

Schedule 1: Designer Information

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

A. Project Information			
Building number, street name		Unit no.	Lot/con.
Municipality BRAMPTON	Postal code	Plan number/ other description	
B. Individual who reviews and takes responsibility for design activities			
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 ()	
C. Design activities undertaken by individual identified in Section B. [Building Code Table 3.5.2.1 OF Division C]			
☐ House ☐ Small Buildings ☐ Large Buildings ☐ Complex Buildings ☒ HVAC – House ☐ Building Services ☐ Detection, Lighting and Power ☐ Fire Protection ☐ Building Structural ☐ Plumbing – House ☐ Plumbing – All Buildings ☐ 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: 2505 Project: LEAFTRAIL HOLDINGS	
D. Declaration of Designer			
I, <u>MICHAEL O'ROURKE</u> declare that (choose one as appropriate): (print name)			
☐ 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: _____			
☒ 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>			
☐ 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				TYPE: 2505				GFA: 2384				DATE: Apr-22				WINTER NATURAL AIR CHANGE RATE 0.273				HEAT LOSS ΔT °F. 74				CSA-F280-12			
BUILDER: ROYAL PINE HOMES												LO# 95323				SUMMER NATURAL AIR CHANGE RATE 0.089				HEAT GAIN ΔT °F. 11				SB-12 PERFORMANCE			
ROOM USE				MBR				ENS				BED-2				BED-3				BED-4				BATH			
EXP. WALL				32				20				20				34				28				6			
CLG. HT.				9				9				9				10				9				9			
FACTORS																											
GRS.WALL AREA	LOSS	GAIN		288			180				180				340				252			54					
GLAZING				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		0	0	0		46	956	1888		35	727	1437	0	0	0			
SOUTH	20.8	24.4		0	0	0	26	540	634		46	956	1122		46	956	1122		0	0	0	0	0	0			
WEST	20.8	41.0		26	540	1067	12	249	493		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		262	908	135	142	492	73		134	465	69		248	860	127		217	752	112	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		343	430	191	118	148	66		155	194	86		205	257	114		202	253	113	92	115	51			
NO ATTIC EXPOSED CLG	2.7	1.2		0	0	0	0	0	0		0	0	0		0	0	0		0	0	0	0	0	0			
EXPOSED FLOOR	2.5	0.4		0	0	0	0	0	0		0	0	0		0	0	0		175	436	65	75	187	28			
BASEMENT/CRAWL HEAT LOSS				0			0				0				0				0			0					
SLAB ON GRADE HEAT LOSS				0			0				0				0				0			0					
SUBTOTAL HT LOSS				1878			1430				1615				3028				2168			489					
SUB TOTAL HT GAIN					1393			1266				1277			3252				1725			107					
LEVEL FACTOR / MULTIPLIER	0.20	0.21					0.20	0.21			0.20	0.21			0.20	0.21			0.20	0.21							
AIR CHANGE HEAT LOSS				389			296				335				628				449			101					
AIR CHANGE HEAT GAIN					59			54				54			138				73			5					
DUCT LOSS				0			0				0				0				262			59					
DUCT GAIN					0		0					0			0				240			47					
HEAT GAIN PEOPLE	240			2			480	0			1		240	1		240	1		240	0		0					
HEAT GAIN APPLIANCES/LIGHTS					360		360					360			360				360			360					
TOTAL HT LOSS BTU/H				2268			1726				1949				3656				2880			650					
TOTAL HT GAIN x 1.3 BTU/H					2980		2183					2511			5187				3430			674					

