

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: 40-6 OPT 5 BED Project: VALES OF HUMBER	
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.			
March 21, 2022		 Signature of Designer	
Date			

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: VALES OF HUMBER				OPT 5 BED				DATE: Mar-22				WINTER NATURAL AIR CHANGE RATE 0.248				HEAT LOSS ΔT °F. 74				CSA-F280-12											
BUILDER: ROYAL PINE HOMES				TYPE: 40-6				GFA: 3491				LO# 92084				SUMMER NATURAL AIR CHANGE RATE 0.081				HEAT GAIN ΔT °F. 11				SB-12 PERFORMANCE							
ROOM USE		MBR		ENS		WIC		BED-2		BED-3		BED-5		BTH-2/3		BED-4		S-BATH													
EXP. WALL		34		26		11		15		25		13		13		40		6													
CLG. HT.		9		9		9		9		9		9		9		9		9													
FACTORS																															
GRS.WALL AREA		LOSS GAIN		306		234		99		135		225		117		117		360		54											
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	19	395	294	0	0	0	7	145	108	13	270	201	0	0	0						
EAST		20.8	41.0	0	0	0	0	0	0	0	0	0	37	769	1519	0	0	0	45	935	1847	0	0	0							
SOUTH		20.8	24.4	0	0	0	6	125	146	6	125	146	0	0	0	0	17	353	415	17	353	415	6	125	146						
WEST		20.8	41.0	38	789	1560	19	395	780	0	0	0	0	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	0	0	0	0						
DOORS		24.7	3.7	0	0	0	0	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	268	929	138	209	725	107	93	322	48	116	402	60	188	652	97	100	347	51	110	381	57	285	988	146	48	166	25	
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	0	0	0	0	0	0		
EXPOSED CLG		1.3	0.6	288	361	160	168	210	94	143	179	80	257	322	143	212	266	118	244	306	136	160	200	89	272	341	152	84	105	47	
NO ATTIC EXPOSED CLG		2.7	1.2	0	0	0	0	0	0	0	0	0	0	0	0	9	24	11	0	0	0	0	0	0	14	38	17	0	0	0	
EXPOSED FLOOR		2.5	0.4	0	0	0	0	0	0	0	0	0	0	0	0	221	550	82	0	0	0	63	157	23	0	0	0	0	0	0	
BASEMENT/CRAWL HEAT LOSS				0		0		0		0		0		0		0		0		0		0		0		0		0		0	
SLAB ON GRADE HEAT LOSS				0		0		0		0		0		0		0		0		0		0		0		0		0		0	
SUBTOTAL HT LOSS				2080		1455		626		1119		2261		1006		884		2925		396											
SUB TOTAL HT GAIN				1858		1127		274		497		1826		602		277		2778		218											
LEVEL FACTOR / MULTIPLIER		0.20	0.24			0.20	0.24			0.20	0.24			0.20	0.24			0.20	0.24			0.20	0.24								
AIR CHANGE HEAT LOSS				489		342		147		263		532		237		208		688		93											
AIR CHANGE HEAT GAIN				110		67		16		29		108		36		16		165		13											
DUCT LOSS				0		0		0		0		279		0		109		0		0											
DUCT GAIN				0		0		0		0		282		0		29		0		0											
HEAT GAIN PEOPLE		240		2	480	0	0	0	0	1	240		1	240		1	240	0	0	1	240	0	0	0	0	0	0	0	0	0	
HEAT GAIN APPLIANCES/LIGHTS				641		0		0		641		641		641		641		641		641		641		641		641		641		641	
TOTAL HT LOSS BTU/H				2569		1797		774		1382		3072		1242		1201		3613		490											
TOTAL HT GAIN x 1.3 BTU/H				4017		1552		377		1830		4026		1975		420		4971		300											

