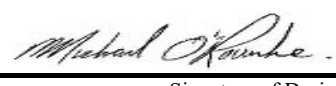


Schedule 1: Designer Information

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: 40-1 Project: VALES OF HUMBER	
D. Declaration of Designer			
I, <u>MICHAEL O'ROURKE</u> (print name) declare that (choose one as appropriate):			
☐ 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										DATE: Mar-22										WINTER NATURAL AIR CHANGE RATE 0.248										HEAT LOSS ΔT °F. 74										CSA-F280-12																													
BUILDER: ROYAL PINE HOMES										TYPE: 40-1										GFA: 2913										LO# 92063										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-4				BATH				ENS-2																																					
EXP. WALL				33				25				7				35				35				15				12				10																																					
CLG. HT.				9				9				9				9				9				9				9				11																																					
FACTORS																																																																					
GRS.WALL AREA		LOSS GAIN		297				225				63				315				315				135				108				110																																					
GLAZING				LOSS GAIN				LOSS GAIN				LOSS GAIN				LOSS GAIN				LOSS GAIN				LOSS GAIN				LOSS GAIN				LOSS GAIN																																					
NORTH		20.8	15.5	0	0	0		8	166	124		0	0	0		12	249	186		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		50	1039	2052		43	893	1765		0	0	0		0	0	0		16	332	657																																			
SOUTH		20.8	24.4	0	0	0		0	0	0		0	0	0		0	0	0		0	0	0		20	416	488		7	145	171		0	0	0																																			
WEST		20.8	41.0	28	582	1149		19	395	780		0	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																																			
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	0	0																																			
NET EXPOSED WALL		3.5	0.5	269	933	138		198	687	102		63	218	32		253	877	130		272	943	140		115	399	59		101	350	52		94	326	48																																			
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																																			
EXPOSED CLG		1.3	0.6	266	333	148		130	163	72		91	114	51		286	358	159		263	330	147		285	357	159		108	135	60		57	71	32																																			
NO ATTIC EXPOSED CLG		2.7	1.2	0	0	0		0	0	0		0	0	0		0	0	0		30	81	36		0	0	0		0	0	0		20	54	24																																			
EXPOSED FLOOR		2.5	0.4	0	0	0		0	0	0		0	0	0		234	583	86		63	157	23		0	0	0		0	0	0		77	192	28																																			
BASEMENT/CRAWL HEAT LOSS				0				0				0				0				0				0				0				0																																					
SLAB ON GRADE HEAT LOSS				0				0				0				0				0				0				0				0																																					
SUBTOTAL HT LOSS				1848				1410				332				3106				2403				1171				631				975																																					
SUB TOTAL HT GAIN				1436				1078				83				2614				2110				706				283				789																																					
LEVEL FACTOR / MULTIPLIER		0.20	0.21			0.20	0.21			0.20	0.21			0.20	0.21			0.20	0.21			0.20	0.21			0.20	0.21			0.20	0.21																																						
AIR CHANGE HEAT LOSS				386				295				69				649				502				245				132				204																																					
AIR CHANGE HEAT GAIN				67				51				4				123				99				33				13				37																																					
DUCT LOSS				0				0				0				376				291				0				0				118																																					
DUCT GAIN				0				0				0				357				304				0				0				83																																					
HEAT GAIN PEOPLE		240		2	480	0		0	0	0		1	240	1		1	240	1		1	240	1		1	240	0		0	0	0		0	0	0																																			
HEAT GAIN APPLIANCES/LIGHTS				593				0				0				593				593				593				0				0																																					
TOTAL HT LOSS BTU/H				2234				1705				402				4131				3196				1416				763				1297																																					
TOTAL HT GAIN x 1.3 BTU/H				3349				1467				113				5105				4351				2044				385				1181																																					

