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	**Postal code**	**Plan number/ other description**		
BRAMPTON				

B. Individual who reviews and takes responsibility for design activities

Name		Firm		
MICHAEL O'ROURKE		**HVAC DESIGNS LTD.**		
Street address			**Unit no.**	**Lot/con.**
375 FINLEY AVE			**202**	**N/A**
Municipality	**Postal code**	**Province**	**E-mail**	
AJAX	**L1S 2E2**	**ONTARIO**	**info@hvacdesigns.ca**	
Telephone number	**Fax number**		**Cell number**	
(905) 619-2300	**(905) 619-2375**		( )	

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:** 1703 **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.

May 22, 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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Web: www.hvacdesigns.ca E-mail: info@hvacdesigns.ca

SITE NAME: FORESTSIDE | DATE: Apr-19 | WINTER NATURAL AIR CHANGE RATE 0.433 | HEAT LOSS ΔT °F. 74 | CSA-F280-12
BUILDER: ROYAL PINE HOMES | TYPE: 1703 | GFA: 2534 | LO# 78684 | SUMMER NATURAL AIR CHANGE RATE 0.149 | HEAT GAIN ΔT °F. 14 | SB-12 PACKAGE A1

ROOM USE			MBR			ENS				BED-2			BED-3				BATH							
EXP. WALL			17			0				5			13				0							
CLG. HT.			9			9				9			9				9							
	FACTORS																							
GRS.WALL AREA	LOSS	GAIN	153			0				45			117				0							
GLAZING				LOSS	GAIN		LOSS	GAIN			LOSS	GAIN		LOSS	GAIN			LOSS	GAIN					
NORTH	20.8	16.3	0	0	0	0	0	0		0	0	0	0	0	0		0	0	0					
EAST	20.8	41.9	0	0	0	0	0	0		20	416	838	34	706	1424		0	0	0					
SOUTH	20.8	25.2	0	0	0	0	0	0		0	0	0	0	0	0		0	0	0					
WEST	20.8	41.9	57	1184	2388	0	0	0		0	0	0	0	0	0		0	0	0					
SKYLT.	36.4	102.1	0	0	0	0	0	0		0	0	0	0	0	0		0	0	0					
DOORS	24.7	4.7	0	0	0	0	0	0		0	0	0	0	0	0		0	0	0					
NET EXPOSED WALL	4.4	0.8	96	418	79	0	0	0		25	109	21	83	362	68		0	0	0					
NET EXPOSED BSMT WALL ABOVE GR	3.5	0.7	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	0	0	0		0	0	0					
NO ATTIC EXPOSED CLG	2.7	1.3	238	639	310	221	593	288		185	496	241	234	628	305		221	593	288					
EXPOSED FLOOR	2.5	0.5	67	167	31	0	0	0		0	0	0	0	0	0		0	0	0					
BASEMENT/CRAWL HEAT LOSS				0			0				0			0				0						
SLAB ON GRADE HEAT LOSS				0			0				0			0				0						
SUBTOTAL HT LOSS				2408			593				1021			1696				593						
SUB TOTAL HT GAIN					2808			288				1099			1797				288					
LEVEL FACTOR / MULTIPLIER			0.10	0.27		0.10	0.27			0.10	0.27		0.10	0.27			0.10	0.27						
AIR CHANGE HEAT LOSS				642			158				272			452				158						
AIR CHANGE HEAT GAIN					273			28				107			175				28					
DUCT LOSS				305			75				0			0				75						
DUCT GAIN					414			32				0			0				32					
HEAT GAIN PEOPLE	240		2		480	0		0		1		240	1		240		0		0					
HEAT GAIN APPLIANCES/LIGHTS					579			0				579			579				0					
TOTAL HT LOSS BTU/H				3355			827				1293			2148				827						
TOTAL HT GAIN x 1.3 BTU/H					5920			452				2632			3628				452					

