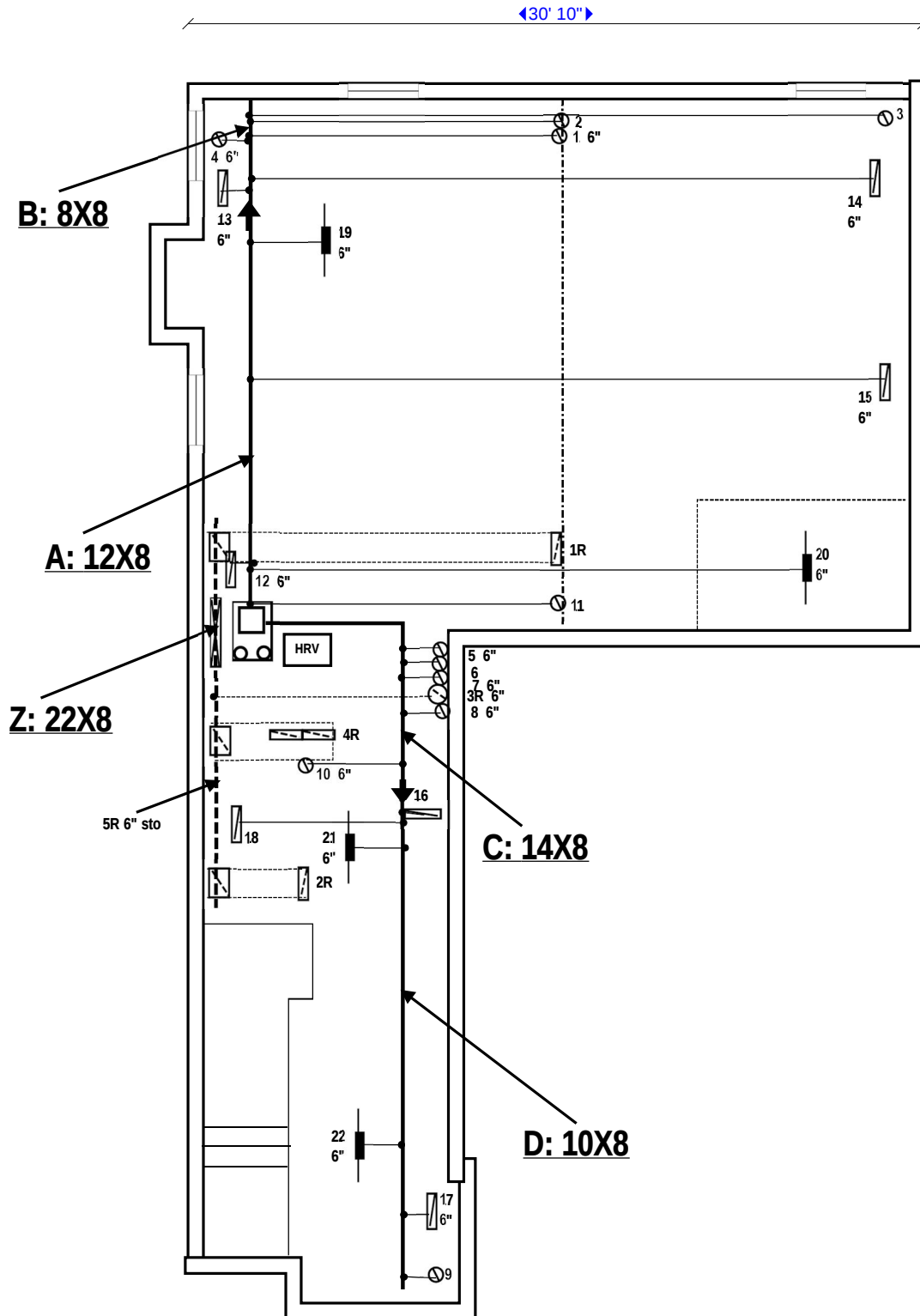




Notes:

- 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	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: 45524 BTU

Heat Gain: 25021 BTU

2516 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	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 Opt
Floor	Basement
Scale	3/16"=1'0"
Date	Mar-18
Revised	

