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**		
RICHMOND HILL				

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:** 2010 **Project:** CENTREFIELD (WEST GORMLEY)

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.

April 21, 2021
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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Web: www.hvacdesigns.ca E-mail: info@hvacdesigns.ca

SITE NAME: CENTREFIELD (WEST GORMLEY) | DATE: Apr-21 | WINTER NATURAL AIR CHANGE RATE 0.236 | HEAT LOSS ΔT °F. 78 | CSA-F280-12
BUILDER: ROYAL PINE HOMES | TYPE: 2010 | GFA: 1742 | LO# 87540 | SUMMER NATURAL AIR CHANGE RATE 0.072 | HEAT GAIN ΔT °F. 13 | SB-12 PERFORMANCE

ROOM USE			MBR			ENS				BED-2			BED-3				BATH							
EXP. WALL			14			22				10			42				0							
CLG. HT.			9			9				9			11				9							
	FACTORS																							
GRS.WALL AREA	LOSS	GAIN	126			198				90			462				0							
GLAZING				LOSS	GAIN		LOSS	GAIN			LOSS	GAIN		LOSS	GAIN			LOSS	GAIN					
NORTH	21.8	16.0	0	0	0	0	0	0		0	0	0	0	0	0		0	0	0					
EAST	21.8	41.6	0	0	0	0	0	0		28	610	1163	36	784	1496		0	0	0					
SOUTH	21.8	24.9	0	0	0	23	501	573		0	0	0	55	1198	1369		0	0	0					
WEST	21.8	41.6	32	697	1330	9	196	374		0	0	0	0	0	0		0	0	0					
SKYLT.	35.8	101.2	0	0	0	0	0	0		0	0	0	0	0	0		0	0	0					
DOORS	25.8	4.3	0	0	0	0	0	0		0	0	0	0	0	0		0	0	0					
NET EXPOSED WALL	4.2	0.7	94	395	65	166	698	115		62	261	43	371	1560	257		0	0	0					
NET EXPOSED BSMT WALL ABOVE GR	3.7	0.6	0	0	0	0	0	0		0	0	0	0	0	0		0	0	0					
EXPOSED CLG	1.3	0.6	298	392	175	105	138	62		176	231	103	253	332	149		70	92	41					
NO ATTIC EXPOSED CLG	2.8	1.3	0	0	0	0	0	0		0	0	0	20	56	25		0	0	0					
EXPOSED FLOOR	2.6	0.4	0	0	0	0	0	0		176	459	76	21	55	9		51	133	22					
BASEMENT/CRAWL HEAT LOSS				0			0				0			0				0						
SLAB ON GRADE HEAT LOSS				0			0				0			0				0						
SUBTOTAL HT LOSS				1484			1533				1561			3986				225						
SUB TOTAL HT GAIN					1570			1123				1385			3305				63					
LEVEL FACTOR / MULTIPLIER			0.20	0.17		0.20	0.17			0.20	0.17		0.20	0.17			0.20	0.17						
AIR CHANGE HEAT LOSS				246			254				258			660				37						
AIR CHANGE HEAT GAIN					57			41				50			120				2					
DUCT LOSS				0			0				182			465				26						
DUCT GAIN					0			0				232			431				7					
HEAT GAIN PEOPLE	240		2		480	0		0		1		240	1		240		0		0					
HEAT GAIN APPLIANCES/LIGHTS					643			0				643			643				0					
TOTAL HT LOSS BTU/H				1730			1787				2002			5110				289						
TOTAL HT GAIN x 1.3 BTU/H					3575			1513				3316			6160				93					

ROOM USE					K/B/G				LAUND			PWD			FOY					BAS		
EXP. WALL					49				7			12			36					120		
CLG. HT.					10				9			10			11					10		
	FACTORS																					
GRS.WALL AREA	LOSS	GAIN			495				63			121			382					1200		
GLAZING						LOSS	GAIN			LOSS	GAIN		LOSS	GAIN		LOSS	GAIN				LOSS	GAIN
NORTH	21.8	16.0			0	0	0		0	0	0	0	0	0	0	0	0			0	0	0
EAST	21.8	41.6			0	0	0		0	0	0	0	0	0	20	436	831			0	0	0
SOUTH	21.8	24.9			71	1547	1768		33	719	822	0	0	0	65	1416	1618			3	65	75
WEST	21.8	41.6			80	1743	3324		0	0	0	0	0	0	0	0	0			7	152	291
SKYLT.	35.8	101.2			0	0	0		0	0	0	0	0	0	0	0	0			0	0	0
DOORS	25.8	4.3			0	0	0		0	0	0	20	517	85	50	1292	213			20	517	85
NET EXPOSED WALL	4.2	0.7			344	1446	238		30	126	21	101	426	70	247	1037	171			0	0	0
NET EXPOSED BSMT WALL ABOVE GR	3.7	0.6			0	0	0		0	0	0	0	0	0	0	0	0			0	0	0
EXPOSED CLG	1.3	0.6			0	0	0		56	74	33	0	0	0	0	0	0			0	0	0
NO ATTIC EXPOSED CLG	2.8	1.3			31	87	39		0	0	0	0	0	0	0	0	0			0	0	0
EXPOSED FLOOR	2.6	0.4			0	0	0		0	0	0	0	0	0	0	0	0			0	0	0
BASEMENT/CRAWL HEAT LOSS						0				0			0			0					3944	
SLAB ON GRADE HEAT LOSS						0				0			0			0						
SUBTOTAL HT LOSS						4823				919			943			4181					4679	
SUB TOTAL HT GAIN							5369				875			155			2833					451
LEVEL FACTOR / MULTIPLIER					0.30	0.24			0.20	0.17		0.30	0.24		0.30	0.24				0.50	0.86	
AIR CHANGE HEAT LOSS						1168				152			228			1013					4016	
AIR CHANGE HEAT GAIN							194				32			6			103					16
DUCT LOSS						0				0			0			0					0	
DUCT GAIN							0				0			0			0					0
HEAT GAIN PEOPLE	240				0		0		0		0	0		0	0		0			0		0
HEAT GAIN APPLIANCES/LIGHTS							643				643			0			0					0
TOTAL HT LOSS BTU/H						5991				1071			1171			5194					8695	
TOTAL HT GAIN x 1.3 BTU/H							8068				2015			209			3816					607

TOTAL HEAT GAIN BTU/H: 29592 | TONS: 2.47 | LOSS DUE TO VENTILATION LOAD BTU/H: 1336 | STRUCTURAL HEAT LOSS: 33038 | TOTAL COMBINED HEAT LOSS BTU/H: 34374

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: CENTREFIELD (WEST GORMLEY)
BUILDER: ROYAL PINE HOMES
TYPE: 2010
DATE: Apr-21
GFA: 1742 LO# 87540

HEATING CFM	875	COOLING CFM	875	furnace pressure	0.6
TOTAL HEAT LOSS	33,038	TOTAL HEAT GAIN	29,372	furnace filter	0.05
AIR FLOW RATE CFM	26.48	AIR FLOW RATE CFM	29.79	a/c coil pressure	0.2
				available pressure for s/a & r/a	0.35

**CARRIER
59TN6A-060-14V 60

FAN SPEED	
LOW	820
MEDLOW	875
MEDIUM	0
MEDIUM HIGH	0
HIGH	1520

AFUE = 97 %
INPUT (BTU/H) = 60,000
OUTPUT (BTU/H) = **58,000**
DESIGN CFM = **875**
CFM @ .6 " E.S.P.
TEMPERATURE RISE 61 °F