ROOM USE			FAM		KT/BR		LV/DN		LAUN		W/R		FOY		MUD								BAS			
EXP. WALL			30		36		46		10		6		14		11								156			
CLG. HT.			10		10		10		9		10		10		11								9			
FACTORS																										
GRS.WALL AREA	LOSS	GAIN	300		360		460		90		60		140		121								936			
GLAZING			LOSS	GAIN	LOSS	GAIN	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	8	166	124						0	0	0
EAST	20.8	41.0	0	0	0	0	0	0	46	956	1888	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
SOUTH	20.8	24.4	0	0	0	57	1184	1391	46	956	1122	16	332	390	0	0	0	0	0	0	0	0	6	125	146	
WEST	20.8	41.0	38	789	1560	47	976	1929	0	0	0	0	0	0	0	0	0	0	0	0	0	3	62	123		
SKYLT.	34.1	100.3	0	0	0	0	0	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	40	783	116	20	392	58			20	392	58	
NET EXPOSED WALL	3.5	0.5	262	908	135	256	888	132	368	1276	189	74	257	38	60	208	31	100	347	51	93	322	48	0	0	0
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	0	0	468	1644	244	
EXPOSED CLG	1.3	0.6	0	0	0	0	0	0	0	0	0	90	113	50	0	0	0	0	0	0	0	0	0	0	0	
NO ATTIC EXPOSED CLG	2.7	1.2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
EXPOSED FLOOR	2.5	0.4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
BASEMENT/CRAWL HEAT LOSS			0			0			0			0			0			0								
SLAB ON GRADE HEAT LOSS			0			0			0			0			0			0								
SUBTOTAL HT LOSS			1698			3048			3187			702			208			1130			880			7555		
SUB TOTAL HT GAIN				1694		3451			3200			479			31			167			230			571		
LEVEL FACTOR / MULTIPLIER	0.30	0.35				0.30	0.35		0.30	0.35		0.20	0.21		0.30	0.35		0.30	0.35		0.30	0.35		0.50	0.78	
AIR CHANGE HEAT LOSS			588			1056			1104			145			72			391			305			5860		
AIR CHANGE HEAT GAIN				72			147			136		20			1			7			10			24		
DUCT LOSS			0			0			0			0			0			0			0			0		
DUCT GAIN				0			0			0		0			0			0			0			0		
HEAT GAIN PEOPLE	240		0		0	0		0	0	0	0	0		0	0	0	0	0	0	0	0	0	0	0	0	
HEAT GAIN APPLIANCES/LIGHTS				360		360			360			360			360			360			360			360		
TOTAL HT LOSS BTU/H			2286			4104			4291			847			280			1521			1185			13415		
TOTAL HT GAIN x 1.3 BTU/H				2764		5145			4804			1116			510			695			779			1242		

SITE NAME: LEAFTRAIL HOLDINGS
BUILDER: ROYAL PINE HOMES

TYPE: 2505

DATE: Apr-22

GFA: 2384 LO# 95323

HEATING CFM 1145 COOLING CFM 1145
TOTAL HEAT LOSS 41,057 TOTAL HEAT GAIN 34,019
AIR FLOW RATE CFM 27.89 AIR FLOW RATE CFM 33.66

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-60-14

60

INPUT (BTU/H) = 60,000

OUTPUT (BTU/H) = 58,000

RUN COUNT	4th	3rd	2nd	1st	Bas
S/A	0	0	10	9	4
R/A	0	0	5	2	1

plenium pressure s/a 0.18 r/a pressure 0.17
max s/a dif press. loss 0.02 r/a grille press. Loss 0.02
min adjusted pressure s/a 0.16 adjusted pressure r/a 0.15

FAN SPEED
LOW 0
MEDLOW 785
MEDIUM 960
MEDIUM HIGH 1145
HIGH 1440

DESIGN CFM = 1145
CFM @ .6" E.S.P.

TEMPERATURE RISE 47 °F

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	11	12	13	14	15	16	17	18	19	20	21	22	23	24
ROOM NAME	MBR	ENS	BED-3	BED-2	BED-3	BED-4	BATH	BED-4	MBR	LV/DN	FAM	FAM	KT/BR	KT/BR	LV/DN	LAUN	W/R	FOY	MUD	BAS	BAS	BAS	BAS
RM LOSS MBH.	1.13	1.73	1.83	1.95	1.83	1.44	0.65	1.44	1.13	2.15	1.14	1.14	2.05	2.05	2.15	0.85	0.28	1.52	1.19	3.35	3.35	3.35	3.35
CFM PER RUN HEAT	32	48	51	54	51	40	18	40	32	60	32	32	57	57	60	24	8	42	33	94	94	94	94
RM GAIN MBH.	1.49	2.18	2.59	2.51	2.59	1.71	0.67	1.71	1.49	2.40	1.38	1.38	2.57	2.57	2.40	1.12	0.51	0.69	0.78	0.31	0.31	0.31	0.31
CFM PER RUN COOLING	50	73	87	85	87	58	23	58	50	81	47	47	87	87	81	38	17	23	26	10	10	10	10
ADJUSTED PRESSURE	0.17	0.17	0.16	0.16	0.16	0.17	0.17	0.17	0.17	0.16	0.17	0.17	0.16	0.16	0.16	0.17	0.17	0.17	0.17	0.16	0.16	0.16	0.16
ACTUAL DUCT LGH.	37	42	59	43	59	54	36	50	42	54	23	13	30	33	50	54	14	34	21	27	11	23	47
EQUIVALENT LENGTH	160	210	200	180	220	140	130	120	150	110	120	100	130	130	110	180	180	180	120	140	130	140	120
TOTAL EFFECTIVE LENGTH	197	252	259	223	279	194	166	170	192	164	143	113	160	163	160	234	194	214	141	167	141	163	167
ADJUSTED PRESSURE	0.09	0.07	0.06	0.07	0.06	0.09	0.1	0.1	0.09	0.1	0.12	0.15	0.1	0.1	0.1	0.07	0.09	0.08	0.12	0.1	0.11	0.1	0.1
ROUND DUCT SIZE	5	6	6	6	6	5	4	5	5	6	4	4	6	6	6	5	4	4	4	6	6	6	6
HEATING VELOCITY (ft/min)	235	245	260	275	260	294	207	294	235	306	367	367	291	291	306	176	92	482	379	479	479	479	479
COOLING VELOCITY (ft/min)	367	372	444	433	444	426	264	426	367	413	539	539	444	444	413	279	195	264	298	51	51	51	51
OUTLET GRILL SIZE	3X10	4X10	4X10	4X10	4X10	3X10	3X10	3X10	3X10	4X10	3X10	3X10	4X10	4X10	4X10	3X10	3X10	3X10	3X10	4X10	4X10	4X10	4X10
TRUNK	A	C	B	C	B	C	C	C	A	B	A	A	A	A	B	B	C	B	C	A	A	C	B

