


## Schedule 1: Designer Information

Use one form for each individual who reviews and takes responsibility for design activities with respect to the project.

<b>A. Project Information</b>			
Building number, street name		Unit no.	Lot/con.
Municipality BRAMPTON	Postal code	Plan number/ other description	
<b>B. Individual who reviews and takes responsibility for design activities</b>			
Name MICHAEL O'ROURKE		Firm HVAC DESIGNS LTD.	
Street address 375 FINLEY AVE		Unit no. 202	Lot/con. N/A
Municipality AJAX	Postal code L1S 2E2	Province ONTARIO	E-mail info@hvacdesigns.ca
Telephone number (905) 619-2300	Fax number (905) 619-2375	Cell number ( )	
<b>C. Design activities undertaken by individual identified in Section B. [Building Code Table 3.5.2.1 OF Division C]</b>			
<input type="checkbox"/> House <input type="checkbox"/> Small Buildings <input type="checkbox"/> Large Buildings <input type="checkbox"/> Complex Buildings <input checked="" type="checkbox"/> HVAC – House <input type="checkbox"/> Building Services <input type="checkbox"/> Detection, Lighting and Power <input type="checkbox"/> Fire Protection <input type="checkbox"/> Building Structural <input type="checkbox"/> Plumbing – House <input type="checkbox"/> Plumbing – All Buildings <input type="checkbox"/> On-site Sewage Systems			
Description of designer's work HEAT LOSS / GAIN CALCULATIONS DUCT SIZING RESIDENTIAL MECHANICAL VENTILATION DESIGN SUMMARY RESIDENTIAL SYSTEM DESIGN per CSA-F280-12		Model: 2503  OPT 2ND  Project: LEAFTRAIL HOLDINGS	
<b>D. Declaration of Designer</b>			
I, <u>MICHAEL O'ROURKE</u> declare that (choose one as appropriate): (print name)			
<input type="checkbox"/> I review and take responsibility for the design work on behalf of a firm registered under subsection 3.2.4. of Division C, of the Building Code. I am qualified, and the firm is registered, in the appropriate classes/categories.  Individual BCIN: _____ Firm BCIN: _____			
<input checked="" type="checkbox"/> I review and take responsibility for the design and am qualified in the appropriate category as an "other designer" under subsection 3.2.5. of Division C, of the Building Code.  Individual BCIN: <u>19669</u> Basis for exemption from registration and qualification: <u>O.B.C SENTENCE 3.2.4.1 (4)</u>			
<input type="checkbox"/> The design work is exempt from the registration and qualification requirements of the Building Code. Basis for exemption from registration and qualification: _____			
I certify that:			
1. The information contained in this schedule is true to the best of my knowledge. 2. I have submitted this application with the knowledge and consent of the firm.			
April 25, 2022			
Date		Signature of Designer	

**NOTE:**

- For the purposes of this form, "individual" means the "person" referred to in Clause 3.2.4.7(1) d) of Division C, Article 3.2.5.1. of Division C, and all other persons who are exempt from qualification under Subsections 3.2.4. and 3.2.5. of Division C.
- Schedule 1 is not required to be completed by a holder of a license, temporary license, or a certificate of authorization, issued by the Ontario Association of Architects. Schedule 1 is also not required to be completed by a holder of a license to practise, a limited license to practise, or a certificate of authorization, issued by the Association of Professional Engineers of Ontario.

**Application for a Permit Construct or Demolish – Effective January 1, 2015**

SITE NAME: LEAFTRAIL HOLDINGS				OPT 2ND				DATE: Apr-22				WINTER NATURAL AIR CHANGE RATE 0.282				HEAT LOSS ΔT °F. 74				CSA-F280-12									
BUILDER: ROYAL PINE HOMES				TYPE: 2503				GFA: 2049				LO# 95320				SUMMER NATURAL AIR CHANGE RATE 0.088				HEAT GAIN ΔT °F. 11				SB-12 PERFORMANCE					
ROOM USE				MBR				ENS				BED-2		BED-3		BED-4		BATH						ENS-2					
EXP. WALL				30				7				25		14		16		6						0					
CLG. HT.				9				9				9		9		9		9						9					
FACTORS																													
GRS.WALL AREA		LOSS GAIN		270				63				225		126		144		54						0					
GLAZING				LOSS GAIN				LOSS GAIN				LOSS GAIN		LOSS GAIN		LOSS GAIN		LOSS GAIN						LOSS GAIN					
NORTH		20.8	15.5	0	0	0		0	0	0		0	0	0	0	0	0	0	0	0				0	0	0			
EAST		20.8	41.0	0	0	0		0	0	0		26	540	1067	46	956	1888	0	0	0				0	0	0			
SOUTH		20.8	24.4	0	0	0		0	0	0		0	0	0	0	0	0	13	270	317				0	0	0			
WEST		20.8	41.0	34	706	1396		17	353	698		0	0	0	0	0	0	0	0	0				0	0	0			
SKYLT.		34.1	100.3	0	0	0		0	0	0		0	0	0	0	0	0	0	0	0				0	0	0			
DOORS		19.6	2.9	0	0	0		0	0	0		0	0	0	0	0	0	0	0	0				0	0	0			
NET EXPOSED WALL		3.5	0.5	236	818	121		46	159	24		199	690	102	80	277	41	131	454	67				54	187	28			
NET EXPOSED BSMT WALL ABOVE GR		3.5	0.5	0	0	0		0	0	0		0	0	0	0	0	0	0	0	0				0	0	0			
EXPOSED CLG		1.3	0.6	378	474	211		130	163	72		155	194	86	140	175	78	155	194	86				100	125	56			
NO ATTIC EXPOSED CLG		2.7	1.2	0	0	0		0	0	0		25	67	30	50	134	60	0	0	0				0	0	0			
EXPOSED FLOOR		2.5	0.4	0	0	0		0	0	0		150	373	55	0	0	0	0	0	0				100	249	37			
BASEMENT/CRAWL HEAT LOSS				0				0				0		0		0		0						0					
SLAB ON GRADE HEAT LOSS				0				0				0		0		0		0						0					
SUBTOTAL HT LOSS				1998				676				1865		1543		919		562						113					
SUB TOTAL HT GAIN				1728				794				1341		2067		471		120						50					
LEVEL FACTOR / MULTIPLIER		0.20	0.27					0.20	0.27			0.20	0.27			0.20	0.27	0.20		0.27			0.20		0.27				
AIR CHANGE HEAT LOSS				539				182				503		416		248		151						30					
AIR CHANGE HEAT GAIN				103				48				80		124		28		7						3					
DUCT LOSS				0				0				237		0		0		71						0					
DUCT GAIN				0				0				220		0		0		13						0					
HEAT GAIN PEOPLE		240		2		480		0				1		240		1		240		0				0		0			
HEAT GAIN APPLIANCES/LIGHTS				538				0				538		538		538		538						0					
TOTAL HT LOSS BTU/H				2537				858				2604		1958		1166		784						143					
TOTAL HT GAIN x 1.3 BTU/H				3703				1094				3145		3859		1660		182						69					

