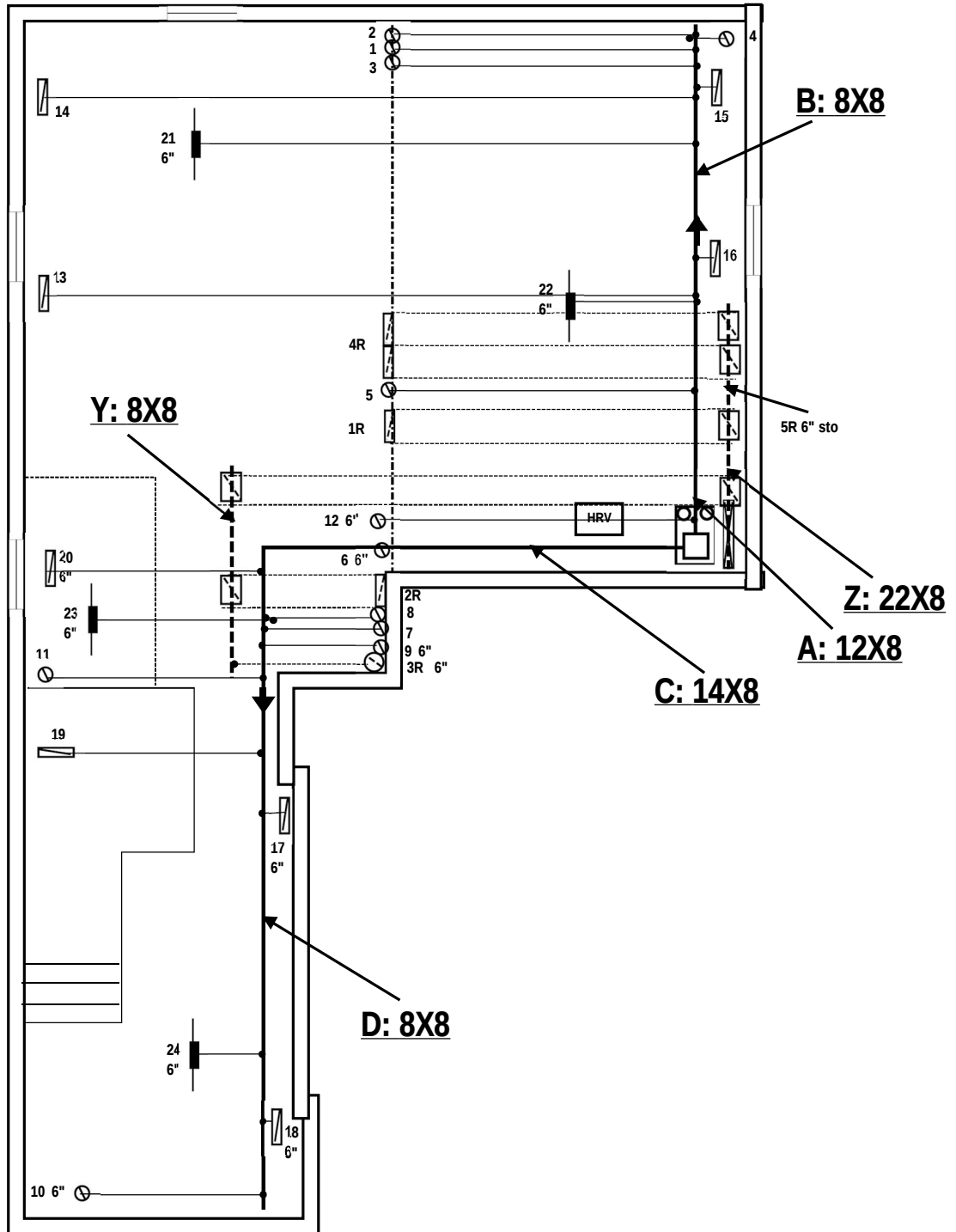


31' 10"



Notes:

- Furnace to have ECM motor
- Hot Water Tank Minimum 0.8EF
- Heat and Cool loads calculated using CAN/CSAF280
- 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
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: 46804 BTU
Heat Gain: 24230 BTU

2675 SF

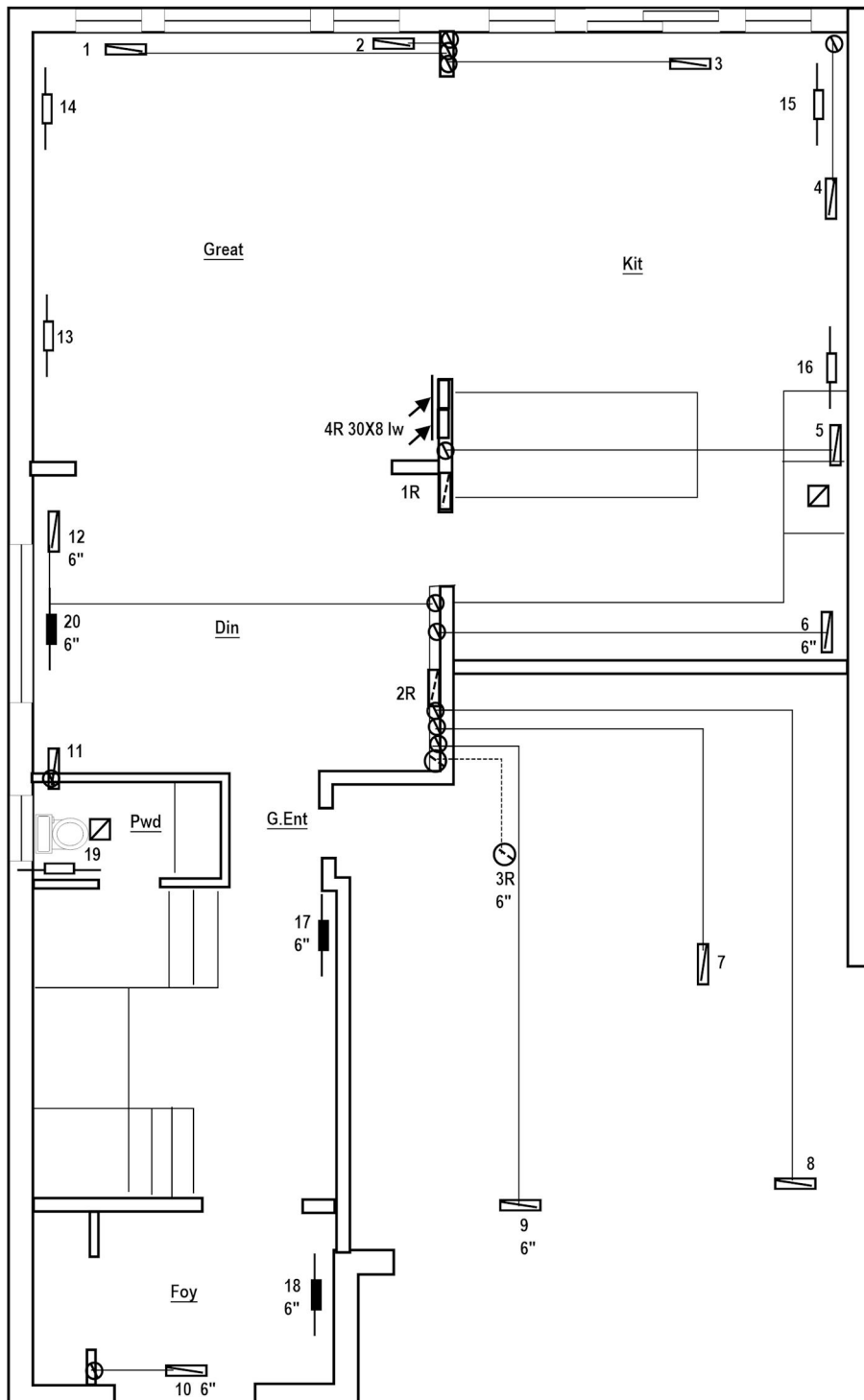
UNIT DATA			
Make	Goodman	Model	GMEC96060
Input	60000 BTU	Output	57600 BTU
Cooling	2 Tons	Fan	785 Cfm
No. of Runs	S/A	R/A	
2nd Floor	12	3	
1st Floor	8	2	
Basement	4	1	

