

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 GROUND - WUB 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			
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: VALES OF HUMBER				OPT GROUND - WUB				DATE: Mar-22				WINTER NATURAL AIR CHANGE RATE 0.227				HEAT LOSS ΔT °F. 74				CSA-F280-12							
BUILDER: ROYAL PINE HOMES				TYPE: 40-6				GFA: 3491				LO# 92089				SUMMER NATURAL AIR CHANGE RATE 0.074				HEAT GAIN ΔT °F. 11				SB-12 PERFORMANCE			
ROOM USE		MBR		ENS		WIC		BED-2		BED-3		BED-4		BTH-2/3		UP-DEN		S-BATH		GM-ENS							
EXP. WALL		34		26		11		15		25		13		13		40		6		0							
CLG. HT.		9		9		9		9		9		9		9		9		9		10							
FACTORS																											
GRS.WALL AREA		LOSS GAIN		306		234		99		135		225		117		117		360		54		0					
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	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	37	769	1519	0	0	0	0	0	0	0	0	0				
SOUTH		20.8	24.4	0	0	0	6	125	146	6	125	146	0	0	0	0	17	353	415	6	125	146	0				
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				
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				
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				
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			
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				
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			
NO ATTIC EXPOSED CLG		2.7	1.2	0	0	0	0	0	0	0	0	0	9	24	11	0	0	0	0	0	0	0	0	0			
EXPOSED FLOOR		2.5	0.4	0	0	0	0	0	0	0	0	0	221	550	82	0	0	0	63	157	23	0	0	0			
BASEMENT/CRAWL HEAT LOSS				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			
SUBTOTAL HT LOSS				2080		1455		626		1119		2261		1006		884		2925		396		121					
SUB TOTAL HT GAIN				1858		1127		274		497		1826		602		277		2778		218		105					
LEVEL FACTOR / MULTIPLIER		0.20	0.22			0.20	0.22			0.20	0.22			0.20	0.22			0.20	0.22			0.30	0.37				
AIR CHANGE HEAT LOSS				448		314		135		241		487		217		191		630		85		45					
AIR CHANGE HEAT GAIN				104		63		15		28		102		34		15		155		12		6					
DUCT LOSS				0		0		0		0		275		0		107		0		0		0					
DUCT GAIN				0		0		0		0		275		0		29		0		0		0					
HEAT GAIN PEOPLE		240		2	480	0	0	0	0	1	240	1	240	1	240	0	0	0	0	0	0	0	0	0			
HEAT GAIN APPLIANCES/LIGHTS				583		0		0		583		583		583		0		583		0		0					
TOTAL HT LOSS BTU/H				2528		1768		761		1360		3023		1222		1182		3555		482		166					
TOTAL HT GAIN x 1.3 BTU/H				3932		1547		376		1752		3934		1897		419		4571		299		144					

ROOM USE			LAND		DN/LV		K/B/F		GM		LND		PWD		FOY		MUD						WUB		BAS		
EXP. WALL			15		20		68		10		9		13		45		28						32		158		
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						320		1106		
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	10	208	155	19	395	294	0	0	0	0	0	0	0	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	0	0	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	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	7	145	287	
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
DOORS	24.7	3.7	20	493	73	0	0	0	0	0	0	0	0	0	0	0	0	40	986	146	20	493	73	20	493	73	
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	288	999	148	
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
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
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
EXPOSED FLOOR	2.5	0.4	0	0	0	0	0	0	0	0	0	0	0	0	80	199	30	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			1492		
SUB TOTAL HT GAIN					140		1010			3949			336			730			74			704			221		
LEVEL FACTOR / MULTIPLIER			0.30	0.37		0.30	0.37		0.30	0.37		0.30	0.37		0.20	0.22		0.30	0.37		0.30	0.37			0.50	0.77	486
AIR CHANGE HEAT LOSS				352			504			1496			252			184			185			1008			556		
AIR CHANGE HEAT GAIN					8		56			221			19			41			4			39			12		56
DUCT LOSS				0			0			0			0			104			0			0			0		0
DUCT GAIN					0		0			0			0			135			0			0			0		0
HEAT GAIN PEOPLE	240			0		0	0		0	0		1	240		0	0		0	0		0	0		0	0	0	0
HEAT GAIN APPLIANCES/LIGHTS					0		583			583			583			583			0			0			583		583
TOTAL HT LOSS BTU/H				1296			1855			5509			928			1142			681			3710			2048		
TOTAL HT GAIN x 1.3 BTU/H					192		2145			6178			1531			1936			101			967			1062		

TOTAL HEAT GAIN BTU/H:

