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	☒ HVAC – House	❑ Building Structural
❑ Small Buildings	❑ Building Services	❑ Plumbing – House
❑ Large Buildings	❑ Detection, Lighting and Power	❑ Plumbing – All Buildings
❑ Complex Buildings	❑ Fire Protection	❑ 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:** 1804 CNR **Project:** FORESTSIDE

D. Declaration of Designer

I **MICHAEL O'ROURKE** 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 Di vision C, of the Building Code.

Individual BCIN: 19669
Basis for exemption from registration and qualification: O.B.C SENTENCE 3.2.4.1 (4)

❑ 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.

June 19, 2018
Date

Signature of Designer

NOTE:

1. 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.
2. 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.

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SITE NAME: FORESTSIDE | DATE: Apr-19 | WINTER NATURAL AIR CHANGE RATE 0.428 | HEAT LOSS ΔT °F. 74 | CSA-F280-12

BUILDER: ROYAL PINE HOMES | TYPE: 1804 CNR | GFA: 2260 | LO# 78930 | SUMMER NATURAL AIR CHANGE RATE 0.134 | HEAT GAIN ΔT °F. 11 | SB-12 PACKAGE A1

ROOM USE			MBR			ENS			WIC			BED-2			BED-3				BATH				PWD-2				
EXP. WALL			16			20			13			10			29				0				12				
CLG. HT.			9			9			9			9			9				9				10				
	FACTORS																										
GRS.WALL AREA	LOSS	GAIN	144			180			117			90			261				0				120				
GLAZING				LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN			LOSS	GAIN			LOSS	GAIN		
NORTH	20.8	14.6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		0	0	0		0	0	0		
EAST	20.8	38.3	0	0	0	0	0	0	0	0	0	32	665	1227	20	416	767		0	0	0		19	395	728		
SOUTH	20.8	22.9	0	0	0	11	229	252	21	436	480	0	0	0	27	561	618		0	0	0		23	478	526		
WEST	20.8	38.3	34	706	1303	11	229	422	0	0	0	0	0	0	0	0	0		0	0	0		0	0	0		
SKYLT.	36.4	100.7	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		
NET EXPOSED WALL	4.4	0.6	110	479	71	158	688	102	96	418	62	58	253	37	214	932	138		0	0	0		78	340	50		
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		
EXPOSED CLG	1.3	0.6	205	257	114	100	125	56	100	125	56	105	132	59	173	217	96		91	114	51		0	0	0		
NO ATTIC EXPOSED CLG	2.7	1.2	0	0	0	0	0	0	0	0	0	12	32	14	0	0	0		0	0	0		0	0	0		
EXPOSED FLOOR	2.5	0.4	14	35	5	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			
SLAB ON GRADE HEAT LOSS				0			0			0			0			0				0				0			
SUBTOTAL HT LOSS				1477			1271			980			1082			2126				114				1212			
SUB TOTAL HT GAIN					1494			831			598			1337			1619				51				1305		
LEVEL FACTOR / MULTIPLIER			0.10	0.21		0.10	0.21		0.10	0.21		0.10	0.21		0.10	0.21			0.10	0.21			0.20	0.37			
AIR CHANGE HEAT LOSS				314			270			208			230			452				24				449			
AIR CHANGE HEAT GAIN					76			42			30			68			82				3				66		
DUCT LOSS				179			0			119			131			258				14				0			
DUCT GAIN					245			0			63			204			234				5				0		
HEAT GAIN PEOPLE	240		2		480	0		0	0		0	1		240	1		240		0		0		0		0		
HEAT GAIN APPLIANCES/LIGHTS					400			0			0			400			400				0				0		
TOTAL HT LOSS BTU/H				1970			1541			1307			1442			2835				152				1661			
TOTAL HT GAIN x 1.3 BTU/H					3503			1135			899			2924			3348				76				1783		

ROOM USE			LV/DN			FAM			KT/BR			OFF			LAUN			PWD			FOY			MUD				BAS		
EXP. WALL			28			30			15			26			10			14			47			5				112		
CLG. HT.			10			10			10			9			10			9			10			10				9		
	FACTORS																													
GRS.WALL AREA	LOSS	GAIN	280			300			150			234			100			126			470			50				616		
GLAZING				LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN			LOSS	GAIN
NORTH	20.8	14.6	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	0
EAST	20.8	38.3	32	665	1227	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		0	0	0
SOUTH	20.8	22.9	23	478	526	23	478	526	23	478	526	18	374	412	0	0	0	12	249	274	14	291	320	0	0	0		6	125	137
WEST	20.8	38.3	0	0	0	70	1454	2684	0	0	0	43	893	1648	0	0	0	0	0	0	0	0	0	0	0	0		3	62	115
SKYLT.	36.4	100.7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		0	0	0
DOORS	24.7	3.7	0	0	0	10	247	37	0	0	0	10	247	37	20	493	73	0	0	0	40	986	146	20	493	73		0	0	0
NET EXPOSED WALL	4.4	0.6	225	980	145	197	858	127	127	553	82	163	710	105	80	349	52	114	497	74	416	1813	269	30	131	19		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	0	0	0	0		392	1377	204
EXPOSED CLG	1.3	0.6	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	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	0		0	0	0
EXPOSED FLOOR	2.5	0.4	206	513	76	0	0	0	72	179	27	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				3881	
SLAB ON GRADE HEAT LOSS				0			0			0			0			0			0			0			0					
SUBTOTAL HT LOSS				2636			3037			1210			2224			842			746			3089			624				5445	
SUB TOTAL HT GAIN					1974			3373			635			2202			125			348			735			92				456
LEVEL FACTOR / MULTIPLIER			0.20	0.37		0.20	0.37		0.20	0.37		0.30	0.60		0.30	0.60		0.30	0.60		0.30	0.60		0.30	0.60			0.40	1.10	
AIR CHANGE HEAT LOSS				975			1123			448			1328			502			445			1844			372				5990	
AIR CHANGE HEAT GAIN					101			172			32			112			6			18			37			5				23
DUCT LOSS				361			0			166			0			0			0			0			0				0	
DUCT GAIN					247			0			107			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
HEAT GAIN APPLIANCES/LIGHTS					400			400			400			400			400			0			0			0					400
TOTAL HT LOSS BTU/H				3972			4160			1824			3552			1344			1191			4934			996				11434	
TOTAL HT GAIN x 1.3 BTU/H					3538			5128			1525			3528			690			476			1004			126					1143