ROOM USE			LAND		DN/LV		K/B/F		DEN		WIC-5		PWD		FOY		MUD						WOD		BAS					
EXP. WALL			15		20		68		10		9		13		45		28						42		190					
CLG. HT.			10		10		10		10		9		11		11		11						10		10					
FACTORS																														
GRS.WALL AREA	LOSS	GAIN	150		200		680		100		81		143		495		308						420		1456					
GLAZING			LOSS	GAIN	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	208	155	19	395	294	0	0	0	7	145	108			0	0	0	6	125	93		
EAST	20.8	41.0	0	0	0	0	0	0	0	0	0	0	0	0	15	312	616	8	166	328	0	0	0	0	0	0	0	0		
SOUTH	20.8	24.4	0	0	0	38	789	927	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6	125	146			
WEST	20.8	41.0	0	0	0	0	0	0	85	1766	3489	0	0	0	0	0	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	0	0	0	0	0	0	0	0		
DOORS	24.7	3.7	20	493	73	0	0	0	0	0	0	0	0	0	0	0	0	40	986	146	40	986	146	0	0	0	0	0	0	
NET EXPOSED WALL	3.5	0.5	130	451	67	162	562	83	585	2028	301	81	281	42	66	229	34	143	496	74	447	1550	230	261	905	134				
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	0	0	0	242	850	126	444	
EXPOSED CLG	1.3	0.6	0	0	0	0	0	0	8	10	4	0	0	0	70	88	39	0	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	10	27	12	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	80	199	30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
BASEMENT/CRAWL HEAT LOSS																														
SLAB ON GRADE HEAT LOSS																														
SUBTOTAL HT LOSS				944			1351			4012			676			854			496			2702			2036			1058		8570
SUB TOTAL HT GAIN					140			1010			3949			336			730			74			704			389			537	470
LEVEL FACTOR / MULTIPLIER			0.30	0.39		0.30	0.39		0.30	0.39		0.30	0.39		0.20	0.24		0.30	0.39		0.30	0.39		0.30	0.39			0.50	0.83	
AIR CHANGE HEAT LOSS				371			531			1576			265			201			195			1062			800				8000	
AIR CHANGE HEAT GAIN					8		60			234			20			43			4			42			23				60	
DUCT LOSS				0			0			0			106			106			0			0			0				0	
DUCT GAIN					0		0			0			0			77			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	
HEAT GAIN APPLIANCES/LIGHTS					0		641			641			641			0			0			0			641			0	641	
TOTAL HT LOSS BTU/H				1315			1882			5588			941			1161			691			3764			2837			1058		16569
TOTAL HT GAIN x 1.3 BTU/H					193		2225			6272			1296			1106			101			970			1369			697		1522

SITE NAME: VALES OF HUMBER
BUILDER: ROYAL PINE HOMES

OPT 5 BED
TYPE: 40-6

DATE: Mar-22

GFA: 3491 LO# 92084

HEATING CFM 1145 COOLING CFM 1145
TOTAL HEAT LOSS 51,943 TOTAL HEAT GAIN 35,220
AIR FLOW RATE CFM 22.04 AIR FLOW RATE CFM 32.51

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

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

RUN COUNT	4th	3rd	2nd	1st	Bas
S/A	0	0	15	9	4
R/A	0	0	6	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	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
ROOM NAME	MBR	ENS	WIC	BED-2	BED-3	BED-5	BTH-2/3	BTH-2/3	BED-4	MBR	S-BATH	LAND	DN/LV	K/B/F	K/B/F	DEN	WIC-5	PWD	FOY	MUD	BAS	BAS	BAS	BAS
RM LOSS MBH.	1.28	0.90	0.77	1.38	1.54	1.24	0.60	0.60	1.81	1.28	0.49	1.31	1.88	1.86	1.86	0.94	1.16	0.69	3.76	2.84	4.41	4.41	4.41	4.41
CFM PER RUN HEAT	28	20	17	30	34	27	13	13	40	28	11	29	41	41	41	21	26	15	83	63	97	97	97	97
RM GAIN MBH.	2.01	0.78	0.38	1.83	2.01	1.98	0.21	0.21	2.49	2.01	0.30	0.19	2.23	2.09	2.09	1.30	1.11	0.10	0.97	1.37	0.56	0.56	0.56	0.56
CFM PER RUN COOLING	65	25	12	59	65	64	7	7	81	65	10	6	72	68	68	42	36	3	32	45	18	18	18	18
ADJUSTED PRESSURE	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	0.17	0.17	0.17	0.17	0.16	0.17	0.16	0.16	0.16	0.16
ACTUAL DUCT LGH.	45	46	38	32	62	19	29	44	63	36	41	34	20	35	27	14	53	28	45	21	26	30	20	45
EQUIVALENT LENGTH	200	130	120	110	190	140	180	120	130	120	150	160	140	130	140	90	170	130	100	210	110	110	130	120
TOTAL EFFECTIVE LENGTH	245	176	158	142	252	159	209	164	193	156	191	194	160	165	167	104	223	158	145	231	136	140	150	165
ADJUSTED PRESSURE	0.07	0.1	0.11	0.12	0.07	0.11	0.08	0.1	0.08	0.11	0.09	0.09	0.11	0.1	0.1	0.17	0.08	0.11	0.11	0.07	0.12	0.12	0.11	0.1
ROUND DUCT SIZE	5	4	4	6	6	6	4	4	6	5	4	4	5	5	5	4	4	4	6	5	6	6	6	6
HEATING VELOCITY (ft/min)	206	229	195	153	173	138	149	149	204	206	126	333	301	301	301	241	298	172	423	463	495	495	495	495
COOLING VELOCITY (ft/min)	477	287	138	301	331	326	80	80	413	477	115	69	529	499	499	482	413	34	163	330	92	92	92	92
OUTLET GRILL SIZE	3X10	3X10	3X10	4X10	4X10	4X10	3X10	3X10	4X10	3X10	3X10	3X10	3X10	3X10	3X10	3X10	3X10	3X10	4X10	3X10	4X10	4X10	4X10	4X10
TRUNK	B	B	B	C	D	E	E	E	D	A	E	D	E	B	B	C	D	E	D	E	A	B	E	D

