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:** 2011 **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.

HVAC DESIGNS LTD.
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Tel: 905.619.2300 Fax: 905.619.2375
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: 2011 | GFA: 1792 | LO# 87544 | SUMMER NATURAL AIR CHANGE RATE 0.071 | HEAT GAIN ΔT °F. 13 | SB-12 PERFORMANCE

ROOM USE			MBR			ENS				BED-2			BED-3				BATH								
EXP. WALL			32			15				10			37				9								
CLG. HT.			9			9				9			9				9								
FACTORS																									
GRS.WALL AREA	LOSS	GAIN	288			135				90			333				81								
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	28	610	697	16	349	398		0	0	0	46	1002	1145		12	261	299						
WEST	21.8	41.6	22	479	914	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						
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	238	1001	165	119	500	82		62	261	43	251	1056	174		69	290	48						
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	330	434	194	120	158	71		180	237	106	126	166	74		112	147	66						
NO ATTIC EXPOSED CLG	2.8	1.3	0	0	0	0	0	0		0	0	0	75	211	94		0	0	0						
EXPOSED FLOOR	2.6	0.4	0	0	0	0	0	0		180	470	77	75	196	32		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				2524			1007				1577			3414				699							
SUB TOTAL HT GAIN					1970			551				1389			3015				412						
LEVEL FACTOR / MULTIPLIER			0.20	0.18		0.20	0.18			0.20	0.18		0.20	0.18			0.20	0.18							
AIR CHANGE HEAT LOSS				444			177				277			600				123							
AIR CHANGE HEAT GAIN					77			21				54			117				16						
DUCT LOSS				0			0				185			401				0							
DUCT GAIN					0			0				222			391				0						
HEAT GAIN PEOPLE	240		2		480	0		0		1		240	1		240		0		0						
HEAT GAIN APPLIANCES/LIGHTS					533			0				533			533				0						
TOTAL HT LOSS BTU/H				2968			1184				2040			4416				822							
TOTAL HT GAIN x 1.3 BTU/H					3978			745				3170			5586				557						

ROOM USE			DEN			GRT			KT/BR						PWD			FOY						BAS		
EXP. WALL			33			19			33						8			21						125		
CLG. HT.			10			10			10						10			11						10		
FACTORS																										
GRS.WALL AREA	LOSS	GAIN	330			190			330						80			231						875		
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	37	806	1537	0	0	0	0	0	0				0	0	0	0	0	0				0	0	0
SOUTH	21.8	24.9	37	806	921	28	610	697	34	741	847				0	0	0	20	436	498				9	196	224
WEST	21.8	41.6	0	0	0	0	0	0	64	1394	2659				0	0	0	0	0	0				3	65	125
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	20	517	85	0	0	0				0	0	0	40	1034	170				20	517	85
NET EXPOSED WALL	4.2	0.7	256	1077	177	142	597	98	232	976	161				80	336	55	171	719	118				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				375	1381	227
EXPOSED CLG	1.3	0.6	0	0	0	0	0	0	0	0	0				0	0	0	0	0	0				0	0	0
NO ATTIC EXPOSED CLG	2.8	1.3	0	0	0	0	0	0	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				0	0	0
BASEMENT/CRAWL HEAT LOSS				0			0			0						0			0					4095	
SLAB ON GRADE HEAT LOSS				0			0			0						0			0						
SUBTOTAL HT LOSS				2689			1724			3110						336			2189					6254	
SUB TOTAL HT GAIN					2636			880			3666						55			786						661
LEVEL FACTOR / MULTIPLIER			0.30	0.24		0.30	0.24		0.30	0.24					0.30	0.24		0.30	0.24					0.50	0.65	
AIR CHANGE HEAT LOSS				651			417			753						81			530					4054	
AIR CHANGE HEAT GAIN					103			34			143						2			31						26
DUCT LOSS				0			0			0						0			0					0	
DUCT GAIN					0			0			0						0			0						0
HEAT GAIN PEOPLE	240		0		0	0		0	0		0				0		0	0		0				0		0
HEAT GAIN APPLIANCES/LIGHTS					533			533			533						0			0						533
TOTAL HT LOSS BTU/H				3339			2141			3863						418			2719					10309	
TOTAL HT GAIN x 1.3 BTU/H					4253			1882			5645						75			1062						1586