RUN #	ROOM NAME	RM LOSS MBH.	CFM PER RUN HEAT	RM GAIN MBH.	CFM PER RUN COOLING	ADJUSTED PRESSURE	ACTUAL DUCT LGH.	EQUIVALENT LENGTH	TOTAL EFFECTIVE LENGTH	ADJUSTED PRESSURE	ROUND DUCT SIZE	HEATING VELOCITY (ft/min)	COOLING VELOCITY (ft/min)	OUTLET GRILL SIZE	TRUNK
1	MBR	1.13	32	1.49	50	0.17	37	160	197	0.09	5	235	367	3X10	A
2	ENS	1.73	48	2.18	73	0.17	42	210	252	0.07	6	245	372	4X10	C
3	BED-3	1.83	51	2.59	87	0.16	59	200	259	0.06	6	260	444	4X10	B
4	BED-2	1.95	54	2.51	85	0.16	43	180	223	0.07	6	275	433	4X10	C
5	BED-3	1.83	51	2.59	87	0.16	59	220	279	0.06	6	260	444	4X10	B
6	BED-4	1.44	40	1.71	58	0.17	54	140	194	0.09	5	294	426	3X10	C
7	BATH	0.65	18	0.67	23	0.17	36	130	166	0.1	4	207	264	3X10	C
8	BED-4	1.44	40	1.71	58	0.17	50	120	170	0.1	5	294	426	3X10	C
10	MBR	1.13	32	1.49	50	0.17	42	150	192	0.09	5	235	367	3X10	A
11	LV/DN	2.15	60	2.40	81	0.16	54	110	164	0.1	6	306	413	4X10	B
12	FAM	1.14	32	1.38	47	0.17	23	120	143	0.12	4	367	539	3X10	A
13	FAM	1.14	32	1.38	47	0.17	13	100	113	0.15	4	367	539	3X10	A
14	KT/BR	2.05	57	2.57	87	0.16	30	130	160	0.1	6	291	444	4X10	A
15	KT/BR	2.05	57	2.57	87	0.16	33	130	163	0.1	6	291	444	4X10	A
16	LV/DN	2.15	60	2.40	81	0.16	50	110	163	0.1	6	306	413	4X10	B
17	LAUN	0.85	24	1.12	38	0.17	54	180	234	0.07	5	176	279	3X10	B
18	W/R	0.28	8	0.51	17	0.17	14	180	194	0.09	4	92	195	3X10	C
19	FOY	1.52	42	0.69	23	0.17	34	180	214	0.08	4	482	264	3X10	B
20	MUD	1.19	33	0.78	26	0.17	21	120	141	0.12	4	379	298	3X10	C
21	BAS	3.35	94	0.31	10	0.16	27	140	167	0.1	6	479	51	4X10	A
22	BAS	3.35	94	0.31	10	0.16	11	130	141	0.11	6	479	51	4X10	A
23	BAS	3.35	94	0.31	10	0.16	23	140	163	0.1	6	479	51	4X10	C
24	BAS	3.35	94	0.31	10	0.16	47	120	167	0.1	6	479	51	4X10	B

SUPPLY AIR TRUNK SIZE															RETURN AIR TRUNK SIZE														
		TRUNK	STATIC	ROUND	RECT				VELOCITY			TRUNK	STATIC	ROUND	RECT				VELOCITY			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	430	0.09	9.9	12	x	8	645			TRUNK G	0	0.00	0	0	x	8	0			TRUNK O	0	0.05	0	0	x	8	0	
	TRUNK B	382	0.06	10.5	14	x	8	491			TRUNK H	0	0.00	0	0	x	8	0			TRUNK P	0	0.05	0	0	x	8	0	
	TRUNK C	717	0.06	13.3	20	x	8	645			TRUNK I	0	0.00	0	0	x	8	0			TRUNK Q	0	0.05	0	0	x	8	0	
	TRUNK D	0	0.00	0	0	x	8	0			TRUNK J	0	0.00	0	0	x	8	0			TRUNK R	0	0.05	0	0	x	8	0	
	TRUNK E	0	0.00	0	0	x	8	0			TRUNK K	0	0.00	0	0	x	8	0			TRUNK S	0	0.05	0	0	x	8	0	
	TRUNK F	0	0.00	0	0	x	8	0			TRUNK L	0	0.00	0	0	x	8	0			TRUNK T	0	0.05	0	0	x	8	0	