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

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	13	14	15	17	18	19	20	21	22
ROOM NAME	MBR	ENS	BED-2	BED-3	BED-3	BATH	MBR	K/B/G	K/B/G	K/B/G	LAUND	PWD	FOY	FOY	BAS	BAS
RM LOSS MBH.	0.86	1.79	2.00	2.56	2.56	0.29	0.86	2.00	2.00	2.00	1.07	1.17	2.60	2.60	2.90	2.90
CFM PER RUN HEAT	23	47	53	68	68	8	23	53	53	53	28	31	69	69	77	77
RM GAIN MBH.	1.79	1.51	3.32	3.08	3.08	0.09	1.79	2.69	2.69	2.69	2.02	0.21	1.91	1.91	0.20	0.20
CFM PER RUN COOLING	53	45	99	92	92	3	53	80	80	80	60	6	57	57	6	6
ADJUSTED PRESSURE	0.17	0.17	0.16	0.16	0.16	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17
ACTUAL DUCT LGH.	40	25	48	55	46	29	33	4	19	24	41	22	34	36	24	13
EQUIVALENT LENGTH	110	130	130	190	170	150	110	150	150	170	190	160	110	130	160	160
TOTAL EFFECTIVE LENGTH	150	155	178	245	216	179	143	154	169	194	231	182	144	166	184	173
ADJUSTED PRESSURE	0.11	0.11	0.09	0.07	0.08	0.1	0.12	0.11	0.1	0.09	0.07	0.09	0.12	0.1	0.09	0.1
ROUND DUCT SIZE	5	4	**6**	**6**	**6**	4	5	5	5	5	5	4	5	5	5	5
HEATING VELOCITY (ft/min)	169	539	270	347	347	92	169	389	389	389	206	356	507	507	565	565
COOLING VELOCITY (ft/min)	389	516	505	469	469	34	389	587	587	587	441	69	419	419	44	44
OUTLET GRILL SIZE	3X10	3X10	4X10	4X10	4X10	3X10	3X10	3X10	3X10	3X10	3X10	3X10	3X10	3X10	3X10	3X10
TRUNK	C	C	B	A	A	B	C	B	C	C	B	B	A	A	C	C

RUN #	25
ROOM NAME	BAS
RM LOSS MBH.	2.90
CFM PER RUN HEAT	77
RM GAIN MBH.	0.20
CFM PER RUN COOLING	6
ADJUSTED PRESSURE	0.17
ACTUAL DUCT LGH.	35
EQUIVALENT LENGTH	120
TOTAL EFFECTIVE LENGTH	155
ADJUSTED PRESSURE	0.11
ROUND DUCT SIZE	5
HEATING VELOCITY (ft/min)	565
COOLING VELOCITY (ft/min)	44
OUTLET GRILL SIZE	3X10
TRUNK	A

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	351	0.07	9.8	12	x	8	527	TRUNK G	0	0.00	0	0	x	8	0
TRUNK B	524	0.07	11.4	16	x	8	590	TRUNK H	0	0.00	0	0	x	8	0
TRUNK C	353	0.09	9.2	10	x	8	635	TRUNK I	0	0.00	0	0	x	8	0
TRUNK D	0	0.00	0	0	x	8	0	TRUNK J	0	0.00	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 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	770	0.05	14.3	24	x	8	578
TRUNK Y	490	0.05	12.1	18	x	8	490
TRUNK Z	0	0.05	0	0	x	8	0
DROP	875	0.05	15	24	x	10	525

RETURN AIR #	1	2	3	4	5	6										BR
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
AIR VOLUME	95	85	85	75	330	105	0	0	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.	57	46	56	55	18	35	1	1	1	1	1	1	1	1	1	14
EQUIVALENT LENGTH	165	205	175	215	190	155	0	0	0	0	0	0	0	0	0	150
TOTAL EFFECTIVE LH	222	251	231	270	208	190	1	1	1	1	1	1	1	1	1	164
ADJUSTED PRESSURE	0.07	0.06	0.06	0.05	0.07	0.08	14.80	14.80	14.80	14.80	14.80	14.80	14.80	14.80	14.80	0.09
ROUND DUCT SIZE	6	6	6	6	9.6	6	0	0	0	0	0	0	0	0	0	5.7
INLET GRILL SIZE	8	8	8	8	6	6	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	14	14	24	10	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: 2010 LO # 87540
SITE NAME: CENTREFIELD (WEST GORMLEY)

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	4	@ 10.6 cfm	42.4	cfm
Other Rooms	1	@ 10.6 cfm	10.6	cfm
Table 9.32.3.A.		TOTAL	116.6	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	116.6	cfm
Less Principal Ventil. Capacity	63.6	cfm
Required Supplemental Capacity	53.0	cfm

PRINCIPAL EXHAUST FAN CAPACITY

Model: VANEE 65H Location: BSMT

63.6 cfm [✓] HVI Approved

PRINCIPAL EXHAUST HEAT LOSS CALCULATION

CFM		ΔT °F		FACTOR		% LOSS
63.6 CFM	X	78 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
PWD	BY INSTALLING CONTRACTOR	50	✓	3.5

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-21

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#: 87540 Model: 2010 Builder: ROYAL PINE HOMES Date: 4/21/2021

Volume Calculation

House Volume

Level	Floor Area (ft²)	Floor Height (ft)	Volume (ft³)
Bsmt	777	10	7770
First	777	10	7847.7
Second	978	9	8802
Third	0	9	0
Fourth	0	9	0
		Total:	24,419.7 ft³
		Total:	691.5 m³

Air Change & Delta T Data

WINTER NATURAL AIR CHANGE RATE	0.236
SUMMER NATURAL AIR CHANGE RATE	0.072

Design Temperature Difference

	Tin °C	Tout °C	ΔT °C	ΔT °F
Winter DTDh	22	-21	43	78
Summer DTDc	24	31	7	13

5.2.3.1 Heat Loss due to Air Leakage

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

0.236 x 192.08 x 43 °C x 1.2 = 2354 W

= **8032 Btu/h**

6.2.6 Sensible Gain due to Air Leakage

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

= 0.072 x 192.08 x 7 °C x 1.2 = 117 W

= **401 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 78 °F x 1.08 x 0.25 = **1336 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 13 °F x 1.08 x 0.25 = **220 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	0.5	8,032	4,679	0.858
2	0.3		9,946	0.242
3	0.2		9,708	0.165
4	0		0	0.000
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: 2010 **BUILDER:** ROYAL PINE HOMES
SFQT: 1742 **LO#** 87540 **SITE:** CENTREFIELD (WEST GORMLEY)

DESIGN ASSUMPTIONS

HEATING	°F	COOLING	°F
OUTDOOR DESIGN TEMP.	-6	OUTDOOR DESIGN TEMP.	88
INDOOR DESIGN TEMP.	72	INDOOR DESIGN TEMP. (MAX 75°F)	75

BUILDING DATA

ATTACHMENT:	ATTACHED	# 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):	24419.7	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:	7.0 ft
LENGTH: 52.0 ft	WIDTH: 22.0 ft	EXPOSED PERIMETER:	120.0 ft

2012 OBC - COMPLIANCE PACKAGE **Component**	**Compliance Package SB-12 PERFORMANCE**	
	Nominal	**Min. Eff.**
Ceiling with Attic Space Minimum RSI (R)-Value	60	59.20
Ceiling Without Attic Space Minimum RSI (R)-Value	31	27.70
Exposed Floor Minimum RSI (R)-Value	31	29.80
Walls Above Grade Minimum RSI (R)-Value	22+1.5	18.50
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	0.96	-
HRV Minimum Efficiency	75%	-
Domestic Hot Water Heater Minimum EF	TE=94%	-

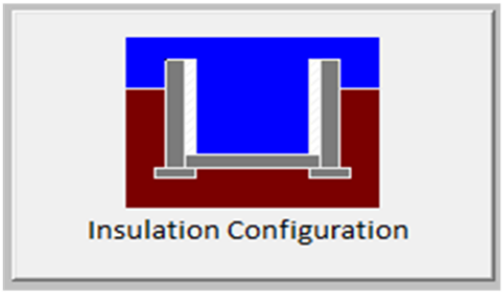
INDIVIDUAL BCIN: 19669
MICHAEL O'ROURKE

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:	Richmond Hill
Site Description	
Soil Conductivity:	Normal conductivity: dry sand, loam, clay
Water Table:	Normal (7-10 m, 23-33 ft)

Foundation Dimensions		
Floor Length (m):	**15.8**	 Insulation Configuration
Floor Width (m):	**6.7**	
Exposed Perimeter (m):	**36.6**	
Wall Height (m):	**3.0**	
Depth Below Grade (m):	**2.13**	
Window Area (m^2):	**0.9**	
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):	**1156**	

