

431' 10"

B: 12X8

A: 18X8

Z: 26X8

C: 12X8

D: 8X8

Notes:

- Furnace to have ECM motor
- Hot Water Tank Minimum 0.8 EF
- Heat and Cool loads calculated using CAN/CSA F280
- HRV: RNC Lifebreath 155 or Equivalent 75% SRE

(Or Equivalent Furnace)

SB-12 Package A1

	Nom	Act		Nom	Act
Ceil.w Attic	60	59.22	Bsmt wall	20ci	21.12
Ceil.w/o Attic	31	27.65	Windows		R3.57
Exp.Floor	31	29.8	Skylights		
Walls	24	17.03	Furn Eff		96%
ECM Motor	Yes		HRV Eff		75%

Heat Loss: 49708 BTU

Heat Gain: 25558 BTU

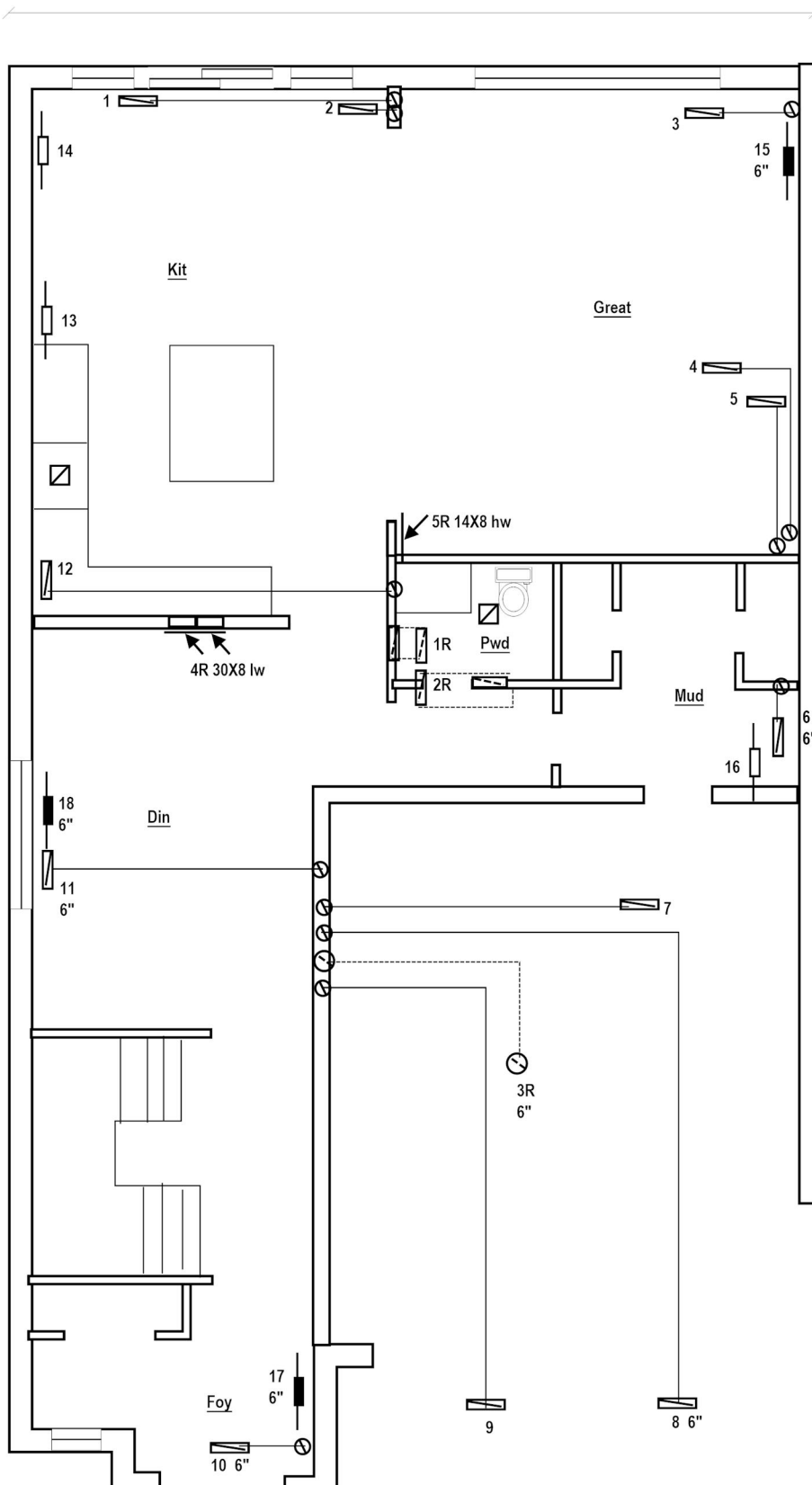
3002 SF

Make	UNIT	DATA
Goodman	Model	GMEC96060
Input	60000	BTU
Output	57600	BTU
Cooling	2.5	Tons
Fan	920	Cfm
No. of Runs	S/A	R/A
2nd Floor	11	3
1st Floor	10	2
Basement	5	1

I have reviewed and take responsibility for this design and am qualified as an "other designer" as described by the OBC Div.C, Part 3, ss 3.2.5 in relation to HVAC design.

Alexis Dearie-Vonk
Alexis Dearie-Vonk 27098 3986
BCIN HRAI

Type	4004 Henry	NewRes
Floor	Basement	HVAC Design
Scale	3/16"=1'0"	9 Hurontario st Orangeville On L9W 1Y8
Date	Mar-18	Phone (416) 320-5870
Revised		Client
		Esquire
		LO#
		9180



Make		UNIT DATA Model		I have reviewed and take responsibility for this design and am qualified as an "other designer" as described by the OBC Div.C, Part 3, ss 3.2.5 in relation to HVAC design. <i>Alexis Dearie-Vonk</i> Alexis Dearie-Vonk 27098 3986 BCIN HRAI	Type	4004 Henry	NewRes HVAC Design 9 Hurontario st Orangeville On L9W 1Y8 Phone (416) 320-5870
Input		Output			Floor	First	
Cooling		Fan			Scale	3/16"=1'0"	
Tons		Cfm			Date	Mar-18	Client