35392

TONS: 2.95

LOSS DUE TO VENTILATION LOAD BTU/H: 1911

STRUCTURAL HEAT LOSS: 50008

TOTAL COMBINED HEAT LOSS BTU/H: 51920

SITE NAME: VALES OF HUMBER
BUILDER: ROYAL PINE HOMES

OPT GROUND - WUB
TYPE: 40-6

DATE: Mar-22

GFA: 3491 LO# 92089

HEATING CFM 1145 COOLING CFM 1145
TOTAL HEAT LOSS 50,008 TOTAL HEAT GAIN 35,109
AIR FLOW RATE CFM 22.9 AIR FLOW RATE CFM 32.61

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	15	10	4
R/A	0	0	6	2	1

plenium pressure s/a 0.18
max s/a dif press. loss 0.02
min adjusted pressure s/a 0.16
r/a pressure 0.17
r/a grille press. Loss 0.02
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	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-4	BTH-2/3	BTH-2/3	UP-DEN	MBR	S-BATH	LAND	DN/LV	K/B/F	K/B/F	GM	LND	PWD	FOY	GM-ENS	BAS	BAS	BAS	BAS
RM LOSS MBH.	1.26	0.88	0.76	1.36	1.51	1.22	0.59	0.59	1.78	1.26	0.48	1.30	1.86	1.84	1.84	0.93	1.14	0.68	3.71	0.17	4.20	4.20	4.20	4.20
CFM PER RUN HEAT	29	20	17	31	35	28	14	14	41	29	11	30	42	42	42	21	26	16	85	4	96	96	96	96
RM GAIN MBH.	1.97	0.77	0.38	1.75	1.97	1.90	0.21	0.21	2.29	1.97	0.30	0.19	2.14	2.06	2.06	1.53	1.94	0.10	0.97	0.14	0.53	0.53	0.53	0.53
CFM PER RUN COOLING	64	25	12	57	64	62	7	7	75	64	10	6	70	67	67	50	63	3	32	5	17	17	17	17
ADJUSTED PRESSURE	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	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	45	27	14	53	28	45	21	47	30	20	45
EQUIVALENT LENGTH	170	130	120	110	130	110	140	120	130	130	150	160	110	140	120	90	170	130	100	170	130	110	130	120
TOTAL EFFECTIVE LENGTH	215	176	158	142	192	129	169	164	193	166	191	194	130	185	147	104	223	158	145	191	177	140	150	165
ADJUSTED PRESSURE	0.08	0.1	0.11	0.12	0.09	0.13	0.1	0.1	0.09	0.1	0.09	0.09	0.13	0.09	0.12	0.17	0.08	0.11	0.11	0.09	0.09	0.12	0.11	0.1
ROUND DUCT SIZE	5	4	4	6	6	6	4	4	6	5	4	4	5	5	5	6	5	4	6	4	6	6	6	6
HEATING VELOCITY (ft/min)	213	229	195	158	178	143	161	161	209	213	126	344	308	308	308	107	191	184	433	46	489	489	489	489
COOLING VELOCITY (ft/min)	470	287	138	291	326	316	80	80	382	470	115	69	514	492	492	255	463	34	163	57	87	87	87	87
OUTLET GRILL SIZE	3X10	3X10	3X10	4X10	4X10	4X10	3X10	3X10	4X10	3X10	3X10	3X10	3X10	3X10	3X10	4X10	3X10	3X10	4X10	3X10	4X10	4X10	4X10	4X10
TRUNK	A	B	B	C	E	C	C	E	D	A	E	D	C	A	A	C	D	E	D	C	A	B	C	D

RUN #	25	26	27	28	29
ROOM NAME	BED-3	UP-DEN	K/B/F	ENS	MUD
RM LOSS MBH.	1.51	1.78	1.84	0.88	2.05
CFM PER RUN HEAT	35	41	42	20	47
RM GAIN MBH.	1.97	2.29	2.06	0.77	1.06
CFM PER RUN COOLING	64	75	67	25	35
ADJUSTED PRESSURE	0.17	0.17	0.17	0.17	0.17
ACTUAL DUCT LGH.	58	70	47	50	26
EQUIVALENT LENGTH	120	150	160	140	150
TOTAL EFFECTIVE LENGTH	178	220	207	190	176
ADJUSTED PRESSURE	0.1	0.08	0.08	0.09	0.1
ROUND DUCT SIZE	6	6	5	4	4
HEATING VELOCITY (ft/min)	178	209	308	229	539
COOLING VELOCITY (ft/min)	326	382	492	287	402
OUTLET GRILL SIZE	4X10	4X10	3X10	3X10	3X10
TRUNK	E	D	B	B	E

