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:** 4501 OPT. 2ND **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) OPT. 2ND DATE: Apr-21 WINTER NATURAL AIR CHANGE RATE 0.233 HEAT LOSS ΔT °F. 78 CSA-F280-12

BUILDER: ROYAL PINE HOMES TYPE: 4501 GFA: 2842 LO# 87507 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-2/3			BED-5				BATH				
EXP. WALL			31			11				12			10			26			20			31				10				
CLG. HT.			9			9				9			9			9			9			9				9				
	FACTORS																													
GRS.WALL AREA	LOSS	GAIN	279			99				108			90			234			180			279				90				
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		18	392	288	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	35	762	1454	27	588	1122	13	283	540	0	0	0		0	0	0		
SOUTH	21.8	24.9	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		28	610	697		
WEST	21.8	41.6	26	566	1080	18	392	748		0	0	0	0	0	0	0	0	0	0	0	0	26	566	1080		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	253	1064	175	81	341	56		90	378	62	55	231	38	207	871	143	167	702	116	253	1064	175		62	261	43		
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	351	461	206	118	155	69		230	302	135	160	210	94	185	243	109	95	125	56	225	296	132		117	154	69		
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		102	266	44	116	303	50	0	0	0	95	248	41	0	0	0		0	0	0		
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				2092			888				1339			1507			1702			1358			1926				1024			
SUB TOTAL HT GAIN					1462			873				529			1636			1374			752			1388				809		
LEVEL FACTOR / MULTIPLIER			0.20	0.20		0.20	0.20			0.20	0.20		0.20	0.20		0.20	0.20		0.20	0.20		0.20	0.20			0.20	0.20			
AIR CHANGE HEAT LOSS				421			179				270			304			343			274			388				206			
AIR CHANGE HEAT GAIN					74			44				27			83			70			38			71				41		
DUCT LOSS				0			0				161			181			0			163			0				0			
DUCT GAIN					0			0				138			254			0			79			0				0		
HEAT GAIN PEOPLE	240		2		480	0		0		1		240	1		240	1		240	0		0	1		240		0		0		
HEAT GAIN APPLIANCES/LIGHTS					581			0				581			581			581			0			581				0		
TOTAL HT LOSS BTU/H				2513			1067				1770			1992			2045			1795			2314				1231			
TOTAL HT GAIN x 1.3 BTU/H					3376			1193				1969			3633			2944			1131			2963				1105		

ROOM USE			LV/DN				KT/GT				LAUN			W/R			FOY			MUD						BAS			
EXP. WALL			55				78				18			7			19			15						172			
CLG. HT.			11				11				9			11			11			12						10			
	FACTORS																													
GRS.WALL AREA	LOSS	GAIN	605				858				162			77			209			180						1204			
GLAZING				LOSS	GAIN			LOSS	GAIN			LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN					LOSS	GAIN		
NORTH	21.8	16.0	0	0	0		12	261	192		0	0	0	0	0	0	0	0	0	0	0	0				4	87	64		
EAST	21.8	41.6	31	675	1288		0	0	0		30	654	1247	0	0	0	24	523	997	0	0	0				0	0	0		
SOUTH	21.8	24.9	21	457	523		0	0	0		0	0	0	0	0	0	0	0	0	0	0	0				4	87	100		
WEST	21.8	41.6	0	0	0		100	2178	4155		0	0	0	0	0	0	0	0	0	0	0	0				12	261	499		
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		15	388	64		0	0	0	0	0	0	20	517	85	20	517	85				20	517	85		
NET EXPOSED WALL	4.2	0.7	553	2326	383		731	3074	506		132	555	91	77	324	53	165	694	114	160	673	111				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				516	1901	313		
EXPOSED CLG	1.3	0.6	0	0	0		20	26	12		82	108	48	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				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						5822			
SLAB ON GRADE HEAT LOSS				0				0				0			0			0			0									
SUBTOTAL HT LOSS				3458				5928				1316			324			1734			1190						8675			
SUB TOTAL HT GAIN					2194				4928				1386			53			1196			196							1060		
LEVEL FACTOR / MULTIPLIER			0.30	0.31			0.30	0.31			0.20	0.20		0.30	0.31		0.30	0.31		0.30	0.31					0.50	0.76			
AIR CHANGE HEAT LOSS				1088				1865				265			102			546			374						6626			
AIR CHANGE HEAT GAIN					112				251				71			3			61			10							54		
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					581				581				581			0			0			0							581		
TOTAL HT LOSS BTU/H				4547				7793				1582			426			2279			1564						15301			
TOTAL HT GAIN x 1.3 BTU/H					3752				7488				2649			73			1635			267							2203		

