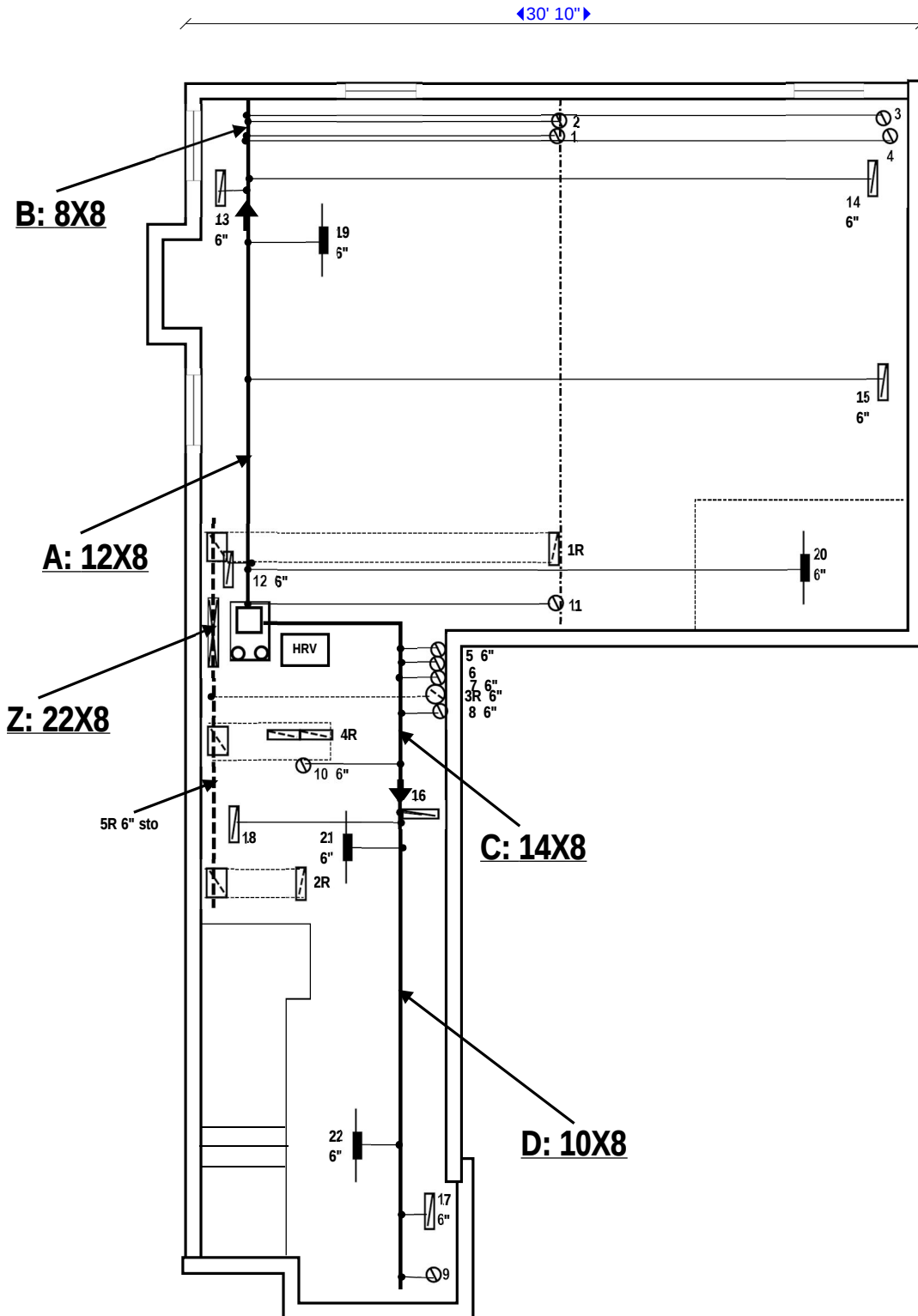




Notes:

- Furnace to have ECM motor
- Hot Water Tank Minimum 0.8EF
- 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	Bsm't 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: 44960 BTU