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

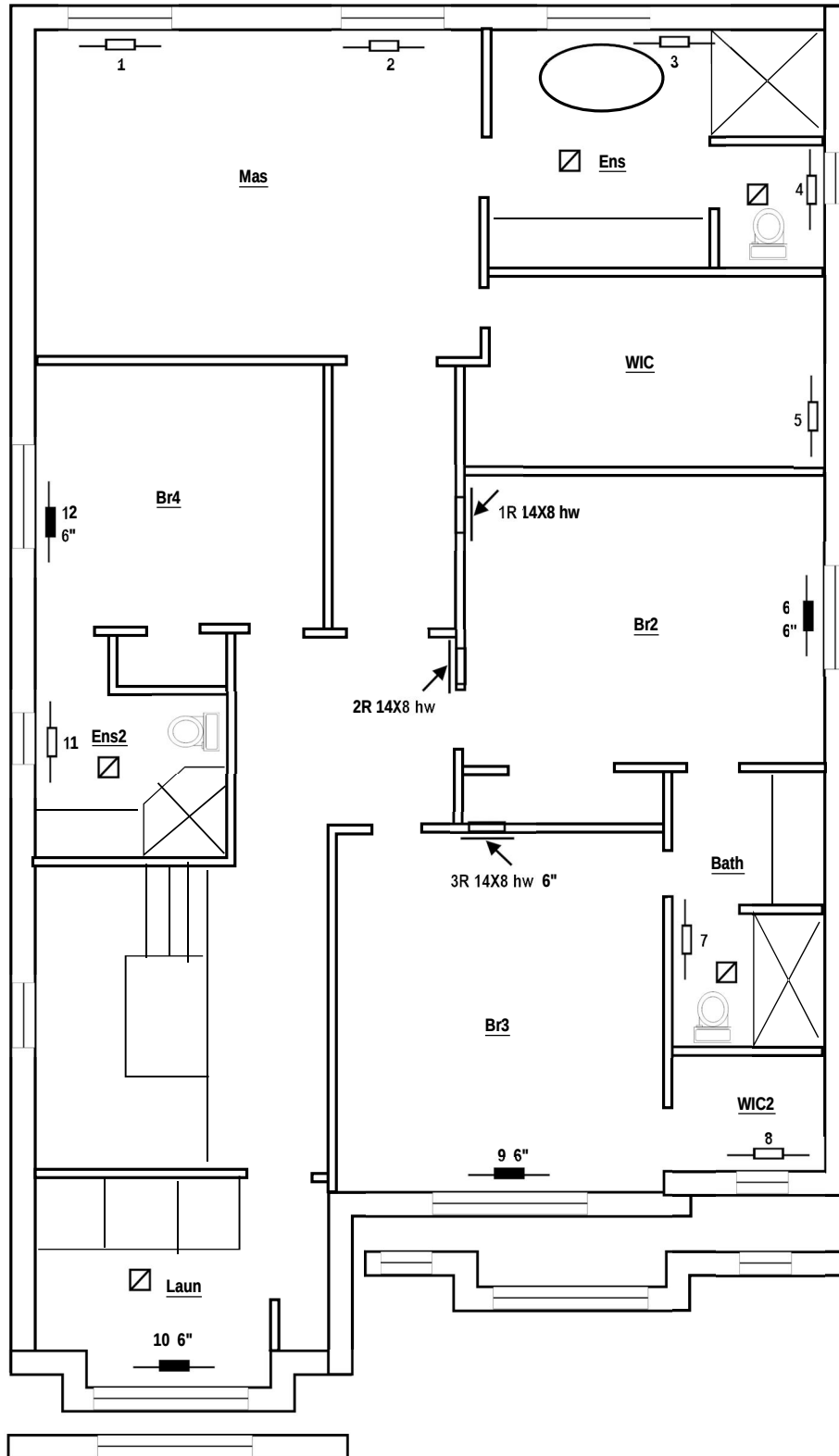
Alexis Dearie-Vonk 27098 3986
BCIN HRAI

Type	4002 Charles	NewRes HVAC Design 9 Hurontario st Orangeville On L9W 1Y8 Phone (416) 320-5870
Floor	Basement	
Scale	3/16"=1'0"	
Date	Mar-18	Client
Revised		LO#
		9178



Make		UNIT DATA		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	4002 Charles	NewRes HVAC Design 9 Hurontario st Orangeville On L9W 1Y8 Phone (416) 320-5870
Input		BTU	Output		Floor	First	
Cooling		Tons	Fan		Scale	3/16"=1'0"	
No. of Runs	S/A	R/A	Cfm		Date	Mar-18	Client
2nd Floor					Revised		Esquire
1st Floor							LO#
Basement							9178

31' 10"



All runs 5" unless otherwise specified

Make		UNIT DATA		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. <u>Alexis Dearie-Vonk</u> Alexis Dearie-Vonk 27098 3986 BCIN HRAI	Type	4002 Charles	NewRes HVAC Design 9 Hurontario st Orangeville On L9W 1Y8 Phone (416) 320-5870	
Input		Model			Floor	Second		
Cooling		Output			Scale	3/16"=1'0"		
Tons		Fan			Date	Mar-18		
No. of Runs		S/A			Revised		Client	Esquire
2nd Floor								
1st Floor								
Basement							LO#	9178

MECHANICAL VENTILATION DESIGN SUMMARY RESIDENTIAL

Housetype 4002 Charles

File # 9178

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	4	10.6 cfm	42.4
Room Count cfm			169.6

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)	170
Less Principal Exhaust Capacity (HRV)	80
Required Supp.Vent Capacity CFM	90

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 4002 Charles
File # 9178
Date Mar-18
Township Ajax

	Eff	Mas		Ens		WIC		Br2		Bath		WIC2		Br3		Laun		Ens2		Br4		Great		Kit		Foy		Pwd/Gent		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		14		7		7		13		12		12		12		16		15		13		13		16											34	