RETURN AIR #	1	2	3	4	5	6	7											BR	TRUNK W TRUNK X TRUNK Y TRUNK Z DROP	835 1145 545 270 1145	0.05 0.05 0.05 0.05 0.05	14.7 16.6 12.6 9.7 16.6	26 32 18 12 24	x x x x x	8 8 8 8 10	578 644 545 405 687
AIR VOLUME	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	175									
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									
ACTUAL DUCT LGH.	55	68	58	63	53	19	47	1	1	1	1	1	1	1	1	1	14									
EQUIVALENT LENGTH	215	225	255	260	205	135	210	0	0	0	0	0	0	0	0	0	135									
TOTAL EFFECTIVE LH	270	293	313	323	258	154	257	1	1	1	1	1	1	1	1	1	149									
ADJUSTED PRESSURE	0.05	0.05	0.05	0.05	0.06	0.10	0.06	14.80	14.80	14.80	14.80	14.80	14.80	14.80	14.80	14.80	0.10									
ROUND DUCT SIZE	6.3	7	7	6	6.7	8.6	7.5	0	0	0	0	0	0	0	0	0	6.9									
INLET GRILL SIZE	8	8	8	8	8	8	8	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									
INLET GRILL SIZE	14	14	14	14	14	30	14	0	0	0	0	0	0	0	0	0	14									

TYPE: 2505
SITE NAME: LEAFTRAIL HOLDINGS

LO # 95323

RESIDENTIAL MECHANICAL VENTILATION DESIGN SUMMARY

COMBUSTION APPLIANCES		9.32.3.1(1)
a)	☒ Direct vent (sealed combustion) only	
b)	☐ Positive venting induced draft (except fireplaces)	
c)	☐ Natural draft, B-vent or induced draft gas fireplace	
d)	☐ Solid Fuel (including fireplaces)	
e)	☐ No Combustion Appliances	

HEATING SYSTEM	
☒ Forced Air	☐ Non Forced Air
☐ Electric Space Heat	

HOUSE TYPE		9.32.1(2)
☒ I	Type a) or b) appliance only, no solid fuel	
☐ II	Type I except with solid fuel (including fireplaces)	
☐ III	Any Type c) appliance	
☐ IV	Type I, or II with electric space heat	
☐	Other: Type I, II or IV no forced air	

SYSTEM DESIGN OPTIONS		O.N.H.W.P.
☐ 1	Exhaust only/Forced Air System	
☐ 2	HRV with Ducting/Forced Air System	
☒ 3	HRV Simplified/connected to forced air system	
☐ 4	HRV with Ducting/non forced air system	
☐	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>4</u> @ 10.6 cfm	<u>42.4</u> cfm
Other Rooms	<u>5</u> @ 10.6 cfm	<u>53.0</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	☒ HVI Approved