SUPPLY AIR TRUNK SIZE

	TRUNK	STATIC	ROUND	RECT		VELOCITY		TRUNK	STATIC	ROUND	RECT		VELOCITY
	CFM	PRESS.	DUCT	DUCT		(ft/min)		CFM	PRESS.	DUCT	DUCT		(ft/min)
TRUNK A	238	0.08	8.2	8	x	8	536	TRUNK G	0	0.00	0	0	8
TRUNK B	195	0.08	7.6	8	x	8	439	TRUNK H	0	0.00	0	0	8
TRUNK C	669	0.08	12.1	18	x	8	669	TRUNK I	0	0.00	0	0	8
TRUNK D	319	0.08	9.1	10	x	8	574	TRUNK J	0	0.00	0	0	8
TRUNK E	477	0.08	10.6	14	x	8	613	TRUNK K	0	0.00	0	0	8
TRUNK F	0	0.00	0	0	x	8	0	TRUNK L	0	0.00	0	0	8

RETURN AIR TRUNK SIZE

	TRUNK	STATIC	ROUND	RECT		VELOCITY
	CFM	PRESS.	DUCT	DUCT		(ft/min)
TRUNK O	0	0.05	0	0	x	8
TRUNK P	0	0.05	0	0	x	8
TRUNK Q	0	0.05	0	0	x	8
TRUNK R	0	0.05	0	0	x	8
TRUNK S	0	0.05	0	0	x	8
TRUNK T	0	0.05	0	0	x	8
TRUNK U	0	0.05	0	0	x	8
TRUNK V	0	0.05	0	0	x	8
TRUNK W	0	0.05	0	0	x	8
TRUNK X	1045	0.05	16	30	x	8
TRUNK Y	635	0.05	13.3	20	x	8
TRUNK Z	0	0.05	0	0	x	8
DROP	1145	0.05	16.6	24	x	10

RETURN AIR #	1	2	3	4	5	6	7	8								BR
AIR VOLUME	85	85	95	100	95	75	320	135	0	0	0	0	0	0	0	155
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	35	66	26	32	1	1	1	1	1	1	1	18
EQUIVALENT LENGTH	205	205	165	120	185	260	235	240	0	0	0	0	0	0	0	265
TOTAL EFFECTIVE LH	245	238	204	154	220	326	261	272	1	1	1	1	1	1	1	283
ADJUSTED PRESSURE	0.06	0.06	0.07	0.10	0.07	0.05	0.06	0.05	14.80	14.80	14.80	14.80	14.80	14.80	14.80	0.05
ROUND DUCT SIZE	6	6	6	5.6	6	6	9.8	7.5	0	0	0	0	0	0	0	7.8
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	24

TYPE: 40-6
SITE NAME: VALES OF HUMBER

LO # 92089
OPT GROUND - WUB

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>6</u> @ 10.6 cfm	<u>63.6</u> cfm
Other Rooms	<u>6</u> @ 10.6 cfm	<u>63.6</u> cfm
Table 9.32.3.A.	TOTAL	<u>212.0</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>212</u>	cfm
Less Principal Ventil. Capacity	<u>95.4</u>	cfm
Required Supplemental Capacity	<u>116.6</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

Michael O'Rourke

CSA F280-12 Residential Heat Loss and Heat Gain Calculations																																																												
Formula Sheet (For Air Leakage / Ventilation Calculation)																																																												
LO#: 92089	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="2" style="text-align: right;">Total:</td> <td></td> <td>48,579.0 ft³</td> </tr> <tr> <td colspan="2" style="text-align: right;">Total:</td> <td></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;">0.227</td> </tr> <tr> <td>SUMMER NATURAL AIR CHANGE RATE</td> <td style="text-align: center;">0.074</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>T_{in} °C</th> <th>T_{out} °C</th> <th>ΔT °C</th> <th>ΔT °F</th> </tr> <tr> <td>Winter DTD_h</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 DTD_c</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	0.227	SUMMER NATURAL AIR CHANGE RATE	0.074	Design Temperature Difference						T _{in} °C	T _{out} °C	ΔT °C	ΔT °F	Winter DTD _h	22	-19	41	74	Summer DTD _c	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																																																									
$HL_{airb} = LR_{airh} \times \frac{V_b}{3.6} \times DTD_h \times 1.2$ 0.227 x 382.11 x 41 °C x 1.2 = 4297 W = 14663 Btu/h			$HG_{salb} = LR_{airc} \times \frac{V_b}{3.6} \times DTD_c \times 1.2$ = 0.074 x 382.11 x 6 °C x 1.2 = 207 W = 706 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)	HL _{airve} Air Leakage + Ventilation Heat Loss (Btu/h)	Level Conductive Heat Loss: (HL _{clevel})	Air Leakage Heat Loss Multiplier (LF x HL _{airbv} / HL _{level})																																																								
1	0.5	14,663	9,461	0.775																																																								
2	0.3		11,793	0.373																																																								
3	0.2		13,605	0.216																																																								
4	0		0	0.000																																																								
5	0		0	0.000																																																								
*HL_{airbv} = Air leakage heat loss + ventilation heat loss *For a balanced or supply only ventilation system HL_{airve} = 0																																																												