ROOM USE			LIV/DIN				KIT			DEN			LAUN			W/R			FOY			MUD					BAS		
EXP. WALL			17				21			12			7			0			6			11					34		
CLG. HT.			10				12			10			10			10			10			10					9		
	FACTORS																												
GRS.WALL AREA	LOSS	GAIN	170				252			120			70			0			60			110					204		
GLAZING				LOSS	GAIN		LOSS	GAIN			LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN				LOSS	GAIN
NORTH	20.8	16.3	0	0	0		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			0	0	0
EAST	20.8	41.9	45	935	1885		0	0	0	32	665	1340	0	0	0	0	0	0	4	83	168	0	0	0			12	249	503
SOUTH	20.8	25.2	0	0	0		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			0	0	0
WEST	20.8	41.9	0	0	0		75	1558	3142	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			0	0	0
SKYLT.	36.4	102.1	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	4.7	0	0	0		20	493	93	0	0	0	0	0	0	0	0	0	20	493	93	20	493	93			0	0	0
NET EXPOSED WALL	4.4	0.8	125	545	103		157	684	129	88	383	72	70	305	58	0	0	0	36	157	30	90	392	74			0	0	0
NET EXPOSED BSMT WALL ABOVE GR	3.5	0.7	0	0	0		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			102	358	68
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
NO ATTIC EXPOSED CLG	2.7	1.3	0	0	0		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			0	0	0
EXPOSED FLOOR	2.5	0.5	0	0	0		378	941	178	0	0	0	0	0	0	30	75	14	0	0	0	0	0	0			0	0	0
BASEMENT/CRAWL HEAT LOSS				0				0			0			0			0			0			0				1063		
SLAB ON GRADE HEAT LOSS				0				0			0			0			0			0			0						
SUBTOTAL HT LOSS				1480				3676			1048			305			75			733			885				1671		
SUB TOTAL HT GAIN					1988				3541			1413			58			14			290			167					570
LEVEL FACTOR / MULTIPLIER			0.20	0.64			0.20	0.64		0.30	1.70		0.30	1.70		0.20	0.64		0.30	1.70		0.30	1.70				0.40	4.03	
AIR CHANGE HEAT LOSS				952				2367			1782			518			48			1246			1505				6734		
AIR CHANGE HEAT GAIN					193				344			137			6			1			28			16					55
DUCT LOSS				0				604			0			0			12			0			0				0		
DUCT GAIN					0				446			0			0			2			0			0					0
HEAT GAIN PEOPLE	240		0		0		0		0	1		240	0		0	0		0	0		0	0		0			0		0
HEAT GAIN APPLIANCES/LIGHTS					579				579			579			579			0			0			0					579
TOTAL HT LOSS BTU/H				2432				6647			2830			823			135			1979			2390				8405		
TOTAL HT GAIN x 1.3 BTU/H					3588				6384			3079			835			22			414			238					1566

TOTAL HEAT GAIN BTU/H: 29508 TONS: 2.46 LOSS DUE TO VENTILATION LOAD BTU/H: 1593 STRUCTURAL HEAT LOSS: 34092 TOTAL COMBINED HEAT LOSS BTU/H: 35685

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

HVAC DESIGNS LTD.

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SITE NAME: FORESTSIDE
BUILDER: ROYAL PINE HOMES TYPE: 1703 DATE: Apr-19 GFA: 2534 LO# 78684

HEATING CFM	875	COOLING CFM	875	furnace pressure	0.6
TOTAL HEAT LOSS	34,092	TOTAL HEAT GAIN	29,208	furnace filter	0.05
AIR FLOW RATE CFM	25.67	AIR FLOW RATE CFM	29.96	a/c coil pressure	0.2
				available pressure for s/a & r/a	0.35