TOTAL HEAT GAIN BTU/H: 36712 TONS: 3.06 LOSS DUE TO VENTILATION LOAD BTU/H: 2004 STRUCTURAL HEAT LOSS: 48218 TOTAL COMBINED HEAT LOSS BTU/H: 50222

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) OPT. 2ND
BUILDER: ROYAL PINE HOMES TYPE: 4501 DATE: Apr-21 GFA: 2842 LO# 87507

HEATING CFM	1145		COOLING CFM	1145			furnace pressure	0.6										**CARRIER		AFUE =	97 %		
TOTAL HEAT LOSS	48,218		TOTAL HEAT GAIN	36,383			furnace filter	0.05										**59TN6A-060-14V**	**60**	INPUT (BTU/H) =	60,000		
AIR FLOW RATE CFM	23.75		AIR FLOW RATE CFM	31.47			a/c coil pressure	0.2										FAN SPEED		OUTPUT (BTU/H) =	**58,000**		
							available pressure for s/a & r/a	0.35										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	13	8	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	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
ROOM NAME	BED-5	MBR	MBR	BED-2	BED-3	BED-4	ENS-2/3	BED-3	BED-4	ENS	LAUN	LV/DN	LV/DN	KT/GT	KT/GT	KT/GT	BATH	W/R	FOY	MUD	BAS	BAS	BAS	BAS
RM LOSS MBH.	2.31	1.26	1.26	1.77	1.00	1.02	0.90	1.00	1.02	1.07	1.58	2.27	2.27	2.60	2.60	2.60	1.23	0.43	2.28	1.56	3.83	3.83	3.83	3.83
CFM PER RUN HEAT	55	30	30	42	24	24	21	24	24	25	38	54	54	62	62	62	29	10	54	37	91	91	91	91
RM GAIN MBH.	2.96	1.69	1.69	1.97	1.82	1.47	0.57	1.82	1.47	1.19	2.65	1.88	1.88	2.50	2.50	2.50	1.11	0.07	1.63	0.27	0.55	0.55	0.55	0.55
CFM PER RUN COOLING	93	53	53	62	57	46	18	57	46	38	83	59	59	79	79	79	35	2	51	8	17	17	17	17
ADJUSTED PRESSURE	0.16	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.16	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.16	0.16	0.16	0.16
ACTUAL DUCT LGH.	70	81	76	64	41	27	49	43	34	54	40	14	29	51	46	58	46	45	26	45	51	52	39	22
EQUIVALENT LENGTH	130	150	160	180	150	120	130	140	150	180	200	110	130	120	180	130	200	160	140	140	110	150	170	120
TOTAL EFFECTIVE LENGTH	200	231	236	244	191	147	179	183	184	234	240	124	159	171	226	188	246	205	166	185	161	202	209	142
ADJUSTED PRESSURE	0.08	0.07	0.07	0.07	0.09	0.12	0.1	0.09	0.09	0.07	0.07	0.14	0.11	0.1	0.08	0.09	0.07	0.08	0.1	0.09	0.1	0.08	0.08	0.11
ROUND DUCT SIZE	**6**	5	5	**6**	5	5	4	5	4	5	**6**	5	5	**6**	**6**	**6**	4	4	5	4	**6**	**6**	**6**	**6**
HEATING VELOCITY (ft/min)	280	220	220	214	176	176	241	176	275	184	194	396	396	316	316	316	333	115	396	424	464	464	464	464
COOLING VELOCITY (ft/min)	474	389	389	316	419	338	207	419	528	279	423	433	433	403	403	403	402	23	374	92	87	87	87	87
OUTLET GRILL SIZE	4X10	3X10	3X10	4X10	3X10	3X10	3X10	3X10	3X10	3X10	4X10	3X10	3X10	4X10	4X10	4X10	3X10	3X10	3X10	3X10	4X10	4X10	4X10	4X10
TRUNK	B	A	A	A	C	D	C	C	D	B	D	D	C	B	A	A	D	A	D	A	B	A	A	D