TOTAL HEAT GAIN BTU/H: 31009 | TONS: 2.58 | LOSS DUE TO VENTILATION LOAD BTU/H: 1223 | STRUCTURAL HEAT LOSS: 44317 | TOTAL COMBINED HEAT LOSS BTU/H: 45540

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.

Michael O'Rourke

INDIVIDUAL BCIN: 19669 MICHAEL O'ROURKE

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SITE NAME: FORESTSIDE
BUILDER: ROYAL PINE HOMES
TYPE: 1804 CNR
DATE: Apr-19
GFA: 2260
LO# 78930

HEATING CFM	970	COOLING CFM	970	furnace pressure	0.6	#CARRIER	AFUE = 96 %
TOTAL HEAT LOSS	44,317	TOTAL HEAT GAIN	30,828	furnace filter	0.05	**59SP5A-60-12** **60**	INPUT (BTU/H) = 60,000
AIR FLOW RATE CFM	21.89	AIR FLOW RATE CFM	31.46	a/c coil pressure	0.2	FAN SPEED	OUTPUT (BTU/H) = **58,000**
				available pressure for s/a & r/a	0.35	LOW 0	

RUN COUNT	4th	3rd	2nd	1st	Bas
S/A	0	8	5	6	3
R/A	0	3	1	1	1

plenum pressure s/a	0.18	r/a pressure	0.17	MEDLOW	785	DESIGN CFM =	**970**
max s/a dif press. loss	0.03	r/a grille press. Loss	0.02	MEDIUM	845	CFM @ .6 " E.S.P.	
min adjusted pressure s/a	0.15	adjusted pressure r/a	0.15	MEDIUM HIGH	970		
				HIGH	1030	TEMPERATURE RISE	55 °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	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-3	BATH	MBR	KT/BR	LV/DN	PWD-2	FAM	FAM	OFF	LAUN	PWD	FOY	MUD	BAS	BAS	BAS	OFF
RM LOSS MBH.	0.99	1.54	1.31	1.44	1.42	1.42	0.15	0.99	1.82	3.97	1.66	2.08	2.08	1.78	1.34	1.19	4.93	1.00	3.81	3.81	3.81	1.78
CFM PER RUN HEAT	22	34	29	32	31	31	3	22	40	87	36	46	46	39	29	26	108	22	83	83	83	39
RM GAIN MBH.	1.75	1.14	0.90	2.92	1.67	1.67	0.08	1.75	1.53	3.54	1.78	2.56	2.56	1.76	0.69	0.48	1.00	0.13	0.38	0.38	0.38	1.76
CFM PER RUN COOLING	55	36	28	92	53	53	2	55	48	111	56	81	81	55	22	15	32	4	12	12	12	55
ADJUSTED PRESSURE	0.17	0.17	0.17	0.16	0.17	0.17	0.17	0.17	0.17	0.15	0.17	0.16	0.16	0.17	0.17	0.17	0.15	0.17	0.16	0.16	0.16	0.17
ACTUAL DUCT LGH.	52	57	67	64	66	69	42	47	23	50	49	41	34	14	16	7	40	25	10	16	22	24
EQUIVALENT LENGTH	210	180	200	170	190	200	180	200	170	130	160	150	150	100	110	120	120	100	110	120	110	120
TOTAL EFFECTIVE LENGTH	262	237	267	234	256	269	222	247	193	180	209	191	184	114	126	127	160	125	120	136	132	144
ADJUSTED PRESSURE	0.07	0.07	0.06	0.07	0.07	0.06	0.08	0.07	0.09	0.08	0.08	0.08	0.09	0.15	0.14	0.14	0.1	0.14	0.14	0.12	0.12	0.12
ROUND DUCT SIZE	5	4	4	**6**	5	5	4	5	5	**6**	5	5	5	5	4	4	**6**	4	**6**	**6**	**6**	5
HEATING VELOCITY (ft/min)	162	390	333	163	228	228	34	162	294	444	264	338	338	286	333	298	551	252	423	423	423	286
COOLING VELOCITY (ft/min)	404	413	321	469	389	389	23	404	352	566	411	595	595	404	252	172	163	46	61	61	61	404
OUTLET GRILL SIZE	3X10	3X10	3X10	4X10	3X10	3X10	3X10	3X10	3X10	4X10	3X10	3X10	3X10	3X10	3X10	3X10	4X10	3X10	4X10	4X10	4X10	3X10
TRUNK	A	A	B	B	B	B	B	A	B	B	B	A	A	E	D	D	D	E	E	E	D	E

