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:** 4500 **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 19, 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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SITE NAME: CENTREFIELD (WEST GORMLEY) | DATE: Apr-21 | WINTER NATURAL AIR CHANGE RATE 0.233 | HEAT LOSS ΔT °F. 78 | CSA-F280-12
BUILDER: ROYAL PINE HOMES | TYPE: 4500 | GFA: 2758 | LO# 87504 | SUMMER NATURAL AIR CHANGE RATE 0.073 | HEAT GAIN ΔT °F. 13 | SB-12 PERFORMANCE

ROOM USE			MBR			ENS				BED-2			BED-3			BED-4			ENS-3/4				WIC-2			ENS-2				
EXP. WALL			44			23				11			32			13			6				12			12				
CLG. HT.			9			9				9			9			9			9				9			9				
	FACTORS																													
GRS.WALL AREA	LOSS	GAIN	396			207				99			288			117			54				108			108				
GLAZING				LOSS	GAIN		LOSS	GAIN			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		0	0	0	7	152	112		
EAST	21.8	41.6	0	0	0	0	0	0		33	719	1371	36	784	1496	0	0	0	0	0	0		16	349	665	0	0	0		
SOUTH	21.8	24.9	0	0	0	8	174	199		0	0	0	0	0	0	16	349	398	7	152	174		0	0	0	0	0	0		
WEST	21.8	41.6	36	784	1496	16	349	665		0	0	0	0	0	0	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		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		0	0	0	0	0	0		
NET EXPOSED WALL	4.2	0.7	360	1514	249	183	770	127		66	278	46	252	1060	174	101	425	70	47	198	33		92	387	64	101	425	70		
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		0	0	0	0	0	0		
EXPOSED CLG	1.3	0.6	420	552	247	130	171	76		270	355	159	222	292	131	208	273	122	86	113	51		38	50	22	72	95	42		
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		0	0	0	0	0	0		
EXPOSED FLOOR	2.6	0.4	0	0	0	0	0	0		160	418	69	0	0	0	0	0	0	0	0	0		38	99	16	45	117	19		
BASEMENT/CRAWL HEAT LOSS				0			0				0			0			0			0				0			0			
SLAB ON GRADE HEAT LOSS				0			0				0			0			0			0				0			0			
SUBTOTAL HT LOSS				2850			1463				1769			2136			1047			463				885			789			
SUB TOTAL HT GAIN					1992			1067				1644			1801			591			257				767			243		
LEVEL FACTOR / MULTIPLIER			0.20	0.23		0.20	0.23			0.20	0.23		0.20	0.23		0.20	0.23		0.20	0.23			0.20	0.23		0.20	0.23			
AIR CHANGE HEAT LOSS				646			332				401			484			237			105				201			179			
AIR CHANGE HEAT GAIN					93			50				77			84			28			12				36			11		
DUCT LOSS				0			0				217			0			0			0				109			97			
DUCT GAIN					0			0				253			0			0			0				80			25		
HEAT GAIN PEOPLE	240		2		480	0		0		1		240	1		240	1		240	0		0		0		0	0		0		
HEAT GAIN APPLIANCES/LIGHTS					566			0				566			566			566			0				0			0		
TOTAL HT LOSS BTU/H				3496			1795				2387			2620			1284			568				1194			1065			
TOTAL HT GAIN x 1.3 BTU/H					4071			1452				3615			3499			1852			350				1148			364		