TOTAL HEAT GAIN BTU/H: 28758 | TONS: 2.40 | LOSS DUE TO VENTILATION LOAD BTU/H: 1336 | STRUCTURAL HEAT LOSS: 34218 | TOTAL COMBINED HEAT LOSS BTU/H: 35554

19.84 btu/ft2

32.36 btu/ft2

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

CITY OF RICHMOND HILL
BUILDING DIVISION
07/20/2021
RECEIVED
Permit: Jocelyn.aguilar

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

SITE NAME: CENTREFIELD (WEST GORMLEY)
BUILDER: ROYAL PINE HOMES

TYPE: 2011 | DATE: Apr-21 | GFA: 1792 | LO# 87544

HEATING CFM	875	COOLING CFM	875	furnace pressure	0.6		
TOTAL HEAT LOSS	34,218	TOTAL HEAT GAIN	28,539	furnace filter	0.05		
AIR FLOW RATE CFM	25.57	AIR FLOW RATE CFM	30.66	a/c coil pressure	0.2		
				available pressure for s/a & r/a	0.35		
				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
59TN6A-060-14V 60

FAN SPEED		AFUE =	97 %
		INPUT (BTU/H) =	60,000
		OUTPUT (BTU/H) =	**58,000**
LOW	820		
MEDLOW	875	DESIGN CFM =	875
MEDIUM	0	CFM @ .6 " E.S.P.	
MEDIUM HIGH	0		
HIGH	1520	TEMPERATURE RISE	61 °F

RUN COUNT	4th	3rd	2nd	1st	Bas
S/A	0	0	8	7	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	3	4	5	6	7	10	11	12	13	14	15	18	19	21	22	23	24
ROOM NAME	MBR	ENS	BED-2	BED-2	BED-3	BED-3	BATH	MBR	DEN	DEN	GRT	KT/BR	KT/BR	PWD	FOY	BAS	BAS	BAS	BAS
RM LOSS MBH.	1.48	1.18	1.02	1.02	2.21	2.21	0.82	1.48	1.67	1.67	2.14	1.93	1.93	0.42	2.72	2.58	2.58	2.58	2.58
CFM PER RUN HEAT	38	30	26	26	56	56	21	38	43	43	55	49	49	11	70	66	66	66	66
RM GAIN MBH.	1.99	0.74	1.59	1.59	2.79	2.79	0.56	1.99	2.13	2.13	1.88	2.82	2.82	0.07	1.06	0.40	0.40	0.40	0.40
CFM PER RUN COOLING	61	23	49	49	86	86	17	61	65	65	58	87	87	2	33	12	12	12	12
ADJUSTED PRESSURE	0.17	0.17	0.17	0.17	0.16	0.16	0.17	0.17	0.17	0.17	0.17	0.16	0.16	0.17	0.17	0.17	0.17	0.17	0.17
ACTUAL DUCT LGH.	72	59	38	33	35	32	45	62	7	11	55	47	50	22	25	58	44	24	16
EQUIVALENT LENGTH	190	180	110	120	170	150	130	150	150	130	150	140	130	110	110	110	160	120	110
TOTAL EFFECTIVE LENGTH	262	239	148	153	205	182	175	212	157	141	205	187	180	132	135	168	204	144	126
ADJUSTED PRESSURE	0.07	0.07	0.12	0.11	0.08	0.09	0.1	0.08	0.11	0.12	0.08	0.09	0.09	0.13	0.13	0.1	0.08	0.12	0.14
ROUND DUCT SIZE	**6**	4	5	4	**6**	**6**	4	**6**	5	5	5	**6**	**6**	4	5	5	5	5	5
HEATING VELOCITY (ft/min)	194	344	191	298	286	286	241	194	316	316	404	250	250	126	514	485	485	485	485
COOLING VELOCITY (ft/min)	311	264	360	562	438	438	195	311	477	477	426	444	444	23	242	88	88	88	88
OUTLET GRILL SIZE	4X10	3X10	3X10	3X10	4X10	4X10	3X10	4X10	3X10	3X10	3X10	4X10	4X10	3X10	3X10	3X10	3X10	3X10	3X10
TRUNK	A	A	D	D	D	D	C	A	D	D	A	A	B	C	C	B	A	B	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 CFM	STATIC PRESS.	ROUND DUCT	RECT DUCT			VELOCITY (ft/min)
TRUNK A	276	0.07	9	10	x	8	497	TRUNK G	0	0.00	0	0	x	8	0
TRUNK B	181	0.09	7.2	8	x	8	407	TRUNK H	0	0.00	0	0	x	8	0
TRUNK C	559	0.07	11.7	16	x	8	629	TRUNK I	0	0.00	0	0	x	8	0
TRUNK D	875	0.07	13.8	22	x	8	716	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	875	0.05	15	26	x	8	606
TRUNK Y	715	0.05	13.9	22	x	8	585
TRUNK Z	430	0.05	11.5	16	x	8	484
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	120	85	85	115	310	120	0	0	0	0	0	0	0	0	0	40
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.	68	45	45	52	37	20	1	1	1	1	1	1	1	1	1	14
EQUIVALENT LENGTH	195	215	195	235	200	135	0	0	0	0	0	0	0	0	0	135
TOTAL EFFECTIVE LH	263	260	240	287	237	155	1	1	1	1	1	1	1	1	1	149
ADJUSTED PRESSURE	0.06	0.06	0.06	0.05	0.06	0.10	14.80	14.80	14.80	14.80	14.80	14.80	14.80	14.80	14.80	0.10
ROUND DUCT SIZE	6.8	6	6	7	9.7	6	0	0	0	0	0	0	0	0	0	4
INLET GRILL SIZE	8	8	8	8	8	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	30	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.