ROOM USE				LV/DN				K/B/F				FOY				MUD				BAS			
EXP. WALL				29				45				10				12				98			
CLG. HT.				10				10				11				10				9			
FACTORS																							
GRS.WALL AREA				290				450				110				120				588			
GLAZING				LOSS GAIN				LOSS GAIN				LOSS GAIN				LOSS GAIN				LOSS GAIN			
NORTH				20.8 15.5				0 0 0				0 0 0				0 0 0				0 0 0			
EAST				20.8 41.0				34 706 1396				0 0 0				0 0 0				0 0 0			
SOUTH				20.8 24.4				0 0 0				0 0 0				0 0 0				0 0 0			

SITE NAME: LEAFTRAIL HOLDINGS  
BUILDER: ROYAL PINE HOMES

OPT 2ND  
TYPE: 2503

DATE: Apr-22

GFA: 2049 LO# 95320

HEATING CFM 710 COOLING CFM 710  
TOTAL HEAT LOSS 29,014 TOTAL HEAT GAIN 23,233  
AIR FLOW RATE CFM 24.47 AIR FLOW RATE CFM 30.56

furnace pressure 0.6  
furnace filter 0.05  
a/c coil pressure 0.2  
available pressure  
for s/a & r/a 0.35

#CARRIER

AFUE = 97 %

59SP5A-40-10

40

INPUT (BTU/H) = 40,000

OUTPUT (BTU/H) = 39,000

FAN SPEED

LOW 0

MEDLOW 0

MEDIUM 0

MEDIUM HIGH 710

HIGH 875

DESIGN CFM = 710

CFM @ .6" E.S.P.

TEMPERATURE RISE 51 °F

RUN COUNT	4th	3rd	2nd	1st	Bas
S/A	0	0	10	5	3
R/A	0	0	4	2	1

All S/A diffusers 4"x10" unless noted otherwise on layout.

All S/A runs 5"Ø unless noted otherwise on layout.

RUN #	1	2	3	4	5	6	7	8	10	13	14	15	17	19	20	21	22	23
ROOM NAME	MBR	ENS	BED-2	BED-2	BED-3	BED-3	BATH	BED-4	MBR	LV/DN	K/B/F	K/B/F	ENS-2	FOY	MUD	BAS	BAS	BAS
RM LOSS MBH.	1.27	0.86	1.30	1.30	0.98	0.98	0.78	1.17	1.27	2.44	2.16	2.16	0.14	1.08	1.13	3.33	3.33	3.33
CFM PER RUN HEAT	31	21	32	32	24	24	19	29	31	60	53	53	4	26	28	82	82	82
RM GAIN MBH.	1.85	1.09	1.57	1.57	1.93	1.93	0.18	1.66	1.85	2.80	2.55	2.55	0.07	0.14	0.15	0.44	0.44	0.44
CFM PER RUN COOLING	57	33	48	48	59	59	6	51	57	86	78	78	2	4	5	14	14	14
ADJUSTED PRESSURE	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.16	0.17	0.17	0.17	0.17	0.17	0.16	0.16	0.16
ACTUAL DUCT LGH.	44	49	53	57	63	70	36	33	35	49	26	18	41	40	17	17	15	45
EQUIVALENT LENGTH	160	180	120	140	150	170	150	180	140	120	110	100	140	120	150	120	130	140
TOTAL EFFECTIVE LENGTH	204	229	173	197	213	240	186	213	175	169	136	118	181	160	167	137	145	185
ADJUSTED PRESSURE	0.08	0.08	0.1	0.09	0.08	0.07	0.09	0.08	0.1	0.1	0.13	0.15	0.1	0.11	0.1	0.12	0.11	0.09
ROUND DUCT SIZE	5	4	5	5	5	5	4	6	5	6	5	5	4	4	4	6	6	6
HEATING VELOCITY (ft/min)	228	241	235	235	176	176	218	148	228	306	389	389	46	298	321	418	418	418
COOLING VELOCITY (ft/min)	419	379	352	352	433	433	69	260	419	438	573	573	23	46	57	71	71	71
OUTLET GRILL SIZE	3X10	3X10	3X10	3X10	3X10	3X10	3X10	4X10	3X10	4X10	3X10	3X10	3X10	3X10	3X10	4X10	4X10	4X10
TRUNK	A	C	C	C	B	B	C	C	A	B	A	A	C	B	C	A	A	B

RUN #	1	2	3	4	5	6	7	8	10	13	14	15	17	19	20	21	22	23
ROOM NAME	MBR	ENS	BED-2	BED-2	BED-3	BED-3	BATH	BED-4	MBR	LV/DN	K/B/F	K/B/F	ENS-2	FOY	MUD	BAS	BAS	BAS
RM LOSS MBH.	1.27	0.86	1.30	1.30	0.98	0.98	0.78	1.17	1.27	2.44	2.16	2.16	0.14	1.08	1.13	3.33	3.33	3.33
CFM PER RUN HEAT	31	21	32	32	24	24	19	29	31	60	53	53	4	26	28	82	82	82
RM GAIN MBH.	1.85	1.09	1.57	1.57	1.93	1.93	0.18	1.66	1.85	2.80	2.55	2.55	0.07	0.14	0.15	0.44	0.44	0.44
CFM PER RUN COOLING	57	33	48	48	59	59	6	51	57	86	78	78	2	4	5	14	14	14
ADJUSTED PRESSURE	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.16	0.17	0.17	0.17	0.17	0.17	0.16	0.16	0.16
ACTUAL DUCT LGH.	44	49	53	57	63	70	36	33	35	49	26	18	41	40	17	17	15	45
EQUIVALENT LENGTH	160	180	120	140	150	170	150	180	140	120	110	100	140	120	150	120	130	140
TOTAL EFFECTIVE LENGTH	204	229	173	197	213	240	186	213	175	169	136	118	181	160	167	137	145	185
ADJUSTED PRESSURE	0.08	0.08	0.1	0.09	0.08	0.07	0.09	0.08	0.1	0.1	0.13	0.15	0.1	0.11	0.1	0.12	0.11	0.09
ROUND DUCT SIZE	5	4	5	5	5	5	4	6	5	6	5	5	4	4	4	6	6	6
HEATING VELOCITY (ft/min)	228	241	235	235	176	176	218	148	228	306	389	389	46	298	321	418	418	418
COOLING VELOCITY (ft/min)	419	379	352	352	433	433	69	260	419	438	573	573	23	46	57	71	71	71
OUTLET GRILL SIZE	3X10	3X10	3X10	3X10	3X10	3X10	3X10	4X10	3X10	4X10	3X10	3X10	3X10	3X10	3X10	4X10	4X10	4X10
TRUNK	A	C	C	C	B	B	C	C	A	B	A	A	C	B	C	A	A	B

