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:** 1804 END **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

Michael O'Rourke
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 END | GFA: 2064 | LO# 78929 | SUMMER NATURAL AIR CHANGE RATE 0.147 | HEAT GAIN ΔT °F. 14 | SB-12 PACKAGE A1

ROOM USE			MBR			ENS			WIC			BED-2			BED-3				BATH				PWD-2				
EXP. WALL			16			20			13			10			23				0				12				
CLG. HT.			9			9			9			9			9				9				10				
	FACTORS																										
GRS.WALL AREA	LOSS	GAIN	144			180			117			90			207				0				120				
GLAZING				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		
EAST	20.8	41.9	0	0	0	0	0	0	0	0	0	32	665	1340	20	416	838		0	0	0		19	395	796		
SOUTH	20.8	25.2	0	0	0	0	0	0	20	416	505	0	0	0	0	0	0		0	0	0		0	0	0		
WEST	20.8	41.9	13	270	545	11	229	461	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		
DOORS	24.7	4.7	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	0.8	131	571	108	169	736	139	97	423	80	58	253	48	187	815	154		0	0	0		101	440	83		
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		
EXPOSED CLG	1.3	0.6	205	257	125	100	125	61	100	125	61	117	147	71	148	185	90		91	114	55		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		
EXPOSED FLOOR	2.5	0.5	14	35	7	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				1133			1090			964			1064			1416				114				835			
SUB TOTAL HT GAIN					783			660			645			1459			1082				55				879		
LEVEL FACTOR / MULTIPLIER			0.10	0.23		0.10	0.23		0.10	0.23		0.10	0.23		0.10	0.23			0.10	0.23			0.20	0.39			
AIR CHANGE HEAT LOSS				261			251			222			245			326				26				329			
AIR CHANGE HEAT GAIN					55			46			45			102			76				4				62		
DUCT LOSS				139			0			119			131			174				14				116			
DUCT GAIN					174			0			69			222			182				6				94		
HEAT GAIN PEOPLE	240		2		480	0		0	0		0	1		240	1		240		0		0		0		0		
HEAT GAIN APPLIANCES/LIGHTS					419			0			0			419			419				0				0		
TOTAL HT LOSS BTU/H				1533			1341			1304			1441			1916				155				1280			
TOTAL HT GAIN x 1.3 BTU/H					2484			919			987			3175			2597				85				1345		

ROOM USE			LV/DN			FAM			KT/BR			OFF			LAUN			PWD			FOY			MUD				BAS		
EXP. WALL			26			30			13			26			10			12			45			5				108		
CLG. HT.			10			10			10			9			10			9			11			10				9		
	FACTORS																													
GRS.WALL AREA	LOSS	GAIN	260			300			130			234			100			108			495			50				594		
GLAZING				LOSS	GAIN		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	0		0	0
EAST	20.8	41.9	32	665	1340	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	25.2	0	0	0	0	0	0	34	706	858	0	0	0	0	0	0	12	249	303	0	0	0	0	0	0	0		3	62	76
WEST	20.8	41.9	0	0	0	70	1454	2932	0	0	0	64	1330	2681	0	0	0	0	0	0	0	0	0	0	0	0	0		3	62	126
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	0		0	0	0
DOORS	24.7	4.7	0	0	0	0	0	0	0	0	0	0	0	0	20	493	93	0	0	0	40	986	186	20	493	93			0	0	0
NET EXPOSED WALL	4.4	0.8	228	993	187	230	1002	189	96	418	79	170	741	140	80	349	66	96	418	79	455	1982	374	30	131	25			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	0	0	0			378	1328	251
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	1.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			0	0	0
EXPOSED FLOOR	2.5	0.5	206	513	97	0	0	0	72	179	34	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				3682	
SLAB ON GRADE HEAT LOSS				0			0			0			0			0			0			0			0					
SUBTOTAL HT LOSS				2171			2456			1304			2070			842			668			2968			624				5135	
SUB TOTAL HT GAIN					1625			3121			971			2821			159			382			560			118				452
LEVEL FACTOR / MULTIPLIER			0.20	0.39		0.20	0.39		0.20	0.39		0.30	0.56		0.30	0.56		0.30	0.56		0.30	0.56		0.30	0.56			0.40	1.04	
AIR CHANGE HEAT LOSS				855			967			513			1154			469			372			1654			348				5329	
AIR CHANGE HEAT GAIN					114			218			68			197			11			27			39			8				32
DUCT LOSS				303			0			182			0			0			0			0			0				0	
DUCT GAIN					216			0			146			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					419			419			419			419			419			0			0			0					419
TOTAL HT LOSS BTU/H				3329			3424			1999			3224			1311			1040			4623			971				10464	
TOTAL HT GAIN x 1.3 BTU/H					3085			4886			2084			4468			765			531			779			164					1173