RUN #	25
ROOM NAME	ENS-2/3
RM LOSS MBH.	0.90
CFM PER RUN HEAT	21
RM GAIN MBH.	0.57
CFM PER RUN COOLING	18
ADJUSTED PRESSURE	0.17
ACTUAL DUCT LGH.	46
EQUIVALENT LENGTH	120
TOTAL EFFECTIVE LENGTH	166
ADJUSTED PRESSURE	0.1
ROUND DUCT SIZE	4
HEATING VELOCITY (ft/min)	241
COOLING VELOCITY (ft/min)	207
OUTLET GRILL SIZE	3X10
TRUNK	C

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	455	0.07	10.8	14	x	8	585	TRUNK G	0	0.00	0	0	x	8	0
TRUNK B	233	0.07	8.4	8	x	8	524	TRUNK H	0	0.00	0	0	x	8	0
TRUNK C	832	0.07	13.5	22	x	8	681	TRUNK I	0	0.00	0	0	x	8	0
TRUNK D	314	0.07	9.4	10	x	8	565	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	1010	0.05	15.8	28	x	8	649
TRUNK Y	510	0.05	12.3	18	x	8	510
TRUNK Z	385	0.05	11	14	x	8	495
DROP	1145	0.05	16.6	24	x	10	687

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	115	115	125	135	320	155	0	0	0	0	0	0	0	0	0	180
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.	62	66	51	55	25	46	1	1	1	1	1	1	1	1	1	14
EQUIVALENT LENGTH	235	240	185	135	140	200	0	0	0	0	0	0	0	0	0	140
TOTAL EFFECTIVE LH	297	306	236	190	165	246	1	1	1	1	1	1	1	1	1	154
ADJUSTED PRESSURE	0.05	0.05	0.06	0.08	0.09	0.06	14.80	14.80	14.80	14.80	14.80	14.80	14.80	14.80	14.80	0.10
ROUND DUCT SIZE	7	7	6.9	6.6	8.9	7.5	0	0	0	0	0	0	0	0	0	7
INLET GRILL SIZE	8	8	8	8	8	8	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	14	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: 4501 LO # 87507
SITE NAME: CENTREFIELD (WEST GORMLEY) OPT. 2ND

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	4	@ 10.6 cfm	42.4	cfm
Kitchen & Bathrooms	5	@ 10.6 cfm	53	cfm
Other Rooms	5	@ 10.6 cfm	53.0	cfm
Table 9.32.3.A.		TOTAL	190.8	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	**95.4**	**cfm**

SUPPLEMENTAL VENTILATION CAPACITY 9.32.3.5.

Total Ventilation Capacity	190.8	cfm
Less Principal Ventil. Capacity	95.4	cfm
Required Supplemental Capacity	95.4	cfm

PRINCIPAL EXHAUST FAN CAPACITY

Model: VANEE 65H Location: BSMT

95.4 cfm [✓] HVI Approved

PRINCIPAL EXHAUST HEAT LOSS CALCULATION

CFM		ΔT °F		FACTOR		% LOSS
95.4 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-2/3	BY INSTALLING CONTRACTOR	50	✓	3.5
BATH	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

HVAC DESIGNS LTD.