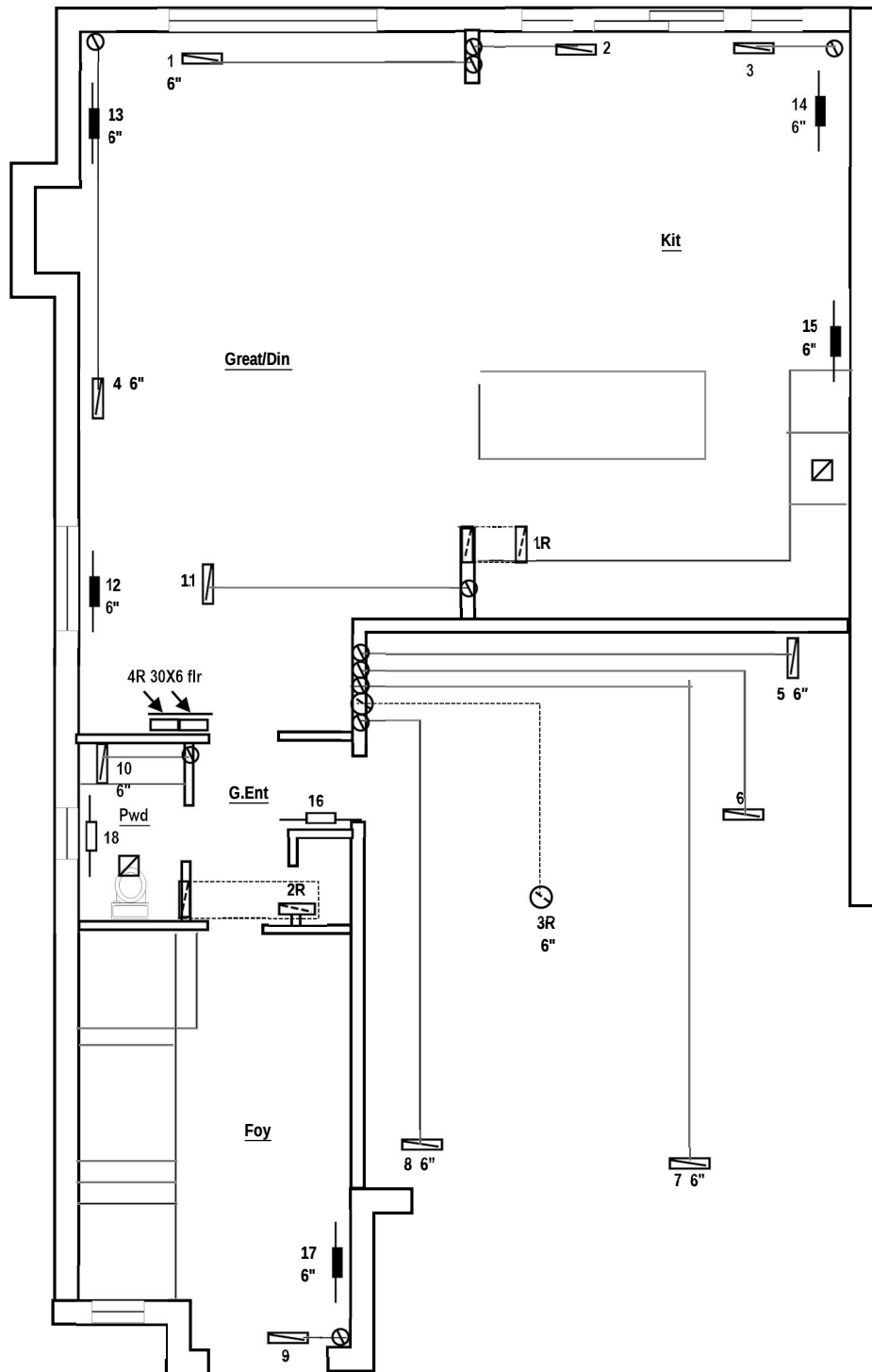
NewRes
HVAC Design

9 Hurontario st Orangeville On L9W 1Y8