Heat Gain: 24607 BTU

2516 SF

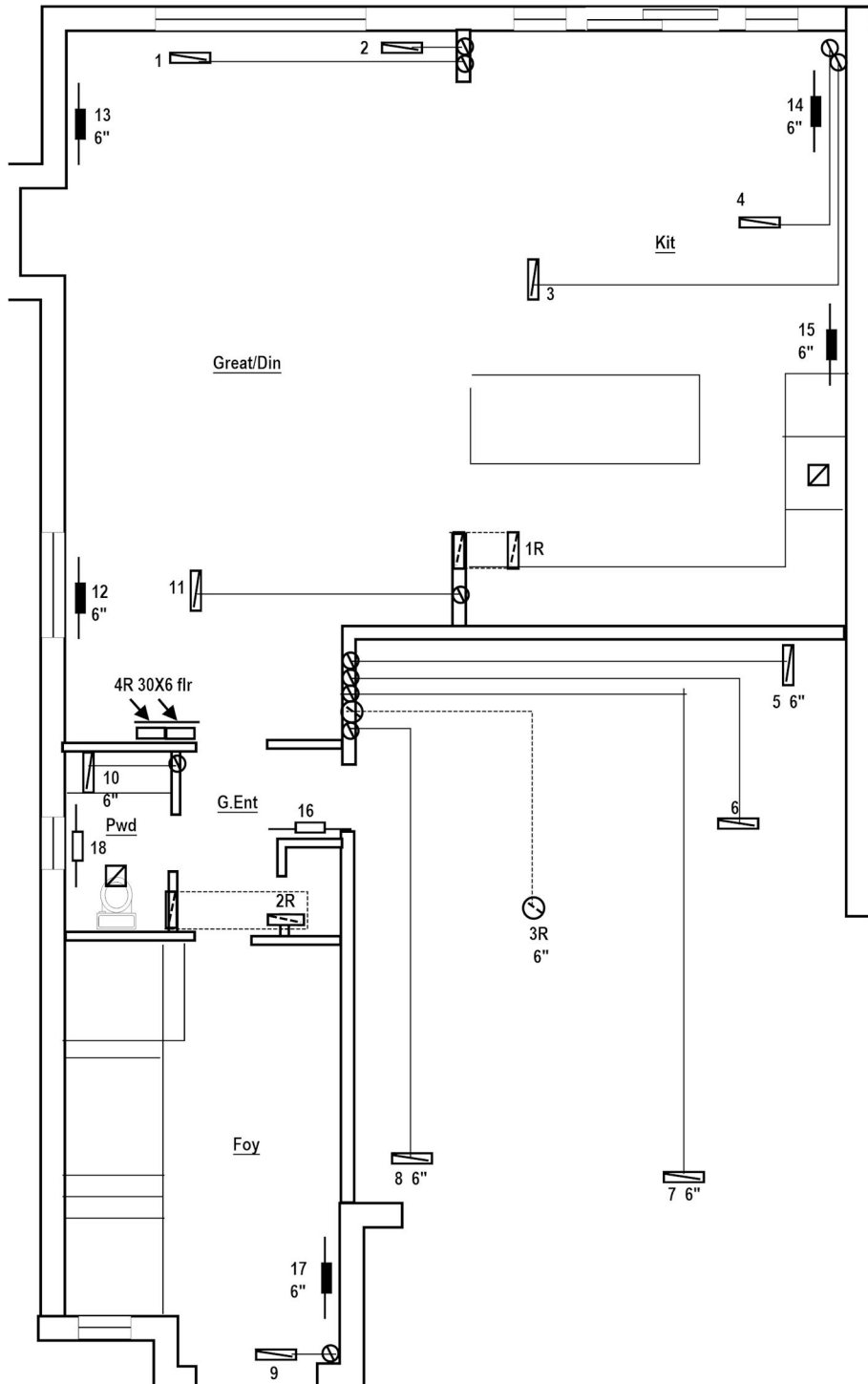
UNIT DATA			
Make	Goodman		Model
			GMEC96060
Input	60000	BTU	Output
			57600
Cooling	2	Tons	Fan
			785
			Cfm
No. of Runs		S/A	R/A
2nd Floor	11		3
1st Floor	7		1
Basement	4		1

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.