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CSA F280-12 Residential Heat Loss and Heat Gain Calculations

Formula Sheet (For Air Leakage / Ventiliation Calculation)

LO#: 87507 Model: 4501 Builder: ROYAL PINE HOMES Date: 4/19/2021

Volume Calculation

House Volume

Level	Floor Area (ft²)	Floor Height (ft)	Volume (ft³)
Bsmt	1276	10	12760
First	1276	11	14036
Second	1566	9	14094
Third	0	9	0
Fourth	0	9	0
		Total:	40,890.0 ft³
		Total:	1157.9 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 321.63 x 43 °C x 1.2 = 3884 W

= **13251 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 321.63 x 7 °C x 1.2 = 199 W

= **680 Btu/h**

5.2.3.2 Heat Loss due to Mechanical Ventilation

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

95 CFM x 78 °F x 1.08 x 0.25 = **2004 Btu/h**

6.2.7 Sensible heat Gain due to Ventilation

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

95 CFM x 13 °F x 1.08 x 0.25 = **330 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	13,251	8,675	0.764
2	0.3		12,634	0.315
3	0.2		13,153	0.201
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: 4501 OPT. 2ND **BUILDER:** ROYAL PINE HOMES
SFQT: 2842 **LO#** 87507 **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):	40890.0	ASSUMED (Y/N):	Y
INTERNAL SHADING:	BLINDS/CURTAINS	ASSUMED OCCUPANTS:	6
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: 49.0 ft	WIDTH: 37.0 ft	EXPOSED PERIMETER:	172.0 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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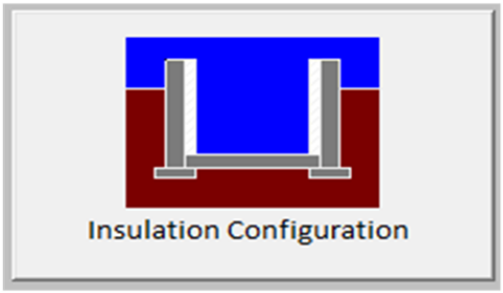
Ajax ON, L1S 2E2
905-619-2300

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):	**14.9**	 Insulation Configuration
Floor Width (m):	**11.3**	
Exposed Perimeter (m):	**0.0**	
Wall Height (m):	**3.0**	
Depth Below Grade (m):	**2.13**	
Window Area (m^2):	**1.9**	
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):		**1706**