PRINCIPAL EXHAUST HEAT LOSS CALCULATION				
CFM	ΔT °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	☒	3.5
BATH	BY INSTALLING CONTRACTOR	50	☒	3.5
W/R	BY INSTALLING CONTRACTOR	50	☒	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	☒ 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#: 95323	Model: 2505	Builder: ROYAL PINE HOMES	Date: 2022-04-25																																																									
Volume Calculation		Air Change & Delta T Data																																																										
House Volume <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>1090</td> <td>9</td> <td>9810</td> </tr> <tr> <td>First</td> <td>1090</td> <td>10</td> <td>10900</td> </tr> <tr> <td>Second</td> <td>1294</td> <td>9</td> <td>11646</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>32,356.0 ft³</td> </tr> <tr> <td colspan="2" style="text-align: right;">Total:</td> <td></td> <td>916.2 m³</td> </tr> </tbody> </table>		Level	Floor Area (ft²)	Floor Height (ft)	Volume (ft³)	Bsmt	1090	9	9810	First	1090	10	10900	Second	1294	9	11646	Third	0	9	0	Fourth	0	9	0	Total:			32,356.0 ft³	Total:			916.2 m³	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 80%;">WINTER NATURAL AIR CHANGE RATE</td> <td style="width: 20%;">0.273</td> </tr> <tr> <td>SUMMER NATURAL AIR CHANGE RATE</td> <td>0.089</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	0.273	SUMMER NATURAL AIR CHANGE RATE	0.089	Design Temperature Difference						Tin °C	Tout °C	ΔT °C	ΔT °F	Winter DTDh	22	-19	41	74	Summer DTDc	24	30	6	11
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5.2.3.1 Heat Loss due to Air Leakage		6.2.6 Sensible Gain due to Air Leakage																																																										
$HL_{airb} = LR_{airh} \times \frac{V_b}{3.6} \times DTD_h \times 1.2$ 0.273 x 254.51 x 41 °C x 1.2 = 3435 W = 11719 Btu/h		$HG_{salb} = LR_{airc} \times \frac{V_b}{3.6} \times DTD_c \times 1.2$ = 0.089 x 254.51 x 6 °C x 1.2 = 165 W = 565 Btu/h																																																										
5.2.3.2 Heat Loss due to Mechanical Ventilation		6.2.7 Sensible heat Gain due to Ventilation																																																										
$HL_{vairb} = PVC \times DTD_h \times 1.08 \times (1 - E)$ 80 CFM x 74 °F x 1.08 x 0.25 = 1593 Btu/h		$HL_{vairb} = PVC \times DTD_h \times 1.08 \times (1 - E)$ 80 CFM x 11 °F x 1.08 x 0.25 = 236 Btu/h																																																										
5.2.3.3 Calculation of Air Change Heat Loss for Each Room (Floor Multiplier Section)																																																												
$HL_{airr} = Level\ Factor \times HL_{airbv} \times \{(HL_{agcr} + HL_{bgcr}) \div (HL_{agclevel} + HL_{bgclevel})\}$																																																												
Level	Level Factor (LF)	HLairve Air Leakage + Ventilation Heat Loss (Btu/h)	Level Conductive Heat Loss: (HL _{clevel})	Air Leakage Heat Loss Multiplier (LF x HLairbv / HLlevel)																																																								
1	0.5	11,719	7,555	0.776																																																								
2	0.3		10,152	0.346																																																								
3	0.2		11,310	0.207																																																								
4	0		0	0.000																																																								
5	0		0	0.000																																																								
*HLairbv = Air leakage heat loss + ventilation heat loss *For a balanced or supply only ventilation system HLairve = 0																																																												
				Michael O'Rourke BCIN# 19669 																																																								

HEAT LOSS AND GAIN SUMMARY SHEET

MODEL: 2505	BUILDER: ROYAL PINE HOMES
SFQT: 2384	SITE: LEAFTRAIL HOLDINGS
LO# 95323	

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:	DETACHED	# 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 ³):	32356.0	ASSUMED (Y/N):	Y
INTERNAL SHADING:	BLINDS/CURTAINS	ASSUMED OCCUPANTS:	5
INTERIOR LIGHTING LOAD (Btu/h/ft ²):	1.45	DC BRUSHLESS MOTOR (Y/N):	Y
FOUNDATION CONFIGURATION	BCIN_1	DEPTH BELOW GRADE:	6.0 ft
LENGTH: 51.0 ft	WIDTH: 27.0 ft	EXPOSED PERIMETER:	156.0 ft

2012 OBC - COMPLIANCE PACKAGE**Component****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	-

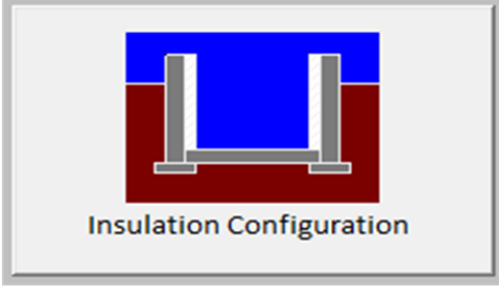
INDIVIDUAL BCIN: 19669

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):	8.2	
Exposed Perimeter (m):	0.0	
Wall Height (m):	2.7	
Depth Below Grade (m):	1.83	
Window Area (m ²):	0.8	
Door Area (m ²):	1.9	
Radiant Slab		
Heated Fraction of the Slab:	0	
Fluid Temperature (°C):	33	
Design Months		
Heating Month	1	
Foundation Loads		
Heating Load (Watts):		1562

