		Ducts	0%	0%			0	0	0%	0%	0	0	0%	0%	0	0	0
			Hydronic	0%	0%			0	0	0%	0%	0	0	0%	0%	0	0	0
	Redistribution								0	0			0	0			0	0
13	Total room load								4519	751			760	439			3595	2641
14	Air required (cfm)								107	55			18	32			85	194

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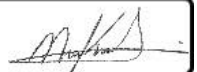
Ontario HVAC Design BCIN 110207 BCIN 123326 

Cert.#: (RHLG, RASD)
2099 BATES COMMON, BURLINGTON, ON L7R 0A5 Phone: 905-818-9523 Email: info@hvacdsgn.ca Web: www.hvacdsgn.ca License: 110207

1		Room name		BAR/REC ROOM				BATH/SAUNA				MUD ROOM						
2		Exposed wall		119.0 ft				14.0 ft				19.5 ft						
3		Room dimensions		1.0 x 1075.3 ft				12.0 x 14.0 ft				5.5 x 11.0 ft						
4		Room height		9.0 ft				9.0 ft				10.0 ft						
5	Ty	CST	R - value	Or	TD/R (Btuh/ft²)		Area (ft²) or perim (ft)		Load (Btuh)		Area (ft²) or perim (ft)		Load (Btuh)		Area (ft²) or perim (ft)		Load (Btuh)	
					Heat	Cool	Gross	N/P/S	Heat	Cool	Gross	N/P/S	Heat	Cool	Gross	N/P/S	Heat	Cool
	W	W-R22	17.03	n	4.5	0.0	369	342	1526	0	126	126	562	0	0	0	0	0
	G	Nw28	3.55	n	21.4	10.6	27	0	579	286	0	0	0	0	0	0	0	0
	W	W-R22	17.03	e	4.5	0.5	257	257	1145	124	0	0	0	0	55	55	245	27
	G	Nw28	3.55	e	21.4	29.5	0	0	0	0	0	0	0	0	0	0	0	0
	G	Nw28	3.55	e	21.4	29.5	0	0	0	0	0	0	0	0	0	0	0	0
	D	23B0	5.03	e	15.1	1.6	0	0	0	0	0	0	0	0	0	0	0	0
	W	W-R22	17.03	s	4.5	0.1	230	230	1024	17	0	0	0	0	110	99	442	7
	G	Nw28	3.55	s	21.4	19.3	0	0	0	0	0	0	0	0	11	0	236	213
	D	23B0	5.03	s	15.1	0.2	0	0	0	0	0	0	0	0	0	0	0	0
	W	W-R22	17.03	w	4.5	0.5	216	216	964	105	0	0	0	0	30	30	134	15
	G	Nw28	3.55	w	21.4	29.5	0	0	0	0	0	0	0	0	0	0	0	0
	C	R60	59.21	-	1.3	0.5	0	0	0	0	0	0	0	0	0	0	0	0
	F	BCIB 1	n/a	-	n/a	0.0	0	0	0	0	0	0	0	0	0	0	0	0
	F	R31 Exp	29.80	-	2.6	0.2	1075	1075	2742	188	168	168	428	29	0	0	0	0
	F	R31 Exp	29.80	-	0.0	0.0	0	0	0	0	0	0	0	0	0	0	0	0
6	Total conductive loss/gain								7980	720			991	29			1057	261
7	a) Infiltration								6290	8			781	0			443	3
	b) Ventilation								0	0			0	0			0	0
8	Internal gains:		People@	230			0		0		0		0		0		0	
			Electric/Appliances						326				326				326	
	Subtotal (lines 6 to 8)								14270	1054			1772	356			1499	590
9	Less external load								0	0			0	0			0	0
10	Less transfer								0	0			0	0			0	0
11	Subtotal								14270	1054			1772	356			1499	590
12	Distribution losses				Ducts	0%	0%		0	0	0%	0%	0	0	0%	0%	0	0
	Redistribution				Hydronic	0%			0	0	0%		0	0	0%		0	0
13	Total room load								14270	1054			1772	356			1499	590
14	Air required (cfm)								337	78			42	26			35	43

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Ontario BCIN 110207
HVAC Design BCIN 123326