TYPE: 4501 OPT. 2ND

LO# 87507

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

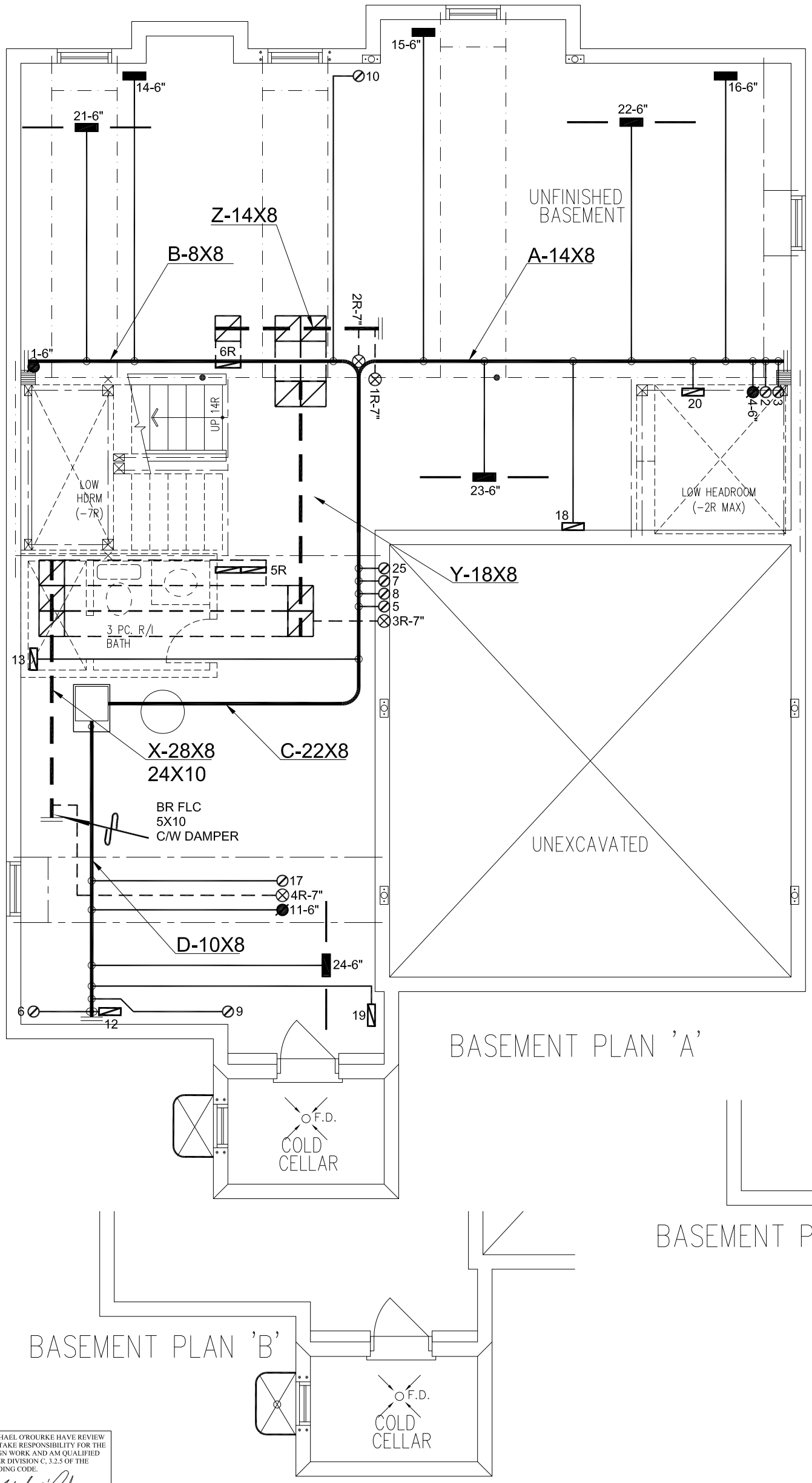
Air Infiltration Residential Load Calculator

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):	7.01
Building Configuration	
Type:	Detached
Number of Stories:	Two
Foundation:	Full
House Volume (m^3):	1157.9
Air Leakage/Ventilation	
Air Tightness Type:	Energy Star Detached (2.5 ACH)
Custom BDT Data:	ELA @ 10 Pa. 1080.9 cm^2
	2.50 ACH @ 50 Pa
Mechanical Ventilation (L/s):	Total Supply 45.0 / Total Exhaust 45.0
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: 4501 OPT. 2ND

LO# 87507



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

OPT. 2ND
4501 2842 sqft

HVAC DESIGNS LTD.
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Specializing in Residential Mechanical Design Services

Installation to comply with the latest Ontario Building Code. All supply branch outlets shall be equipped with a manual balancing damper. Ductwork which passes through the garage or unheated spaces shall be adequately insulated and be gas-proofed.