HEAT LOSS AND GAIN SUMMARY SHEET

MODEL: 40-6	OPT GROUND - WUB	BUILDER: ROYAL PINE HOMES
SFQT: 3491	LO# 92089	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:	158.0 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	-

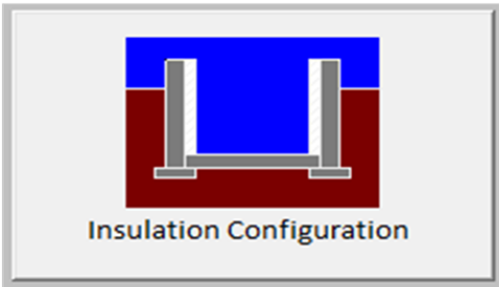
INDIVIDUAL BCIN: 19669

MICHAEL O'ROURKE



Residential Foundation Thermal Load Calculator

Supplemental tool for CAN/CSA-F280

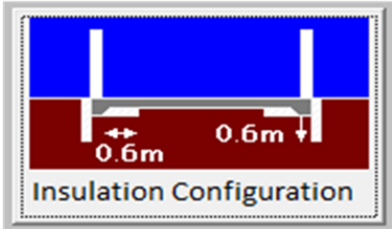
Weather Station Description		
Province:	Ontario	
Region:	Brampton	
Site Description		
Soil Conductivity:	Normal conductivity: dry sand, loam, clay	
Water Table:	Normal (7-10 m, 23-33 ft)	
Foundation Dimensions		
Floor Length (m):	19.2	 Insulation Configuration
Floor Width (m):	9.8	
Exposed Perimeter (m):	48.2	
Wall Height (m):	3.0	
Depth Below Grade (m):	2.13	
Window Area (m ²):	1.8	
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):		1629

TYPE: 40-6
LO# 92089

OPT GROUND - WUB

Residential Slab on Grade 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		
Length (m):	2.1	
Width (m):	5.5	
Exposed Perimeter (m):	9.8	
Radiant Slab		
Heated Fraction of the Slab:	0	
Fluid Temperature (°C):	33	
Design Months		
Heating Month	1	
Results		
Heating Load (Watts):		98