TYPE: 2010
LO# 87540

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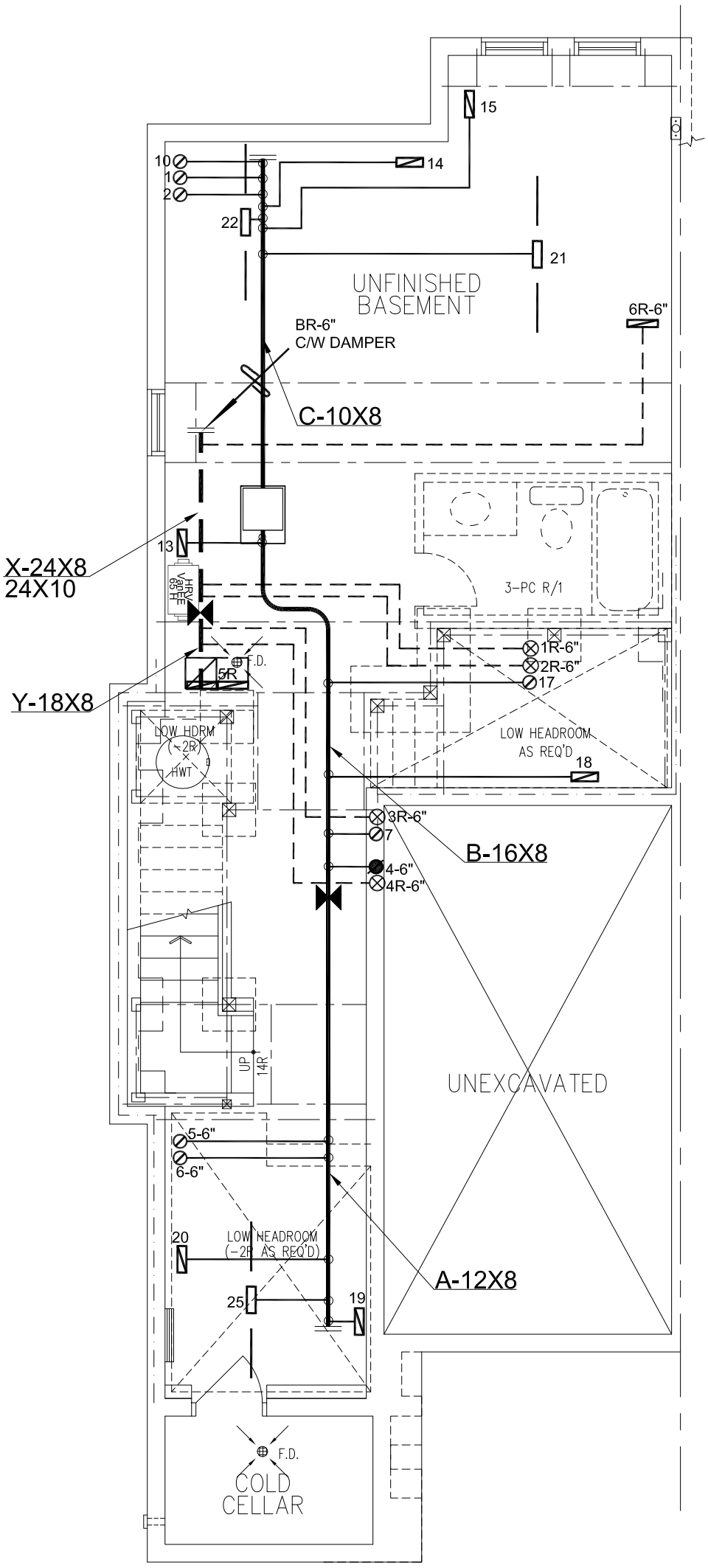
Ajax ON, L1S 2E2
905-619-2300

Air Infiltration Residential Load Calculator

Supplemental tool for CAN/CSA-F280

Weather Station Description	
Province:	Ontario
Region:	Richmond Hill
Weather Station Location:	Open flat terrain, grass
Anemometer height (m):	10
Local Shielding	
Building Site:	Suburban, forest
Walls:	Heavy
Flue:	Heavy
Highest Ceiling Height (m):	6.74
Building Configuration	
Type:	Semi
Number of Stories:	Two
Foundation:	Full
House Volume (m^3):	691.5
Air Leakage/Ventilation	
Air Tightness Type:	Energy Star Detached (2.5 ACH)
Custom BDT Data:	ELA @ 10 Pa. 645.5 cm^2
	2.50 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):	**0.236**
Cooling Air Leakage Rate (ACH/H):	**0.072**

TYPE: 2010
LO# 87540



BASEMENT PLAN, EL. '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 BUILDING CODE.

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

CSA-F280-12

SB-12 PERFORMANCE

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.	REVISED AS PER ARCHITECTURALS	APR/2021
1.	REVISED TO PERFORMANCE	SEPT/2020

REVISIONS

Client
ROYAL PINE HOMES

Project Name
CENTREFIELD (WEST GORMLEY)
RICHMOND HILL, ONTARIO

2010 1742 sqft

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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.

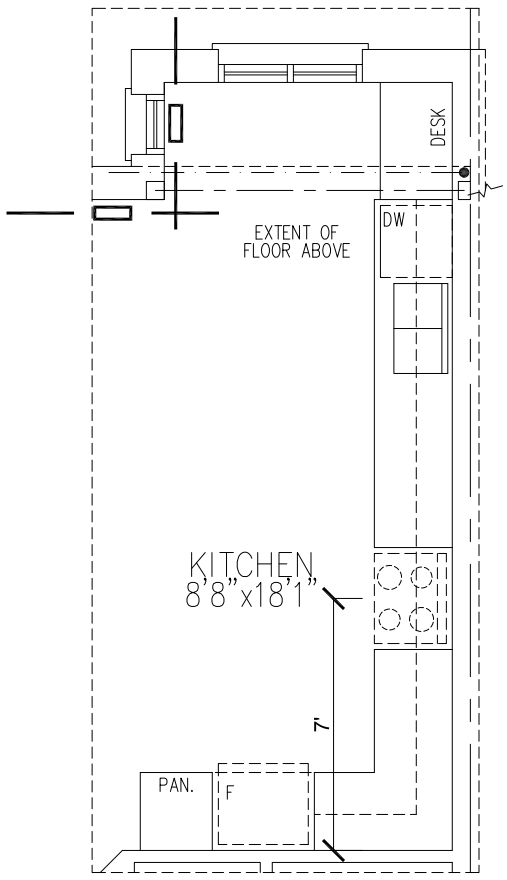
HEAT LOSS 34374 BTU/H		
UNIT DATA		
MAKE	CARRIER	
MODEL	59TN6A-060-14V	
INPUT	60	MBTU/H
OUTPUT	58	MBTU/H
COOLING	2.5	TONS
FAN SPEED	875	cfm @ 0.6" w.c.

# OF RUNS	S/A	R/A	FANS
3RD FLOOR			
2ND FLOOR	8	4	2
1ST FLOOR	6	2	2
BASEMENT	3	1	0

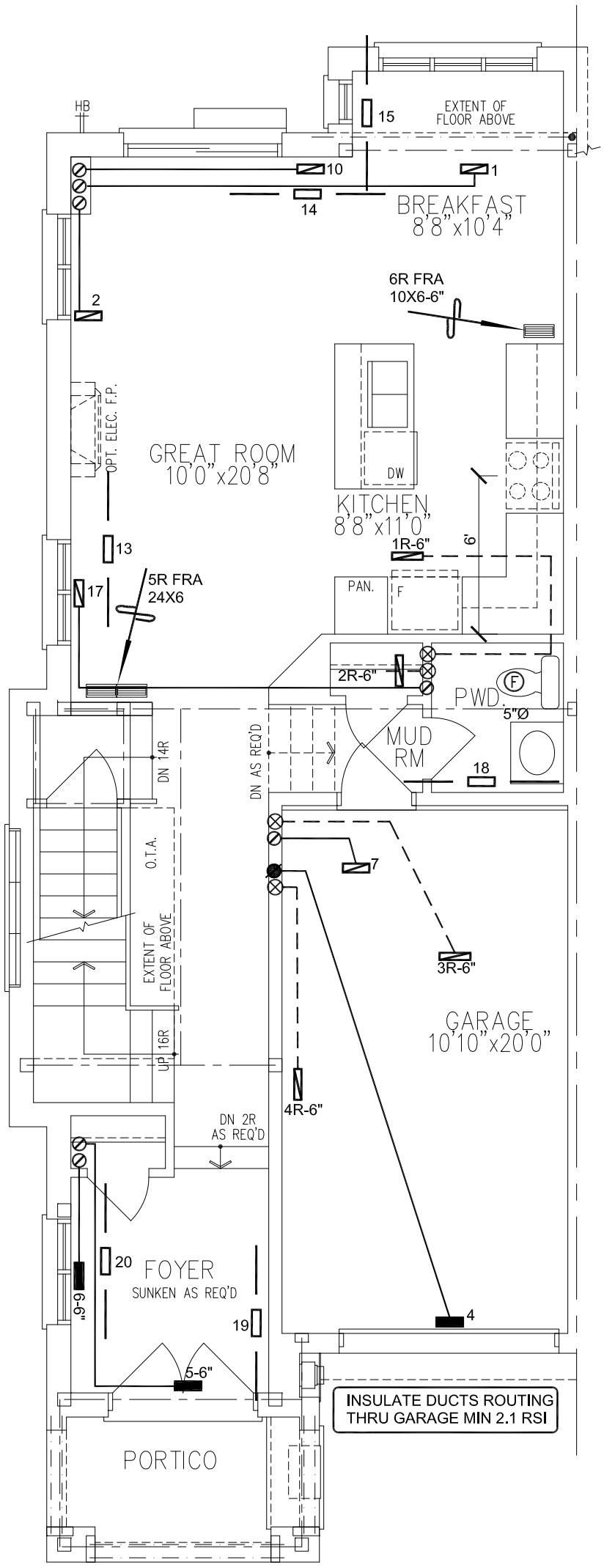
ALL S/A DIFFUSERS 4 "x10" UNLESS NOTED OTHERWISE ON LAYOUT. ALL S/A RUNS 5"Ø UNLESS NOTED OTHERWISE ON LAYOUT. UNDERCUT DOORS 1" min. FOR R/A