ROOM USE			DEN			DIN			KT/GT				LAUN			W/R			FOY									BAS		
EXP. WALL			25			26			70				26			8			24									168		
CLG. HT.			11			11			11				13			11			11									10		
	FACTORS																													
GRS.WALL AREA	LOSS	GAIN	275			286			770				338			88			264									1176		
GLAZING				LOSS	GAIN		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		8	174	128	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	28	610	1163							0	0	0
SOUTH	21.8	24.9	0	0	0	31	675	772	0	0	0		0	0	0	9	196	224	0	0	0							12	261	299
WEST	21.8	41.6	0	0	0	0	0	0	134	2919	5568		0	0	0	0	0	0	0	0	0							4	87	166
SKYLT.	35.8	101.2	0	0	0	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		20	517	85	0	0	0	20	517	85							20	517	85
NET EXPOSED WALL	4.2	0.7	238	1001	165	255	1072	176	636	2675	440		310	1304	214	79	332	55	216	908	149							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							504	1857	305
EXPOSED CLG	1.3	0.6	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0	45	59	26							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							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							0	0	0
BASEMENT/CRAWL HEAT LOSS				0			0			0				0			0			0								5679		
SLAB ON GRADE HEAT LOSS				0			0			0				0			0			0										
SUBTOTAL HT LOSS				1807			1748			5594				1995			528			2094								8401		
SUB TOTAL HT GAIN					1702			948			6008				427			279			1424									856
LEVEL FACTOR / MULTIPLIER			0.30	0.28		0.30	0.28		0.30	0.28			0.30	0.28		0.30	0.28		0.30	0.28								0.50	0.77	
AIR CHANGE HEAT LOSS				509			492			1576				562			149			590								6462		
AIR CHANGE HEAT GAIN					80			44			282				20			13			67									40
DUCT LOSS				0			0			0				0			0			0								0		
DUCT GAIN					0			0			0				0			0			0									0
HEAT GAIN PEOPLE	240		0		0	0		0	0		0		0		0	0		0	0		0							0		0
HEAT GAIN APPLIANCES/LIGHTS					566			566			566				566			0			0									566
TOTAL HT LOSS BTU/H				2316			2240			7169				2557			677			2684								14863		
TOTAL HT GAIN x 1.3 BTU/H					3053			2027			8913				1318			379			1939									1900

TOTAL HEAT GAIN BTU/H: 36155 TONS: 3.01 LOSS DUE TO VENTILATION LOAD BTU/H: 1670 STRUCTURAL HEAT LOSS: 46916 TOTAL COMBINED HEAT LOSS BTU/H: 48586

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: 4500 | DATE: Apr-21 | GFA: 2758 | LO# 87504

				furnace pressure	0.6			
HEATING CFM	1145	COOLING CFM	1145	furnace filter	0.05		**CARRIER	AFUE = 97 %
TOTAL HEAT LOSS	46,916	TOTAL HEAT GAIN	35,880	a/c coil pressure	0.2		**59TN6A-060-14V 60**	INPUT (BTU/H) = 60,000
AIR FLOW RATE CFM	24.41	AIR FLOW RATE CFM	31.91	available pressure for s/a & r/a	0.35		FAN SPEED	OUTPUT (BTU/H) = **58,000**
							LOW 820	
							MEDLOW 0	DESIGN CFM = **1145**
				plenum pressure s/a	0.18	r/a pressure 0.17	MEDIUM 1145	CFM @ .6 " E.S.P.
				max s/a dif press. loss	0.02	r/a grille press. Loss 0.02	MEDIUM HIGH 0	
				min adjusted pressure s/a	0.16	adjusted pressure r/a 0.15	HIGH 1520	TEMPERATURE RISE 47 °F