SUPPLY AIR TRUNK SIZE	TRUNK	STATIC	ROUND	RECT	VELOCITY	TRUNK	STATIC	ROUND	RECT	VELOCITY	RETURN AIR TRUNK SIZE	TRUNK	STATIC	ROUND	RECT	VELOCITY
	CFM	PRESS.	DUCT	DUCT	(ft/min)	CFM	PRESS.	DUCT	DUCT	(ft/min)		CFM	PRESS.	DUCT	DUCT	(ft/min)
TRUNK A	332	0.08	9.3	10	x 8	598	0	0.00	0	0	x 8	0	0.05	0	0	x 8
TRUNK B	216	0.07	8.2	8	x 8	486	0	0.00	0	0	x 8	0	0.05	0	0	x 8
TRUNK C	381	0.07	10.1	12	x 8	572	0	0.00	0	0	x 8	0	0.05	0	0	x 8
TRUNK D	0	0.00	0	0	x 8	0	0	0.00	0	0	x 8	0	0.05	0	0	x 8
TRUNK E	0	0.00	0	0	x 8	0	0	0.00	0	0	x 8	0	0.05	0	0	x 8
TRUNK F	0	0.00	0	0	x 8	0	0	0.00	0	0	x 8	0	0.05	0	0	x 8

RETURN AIR #	1	2	3	4	5	6	7	8	10	13	14	15	17	19	20	21	22	23
AIR VOLUME	85	65	65	65	180	135	0	0	0	0	0	0	0	0	0	0	0	0
PLENUM PRESSURE	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15
ACTUAL DUCT LGH.	44	57	63	54	15	39	1	1	1	1	1	1	1	1	1	1	1	14
EQUIVALENT LENGTH	155	270	245	205	175	270	0	0	0	0	0	0	0	0	0	0	0	135
TOTAL EFFECTIVE LH	199	327	308	259	190	309	1	1	1	1	1	1	1	1	1	1	1	149
ADJUSTED PRESSURE	0.07	0.05	0.05	0.06	0.08	0.05	14.80	14.80	14.80	14.80	14.80	14.80	14.80	14.80	14.80	14.80	14.80	0.10
ROUND DUCT SIZE	5.8	5.7	5.7	5.4	7.4	7.5	0	0	0	0	0	0	0	0	0	0	0	5.9
INLET GRILL SIZE	8	8	8	8	8	8	0	0	0	0	0	0	0	0	0	0	0	8
INLET GRILL SIZE	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
INLET GRILL SIZE	14	14	14	14	14	14	0	0	0	0	0	0	0	0	0	0	0	14

TYPE: 2503  
SITE NAME: LEAFTRAIL HOLDINGS

LO # 95320  
OPT 2ND

**RESIDENTIAL MECHANICAL VENTILATION DESIGN SUMMARY**

COMBUSTION APPLIANCES		9.32.3.1(1)
a)	<input checked="" type="checkbox"/> Direct vent (sealed combustion) only	
b)	<input type="checkbox"/> Positive venting induced draft (except fireplaces)	
c)	<input type="checkbox"/> Natural draft, B-vent or induced draft gas fireplace	
d)	<input type="checkbox"/> Solid Fuel (including fireplaces)	
e)	<input type="checkbox"/> No Combustion Appliances	

HEATING SYSTEM	
<input checked="" type="checkbox"/> Forced Air	<input type="checkbox"/> Non Forced Air
<input type="checkbox"/> Electric Space Heat	

HOUSE TYPE		9.32.1(2)
<input checked="" type="checkbox"/> I	Type a) or b) appliance only, no solid fuel	
<input type="checkbox"/> II	Type I except with solid fuel (including fireplaces)	
<input type="checkbox"/> III	Any Type c) appliance	
<input type="checkbox"/> IV	Type I, or II with electric space heat	
<input type="checkbox"/> Other:	Type I, II or IV no forced air	

SYSTEM DESIGN OPTIONS		O.N.H.W.P.
<input type="checkbox"/> 1	Exhaust only/Forced Air System	
<input type="checkbox"/> 2	HRV with Ducting/Forced Air System	
<input checked="" type="checkbox"/> 3	HRV Simplified/connected to forced air system	
<input type="checkbox"/> 4	HRV with Ducting/non forced air system	
<input type="checkbox"/>	Part 6 Design	

TOTAL VENTILATION CAPACITY		9.32.3.3(1)
Basement + Master Bedroom	<u>2</u> @ 21.2 cfm	<u>42.4</u> cfm
Other Bedrooms	<u>3</u> @ 10.6 cfm	<u>31.8</u> cfm
Kitchen & Bathrooms	<u>5</u> @ 10.6 cfm	<u>53</u> cfm
Other Rooms	<u>4</u> @ 10.6 cfm	<u>42.4</u> cfm
Table 9.32.3.A.	TOTAL	<u>169.6</u> cfm

PRINCIPAL VENTILATION CAPACITY REQUIRED		9.32.3.4.(1)
1 Bedroom	31.8	cfm
2 Bedroom	47.7	cfm
3 Bedroom	63.6	cfm
4 Bedroom	79.5	cfm
5 Bedroom	95.4	cfm
TOTAL		<u>79.5</u> cfm