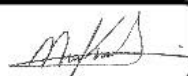


Ontario HVAC Design

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1	Room name				POWDER													
	Exposed wall				0 ft													
	Room dimensions				5.0 x 6.0 ft													
4	Room height				10.0 ft				heat/cool									
	Ty	CST	R-value	Or	TD/R (Btuh/ft²)		Area (ft²) or perim (ft)		Load (Btuh)		Area or perim		Load		Area or perim		Load	
					Heat	Cool	Gross	N/P/S	Heat	Cool	Gross	N/P/S	Heat	Cool	Gross	N/P/S	Heat	Cool
5	W	W-R22	17.03	n	4.5	0.0	0	0	0	0								
	G	Nw28	3.55	n	21.4	10.6	0	0	0	0								
	W	W-R22	17.03	e	4.5	0.5	0	0	0	0								
	G	Nw28	3.55	e	21.4	29.5	0	0	0	0								
	G	Nw28	3.55	e	21.4	29.5	0	0	0	0								
	D	23B0	5.03	e	15.1	1.6	0	0	0	0								
	W	W-R22	17.03	s	4.5	0.1	0	0	0	0								
	G	Nw28	3.55	s	21.4	19.3	0	0	0	0								
	D	23B0	5.03	s	15.1	0.2	0	0	0	0								
	W	W-R22	17.03	w	4.5	0.5	0	0	0	0								
	G	Nw28	3.55	w	21.4	29.5	0	0	0	0								
	C	R60	59.21	-	1.3	0.5	0	0	0	0								
	F	BCIB 1	n/a	-	n/a	0.0	0	0	0	0								
	F	R31 Exp	29.80	-	2.6	0.2	0	0	0	0								
	F	R31 Exp	29.80	-	0.0	0.0	0	0	0	0								
6	Total conductive loss/gain								0	0								
7	a) Infiltration								0	0								
	b) Ventilation								0	0								
8	Internal gains:		People@	230				0		0								
			Electric/Appliances							326								
	Subtotal (lines 6 to 8)								0	326								
9	Less external load								0	0								
10	Less transfer								0	0								
11	Subtotal								0	326								
12	Distribution losses		Ducts		0%	0%			0	0								
			Hydronic		0%				0	0								
	Redistribution								0	0								
13	Total room load								0	326								
14	Air required (cfm)								0	24								

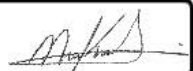
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Ontario HVAC Design BCIN 110207 BCIN 123326 

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1		Room name		SECOND F.				MASTER BEDROOM				MASTER ENSUITE						
2		Exposed wall		182.0 ft				60.0 ft				16.5 ft						
3		Room dimensions		8.9 ft d				1.0 x 532.0 ft				1.0 x 177.8 ft						
4		Room height		heat/cool				heat/cool				heat/cool						
5	Ty	CST	R-value	Or	TD/R (Btuh/ft²)		Area (ft²) or perim (ft)		Load (Btuh)		Area (ft²) or perim (ft)		Load (Btuh)		Area (ft²) or perim (ft)		Load (Btuh)	
					Heat	Cool	Gross	N/P/S	Heat	Cool	Gross	N/P/S	Heat	Cool	Gross	N/P/S	Heat	Cool
5	W	W-R22	17.03	n	4.5	0.0	452	443	1978	0	50	50	221	0	132	124	552	0
	G	Nw28	3.55	n	21.4	10.6	8	0	179	88	0	0	0	0	8	0	179	88
	W	W-R22	17.03	e	4.5	0.5	351	212	948	103	0	0	0	0	0	0	0	0
	G	Nw28	3.55	e	21.4	29.5	139	0	2970	4084	0	0	0	0	0	0	0	0
	G	Nw28	3.55	e	0.0	0.0	0	0	0	0	0	0	0	0	0	0	0	0
	D	23B0	5.03	e	0.0	0.0	0	0	0	0	0	0	0	0	0	0	0	0
	W	W-R22	17.03	s	4.5	0.1	468	444	1983	32	167	167	743	12	0	0	0	0
	G	Nw28	3.55	s	21.4	19.3	24	0	506	456	0	0	0	0	0	0	0	0
	D	23B0	5.03	s	0.0	0.0	0	0	0	0	0	0	0	0	0	0	0	0
	W	W-R22	17.03	w	4.5	0.5	351	178	793	86	324	151	673	73	0	0	0	0
	G	Nw28	3.55	w	21.4	29.5	173	0	3713	5106	173	0	3713	5106	0	0	0	0
	C	R60	59.21	-	1.3	0.5	1817	1817	2333	988	532	532	683	289	178	178	228	97
	F	BCIB 1	n/a	-	n/a	0.0	0	0	0	0	0	0	0	0	0	0	0	0
	F	R31 Exp	29.80	-	0.0	0.0	0	0	0	0	0	0	0	0	0	0	0	0
F	R31 Exp	29.80	-	2.6	0.2	355	355	905	62	0	0	0	0	0	0	0	0	
6	Total conductive loss/gain							16307	11007			6033	5481			959	185	
7	a) Infiltration							4225	120			1563	60			248	2	
	b) Ventilation							0	0			0	0			0	0	
8	Internal gains:		People@	230			4		920		2		460		0		0	
			Electric/Appliances						3264				326				326	
	Subtotal (lines 6 to 8)							20532	15310			7596	6327			1207	513	
9	Less external load							0	0			0	0			0	0	
10	Less transfer							0	0			0	0			0	0	
11	Subtotal							20532	15310			7791	6452			1250	541	
12	Distribution losses		Ducts			1%	1%	198	139	0%	0%	0	0	0%	0%	0	0	
			Hydronic			0%		0	0	0%	0%	0	126	0%	0%	43	27	
	Redistribution							0	0			195	126			43	27	
13	Total room load							20730	15449			7791	6452			1250	541	
14	Air required (cfm)							722	722			271	302			44	25	