TOTAL HEAT GAIN BTU/H: 29765 | TONS: 2.48 | LOSS DUE TO VENTILATION LOAD BTU/H: 1274 | STRUCTURAL HEAT LOSS: 39354 | TOTAL COMBINED HEAT LOSS BTU/H: 40628

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: 1804 END

DATE: Apr-19

GFA: 2064 LO# 78929

HEATING CFM	970	COOLING CFM	970	furnace pressure	0.6
TOTAL HEAT LOSS	39,354	TOTAL HEAT GAIN	29,525	furnace filter	0.05
AIR FLOW RATE CFM	24.65	AIR FLOW RATE CFM	32.85	a/c coil pressure	0.2
				available pressure for s/a & r/a	0.35
				plenum pressure s/a	0.18
				max s/a dif press. loss	0.03
				min adjusted pressure s/a	0.15

				r/a pressure	0.17
				r/a grille press. Loss	0.02
				adjusted pressure r/a	0.15

#CARRIER
59SP5A-60-12 60

FAN SPEED	
LOW	0
MEDLOW	785
MEDIUM	845
MEDIUM HIGH	970
HIGH	1030

AFUE = 96 %
INPUT (BTU/H) = 60,000
OUTPUT (BTU/H) = **58,000**

DESIGN CFM = **970**
CFM @ .6 " E.S.P.

TEMPERATURE RISE 55 °F

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

All S/A diffusers 4"x10" unless noted otherwise on layout.
All S/A runs 5"Ø unless noted otherwise on layout.

RUN #	2	3	4	5	7	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
ROOM NAME	ENS	WIC	BED-2	BED-3	BATH	MBR	KT/BR	LV/DN	PWD-2	FAM	FAM	OFF	LAUN	PWD	FOY	MUD	BAS	BAS	BAS	OFF
RM LOSS MBH.	1.34	1.30	1.44	1.92	0.15	1.53	2.00	3.33	1.28	1.71	1.71	1.61	1.31	1.04	4.62	0.97	3.49	3.49	3.49	1.61
CFM PER RUN HEAT	33	32	36	47	4	38	49	82	32	42	42	40	32	26	114	24	86	86	86	40
RM GAIN MBH.	0.92	0.99	3.17	2.60	0.08	2.48	2.08	3.08	1.34	2.44	2.44	2.23	0.77	0.53	0.78	0.16	0.39	0.39	0.39	2.23
CFM PER RUN COOLING	30	32	104	85	3	82	68	101	44	80	80	73	25	17	26	5	13	13	13	73
ADJUSTED PRESSURE	0.17	0.17	0.16	0.16	0.17	0.16	0.17	0.16	0.17	0.17	0.17	0.17	0.17	0.17	0.15	0.17	0.16	0.16	0.16	0.17
ACTUAL DUCT LGH.	57	67	64	66	42	47	23	50	49	41	34	14	16	7	40	25	10	16	22	24
EQUIVALENT LENGTH	180	200	170	190	180	200	170	130	160	150	150	100	110	120	120	100	110	120	110	120
TOTAL EFFECTIVE LENGTH	237	267	234	256	222	247	193	180	209	191	184	114	126	127	160	125	120	136	132	144
ADJUSTED PRESSURE	0.07	0.06	0.07	0.06	0.08	0.07	0.09	0.09	0.08	0.09	0.09	0.15	0.14	0.14	0.1	0.14	0.14	0.12	0.12	0.12
ROUND DUCT SIZE	4	4	**6**	**6**	4	**6**	5	**6**	4	5	5	4	4	4	**6**	4	**6**	**6**	**6**	5
HEATING VELOCITY (ft/min)	379	367	184	240	46	194	360	418	367	308	308	459	367	298	581	275	438	438	438	294
COOLING VELOCITY (ft/min)	344	367	530	433	34	418	499	515	505	587	587	**837**	287	195	133	57	66	66	66	536
OUTLET GRILL SIZE	3X10	3X10	4X10	4X10	3X10	4X10	3X10	4X10	3X10	3X10	3X10	3X10	3X10	3X10	4X10	3X10	4X10	4X10	4X10	3X10
TRUNK	A	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	155	0.07	7.2	10	x	8	279	TRUNK G	0	0.00	0	0	x	8	0
TRUNK B	282	0.06	9.4	14	x	8	363	TRUNK H	0	0.00	0	0	x	8	0
TRUNK C	437	0.06	11.1	20	x	8	393	TRUNK I	0	0.00	0	0	x	8	0
TRUNK D	258	0.10	8	8	x	8	581	TRUNK J	0	0.00	0	0	x	8	0
TRUNK E	276	0.12	7.8	8	x	8	621	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	0	
AIR VOLUME	130	95	260	290	75	0	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	0.15
ACTUAL DUCT LGH.	55	70	41	50	74	1	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	0	140
TOTAL EFFECTIVE LH	230	205	261	190	314	1	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	14.80	0.10
ROUND DUCT SIZE	7	6	9.1	8.8	6	0	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	0	8
	X	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	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.