RUN #	25	26	27	28
ROOM NAME	BED-3	BED-4	K/B/F	ENS
RM LOSS MBH.	1.54	1.81	1.86	0.90
CFM PER RUN HEAT	34	40	41	20
RM GAIN MBH.	2.01	2.49	2.09	0.78
CFM PER RUN COOLING	65	81	68	25
ADJUSTED PRESSURE	0.17	0.16	0.17	0.17
ACTUAL DUCT LGH.	58	70	33	50
EQUIVALENT LENGTH	180	150	100	140
TOTAL EFFECTIVE LENGTH	238	220	133	190
ADJUSTED PRESSURE	0.07	0.07	0.13	0.09
ROUND DUCT SIZE	6	6	5	4
HEATING VELOCITY (ft/min)	173	204	301	229
COOLING VELOCITY (ft/min)	331	413	499	287
OUTLET GRILL SIZE	4X10	4X10	3X10	3X10
TRUNK	D	D	A	B

SUPPLY AIR TRUNK SIZE														RETURN AIR TRUNK SIZE													
	TRUNK CFM	STATIC PRESS.	ROUND DUCT	RECT DUCT			VELOCITY (ft/min)		TRUNK CFM	STATIC PRESS.	ROUND DUCT	RECT DUCT			VELOCITY (ft/min)		TRUNK CFM	STATIC PRESS.	ROUND DUCT	RECT DUCT			VELOCITY (ft/min)				
TRUNK A	166	0.11	6.6	8	x	8	374	TRUNK G	0	0.00	0	0	x	8	0	TRUNK O	0	0.05	0	0	x	8	0				
TRUNK B	264	0.07	8.8	10	x	8	475	TRUNK H	0	0.00	0	0	x	8	0	TRUNK P	0	0.05	0	0	x	8	0				
TRUNK C	481	0.07	11	16	x	8	541	TRUNK I	0	0.00	0	0	x	8	0	TRUNK Q	0	0.05	0	0	x	8	0				
TRUNK D	383	0.07	10.1	12	x	8	575	TRUNK J	0	0.00	0	0	x	8	0	TRUNK R	0	0.05	0	0	x	8	0				
TRUNK E	663	0.07	12.4	18	x	8	663	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	8								BR
AIR VOLUME	85	95	95	95	95	75	300	155	0	0	0	0	0	0	0	150
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
ACTUAL DUCT LGH.	40	33	39	34	40	73	26	25	1	1	1	1	1	1	1	13
EQUIVALENT LENGTH	205	175	165	180	185	235	235	240	0	0	0	0	0	0	0	225
TOTAL EFFECTIVE LH	245	208	204	214	225	308	261	265	1	1	1	1	1	1	1	238
ADJUSTED PRESSURE	0.06	0.07	0.07	0.07	0.07	0.05	0.06	0.06	14.80	14.80	14.80	14.80	14.80	14.80	14.80	0.06
ROUND DUCT SIZE	6	6	6	6	6	6	9.6	7.5	0	0	0	0	0	0	0	7.4
INLET GRILL SIZE	8	8	8	8	8	8	8	8	0	0	0	0	0	0	0	8
	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	30	14	0	0	0	0	0	0	0	14

TYPE: 40-6
SITE NAME: VALES OF HUMBER

LO # 92084
OPT 5 BED

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>4</u> @ 10.6 cfm	<u>42.4</u> cfm
Kitchen & Bathrooms	<u>5</u> @ 10.6 cfm	<u>53</u> cfm
Other Rooms	<u>5</u> @ 10.6 cfm	<u>53.0</u> cfm
Table 9.32.3.A.	TOTAL	<u>190.8</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>95.4</u> cfm

SUPPLEMENTAL VENTILATION CAPACITY		9.32.3.5.
Total Ventilation Capacity	<u>190.8</u>	cfm
Less Principal Ventil. Capacity	<u>95.4</u>	cfm
Required Supplemental Capacity	<u>95.4</u>	cfm