Phone (416) 320-5870

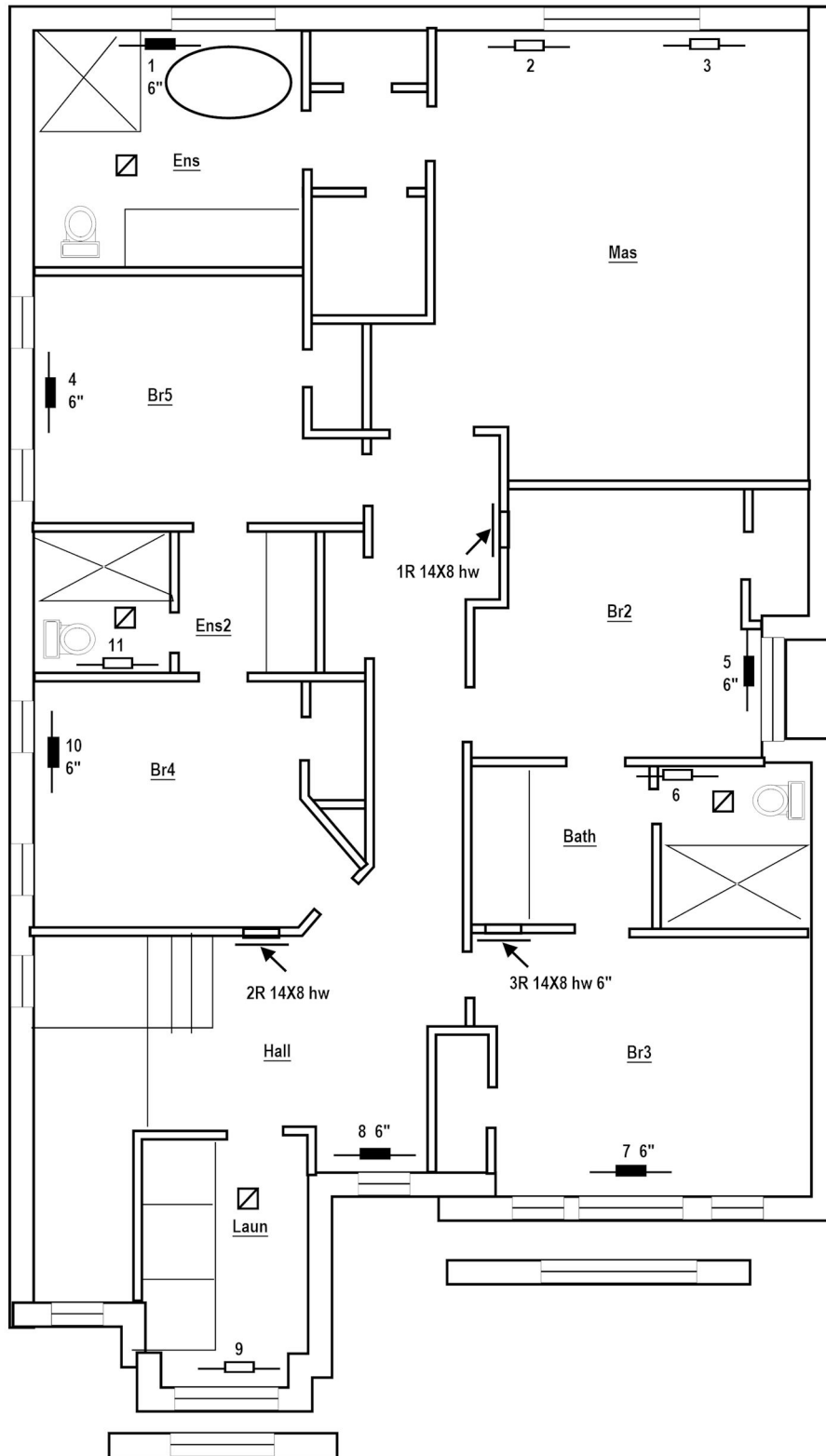
Client **Esquire**

LO# **9173**

30' 10"