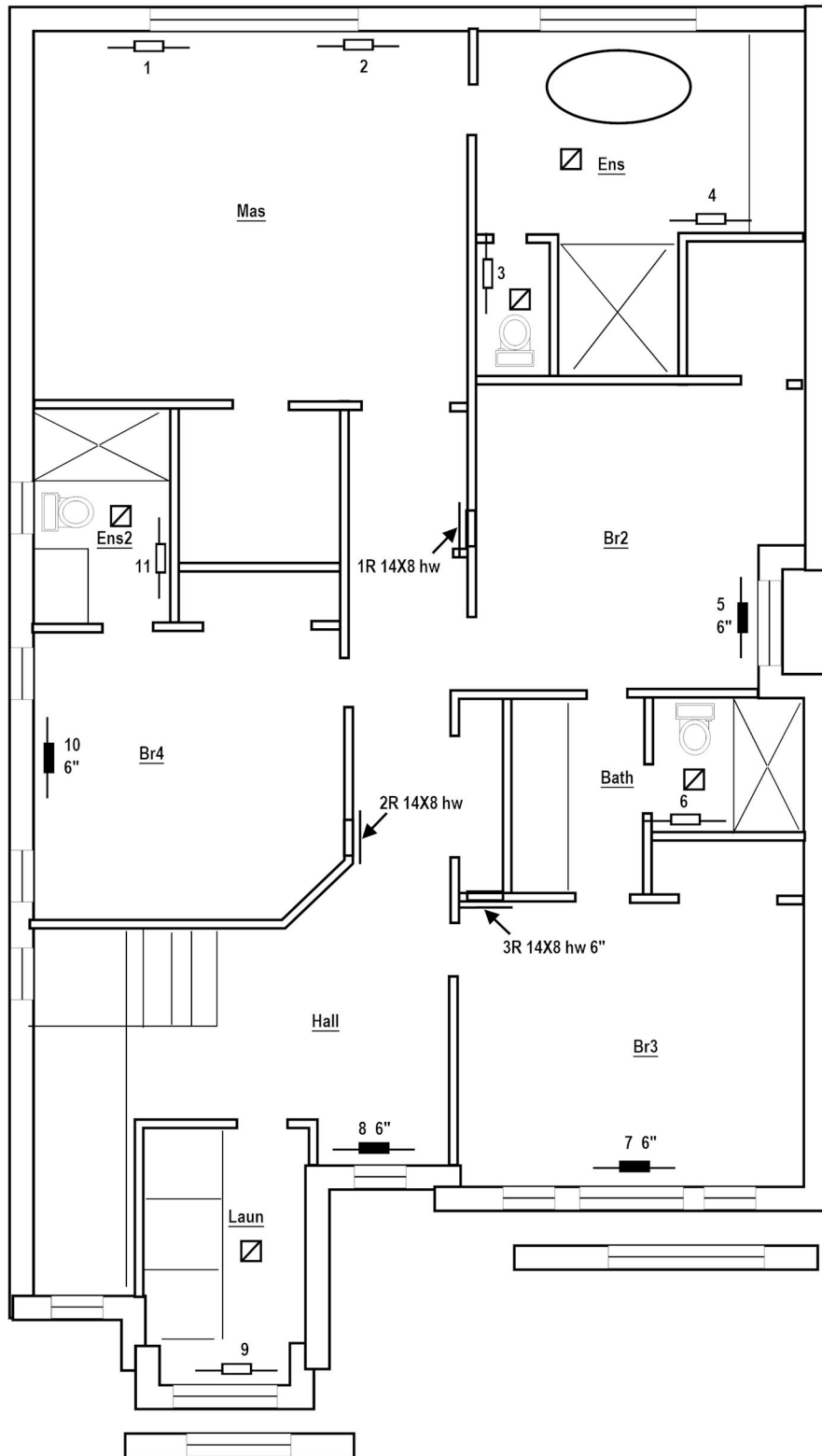
Alexis Dearie-Vonk

Alexis Dearie-Vonk 27098 3986
BCIN HRAI

Type	3702 Arthur	NewRes HVAC Design 9 Hurlantario st Orangeville On L9W 1Y8 Phone (416) 320-5870
Floor	Basement	
Scale	3/16"=1'0"	
Date	Mar-18	Client
Revised		LO#
		9172



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	3702 Arthur		NewRes HVAC Design 9 Hurontario st Orangeville On L9W 1Y8 Phone (416) 320-5870
Input		BTU			Floor	First		
Cooling		Fan			Scale	3/16"=1'0"		
Tons		Cfm			Date	Mar-18		
No. of Runs		S/A			R/A		Client	
2nd Floor							Esquire	
1st Floor							LO#	
Basement							9172	