RUN COUNT	4th	3rd	2nd	1st	Bas
S/A	0	7	6	4	3
R/A	0	4	2	2	1

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

#CARRIER
59SP5A-40-10 **40**

FAN SPEED	
LOW	0
MEDLOW	0
MEDIUM	0
MEDIUM HIGH	710
HIGH	875

AFUE = 97 %
INPUT (BTU/H) = 40,000
OUTPUT (BTU/H) = **39,000**
DESIGN CFM = **875**
CFM @ .6 " E.S.P.
TEMPERATURE RISE 41 °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	4	5	6	7	10	11	12	13	14	15	16	17	18	19	20	21	22	23
ROOM NAME	MBR	ENS	BED-2	BED-3	BED-3	BATH	MBR	LIV/DIN	LIV/DIN	KIT	KIT	KIT	DEN	LAUN	W/R	FOY	MUD	BAS	BAS	BAS
RM LOSS MBH.	1.68	0.83	1.29	1.07	1.07	0.83	1.68	1.22	1.22	2.22	2.22	2.22	2.83	0.82	0.14	1.98	2.39	2.80	2.80	2.80
CFM PER RUN HEAT	43	21	33	28	28	21	43	31	31	57	57	57	73	21	3	51	61	72	72	72
RM GAIN MBH.	2.96	0.45	2.63	1.81	1.81	0.45	2.96	1.79	1.79	2.13	2.13	2.13	3.08	0.83	0.02	0.41	0.24	0.52	0.52	0.52
CFM PER RUN COOLING	89	14	79	54	54	14	89	54	54	64	64	64	92	25	1	12	7	16	16	16
ADJUSTED PRESSURE	0.16	0.17	0.17	0.17	0.17	0.17	0.16	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
ACTUAL DUCT LGH.	83	69	77	72	75	42	74	63	53	68	66	57	32	8	49	41	7	28	28	8
EQUIVALENT LENGTH	190	200	190	180	240	210	170	180	140	160	150	140	110	110	170	100	90	110	120	130
TOTAL EFFECTIVE LENGTH	273	269	267	252	315	252	244	243	193	228	216	197	142	118	219	141	97	138	148	138
ADJUSTED PRESSURE	0.06	0.06	0.06	0.07	0.05	0.07	0.07	0.07	0.09	0.08	0.08	0.09	0.11	0.15	0.08	0.12	0.18	0.12	0.12	0.12
ROUND DUCT SIZE	**6**	4	**6**	5	5	4	**6**	5	5	5	5	5	**6**	4	4	4	5	5	5	5
HEATING VELOCITY (ft/min)	219	241	168	206	206	241	219	228	228	419	419	419	372	241	34	585	448	529	529	529
COOLING VELOCITY (ft/min)	454	161	403	396	396	161	454	396	396	470	470	470	469	287	11	138	51	117	117	117
OUTLET GRILL SIZE	4X10	3X10	4X10	3X10	3X10	3X10	4X10	3X10	3X10	3X10	3X10	3X10	4X10	3X10	3X10	3X10	3X10	3X10	3X10	3X10
TRUNK	A	A	B	B	B	A	A	B	B	A	A	A	D	D	A	D	D	D	D	D

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 A	302	0.06	9.6	12	x	8	453
TRUNK B	151	0.05	7.8	10	x	8	272
TRUNK C	453	0.05	11.7	20	x	8	408
TRUNK D	422	0.11	9.4	10	x	8	760
TRUNK E	875	0.05	15	26	x	8	606
TRUNK F	0	0.00	0	0	x	8	0

	TRUNK CFM	STATIC PRESS.	ROUND DUCT	RECT DUCT			VELOCITY (ft/min)
TRUNK G	0	0.00	0	0	x	8	0
TRUNK H	0	0.00	0	0	x	8	0
TRUNK I	0	0.00	0	0	x	8	0
TRUNK J	0	0.00	0	0	x	8	0
TRUNK K	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	875	0.05	15	26	x	8	606
TRUNK Y	400	0.05	11.2	14	x	8	514
TRUNK Z	170	0.05	8.1	8	x	8	383
DROP	875	0.05	15	24	x	10	525