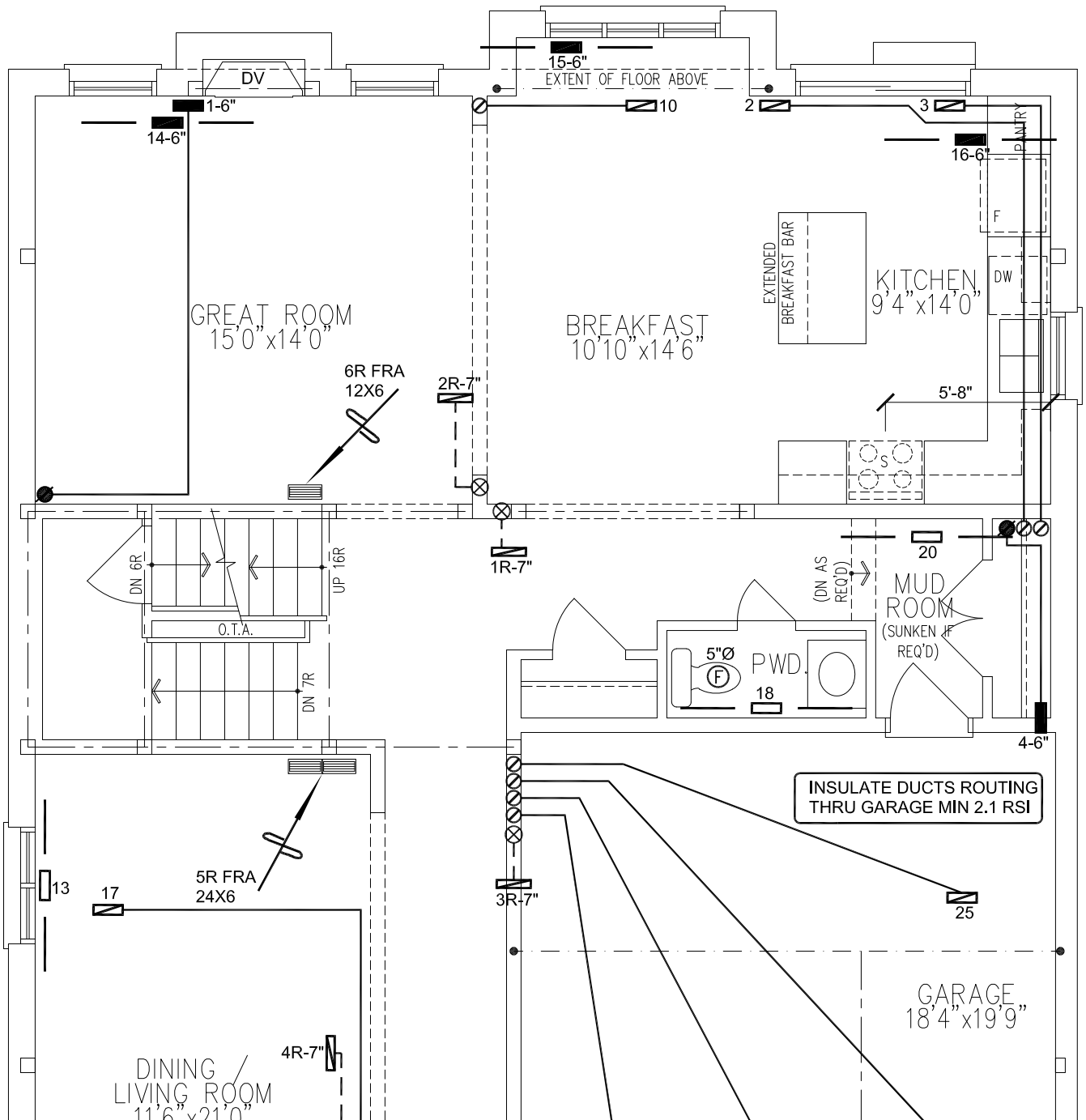
HEAT LOSS 50222 BTU/H	
UNIT DATA	
MAKE	CARRIER
MODEL	59TN6A-060-14V
INPUT	60 MBTU/H
OUTPUT	58 MBTU/H
COOLING	3.0 TONS
FAN SPEED	1145 cfm @ 0.6" w.c.