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	

SUPPLY 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 A	170	0.07	7.5	10	x	8	306	TRUNK G	0	0.00	0	0	x	8	0
TRUNK B	289	0.06	9.5	14	x	8	372	TRUNK H	0	0.00	0	0	x	8	0
TRUNK C	459	0.06	11.3	20	x	8	413	TRUNK I	0	0.00	0	0	x	8	0
TRUNK D	246	0.10	7.8	8	x	8	554	TRUNK J	0	0.00	0	0	x	8	0
TRUNK E	266	0.12	7.7	8	x	8	599	TRUNK K	0	0.00	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

RETURN AIR TRUNK SIZE

	TRUNK CFM	STATIC PRESS.	ROUND DUCT	RECT DUCT			VELOCITY (ft/min)
TRUNK O	0	0.05	0	0	x	8	0
TRUNK P	0	0.05	0	0	x	8	0
TRUNK Q	0	0.05	0	0	x	8	0
TRUNK R	0	0.05	0	0	x	8	0
TRUNK S	0	0.05	0	0	x	8	0
TRUNK T	0	0.05	0	0	x	8	0
TRUNK U	0	0.05	0	0	x	8	0
TRUNK V	0	0.05	0	0	x	8	0
TRUNK W	0	0.05	0	0	x	8	0
TRUNK X	970	0.05	15.6	28	x	8	624
TRUNK Y	560	0.05	12.7	18	x	8	560
TRUNK Z	0	0.05	0	0	x	8	0
DROP	970	0.05	15.6	24	x	10	582

RETURN AIR #	1	2	3	4	5											**BR**
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
AIR VOLUME	130	95	260	290	75	0	0	0	0	0	0	0	0	0	0	120
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.	55	70	41	50	74	1	1	1	1	1	1	1	1	1	1	14
EQUIVALENT LENGTH	175	135	220	140	240	0	0	0	0	0	0	0	0	0	0	140
TOTAL EFFECTIVE LH	230	205	261	190	314	1	1	1	1	1	1	1	1	1	1	154
ADJUSTED PRESSURE	0.06	0.07	0.06	0.08	0.05	14.80	14.80	14.80	14.80	14.80	14.80	14.80	14.80	14.80	14.80	0.10
ROUND DUCT SIZE	7	6	9.1	8.8	6	0	0	0	0	0	0	0	0	0	0	6
INLET GRILL SIZE	8	8	8	8	8	0	0	0	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	30	30	14	0	0	0	0	0	0	0	0	0	0	14

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

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Web: www.hvacdesigns.ca E-mail: info@hvacdesigns.ca

TYPE: 1804 CNR LO # 78930
SITE NAME: FORESTSIDE

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	2	@ 21.2 cfm	42.4	cfm
Other Bedrooms	2	@ 10.6 cfm	21.2	cfm
Kitchen & Bathrooms	5	@ 10.6 cfm	53	cfm
Other Rooms	5	@ 10.6 cfm	53.0	cfm
Table 9.32.3.A.		TOTAL	169.6	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	**63.6**	**cfm**

SUPPLEMENTAL VENTILATION CAPACITY 9.32.3.5.

Total Ventilation Capacity	169.6	cfm
Less Principal Ventil. Capacity	63.6	cfm
Required Supplemental Capacity	106.0	cfm

PRINCIPAL EXHAUST FAN CAPACITY

Model: LIFEBREATH RNC5-HEX Location: BSMT

63.6 cfm 3.0 sones [✓] HVI Approved

PRINCIPAL EXHAUST HEAT LOSS CALCULATION

CFM		ΔT °F		FACTOR		% LOSS
63.6 CFM	X	74 F	X	1.08	X	0.24

SUPPLEMENTAL FANS NUTONE

Location	Model	cfm	HVI	Sones
ENS	QTXEN050C	50	✓	0.3
BATH	QTXEN050C	50	✓	0.3
PWD-2	QTXEN050C	50	✓	0.3
PWD	QTXEN050C	50	✓	0.3

HEAT RECOVERY VENTILATOR 9.32.3.11.

Model: LIFEBREATH RNC5-HEX

108 cfm high 59 cfm low

76 % 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: Michael O'Rourke.