ROOM USE		DIN		KIT		FAM		LAUN		PWD		FOY		MUD		WOD		BAS	
EXP. WALL		47		40		37		11		15		22		25		42		182	
CLG. HT.		10		10		10		9		11		11		12		10		10	
FACTORS																			
GRS.WALL AREA	LOSS GAIN	470		400		370		99		165		242		300		420		1820	
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	20	416	309	0	0	0	28	582	433	0	7	145
EAST	20.8 41.0	0	0	0	0	0	0	0	0	0	12	249	493	19	395	780	0	0	0
SOUTH	20.8 24.4	30	623	732	28	582	683	0	0	0	0	0	0	0	0	0	0	7	145
WEST	20.8 41.0	0	0	0	72	1496	2955	34	706	1396	0	0	0	0	0	0	5	104	205
SKYLT.	34.1 100.3	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	25	616	91	0	20	493
NET EXPOSED WALL	3.5 0.5	440	1526	226	300	1040	154	336	1165	173	79	274	41	153	530	79	198	687	102
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	0	0	0	0	0	0	0	0	0	143	179	80	0	0	0	247	868	129
NO ATTIC EXPOSED CLG	2.7 1.2	0	0	0	0	0	0	10	27	12	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
BASEMENT/CRAWL HEAT LOSS		0	0	0	0	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	0	0	0	0
SUBTOTAL HT LOSS		2149		3118		1898		869		780		1698		1949		972		7147	
SUB TOTAL HT GAIN		958		3793		1580		430		571		973		636		334		352	
LEVEL FACTOR / MULTIPLIER	0.30 0.34																		
AIR CHANGE HEAT LOSS		741		1074		654		181		269		585		672		0		6658	
AIR CHANGE HEAT GAIN		45		178		74		20		27		46		30		0		32	
DUCT LOSS		0		0		0		0		0		0		0		0		0	
DUCT GAIN		0		0		0		0		0		0		0		0		0	
HEAT GAIN PEOPLE	240	0		0		0		0		0		0		0		0		0	
HEAT GAIN APPLIANCES/LIGHTS		593		593		593		593		593		0		0		0		593	
TOTAL HT LOSS BTU/H		2889		4192		2552		1050		1049		2283		2620		972		13804	
TOTAL HT GAIN x 1.3 BTU/H		2075		5933		2922		1356		777		1324		865		434		1271	

TOTAL HEAT GAIN BTU/H:

35190

TONS: 2.93

SITE NAME: VALES OF HUMBER
BUILDER: ROYAL PINE HOMES

TYPE: 40-1

DATE: Mar-22

GFA: 2913

LO# 92063

HEATING CFM 1145 COOLING CFM 1145
TOTAL HEAT LOSS 46,554 TOTAL HEAT GAIN 34,954
AIR FLOW RATE CFM 24.59 AIR FLOW RATE CFM 32.76

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	12	7	4
R/A	0	0	5	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