PRINCIPAL EXHAUST FAN CAPACITY	
Model:	VANEE V150H
Location:	BSMT
<u>95.4</u> cfm	☒ HVI Approved

PRINCIPAL EXHAUST HEAT LOSS CALCULATION				
CFM	ΔT °F	FACTOR	% LOSS	
95.4 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
BTB-2/3	BY INSTALLING CONTRACTOR	50	☒	3.5
S-BATH	BY INSTALLING CONTRACTOR	50	☒	3.5
PWD	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 @ 32 deg F (0 deg C)	☒ HVI Approved

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:	March-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

CSA F280-12 Residential Heat Loss and Heat Gain Calculations																																																												
Formula Sheet (For Air Leakage / Ventilation Calculation)																																																												
LO#: 92084	Model: 40-6	Builder: ROYAL PINE HOMES	Date: 2022-03-21																																																									
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>1560</td> <td>10</td> <td>15600</td> </tr> <tr> <td>First</td> <td>1560</td> <td>10</td> <td>15600</td> </tr> <tr> <td>Second</td> <td>1931</td> <td>9</td> <td>17379</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="3" style="text-align: right;">Total:</td> <td>48,579.0 ft³</td> </tr> <tr> <td colspan="3" style="text-align: right;">Total:</td> <td>1375.6 m³</td> </tr> </tbody> </table>			Level	Floor Area (ft²)	Floor Height (ft)	Volume (ft³)	Bsmt	1560	10	15600	First	1560	10	15600	Second	1931	9	17379	Third	0	9	0	Fourth	0	9	0	Total:			48,579.0 ft³	Total:			1375.6 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%; text-align: center;">0.248</td> </tr> <tr> <td>SUMMER NATURAL AIR CHANGE RATE</td> <td style="text-align: center;">0.081</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 style="text-align: center;">22</td> <td style="text-align: center;">-19</td> <td style="text-align: center;">41</td> <td style="text-align: center;">74</td> </tr> <tr> <td>Summer DTDc</td> <td style="text-align: center;">24</td> <td style="text-align: center;">30</td> <td style="text-align: center;">6</td> <td style="text-align: center;">11</td> </tr> </table>		WINTER NATURAL AIR CHANGE RATE	0.248	SUMMER NATURAL AIR CHANGE RATE	0.081	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																																																									
$HL_{airb} = LR_{airh} \times \frac{V_b}{3.6} \times DTD_h \times 1.2$ 0.248 x 382.11 x 41 °C x 1.2 = 4689 W = 15999 Btu/h			$HG_{salb} = LR_{airc} \times \frac{V_b}{3.6} \times DTD_c \times 1.2$ = 0.081 x 382.11 x 6 °C x 1.2 = 226 W = 771 Btu/h																																																									
5.2.3.2 Heat Loss due to Mechanical Ventilation			6.2.7 Sensible heat Gain due to Ventilation																																																									
$HL_{vairb} = PVC \times DTD_h \times 1.08 \times (1 - E)$ 95 CFM x 74 °F x 1.08 x 0.25 = 1911 Btu/h			$HL_{vairb} = PVC \times DTD_h \times 1.08 \times (1 - E)$ 95 CFM x 11 °F x 1.08 x 0.25 = 283 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	15,999	9,628	0.831																																																								
2	0.3		12,217	0.393																																																								
3	0.2		13,605	0.235																																																								
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																																																												

HEAT LOSS AND GAIN SUMMARY SHEET

MODEL: 40-6	OPT 5 BED	BUILDER: ROYAL PINE HOMES
SFQT: 3491	LO# 92084	SITE: VALES OF HUMBER

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

BUILDING DATA

ATTACHMENT:	DETACHED	# OF STORIES (+BASEMENT):	3
FRONT FACES:	EAST	ASSUMED (Y/N):	Y
AIR CHANGES PER HOUR:	2.50	ASSUMED (Y/N):	Y
AIR TIGHTNESS CATEGORY:	TIGHT	ASSUMED (Y/N):	Y
WIND EXPOSURE:	SHELTERED	ASSUMED (Y/N):	Y
HOUSE VOLUME (ft ³):	48579.0	ASSUMED (Y/N):	Y
INTERNAL SHADING:	BLINDS/CURTAINS	ASSUMED OCCUPANTS:	6
INTERIOR LIGHTING LOAD (Btu/h/ft ²):	1.27	DC BRUSHLESS MOTOR (Y/N):	Y
FOUNDATION CONFIGURATION	BCIN_1	DEPTH BELOW GRADE:	7.0 ft
LENGTH: 63.0 ft	WIDTH: 32.0 ft	EXPOSED PERIMETER:	190.0 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 Minimum Efficiency	75%	-
Domestic Hot Water Heater Minimum EF	0.9	-