TYPE: 40-6
LO# 92089

OPT GROUND - WUB

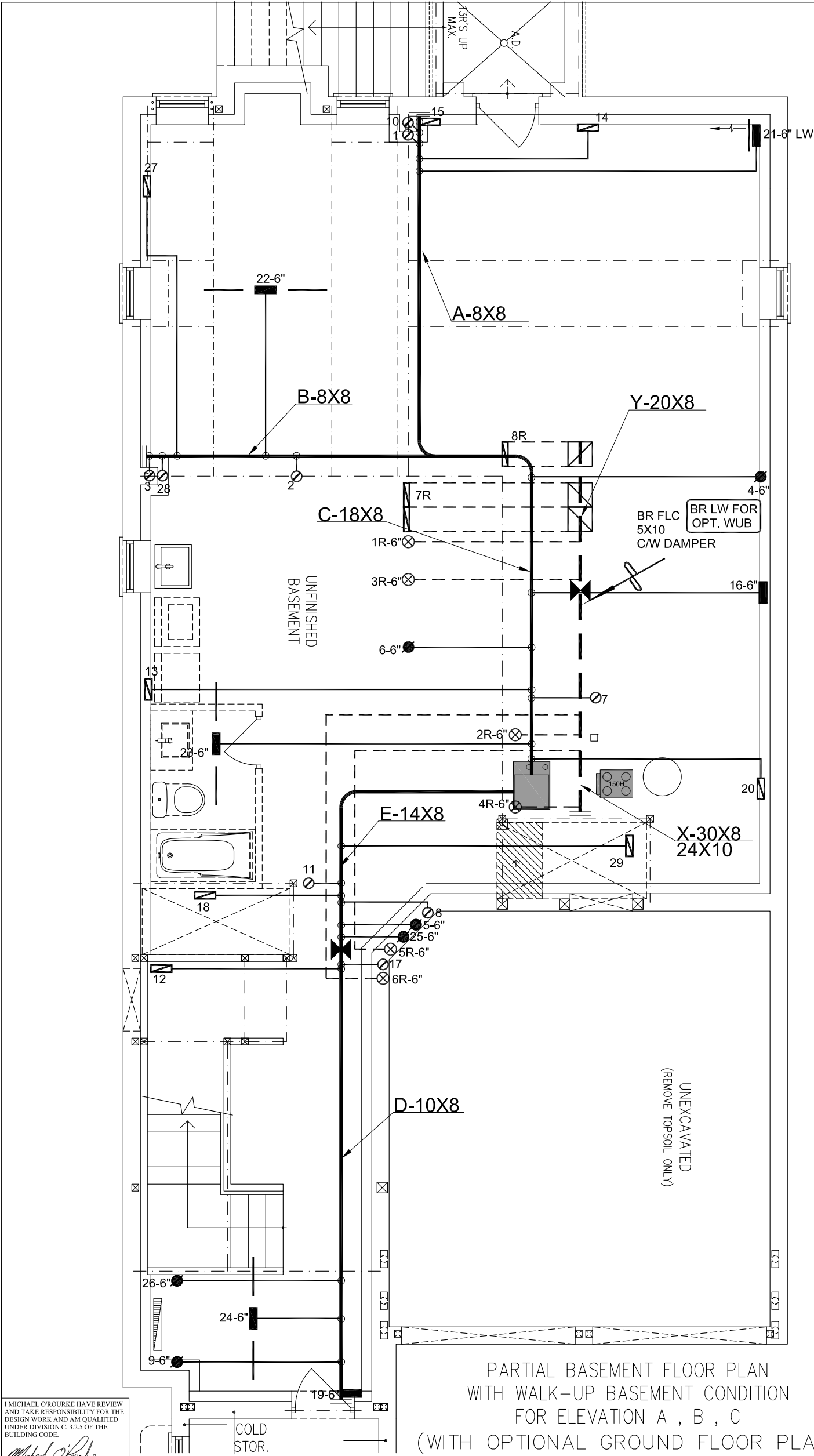
Air Infiltration Residential Load Calculator

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):	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):	0.227			
Cooling Air Leakage Rate (ACH/H):	0.074			

TYPE: 40-6
LO# 92089

OPT GROUND - WUB



I MICHAEL O'ROURKE HAVE REVIEW
AND TAKE RESPONSIBILITY FOR THE
DESIGN WORK AND AM QUALIFIED
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BUILDING CODE.