INDIVIDUAL BCIN: 19669 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

TYPE: 2011 LO # 87544
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	3	@ 10.6 cfm	31.8	cfm
Table 9.32.3.A.		TOTAL	137.8	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	137.8	cfm
Less Principal Ventil. Capacity	63.6	cfm
Required Supplemental Capacity	74.2	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

CITY OF RICHMOND HILL
BUILDING DIVISION
07/20/2021
RECEIVED
Per: jocelyn.aguilar

375 Finley Ave. Suite 202 Ajax, ON L1S 2E2
Tel: 905.619.2300 Fax: 905.619.2375
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CSA F280-12 Residential Heat Loss and Heat Gain Calculations

Formula Sheet (For Air Leakage / Ventiliation Calculation)

LO#: 87544 Model: 2011 Builder: ROYAL PINE HOMES Date: 4/21/2021

Volume Calculation

House Volume

Level	Floor Area (ft²)	Floor Height (ft)	Volume (ft³)
Bsmt	782	10	7820
First	782	10	7820
Second	1010	9	9090
Third	0	9	0
Fourth	0	9	0
		Total:	24,730.0 ft³
		Total:	700.3 m³

Air Change & Delta T Data

WINTER NATURAL AIR CHANGE RATE	0.236
SUMMER NATURAL AIR CHANGE RATE	0.071

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 194.52 x 43 °C x 1.2 = 2376 W

= **8108 Btu/h**

6.2.6 Sensible Gain due to Air Leakage

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

= 0.071 x 194.52 x 7 °C x 1.2 = 119 W

= **404 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	8,108	6,254	0.648
2	0.3		10,048	0.242
3	0.2		9,220	0.176
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

CITY OF RICHMOND HILL
BUILDING DIVISION
07/20/2021
RECEIVED
Per: jocelyn.aguilar

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

HEAT LOSS AND GAIN SUMMARY SHEET

MODEL: 2011 **BUILDER:** ROYAL PINE HOMES
SFQT: 1792 **LO#** 87544 **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):	24730.0	ASSUMED (Y/N):	Y
INTERNAL SHADING:	BLINDS/CURTAINS	ASSUMED OCCUPANTS:	4
INTERIOR LIGHTING LOAD ($Btu/h/ft^2$):	1.45	DC BRUSHLESS MOTOR (Y/N):	Y
FOUNDATION CONFIGURATION	BCIN_1	DEPTH BELOW GRADE:	7.0 ft
LENGTH: 51.0 ft	WIDTH: 22.0 ft	EXPOSED PERIMETER:	125.0 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