RUN COUNT	4th	3rd	2nd	1st	Bas
S/A	0	0	11	8	4
R/A	0	0	4	3	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	8	9	10	11	12	13	14	15	16	17	18	19	21	22	23	24
ROOM NAME	MBR	ENS	BED-2	BED-2	BED-3	BED-4	ENS-3/4	BED-3	WIC-2	MBR	ENS-2	DEN	DIN	KT/GT	KT/GT	KT/GT	LAUN	W/R	FOY	BAS	BAS	BAS	BAS
RM LOSS MBH.	1.75	1.79	1.19	1.19	1.31	1.28	0.57	1.31	1.19	1.75	1.07	2.32	2.24	2.39	2.39	2.39	2.56	0.68	2.68	3.72	3.72	3.72	3.72
CFM PER RUN HEAT	43	44	29	29	32	31	14	32	29	43	26	57	55	58	58	58	62	17	66	91	91	91	91
RM GAIN MBH.	2.04	1.45	1.81	1.81	1.75	1.85	0.35	1.75	1.15	2.04	0.36	3.05	2.03	2.97	2.97	2.97	1.32	0.38	1.94	0.48	0.48	0.48	0.48
CFM PER RUN COOLING	65	46	58	58	56	59	11	56	37	65	12	97	65	95	95	95	42	12	62	15	15	15	15
ADJUSTED PRESSURE	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.16	0.17	0.16	0.16	0.16	0.17	0.17	0.17	0.16	0.16	0.16	0.16
ACTUAL DUCT LGH.	49	28	40	41	38	22	23	41	44	59	41	25	10	29	38	49	34	3	28	43	21	23	26
EQUIVALENT LENGTH	180	160	120	130	130	160	190	160	140	160	150	120	80	90	150	100	110	120	150	120	100	140	120
TOTAL EFFECTIVE LENGTH	229	188	160	171	168	182	213	201	184	219	191	145	90	119	188	149	144	123	178	163	121	163	146
ADJUSTED PRESSURE	0.08	0.09	0.11	0.1	0.1	0.09	0.08	0.09	0.09	0.08	0.09	0.11	0.19	0.14	0.09	0.11	0.12	0.14	0.1	0.1	0.13	0.1	0.11
ROUND DUCT SIZE	5	4	5	5	5	**6**	4	5	4	5	4	**6**	5	**6**	**6**	**6**	5	4	5	**6**	**6**	**6**	**6**
HEATING VELOCITY (ft/min)	316	505	213	213	235	158	161	235	333	316	298	291	404	296	296	296	455	195	485	464	464	464	464
COOLING VELOCITY (ft/min)	477	528	426	426	411	301	126	411	424	477	138	495	477	484	484	484	308	138	455	76	76	76	76
OUTLET GRILL SIZE	3X10	3X10	3X10	3X10	3X10	4X10	3X10	3X10	3X10	3X10	3X10	4X10	3X10	4X10	4X10	4X10	3X10	3X10	3X10	4X10	4X10	4X10	4X10
TRUNK	A	B	D	D	C	B	D	C	D	A	D	C	D	B	A	A	A	B	C	A	B	C	C

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	355	0.08	9.5	10	x	8	639	TRUNK G	0	0.00	0	0	x	8	0
TRUNK B	596	0.08	11.6	16	x	8	671	TRUNK H	0	0.00	0	0	x	8	0
TRUNK C	369	0.09	9.4	10	x	8	664	TRUNK I	0	0.00	0	0	x	8	0
TRUNK D	551	0.08	11.2	14	x	8	708	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	800	0.05	14.5	24	x	8	600
TRUNK Y	0	0.05	0	0	x	8	0
TRUNK Z	0	0.05	0	0	x	8	0
DROP	1145	0.05	16.6	24	x	10	687

RETURN AIR #	1	2	3	4	5	6	7									**BR**
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
AIR VOLUME	135	135	125	125	75	330	85	0	0	0	0	0	0	0	0	135
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.	46	39	51	43	34	16	41	1	1	1	1	1	1	1	1	14
EQUIVALENT LENGTH	175	175	215	220	255	135	215	0	0	0	0	0	0	0	0	260
TOTAL EFFECTIVE LH	221	214	266	263	289	151	256	1	1	1	1	1	1	1	1	274
ADJUSTED PRESSURE	0.07	0.07	0.06	0.06	0.05	0.10	0.06	14.80	14.80	14.80	14.80	14.80	14.80	14.80	14.80	0.05
ROUND DUCT SIZE	6.8	6.8	6.9	6.9	6	8.8	6	0	0	0	0	0	0	0	0	7.5
INLET GRILL SIZE	8	8	8	8	8	8	8	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	14	30	14	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: 4500 LO # 87504
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	3	@ 10.6 cfm	31.8	cfm
Kitchen & Bathrooms	5	@ 10.6 cfm	53	cfm
Other Rooms	5	@ 10.6 cfm	53.0	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	**79.5**	**cfm**

SUPPLEMENTAL VENTILATION CAPACITY 9.32.3.5.