No. of Runs	S/A	R/A			Revised		LO#
2nd Floor					9180		
1st Floor							
Basement							

The floor plan illustrates a 10-unit apartment building with the following details:

- Unit 1 (Top Left):** Labeled "Mas", featuring a bathroom with a toilet and a shower area.
- Unit 2 (Top Right):** Labeled "Ens", featuring a bathroom with a toilet and a shower area.
- Unit 3 (Middle Left):** Labeled "Ens2", featuring a bathroom with a toilet and a shower area.
- Unit 4 (Middle Right):** Labeled "WIC", featuring a kitchen area with a sink and a shower area.
- Unit 5 (Bottom Left):** Labeled "Br4", featuring a bedroom with a bed and a shower area.
- Unit 6 (Bottom Right):** Labeled "Br2", featuring a bedroom with a bed and a shower area.
- Unit 7 (Bottom Center):** Labeled "Bath", featuring a bathroom with a toilet and a shower area.
- Unit 8 (Bottom Right):** Labeled "Br3", featuring a bedroom with a bed and a shower area.
- Unit 9 (Bottom Left):** Labeled "Laun", featuring a laundry room with a sink and a shower area.
- Unit 10 (Bottom Center):** Labeled "Br1", featuring a bedroom with a bed and a shower area.

Dimensions and other features include:

- Unit 1: 12' 6" (width), 10' 6" (depth).
- Unit 2: 12' 6" (width), 10' 6" (depth).
- Unit 3: 12' 6" (width), 10' 6" (depth).
- Unit 4: 12' 6" (width), 10' 6" (depth).
- Unit 5: 12' 6" (width), 10' 6" (depth).
- Unit 6: 12' 6" (width), 10' 6" (depth).
- Unit 7: 12' 6" (width), 10' 6" (depth).
- Unit 8: 12' 6" (width), 10' 6" (depth).
- Unit 9: 12' 6" (width), 10' 6" (depth).
- Unit 10: 12' 6" (width), 10' 6" (depth).