SUPPLEMENTAL VENTILATION CAPACITY		9.32.3.5.
Total Ventilation Capacity	<u>169.6</u>	cfm
Less Principal Ventil. Capacity	<u>79.5</u>	cfm
Required Supplemental Capacity	<u>90.1</u>	cfm

PRINCIPAL EXHAUST FAN CAPACITY	
Model: VANEE V150H	Location: BSMT
<u>79.5</u> cfm	<input checked="" type="checkbox"/> HVI Approved

PRINCIPAL EXHAUST HEAT LOSS CALCULATION				
CFM	$\Delta T$ °F	FACTOR	% LOSS	
79.5 CFM	X 74 F	X 1.08	X	0.25

SUPPLEMENTAL FANS		BY INSTALLING CONTRACTOR		
Location	Model	cfm	HVI	Sones
ENS	BY INSTALLING CONTRACTOR	50	<input checked="" type="checkbox"/>	3.5
BATH	BY INSTALLING CONTRACTOR	50	<input checked="" type="checkbox"/>	3.5
ENS-2	BY INSTALLING CONTRACTOR	50	<input checked="" type="checkbox"/>	3.5

HEAT RECOVERY VENTILATOR		9.32.3.11.
Model: VANEE V150H		
<u>150</u> cfm high	<u>35</u> cfm low	
<u>75</u> % Sensible Efficiency	<input checked="" type="checkbox"/> HVI Approved	
@ 32 deg F ( 0 deg C)		

LOCATION OF INSTALLATION	
Lot:	Concession
Township	Plan:
Address	
Roll #	Building Permit #

BUILDER:	
ROYAL PINE HOMES	
Name:	
Address:	
City:	
Telephone #:	Fax #:

INSTALLING CONTRACTOR	
Name:	
Address:	
City:	
Telephone #:	Fax #:

DESIGNER CERTIFICATION	
I hereby certify that this ventilation system has been designed in accordance with the Ontario Building Code.	
Name:	HVAC Designs Ltd.
Signature:	<i>Michael O'Rourke</i>
HRAI #	001820
Date:	April-22

I REVIEW AND TAKE RESPONSIBILITY FOR THE DESIGN WORK AND AM QUALIFIED IN THE APPROPRIATE CATEGORY AS AN "OTHER DESIGNER" UNDER DIVISION C, 3.2.5 OF THE BUILDING CODE.

INDIVIDUAL BCIN: 19669

MICHAEL O'ROURKE

*Michael O'Rourke*

CSA F280-12 Residential Heat Loss and Heat Gain Calculations																																																													
Formula Sheet (For Air Leakage / Ventilation Calculation)																																																													
LO#: 95320		Model: 2503		Builder: ROYAL PINE HOMES																																																									
				Date: 2022-04-25																																																									
<b>Volume Calculation</b>			<b>Air Change &amp; Delta T Data</b>																																																										
<b>House Volume</b> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>Level</th> <th>Floor Area (ft²)</th> <th>Floor Height (ft)</th> <th>Volume (ft³)</th> </tr> </thead> <tbody> <tr> <td>Bsmt</td> <td>914</td> <td>9</td> <td>8226</td> </tr> <tr> <td>First</td> <td>914</td> <td>10</td> <td>9140</td> </tr> <tr> <td>Second</td> <td>1135</td> <td>9</td> <td>10215</td> </tr> <tr> <td>Third</td> <td>0</td> <td>9</td> <td>0</td> </tr> <tr> <td>Fourth</td> <td>0</td> <td>9</td> <td>0</td> </tr> <tr> <td colspan="2" style="text-align: right;">Total:</td> <td></td> <td>27,581.0 ft³</td> </tr> <tr> <td colspan="2" style="text-align: right;">Total:</td> <td></td> <td>781.0 m³</td> </tr> </tbody> </table>			Level	Floor Area (ft²)	Floor Height (ft)	Volume (ft³)	Bsmt	914	9	8226	First	914	10	9140	Second	1135	9	10215	Third	0	9	0	Fourth	0	9	0	Total:			27,581.0 ft³	Total:			781.0 m³	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 70%;">WINTER NATURAL AIR CHANGE RATE</td> <td style="width: 30%;">0.282</td> </tr> <tr> <td>SUMMER NATURAL AIR CHANGE RATE</td> <td>0.088</td> </tr> </table> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th colspan="5" style="text-align: center;">Design Temperature Difference</th> </tr> <tr> <th></th> <th>Tin °C</th> <th>Tout °C</th> <th>ΔT °C</th> <th>ΔT °F</th> </tr> <tr> <td>Winter DTDh</td> <td>22</td> <td>-19</td> <td>41</td> <td>74</td> </tr> <tr> <td>Summer DTDc</td> <td>24</td> <td>30</td> <td>6</td> <td>11</td> </tr> </table>			WINTER NATURAL AIR CHANGE RATE	0.282	SUMMER NATURAL AIR CHANGE RATE	0.088	Design Temperature Difference						Tin °C	Tout °C	ΔT °C	ΔT °F	Winter DTDh	22	-19	41	74	Summer DTDc	24	30	6	11
Level	Floor Area (ft²)	Floor Height (ft)	Volume (ft³)																																																										
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<b>5.2.3.1 Heat Loss due to Air Leakage</b>			<b>6.2.6 Sensible Gain due to Air Leakage</b>																																																										
$HL_{airb} = LR_{airh} \times \frac{V_b}{3.6} \times DTD_h \times 1.2$ <p>0.282 x 216.95 x 41 °C x 1.2 = 3031 W</p> <p>= 10341 Btu/h</p>			$HG_{salb} = LR_{airc} \times \frac{V_b}{3.6} \times DTD_c \times 1.2$ <p>= 0.088 x 216.95 x 6 °C x 1.2 = 141 W</p> <p>= 480 Btu/h</p>																																																										
<b>5.2.3.2 Heat Loss due to Mechanical Ventilation</b>			<b>6.2.7 Sensible heat Gain due to Ventilation</b>																																																										
$HL_{vairb} = PVC \times DTD_h \times 1.08 \times (1 - E)$ <p>80 CFM x 74 °F x 1.08 x 0.25 = 1593 Btu/h</p>			$HL_{vairb} = PVC \times DTD_h \times 1.08 \times (1 - E)$ <p>80 CFM x 11 °F x 1.08 x 0.25 = 236 Btu/h</p>																																																										
<b>5.2.3.3 Calculation of Air Change Heat Loss for Each Room (Floor Multiplier Section)</b>																																																													
$HL_{airr} = Level\ Factor \times HL_{airbv} \times \{(HL_{agcr} + HL_{bgcr}) \div (HL_{agclevel} + HL_{bgclevel})\}$																																																													
Level	Level Factor (LF)	HLairve Air Leakage + Ventilation Heat Loss (Btu/h)	Level Conductive Heat Loss: (HL <sub>clevel</sub> )	Air Leakage Heat Loss Multiplier (LF x HLairbv / HLlevel)																																																									
1	0.5	10,341	4,831	1.070																																																									
2	0.3		5,860	0.529																																																									
3	0.2		7,674	0.270																																																									
4	0		0	0.000																																																									
5	0		0	0.000																																																									
<p>*HLairbv = Air leakage heat loss + ventilation heat loss</p> <p>*For a balanced or supply only ventilation system HLairve = 0</p>																																																													
				Michael O'Rourke BCIN# 19669 																																																									