Length		13		8		7		12		10		5		16		20		8		10		17		24		17		4		12										34		
Area		234		104		91		168		70		35		208		240		96		120		272		360		221		52		192										1156		
Height		8		8		8		8		8		8		8		12		8		8		9		9		9		9		9										8		
LinFtWall		32		21		7		12		10		12		14		36		8		10		33		53		47		8		16										164		
Gr.Wall		256		168		56		96		80		96		112		432		64		80		297		477		423		72		144												
Net Wall		224	1000	146	652	56	250	80	357	80	357	86	384	82	366	384	1714	56	250	64	286	239	1067	411	1834	395	1763	64	286	114	509											
Windows																																										
E,W		32	681	14	298								10	213	30	639	38	809					58	1235	66	1405	28	596												4	85	
S																10	213	8	170	16	341						8	170	30	639										8	170	
N			8	170			16	341																															4	85		
Skylight	3.57																																									
Door	4																								32	608	21	399														
Ceiling	59.2	234	300	104	133	91	117	168	216	70	90	35	45	208	267	240	308	96	123	120	154																					
Cold Flr	29.8						40	102	70	179	35	89	208	530																												
Header	17.0																					33	136	53	218	47	193	8	33	16	66								164	674		
HL bgcr																																									4883	
SlabHLbgcr																																										
People/App		1					1						1		2				1		1		3																			
HL agcr			1981		1253		367		1015		625		731		1802		3044		543		780		2437		3457		3160		888		1213											
HL airr		2	506	2	320	2	94	2	259	2	160	2	187	2	460	2	778	2	139	2	199	1	623	1	1442	1	1318	1	370	1	506										7755	
HL dr							40	127	70	79	35	92	208	226																												
Tot.Rm.Loss BTU		2487		1574		460		1402		864		1009		2489		3821		682		980		3059		4899		4478		1258		1719										13652		