Sheet Title
BASEMENT HEATING LAYOUT

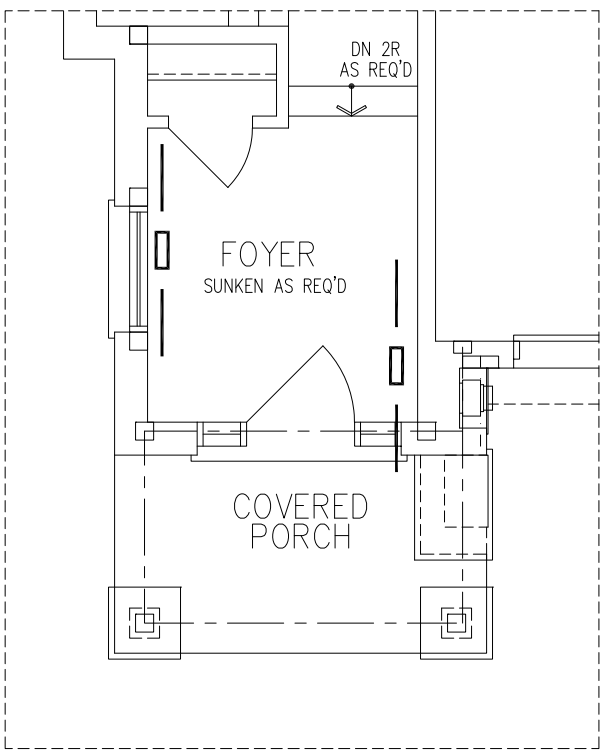
Date SEPT/2020
Scale 3/16" = 1'-0"
BCIN# 19669
LO# 87540



PART. GROUND FLOOR PLAN – OPT. KITCHEN LAYOUT



GROUND FLOOR PLAN, EL. 'A'



GROUND 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.

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

CSA-F280-12

SB-12 PERFORMANCE

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.	REVISED AS PER ARCHITECTURALS	APR/2021
1.	REVISED TO PERFORMANCE	SEPT/2020

REVISIONS

Client

ROYAL PINE HOMES

Project Name

CENTREFIELD (WEST GORMLEY)
RICHMOND HILL, ONTARIO

2010 1742 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

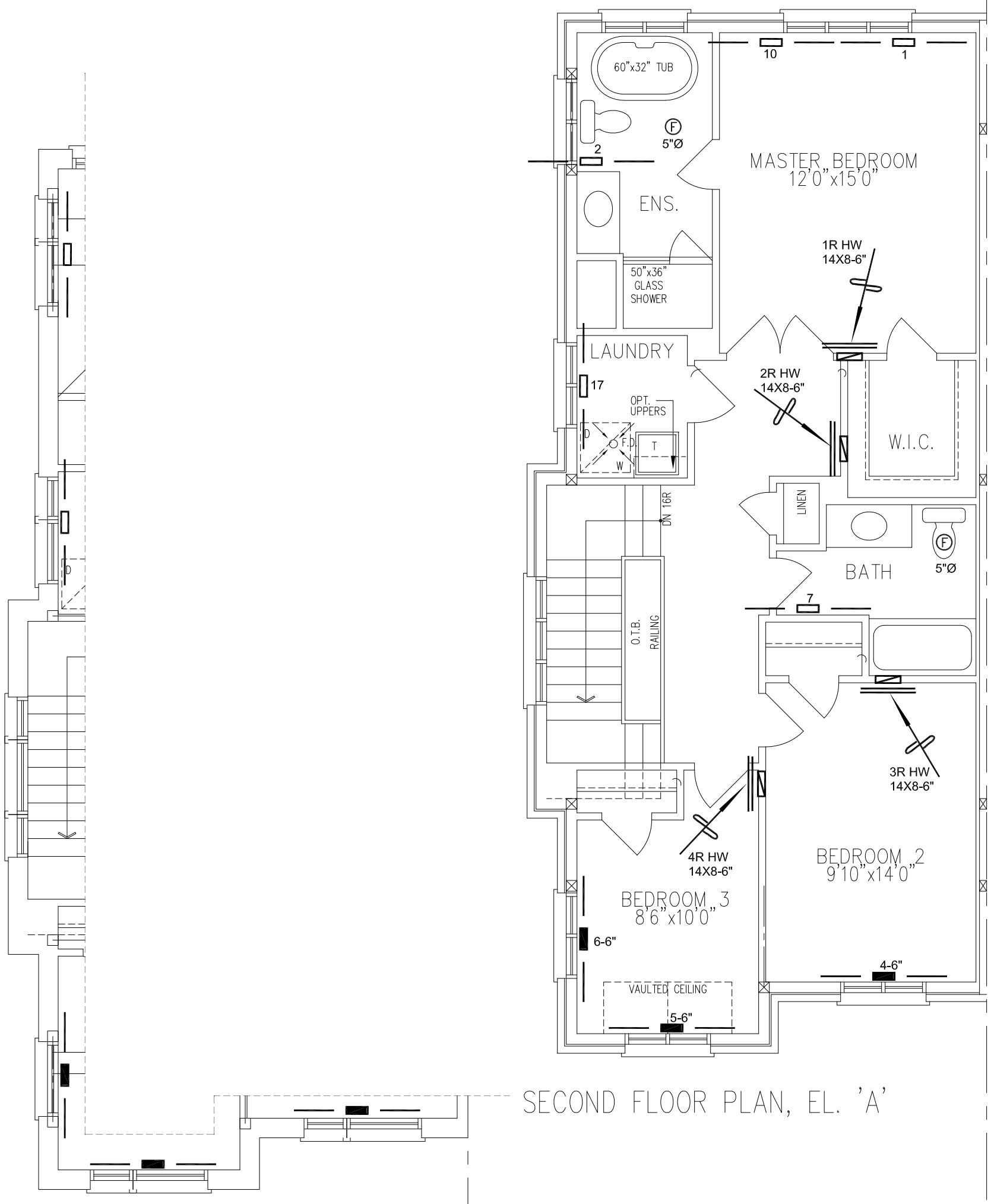
FIRST FLOOR HEATING LAYOUT

Date SEPT/2020

Scale 3/16" = 1'-0"

BCIN# 19669

LO# 87540



SECOND FLOOR PLAN, EL. 'A'

SECOND FLOOR PLAN, EL. 'B'

SECOND 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

SB-12 PERFORMANCE

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.	REVISED AS PER ARCHITECTURALS	APR/2021
1.	REVISED TO PERFORMANCE	SEPT/2020

REVISIONS

Client

ROYAL PINE HOMES

Project Name

CENTREFIELD (WEST GORMLEY)
RICHMOND HILL, ONTARIO

2010 1742 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

SECOND FLOOR HEATING LAYOUT

Date SEPT/2020

Scale 3/16" = 1'-0"

BCIN# 19669

LO# 87540

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**		
RICHMOND HILL				

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:** 2010 FIN BSMT **Project:** CENTREFIELD (WEST GORMLEY)

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.