HRAI # 001820

Date: April-19

I REVIEW AND TAKE RESPONIBILITY 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

375 Finley Ave. Suite 202 Ajax, ON L1S 2E2
Tel: 905.619.2300 Fax: 905.619.2375
Web: www.hvacdesigns.ca E-mail: info@hvacdesigns.ca

CSA F280-12 Residential Heat Loss and Heat Gain Calculations

Formula Sheet (For Air Leakage / Ventiliation Calculation)

LO#: 78930 Model: 1804 CNR Builder: ROYAL PINE HOMES Date: 4/22/2019

Volume Calculation

House Volume

Level	Floor Area (ft^2)	Floor Height (ft)	Volume (ft^3)
Bsmt	573	9	5157
First	573	9	5157
Second	834	10	8340
Third	853	9	7677
Fourth	0	9	0
		Total:	26,331.0 ft^3
		Total:	745.6 m^3

Air Change & Delta T Data

WINTER NATURAL AIR CHANGE RATE	0.428
SUMMER NATURAL AIR CHANGE RATE	0.134

Design Temperature Difference

	Tin °C	Tout °C	ΔT °C	ΔT °F
Winter DTDh	22	-19	41	74
Summer DTDc	24	30	6	11

5.2.3.1 Heat Loss due to Air Leakage

$$HL_{airb} = LR_{airh} \times \frac{V_b}{3.6} \times DTD_h \times 1.2$$

0.428 x 207.11 x 41 °C x 1.2 = 4389 W

= **14974 Btu/h**

6.2.6 Sensible Gain due to Air Leakage

$$HG_{salb} = LR_{airc} \times \frac{V_b}{3.6} \times DTD_c \times 1.2$$

= 0.134 x 207.11 x 6 °C x 1.2 = 203 W

= **693 Btu/h**

5.2.3.2 Heat Loss due to Mechanical Ventilation

$$HL_{vairb} = PVC \times DTD_h \times 1.08 \times (1 - E)$$

64 CFM x 74 °F x 1.08 x 0.24 = **1223 Btu/h**

6.2.7 Sensible heat Gain due to Ventilation

$$HL_{vairb} = PVC \times DTD_h \times 1.08 \times (1 - E)$$

64 CFM x 11 °F x 1.08 x 0.24 = **181 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	0.4	14,974	5,445	1.100
2	0.3		7,525	0.597
3	0.2		8,096	0.370
4	0.1		7,050	0.212
5	0		0	0.000

*HLairbv = Air leakage heat loss + ventilation heat loss
*For a balanced or supply only ventilation system HLairve = 0

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HEAT LOSS AND GAIN SUMMARY SHEET

MODEL: 1804 CNR **BUILDER:** ROYAL PINE HOMES
SFQT: 2260 **LO#** 78930 **SITE:** FORESTSIDE

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:	ATTACHED	# OF STORIES (+BASEMENT):	4
FRONT FACES:	EAST	ASSUMED (Y/N):	Y
AIR CHANGES PER HOUR:	3.57	ASSUMED (Y/N):	Y
AIR TIGHTNESS CATEGORY:	AVERAGE	ASSUMED (Y/N):	Y
WIND EXPOSURE:	SHELTERED	ASSUMED (Y/N):	Y
HOUSE VOLUME (ft^3):	26331.0	ASSUMED (Y/N):	Y
INTERNAL SHADING:	BLINDS/CURTAINS	ASSUMED OCCUPANTS:	4
INTERIOR LIGHTING LOAD (Btu/h/ft^2):	1.27	DC BRUSHLESS MOTOR (Y/N):	Y
FOUNDATION CONFIGURATION	BCIN_1	DEPTH BELOW GRADE:	5.5 ft
LENGTH: 44.0 ft	WIDTH: 20.0 ft	EXPOSED PERIMETER:	112.0 ft

2012 OBC - COMPLIANCE PACKAGE **Component**	**Compliance Package A1**	
	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	17.03
Basement Walls Minimum RSI (R)-Value	20 ci	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	0.28	-
Skylights Maximum U-Value	0.49	-
Space Heating Equipment Minimum AFUE	0.96	-
HRV Minimum Efficiency	75%	-
Domestic Hot Water Heater Minimum EF	0.8	-

INDIVIDUAL BCIN: 19669
MICHAEL O'ROURKE

Michael O'Rourke

HVAC Designs Ltd.
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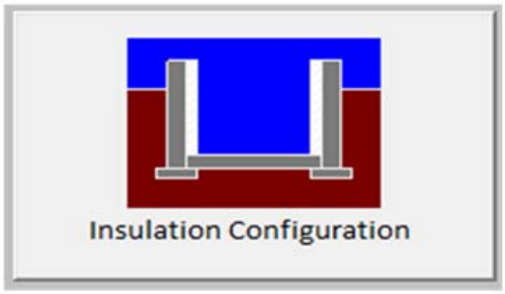
Ajax ON, L1S 2E2
905-619-2300

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):	**13.4**	 Insulation Configuration
Floor Width (m):	**6.1**	
Exposed Perimeter (m):	**34.1**	
Wall Height (m):	**2.7**	
Depth Below Grade (m):	**1.68**	
Window Area (m^2):	**0.8**	
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):		**1137**