HL airb= 32487 X 0.018 X 76 X 0.3490 4546 W 15510 BTU 4883 BTU

BasementHLR 1431 W X 3.41

Total Structure Heat Loss 44834

Mech.Vent Loss 1970

TOTAL HEAT LOSS BTU 46804

HLairr Multipliers

2nd BTU (0.2)	12142	0.26
1st BTU (0.3)	11155	0.42
Bsmt BTU (0.5)	5897	1.32

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 4002 Charles
File # 9178
Date Mar-18
Township Ajax

	Fac	Mas		Ens		WIC		Br2		Bath		WIC2		Br3		Laun		Ens2		Br4		Great		Kit		Foy		Pwd/Gent		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	Act	Gain	
Width	17.03	18		13		13		14		7		7		13		12		12		12		16		15		13		13		16											34	
Length		13		8		7		12		10		5		16		20		8		10		17		24		17		4		12										34		
Area		234		104		91		168		70		35		208		240		96		120		272		360		221		52		192										1156		
Height		8		8		8		8		8		8		8		12		8		8		9		9		9		9		9										8		
LinFtWall		32		21		7		12		10		12		14		36		8		10		33		53		47		8		16										164		
Gr.Wall		256		168		56		96		80		96		112		432		64		80		297		477		423		72		144												
Net Wall		224	53	146	34	56	13	80	19	80	19	86	20	82	19	384	90	56	13	64	15	239	56	411	97	395	93	64	15	114	27											
Windows																																										
E,W		27	32	875	14	383						10	273	30	820	38	1039					58	1586	66	1804	28	765													4	109	
S		18														10	182	8	145	16	291						8	145	30	545										8	145	
N		11			8	87			16	174																														4	44	
Skylight	49																																									
Door	4																								32	32	21	21														
Ceiling	59.22	234	304	104	135	91	118	168	218	70	91	35	46	208	270	240	312	96	125	120	156																					
Cold Flr	29.8							40	0	70	1	35	0	208	2																											
Header	17.03																				33	7	53	11	47	10	8	2	16	3								164	35			
HG svr			98		51		11		33		9		27		89		130		23		37		132		153		72		15		46									27		
HG dr								332				76		489																												
Total Cond			1232		639		131		412		111		339		1112		1623		283		462		1649		1912		900		183		575									334		
Air Leak.			54		28		6		18		5		15		49		71		12		20		72		84		39		8		25									15		
Peop/App		1	240					1	240						1	240	2	800			1	240	1	1000	3	1600																
HG sr		1624		718		148		1035		124		457		1978		2623		331		759		2853		3749		1012		206		647										375		

HG salb= 32487 X 0.018 X 11 X 0.081 153 W 521 BTU
Mech. Vent Gain 950 BTU HG cb 11898 BTU
All Calculations based on CAN/CSAF280 and HRAI Digest Standards

Total Structure Heat Gain 18639
Latent Load Multiplier 1.3
Total Heat Gain BTU 24230

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 4002 Charles
File # 9178
Date Mar-18
Township Ajax