April 21, 2021
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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Web: www.hvacdesigns.ca E-mail: info@hvacdesigns.ca

SITE NAME: CENTREFIELD (WEST GORMLEY) | FIN BSMT | DATE: Apr-21 | WINTER NATURAL AIR CHANGE RATE 0.236 | HEAT LOSS ΔT °F. 78 | CSA-F280-12
BUILDER: ROYAL PINE HOMES | TYPE: 2010 | GFA: 1742 | LO# 87541 | SUMMER NATURAL AIR CHANGE RATE 0.072 | HEAT GAIN ΔT °F. 13 | SB-12 PERFORMANCE

ROOM USE			MBR			ENS				BED-2			BED-3				BATH				B-BATH			
EXP. WALL			14			22				10			42				0				0			
CLG. HT.			9			9				9			11				9				10			
	FACTORS																							
GRS.WALL AREA	LOSS	GAIN	126			198				90			462				0				0			
GLAZING				LOSS	GAIN		LOSS	GAIN			LOSS	GAIN		LOSS	GAIN			LOSS	GAIN			LOSS	GAIN	
NORTH	21.8	16.0	0	0	0	0	0	0		0	0	0	0	0	0		0	0	0		0	0	0	
EAST	21.8	41.6	0	0	0	0	0	0		28	610	1163	36	784	1496		0	0	0		0	0	0	
SOUTH	21.8	24.9	0	0	0	23	501	573		0	0	0	55	1198	1369		0	0	0		0	0	0	
WEST	21.8	41.6	32	697	1330	9	196	374		0	0	0	0	0	0		0	0	0		0	0	0	
SKYLT.	35.8	101.2	0	0	0	0	0	0		0	0	0	0	0	0		0	0	0		0	0	0	
DOORS	25.8	4.3	0	0	0	0	0	0		0	0	0	0	0	0		0	0	0		0	0	0	
NET EXPOSED WALL	4.2	0.7	94	395	65	166	698	115		62	261	43	371	1560	257		0	0	0		0	0	0	
NET EXPOSED BSMT WALL ABOVE GR	3.7	0.6	0	0	0	0	0	0		0	0	0	0	0	0		0	0	0		0	0	0	
EXPOSED CLG	1.3	0.6	298	392	175	105	138	62		176	231	103	253	332	149		70	92	41		0	0	0	
NO ATTIC EXPOSED CLG	2.8	1.3	0	0	0	0	0	0		0	0	0	20	56	25		0	0	0		0	0	0	
EXPOSED FLOOR	2.6	0.4	0	0	0	0	0	0		176	459	76	21	55	9		51	133	22		0	0	0	
BASEMENT/CRAWL HEAT LOSS				0			0				0			0				0				305		
SLAB ON GRADE HEAT LOSS				0			0				0			0				0				0		
SUBTOTAL HT LOSS				1484			1533				1561			3986				225				305		
SUB TOTAL HT GAIN					1570			1123				1385			3305				63				0	
LEVEL FACTOR / MULTIPLIER			0.20	0.17		0.20	0.17			0.20	0.17		0.20	0.17			0.20	0.17			0.50	0.86		
AIR CHANGE HEAT LOSS				246			254				258			660				37				261		
AIR CHANGE HEAT GAIN					57			41				50			120				2				0	
DUCT LOSS				0			0				182			465				26				0		
DUCT GAIN					0			0				232			431				7				0	
HEAT GAIN PEOPLE	240		2		480	0		0		1		240	1		240		0		0		0		0	
HEAT GAIN APPLIANCES/LIGHTS					643			0				643			643				0				0	
TOTAL HT LOSS BTU/H				1730			1787				2002			5110				289				566		
TOTAL HT GAIN x 1.3 BTU/H					3575			1513				3316			6160				93				0	

ROOM USE			K/B/G			LAUND			PWD			FOY			BAS		
EXP. WALL			49			7			12			36			120		
CLG. HT.			10			9			10			11			10		
	FACTORS																
GRS.WALL AREA	LOSS	GAIN	495			63			121			382			1200		
GLAZING				LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN
NORTH	21.8	16.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
EAST	21.8	41.6	0	0	0	0	0	0	0	0	0	20	436	831	0	0	0
SOUTH	21.8	24.9	71	1547	1768	33	719	822	0	0	0	65	1416	1618	3	65	75
WEST	21.8	41.6	80	1743	3324	0	0	0	0	0	0	0	0	0	7	152	291
SKYLT.	35.8	101.2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
DOORS	25.8	4.3	0	0	0	0	0	0	20	517	85	50	1292	213	20	517	85
NET EXPOSED WALL	4.2	0.7	344	1446	238	30	126	21	101	426	70	247	1037	171	0	0	0
NET EXPOSED BSMT WALL ABOVE GR	3.7	0.6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
EXPOSED CLG	1.3	0.6	0	0	0	56	74	33	0	0	0	0	0	0	0	0	0
NO ATTIC EXPOSED CLG	2.8	1.3	31	87	39	0	0	0	0	0	0	0	0	0	0	0	0
EXPOSED FLOOR	2.6	0.4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
BASEMENT/CRAWL HEAT LOSS				0			0			0			0			3640	
SLAB ON GRADE HEAT LOSS				0			0			0			0				
SUBTOTAL HT LOSS				4823			919			943			4181			4374	
SUB TOTAL HT GAIN					5369			875			155			2833			451
LEVEL FACTOR / MULTIPLIER			0.30	0.24		0.20	0.17		0.30	0.24		0.30	0.24		0.50	0.86	
AIR CHANGE HEAT LOSS				1168			152			228			1013			3754	
AIR CHANGE HEAT GAIN					194			32			6			103			16
DUCT LOSS				0			0			0			0			0	
DUCT GAIN					0			0			0			0			0
HEAT GAIN PEOPLE	240		0		0	0		0	0		0	0		0	0		0
HEAT GAIN APPLIANCES/LIGHTS					643			643			0			0			0
TOTAL HT LOSS BTU/H				5991			1071			1171			5194			8129	
TOTAL HT GAIN x 1.3 BTU/H					8068			2015			209			3816			607

TOTAL HEAT GAIN BTU/H: 29592 **TONS:** 2.47 **LOSS DUE TO VENTILATION LOAD BTU/H:** 1336 **STRUCTURAL HEAT LOSS:** 33038 **TOTAL COMBINED HEAT LOSS BTU/H:** 34374

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

SITE NAME: CENTREFIELD (WEST GORMLEY) FIN BSMT
BUILDER: ROYAL PINE HOMES TYPE: 2010 DATE: Apr-21 GFA: 1742 LO# 87541

HEATING CFM	875	COOLING CFM	875	furnace pressure	0.6			**CARRIER	AFUE =	97 %
TOTAL HEAT LOSS	33,038	TOTAL HEAT GAIN	29,372	furnace filter	0.05			**59TN6A-060-14V** **60**	INPUT (BTU/H) =	60,000
AIR FLOW RATE CFM	26.48	AIR FLOW RATE CFM	29.79	a/c coil pressure	0.2			FAN SPEED	OUTPUT (BTU/H) =	**58,000**
				available pressure for s/a & r/a	0.35			LOW 820		
				plenum pressure s/a	0.18	r/a pressure	0.17	MEDLOW 875	DESIGN CFM =	**875**
				max s/a dif press. loss	0.02	r/a grille press. Loss	0.02	MEDIUM 0	CFM @ .6 " E.S.P.	
				min adjusted pressure s/a	0.16	adjusted pressure r/a	0.15	MEDIUM HIGH 0		
								HIGH 1520	TEMPERATURE RISE	61 °F