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

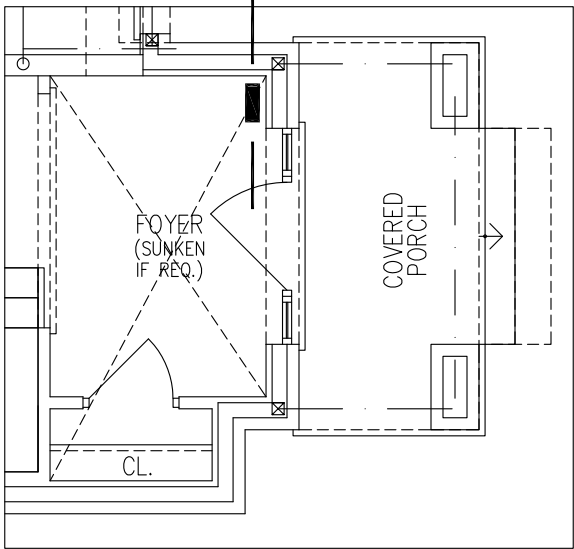
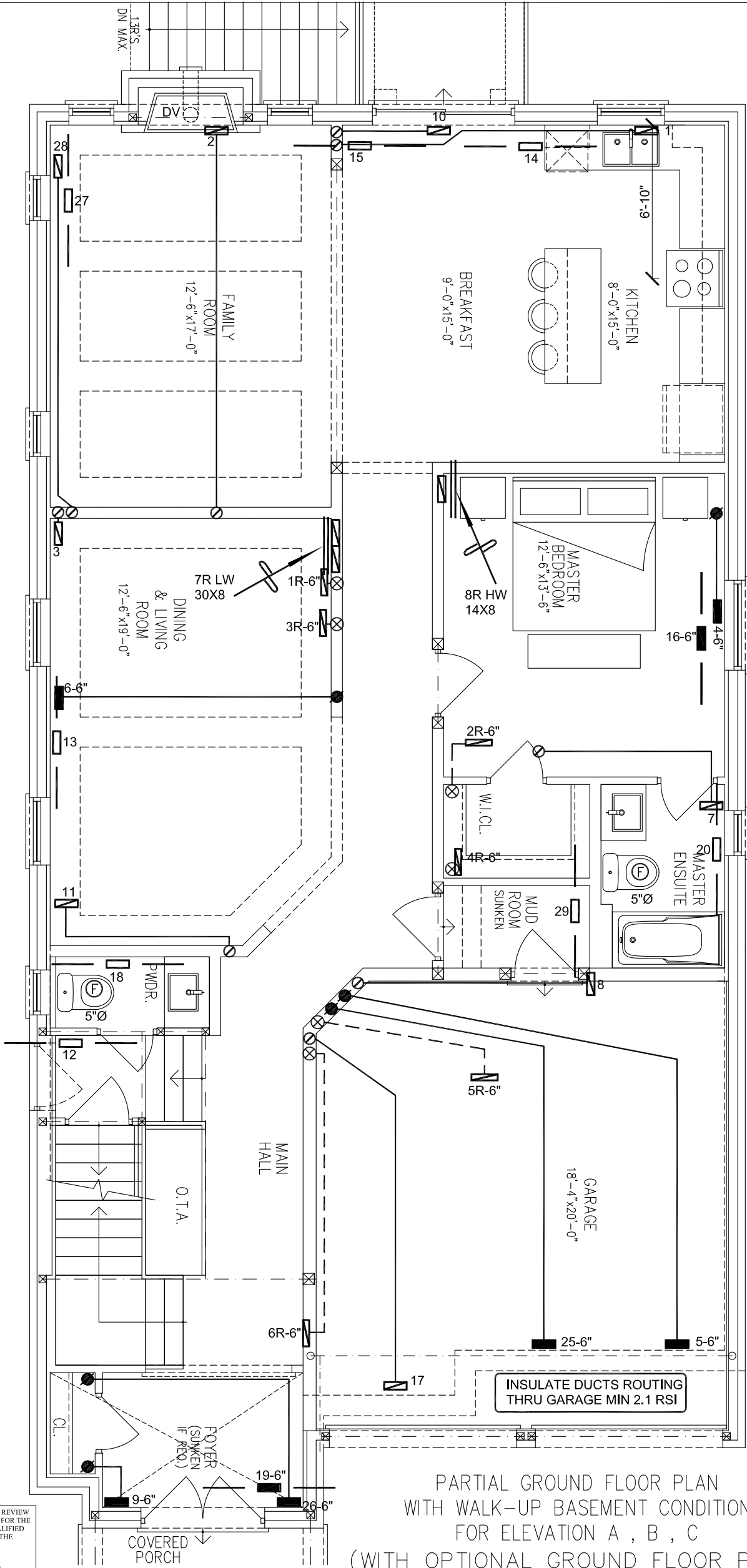
PARTIAL BASEMENT FLOOR PLAN
WITH WALK-UP BASEMENT CONDITION
FOR ELEVATION A , B , C
(WITH OPTIONAL GROUND FLOOR PLAN)