TYPE: 2505
LO# 95323

Air Infiltration Residential Load Calculator

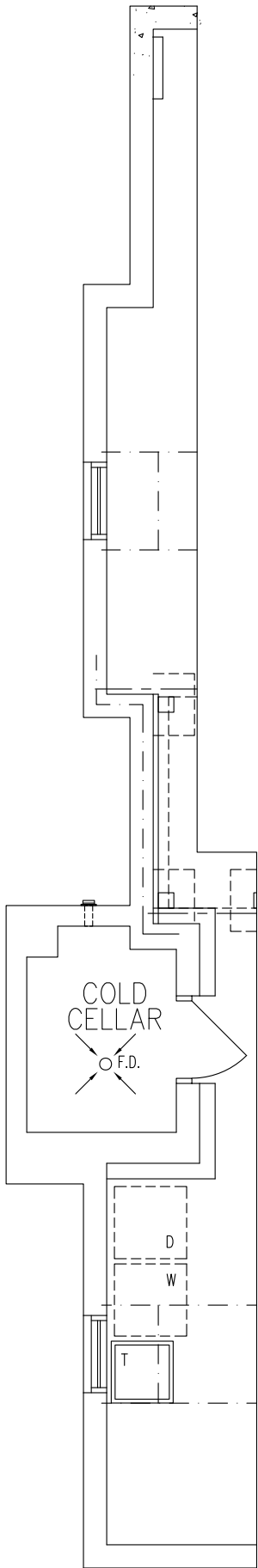
Supplemental tool for CAN/CSA-F280

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:	Detached			
Number of Stories:	Two			
Foundation:	Full			
House Volume (m ³):	916.2			
Air Leakage/Ventilation				
Air Tightness Type:	Energy Star Attached (3.0 ACH)			
Custom BDT Data:	ELA @ 10 Pa.	1026.3 cm ²		
	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):	0.273			
Cooling Air Leakage Rate (ACH/H):	0.089			

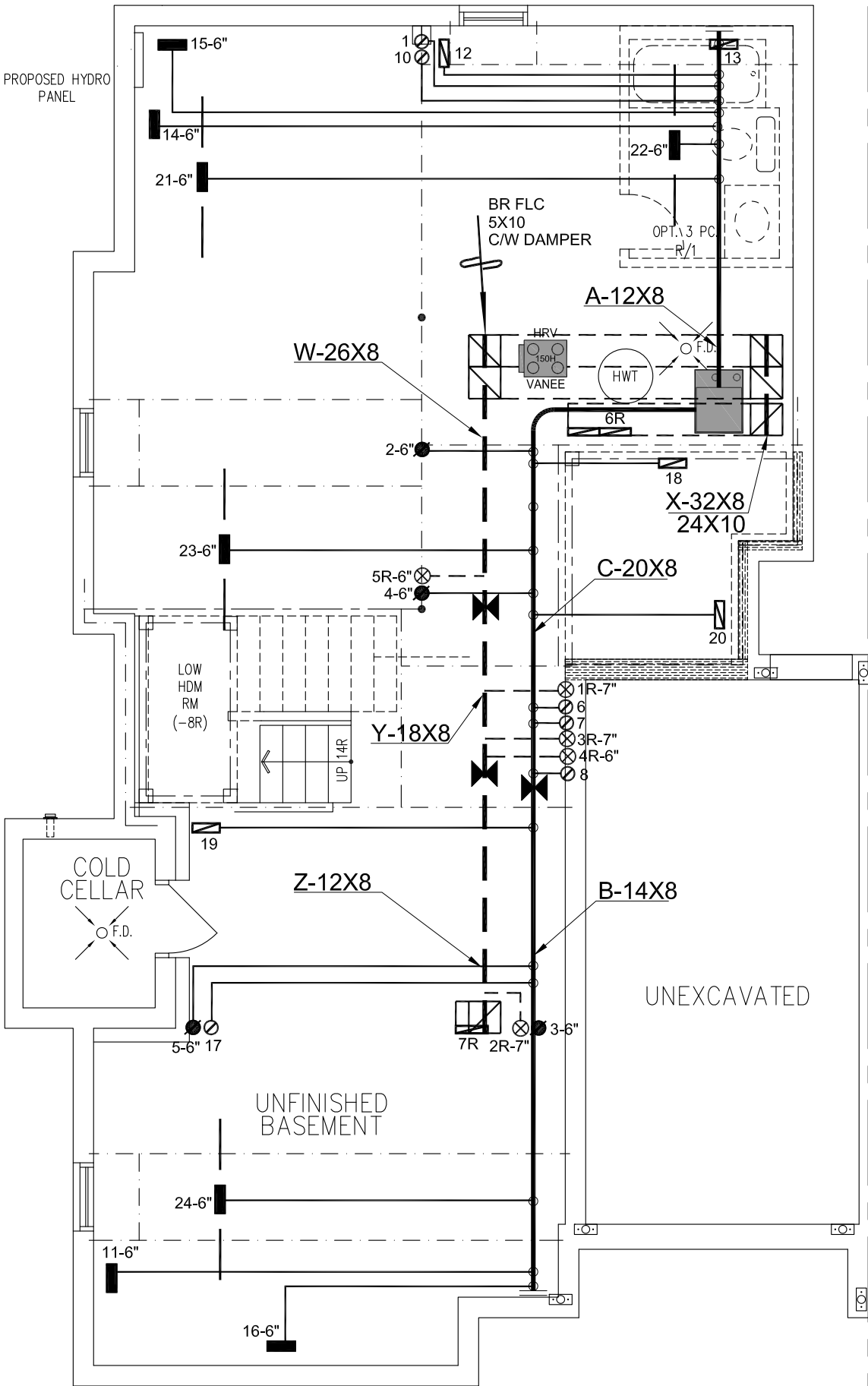
TYPE: 2505
LO# 95323

Michael O'Rourke BCIN# 19669





PARTIAL BASEMENT PLAN, ELEV 'B'