Michael O'Rourke

INDIVIDUAL BCIN: 19669 MICHAEL O'ROURKE

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TYPE: 1804 END LO # 78929
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	6	@ 10.6 cfm	63.6	cfm
Table 9.32.3.A.		TOTAL	180.2	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	180.2	cfm
Less Principal Ventil. Capacity	63.6	cfm
Required Supplemental Capacity	116.6	cfm

PRINCIPAL EXHAUST FAN CAPACITY

Model: VANEE 65H 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	0.25

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: 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

HVAC DESIGNS LTD.

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#: 78929 Model: 1804 END Builder: ROYAL PINE HOMES Date: 4/22/2019

Volume Calculation

House Volume

Level	Floor Area (ft²)	Floor Height (ft)	Volume (ft³)
Bsmt	434	9	3906
First	434	9	3906
Second	817	10	8170
Third	827	9	7443
Fourth	0	9	0
		Total:	23,425.0 ft³
		Total:	663.3 m³

Air Change & Delta T Data

WINTER NATURAL AIR CHANGE RATE	0.428
SUMMER NATURAL AIR CHANGE RATE	0.147

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

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

0.428 x 184.26 x 41 °C x 1.2 = 3904 W

= **13321 Btu/h**

6.2.6 Sensible Gain due to Air Leakage

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

= 0.147 x 184.26 x 8 °C x 1.2 = 253 W

= **863 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 0.25 = **1274 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 14 °F x 1.08 x 0.25 = **240 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	13,321	5,135	1.038
2	0.3		7,172	0.557
3	0.2		6,767	0.394
4	0.1		5,781	0.230
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 END **BUILDER:** ROYAL PINE HOMES
SFQT: 2064 **LO#** 78929 **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):	23425.0	ASSUMED (Y/N):	Y
INTERNAL SHADING:	BLINDS/CURTAINS	ASSUMED OCCUPANTS:	4
INTERIOR LIGHTING LOAD (Btu/h/ft^2):	1.50	DC BRUSHLESS MOTOR (Y/N):	Y
FOUNDATION CONFIGURATION	BCIN_1	DEPTH BELOW GRADE:	5.5 ft
LENGTH: 44.0 ft	WIDTH: 18.0 ft	EXPOSED PERIMETER:	108.0 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	-

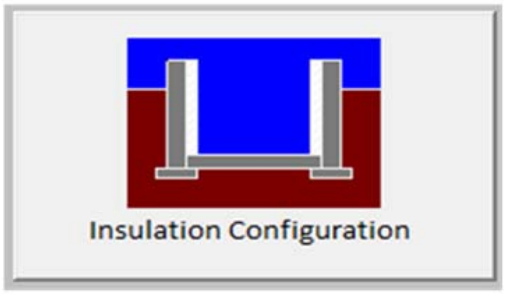
INDIVIDUAL BCIN: 19669
MICHAEL O'ROURKE

HVAC Designs Ltd.
375 Finley Ave, Suite 202
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):	**5.5**	
Exposed Perimeter (m):	**32.9**	
Wall Height (m):	**2.7**	
Depth Below Grade (m):	**1.68**	
Window Area (m^2):	**0.6**	
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):		**1079**