WUB
CSA-F280-12
SB-12 PERFORMANCE

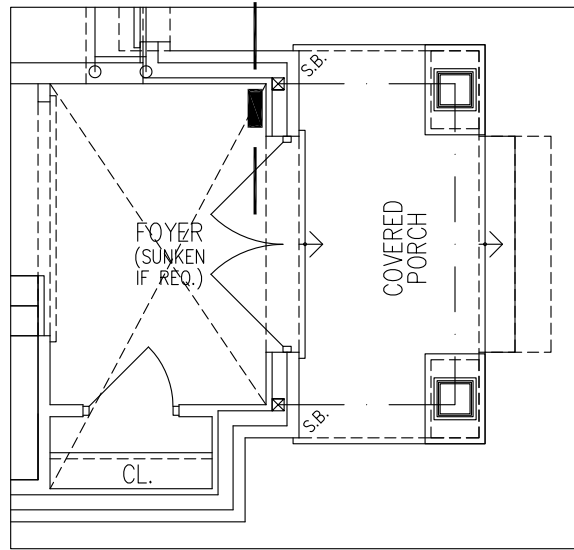
HVAC LEGEND								3.		
SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	2.		
	SUPPLY AIR GRILLE		6" SUPPLY AIR BOOT ABOVE		14"x8" RETURN AIR GRILLE		RETURN AIR STACK ABOVE	1.	REVISED TO PERFORMANCE PATH	MAR/2022
	SUPPLY AIR GRILLE 6" BOOT		SUPPLY AIR STACK FROM 2nd FLOOR		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	ROYAL PINE HOMES Project Name VALES OF HUMBER BRAMPTON, ONTARIO OPT GROUND 40-6 - WUB 3491 sqft		HVAC DESIGNS LTD. 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.	<table><tr><td>HEAT LOSS 51920 BTU/H UNIT DATA</td><td colspan="3"># OF RUNS S/A R/A FANS</td><td rowspan="4">Sheet Title BASEMENT HEATING LAYOUT</td></tr><tr><td>MAKE CARRIER</td><td>3RD FLOOR</td><td></td><td></td></tr><tr><td>MODEL 59SP5A-60-14</td><td>2ND FLOOR</td><td>15</td><td>6</td><td>4</td></tr><tr><td>INPUT 60 MBTU/H</td><td>1ST FLOOR</td><td>10</td><td>2</td><td>2</td></tr><tr><td>OUTPUT 58 MBTU/H</td><td>BASEMENT</td><td>4</td><td>1</td><td>0</td><td>Date AUG/2021</td></tr><tr><td>COOLING 3.0 TONS</td><td colspan="4">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</td><td>Scale 3/16" = 1'-0"</td></tr><tr><td>FAN SPEED 1145 cfm @ 0.6" w.c.</td><td colspan="4"></td><td>BCIN# 19669</td></tr><tr><td colspan="4"></td><td>LO#</td><td>92089</td></tr></table>	HEAT LOSS 51920 BTU/H UNIT DATA	# OF RUNS S/A R/A FANS			Sheet Title BASEMENT HEATING LAYOUT	MAKE CARRIER	3RD FLOOR			MODEL 59SP5A-60-14	2ND FLOOR	15	6	4	INPUT 60 MBTU/H	1ST FLOOR	10	2	2	OUTPUT 58 MBTU/H	BASEMENT	4	1	0	Date AUG/2021	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#	92089
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STANDARD
GROUND FLOOR PLAN
ELEVATION B



STANDARD
GROUND FLOOR PLAN
ELEVATION C

PARTIAL GROUND FLOOR PLAN
WITH WALK-UP BASEMENT CONDITION
FOR ELEVATION A , B , C
(WITH OPTIONAL GROUND FLOOR PLAN)

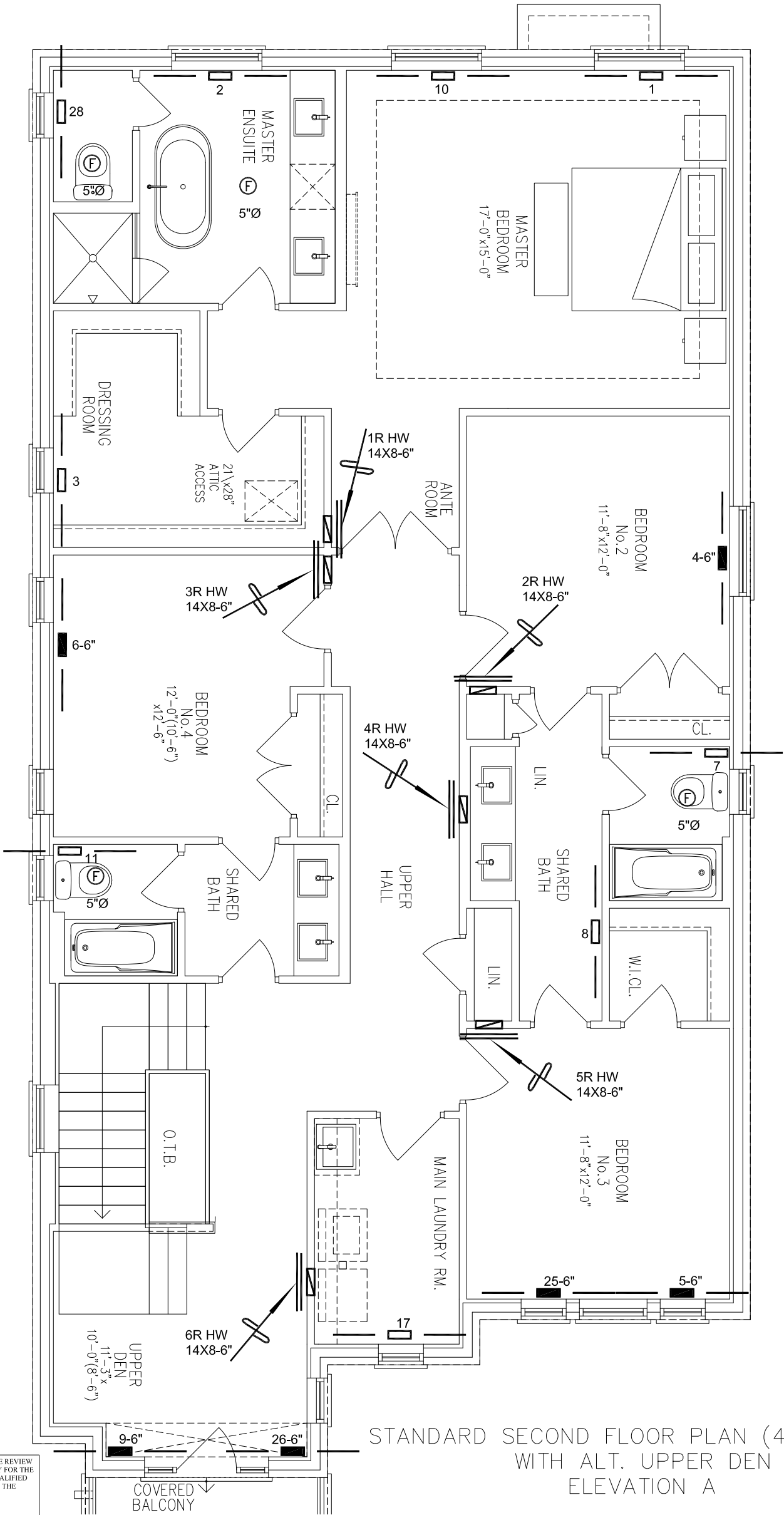
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Michael O'Rourke, BCIN# 19669
HVAC DESIGNS LTD.