TYPE: 1804 CNR
LO# 78930

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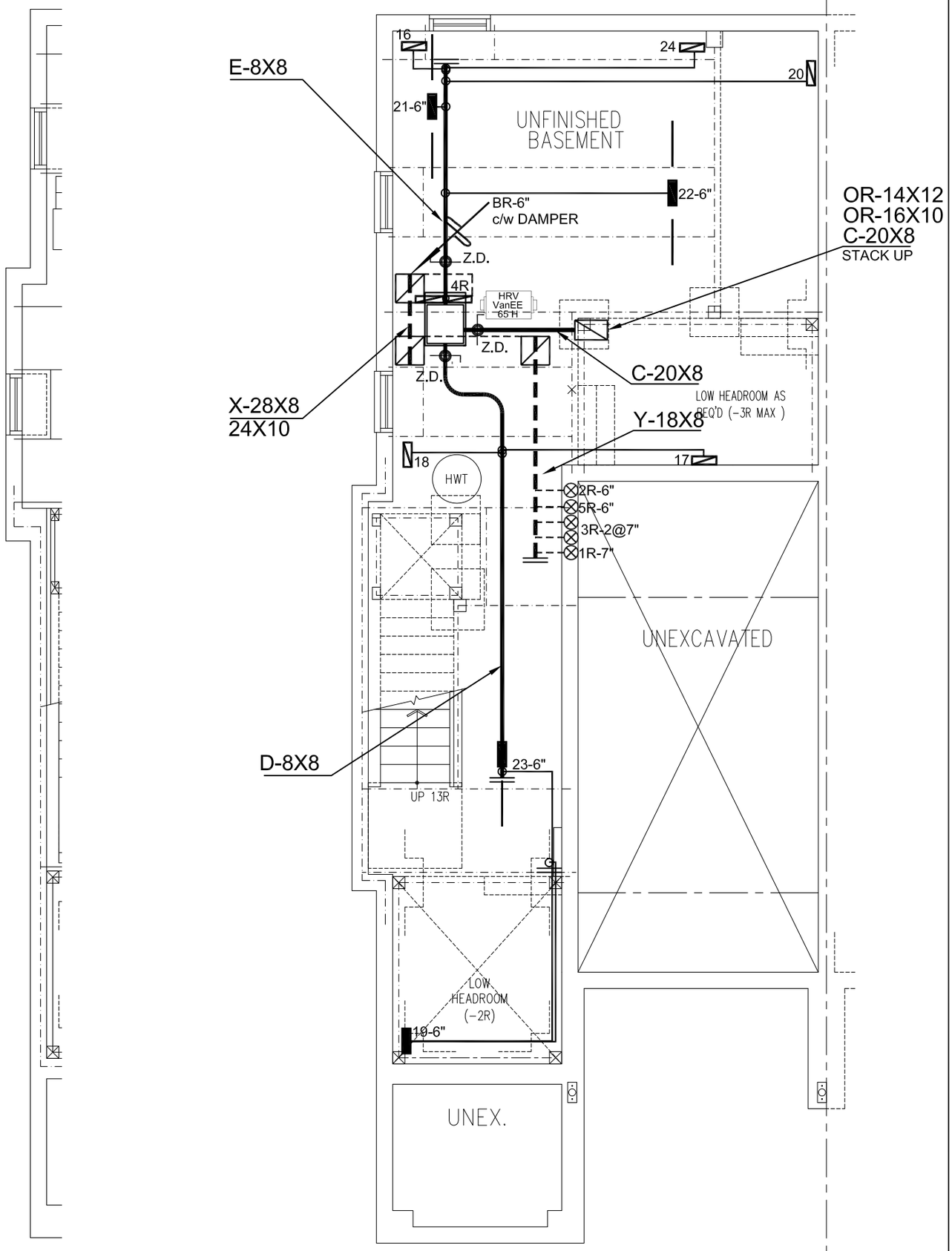
Air Infiltration Residential Load Calculator

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):	9.60
Building Configuration	
Type:	Semi
Number of Stories:	Three
Foundation:	Full
House Volume (m^3):	745.6
Air Leakage/Ventilation	
Air Tightness Type:	Present (1961-) (3.57 ACH)
Custom BDT Data:	ELA @ 10 Pa. 993.9 cm^2
	3.57 ACH @ 50 Pa
Mechanical Ventilation (L/s):	Total Supply 30.0 / Total Exhaust 30.0
Flue Size	
Flue #:	#1 #2 #3 #4
Diameter (mm):	0 0 0 0
Natural Infiltration Rates	
Heating Air Leakage Rate (ACH/H):	**0.428**
Cooling Air Leakage Rate (ACH/H):	**0.134**

TYPE: 1804 CNR
LO# 78930



BASEMENT PLAN EL. 'B'

BASEMENT PLAN EL. 'A'

Z.D. = MOTORIZED ZONE DAMPER

CSA-F280-12

PACKAGE A1

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

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

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 AS PER ARCHITECTURALS	APR/2019
	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		

Client
ROYAL PINE HOMES

Project Name
FORESTSIDE
BRAMPTON, ONTARIO

1804 - CNR 2260 sqft

HVAC DESIGNS LTD.
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L1S 2E2 Tel. 905.619.2300 - 905.420.5300 Fax 905.619.2375
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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 45540 BTU/H	
UNIT DATA	
MAKE	CARRIER
MODEL	59SP5A-60-12
INPUT	60 MBTU/H
OUTPUT	58 MBTU/H
COOLING	2.5 TONS
FAN SPEED	970 cfm @ 0.6" w.c.