CITY OF RICHMOND HILL
BUILDING DIVISION
07/20/2021
Michael O'Rourke
RECEIVED
Per:____jocelyn.aguilar_____

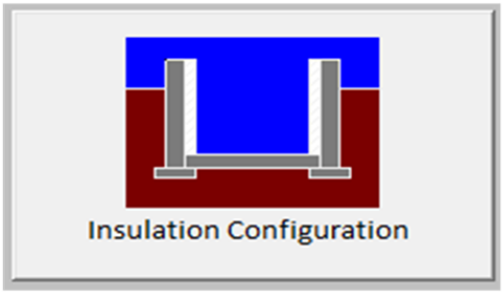
HVAC Designs Ltd.
375 Finley Ave, Suite 202
Ajax ON, L1S 2E2
905-619-2300

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):	**15.5**	
Floor Width (m):	**6.7**	
Exposed Perimeter (m):	**38.1**	
Wall Height (m):	**3.0**	
Depth Below Grade (m):	**2.13**	
Window Area (m^2):	**1.1**	
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):	**1200**	

TYPE: 2011
LO# 87544

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):	6.71
Building Configuration	
Type:	Semi
Number of Stories:	Two
Foundation:	Full
House Volume (m^3):	700.3
Air Leakage/Ventilation	
Air Tightness Type:	Energy Star Detached (2.5 ACH)
Custom BDT Data:	ELA @ 10 Pa. 653.7 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):	**0.071**

TYPE: 2011
LO# 87544

City of Richmond Hill
Building Division

REVIEWED

By: **PxV** Date: **SEPT/02/2021**

Building Permit #: **BP#-2021-50735**

All construction shall comply with the Ontario Building Code and all other applicable statutory regulations. The reviewed documents must be kept on site at all times.

Building inspection line: 905-771-5465 (24 hr)
buildinginspections@richmondhill.ca
Building inquiry line 905-771-8810
building@richmondhill.ca

Ensure that R-Values and U-Values used for heat loss and heat gain calculations are consistent with the values specified by SB-12 Performance Compliance: Energy Modeling/air leak test and the values used for architectural design.

Minimum R-12 Insulation Value required for ducts installed at unheated or exposed condition (OBC 2012 Div.B 6.2.4.3(10) and seal the ducts as per 6.2.4.3(11) & HRAI Digest 2005, Clause 4.5.

Penetration of Air Barrier System by ducts, wires, conduits or building materials shall be sealed as per OBC 2012, Div.B 9.25.3.3.(9) & (10).

HRV Unit shall be energy qualified complete with sealed and insulated connection to outdoor vent hoods per Energy Star Technical Specification 4.7.1.2. When HRV is used as principal fan, the controller shall be wired to the HRV Unit and interconnected to the furnace fan. HRV shall be designed for operation at outside temperature of -25°C and a flow of minimum 30 L/s (64 CFM)

This review does not exempt the owner, designer and the builder from complying with all applicable regulations and by-laws of the City of Richmond Hill and the Ontario Building Code.

Volume control dampers to all branches to be installed per OBC 2012, Div.B, 6.2.4.5.

Space between studs and joists used as return ducts shall be separated from unused portion as per OBC 2012 Div.B 6.2.4.7(6)

Combustion air supply shall be provided to the furnace and hot water tank.