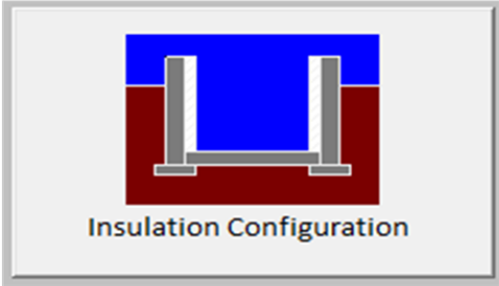
INDIVIDUAL BCIN: 19669

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):	19.2	
Floor Width (m):	9.8	
Exposed Perimeter (m):	0.0	
Wall Height (m):	3.0	
Depth Below Grade (m):	2.13	
Window Area (m ²):	2.0	
Door Area (m ²):	0.0	
Radiant Slab		
Heated Fraction of the Slab:	0	
Fluid Temperature (°C):	33	
Design Months		
Heating Month	1	
Foundation Loads		
Heating Load (Watts):		1981

TYPE: 40-6
LO# 92084

OPT 5 BED

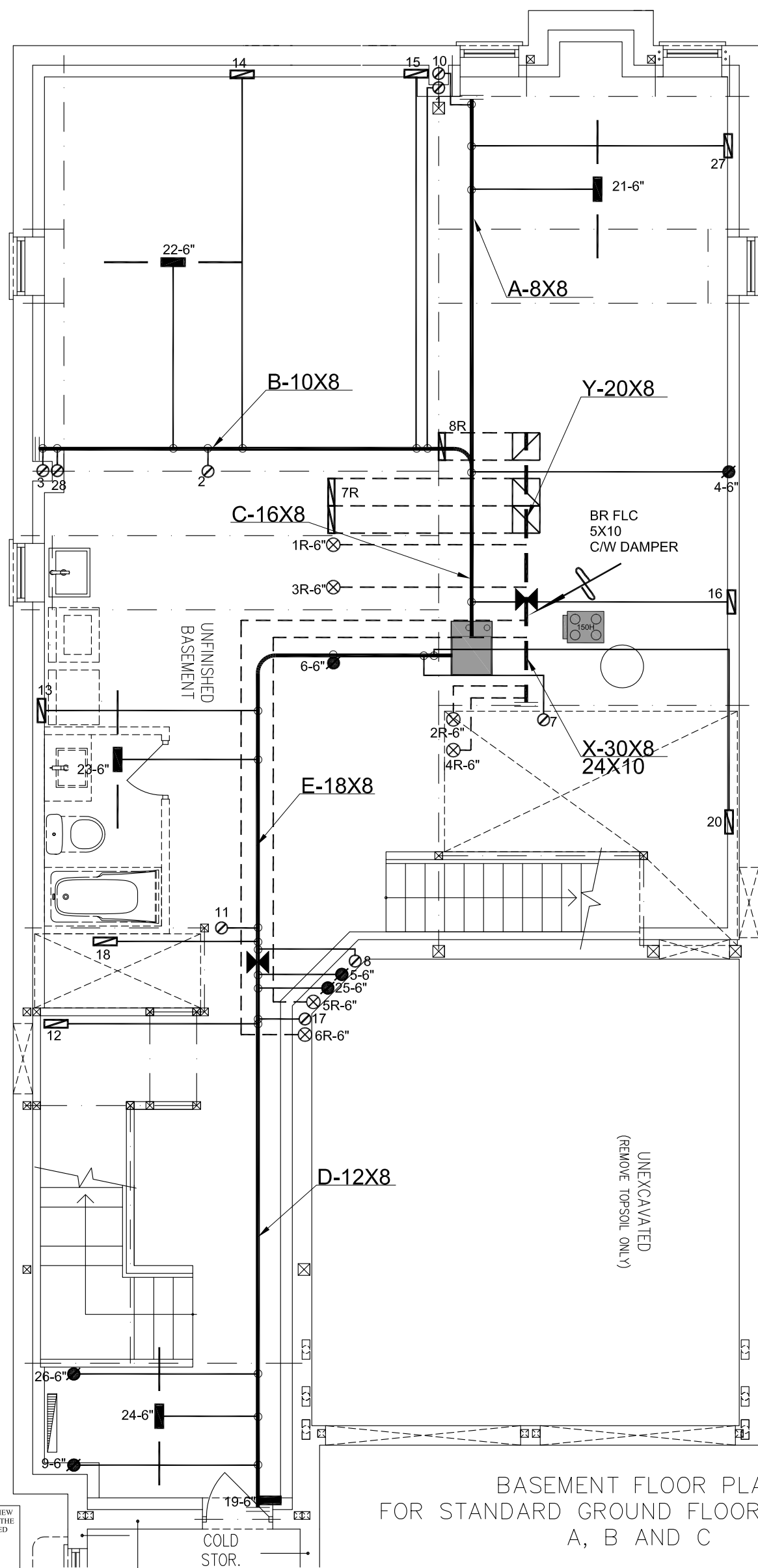
Air Infiltration Residential Load Calculator