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 Opt		NewRes HVAC Design 9 Hurontario st Orangeville On L9W 1Y8 Phone (416) 320-5870				
Input		BTU			Output	BTU			Floor	First		
Cooling		Tons			Fan		Cfm		Scale	3/16"=1'0"		
No. of Runs		S/A			R/A		Date	Mar-18		Client	Esquire	
2nd Floor							Revised		LO#		9173	
1st Floor												
Basement												



All runs 5" unless otherwise specified

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 Opt	NewRes HVAC Design 9 Hurontario st Orangeville On L9W 1Y8 Phone (416) 320-5870
Input		Output			Floor Second	
Cooling		Fan			Scale 3/16"=1'0"	
Tons		Cfm			Date Mar-18	Client Esquire
No. of Runs	S/A	R/A			Revised	LO# 9173
2nd Floor						
1st Floor						
Basement						

MECHANICAL VENTILATION DESIGN SUMMARY RESIDENTIAL

Housetype 3702 Arthur Opt

File # 9173

Builder	Esquire
Address	
City	
Phone	

Heat Loss Due to Mechanical Ventilation		
PVC X DTDh X 1.08 X (1-E)=	2339	BTU
Heat Gain Due to Mechanical Ventilation		
PVC X DTDc X 1.08=	1129	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	4	10.6 cfm	42.4
Bath & Kitchen	5	10.6 cfm	53
Other Rooms	4	10.6 cfm	42.4
Room Count cfm			180.2

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

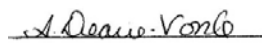
Housetype	
☒	I - Type a or b appliances only, no solid fuel
☐	II - Type I with solid fuel (including fireplace)
☐	III - Type C appliance
☐	IV - Type I or II with electric space heat
☐	Other - Type I,II,or IV no forced air

Supplemental Ventilation Capacity	
TVC room or air change (which larger)	180
Less Principal Exhaust Capacity (HRV)	95
Required Supp.Vent Capacity CFM	85

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	
45 L/S	95 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 Opt
File # 9173
Date Mar-18
Township Ajax

	Eff	Ens		Mas		Br2		Bath		Br3		Hall		Laun		Br4		Ens2		Great/Din		Kit		Foy/Pw/G		Br5												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	14		15		14		14		14		14		7		12		12		15		15		11		12													30	
Length		8		18		12		6		12		10		10		12		8		27		22		25		10												30		
Area		112		270		168		84		168		140		70		144		96		405		330		275		120													900	
Height		8		8		8		8		10		8		8		8		8		9		9		9		8													8	
LinFtWall		22		32		14		6		26		16		14		12		8		47		52		62		10													176	
Gr.Wall		176		256		112		48		260		128		112		96		64		423		468		558		80														
Net Wall		160	714	232	1035	96	428	48	214	222	991	88	393	86	384	80	357	64	286	353	1575	402	1794	522	2330	64	286													
Windows																																								
E,W		16	341	24	511					38	809	32	681	26	554					48	1022	66	1405	28	596														6	128
S												8	170			16	341			22	468			8	170	16	341												6	128
N						16	341																																	
Skylight	3.57																																							
Door	4																						32	608																
Ceiling	59.2	112	144	270	347	168	216	84	108	168	216	140	180	70	90	144	185	96	123						120	154														
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				1				2		1				1		3			1															
HL agcr			1198		1893		1138		536		2444		1526		1027		882		409		3259		3413		3959		780													
HL airr		2	295	2	467	2	281	2	132	2	603	2	376	2	253	2	218	2	101	1	1342	1	841	1	1630	2	192												7294	
HL dr						60	142	84	67	168	305	40	190																											
Tot.Rm.Loss BTU		1494		2359		1560		735		3351		2092		1280		1100		510		4600		4254		5588		973												13288		