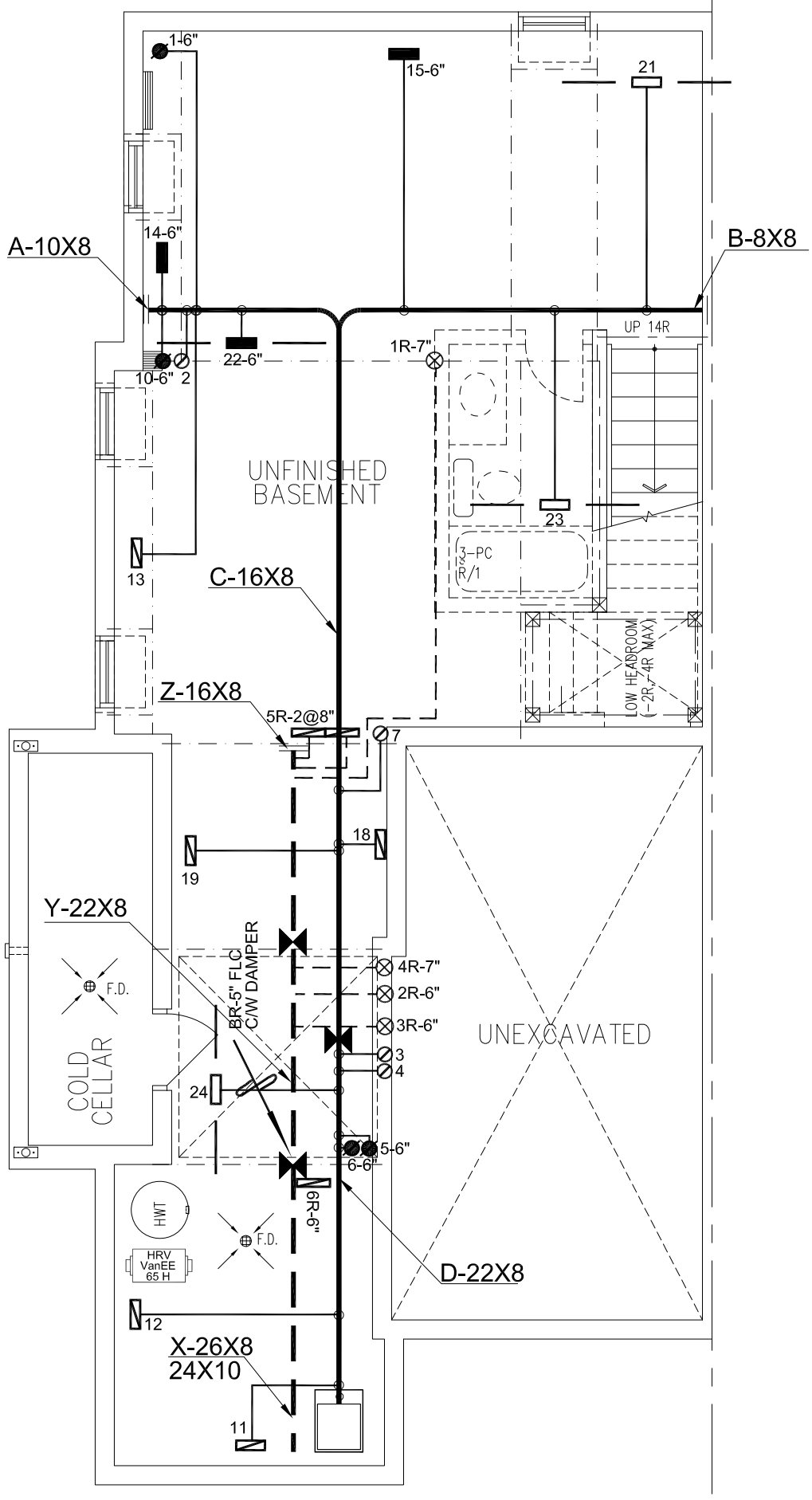
HRV installation, testing, startup and commissioning shall be in compliance with OBC 2012, Div.B 9.32.3.11, 9.32.3.11(7)&(10)

HRV duct connection shall be in compliance with OBC 2012 Div.B 9.32.3.6(3) & 9.32.3.4(7).

Supply air grill at finished basement shall be at low level. Return air grill for finished or unfinished basement shall be at low level. HRAI digest 2005, clause 7.7(3).

Air supply outlet shall not be installed on a furnace plenum or trunk duct. (HRAI Digest 2005, 4.6)

Exterior insulation effective R-Value for wall, roof or exposed floor shall be maintained at the respective location where duct or sanitary pipes are routed inside exterior envelope.



BASEMENT PLAN, EL. 'A' & 'B'

Return air intake shall be provided as recommended in HRAI Digest 2005 Section 4.7 Return air inlet should be positioned so that short circuiting of supply air is avoided. A high and low wall return air combination shall be provided when a combined cooling & heating system is installed.

For simplified HRV/ERV installation, with stale air and fresh air connected to return air plenum, stale air intake and fresh air supply shall be separated minimum 3' or as recommended by HRV/ERV Manufacturer.