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	13	14	15	16	17	18	19	20	21	22	23	24
ROOM NAME	MBR	ENS	WIC	BED-2	BED-3	BED-4	BATH	BED-2	BED-3	MBR	ENS-2	DIN	KIT	KIT	FAM	LAUN	PWD	FOY	MUD	BAS	BAS	BAS	BAS
RM LOSS MBH.	1.12	1.71	0.40	2.07	1.60	1.42	0.76	2.07	1.60	1.12	1.30	2.89	2.10	2.10	2.55	1.05	1.05	2.28	2.62	3.69	3.69	3.69	3.69
CFM PER RUN HEAT	27	42	10	51	39	35	19	51	39	27	32	71	52	52	63	26	26	56	64	91	91	91	91
RM GAIN MBH.	1.67	1.47	0.11	2.55	2.18	2.04	0.38	2.55	2.18	1.67	1.18	2.08	2.97	2.97	2.92	1.36	0.78	1.32	0.87	0.43	0.43	0.43	0.43
CFM PER RUN COOLING	55	48	4	84	71	67	13	84	71	55	39	68	97	97	96	44	25	43	28	14	14	14	14
ADJUSTED PRESSURE	0.17	0.17	0.17	0.16	0.17	0.17	0.17	0.16	0.17	0.17	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.	43	42	21	52	55	34	38	58	58	37	50	31	32	23	27	30	43	41	16	26	24	18	36
EQUIVALENT LENGTH	130	170	150	160	230	150	130	170	210	130	150	100	130	120	170	160	160	130	180	140	90	150	170
TOTAL EFFECTIVE LENGTH	173	212	171	212	285	184	168	228	268	167	200	131	162	143	197	190	203	171	196	166	114	168	206
ADJUSTED PRESSURE	0.1	0.08	0.1	0.08	0.06	0.09	0.1	0.07	0.06	0.1	0.09	0.13	0.1	0.11	0.08	0.09	0.08	0.1	0.09	0.1	0.14	0.1	0.08
ROUND DUCT SIZE	5	5	4	6	6	6	4	6	6	5	4	6	6	6	6	4	4	5	5	6	6	6	6
HEATING VELOCITY (ft/min)	198	308	115	260	199	178	218	260	199	198	367	362	265	265	321	298	298	411	470	464	464	464	464
COOLING VELOCITY (ft/min)	404	352	46	428	362	342	149	428	362	404	447	347	495	495	489	505	287	316	206	71	71	71	71
OUTLET GRILL SIZE	3X10	3X10	3X10	4X10	4X10	4X10	3X10	4X10	4X10	3X10	3X10	4X10	4X10	4X10	4X10	3X10	3X10	3X10	3X10	4X10	4X10	4X10	4X10
TRUNK	A	B	B	D	C	B	D	D	C	A	D	D	A	A	A	B	C	C	D	A	B	D	C

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	1.12	27	1.67	55	0.17	43	130	173	0.1	5	198	404	3X10	A
2	ENS	1.71	42	1.47	48	0.17	42	170	212	0.08	5	308	352	3X10	B
3	WIC	0.40	10	0.11	4	0.17	21	150	171	0.1	4	115	46	3X10	B
4	BED-2	2.07	51	2.55	84	0.16	52	160	212	0.08	6	260	428	4X10	D
5	BED-3	1.60	39	2.18	71	0.17	55	230	285	0.06	6	199	362	4X10	C
6	BED-4	1.42	35	2.04	67	0.17	34	150	184	0.09	6	178	342	4X10	B
7	BATH	0.76	19	0.38	13	0.17	38	130	168	0.1	4	218	149	3X10	D
8	BED-2	2.07	51	2.55	84	0.16	58	170	228	0.07	6	260	428	4X10	D
9	BED-3	1.60	39	2.18	71	0.17	58	210	268	0.06	6	199	362	4X10	C
10	MBR	1.12	27	1.67	55	0.17	37	130	167	0.1	5	198	404	3X10	A
11	ENS-2	1.30	32	1.18	39	0.17	50	150	200	0.09	4	367	447	3X10	D
13	DIN	2.89	71	2.08	68	0.17	31	100	131	0.13	6	362	347	4X10	D
14	KIT	2.10	52	2.97	97	0.16	32	130	162	0.1	6	265	495	4X10	A
15	KIT	2.10	52	2.97	97	0.16	23	120	143	0.11	6	265	495	4X10	A
16	FAM	2.55	63	2.92	96	0.16	27	170	197	0.08	6	321	489	4X10	A
17	LAUN	1.05	26	1.36	44	0.17	30	160	190	0.09	4	298	505	3X10	B
18	PWD	1.05	26	0.78	25	0.17	43	160	203	0.08	4	298	287	3X10	C
19	FOY	2.28	56	1.32	43	0.17	41	130	171	0.1	5	411	316	3X10	C
20	MUD	2.62	64	0.87	28	0.17	16	180	196	0.09	5	470	206	3X10	D
21	BAS	3.69	91	0.43	14	0.16	26	140	166	0.1	6	464	71	4X10	A
22	BAS	3.69	91	0.43	14	0.16	24	90	114	0.14	6	464	71	4X10	B
23	BAS	3.69	91	0.43	14	0.16	18	150	168	0.1	6	464	71	4X10	D
24	BAS	3.69	91	0.43	14	0.16	36	170	206	0.08	6	464	71	4X10	C