BASEMENT PLAN ELEV 'A'

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

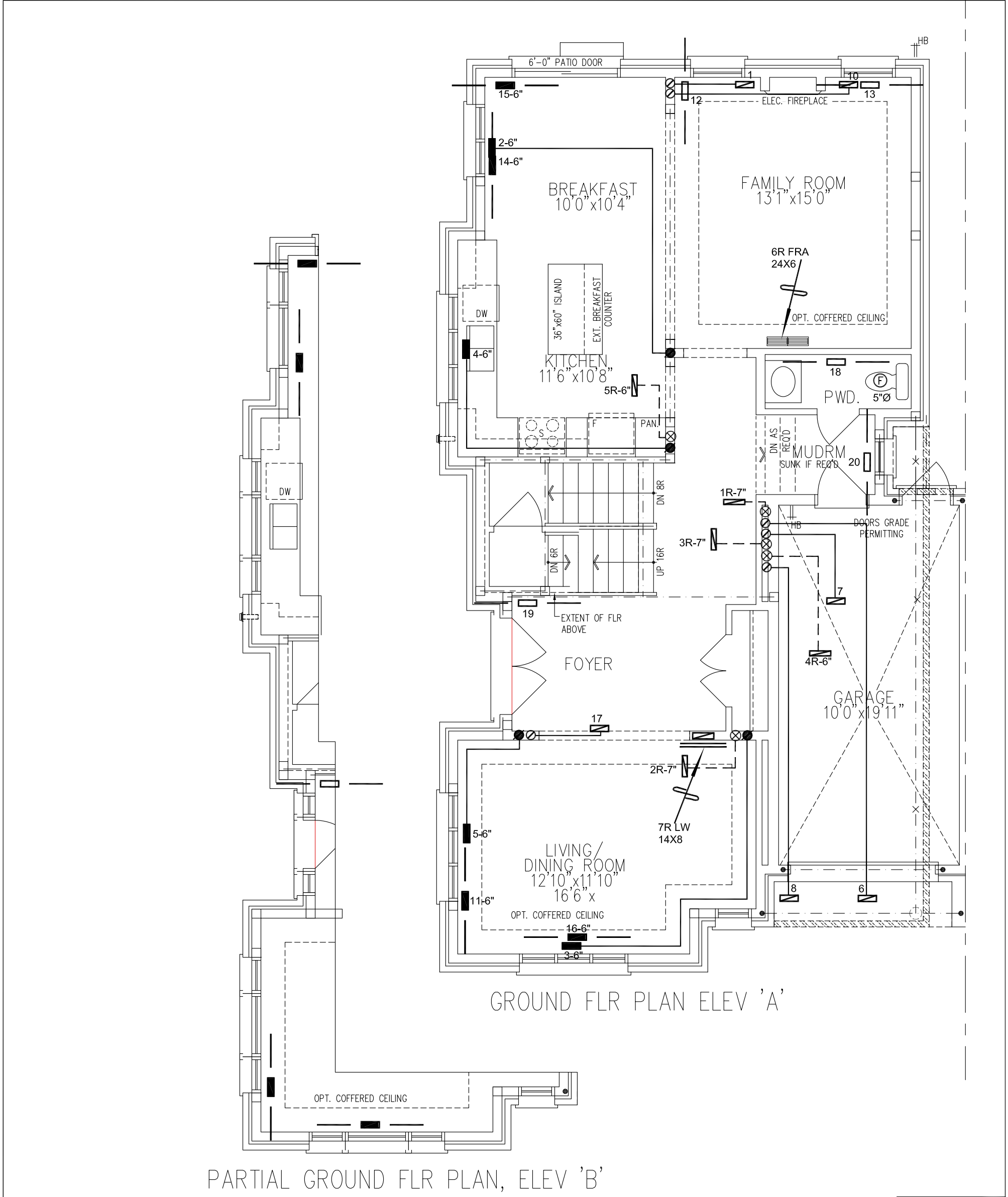
CSA-F280-12

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		

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Client		 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		HEAT LOSS 42650 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				MODEL 59SP5A-60-14		2ND FLOOR 10 5 2				
LEAFTRAIL HOLDINGS BRAMPTON, ONTARIO				INPUT 60 MBTU/H		1ST FLOOR 9 2 2				
2505		2384 sqft		OUTPUT 58 MBTU/H		BASEMENT 4 1 0			Date	MAR/2022
		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.		COOLING 3,0 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"
				FAN SPEED 1145 cfm @ 0.6" w.c.					BCIN# 19669	
									LO#	95323