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

2011 1792 sqft

HVAC DESIGNS LTD.
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L1S 2E2 Tel. 905.619.2300 - 905.420.5300 Fax 905.619.2375
Email: info@hvacdesigns.ca
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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	35554	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.

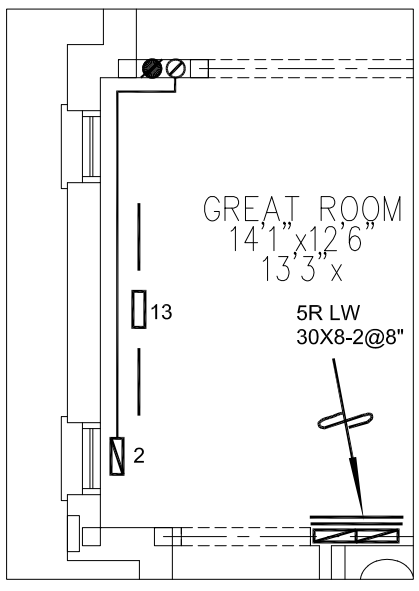
# OF RUNS	S/A	R/A	FANS
3RD FLOOR			
2ND FLOOR	8	4	2
1ST FLOOR	7	2	2
BASEMENT	4	1	0

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# 87544

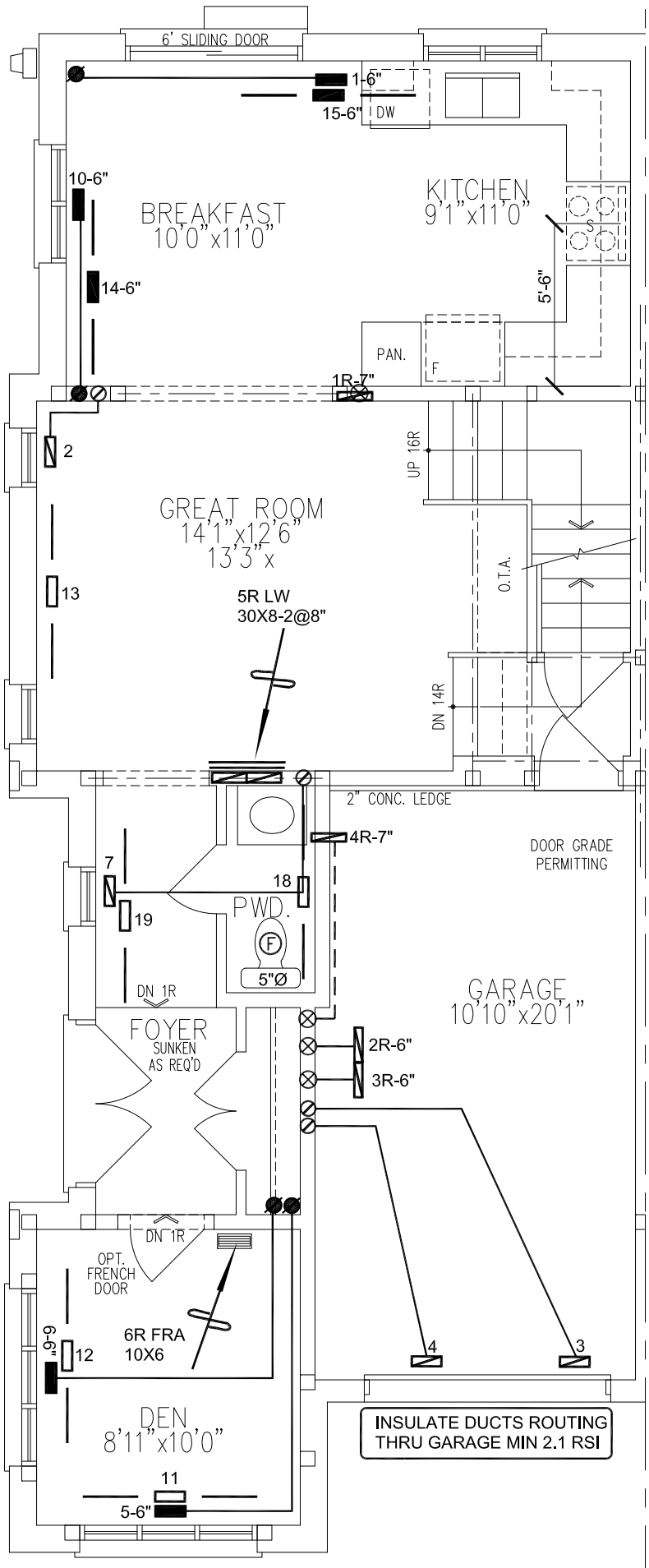
Space between studs and joists used as return ducts shall be separated from unused portion as per OBC 2012 Div.B 6.2.4.7(6)