Make		UNIT DATA Model		I have reviewed and take responsibility for this design and am qualified as an "other designer" as described by the OBC Div.C, Part 3, ss 3.2.5 in relation to HVAC design. <i>Alexis Dearie-Vonk</i> Alexis Dearie-Vonk 27098 3986 BCIN HRAI	Type	4004 Henry		NewRes HVAC Design 9 Hurontario st Orangeville On L9W 1Y8 Phone (416) 320-5870	
Input		BTU	Output		BTU	Floor	Second		
Cooling		Tons	Fan		Cfm	Scale	3/16"=1'0"		
No. of Runs	S/A		R/A		Date	Mar-18			
2nd Floor					Client	Esquire			
1st Floor					Revised	LO#		9180	
Basement									

MECHANICAL VENTILATION DESIGN SUMMARY RESIDENTIAL

Housetype 4004 Henry

File # 9180

Builder Esquire
Address
City
Phone

Heat Loss Due to Mechanical Ventilation
PVC X DTDh X 1.08 X (1-E)= 1970 BTU
Heat Gain Due to Mechanical Ventilation
PVC X DTDc X 1.08= 950 BTU

Combustion Appliances
☒ a) Direct Vent (sealed combust) including fireplaces
☐ b) Positive venting induced draft (exclude fireplace)
☐ c) Natural Draft, B vent or induced draft fireplaces
☐ d) Solid Fuel
☐ e) No Combustion Appliances

Total Ventilation Capacity

Bsmt & Master	2	21.2 cfm	42.4
Other Bed	3	10.6 cfm	31.8
Bath & Kitchen	5	10.6 cfm	53
Other Rooms	5	10.6 cfm	53
Room Count cfm			180.2

Heating System
☒ Forced Air
☐ Non Forced Air
☐ Electric Space Heat

Housetype
☒ I - Type a or b appliances only, no solid fuel
☐ II - Type I with solid fuel (including fireplace)
☐ III - Type C appliance
☐ IV - Type I or II with electric space heat
☐ Other - Type I,II,or IV no forced air

Supplemental Ventilation Capacity

TVC room or air change (which larger)	180
Less Principal Exhaust Capacity (HRV)	80
Required Supp.Vent Capacity CFM	100

System Design Option
☒ Exhaust Only/Forced air system
☒ HRV Simplified Connection to Forced Air System
☐ HRV with ducting to forced air system
☐ HRV fully ducted/ not coupled with forced air sys.
☐ Part 6 design CSA F326-M91
☒ Part 9 9.32.3.1

Supplemental Fans

Location	cfm	Model	Pipe
Ens	50	Broan ZB80M	5"
Pwd	50	Broan ZB80M	5"
Bath	50	Broan ZB80M	5"
Ens2	50	Broan ZB80M	5"

all fans HVI listed

HRV-Principal Ventilation

Model		
RNC Lifebreath 155		
37.5 L/S		80 cfm
ASE		84

Designer Certification

I have reviewed and take responsibility for this design and am qualified as an "other designer" as required by the OBC 3.2.5 as it relates to residential HVAC design

Alexis Dearie-Vonk *Alexis Dearie-Vonk*

BCIN# 27098 HRAI# 3986

NEWRES HVAC DESIGN

9 Hurontario St
Orangeville Ont
L9W 1Y8
416-320-5870

Heat Loss Calculation

Heat loss ΔT 76 f Heat Gain ΔT 11 f Bsmt ΔT 62 f

I have reviewed and take responsibility for this design & am
qualified as an "other designer" as required by the OBC 3.2.5
as it relates to residential HVAC design.
Alexis Dearie-Vonk BCIN# 27098 HRAI# 3986