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):	7.62			
Building Configuration				
Type:	Detached			
Number of Stories:	Two			
Foundation:	Full			
House Volume (m ³):	1375.6			
Air Leakage/Ventilation				
Air Tightness Type:	Energy Star Detached (2.5 ACH)			
Custom BDT Data:	ELA @ 10 Pa.	1284.1 cm ²		
	2.50	ACH @ 50 Pa		
Mechanical Ventilation (L/s):	Total Supply	Total Exhaust		
	45.0	45.0		
Flue Size				
Flue #:	#1	#2	#3	#4
Diameter (mm):	0	0	0	0
Natural Infiltration Rates				
Heating Air Leakage Rate (ACH/H):	0.248			
Cooling Air Leakage Rate (ACH/H):	0.081			

TYPE: 40-6
LO# 92084

OPT 5 BED



BASEMENT FLOOR PLAN
FOR STANDARD GROUND FLOOR ELEVATION
A, B AND C

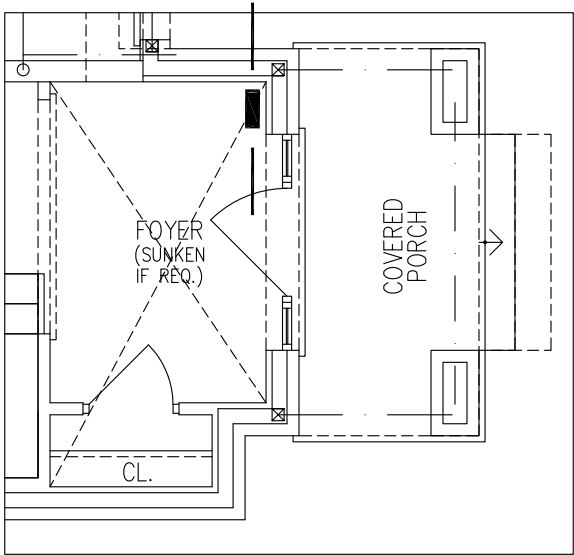
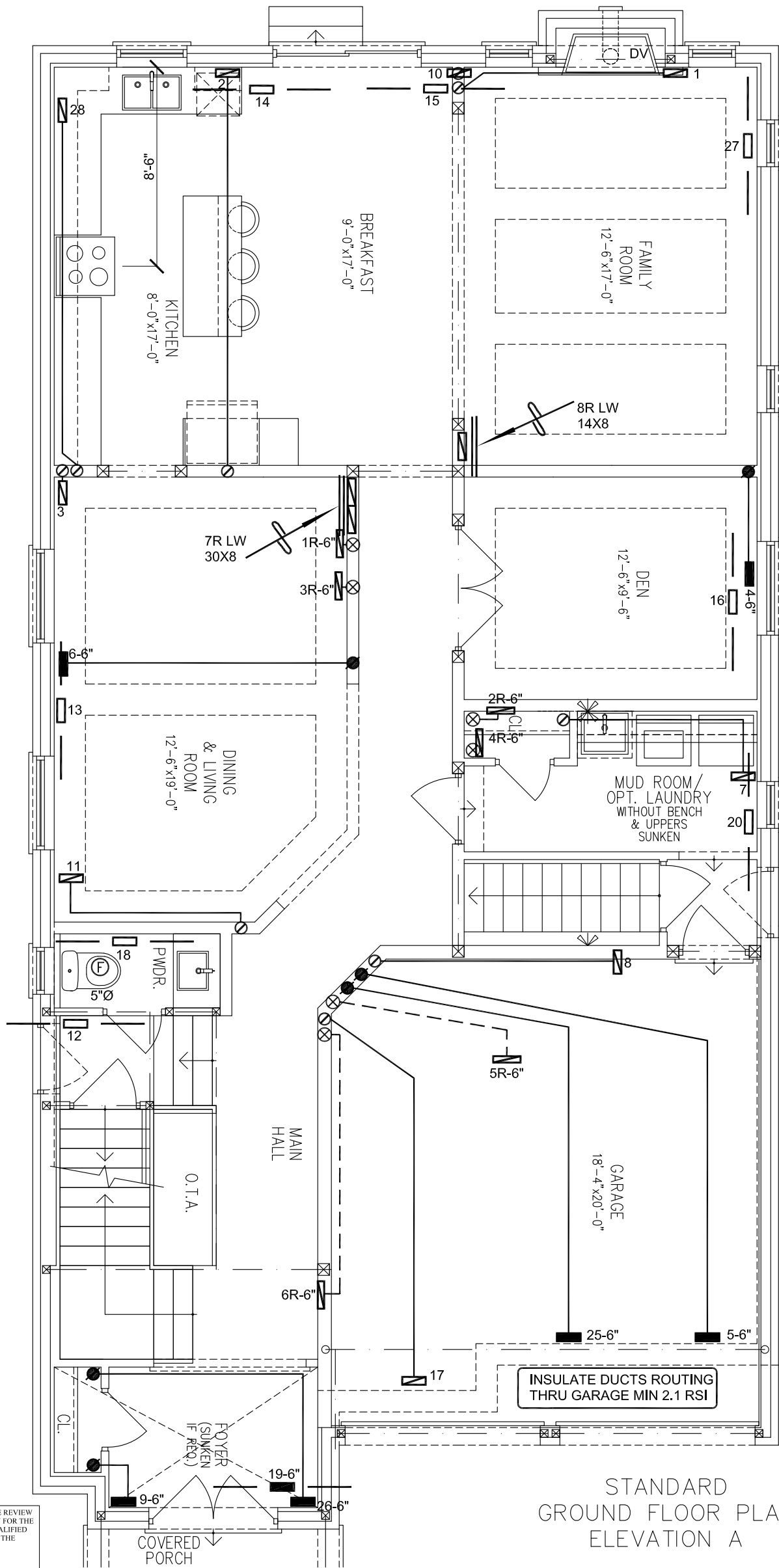