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	312	0.08	9.1	10	x	8	562	TRUNK G	0	0.00	0	0	x	8	0	TRUNK O	0	0.05	0	0	x	8	0
TRUNK B	516	0.08	10.9	14	x	8	663	TRUNK H	0	0.00	0	0	x	8	0	TRUNK P	0	0.05	0	0	x	8	0
TRUNK C	251	0.06	9	10	x	8	452	TRUNK I	0	0.00	0	0	x	8	0	TRUNK Q	0	0.05	0	0	x	8	0
TRUNK D	630	0.06	12.7	18	x	8	630	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	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
AIR VOLUME	130	130	115	75	75	190	275	0	0	0	0	0	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	0.15	0.15	0.15	0.15	0.15	0.15
ACTUAL DUCT LGH.	40	54	53	54	54	25	24	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
EQUIVALENT LENGTH	175	205	260	235	265	150	175	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL EFFECTIVE LH	215	259	313	289	319	175	199	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
ADJUSTED PRESSURE	0.07	0.06	0.05	0.05	0.05	0.08	0.07	14.80	14.80	14.80	14.80	14.80	14.80	14.80	14.80	14.80	14.80	14.80	14.80	14.80	14.80	14.80	14.80	14.80
ROUND DUCT SIZE	6.8	7	7	6	6	7.5	8.9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
INLET GRILL SIZE	8	8	8	8	8	8	8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
INLET GRILL SIZE	X	X	X	X	X	X	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	30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

TYPE: 40-1
SITE NAME: VALES OF HUMBER

LO # 92063

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>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	☒ 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
ENS-2	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	☒ 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:	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#: 92063	Model: 40-1	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>1292</td> <td>10</td> <td>12920</td> </tr> <tr> <td>First</td> <td>1292</td> <td>10</td> <td>12920</td> </tr> <tr> <td>Second</td> <td>1621</td> <td>9</td> <td>14589</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>40,429.0 ft³</td> </tr> <tr> <td colspan="3" style="text-align: right;">Total:</td> <td>1144.8 m³</td> </tr> </tbody> </table>			Level	Floor Area (ft²)	Floor Height (ft)	Volume (ft³)	Bsmt	1292	10	12920	First	1292	10	12920	Second	1621	9	14589	Third	0	9	0	Fourth	0	9	0	Total:			40,429.0 ft³	Total:			1144.8 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>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	0.248	SUMMER NATURAL AIR CHANGE RATE	0.081	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																																																									
$HL_{airb} = LR_{airh} \times \frac{V_b}{3.6} \times DTD_h \times 1.2$ 0.248 x 318.01 x 41 °C x 1.2 = 3902 W = 13315 Btu/h			$HG_{salb} = LR_{airc} \times \frac{V_b}{3.6} \times DTD_c \times 1.2$ = 0.081 x 318.01 x 6 °C x 1.2 = 188 W = 642 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)	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 _{clevel})																																																								
1	0.5	13,315	8,118	0.820																																																								
2	0.3		11,591	0.345																																																								
3	0.2		12,746	0.209																																																								
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: 40-1	BUILDER: ROYAL PINE HOMES
SFQT: 2913	LO# 92063
	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):	40429.0	ASSUMED (Y/N):	Y
INTERNAL SHADING:	BLINDS/CURTAINS	ASSUMED OCCUPANTS:	5
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: 57.0 ft	WIDTH: 34.0 ft	EXPOSED PERIMETER:	182.0 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	-

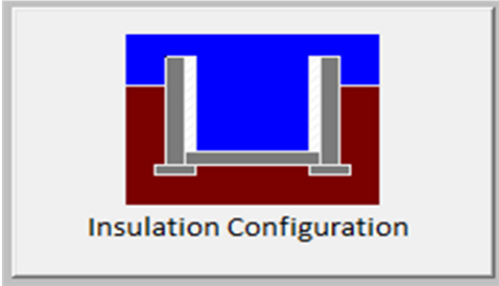
INDIVIDUAL BCIN: 19669

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):	17.4	
Floor Width (m):	10.4	
Exposed Perimeter (m):	0.0	
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):		1864