**HEAT LOSS AND GAIN SUMMARY SHEET**

<b>MODEL:</b> 2503	<b>OPT 2ND</b>	<b>BUILDER:</b> ROYAL PINE HOMES
<b>SFQT:</b> 2049	<b>LO#</b> 95320	<b>SITE:</b> LEAFTRAIL HOLDINGS

**DESIGN ASSUMPTIONS**

HEATING	°F	COOLING	°F
OUTDOOR DESIGN TEMP.	-2	OUTDOOR DESIGN TEMP.	86
INDOOR DESIGN TEMP.	72	INDOOR DESIGN TEMP. (MAX 75°F)	75
		WINDOW SHGC	0.50

**BUILDING DATA**

ATTACHMENT:	ATTACHED	# OF STORIES (+BASEMENT):	3
FRONT FACES:	EAST	ASSUMED (Y/N):	Y
AIR CHANGES PER HOUR:	3.00	ASSUMED (Y/N):	Y
AIR TIGHTNESS CATEGORY:	TIGHT	ASSUMED (Y/N):	Y
WIND EXPOSURE:	SHELTERED	ASSUMED (Y/N):	Y
HOUSE VOLUME (ft <sup>3</sup> ):	27581.0	ASSUMED (Y/N):	Y
INTERNAL SHADING:	BLINDS/CURTAINS	ASSUMED OCCUPANTS:	5
INTERIOR LIGHTING LOAD (Btu/h/ft <sup>2</sup> ):	1.27	DC BRUSHLESS MOTOR (Y/N):	Y
FOUNDATION CONFIGURATION	BCIN_1	DEPTH BELOW GRADE:	6.0 ft
LENGTH: 51.0 ft	WIDTH: 23.0 ft	EXPOSED PERIMETER:	98.0 ft

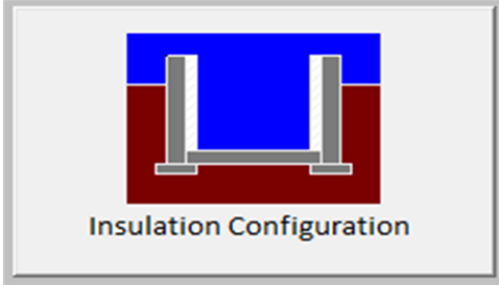
2012 OBC - COMPLIANCE PACKAGE	Compliance Package	
	SB-12 PERFORMANCE	
	Nominal	Min. Eff.
Ceiling with Attic Space Minimum RSI (R)-Value	60	59.22
Ceiling Without Attic Space Minimum RSI (R)-Value	31	27.65
Exposed Floor Minimum RSI (R)-Value	31	29.80
Walls Above Grade Minimum RSI (R)-Value	22+1.5	21.40
Basement Walls Minimum RSI (R)-Value	20	21.12
Below Grade Slab Entire surface > 600 mm below grade Minimum RSI (R)-Value	-	-
Edge of Below Grade Slab ≤ 600 mm Below Grade Minimum RSI (R)-Value	10	10
Heated Slab or Slab ≤ 600 mm below grade Minimum RSI (R)-Value	10	11.13
Windows and Sliding Glass Doors Maximum U-Value	1.6	-
Skylights Maximum U-Value	2.6	-
Space Heating Equipment Minimum AFUE	96%	-
HRV/ERV Minimum Efficiency	75%	-
Domestic Hot Water Heater Minimum EF	0.9	-

INDIVIDUAL BCIN: 19669  
MICHAEL O'ROURKE



# Residential Foundation Thermal Load Calculator

Supplemental tool for CAN/CSA-F280

Weather Station Description		
Province:	Ontario	
Region:	Brampton	
Site Description		
Soil Conductivity:	Normal conductivity: dry sand, loam, clay	
Water Table:	Normal (7-10 m, 23-33 ft)	
Foundation Dimensions		
Floor Length (m):	15.5	 Insulation Configuration
Floor Width (m):	7.0	
Exposed Perimeter (m):	29.9	
Wall Height (m):	2.7	
Depth Below Grade (m):	1.83	
Window Area (m <sup>2</sup> ):	0.6	
Door Area (m <sup>2</sup> ):	1.9	
Radiant Slab		
Heated Fraction of the Slab:	0	
Fluid Temperature (°C):	33	
Design Months		
Heating Month	1	
Foundation Loads		
Heating Load (Watts):		962