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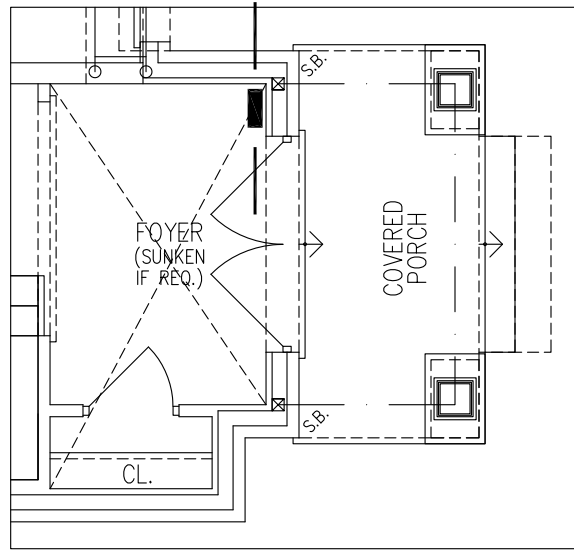
Michael O'Rourke, BCIN# 19669
HVAC DESIGNS LTD.

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Client			HEAT LOSS 53854 BTU/H UNIT DATA		# OF RUNS S/A R/A FANS				Sheet Title	
ROYAL PINE HOMES	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		MAKE		3RD FLOOR				BASEMENT HEATING LAYOUT	
Project Name			CARRIER		2ND FLOOR					
VALES OF HUMBER BRAMPTON, ONTARIO			MODEL 59SP5A-60-14		1ST FLOOR					
OPT 5 BED 40-6	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.		INPUT		BASEMENT				Date	
3491 sqft			60 MBTU/H		4 1 0				AUG/2021	
			OUTPUT		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	
			58 MBTU/H						3/16" = 1'-0"	
			COOLING						BCIN# 19669	
			3,0 TONS						LO# 92084	
			FAN SPEED							
			1145 cfm @ 0.6" w.c.							