RETURN AIR #	1	2	3	4	5	6	7	8								BR
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
AIR VOLUME	75	75	75	170	155	75	75	75	0	0	0	0	0	0	0	100
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.	59	72	61	44	33	39	70	52	1	1	1	1	1	1	1	20
EQUIVALENT LENGTH	235	205	210	120	150	175	165	165	0	0	0	0	0	0	0	165
TOTAL EFFECTIVE LH	294	277	271	164	183	214	235	217	1	1	1	1	1	1	1	185
ADJUSTED PRESSURE	0.05	0.05	0.05	0.09	0.08	0.07	0.06	0.07	14.80	14.80	14.80	14.80	14.80	14.80	14.80	0.08
ROUND DUCT SIZE	6	6	6	7	7	5.5	5.7	5.5	0	0	0	0	0	0	0	5.9
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	14	14	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

HVAC DESIGNS LTD.
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Tel: 905.619.2300 Fax: 905.619.2375
Web: www.hvacdesigns.ca E-mail: info@hvacdesigns.ca

TYPE: 1703 LO # 78684
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	3	@ 10.6 cfm	31.8	cfm
Kitchen & Bathrooms	5	@ 10.6 cfm	53	cfm
Other Rooms	3	@ 10.6 cfm	31.8	cfm
Table 9.32.3.A.		TOTAL	159.0	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	**79.5**	**cfm**

SUPPLEMENTAL VENTILATION CAPACITY 9.32.3.5.

Total Ventilation Capacity	159	cfm
Less Principal Ventil. Capacity	79.5	cfm
Required Supplemental Capacity	79.5	cfm

PRINCIPAL EXHAUST FAN CAPACITY

Model: VANEE 65H Location: BSMT

79.5 cfm 3.0 sones [✓] 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 NUTONE

Location	Model	cfm	HVI	Sones
ENS	QTXEN050C	50	✓	0.3
BATH	QTXEN050C	50	✓	0.3
LAUN	QTXEN050C	50	✓	0.3
W/R	QTXEN050C	50	✓	0.3

HEAT RECOVERY VENTILATOR 9.32.3.11.

Model: VANEE 65H

155 cfm high 64 cfm low

75 % 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

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CSA F280-12 Residential Heat Loss and Heat Gain Calculations

Formula Sheet (For Air Leakage / Ventiliation Calculation)

LO#: 78684 Model: 1703 Builder: ROYAL PINE HOMES Date: 4/22/2019

Volume Calculation

House Volume

Level	Floor Area (ft²)	Floor Height (ft)	Volume (ft³)
Bsmt	553	9	4977
First	553	10	5530
Second	960	10	9600
Third	1021	9	9189
Fourth	0	9	0
		Total:	29,296.0 ft³
		Total:	829.6 m³

Air Change & Delta T Data

WINTER NATURAL AIR CHANGE RATE	0.433
SUMMER NATURAL AIR CHANGE RATE	0.149

Design Temperature Difference

	Tin °C	Tout °C	ΔT °C	ΔT °F
Winter DTDh	22	-19	41	74
Summer DTDc	22	30	8	14

5.2.3.1 Heat Loss due to Air Leakage

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

0.433 x 230.44 x 41 °C x 1.2 = 4934 W

= **16836 Btu/h**

6.2.6 Sensible Gain due to Air Leakage

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

= 0.149 x 230.44 x 8 °C x 1.2 = 320 W

= **1091 Btu/h**

5.2.3.2 Heat Loss due to Mechanical 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**

6.2.7 Sensible heat Gain due to Ventilation

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

80 CFM x 14 °F x 1.08 x 0.25 = **301 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	16,836	1,671	4.031
2	0.3		2,971	1.700
3	0.2		5,231	0.644
4	0.1		6,312	0.267
5	0		0	0.000

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

HVAC DESIGNS LTD.
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HEAT LOSS AND GAIN SUMMARY SHEET

MODEL: 1703 **BUILDER:** ROYAL PINE HOMES
SFQT: 2534 **LO#** 78684 **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)	72