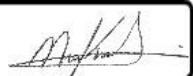
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1	Room name				BEDROOM 4				BEDROOM 2				BEDROOM 3							
	Exposed wall				20.0 ft				36.5 ft				24.0 ft							
	Room dimensions				1.0 x 167.5 ft				1.0 x 218.0 ft				1.0 x 146.3 ft							
4	Room height				9.0 ft				9.0 ft				9.0 ft							
5	Ty	CST	R-value	Or	TD/R (Btuh/ft²)		Area (ft²) or perim (ft)		Load (Btuh)		Area (ft²) or perim (ft)		Load (Btuh)		Area (ft²) or perim (ft)		Load (Btuh)			
					Heat	Cool	Gross	N/P/S	Heat	Cool	Gross	N/P/S	Heat	Cool	Gross	N/P/S	Heat	Cool		
	W	W-R22	17.03	n	4.5	0.0	0	0	0	0	198	198	884	0	14	14	60	0		
	G	Nw28	3.55	n	21.4	10.6	0	0	0	0	0	0	0	0	0	0	0	0		
	W	W-R22	17.03	e	4.5	0.5	0	0	0	0	104	41	181	20	95	61	270	29		
	G	Nw28	3.55	e	21.4	29.5	0	0	0	0	63	0	1350	1857	34	0	729	1002		
	G	Nw28	3.55	e	0.0	0.0	0	0	0	0	0	0	0	0	0	0	0	0		
	D	23B0	5.03	e	0.0	0.0	0	0	0	0	0	0	0	0	0	0	0	0		
	W	W-R22	17.03	s	4.5	0.1	153	129	577	9	27	27	120	2	108	108	482	8		
	G	Nw28	3.55	s	21.4	19.3	24	0	506	456	0	0	0	0	0	0	0	0		
	D	23B0	5.03	s	0.0	0.0	0	0	0	0	0	0	0	0	0	0	0	0		
	W	W-R22	17.03	w	4.5	0.5	27	27	120	13	0	0	0	0	0	0	0	0		
	G	Nw28	3.55	w	21.4	29.5	0	0	0	0	0	0	0	0	0	0	0	0		
	C	R60	59.21	-	1.3	0.5	168	168	215	91	218	218	280	119	146	146	188	80		
	F	BCIB 1	n/a	-	n/a	0.0	0	0	0	0	0	0	0	0	0	0	0	0		
	F	R31 Exp	29.80	-	0.0	0.0	0	0	0	0	0	0	0	0	0	0	0	0		
	F	R31 Exp	29.80	-	2.6	0.2	52	52	133	9	0	0	0	0	146	146	373	26		
6	Total conductive loss/gain								1552	579					2815	1997				
7	a) Infiltration								402	6					729	22				
	b) Ventilation								0	0					0	0				
8	Internal gains:		People@	230	Electric/Appliances		1		230	326	0		0	326	1		230	326		
	Subtotal (lines 6 to 8)								1954	1142					3544	2345				
9	Less external load								0	0					0	0				
10	Less transfer								0	0					0	0				
11	Subtotal								2137	1260					3640	2602				
12	Distribution losses		Ducts	0%	0%	0		0	0	0%	0%	0		0	5%	5%	137		88	
	Redistribution		Hydronic	0%	0		0	0	0	0	0		0	0%	0		0	0		
	Subtotal								183	118					96	257				
13	Total room load								2137	1260					3640	2602				
14	Air required (cfm)								74	59					127	122				