Total Ventilation Capacity	180.2	cfm
Less Principal Ventil. Capacity	79.5	cfm
Required Supplemental Capacity	100.7	cfm

PRINCIPAL EXHAUST FAN CAPACITY

Model: VANEE 65H Location: BSMT

79.5 cfm [✓] HVI Approved

PRINCIPAL EXHAUST HEAT LOSS CALCULATION

CFM		ΔT °F		FACTOR		% LOSS
79.5 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
ENS-3/4	BY INSTALLING CONTRACTOR	50	✓	3.5
ENS-2	BY INSTALLING CONTRACTOR	50	✓	3.5
W/R	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

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#: 87504 Model: 4500 Builder: ROYAL PINE HOMES Date: 4/19/2021

Volume Calculation

House Volume

Level	Floor Area (ft²)	Floor Height (ft)	Volume (ft³)
Bsmt	1255	10	12550
First	1255	11	13805
Second	1503	9	13527
Third	0	9	0
Fourth	0	9	0
		Total:	39,882.0 ft³
		Total:	1129.3 m³

Air Change & Delta T Data

WINTER NATURAL AIR CHANGE RATE	0.233
SUMMER NATURAL AIR CHANGE RATE	0.073

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

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

0.233 x 313.70 x 43 °C x 1.2 = 3788 W

= **12924 Btu/h**

6.2.6 Sensible Gain due to Air Leakage

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

= 0.073 x 313.70 x 7 °C x 1.2 = 194 W

= **663 Btu/h**

5.2.3.2 Heat Loss due to Mechanical Ventilation

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

80 CFM x 78 °F x 1.08 x 0.25 = **1670 Btu/h**

6.2.7 Sensible heat Gain due to Ventilation

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

80 CFM x 13 °F x 1.08 x 0.25 = **275 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	12,924	8,401	0.769
2	0.3		13,766	0.282
3	0.2		11,402	0.227
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: 4500 **BUILDER:** ROYAL PINE HOMES
SFQT: 2758 **LO#** 87504 **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:	DETACHED	# 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):	39882.0	ASSUMED (Y/N):	Y
INTERNAL SHADING:	BLINDS/CURTAINS	ASSUMED OCCUPANTS:	5
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: 48.0 ft	WIDTH: 36.0 ft	EXPOSED PERIMETER:	168.0 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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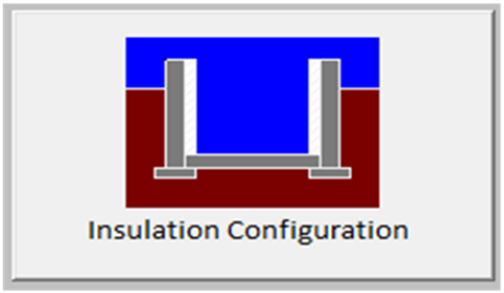
905-619-2300

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):	**14.6**	 Insulation Configuration
Floor Width (m):	**11.0**	
Exposed Perimeter (m):	**0.0**	
Wall Height (m):	**3.0**	
Depth Below Grade (m):	**2.13**	
Window Area (m^2):	**1.5**	
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):		**1664**