TYPE: 1804 END
LO# 78929

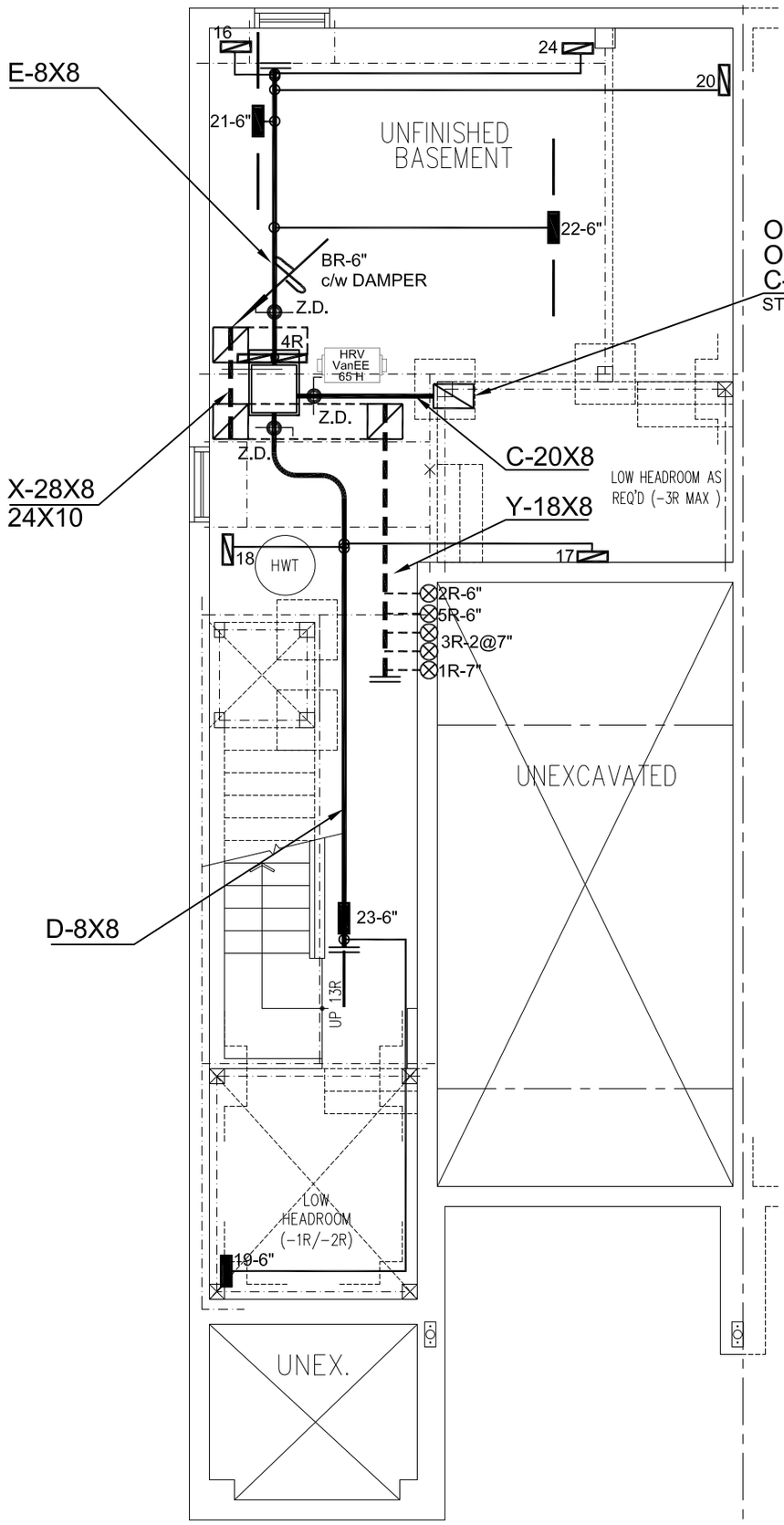
HVAC Designs Ltd.
375 Finley Ave, Suite 202
Ajax ON, L1S 2E2
905-619-2300

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):	663.3
Air Leakage/Ventilation	
Air Tightness Type:	Present (1961-) (3.57 ACH)
Custom BDT Data:	ELA @ 10 Pa. 884.2 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):	**0.147**

TYPE: 1804 END
LO# 78929



BASEMENT PLAN EL. 'A' & 'B'

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

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 - END 2064 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.