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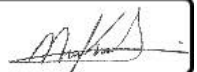
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1 Room name				BATH 9.0 ft				ENSUITE 9.5 ft				UTILITY 0 ft						
2 Exposed wall				1.0 x 57.5 ft				8.0 x 9.0 ft				7.5 x 6.0 ft						
3 Room dimensions				9.0 ft				9.0 ft				9.0 ft						
4 Room height				heat/cool				heat/cool				heat/cool						
Ty	CST	R-value	Or	TD/R (Btuh/ft²)		Area (ft²) or perim (ft)		Load (Btuh)		Area (ft²) or perim (ft)		Load (Btuh)		Area (ft²) or perim (ft)		Load (Btuh)		
				Heat	Cool	Gross	N/P/S	Heat	Cool	Gross	N/P/S	Heat	Cool	Gross	N/P/S	Heat	Cool	
5	W	W-R22	17.03	n	4.5	0.0	0	0	0	0	0	0	0	0	0	0	0	
	G	Nw28	3.55	n	21.4	10.6	0	0	0	0	0	0	0	0	0	0	0	
	W	W-R22	17.03	e	4.5	0.5	81	62	277	30	72	49	220	24	0	0	0	
	G	Nw28	3.55	e	21.4	29.5	19	0	405	557	23	0	486	668	0	0	0	
	G	Nw28	3.55	e	0.0	0.0	0	0	0	0	0	0	0	0	0	0	0	
	D	23B0	5.03	e	0.0	0.0	0	0	0	0	0	0	0	0	0	0	0	
	W	W-R22	17.03	s	4.5	0.1	0	0	0	0	14	14	60	1	0	0	0	
	G	Nw28	3.55	s	21.4	19.3	0	0	0	0	0	0	0	0	0	0	0	
	D	23B0	5.03	s	0.0	0.0	0	0	0	0	0	0	0	0	0	0	0	
	W	W-R22	17.03	w	4.5	0.5	0	0	0	0	0	0	0	0	0	0	0	
	G	Nw28	3.55	w	21.4	29.5	0	0	0	0	0	0	0	0	0	0	0	
	C	R60	59.21	-	1.3	0.5	58	58	74	31	72	92	39	45	45	58	24	
	F	BCIB 1	n/a	-	n/a	0.0	0	0	0	0	0	0	0	0	0	0	0	
	F	R31 Exp	29.80	-	0.0	0.0	0	0	0	0	0	0	0	0	0	0	0	
	F	R31 Exp	29.80	-	2.6	0.2	58	58	147	10	9	9	23	2	0	0	0	
6	Total conductive loss/gain								902	628			882	734			58	24
7	a) Infiltration								234	7			228	8			15	0
	b) Ventilation								0	0			0	0			0	0
8	Internal gains:		People@	230			0				0				0			0
			Electric/Appliances												326			326
	Subtotal (lines 6 to 8)								1136	961			1110	1068			73	351
9	Less external load								0	0			0	0			0	0
10	Less transfer								0	0			0	0			0	0
11	Subtotal								1222	1016			1196	1123			0	0
12	Distribution losses		Ducts			5%	5%		61	51	0%	0%	0	0	0%	0%	0	0
			Hydronic			0%			0		0%		0		0%		0	0
	Redistribution								86	55			86	55			-73	-351
13	Total room load								1283	1067			1196	1123			0	0
14	Air required (cfm)								45	50			42	52			0	0

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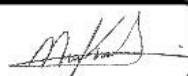
Ontario BCIN 110207
HVAC Design BCIN 123326



Cert.#: (RHLG, RASD)
2099 BATES COMMON, BURLINGTON, ON L7R 0A5 Phone: 905-818-9523 Email: info@hvacdsgn.ca Web: www.hvacdsgn.ca License: 110207

1	Room name				HALL				LAUNDRY											
	Exposed wall				0 ft				6.5 ft											
	Room dimensions				16.0 x 20.0 ft				12.5 x 6.5 ft											
4	Room height				9.0 ft				heat/cool				9.0 ft				heat/cool			
	Ty	CST	R-value	Or	TD/R (Btuh/ft²)		Area (ft²) or perim (ft)		Load (Btuh)		Area (ft²) or perim (ft)		Load (Btuh)		Area or perim		Load			
					Heat	Cool	Gross	N/P/S	Heat	Cool	Gross	N/P/S	Heat	Cool	Gross	N/P/S	Heat	Cool		
5	W	W-R22	17.03	n	4.5	0.0	0	0	0	0	59	59	261	0						
		G	Nw28	3.55	n	21.4	10.6	0	0	0	0	0	0	0						
	W	W-R22	17.03	e	4.5	0.5	0	0	0	0	0	0	0	0						
		G	Nw28	3.55	e	21.4	29.5	0	0	0	0	0	0	0						
		G	Nw28	3.55	e	0.0	0.0	0	0	0	0	0	0	0						
		D	23B0	5.03	e	0.0	0.0	0	0	0	0	0	0	0						
	W	W-R22	17.03	s	4.5	0.1	0	0	0	0	0	0	0	0						
		G	Nw28	3.55	s	21.4	19.3	0	0	0	0	0	0	0						
		D	23B0	5.03	s	0.0	0.0	0	0	0	0	0	0	0						
	W	W-R22	17.03	w	4.5	0.5	0	0	0	0	0	0	0	0						
		G	Nw28	3.55	w	21.4	29.5	0	0	0	0	0	0	0						
	C	R60	59.21	-	1.3	0.5	320	320	411	174	81	81	104	44						
	F	BCIB 1	n/a	-	n/a	0.0	0	0	0	0	0	0	0	0						
	F	R31 Exp	29.80	-	0.0	0.0	0	0	0	0	0	0	0	0						
	F	R31 Exp	29.80	-	2.6	0.2	90	90	230	16	0	0	0	0						
6	Total conductive loss/gain								640	190			365	44						
7	a) Infiltration								166	2			95	0						
	b) Ventilation								0	0			0	0						
8	Internal gains:		People@	230				0		0		0		0						
			Electric/Appliances							326				326						
	Subtotal (lines 6 to 8)								806	518			460	371						
9	Less external load								0	0			0	0						
10	Less transfer								0	0			0	0						
11	Subtotal								0	0			565	547						
12	Distribution losses		Ducts		0%	0%			0	0	0%	0%	0	0						
			Hydronic		0%				0		0%		0							
	Redistribution								-806	-518			105	176						
13	Total room load								0	0			565	547						
14	Air required (cfm)								0	0			20	26						