TYPE: 4500
LO# 87504

HVAC Designs Ltd.
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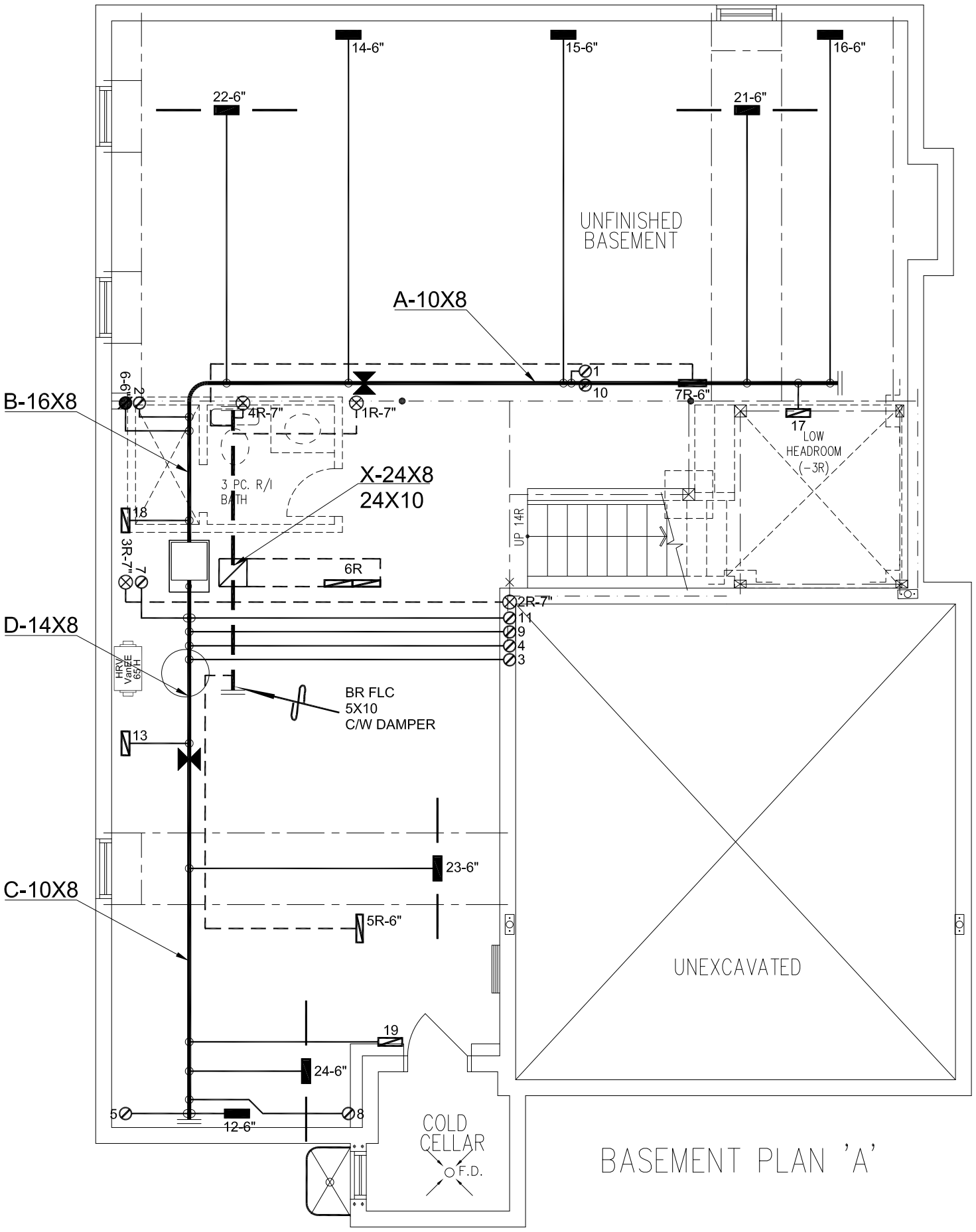
Air Infiltration Residential Load Calculator