# OF RUNS	S/A	R/A	FANS
3RD FLOOR			
2ND FLOOR	13	4	3
1ST FLOOR	8	2	2
BASEMENT	4	1	0

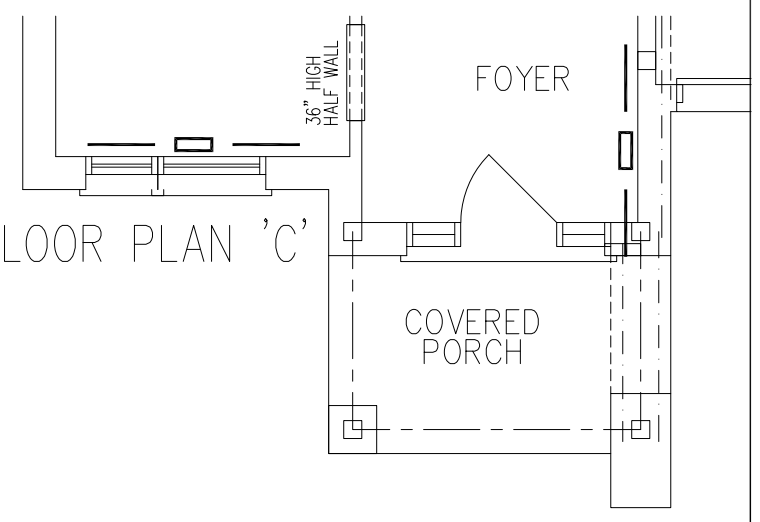
ALL S/A DIFFUSERS 4 "x10" UNLESS NOTED OTHERWISE ON LAYOUT. ALL S/A RUNS 5"Ø UNLESS NOTED OTHERWISE ON LAYOUT. UNDERCUT DOORS 1" min. FOR R/A

Sheet Title
BASEMENT HEATING LAYOUT

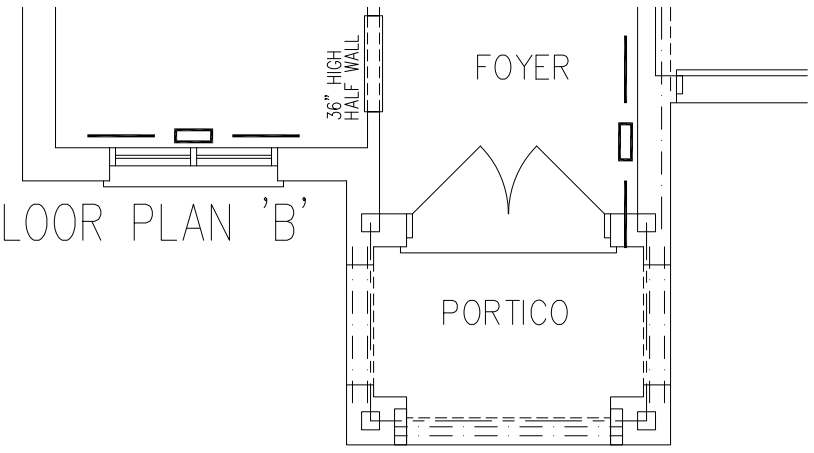
Date SEPT/2020
Scale 3/16" = 1'-0"
BCIN# 19669
LO# 87507



GROUND FLOOR PLAN 'A'



GROUND FLOOR PLAN 'C'



GROUND FLOOR PLAN '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
	REVISIONS	
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