# OF RUNS	S/A	R/A	FANS
3RD FLOOR	8	3	2
2ND FLOOR	5	1	2
1ST FLOOR	6	1	2
BASEMENT	3	1	0

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

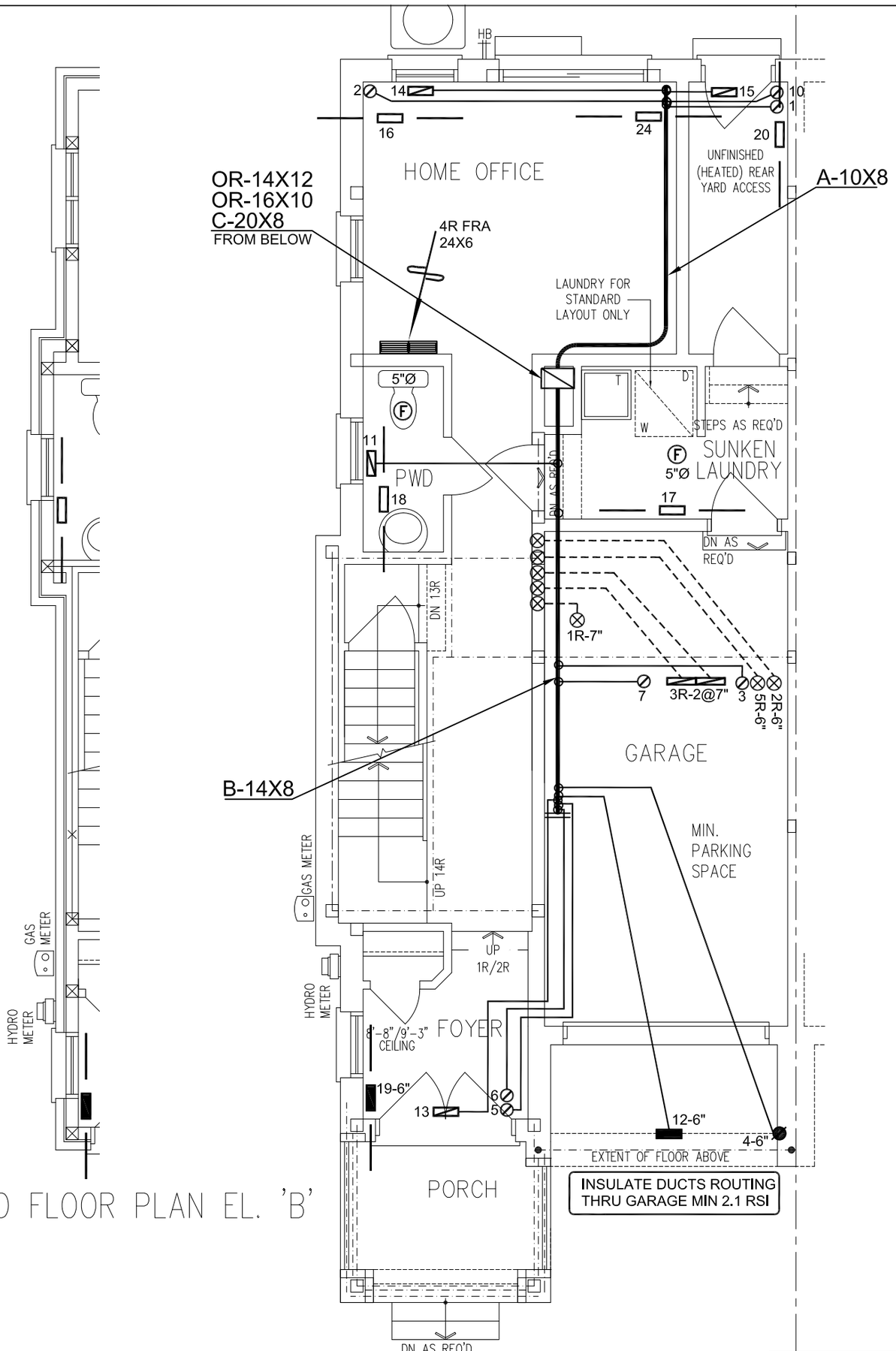
Sheet Title
BASEMENT HEATING LAYOUT

Date JUNE/2018

Scale 3/16" = 1'-0"

BCIN# 19669

LO# 78930



GROUND FLOOR PLAN EL. 'B'

GROUND FLOOR PLAN EL. 'A'

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HVAC DESIGNS LTD.

CSA-F280-12

PACKAGE A1

HVAC LEGEND

SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION
— ▭ —	SUPPLY AIR GRILLE	▬	6" SUPPLY AIR BOOT ABOVE	▭	14"x8" RETURN AIR GRILLE	▭	RETURN AIR STACK ABOVE
— ▬ —	SUPPLY AIR GRILLE 6" BOOT	⊘	SUPPLY AIR STACK FROM 2nd FLOOR	▭	30"x8" RETURN AIR GRILLE	▭	RETURN AIR STACK 2nd FLOOR
▭	SUPPLY AIR BOOT ABOVE	⊘	6" SUPPLY AIR STACK 2nd FLOOR	▬	FRA- FLOOR RETURN AIR GRILLE	⧗	REDUCER