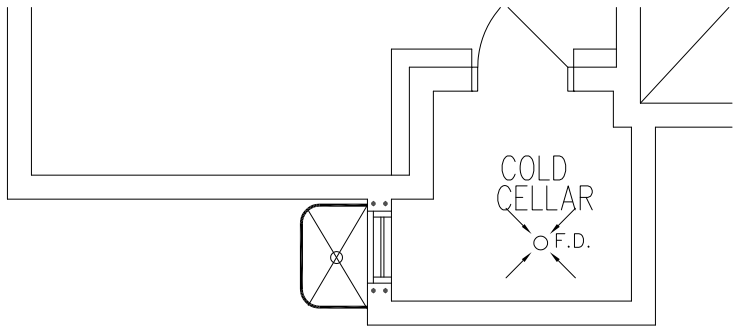
Supplemental tool for CAN/CSA-F280

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):	7.01
Building Configuration	
Type:	Detached
Number of Stories:	Two
Foundation:	Full
House Volume (m^3):	1129.3
Air Leakage/Ventilation	
Air Tightness Type:	Energy Star Detached (2.5 ACH)
Custom BDT Data:	ELA @ 10 Pa. 1054.2 cm^2
	2.50 ACH @ 50 Pa
Mechanical Ventilation (L/s):	Total Supply 37.5 / Total Exhaust 37.5
Flue Size	
Flue #:	#1 #2 #3 #4
Diameter (mm):	0 0 0 0
Natural Infiltration Rates	
Heating Air Leakage Rate (ACH/H):	**0.233**
Cooling Air Leakage Rate (ACH/H):	**0.073**

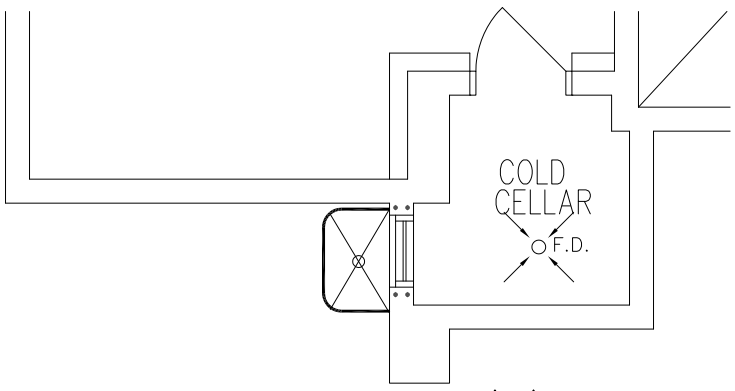
TYPE: 4500
LO# 87504



BASEMENT PLAN 'A'



BASEMENT PLAN 'B'



BASEMENT PLAN 'C'

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

4500 2758 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 46810 BTU/H		
UNIT DATA		
MAKE	CARRIER	
MODEL	59TN6A-060-14V	
INPUT	60	MBTU/H
OUTPUT	58	MBTU/H
COOLING	3.0	TONS
FAN SPEED	1145	cfm @ 0.6" w.c.