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

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	13	14	15	17	18	19	20	21	22	23
ROOM NAME	MBR	ENS	BED-2	BED-3	BED-3	BATH	MBR	K/B/G	K/B/G	K/B/G	LAUND	PWD	FOY	FOY	BAS	BAS	B-BATH
RM LOSS MBH.	0.86	1.79	2.00	2.56	2.56	0.29	0.86	2.00	2.00	2.00	1.07	1.17	2.60	2.60	2.71	2.71	0.57
CFM PER RUN HEAT	23	47	53	68	68	8	23	53	53	53	28	31	69	69	72	72	15
RM GAIN MBH.	1.79	1.51	3.32	3.08	3.08	0.09	1.79	2.69	2.69	2.69	2.02	0.21	1.91	1.91	0.20	0.20	0.00
CFM PER RUN COOLING	53	45	99	92	92	3	53	80	80	80	60	6	57	57	6	6	0
ADJUSTED PRESSURE	0.17	0.17	0.16	0.16	0.16	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17
ACTUAL DUCT LGH.	40	25	48	55	46	29	33	4	19	24	41	22	34	36	39	22	9
EQUIVALENT LENGTH	110	130	130	190	170	150	110	150	150	170	190	160	110	130	160	160	140
TOTAL EFFECTIVE LENGTH	150	155	178	245	216	179	143	154	169	194	231	182	144	166	199	182	149
ADJUSTED PRESSURE	0.11	0.11	0.09	0.07	0.08	0.1	0.12	0.11	0.1	0.09	0.07	0.09	0.12	0.1	0.09	0.09	0.12
ROUND DUCT SIZE	5	4	**6**	**6**	**6**	4	5	5	5	5	5	4	5	5	5	5	4
HEATING VELOCITY (ft/min)	169	539	270	347	347	92	169	389	389	389	206	356	507	507	529	529	172
COOLING VELOCITY (ft/min)	389	516	505	469	469	34	389	587	587	587	441	69	419	419	44	44	0
OUTLET GRILL SIZE	3X10	3X10	4X10	4X10	4X10	3X10	3X10	3X10	3X10	3X10	3X10	3X10	3X10	3X10	3X10	3X10	3X10
TRUNK	C	C	B	A	A	B	C	B	C	C	B	B	A	A	C	C	B

RUN #	25
ROOM NAME	BAS
RM LOSS MBH.	2.71
CFM PER RUN HEAT	72
RM GAIN MBH.	0.20
CFM PER RUN COOLING	6
ADJUSTED PRESSURE	0.17
ACTUAL DUCT LGH.	35
EQUIVALENT LENGTH	120
TOTAL EFFECTIVE LENGTH	155
ADJUSTED PRESSURE	0.11
ROUND DUCT SIZE	5
HEATING VELOCITY (ft/min)	529
COOLING VELOCITY (ft/min)	44
OUTLET GRILL SIZE	3X10
TRUNK	A

SUPPLY AIR TRUNK SIZE

	TRUNK CFM	STATIC PRESS.	ROUND DUCT	RECT DUCT	x		VELOCITY (ft/min)		TRUNK CFM	STATIC PRESS.	ROUND DUCT	RECT DUCT	x		VELOCITY (ft/min)
TRUNK A	346	0.07	9.7	12	x	8	519	TRUNK G	0	0.00	0	0	x	8	0
TRUNK B	534	0.07	11.5	16	x	8	601	TRUNK H	0	0.00	0	0	x	8	0
TRUNK C	343	0.09	9.1	10	x	8	617	TRUNK I	0	0.00	0	0	x	8	0
TRUNK D	0	0.00	0	0	x	8	0	TRUNK J	0	0.00	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 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	x		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	770	0.05	14.3	24	x	8	578
TRUNK Y	490	0.05	12.1	18	x	8	490
TRUNK Z	0	0.05	0	0	x	8	0
DROP	875	0.05	15	24	x	10	525

RETURN AIR #	1	2	3	4	5	6										**BR**
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
AIR VOLUME	95	85	85	75	330	105	0	0	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.	57	46	56	55	18	35	1	1	1	1	1	1	1	1	1	30
EQUIVALENT LENGTH	165	205	175	215	190	160	0	0	0	0	0	0	0	0	0	145
TOTAL EFFECTIVE LH	222	251	231	270	208	195	1	1	1	1	1	1	1	1	1	175
ADJUSTED PRESSURE	0.07	0.06	0.06	0.05	0.07	0.08	14.80	14.80	14.80	14.80	14.80	14.80	14.80	14.80	14.80	0.08
ROUND DUCT SIZE	6	6	6	6	9.6	6	0	0	0	0	0	0	0	0	0	5.9
INLET GRILL SIZE	8	8	8	8	6	4	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	14	14	24	12	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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TYPE: 2010 LO # 87541
SITE NAME: CENTREFIELD (WEST GORMLEY) FIN BSMT

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	1	@ 10.6 cfm	10.6	cfm
Table 9.32.3.A.		TOTAL	127.2	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	127.2	cfm
Less Principal Ventil. Capacity	63.6	cfm
Required Supplemental Capacity	63.6	cfm

PRINCIPAL EXHAUST FAN CAPACITY

Model: VANEE 65H Location: BSMT

63.6 cfm [✓] HVI Approved

PRINCIPAL EXHAUST HEAT LOSS CALCULATION

CFM		ΔT °F		FACTOR		% LOSS
63.6 CFM	X	78 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
PWD	BY INSTALLING CONTRACTOR	50	✓	3.5

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-21

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#: 87541 Model: 2010 Builder: ROYAL PINE HOMES Date: 4/21/2021

Volume Calculation

House Volume

Level	Floor Area (ft²)	Floor Height (ft)	Volume (ft³)
Bsmt	777	10	7770
First	777	10	7847.7
Second	978	9	8802
Third	0	9	0
Fourth	0	9	0
		Total:	24,419.7 ft³
		Total:	691.5 m³

Air Change & Delta T Data

WINTER NATURAL AIR CHANGE RATE	0.236
SUMMER NATURAL AIR CHANGE RATE	0.072

Design Temperature Difference

	Tin °C	Tout °C	ΔT °C	ΔT °F
Winter DTDh	22	-21	43	78
Summer DTDc	24	31	7	13

5.2.3.1 Heat Loss due to Air Leakage

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

0.236 x 192.08 x 43 °C x 1.2 = 2354 W

= **8032 Btu/h**

6.2.6 Sensible Gain due to Air Leakage

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

= 0.072 x 192.08 x 7 °C x 1.2 = 117 W

= **401 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 78 °F x 1.08 x 0.25 = **1336 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 13 °F x 1.08 x 0.25 = **220 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	0.5	8,032	4,679	0.858
2	0.3		9,946	0.242
3	0.2		9,708	0.165
4	0		0	0.000
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: 2010 FIN BSMT **BUILDER:** ROYAL PINE HOMES
SFQT: 1742 **LO#** 87541 **SITE:** CENTREFIELD (WEST GORMLEY)

DESIGN ASSUMPTIONS

HEATING	°F	COOLING	°F
OUTDOOR DESIGN TEMP.	-6	OUTDOOR DESIGN TEMP.	88
INDOOR DESIGN TEMP.	72	INDOOR DESIGN TEMP. (MAX 75°F)	75

BUILDING DATA

ATTACHMENT:	ATTACHED	# 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):	24419.7	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:	7.0 ft
LENGTH: 52.0 ft	WIDTH: 22.0 ft	EXPOSED PERIMETER:	120.0 ft

2012 OBC - COMPLIANCE PACKAGE **Component**	**Compliance Package SB-12 PERFORMANCE**	
	Nominal	**Min. Eff.**
Ceiling with Attic Space Minimum RSI (R)-Value	60	59.20
Ceiling Without Attic Space Minimum RSI (R)-Value	31	27.70
Exposed Floor Minimum RSI (R)-Value	31	29.80
Walls Above Grade Minimum RSI (R)-Value	22+1.5	18.50
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	0.96	-
HRV Minimum Efficiency	75%	-
Domestic Hot Water Heater Minimum EF	TE=94%	-

INDIVIDUAL BCIN: 19669
MICHAEL O'ROURKE

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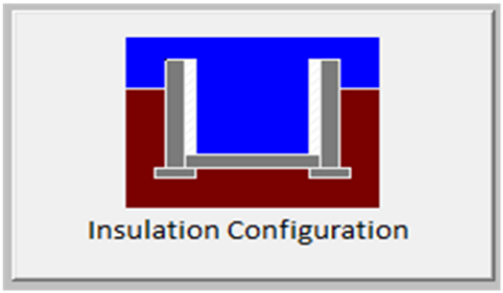
Residential Foundation Thermal Load Calculator

Supplemental tool for CAN/CSA-F280

Weather Station Description	
Province:	Ontario
Region:	Richmond Hill
Site Description	
Soil Conductivity:	Normal conductivity: dry sand, loam, clay
Water Table:	Normal (7-10 m, 23-33 ft)

Foundation Dimensions		
Floor Length (m):	**15.8**	 Insulation Configuration
Floor Width (m):	**6.7**	
Exposed Perimeter (m):	**36.6**	
Wall Height (m):	**3.0**	
Depth Below Grade (m):	**2.13**	
Window Area (m^2):	**0.9**	
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):		**1156**