No.	Description	Date
3.		
2.		
1.	REVISED AS PER ARCHITECTURALS	APR/2019

REVISIONS

Client
ROYAL PINE HOMES

Project Name
FORESTSIDE
BRAMPTON, ONTARIO

1804 - CNR 2260 sqft

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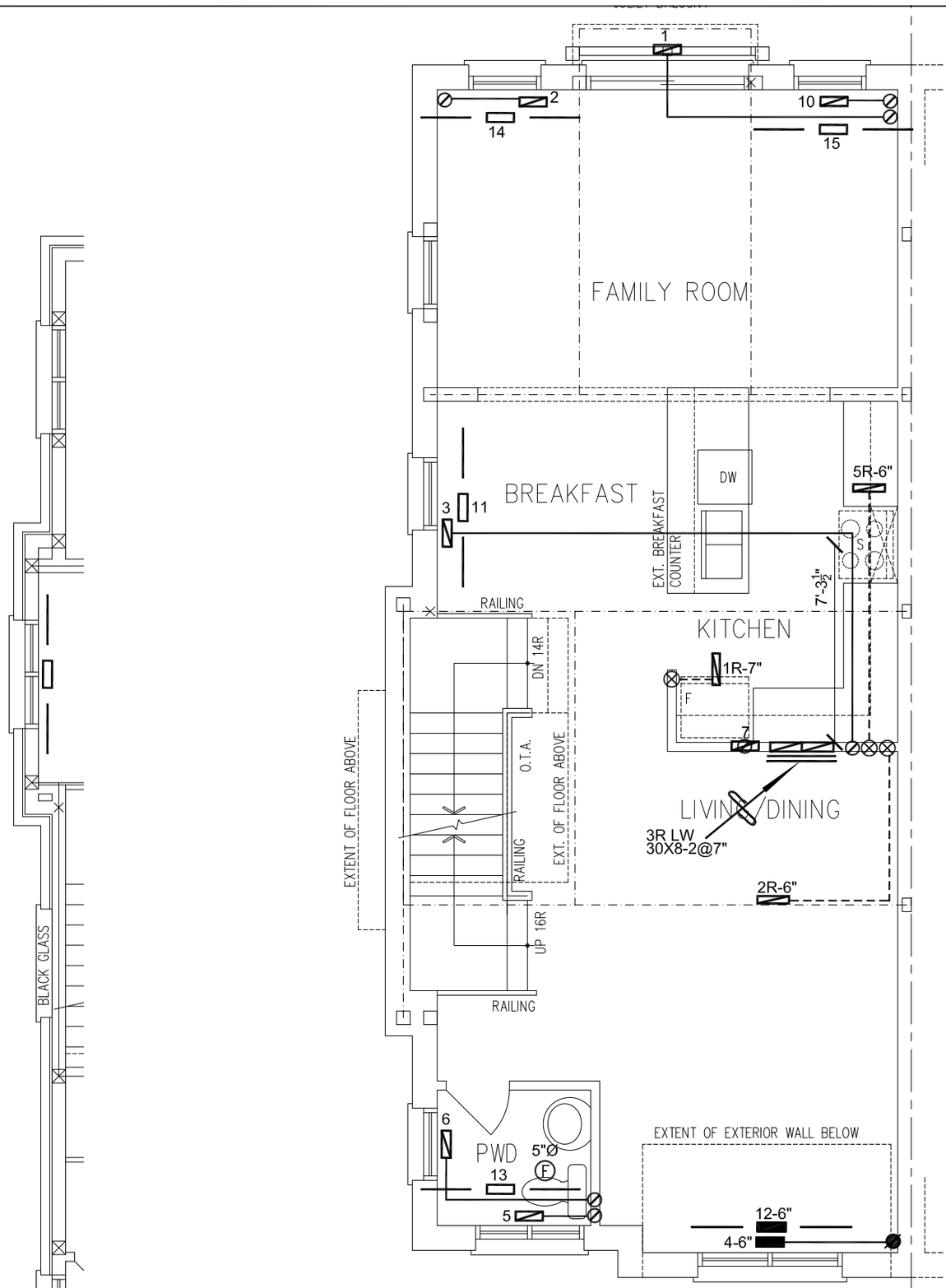
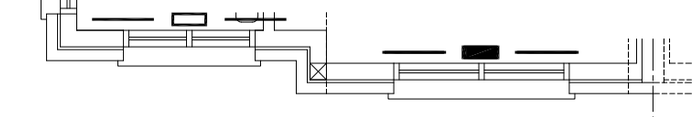
Installation to comply with the latest Ontario Building Code. All supply branch outlets shall be equipped with a manual balancing damper. Ductwork which passes through the garage or unheated spaces shall be adequately insulated and be gas-proofed.

Sheet Title
FIRST FLOOR HEATING LAYOUT

Date JUNE/2018
Scale 3/16" = 1'-0"
BCIN# 19669
LO# 78930



MAIN FLOOR PLAN EL. 'A'



MAIN FLOOR PLAN EL. 'B'

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HVAC DESIGNS LTD.