# OF RUNS	S/A	R/A	FANS
3RD FLOOR			
2ND FLOOR	11	4	3
1ST FLOOR	8	3	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

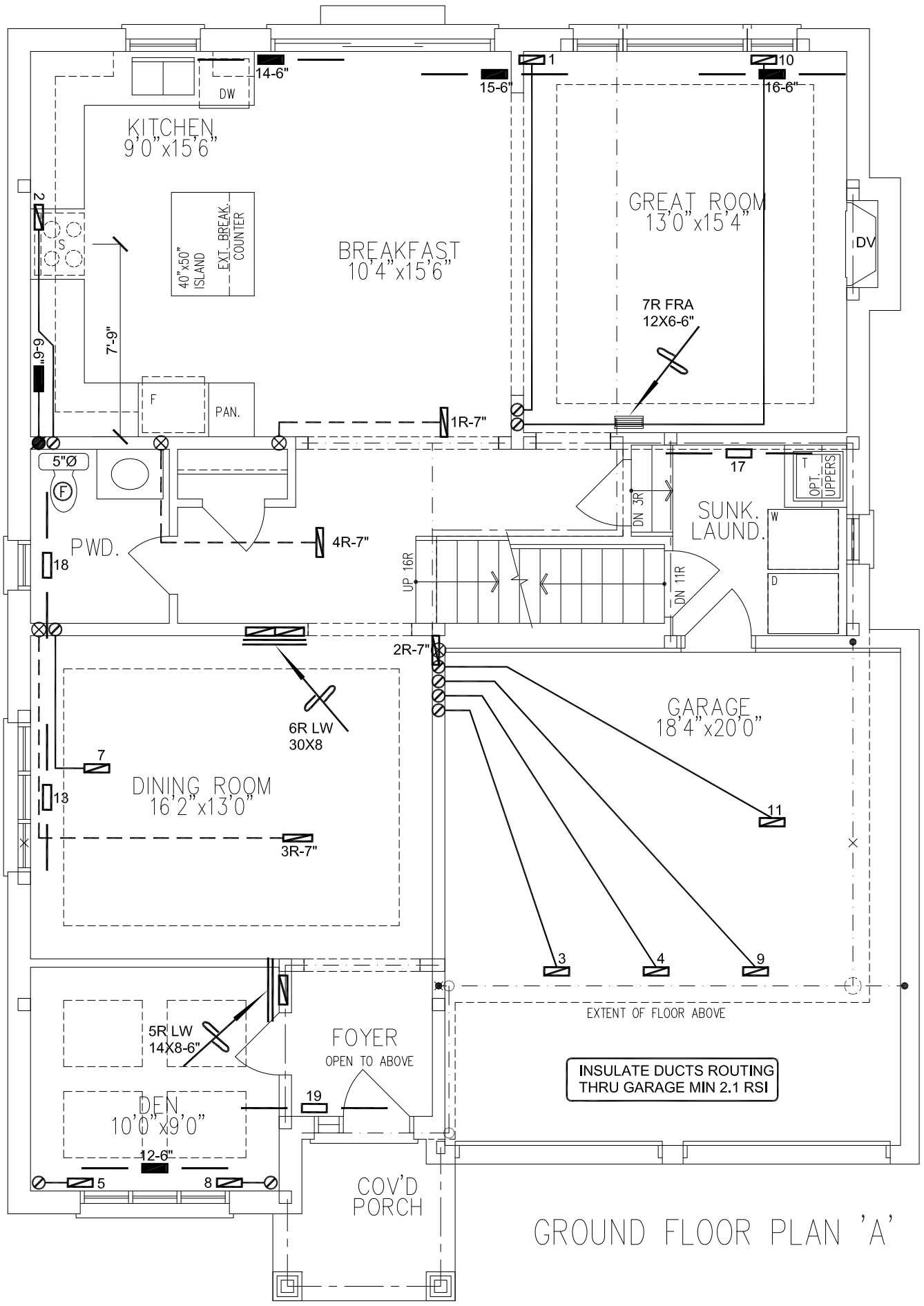
BASEMENT HEATING LAYOUT

Date SEPT/2020

Scale 3/16" = 1'-0"

BCIN# 19669

LO# 87504



GROUND FLOOR PLAN 'A'

GROUND FLOOR PLAN 'B'

GROUND FLOOR PLAN 'C'

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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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
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