TYPE: 2010 FIN BSMT
LO# 87541

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

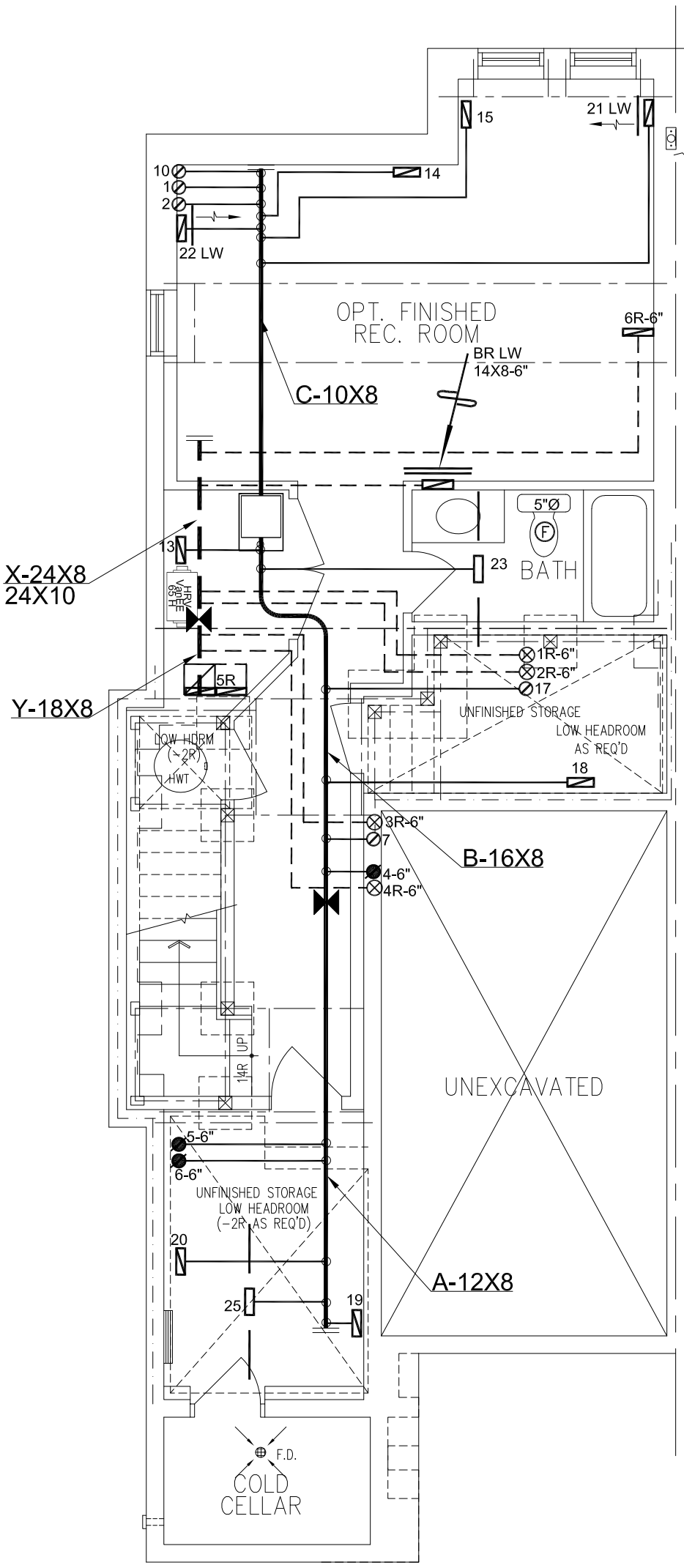
Air Infiltration Residential Load Calculator

Supplemental tool for CAN/CSA-F280

Weather Station Description	
Province:	Ontario
Region:	Richmond Hill
Weather Station Location:	Open flat terrain, grass
Anemometer height (m):	10
Local Shielding	
Building Site:	Suburban, forest
Walls:	Heavy
Flue:	Heavy
Highest Ceiling Height (m):	6.74
Building Configuration	
Type:	Semi
Number of Stories:	Two
Foundation:	Full
House Volume (m^3):	691.5
Air Leakage/Ventilation	
Air Tightness Type:	Energy Star Detached (2.5 ACH)
Custom BDT Data:	ELA @ 10 Pa. 645.5 cm^2
	2.50 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):	**0.236**
Cooling Air Leakage Rate (ACH/H):	**0.072**

TYPE: 2010 FIN BSMT

LO# 87541



OPT. FINISHED
BASEMENT PLAN, EL. '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 BUILDING CODE.

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

CSA-F280-12

SB-12 PERFORMANCE

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.	REVISED AS PER ARCHITECTURALS	APR/2021
1.	REVISED TO PERFORMANCE	SEPT/2020

REVISIONS

Client
ROYAL PINE HOMES

Project Name
CENTREFIELD (WEST GORMLEY)
RICHMOND HILL, ONTARIO

FIN BSMT
2010 1742 sqft

HVAC DESIGNS LTD.
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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 34374 BTU/H

UNIT DATA

MAKE	CARRIER	
MODEL	59TN6A-060-14V	
INPUT	60	MBTU/H
OUTPUT	58	MBTU/H
COOLING	2.5	TONS
FAN SPEED	875	cfm @ 0.6" w.c.