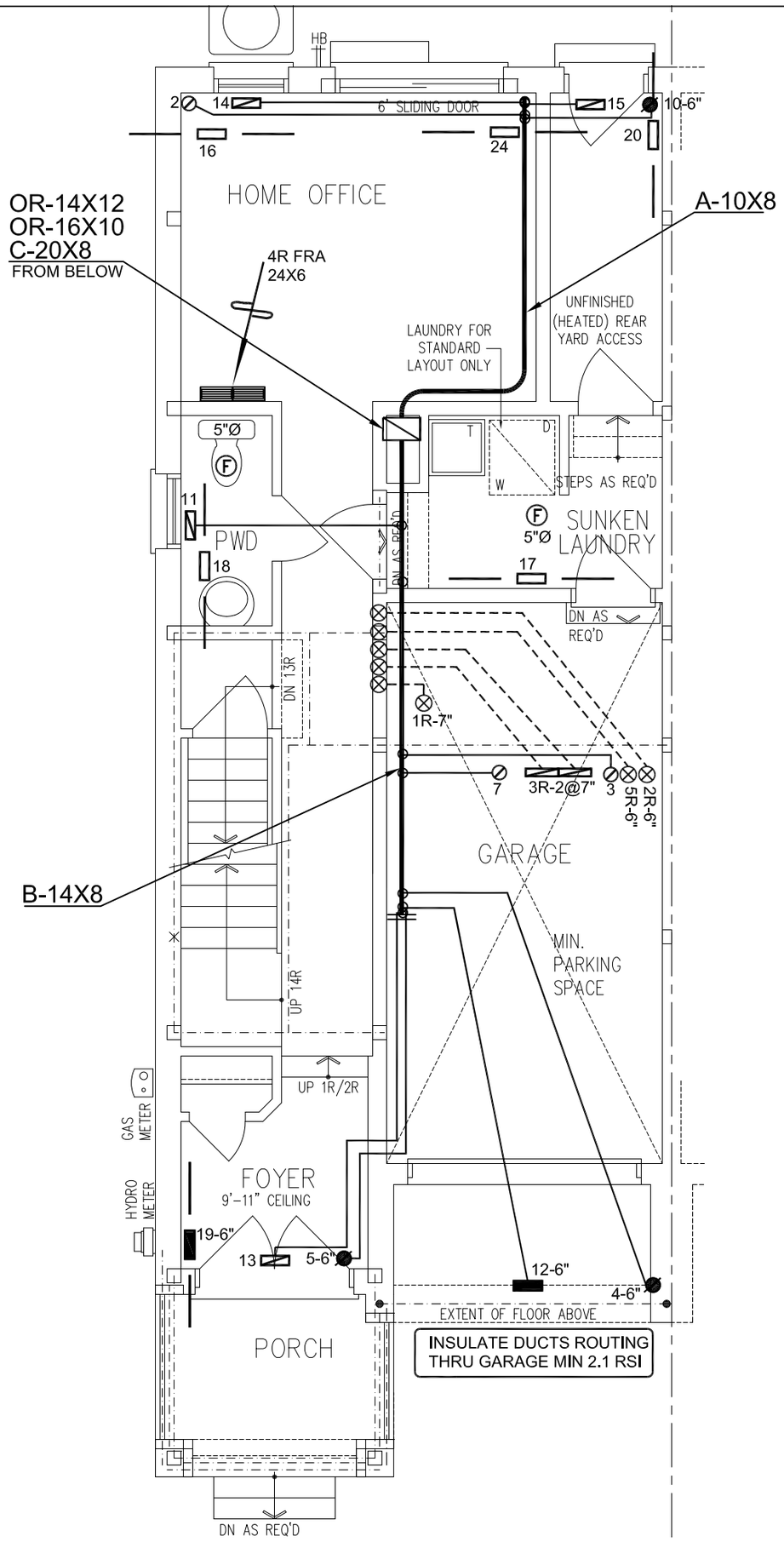
HEAT LOSS 40628 BTU/H	
UNIT DATA	
MAKE	CARRIER
MODEL	59SP5A-60-12
INPUT	60 MBTU/H
OUTPUT	58 MBTU/H
COOLING	2.5 TONS
FAN SPEED	970 cfm @ 0.6" w.c.