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Project Information

For: 35 Botfield Ave, Toronto, ON

Design Conditions

House type	Detached
Site	Suburban, forest
Wall shielding	Very heavy shielding
Storeys	2.0 (w/o basement)
Highest ceiling height (ft)	24.0
Foundation	Full

Air Leakage

Air tightness Present (1961-) (ACH=3.57)


Flues

Shielding	Heavy shielding			
Diameter (in)	#1	#2	#3	#4
	0	0	0	0

Summary

Heating		Cooling	
Infiltration area	4891 ft ²	Infiltration area	4891 ft ²
Infiltration volume	45376 ft ³	Infiltration volume	45376 ft ³
Unadjusted air change rate	0.340 ach	Unadjusted air change rate	0.057 ach
Unadjusted AVF	257 cfm	Unadjusted AVF	43 cfm
Vent adjustment	0 cfm	Vent adjustment	0 cfm
Net AVF	257 cfm	Net AVF	43 cfm
Net air change rate	0.340 ach	Net air change rate	0.057 ach

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Room Name	Level Factor	Htg load (Btuh)	Clg load (Btuh)	Htg AVF (cfm)	Clg AVF (cfm)
SECOND F.	0	4225	120	51	21
BASEMENT/FIRST F	0	16901	123	206	22
Entire House	0	21126	243	257	43

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Foundation	Full

Air Leakage

Air tightness Present (1961-) (ACH=3.57)

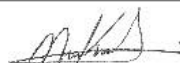
Flues

Shielding	Heavy shielding			
Diameter (in)	#1	#2	#3	#4
	0	0	0	0

Summary

Heating		Cooling	
Infiltration area	3074 ft ²	Infiltration area	3074 ft ²
Infiltration volume	29198 ft ³	Infiltration volume	29198 ft ³
Unadjusted air change rate	0.423 ach	Unadjusted air change rate	0.045 ach
Unadjusted AVF	206 cfm	Unadjusted AVF	22 cfm
Vent adjustment	0 cfm	Vent adjustment	0 cfm
Net AVF	206 cfm	Net AVF	22 cfm
Net air change rate	0 ach	Net air change rate	0 ach

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Room Name	Level Factor	Htg load (Btuh)	Clg load (Btuh)	Htg AVF (cfm)	Clg AVF (cfm)
KIT/DIN/FAM	0.30	4610	84	56	15
UTILITY/STORAGE	0.50	1501	0	18	0
NANNY SUITE	0.50	1992	2	24	0
PANTRY	0.30	224	1	3	0
STUDY	0.30	1061	25	13	4
BAR/REC ROOM	0.50	6290	8	77	1
BATH/SAUNA	0.50	781	0	10	0
MUD ROOM	0.30	443	3	5	1
POWDER	0.30	0	0	0	0
BASEMENT/FIRST F	0	16901	123	206	22

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Project Information

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Design Conditions

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Wall shielding	Very heavy shielding
Storeys	2.0 (w/o basement)
Highest ceiling height (ft)	24.0
Foundation	Full

Air Leakage

Air tightness Present (1961-) (ACH=3.57)

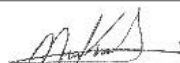
Flues

Shielding	Heavy shielding			
	#1	#2	#3	#4
Diameter (in)	0	0	0	0

Summary

Heating		Cooling	
Infiltration area	1817 ft ²	Infiltration area	1817 ft ²
Infiltration volume	16178 ft ³	Infiltration volume	16178 ft ³
Unadjusted air change rate	0.191 ach	Unadjusted air change rate	0.079 ach
Unadjusted AVF	51 cfm	Unadjusted AVF	21 cfm
Vent adjustment	0 cfm	Vent adjustment	0 cfm
Net AVF	51 cfm	Net AVF	21 cfm
Net air change rate	0 ach	Net air change rate	0 ach

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Room Name	Level Factor	Htg load (Btuh)	Clg load (Btuh)	Htg AVF (cfm)	Clg AVF (cfm)
MASTER BEDROOM	0.20	1563	60	19	11
MASTER ENSUITE	0.20	248	2	3	0
BEDROOM 4	0.20	402	6	5	1
BEDROOM 2	0.20	729	22	9	4
BEDROOM 3	0.20	545	12	7	2
BATH	0.20	234	7	3	1
ENSUITE	0.20	228	8	3	1
UTILITY	0.20	15	0	0	0
HALL	0.20	166	2	2	0
LAUNDRY	0.20	95	0	1	0
SECOND F.	0	4225	120	51	21

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Heat loss and gain calculation summary sheet

CSA-F280-M12
Standard Form No. 1

These documents issued for the use of **Ontario HVAC Design** and may not be used by any other persons without authorization. Documents for permit and/or construction are signed in red.