CSA-F280-12

PACKAGE A1

HVAC LEGEND

SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION
	SUPPLY AIR GRILLE		6" SUPPLY AIR BOOT ABOVE		14"x8" RETURN AIR GRILLE		RETURN AIR STACK ABOVE
	SUPPLY AIR GRILLE 6" BOOT		SUPPLY AIR STACK FROM 2nd FLOOR		30"x8" RETURN AIR GRILLE		RETURN AIR STACK 2nd FLOOR
	SUPPLY AIR BOOT ABOVE		6" SUPPLY AIR STACK 2nd FLOOR		FRA- FLOOR RETURN AIR GRILLE		REDUCER

No.	Description	Date
3.		
2.		
1.	REVISED AS PER ARCHITECTURALS	APR/2019

REVISIONS

Client
ROYAL PINE HOMES

Project Name
FORESTSIDE
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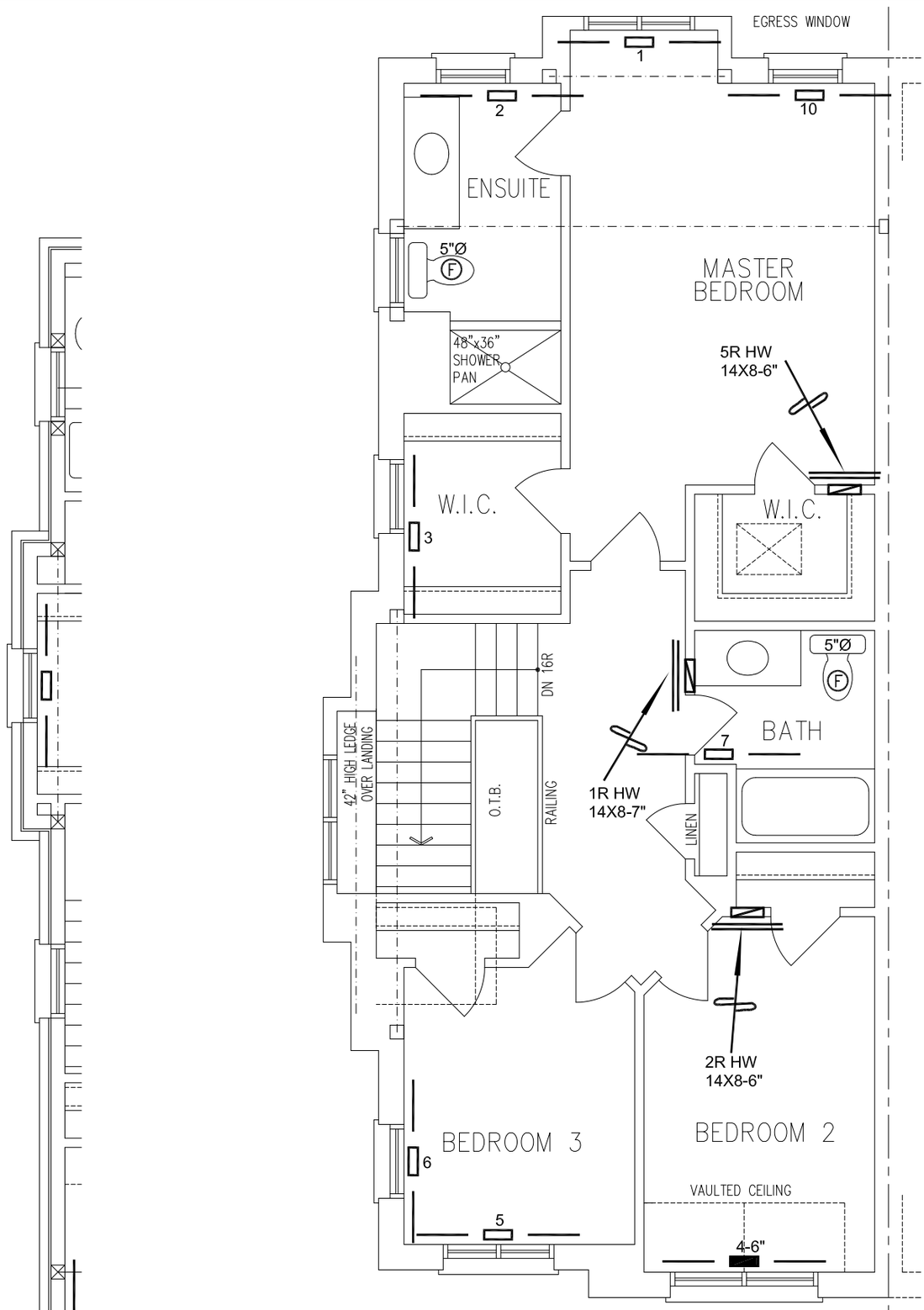
Sheet Title
SECOND FLOOR HEATING LAYOUT

Date JUNE/2018
Scale 3/16" = 1'-0"
BCIN# 19669
LO# 78930



THIRD FLOOR PLAN EL. 'A'

THIRD FLOOR PLAN EL. '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 BUILDING CODE.

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HVAC DESIGNS LTD.

CSA-F280-12

PACKAGE A1

HVAC LEGEND

SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION
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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
▱	SUPPLY AIR BOOT ABOVE	⌀	6" SUPPLY AIR STACK 2nd FLOOR	▬	FRA- FLOOR RETURN AIR GRILLE	⧗	REDUCER

No.	Description	Date
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REVISIONS

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Sheet Title
THIRD FLOOR HEATING LAYOUT

Date JUNE/2018
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BCIN# 19669
LO# 78930