TYPE: 2503  
LO# 95320

OPT 2ND

# Air Infiltration Residential Load Calculator

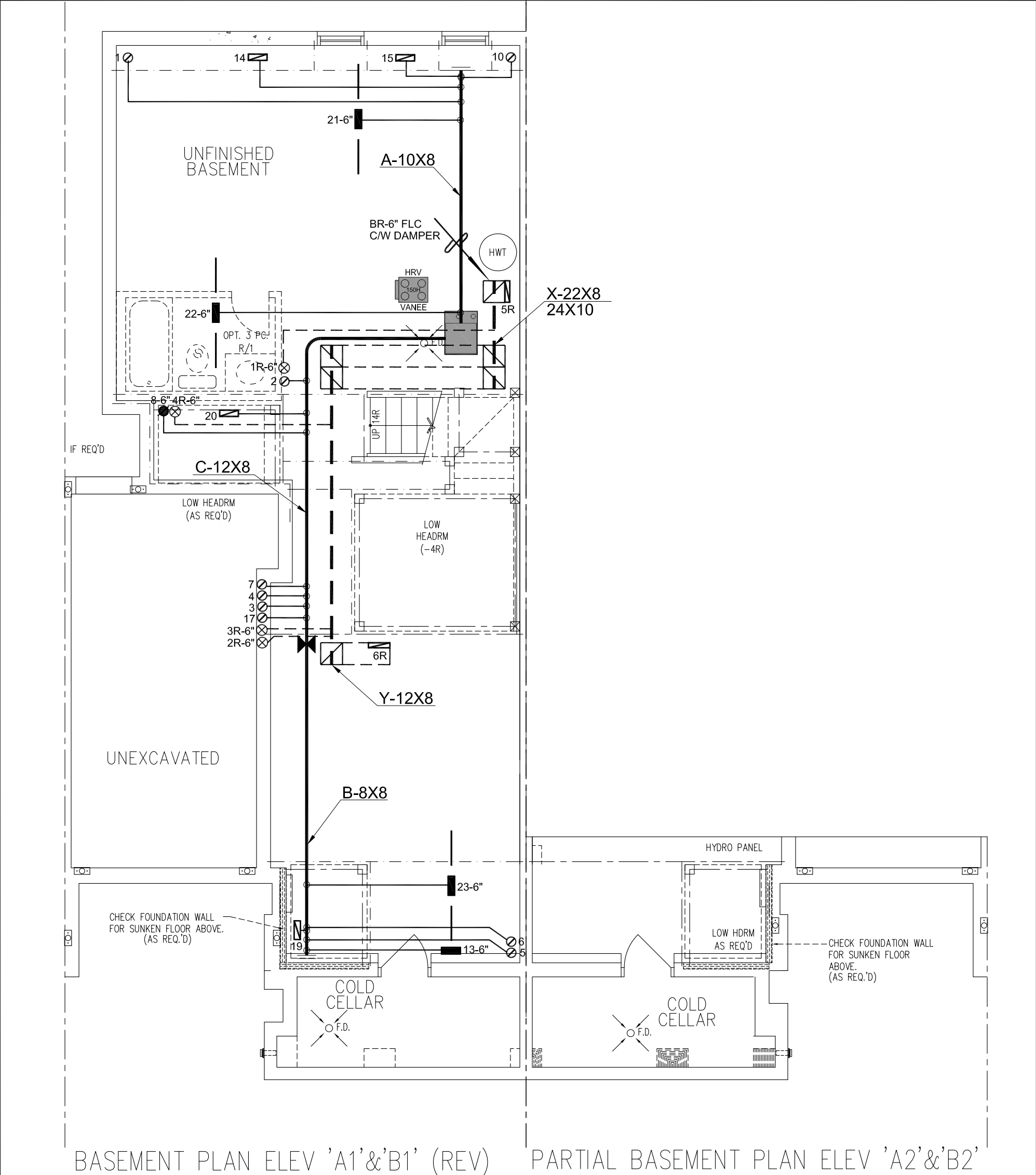
Supplemental tool for CAN/CSA-F280

Weather Station Description				
Province:	Ontario			
Region:	Brampton			
Weather Station Location:	Open flat terrain, grass			
Anemometer height (m):	10			
Local Shielding				
Building Site:	Suburban, forest			
Walls:	Heavy			
Flue:	Heavy			
Highest Ceiling Height (m):	6.71			
Building Configuration				
Type:	Semi			
Number of Stories:	Two			
Foundation:	Full			
House Volume (m <sup>3</sup> ):	781.0			
Air Leakage/Ventilation				
Air Tightness Type:	Energy Star Attached (3.0 ACH)			
Custom BDT Data:	ELA @ 10 Pa.		874.9 cm <sup>2</sup>	
	3.00		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
Natural Infiltration Rates				
Heating Air Leakage Rate (ACH/H):	0.282			
Cooling Air Leakage Rate (ACH/H):	0.088			

TYPE: 2503  
LO# 95320

OPT 2ND





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*Michael O'Rourke*  
Michael O'Rourke, BCIN# 19669  
HVAC DESIGNS LTD.