Project no.
HVAC - 901

Building location

Model:	Site:
Address: 35 Botfield Ave	Lot:
City and Province: Toronto ON	Postal code:

Calculations based on

Dimensional information based on:			
Attachment: Detached	Front facing: South	Assumed? No	
Number of storeys: 2 + basement	Air tightness: Present (1961-) (ACH=3.57)	Assumed? Yes	
Weather location: Toronto City Centre, ON, CA	Ventilated: Included	Wind exposure: Very heavy shielding	
HRV? (multiple)	Internal shading: (none)	Occupants: 5	
Recovery %: 75 %	Units: Imperial (I-P)		

Heating design conditions

Cooling design conditions

Outdoor temp: -4 °F	Indoor temp: 72 °F	Mean soil temp: 0 °F	Outdoor temp: 80 °F	Indoor temp: 75 °F	Latitude: 44 °N	S'Trange: 12 °F
---------------------	--------------------	----------------------	---------------------	--------------------	-----------------	-----------------

Above grade walls

Below grade walls

Style A: n,e,s,w - W-R22 (Frm wall, brk 4" ext, 1/2" wood shth, r-22 cav ins, 1/2" gypsum board int fns, 2"x6" wood frm, 16" p.c. stud)	Style A: BCIB_1: Bsmnt, 7 ft BG, conc fndatn, wall R-21.12, full R-11.13 blw flr
Style B:	Style B:
Style C:	Style C:
Style D:	Style D:

Floors on soil

Ceilings

Style A: BCIB_1: Bsmnt, 7 ft BG, conc fndatn, wall R-21.12, full R-11.13 blw flr HLR=3783 Btuh	Style A: R60 (Attic ceiling, asphalt shingles roof mat, r-60 ceil ins, 1/2" gypsum board int fns)
Style B:	Style B:
	Style C:

Exposed floors

Doors

Style A: R31 Exposed Floor (Flr floor, frm flr, 12" thkns, r-31 cav ins, amb ovr)	Style A: e,s - 23B0 (Door, wd sc type, wd strm)
Style B:	Style B:

Windows

Skylights

Style A: n,e,s,w - Nw28 (2 glazing, clr low-e outr, argon gas, vnl frm mat, clr innr, 1/4" gap, 1/8" thk; 67" head ht)	Style C:
Style B:	
Style C:	Style A:
Style D:	Style B:

Attached documents:

Notes:

Calculations performed by

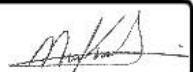
Name:	Murat Karadag
Company:	Ontario HVAC Design
Address:	2099 BATES COMMON
City and Province:	BURLINGTON ON
Postal code:	L7R 0A5
Telephone:	905-818-9523
Fax:	
E-mail:	info@hvacdsgn.ca

Ontario
HVAC Design

HRAI cert.#: (Loads,Ducts)

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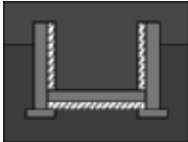
Cert.#: (RHLG, RASD)

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Project Information

For:
35 Botfield Ave, Toronto, ON

Weather Station	
Province Region	ON Toronto City Centre
Foundation Dimensions	
Floor length (ft)	40.8
Floor width (ft)	7.2
Exposed perimeter (ft)	55.0
Wall height (ft)	9.0
Depth below grade (ft)	7.0
Window area (ft ²)	9.3
Door area (ft ²)	0
Radiant Slab	
Heated fraction	0
Design Months	
Heating month	1
Foundation Loads	
Heating load (Btuh)	3783

Site	
Soil conductivity	Normal - dry sand, loam, clay
Water table	Normal (23-33 ft)
Insulation Configuration	
Configuration	BCIB_1
Int wall insul (ft ² -°F/Btuh)	21.12
Slab insul (ft ² -°F/Btuh)	11.13
	
<ul style="list-style-type: none"> - concrete walls and floor - interior surface of wall insulated over full-height - sub-surface of floor slab fully insulated but no insulation under footings - any first storey construction type 	

Load Allocation

Room	Exposed perimeter (ft)	Heating load (Btuh)
UTILITY/STORAGE	24.5	1685
NANNY SUITE	30.5	2098

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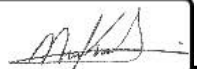
	Heating	Cooling
External static pressure	0.50 in H2O	0.50 in H2O
Pressure losses	0.22 in H2O	0.22 in H2O
Available static pressure	0.28 in H2O	0.28 in H2O
Supply / return available pressure	0.139 / 0.141 in H2O	0.139 / 0.141 in H2O
Lowest friction rate	0.071 in/100ft	0.071 in/100ft
Actual air flow	1074 cfm	1074 cfm
Total effective length (TEL)	393 ft	