STANDARD
GROUND FLOOR PLAN
ELEVATION B



STANDARD
GROUND FLOOR PLAN
ELEVATION C

STANDARD
GROUND FLOOR PLAN
ELEVATION A

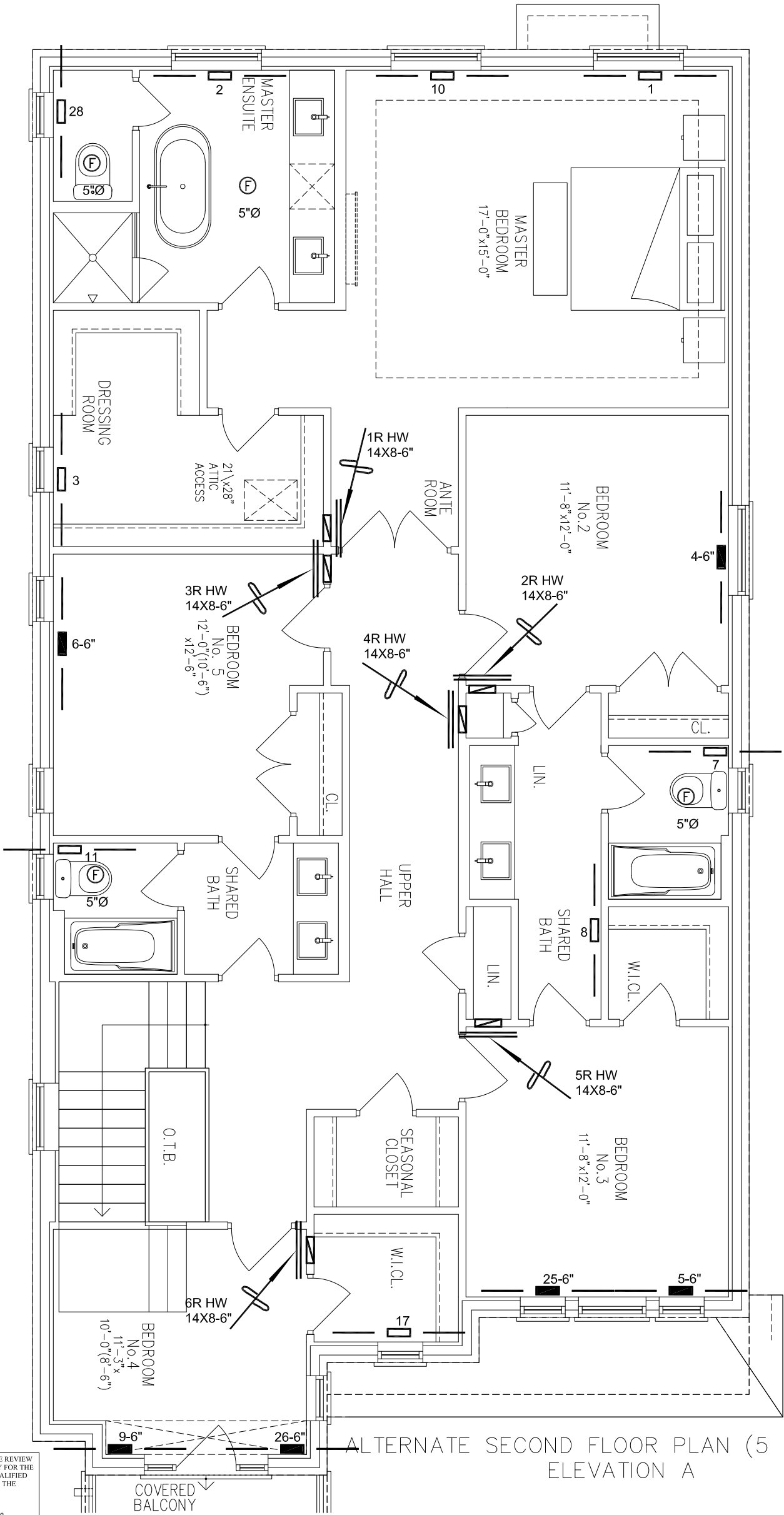
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Michael O'Rourke
Michael O'Rourke, BCIN# 19669
HVAC DESIGNS LTD.

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	MAR/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	Sheet Title	
ROYAL PINE HOMES			FIRST FLOOR HEATING LAYOUT	
Project Name VALES OF HUMBER BRAMPTON, ONTARIO			Date	AUG/2021
OPT 5 BED 40-6			Scale	3/16" = 1'-0"
3491 sqft		BCIN# 19669		
		LO#	92084	



ALTERNATE SECOND FLOOR PLAN (5 BEDROOM)
ELEVATION B

ALTERNATE SECOND FLOOR PLAN (5 BEDROOM)
ELEVATION C

ALTERNATE SECOND FLOOR PLAN (5 BEDROOM)
ELEVATION A

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

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	MAR/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 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.	Sheet Title	
ROYAL PINE HOMES			SECOND FLOOR HEATING LAYOUT	
Project Name			Date	AUG/2021
VALES OF HUMBER BRAMPTON, ONTARIO			Scale	3/16" = 1'-0"
OPT 5 BED 40-6			BCIN# 19669	
3491 sqft			LO#	92084