Alexis Dearie-Vonk

Customer Esquire
Housetype 4004 Henry
File # 9180
Date Mar-18
Township Ajax

	Eff	Mas		Ens		WIC		Br2		Bath		Br3		Laun		Br4		Ens2		Kit		Great		Mud/Pwd		Foy		Din												Bsmt		
	Fac	Act	Loss	Act	Loss	Act	Loss	Act	Loss	Act	Loss	Act	Loss	Act	Loss	Act	Loss	Act	Loss	Act	Loss	Act	Loss	Act	Loss	Act	Loss	Act	Loss	Act	Loss	Act	Loss	Act	Loss	Act	Loss	Act	Loss	Act	Loss	
Width	17.0	18		13		13		15		15		17		12		11		11		15		16		16		12		12													35	
Length		16		10		7		12		6		15		15		14		7		21		18		7		15		16													36	
Area		288		130		91		180		90		255		180		154		77		315		288		112		180		192													1260	
Height		8		8		8		8		8		10		10		8		8		9		9		9		9		9													8	
LinFtWall		34		23		7		12		6		32		30		14		7		36		34		23		38		24													172	
Gr.Wall		272		184		56		96		48		320		300		112		56		324		306		207		342		216														
Net Wall		240	1071	152	678	56	250	80	357	48	214	272	1214	242	1080	96	428	48	214	258	1151	252	1125	207	924	304	1357	186	830													
Windows																																										
E,W		32	681	24	511							48	1022	38	809					66	1405	54	1150			38	809														8	170
S														20	426	16	341	8	170									30	639												4	85
N				8	170			16	341																															4	85	
Skylight	3.57																																									
Door	4																						42	798	22	418																
Ceiling	59.2	288	370	130	167	91	117	180	231	90	116	255	327	180	231	154	198	77	99																							
Cold Flr	29.8									90	230	255	650																													
Header	17.0																			36	148	34	140	23	94	38	156	24	99											172	707	
HL bgcr																																									5309	
SlabHLbgcr																																										
People/App		1					1				1		2		1				3		1																					
HL agcr			2122		1526		367		929		559		3213		2546		967		483		2704		2414		1816		2740		1567													
HL airr		2	581	2	418	2	100	2	254	2	153	2	880	2	697	2	265	2	132	1	1256	1	661	1	844	1	1273	1	728												8704	
HL dr										90	71	255	409																													
Tot.Rm.Loss BTU		2703		1944		467		1183		784		4503		3243		1231		616		3961		3075		2660		4013		2295												15060		

HL airb=

36151 X 0.018 X 76 X 0.3520

5102 W

BasementHLR

1556 W X 3.41

17408 BTU

5309 BTU

Total Structure Heat Loss

47738

Mech.Vent Loss

1970

TOTAL HEAT LOSS BTU

49708

HLairr Multipliers

2nd BTU (0.2)	12712	0.27
1st BTU (0.3)	11241	0.46
Bsmt BTU (0.5)	6356	1.37

All Calculations based on CAN/CSAF280 and HRAI Digest Standards

NEWRES HVAC DESIGN

9 Hurontario street
Orangeville Ont
L9W 1Y8
416-320-5870

Heat Gain Calculation

Heat loss ΔT 76 f Heat Gain ΔT 11 f Bsmt ΔT 62 f

I have reviewed and take responsibility for this design & am
qualified as an "other designer" as required by the OBC 3.2.5
as it relates to residential HVAC design.

Alexis Dearie-Vonk BCIN# 27098 HRAI# 3986

Alexis Dearie-Vonk

Customer

Esquire

Housetype

4004 Henry

File #

9180

Date

Mar-18

Township

Ajax

	Fac	Mas		Ens		WIC		Br2		Bath		Br3		Laun		Br4		Ens2		Kit		Great		Mud/Pwd		Foy		Din										Bsmt		
		Act	Gain	Act	Gain	Act	Gain	Act	Gain	Act	Gain	Act	Gain	Act	Gain	Act	Gain	Act	Gain	Act	Gain	Act	Gain	Act	Gain	Act	Gain	Act	Gain	Act	Gain	Act	Gain	Act	Gain	Act	Gain	Act	Gain	
Width	17.03	18		13		13		15		15		17		12		11		11		15		16		16		12		12											35	
Length		16		10		7		12		6		15		15		14		7		21		18		7		15		16										36		
Area		288		130		91		180		90		255		180		154		77		315		288		112		180		192											1260	
Height		8		8		8		8		8		10		10		8		8		9		9		9		9		9											8	
LinFtWall		34		23		7		12		6		32		30		14		7		36		34		23		38		24											172	
Gr.Wall		272		184		56		96		48		320		300		112		56		324		306		207		342		216												
Net Wall		240	56	152	36	56	13	80	19	48	11	272	64	242	57	96	23	48	11	258	61	252	59	207	49	304	71	186	44											
Windows																																								
E,W		27	32	875	24	656							48	1312	38	1039					66	1804	54	1476			38	1039											8	219
S		18												20	363	16	291	8	145									30	545										4	73
N		11			8	87			16	174																													4	44
Skylight	49																																							
Door	4																						42	42	22	22														
Ceiling	59.22	288	374	130	169	91	118	180	234	90	117	255	332	180	234	154	200	77	100																					
Cold Flr	29.8									90	1	255	3																											
Header	17.03																			36	8	34	7	23	5	38	8	24	5								172	37		
HG svr			97		71		10		32		10		128		126		38		19		140		115		7		85		44										28	
HG dr											1		617																											
Total Cond			1306		948		131		427		129		1710		1693		514		257		1873		1543		96		1140		594										372	
Air Leak.			60		44		6		20		6		79		78		24		12		86		71		4		53		27										17	
Peop/App		1	240					1	240				1	240	2	800	1	240			3	1800	1	1200																
HG sr		1703		1062		147		719		146		2774		2698		816		300		3899		2929		107		1278		666											417	