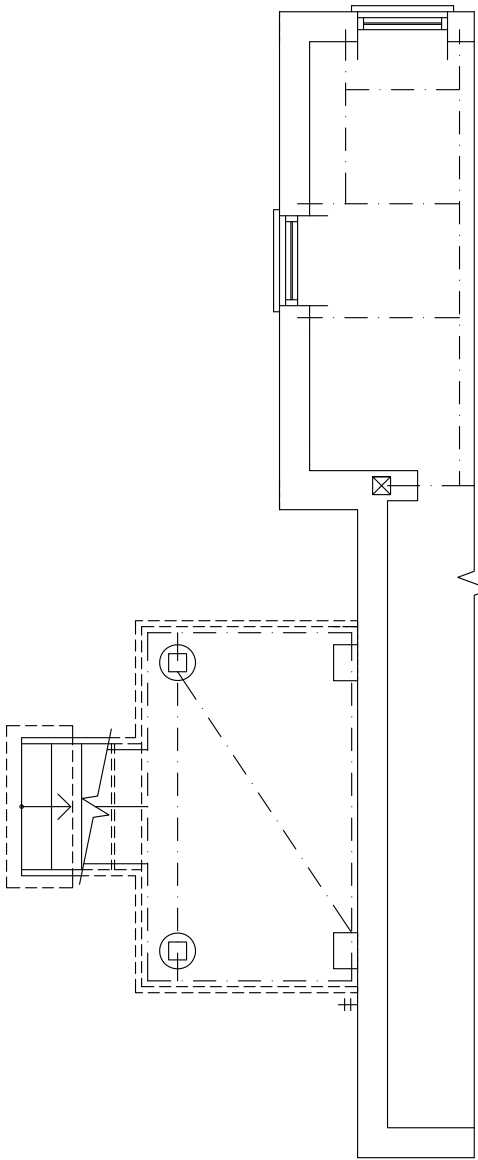
TYPE: 40-1
LO# 92063

Air Infiltration Residential Load Calculator

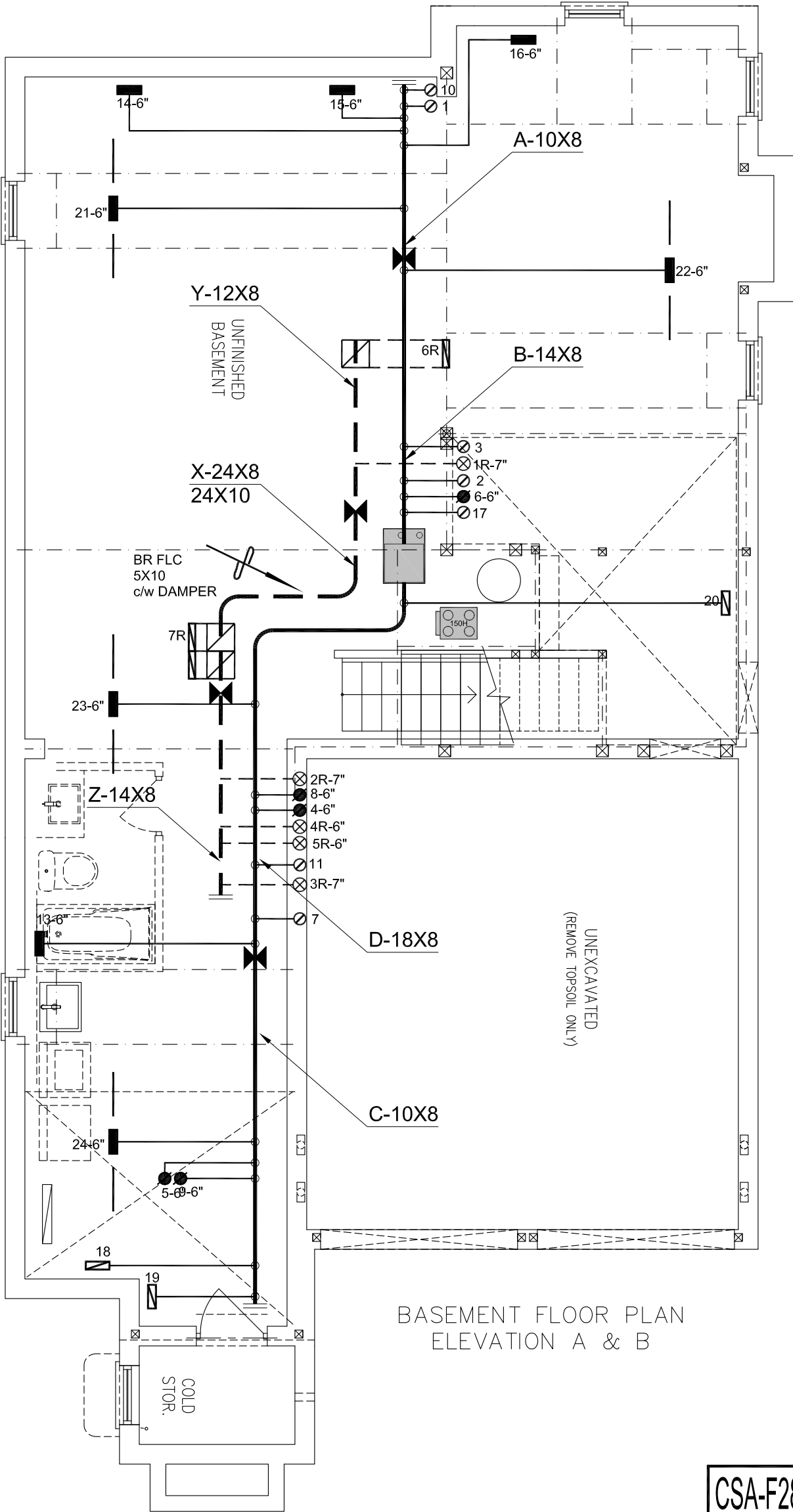
Supplemental tool for CAN/CSA-F280

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):	1144.8			
Air Leakage/Ventilation				
Air Tightness Type:	Energy Star Detached (2.5 ACH)			
Custom BDT Data:	ELA @ 10 Pa.	1068.7 cm ²		
	2.50	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):	0.248			
Cooling Air Leakage Rate (ACH/H):	0.081			