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.	Type	3702 Arthur	NewRes HVAC Design 9 Hurontario st Orangeville On L9W 1Y8 Phone (416) 320-5870
	Model			Floor	Second	
Input	BTU	Output	BTU	Scale	3/16"=1'0"	Client
Cooling	Tons	Fan	Cfm	Date	Mar-18	
No. of Runs	S/A	R/A		Revised		LO#
2nd Floor			Alexis Dearie-Vonk			9172
1st Floor			27098 BCIN			
Basement			3986 HRAI			

MECHANICAL VENTILATION DESIGN SUMMARY RESIDENTIAL

Housetype 3702 Arthur

File # 9172

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

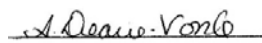
Housetype	
☒	I - Type a or b appliances only, no solid fuel
☐	II - Type I with solid fuel (including fireplace)
☐	III - Type C appliance
☐	IV - Type I or II with electric space heat
☐	Other - Type I,II,or IV no forced air

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	
BCIN# 27098	HRAI# 3986

NEWRES HVAC DESIGN

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

Heat Loss Calculation

Heat loss ^T 76 f Heat Gain ^T 11 f Bsmt ^T 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 3702 Arthur
File # 9172
Date Mar-18
Township Ajax

	Eff	Mas		Ens		Br2		Bath		Br3		Hall		Laun		Br4		Ens2		Great/Din		Kit		Foy/Pw/G														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	
Width	17.0	17		13		14		14		14		14		7		12		12		15		15		11															30	
Length		15		13		12		6		12		10		10		12		8		27		22		25														30		
Area		255		169		168		84		168		140		70		144		96		405		330		275															900	
Height		8		8		8		8		10		8		8		8		8		9		9		9															8	
LinFtWall		32		26		14		6		26		16		14		12		8		47		52		62															176	
Gr.Wall		256		208		112		48		260		128		112		96		64		423		468		558																
Net Wall		224	1000	186	830	96	428	48	214	222	991	88	393	86	384	80	357	56	250	353	1575	402	1794	522	2330															
Windows																																								
E,W		32	681	22	468					38	809	32	681	26	554					48	1022	66	1405	28	596														6	128
S												8	170			16	341	8	170	22	468			8	170														6	128
N						16	341																																	
Skylight	3.57																																							
Door	4																						32	608																
Ceiling	59.2	255	327	169	217	168	216	84	108	168	216	140	180	70	90	144	185	96	123																					
Cold Flr	29.8					60	153	84	214	168	428	40	102																											
Header	17.0																			47	193	52	214	62	255												176	723		
HL bgcr																																							5016	
SlabHLbgcr																																								
People/App		1				1				1				2		1				1		3																		
HL agcr			2008		1515		1138		536		2444		1526		1027		882		543		3259		3413		3959															
HL airr		2	504	2	380	2	286	2	135	2	614	2	383	2	258	2	222	2	136	1	1342	1	857	1	1630														7294	
HL dr						60	142	84	67	168	306	40	191																											
Tot.Rm.Loss BTU		2512		1896		1566		738		3363		2100		1285		1104		680		4600		4270		5588														13288		

HL airb=

30294 X 0.018 X 76 X 0.3520

4276 W

BasementHLR

1470 W X 3.41

14588 BTU

5016 BTU

Total Structure Heat Loss

42990

Mech.Vent Loss

1970

TOTAL HEAT LOSS BTU

44960

HLairr Multipliers

2nd BTU (0.2)	11620	0.25
1st BTU (0.3)	10630	0.41
Bsmt BTU (0.5)	5994	1.22

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 3702 Arthur
File # 9172
Date Mar-18
Township Ajax