Kitchen hood exhaust duct shall be provided as per OBC 2012, Div.B 9.32.3.10, 9.32.3.5(2).



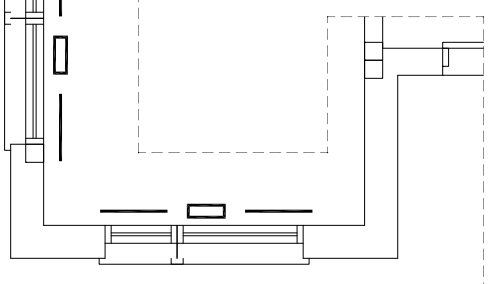
FOR OPT SECOND FLOOR PLAN

PARTIAL GROUND FLOOR PLAN, EL. 'B' MOD



GROUND FLOOR PLAN, EL. 'A'

Exterior insulation effective R-Value for wall, roof or exposed floor shall be maintained at the respective location where duct or sanitary pipes are routed inside exterior envelope.



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
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— ▬ —	SUPPLY AIR GRILLE 6" BOOT	⊘	SUPPLY AIR STACK FROM 2nd FLOOR	▱	30"x8" RETURN AIR GRILLE	⊠	RETURN AIR STACK 2nd FLOOR
▱	SUPPLY AIR BOOT ABOVE	●	6" SUPPLY AIR STACK 2nd FLOOR	▤	FRA- FLOOR RETURN AIR GRILLE	⧗	REDUCER

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

Client
ROYAL PINE HOMES

Project Name
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RICHMOND HILL, ONTARIO

2011 1792 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.

CITY OF RICHMOND HILL
BUILDING DIVISION
07/20/2021
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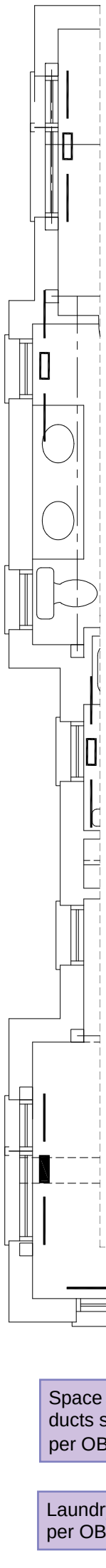
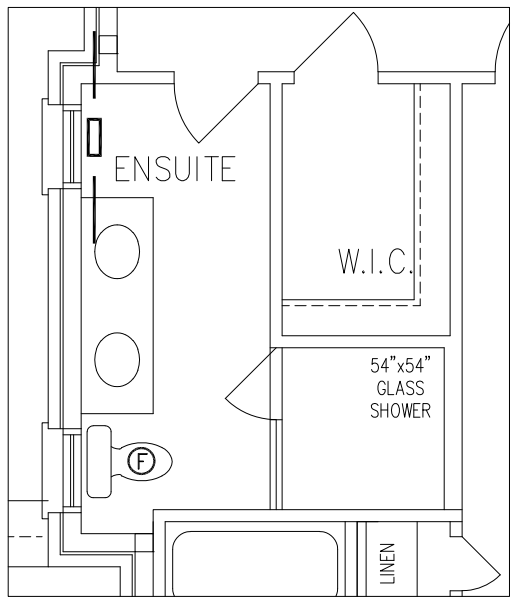
Per: jocelyn.aguilar