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Michael O'Rourke
Michael O'Rourke, BCIN# 19669
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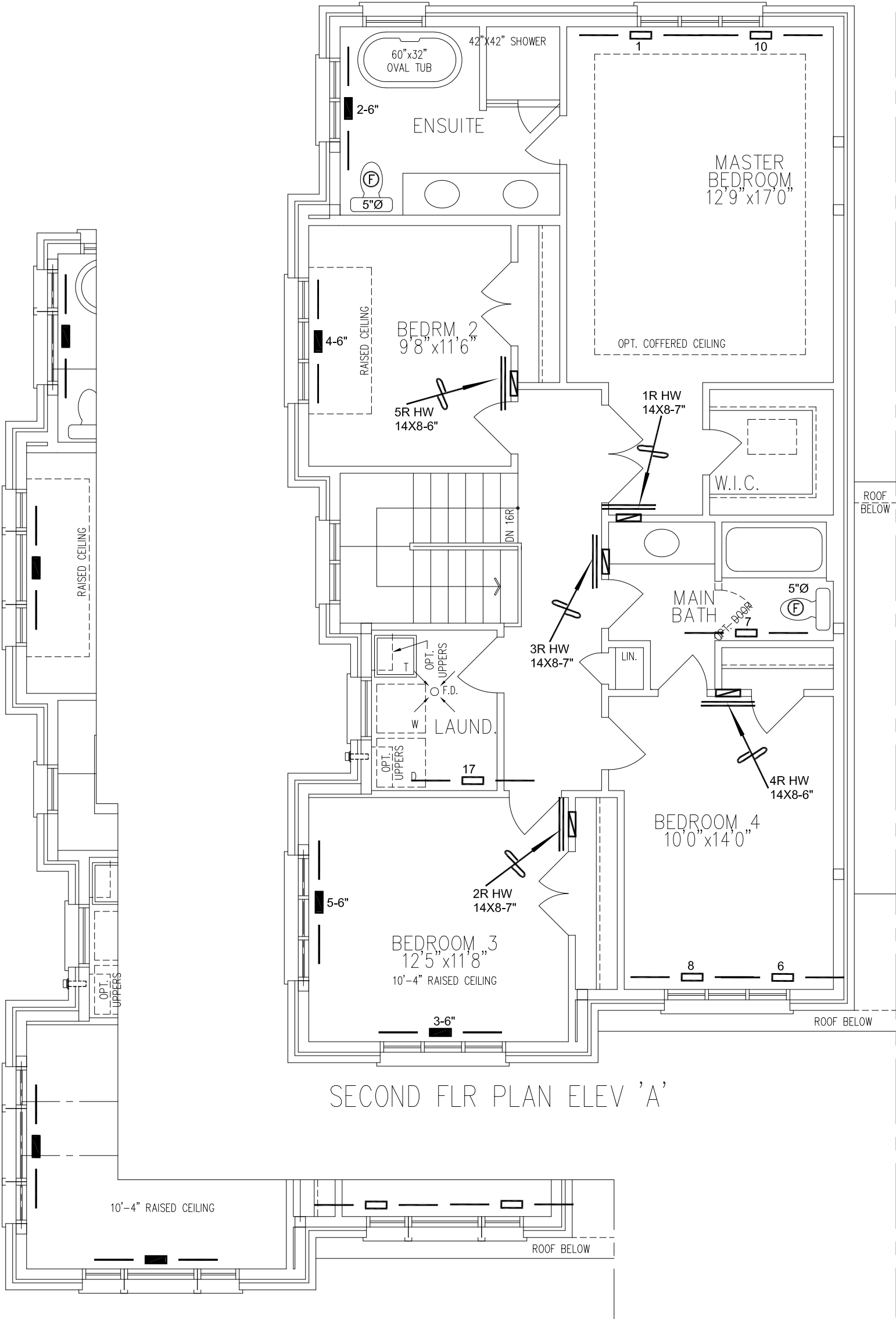
CSA-F280-12

SB-12 PERFORMANCE

HVAC LEGEND								3.		
SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	2.		
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	SUPPLY AIR GRILLE 6" BOOT		SUPPLY AIR STACK FROM 2nd FLOOR		30"x8" RETURN AIR GRILLE		RETURN AIR STACK 2nd FLOOR	No.	Description	Date
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ROYAL PINE HOMES			FIRST FLOOR HEATING LAYOUT	
Project Name LEAFTRAIL HOLDINGS BRAMPTON, ONTARIO			Date	MAR/2022
			Scale	3/16" = 1'-0"
			BCIN# 19669	
2505				



SECOND FLR PLAN ELEV 'A'

PARTIAL SECOND FLOOR PLAN ELEV 'B'

I MICHAEL O'ROURKE HAVE REVIEWED AND TAKE RESPONSIBILITY FOR THE DESIGN WORK AND AM QUALIFIED UNDER DIVISION C, 3.2.5 OF THE BUILDING CODE.

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

CSA-F280-12

SB-12 PERFORMANCE

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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"
2505			BCIN# 19669	
2384 sqft			LO#	95323