TYPE: 40-1
LO# 92063



PARTIAL BASEMENT FLOOR PLAN
WITH WOOD DECK CONDITION
FOR ELEVATION A & B



BASEMENT FLOOR PLAN
ELEVATION A & B

I MICHAEL O'ROURKE HAVE REVIEW
AND TAKE RESPONSIBILITY FOR THE
DESIGN WORK AND AM QUALIFIED
UNDER DIVISION C, 3.2.5 OF THE
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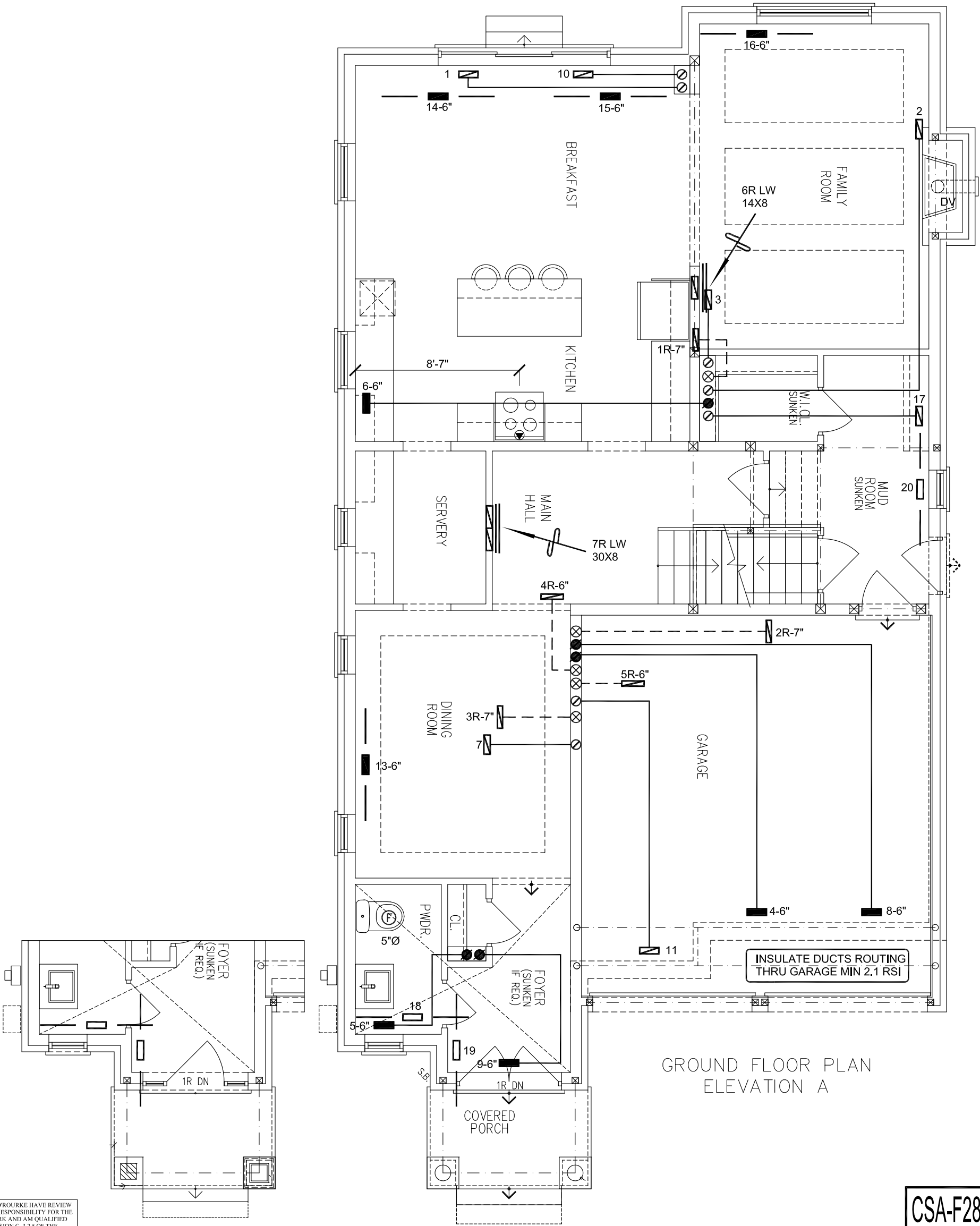
Michael O'Rourke
Michael O'Rourke, BCIN# 19669
HVAC DESIGNS LTD.

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		HVACDESIGNS 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.	HEAT LOSS 48147 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 VALES OF HUMBER BRAMPTON, ONTARIO			MODEL 59SP5A-60-14		2ND FLOOR	12	5	3	
			INPUT 60 MBTU/H		1ST FLOOR	7	2	2	Date AUG/2021
			OUTPUT 58 MBTU/H		BASEMENT	4	1	0	Scale 3/16" = 1'-0"
		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				BCIN# 19669	
40-1		FAN SPEED 1145 cfm @ 0.6" w.c.						LO#	92063
2913 sqft									