4500 2758 sqft

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Sheet Title

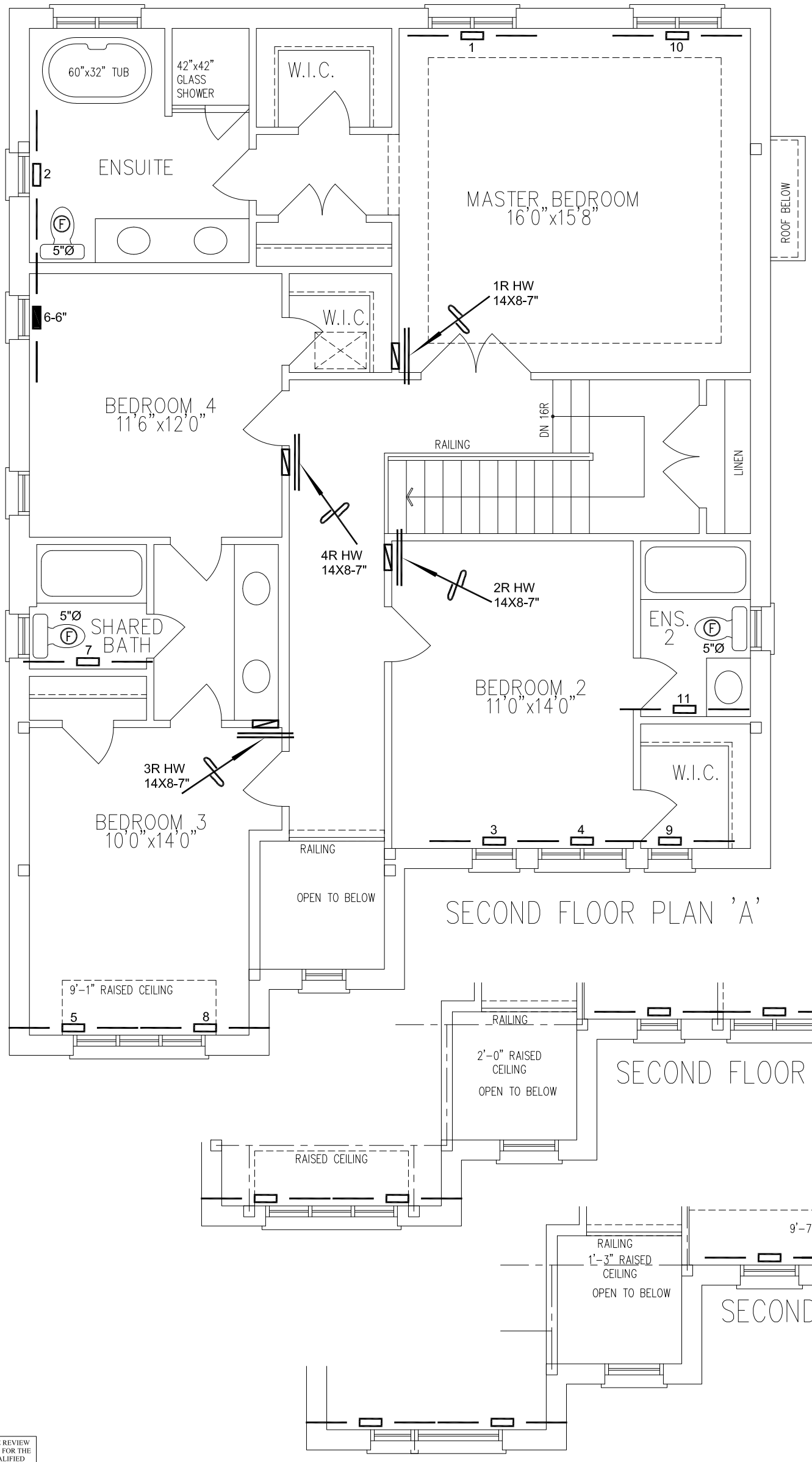
FIRST FLOOR HEATING LAYOUT

Date SEPT/2020

Scale 3/16" = 1'-0"

BCIN# 19669

LO# 87504



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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

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Sheet Title

SECOND FLOOR HEATING LAYOUT

Date SEPT/2020

Scale 3/16" = 1'-0"

BCIN# 19669

LO# 87504