WUB
CSA-F280-12
SB-12 PERFORMANCE

HVAC LEGEND							3.		
SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	2.	
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							REVISIONS		

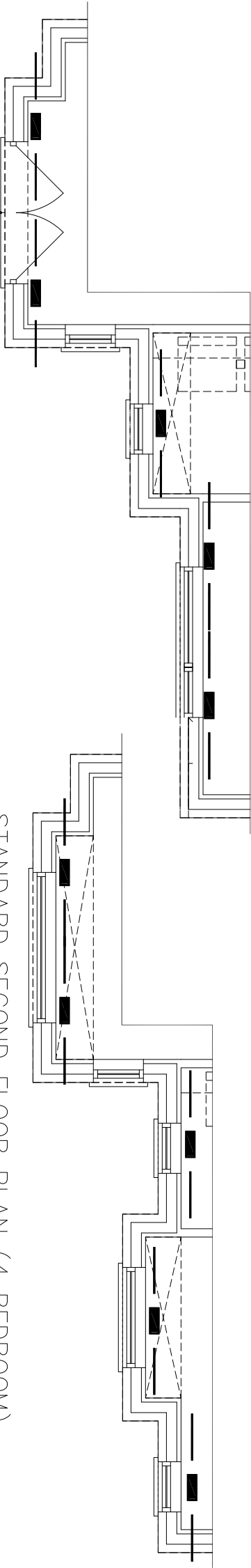
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Client		 375 Finley Ave. Suite 202 - Ajax, Ontario L1S 2E2 Tel. 905.619.2300 - 905.420.5300 Fax 905.619.2375 Email: info@hvacdesigns.ca Web: www.hvacdesigns.ca Specializing in Residential Mechanical Design Services	Sheet Title	
ROYAL PINE HOMES			FIRST FLOOR HEATING LAYOUT	
Project Name		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.	Date	AUG/2021
VALES OF HUMBER BRAMPTON, ONTARIO			Scale	3/16" = 1'-0"
OPT GROUND 40-6 - WUB		3491 sqft	BCIN# 19669	
			LO#	92089



STANDARD SECOND FLOOR PLAN (4 BEDROOM)
WITH ALT. UPPER DEN
ELEVATION B

STANDARD SECOND FLOOR PLAN (4 BEDROOM)
WITH ALT. UPPER DEN
ELEVATION C



STANDARD SECOND FLOOR PLAN (4 BEDROOM)
WITH ALT. UPPER DEN
ELEVATION A

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WUB

CSA-F280-12

SB-12 PERFORMANCE

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ROYAL PINE HOMES			SECOND FLOOR HEATING LAYOUT	
Project Name			Date	AUG/2021
VALES OF HUMBER BRAMPTON, ONTARIO			Scale	3/16" = 1'-0"
OPT GROUND 40-6 - WUB			BCIN# 19669	
3491 sqft			LO#	92089