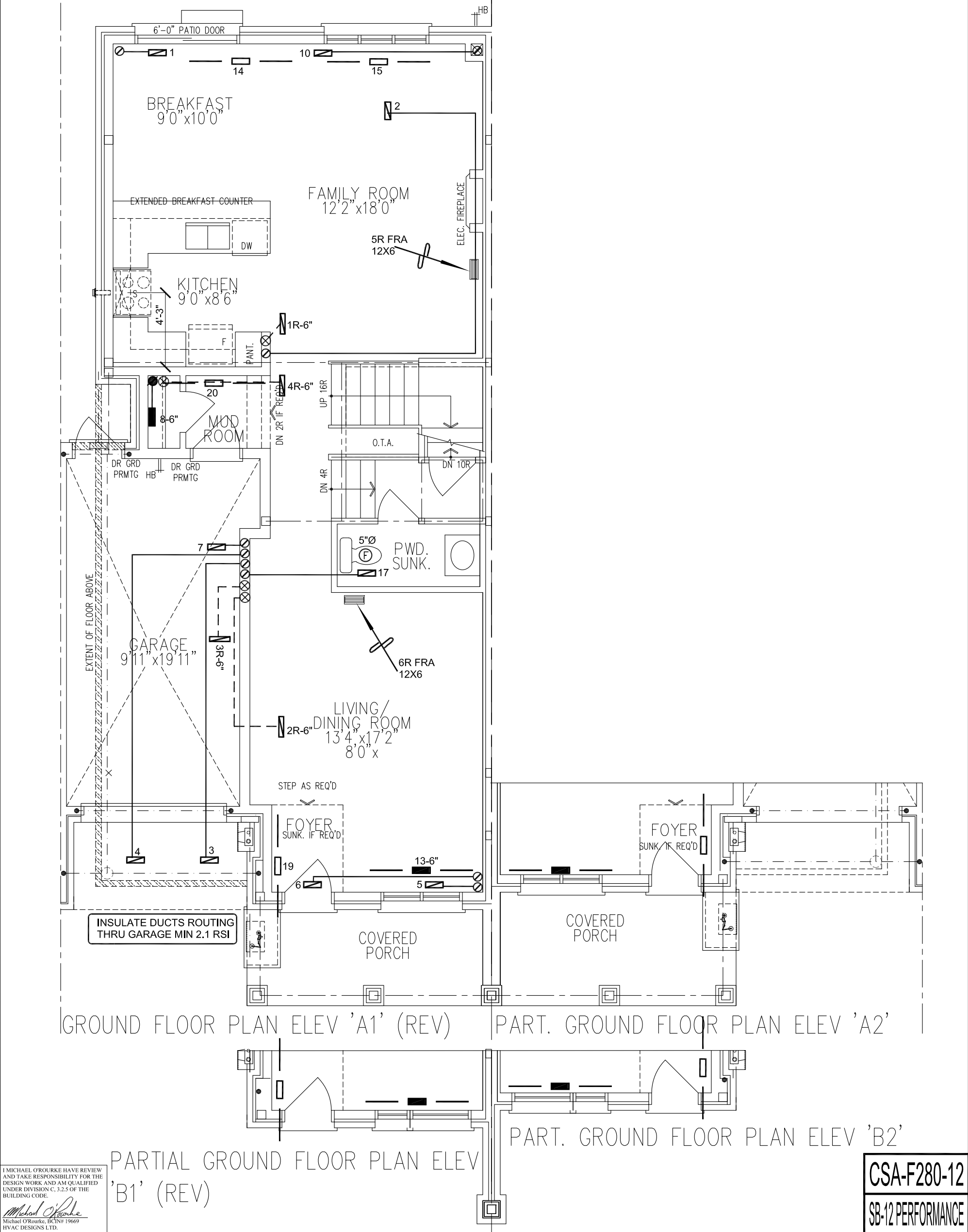
CSA-F280-12

SB-12 PERFORMANCE

HVAC LEGEND								3.		
SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	2.		
	SUPPLY AIR GRILLE		6" SUPPLY AIR BOOT ABOVE		14"x8" RETURN AIR GRILLE		RETURN AIR STACK ABOVE	1.	REVISED TO PERFORMANCE PATH	APR/2022
	SUPPLY AIR GRILLE 6" BOOT		SUPPLY AIR STACK FROM 2nd FLOOR		30"x8" RETURN AIR GRILLE		RETURN AIR STACK 2nd FLOOR	No.	Description	Date
	SUPPLY AIR BOOT ABOVE		6" SUPPLY AIR STACK 2nd FLOOR		FRA- FLOOR RETURN AIR GRILLE		REDUCER	REVISIONS		

ALL DRAWINGS, CALCULATIONS AND SPECIFICATIONS ARE THE PROPERTY OF HVAC DESIGNS LTD.© AND MAY NOT BE REPRODUCED, MODIFIED OR ALTERED WITHOUT EXPRESSED WRITTEN CONSENT. THE DRAWINGS ARE DATED AND USE OF THESE DRAWINGS AFTER ONE YEAR FROM THE DATED NOTED IS NOT AUTHORIZED. CONTRACTOR SHALL CHECK ALL CONDITIONS BEFORE PROCEEDING WITH WORK. LATEST MUNICIPAL APPROVED DRAWINGS ONLY TO BE USED DURING INSTALLATION OF HEATING SYSTEM. HVAC DESIGNS LTD. IS NOT LIABLE FOR ANY CLAIMS ARISING FROM UNAUTHORIZED USE OF THE DRAWINGS OR FROM ANY CHANGES TO ACCEPTED STANDARDS AND/OR THE ONTARIO BUILDING CODE.

Client		<div><div>HVACDESIGNS LTD.</div><div>375 Finley Ave. Suite 202 - Ajax, Ontario L1S 2E2 Tel. 905.619.2300 - 905.420.5300 Fax 905.619.2375 Email: info@hvacdesigns.ca Web: www.hvacdesigns.ca Specializing in Residential Mechanical Design Services</div></div>	HEAT LOSS 30607 BTU/H UNIT DATA		# OF RUNS S/A R/A FANS			Sheet Title	
ROYAL PINE HOMES			MAKE CARRIER		3RD FLOOR			BASEMENT HEATING LAYOUT	
Project Name LEAFTRAIL HOLDINGS BRAMPTON, ONTARIO			MODEL 59SP5A-40-10		2ND FLOOR	10	4	3	
			INPUT 40 MBTU/H		1ST FLOOR	5	2	2	
			OUTPUT 39 MBTU/H		BASEMENT	3	1	0	Date MAR/2022
		COOLING 2.0 TONS		ALL S/A DIFFUSERS 4 "x10" UNLESS NOTED OTHERWISE ON LAYOUT. ALL S/A RUNS 5"Ø UNLESS NOTED OTHERWISE ON LAYOUT. UNDERCUT DOORS 1" min. FOR R/A					Scale 3/16" = 1'-0"
2503 - OPT 2ND 2049 sqft		Installation to comply with the latest Ontario Building Code. All supply branch outlets shall be equipped with a manual balancing damper. Ductwork which passes through the garage or unheated spaces shall be adequately insulated and be gas-proofed.		FAN SPEED 710 cfm @ 0.6" w.c.					BCIN# 19669
									LO# 95320