Supply Branch Detail Table

Name	Design (Btuh)	Htg (cfm)	Clg (cfm)	Design FR	Diam (in)	H x W (in)	Duct Matl	Actual Ln (ft)	Ftg.Eqv Ln (ft)	Trunk
BAR/REC ROOM	h 2854	67	16	0.087	6.0	0x0	ShMt	51.0	110.0	st18
BAR/REC ROOM-A	h 2854	67	16	0.073	6.0	0x0	ShMt	41.5	150.0	st19
BAR/REC ROOM-B	h 2854	67	16	0.073	6.0	0x0	ShMt	67.0	125.0	st19A
BAR/REC ROOM-C	h 2854	67	16	0.080	6.0	0x0	ShMt	55.0	120.0	st19
BAR/REC ROOM-D	h 2854	67	16	0.089	6.0	0x0	ShMt	56.0	100.0	st19
BATH/SAUNA	h 1772	42	26	0.075	5.0	0x0	ShMt	45.0	140.0	st19
KIT/DIN/FAM	c 1013	46	75	0.089	6.0	0x0	ShMt	27.5	130.0	st3
KIT/DIN/FAM-A	c 1013	46	75	0.132	5.0	0x0	ShMt	5.7	100.0	st3
KIT/DIN/FAM-B	c 1013	46	75	0.083	6.0	0x0	ShMt	58.5	110.0	st19B
KIT/DIN/FAM-C	c 1013	46	75	0.096	6.0	0x0	ShMt	35.0	110.0	st3
KIT/DIN/FAM-E	c 1013	46	75	0.092	6.0	0x0	ShMt	46.0	105.0	st18A
KIT/DIN/FAM-F	c 1013	46	75	0.077	6.0	0x0	ShMt	56.0	125.0	st18A
KIT/DIN/FAM-G	c 1013	46	75	0.088	6.0	0x0	ShMt	58.5	100.0	st18
KIT/DIN/FAM-H	c 1013	46	75	0.085	6.0	0x0	ShMt	45.0	120.0	st18
MUD ROOM	c 590	35	43	0.137	5.0	0x0	ShMt	12.0	90.0	st3
NANNY SUITE	h 2260	53	28	0.114	5.0	0x0	ShMt	22.0	100.0	st3
NANNY SUITE-A	h 2260	53	28	0.091	5.0	0x0	ShMt	33.0	120.0	st3
PANTRY	c 439	18	32	0.079	5.0	0x0	ShMt	47.0	130.0	st19
POWDER	c 326	0	24	0.179	5.0	0x0	ShMt	8.0	70.0	st3
STUDY	c 880	28	65	0.077	6.0	0x0	ShMt	65.5	115.0	st19A
STUDY-A	c 880	28	65	0.071	6.0	0x0	ShMt	70.5	125.0	st19A
STUDY-B	c 880	28	65	0.080	6.0	0x0	ShMt	65.0	110.0	st19
UTILITY/STORAGE	h 3405	80	25	0.117	6.0	0x0	ShMt	9.5	110.0	st3

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Supply Trunk Detail Table

Name	Trunk Type	Htg (cfm)	Clg (cfm)	Design FR	Veloc (fpm)	Diam (in)	H x W (in)	Duct Material	Trunk
st19A	Peak AVF	170	219	0.071	494	8.4	8 x 8	ShtMetl	st19
st19B	Peak AVF	46	75	0.083	168	5.4	8 x 8	ShtMetl	st19A
st19	Peak AVF	461	389	0.071	592	11.0	8 x 14	ShtMetl	st3
st18	Peak AVF	252	314	0.077	564	9.4	8 x 10	ShtMetl	st3
st3	Peak AVF	1074	1074	0.071	744	15.1	8 x 26	ShtMetl	
st18A	Peak AVF	92	149	0.077	335	7.1	8 x 8	ShtMetl	st18

Return Branch Detail Table

Name	Grille Size (in)	Htg (cfm)	Clg (cfm)	TEL (ft)	Design FR	Veloc (fpm)	Diam (in)	H x W (in)	Stud/Joist Opening (in)	Duct Matl	Trunk
rb7	0x0	362	207	172.5	0.081	382	9.8	3-3.25x14	3-10x27	SJSp	rt2A
rb5	0x0	131	269	197.0	0.071	425	9.0	2-3.25x14	2-10x18	SJSp	rt2B
rb6	0x0	312	514	113.5	0.124	543	10.3	3-3.25x14	3-10x27	SJSp	rt2
rb8	0x0	269	84	157.5	0.089	425	8.6	2-3.25x14	2-10x18	SJSp	rt2