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):	29296.0	ASSUMED (Y/N):	Y
INTERNAL SHADING:	BLINDS/CURTAINS	ASSUMED OCCUPANTS:	5
INTERIOR LIGHTING LOAD (Btu/h/ft^2):	1.50	DC BRUSHLESS MOTOR (Y/N):	Y
FOUNDATION CONFIGURATION	BCIN_1	DEPTH BELOW GRADE:	6.0 ft
LENGTH: 33.0 ft	WIDTH: 17.0 ft	EXPOSED PERIMETER:	34.0 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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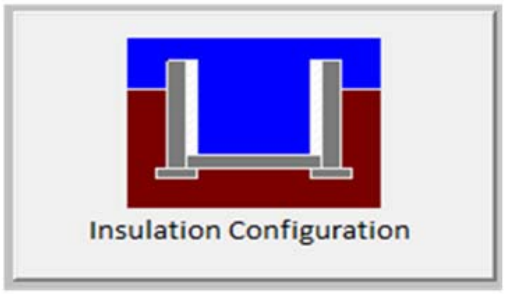
Ajax ON, L1S 2E2
905-619-2300

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):	**10.1**	 Insulation Configuration
Floor Width (m):	**5.2**	
Exposed Perimeter (m):	**10.4**	
Wall Height (m):	**2.7**	
Depth Below Grade (m):	**1.83**	
Window Area (m^2):	**1.1**	
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):	**311**	

TYPE: 1703
LO# 78684

HVAC Designs Ltd.
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Ajax ON, L1S 2E2
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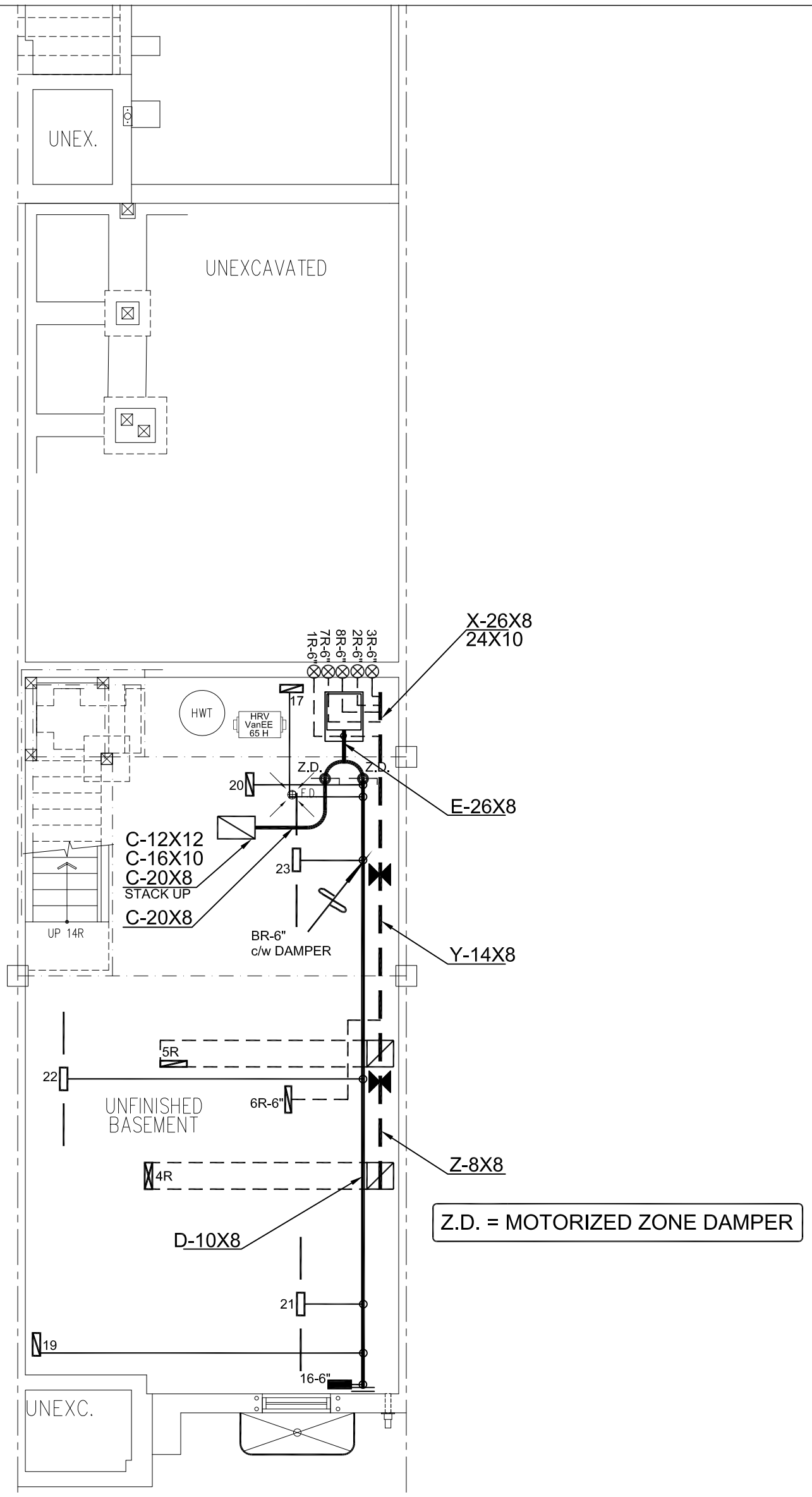
Air Infiltration Residential Load Calculator