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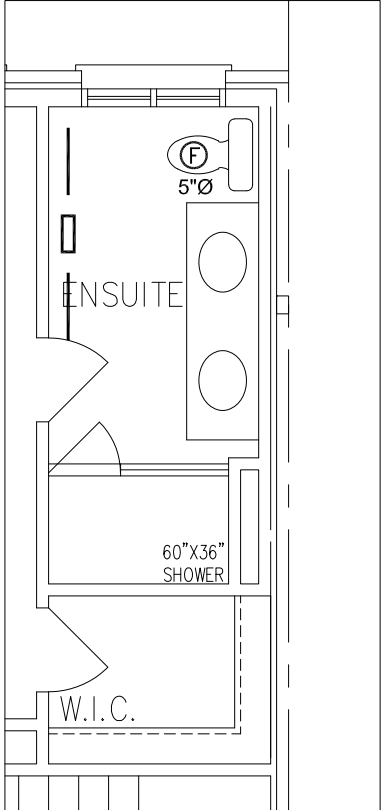
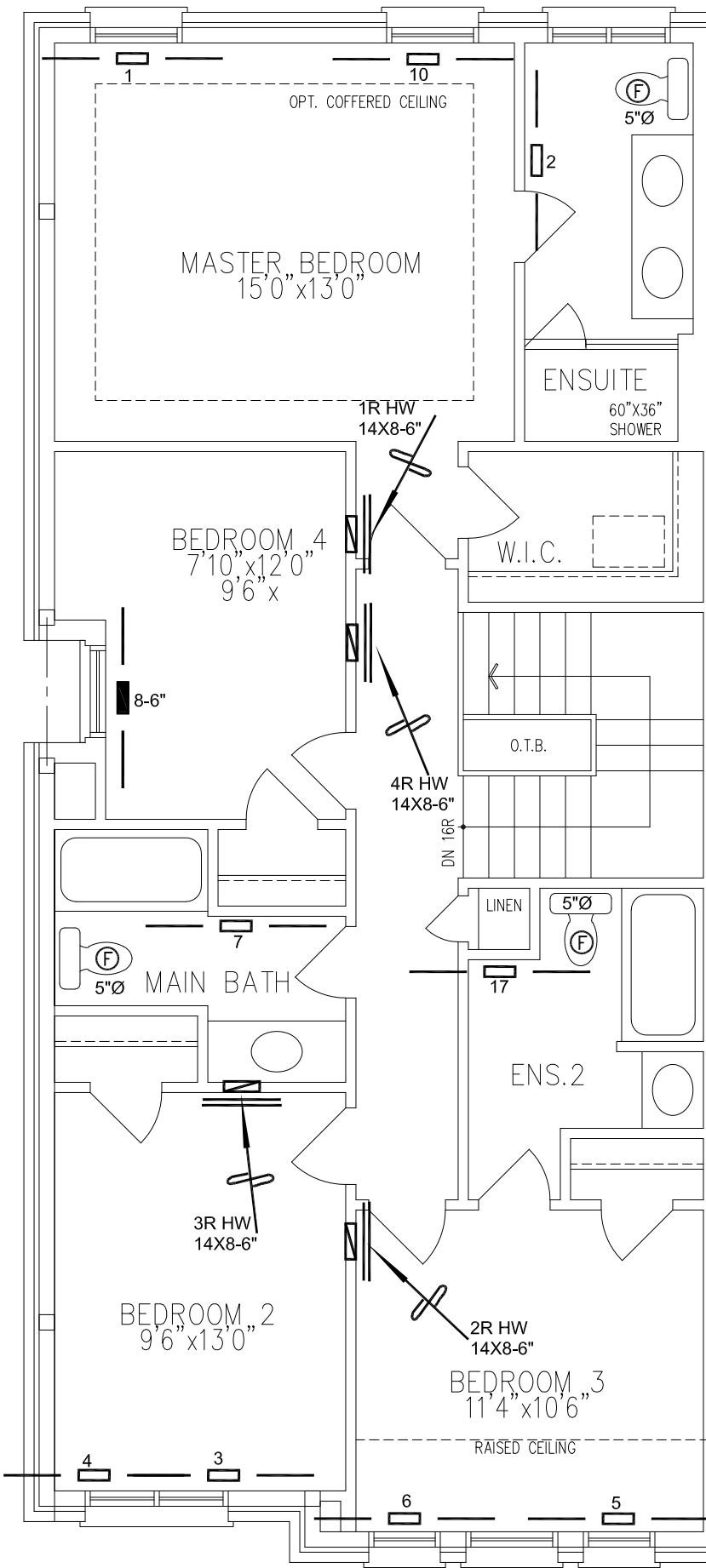
*Michael O'Rourke*  
Michael O'Rourke, BCIN# 19669  
HVAC DESIGNS LTD.

**CSA-F280-12**  
**SB-12 PERFORMANCE**

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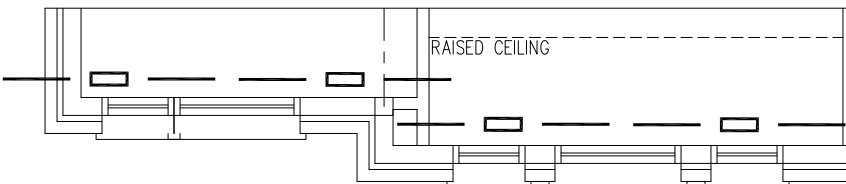
Client		<div><div><div>HVAC</div><div>DESIGNS LTD.</div></div><div>375 Finley Ave. Suite 202 - Ajax, Ontario L1S 2E2 Tel. 905.619.2300 - 905.420.5300 Fax 905.619.2375 Email: info@hvacdesigns.ca Web: www.hvacdesigns.ca Specializing in Residential Mechanical Design Services</div></div>	Sheet Title	
ROYAL PINE HOMES			FIRST FLOOR HEATING LAYOUT	
Project Name LEAFTRAIL HOLDINGS BRAMPTON, ONTARIO			Date	MAR/2022
2503 - OPT 2ND      2049 sqft			Scale	3/16" = 1'-0"
		BCIN# 19669		
		LO#	95320	



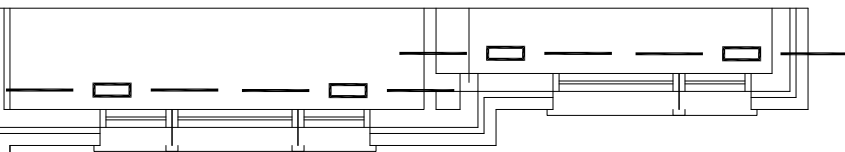
PARTIAL SECOND FLR PLAN,  
ELEV 'A1' (REV)  
(W/ OPT. ENSUITE LAYOUT)  
(ELEV. 'B1' REV. & 'B2' SIMILAR)

OPT. SECOND FLOOR PLAN, 'A1' (REV.)  
(W/ OPT. 4 BEDROOM)

PARTIAL OPT. SECOND FLOOR PLAN,  
'A2' (W/ OPT. 4 BEDROOM)



PARTIAL SECOND FLR PLAN, ELEV  
'B1' (REV)



PARTIAL SECOND FLR PLAN, ELEV 'B2'

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HVAC DESIGNS LTD.

CSA-F280-12  
SB-12 PERFORMANCE

HVAC LEGEND								3.		
SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	2.		
	SUPPLY AIR GRILLE		6" SUPPLY AIR BOOT ABOVE		14"x8" RETURN AIR GRILLE		RETURN AIR STACK ABOVE	1.	REVISED TO PERFORMANCE PATH	APR/2022
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ROYAL PINE HOMES			SECOND FLOOR HEATING LAYOUT	
Project Name			Date	MAR/2022
LEAFTRAIL HOLDINGS BRAMPTON, ONTARIO			Scale	3/16" = 1'-0"
2503 - OPT 2ND			BCIN# 19669	
2049 sqft			LO#	95320