Return Trunk Detail Table

Name	Trunk Type	Htg (cfm)	Clg (cfm)	Design FR	Veloc (fpm)	Diam (in)	H x W (in)	Duct Material	Trunk
rt2A	Peak AVF	493	476	0.071	628	12.0	0 x 0	ShtMetl	rt2
rt2B	Peak AVF	131	269	0.071	608	9.0	0 x 0	ShtMetl	rt2A
rt2	Peak AVF	1074	1074	0.071	608	18.0	0 x 0	ShtMetl	

The undersigned has reviewed and takes responsibility for this design, and has all qualifications and meets the requirements set out in the Ontario Building Code to be a designer. This design is valid for one year from date of stamp

Ontario BCIN 110207
HVAC Design BCIN 123326



Cert.#: (RHLG, RASD)

2099 BATES COMMON, BURLINGTON, ON L7R 0A5 Phone: 905-818-9523 Email: info@hvacdsgn.ca Web: www.hvacdsgn.ca License: 110207

Project Information

For: 35 Botfield Ave, Toronto, ON

	Heating	Cooling
External static pressure	0.50 in H2O	0.50 in H2O
Pressure losses	0.22 in H2O	0.22 in H2O
Available static pressure	0.28 in H2O	0.28 in H2O
Supply / return available pressure	0.166 / 0.114 in H2O	0.166 / 0.114 in H2O
Lowest friction rate	0.104 in/100ft	0.104 in/100ft
Actual air flow	722 cfm	722 cfm
Total effective length (TEL)		269 ft

Supply Branch Detail Table

Name	Design (Btuh)	Htg (cfm)	Clg (cfm)	Design FR	Diam (in)	H x W (in)	Duct Matl	Actual Ln (ft)	Ftg.Eqv Ln (ft)	Trunk	
BATH	c	1067	45	50	0.143	5.0	0x0	ShMt	26.0	90.0	st1
BEDROOM 2	h	1820	63	61	0.160	5.0	0x0	ShMt	19.0	85.0	st1A
BEDROOM 2-A	h	1820	63	61	0.129	5.0	0x0	ShMt	24.4	105.0	st1A
BEDROOM 3	h	1434	50	43	0.105	5.0	0x0	ShMt	37.9	120.0	st1
BEDROOM 3-A	h	1434	50	43	0.115	5.0	0x0	ShMt	34.2	110.0	st1
BEDROOM 4	h	1068	37	29	0.139	3.8	8x5	ShMt	39.5	80.0	st2
BEDROOM 4-A	h	1068	37	29	0.104	5.0	0x0	ShMt	29.5	130.0	st2
ENSUITE	c	1123	42	52	0.166	5.0	0x0	ShMt	20.0	80.0	st1
LAUNDRY	c	547	20	26	0.167	3.2	8x5	ShMt	9.5	90.0	st2
MASTER BEDROOM	c	1613	68	75	0.123	6.0	0x0	ShMt	40.1	95.0	st2A
MASTER BEDROOM-A	c	1613	68	75	0.119	6.0	0x0	ShMt	35.0	105.0	st2A
MASTER BEDROOM-B	c	1613	68	75	0.121	6.0	0x0	ShMt	47.9	90.0	st2
MASTER BEDROOM-C	c	1613	68	75	0.126	5.0	0x0	ShMt	42.5	90.0	st2
MASTER ENSUITE	h	1250	44	25	0.133	5.0	0x0	ShMt	25.5	100.0	st2

Supply Trunk Detail Table

Name	Trunk Type	Htg (cfm)	Clg (cfm)	Design FR	Veloc (fpm)	Diam (in)	H x W (in)	Duct Material	Trunk
st1	Peak AVF	313	311	0.105	563	8.8	8 x 10	ShtMetl	
st1A	Peak AVF	127	122	0.129	285	6.1	8 x 8	ShtMetl	st1
st2	Peak AVF	409	411	0.104	740	9.8	8 x 10	ShtMetl	
st2A	Peak AVF	136	151	0.119	339	6.6	8 x 8	ShtMetl	st2

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Return Branch Detail Table

Name	Grille Size (in)	Htg (cfm)	Clg (cfm)	TEL (ft)	Design FR	Veloc (fpm)	Diam (in)	H x W (in)	Stud/Joist Opening (in)	Duct Matl	Trunk
rb4	0x0	407	395	101.5	0.112	611	9.6	8x 12		ShMt	rt1
rb2	0x0	315	327	109.0	0.104	588	9.0	8x 10		ShMt	rt1A

Return Trunk Detail Table

Name	Trunk Type	Htg (cfm)	Clg (cfm)	Design FR	Veloc (fpm)	Diam (in)	H x W (in)	Duct Material	Trunk
rt1	Peak AVF	722	722	0.104	650	12.1	8 x 20	ShtMetl	
rt1A	Peak AVF	315	327	0.104	588	9.0	8 x 10	ShtMetl	rt1

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