Trunk	D					C							B							A												
Outlet #	10	18	24	17	19	11	9	7	8	23	20	6	4	2	1	3	15	14	21	16	13	22	5	12								
Outlet Loc	Laun	Foy	Bsmt	wd/G.Er	wd/G.Er	Ens2	Br3	Bath	WIC2	Bsmt	Din	Br2	Ens	Mas	Mas	Ens	Kit	Great	Bsmt	Kit	Great	Bsmt	WIC	Br4								
BTU/RM	3821	4478	13652	1258	1258	682	2489	864	1009	13652	1719	1402	1574	2487	2487	1574	4899	3059	13652	4899	3059	13652	460	980								
# Out/Rm	1	1	4	2	2	1	1	1	1	4	1	1	2	2	2	2	2	2	4	2	2	4	1	1								
CFM/Outlet	67	78	60	11	11	12	44	15	18	60	30	25	14	22	22	14	43	27	60	43	27	60	8	17								
Act&Eff Len	145	155	170	170	180	155	180	195	195	190	200	210	145	165	175	180	180	190	195	145	150	160	170	185								
Adj.Press	0.09	0.08	0.08	0.08	0.07	0.08	0.07	0.07	0.07	0.07	0.07	0.06	0.09	0.08	0.07	0.07	0.07	0.07	0.07	0.09	0.09	0.08	0.08	0.07								
Pipe Size	6	6	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5								
Tr.Fl.Rate					227							430							201					355								
TrunkWidth					8							14							8					12								
Tr.Height					8							8							8					8								
Velocity					511							553							451					533								

Trunk	Y		Z							
Inlet #	3R	2R	4R	5R	1R					
CFM	90	140	325	90	140					
Inlet Size	6"	14X8	30X8	6"	14X8					
Act&Eff Len	185	180	200	190	170					
Adj.Press.	0.06	0.06	0.06	0.06	0.06					
Tr.Fl.Rate		230			785					
Tr.Width		8			22					
Tr.Height		8			8					
Velocity		518			642					

Equipment	
Manufacturer	Goodman
Furnace	GMEC96060
Output	57600
AirFlow	785
AC Size	2

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		Project #
and may not be used by any other person without authorization. Documents for permit and/or construction are signed in red							
Building Location							
Model:	4002 Charles Ajax				Site:		
Address:					Lot:		
City:					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 (R 17.03 Actual)			Style A:	R20ci Nominal (R21.12 Actual)		
Style B:							
Style C:							
Style D:							
Floors on Soil				Ceilings			
Style A:				Style A:	R60 Nominal (R59.22 Actual) (R27.65 Actual Ceiling with no attic)		
Style B:							
Exposed Floors				Style C:			
Style A:	R31 Nominal (R29.8 Actual)			Doors			
Style B:							
Windows				Style A:	Assumed Insulated		
Style A:	U 0.28 (R 3.57 Actual)			Style B:			
Style B:							
Style C:							
Style D:				Skylights			
				Style A:	U 0.49 (R 2.04 Actual)		
				Style B:			
Att.Docs:							
Notes:				96% Furnace; Min 0.8EF HWT			
Calculations Performed By				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 			
Name:	Alexis Dearie-Vonk						
Company:	New Res Hvac Design						
Address:	9 Hurontario Street						
City:	Orangeville ON						
Postal Code:	L9W 1Y8						
Phone:	416-320-5870						
Email:	alexis_dearie@hotmail.com						

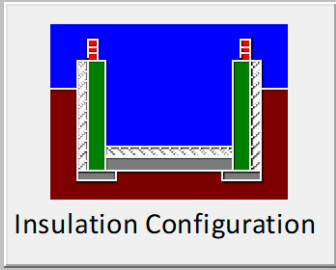
Envelope Air Leakage Calculator

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):	8.1			
Building Configuration				
Type:	Detached ▼			
Number of Stories:	Two ▼			
Foundation:	Full ▼			
House Volume (m ³):	919			
Air Leakage/Ventilation				
Air Tightness Type:	Present (1961-) (ACH=3.57) ▼			
Custom BDT Data:	ELA @ 10 Pa. ▼ 1162.6 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):		0.349		
Cooling Air Leakage Rate (ACH/H):		0.081		

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):	9.1	 Insulation Configuration
Floor Width (m):	15.8	
Exposed Perimeter (m):	49.8	
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):		1431