HL airb=

30294 X 0.018 X 76 X 0.3520

4276 W

BasementHLR

1470 W

X 3.41

5016 BTU

Total Structure Heat Loss

43185

Mech.Vent Loss

2339

TOTAL HEAT LOSS BTU

45524

HLairr Multipliers

2nd BTU (0.2)	11833	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 Opt

File #

9173

Date

Mar-18

Township

Ajax

	Fac	Ens		Mas		Br2		Bath		Br3		Hall		Laun		Br4		Ens2		Great/Din		Kit		Foy/Pw/G		Br5										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	14		15		14		14		14		14		7		12		12		15		15		11		12										30	
Length		8		18		12		6		12		10		10		12		8		27		22		25		10									30		
Area		112		270		168		84		168		140		70		144		96		405		330		275		120									900		
Height		8		8		8		8		10		8		8		8		8		9		9		9		8									8		
LinFtWall		22		32		14		6		26		16		14		12		8		47		52		62		10									176		
Gr.Wall		176		256		112		48		260		128		112		96		64		423		468		558		80											
Net Wall		160	38	232	54	96	23	48	11	222	52	88	21	86	20	80	19	64	15	353	83	402	94	522	123	64	15										
Windows																																					
E,W		27	16	437	24	656					38	1039	32	875	26	711					48	1312	66	1804	28	765									6	164	
S		18										8	145			16	291			22	400			8	145	16	291								6	109	
N		11					16	174																													
Skylight		49																																			
Door		4																					32	32													
Ceiling	59.22	112	146	270	351	168	218	84	109	168	218	140	182	70	91	144	187	96	125						120	156											
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			60		102		40		11		125		117		79		48		13		173		183		104		44								30		
HG dr						338		28					290																								
Total Cond			621		1062		413		118		1304		1222		822		497		140		1805		1910		1079		462								311		
Air Leak.			26		44		17		5		55		51		34		21		6		75		80		45		19								13		
Peop/App		1	240	1		1	240			1	240			2	800	1	240			1	1400	3	1800			1	240										
HG sr		946		1208		1049		162		1723		1680		1735		805		165		3454		3973		1227		765									354		

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

Mech. Vent Gain 1129 BTU HG cb 11764 BTU

All Calculations based on CAN/CSAF280 and HRAI Digest Standards

Total Structure Heat Gain 19247

Latent Load Multiplier 1.3

Total Heat Gain BTU 25021

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 Opt
File # 9173
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	Mas	Mas	Ens	Br5	Kit	Great/Di	Bsmt	Kit	Bsmt	Great/Di	Ens2								
BTU/RM	1280	5588	13288	13288	5588	5588	1100	2092	3351	735	1560	2359	2359	1494	973	4254	4600	13288	4254	13288	4600	510								
# Out/Rm	1	3	4	4	3	3	1	1	1	1	1	2	2	1	2	2	2	4	2	4	2	1								
CFM/Outlet	23	34	60	60	34	34	20	38	61	13	28	21	21	27	9	39	42	60	39	60	42	9								
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						246					406						159					370								
TrunkWidth						10					14						8					12								
Tr.Height						8					8						8					8								
Velocity						442					522						359					555								

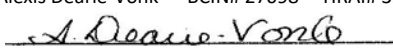
Trunk	Z									
Inlet #	2R	5R	1R	4R	3R					
CFM	140	90	140	325	90					
Inlet Size	14X8	6"	14X8	30X6	6"					
Act&Eff Len	230	205	200	175	160					
Adj.Press.	0.05	0.05	0.06	0.06	0.07					
Tr.Fl.Rate					785					
Tr.Width					22					
Tr.Height					8					
Velocity					642					

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 Opt			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+Bsmt			Air Tight:	Very Tight	Assumed? Yes
Weath Loc:	Ajax	Ventilated?	Yes	Wind Exp:	Partial Shade	
HRV?	Yes			Int.Shade:	Yes	Occupants: 6
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					

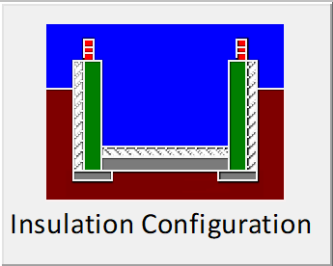
Envelope Air Leakage Calculator

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:		
	45	45		
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