# OF RUNS	S/A	R/A	FANS
3RD FLOOR	6	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# 78929



GROUND FLOOR PLAN EL. 'A'

CSA-F280-12

PACKAGE A1

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HVAC DESIGNS LTD.

HVAC LEGEND

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

REVISIONS

Client
ROYAL PINE HOMES

Project Name
FORESTSIDE
BRAMPTON, ONTARIO

1804 - END 2064 sqft

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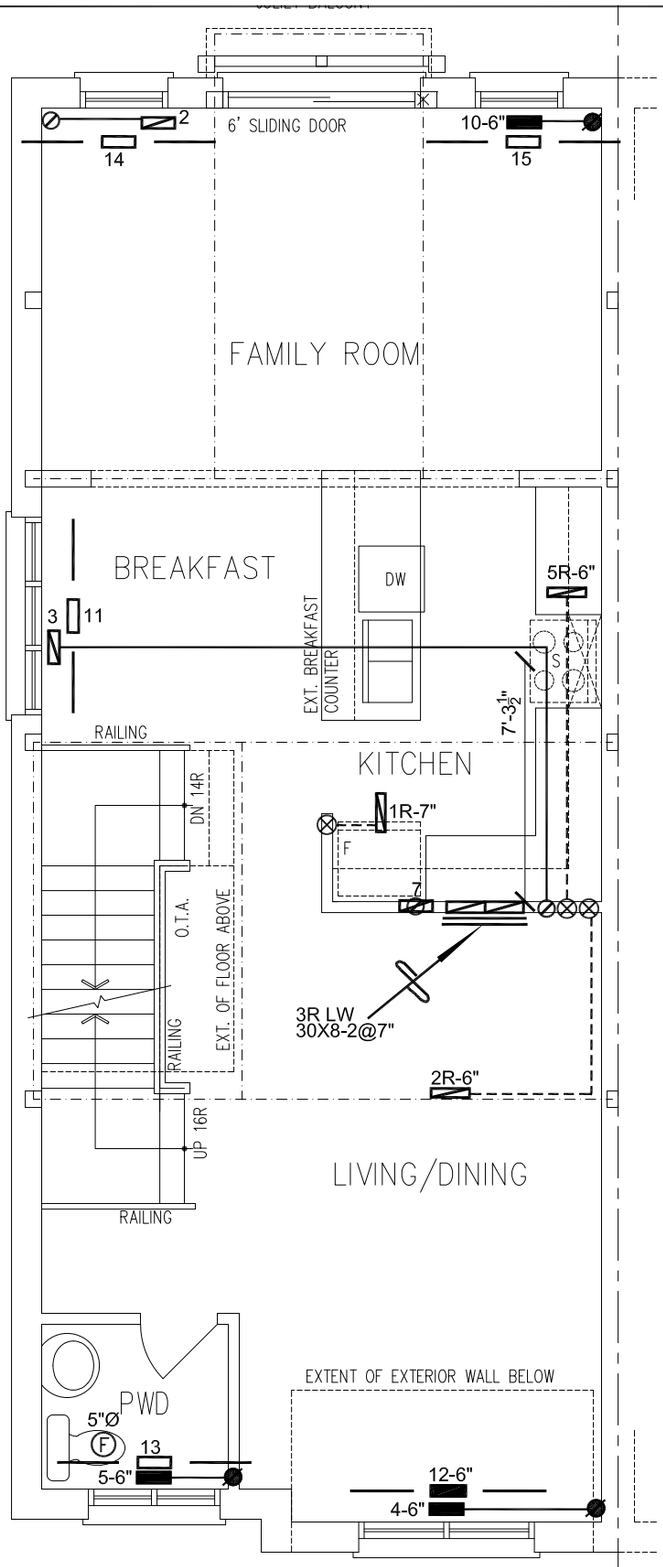
Sheet Title
FIRST FLOOR
HEATING
LAYOUT

Date JUNE/2018
Scale 3/16" = 1'-0"
BCIN# 19669
LO# 78929



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.