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):	9.75
Building Configuration	
Type:	Semi
Number of Stories:	Three
Foundation:	Full
House Volume (m^3):	829.6
Air Leakage/Ventilation	
Air Tightness Type:	Present (1961-) (3.57 ACH)
Custom BDT Data:	ELA @ 10 Pa. 1105.8 cm^2
	3.57 ACH @ 50 Pa
Mechanical Ventilation (L/s):	Total Supply 37.5 / Total Exhaust 37.5
Flue Size	
Flue #:	#1 #2 #3 #4
Diameter (mm):	0 0 0 0
Natural Infiltration Rates	
Heating Air Leakage Rate (ACH/H):	**0.433**
Cooling Air Leakage Rate (ACH/H):	**0.149**

TYPE: 1703
LO# 78684



Z.D. = MOTORIZED ZONE DAMPER

BASEMENT PLAN, EL. 'A'

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.

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 ARCHITECURALS	APR/2019

REVISIONS

Client

ROYAL PINE HOMES

Project Name

FORESTSIDE
BRAMPTON, ONTARIO

1703 2534 sqft

HVAC DESIGNS LTD.
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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 35685 BTU/H	
UNIT DATA	
MAKE	CARRIER
MODEL	59SP5A-40-10
INPUT	40 MBTU/H
OUTPUT	39 MBTU/H
COOLING	2.5 TONS
FAN SPEED	875 cfm @ 0.6" w.c.

# OF RUNS	S/A	R/A	FANS
3RD FLOOR	7	4	2
2ND FLOOR	6	2	2
1ST FLOOR	4	2	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