	Fac	Mas		Ens		Br2		Bath		Br3		Hall		Laun		Br4		Ens2		Great/Din		Kit		Foy/Pw/G												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				
Width	17.03	17		13		14		14		14		14		7		12		12		15		15		11												30			
Length		15		13		12		6		12		10		10		12		8		27		22		25												30			
Area		255		169		168		84		168		140		70		144		96		405		330		275													900		
Height		8		8		8		8		10		8		8		8		8		9		9		9													8		
LinFtWall		32		26		14		6		26		16		14		12		8		47		52		62														176	
Gr.Wall		256		208		112		48		260		128		112		96		64		423		468		558															
Net Wall		224	53	186	44	96	23	48	11	222	52	88	21	86	20	80	19	56	13	353	83	402	94	522	123														
Windows																																							
E,W		27	32	875	22	601					38	1039	32	875	26	711					48	1312	66	1804	28	765											6	164	
S		18										8	145			16	291	8	145	22	400			8	145												6	109	
N		11					16	174																															
Skylight		49																																					
Door		4																					32	32															
Ceiling	59.22	255	332	169	220	168	218	84	109	168	218	140	182	70	91	144	187	96	125																				
Cold Flr	29.8					60	-2	84	-3	168	-6	40	-1																										
Header	17.03																			47	10	52	11	62	13											176	38		
HG svr			101		69		33		9		104		98		66		40		23		144		153		86												25		
HG dr							331		26				270																										
Total Cond			1259		865		413		118		1304		1222		822		497		283		1805		1910		1079												311		
Air Leak.			52		36		17		5		54		51		34		21		12		75		79		45												13		
Peop/App		1	240			1	240			1	240			2	800	1	240			1	1400	3	1800																
HG sr		1652		970		1035		158		1702		1640		1722		797		329		3424		3942		1210													349		

HG salb= 30294 X 0.018 X 11 X 0.082 144 W 492 BTU

Mech. Vent Gain 950 BTU HG cb 11887 BTU

All Calculations based on CAN/CSAF280 and HRAI Digest Standards

Total Structure Heat Gain 18929

Latent Load Multiplier 1.3

Total Heat Gain BTU 24607

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 3702 Arthur
File # 9172
Date Mar-18
Township Ajax

Trunk	D						C					B					A														
Outlet #	9	17	22	21	18	16	10	8	7	6	5	3	2	1	4	14	13	19	15	20	12	11									
Outlet Loc	Laun	oy/Pwd/	Bsmt	Bsmt	oy/Pwd/	oy/Pwd/	Br4	Hall	Br3	Bath	Br2	Ens	Mas	Mas	Ens	Kit	Great/Di	Bsmt	Kit	Bsmt	Great/Di	Ens2									
BTU/RM	1285	5588	13288	13288	5588	5588	1104	2100	3363	738	1566	1896	2512	2512	1896	4270	4600	13288	4270	13288	4600	680									
# Out/Rm	1	3	4	4	3	3	1	1	1	1	1	2	2	2	2	2	2	4	2	4	2	1									
CFM/Outlet	23	34	61	61	34	34	20	38	61	13	29	17	23	23	17	39	42	61	39	61	42	12									
Act&Eff Len	145	150	160	175	180	190	155	165	180	185	190	155	170	185	190	195	200	140	155	170	180	190									
Adj.Press	0.09	0.09	0.08	0.07	0.07	0.07	0.08	0.08	0.07	0.07	0.07	0.08	0.08	0.07	0.07	0.07	0.07	0.09	0.08	0.08	0.07	0.07									
Pipe Size	5	5	6	6	5	5	5	5	6	5	5	5	5	5	5	5	5	6	5	6	5	5									
Tr.Fl.Rate						247					409						161					376									
TrunkWidth						10					14						8					12									
Tr.Height						8					8						8					8									
Velocity						444					526						363					564									

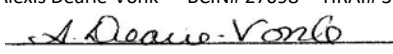
Trunk	Z									
Inlet #	2R	5R	1R	4R	3R					
CFM	140	90	140	325	90					
Inlet Size	14X8	6"	14X8	30X6	6"					
Act&Eff Len	230	205	200	175	160					
Adj.Press.	0.05	0.05	0.06	0.06	0.07					
Tr.Fl.Rate					785					
Tr.Width					22					
Tr.Height					8					
Velocity					642					

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	
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:	3702 Arthur				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						

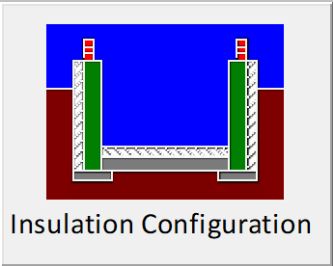
Envelope Air Leakage Calculator

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):	857			
Air Leakage/Ventilation				
Air Tightness Type:	Present (1961-) (ACH=3.57) ▼			
Custom BDT Data:	ELA @ 10 Pa. ▼ 1084.1 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):	9.1	 Insulation Configuration
Floor Width (m):	16.4	
Exposed Perimeter (m):	51	
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):		1470