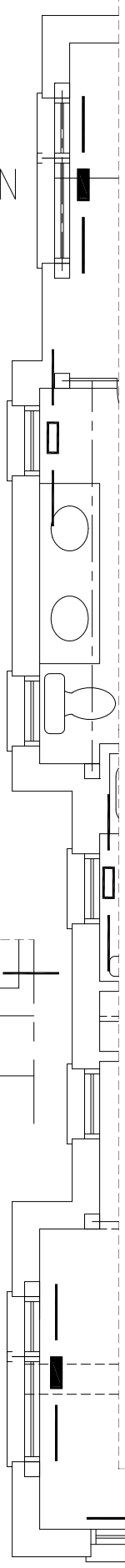
Sheet Title
FIRST FLOOR HEATING LAYOUT

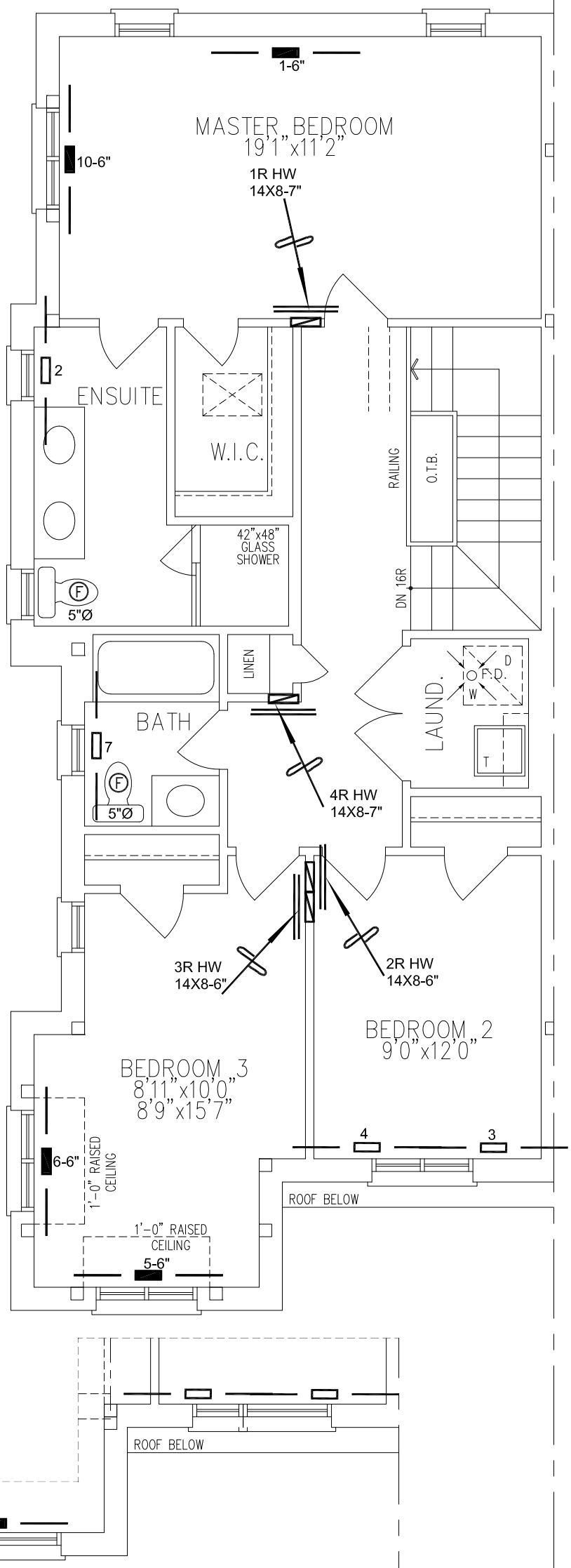
Date SEPT/2020
Scale 3/16" = 1'-0"
BCIN# 19669
LO# 87544





PART. SECOND FLOOR PLAN
EL. 'B MOD'





Space between studs and joists used as return ducts shall be separated from unused portion as per OBC 2012 Div.B 6.2.4.7(6)

Laundry dryer exhaust duct shall be provided as per OBC 2012 Div.B 6.2.3.8(7).

SECOND FLOOR PLAN, EL. 'B'

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

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HVAC DESIGNS LTD.

CSA-F280-12

SB-12 PERFORMANCE

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ROYAL PINE HOMES

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SECOND FLOOR HEATING LAYOUT

Date SEPT/2020

Scale 3/16" = 1'-0"

BCIN# 19669

LO# 87544