OPT. 2ND
4501 2842 sqft

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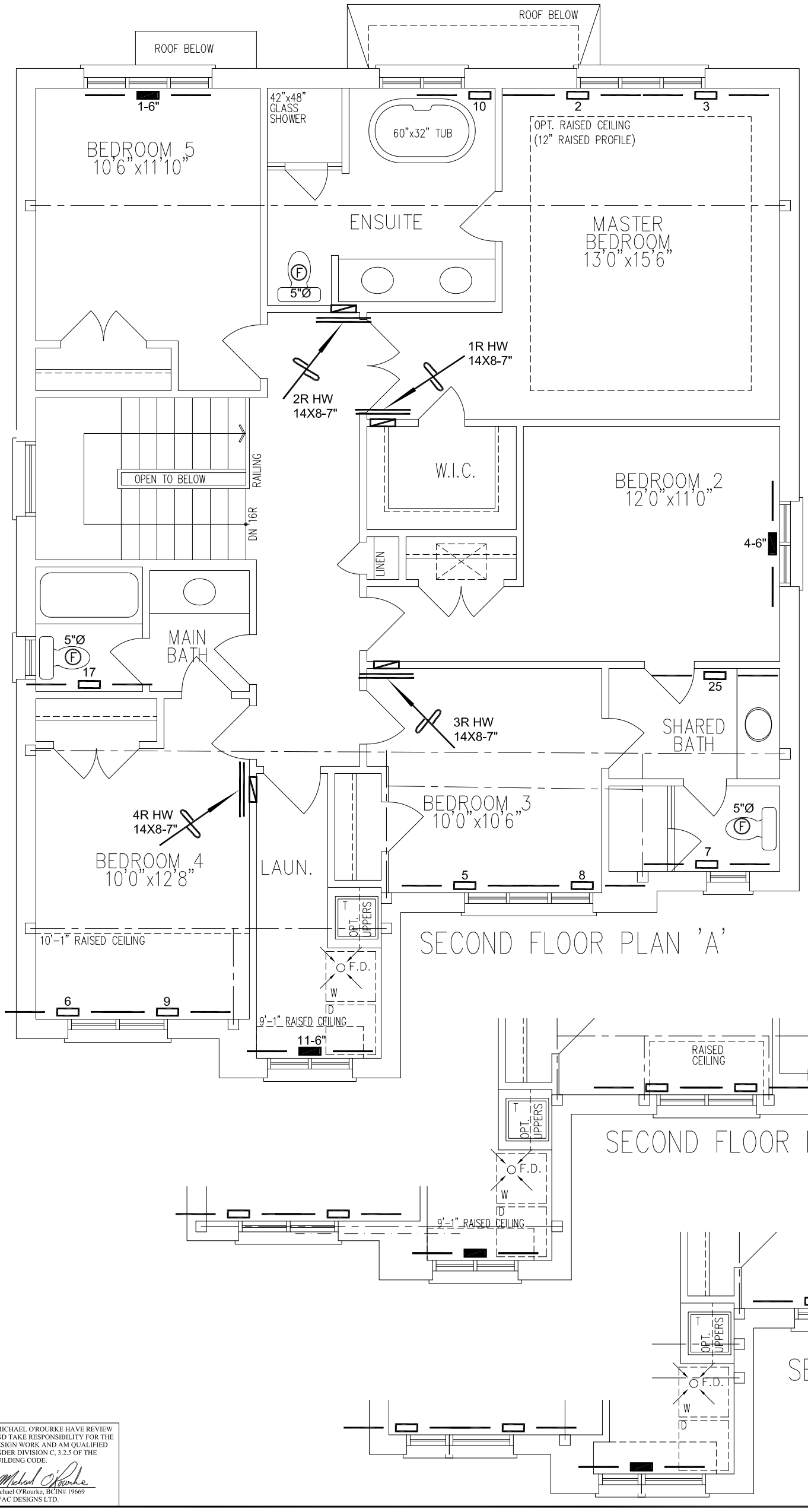
Installation to comply with the latest Ontario Building Code. All supply branch outlets shall be equipped with a manual balancing damper. Ductwork which passes through the garage or unheated spaces shall be adequately insulated and be gas-proofed.

Sheet Title
FIRST FLOOR HEATING LAYOUT

Date SEPT/2020
Scale 3/16" = 1'-0"
BCIN# 19669
LO# 87507



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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
ROYAL PINE HOMES

Project Name
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RICHMOND HILL, ONTARIO

OPT. 2ND
4501 2842 sqft

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Sheet Title
SECOND FLOOR HEATING LAYOUT

Date SEPT/2020
Scale 3/16" = 1'-0"
BCIN# 19669
LO# 87507