# OF RUNS	S/A	R/A	FANS
3RD FLOOR			
2ND FLOOR	8	4	2
1ST FLOOR	6	2	2
BASEMENT	4	1	1

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

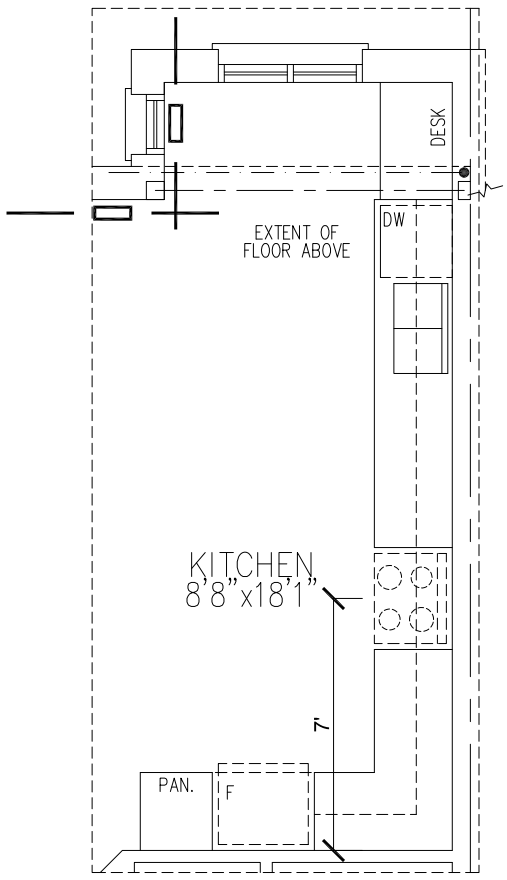
Sheet Title
BASEMENT HEATING LAYOUT

Date SEPT/2020

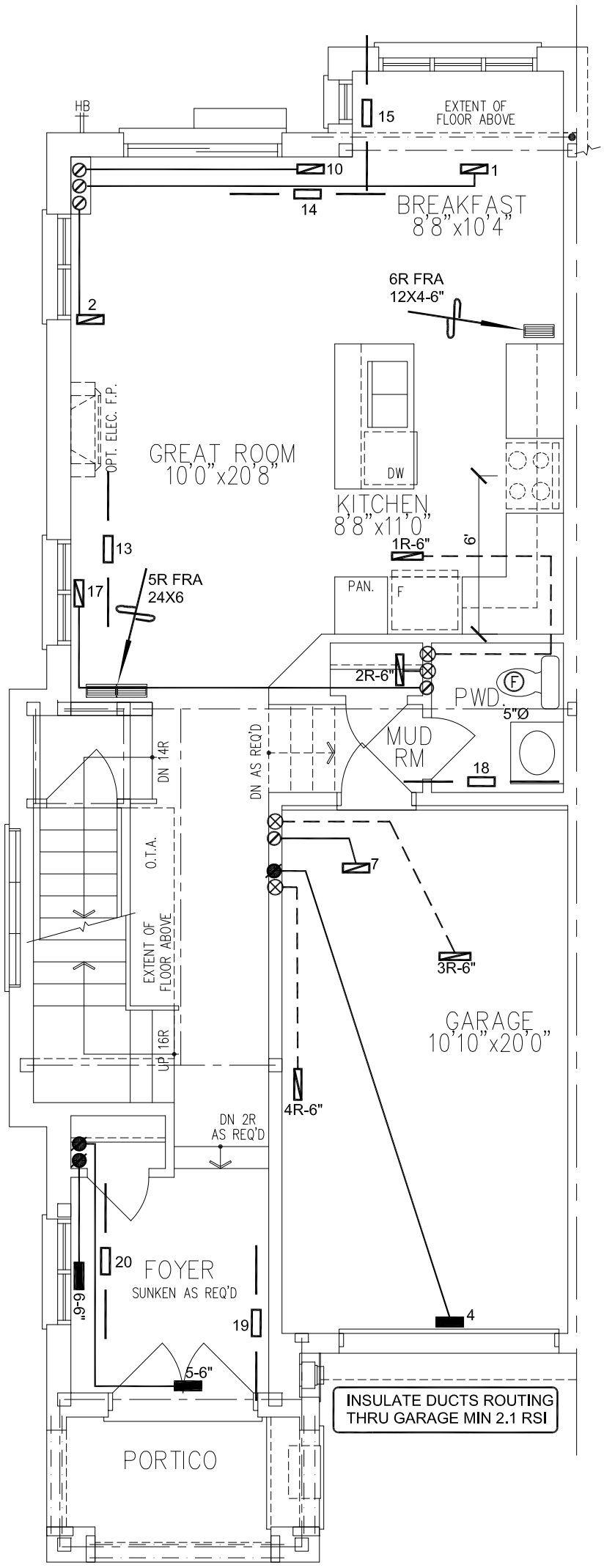
Scale 3/16" = 1'-0"

BCIN# 19669

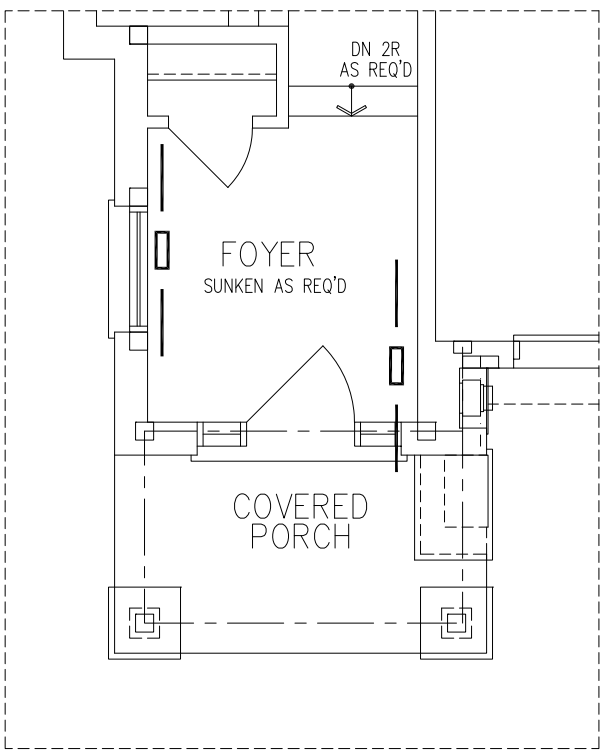
LO# 87541



PART. GROUND FLOOR PLAN – OPT. KITCHEN LAYOUT



GROUND FLOOR PLAN, EL. 'A'



GROUND 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.

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

CSA-F280-12

SB-12 PERFORMANCE

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

REVISIONS

No.	Description	Date
3.		
2.	REVISED AS PER ARCHITECTURALS	APR/2021
1.	REVISED TO PERFORMANCE	SEPT/2020

Client
ROYAL PINE HOMES

Project Name
CENTREFIELD (WEST GORMLEY)
RICHMOND HILL, ONTARIO

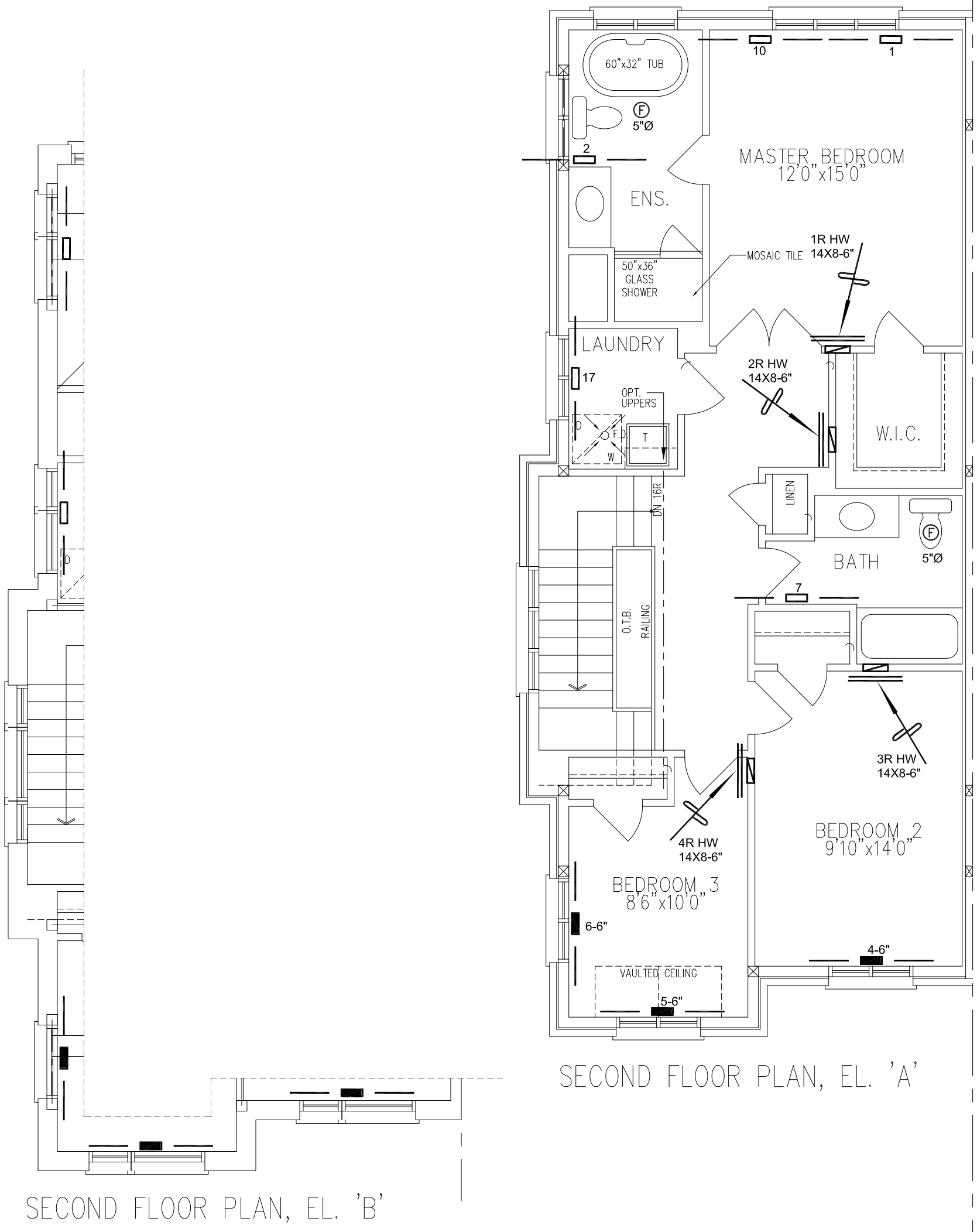
FIN BSMT
2010 1742 sqft

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.

Sheet Title
FIRST FLOOR HEATING LAYOUT

Date SEPT/2020
Scale 3/16" = 1'-0"
BCIN# 19669
LO# 87541



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

SB-12 PERFORMANCE

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.	REVISED AS PER ARCHITECTURALS	APR/2021
1.	REVISED TO PERFORMANCE	SEPT/2020

REVISIONS

Client

ROYAL PINE HOMES

Project Name

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Sheet Title

SECOND FLOOR HEATING LAYOUT

Date SEPT/2020

Scale 3/16" = 1'-0"

BCIN# 19669

LO# 87541