GROUND FLOOR PLAN
ELEVATION B

GROUND FLOOR PLAN
ELEVATION A

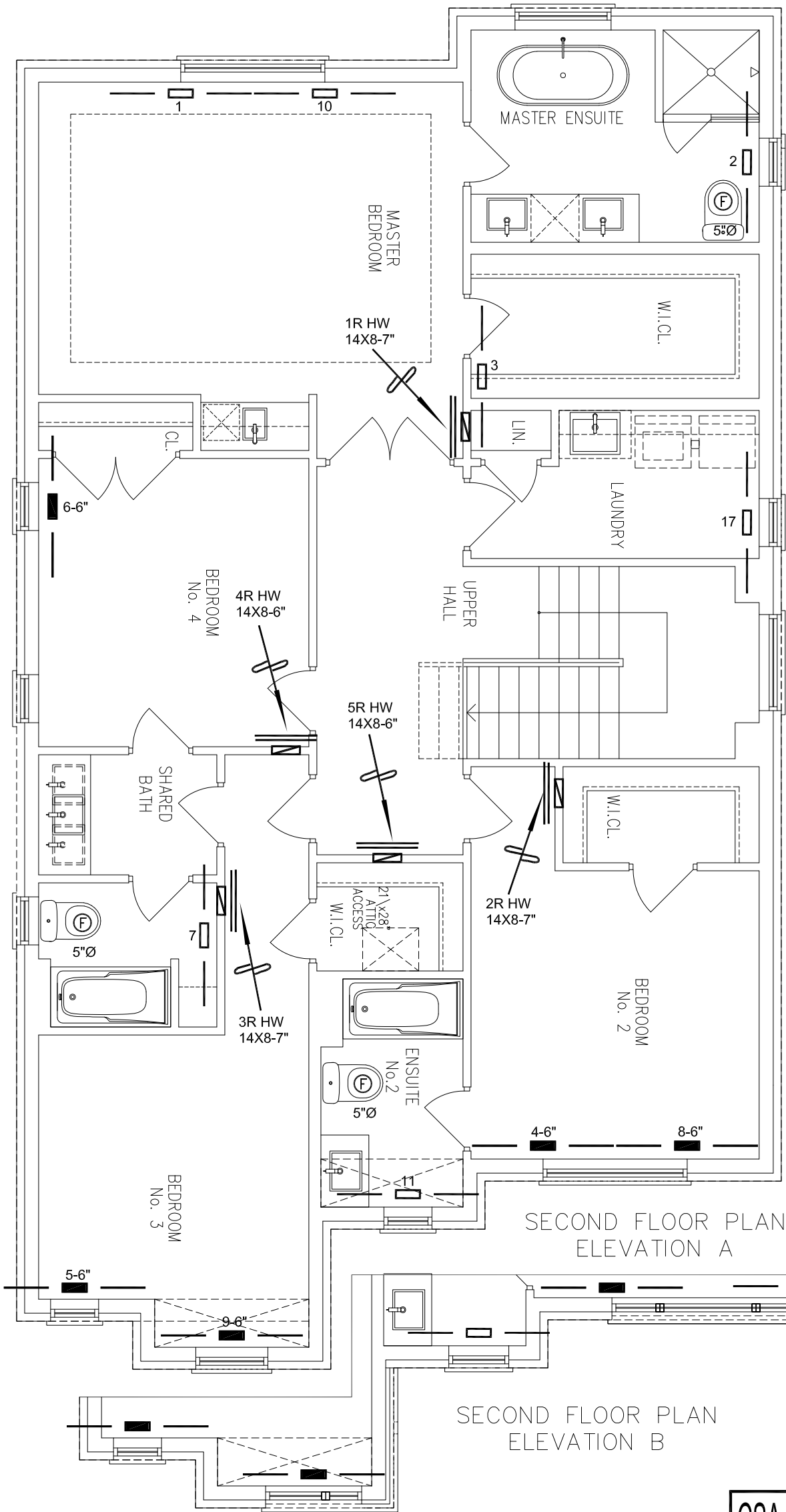
CSA-F280-12
SB-12 PERFORMANCE

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.

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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"
			BCIN# 19669	
40-1			LO#	92063
2913 sqft				



SECOND FLOOR PLAN
ELEVATION A

SECOND FLOOR PLAN
ELEVATION 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	AUG/2021
VALES OF HUMBER BRAMPTON, ONTARIO			Scale	3/16" = 1'-0"
			BCIN# 19669	
40-1	2913 sqft		LO#	92063