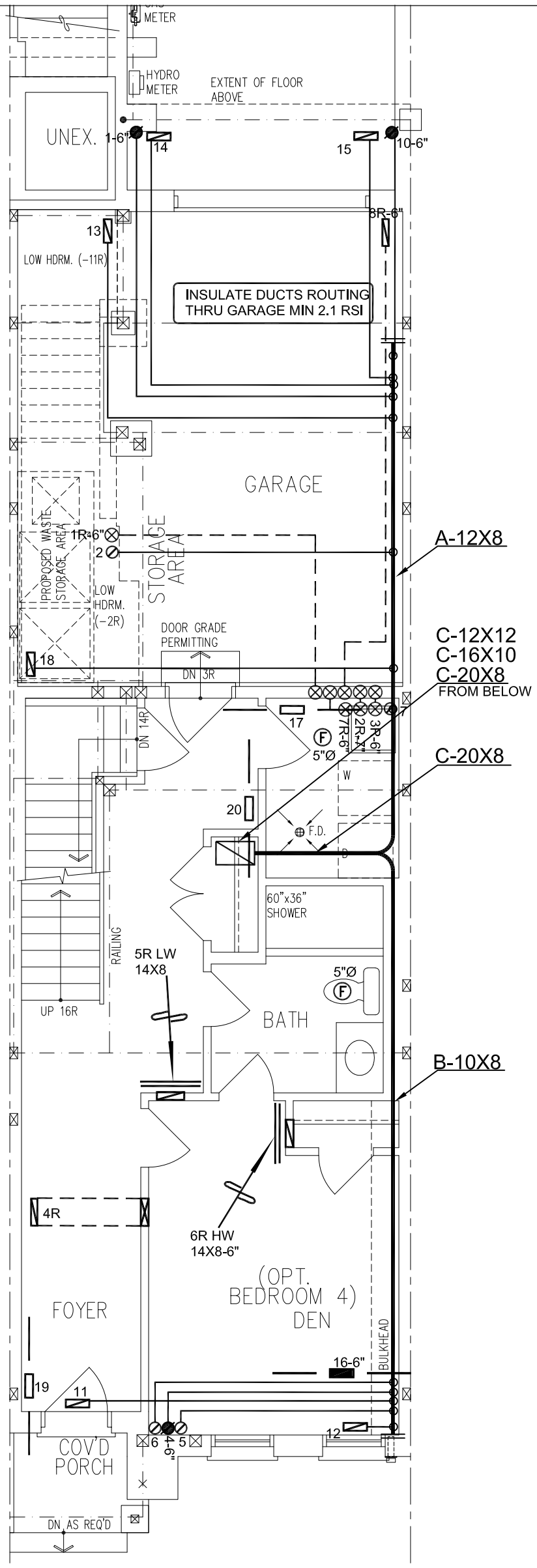
BASEMENT HEATING LAYOUT

Date MAY/2018

Scale 3/16" = 1'-0"

BCIN# 19669

LO# 78684



GROUND FLOOR PLAN, EL. 'A'

CSA-F280-12

PACKAGE A1

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HVAC DESIGNS LTD.

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
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Client
ROYAL PINE HOMES

Project Name
FORESTSIDE
BRAMPTON, ONTARIO

1703 2534 sqft

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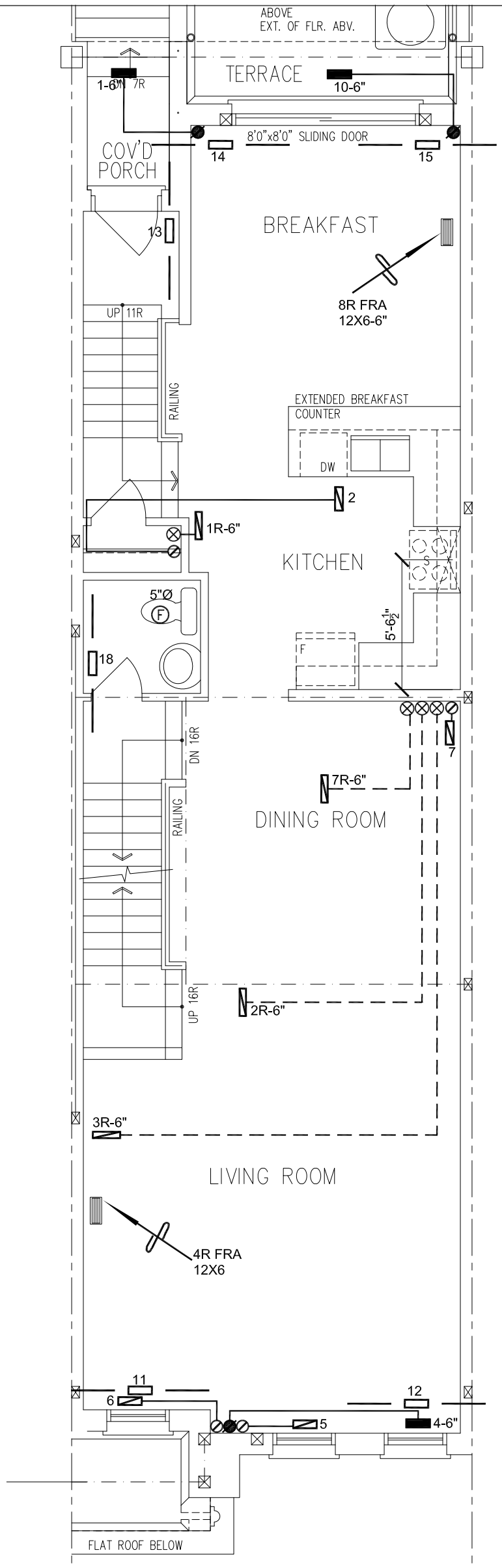
Sheet Title
FIRST FLOOR HEATING LAYOUT