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
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	SUPPLY AIR BOOT ABOVE		6" SUPPLY AIR STACK 2nd FLOOR		FRA- FLOOR RETURN AIR GRILLE		REDUCER

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REVISIONS

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Project Name
FORESTSIDE
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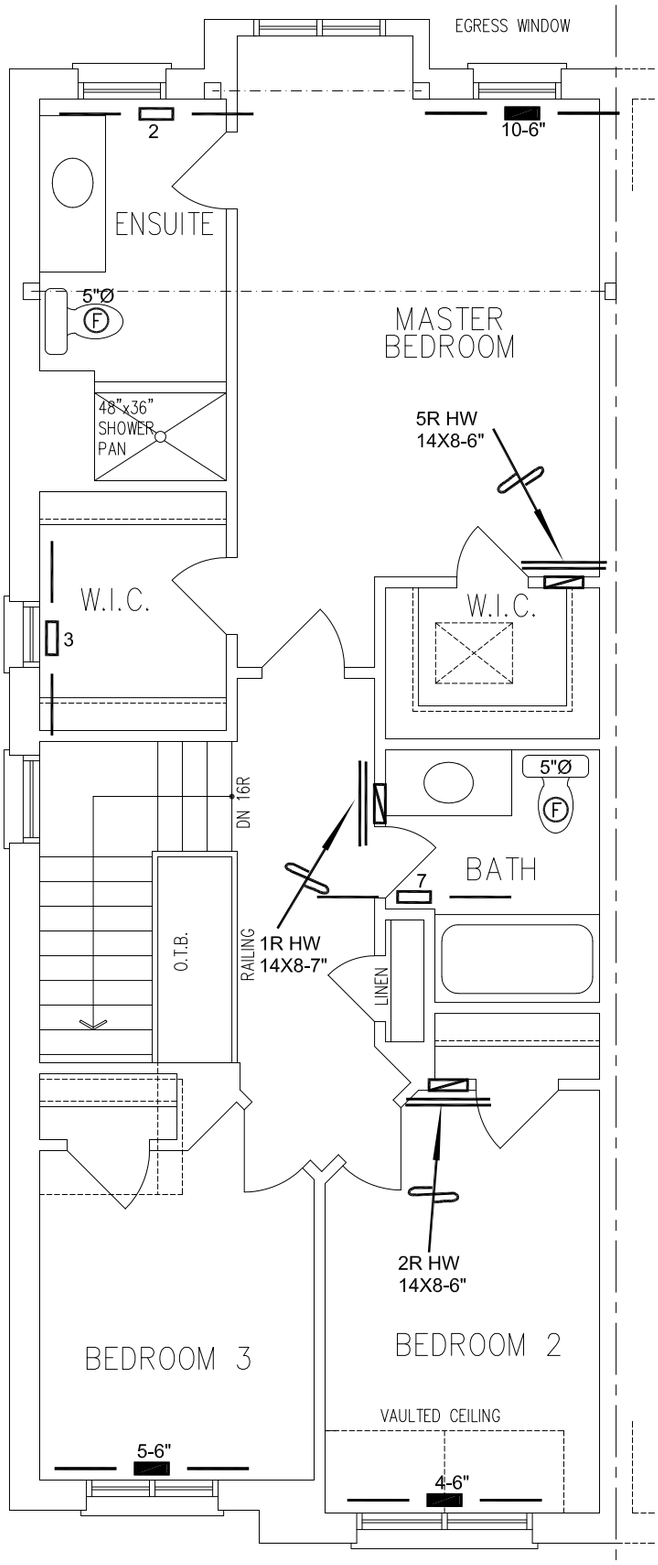
Sheet Title
SECOND FLOOR HEATING LAYOUT

Date JUNE/2018
Scale 3/16" = 1'-0"
BCIN# 19669
LO# 78929



THIRD 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.

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

CSA-F280-12

PACKAGE A1

HVAC LEGEND

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

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REVISIONS

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Sheet Title
THIRD FLOOR HEATING LAYOUT

Date JUNE/2018
Scale 3/16" = 1'-0"
BCIN# 19669
LO# 78929