HG salb= 36150.5 X 0.018 X 11 X 0.082 172 W 587 BTU

Mech. Vent Gain 950 BTU HG cb 12733 BTU

All Calculations based on CAN/CSAF280 and HRAI Digest Standards

Total Structure Heat Gain 19660

Latent Load Multiplier 1.3

Total Heat Gain BTU 25558

NEWRES HVAC DESIGN
9 Hurontario street
Orangeville Ont
L9W 1Y8
416-320-5870

Duct Calculation

I have reviewed and take responsibility for this
design & am qualified as an "other designer"
as required by the OBC 3.2.5 as it relates to
residential HVAC design. Alexis Dearie-Vonk
Alexis Dearie-Vonk BCIN# 27098 HRAI# 3986

Customer Esquire
Housetype 4004 Henry
File # 9180
Date Mar-18
Township Ajax

Trunk	D			C				B							A															
Outlet #	10	17	22	9	8	7	11	1	3	2	14	15	19	13	20	4	5	12	21	6	16	18								
Outlet Loc	Laun	Foy	Bsmt	Br3	Br3	Bath	Br4	Mas	Ens	Mas	Kit	Great	Bsmt	Kit	Bsmt	Ens	WIC	Ens2	Bsmt	Br2	Mud	Din								
BTU/RM	3243	4013	15060	4503	4503	784	1231	2703	1944	2703	3961	3075	15060	3961	15060	1944	467	616	15060	1183	2660	2295								
# Out/Rm	1	1	4	2	2	1	1	2	2	2	2	1	4	2	4	2	1	1	4	1	1	1								
CFM/Outlet	62	77	73	43	43	15	24	26	19	26	38	59	73	38	73	19	9	12	73	23	51	44								
Act&Eff Len	145	160	160	150	170	180	190	155	170	180	190	195	200	205	200	155	170	180	185	195	200	205								
Adj.Press	0.09	0.08	0.08	0.09	0.08	0.07	0.07	0.08	0.08	0.07	0.07	0.07	0.07	0.06	0.07	0.08	0.08	0.07	0.07	0.07	0.07	0.06								
Pipe Size	6	6	6	5	5	5	5	5	5	5	5	5	6	5	6	5	5	5	6	5	5	5								
Tr.Fl.Rate			212				338								352							582								
TrunkWidth			8				12								12							18								
Tr.Height			8				8								8							8								
Velocity			478				507								527							582								

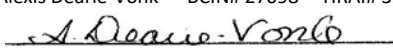
Trunk	Z									
Inlet #	5R	6R	4R	1R	2R	3R				
CFM	140	90	320	140	140	90				
Inlet Size	14X8	6"	30X8	14X8	14X8	6"				
Act&Eff Len	235	205	200	185	170	150				
Adj.Press.	0.05	0.05	0.06	0.06	0.06	0.06				
Tr.Fl.Rate						920				
Tr.Width						26				
Tr.Height						8				
Velocity						637				

Equipment	
Manufacturer	Goodman
Furnace	GMEC96060
Output	57600
AirFlow	920
AC Size	2.5

Supply Air Pres	0.15
S.Air Plenum Pres	0.14
Diffuser Loss	0.01
System Static	0.5

Return Air Pres	0.15
R.Air Plenum Pres	0.11
Diffuser Loss	0.04

Required equipment capacity based on CAN/CSA-F280 standards
All Calculations based on CAN/CSAF280 and HRAI Digest Standards