Date MAY/2018
Scale 3/16" = 1'-0"
BCIN# 19669
LO# 78684



MAIN FLOOR PLAN, EL. 'A'

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
— ▭ —	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

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ROYAL PINE HOMES

Project Name
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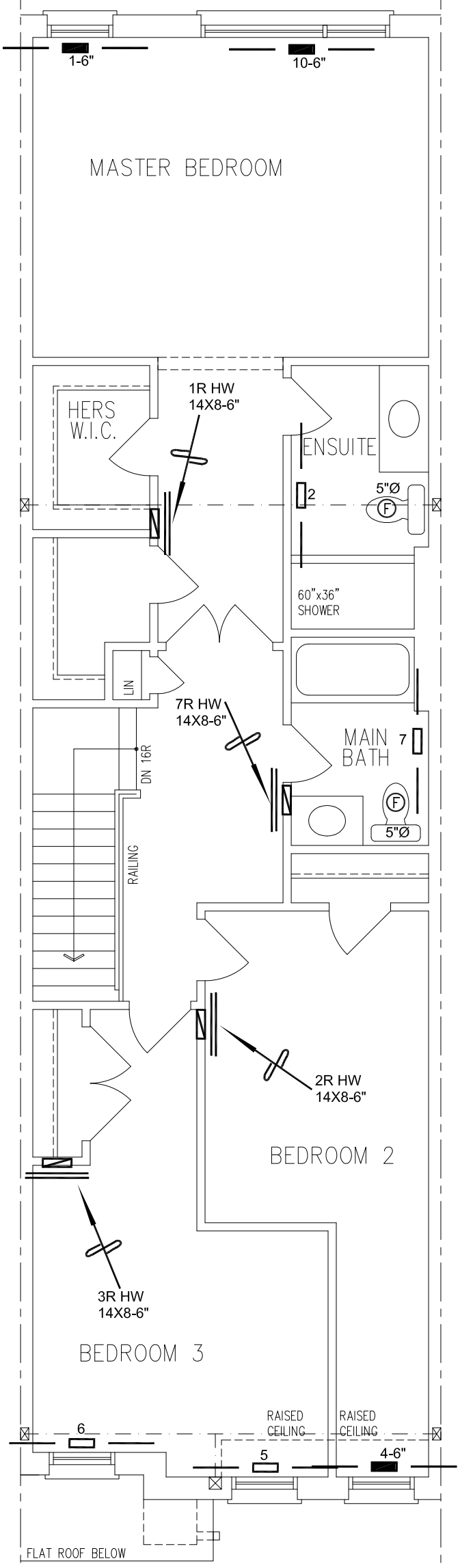
Sheet Title
SECOND FLOOR HEATING LAYOUT

Date MAY/2018
Scale 3/16" = 1'-0"
BCIN# 19669
LO# 78684



THIRD FLOOR PLAN, EL. 'A'

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Michael O'Rourke, BCIN# 19669
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

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Sheet Title
THIRD FLOOR HEATING LAYOUT

Date MAY/2018
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LO# 78684