Heat Loss & Gain Calculation Summary Sheet						CSA-F280-M12	
These documents issued for the use of						Esquire	
and may not be used by any other person without authorization. Documents for permit and/or construction are signed in red						Project #	
Building Location							
Model:	4004 Henry				Site:		
Address:					Lot:		
City:	Ajax				Postal Code:		
Calculations Based On							
Dimensional Info. Based on:				Hunt Design			
Attachment:	Detached			Front Face:	East	Assumed?	Yes
# of Stories:	2+Bsm't			Air Tight:	Very Tight	Assumed?	Yes
Weath Loc:	Ajax	Ventilated?	Yes	Wind Exp:	Partial Shade		
HRV?	Yes			Int.Shade:	Yes	Occupants:	5
Recovery %	75			Unit:	Imperial		
Heating Design Conditions				Cooling Design Conditions			
Out Temp:	-20	Ind.Temp:	22	Soil Temp:	10	Out Temp:	30
						Ind.Temp:	24 Lat:43.85 ST ran:10
Above Grade Walls				Below Grade Walls			
Style A:	R22 Nominal			Style A:	R20ci Nominal		
Style B:	(R 17.03 Actual)			Style B:	(R21.12 Actual)		
Style C:				Style C:			
Style D:				Style D:			
Floors on Soil				Ceilings			
Style A:				Style A:	R60 Nominal		
Style B:				Style B:	(R59.22 Actual)		
Exposed Floors				Style C:	(R27.65 Actual Ceiling with no attic)		
Style A:	R31 Nominal			Doors			
Style B:	(R29.8 Actual)			Style A:	Assumed Insulated		
Windows				Style B:			
Style A:	U 0.28			Style C:			
Style B:	(R 3.57 Actual)			Skylights			
Style C:				Style A:	U 0.49		
Style D:				Style B:	(R 2.04 Actual)		
Att.Docs:							
Notes:	96% Furnace; Min 0.8EF HWT						
Calculations Performed By				I have reviewed and take responsibility for this design & am			
Name:	Alexis Dearie-Vonk			qualified as an "other designer" as required by the OBC 3.2.5			
Company:	New Res Hvac Design			as it relates to residential HVAC design.			
Address:	9 Hurontario Street			Alexis Dearie-Vonk BCIN# 27098 HRAI# 3986			
City:	Orangeville ON						
Postal Code:	L9W 1Y8						
Phone:	416-320-5870						
Email:	alexis_dearie@hotmail.com						

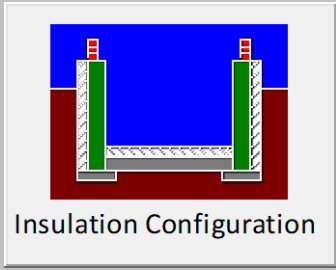
Envelope Air Leakage Calculator

Supplemental tool for CAN/CSA-F280

Weather Station Description				
Province:	Ontario ▼			
Region:	Atx ▼			
Weather Station Location:	Open flat terrain, grass ▼			
Anemometer height (m):	10			
Local Shielding				
Building Site:	Suburban forest ▼			
Walls:	Urban ▼			
Flue:	Hwy ▼			
Highest Ceiling Height (m):	8.2			
Building Configuration				
Type:	Detached ▼			
Number of Stories:	Two ▼			
Foundation:	Full ▼			
House Volume (m ³):	1026			
Air Leakage/Ventilation				
Air Tightness Type:	Present (1961-) (ACH=3.57) ▼			
Custom BDT Data:	ELA @ 10 Pa. ▼ 1128.4 cm ² 3.57 ACH @ 50 Pa			
Mechanical Ventilation (L/s):	Total Supply:	Total Exhaust:		
	37.5	37.5		
Flue Size				
Flue #:	#1	#2	#3	#4
Diameter (mm):	0	0	0	0
Envelope Air Leakage Rate				
Heating Air Leakage Rate (ACH/H):		0.352		
Cooling Air Leakage Rate (ACH/H):		0.082		

Residential Foundation Thermal Load Calculator

Supplemental tool for CAN/CSA-F280

Weather Station Description		
Province:	Ontario	▼
Region:	Ajax	▼
Site Description		
Soil Conductivity:	Normal conductivity: dry sand, loam, clay	▼
Water Table:	Normal (7-10 m, 23-33 Ft)	▼
Foundation Dimensions		
Floor Length (m):	9.4	 Insulation Configuration
Floor Width (m):	17.4	
Exposed Perimeter (m):	53.6	
Wall Height (m):	2.5	
Depth Below Grade (m):	1.9	
Window Area (m ²):	1.1	
Door Area (m ²):	0	
Radiant Slab		
Heated Fraction of the Slab:	0	
Fluid Temperature (°C):	33	
Design Months		
Heating Month	1	
Foundation Loads		
Heating Load (Watts):		1556