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:** 38-11 **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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Web: www.hvacdesigns.ca E-mail: info@hvacdesigns.ca

SITE NAME: CENTREFIELD (WEST GORMLEY) | DATE: Apr-21 | WINTER NATURAL AIR CHANGE RATE 0.227 | HEAT LOSS ΔT °F. 78 | CSA-F280-12
BUILDER: ROYAL PINE HOMES | TYPE: 38-11 | GFA: 2674 | LO# 87614 | SUMMER NATURAL AIR CHANGE RATE 0.071 | HEAT GAIN ΔT °F. 13 | SB-12 PERFORMANCE

ROOM USE			MBR			ENS			WIC			BED-2			BED-3			BED-4			BATH						ENS-4					
EXP. WALL			41			22			6			18			35			31			7						8					
CLG. HT.			9			9			9			9			9			9			9						9					
	FACTORS																															
GRS.WALL AREA	LOSS	GAIN	369			198			54			162			315			279			63						72					
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				0	0	0			
EAST	21.8	41.6	44	958	1828	22	479	914	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				0	0	0			
SOUTH	21.8	24.9	0	0	0	0	0	0	0	0	0	18	392	448	0	0	0	0	0	0	7	152	174				0	0	0			
WEST	21.8	41.6	0	0	0	0	0	0	0	0	0	0	0	0	51	1111	2119	55	1198	2285	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	325	1367	225	176	740	122	54	227	37	144	606	100	264	1110	183	224	942	155	56	236	39				72	303	50			
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	355	467	209	125	164	73	70	92	41	232	305	136	162	213	95	198	260	116	85	112	50				75	99	44			
NO ATTIC EXPOSED CLG	2.8	1.3	0	0	0	0	0	0	0	0	0	0	0	0	40	112	50	40	112	50	0	0	0				0	0	0			
EXPOSED FLOOR	2.6	0.4	0	0	0	0	0	0	0	0	0	0	0	0	40	104	17	238	621	102	0	0	0				75	196	32			
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				2792			1384			319			1303			2651			3134			500						597				
SUB TOTAL HT GAIN					2262			1109			79			684			2464			2709			263						126			
LEVEL FACTOR / MULTIPLIER			0.20	0.18		0.20	0.18		0.20	0.18		0.20	0.18		0.20	0.18		0.20	0.18		0.20	0.18					0.20	0.18				
AIR CHANGE HEAT LOSS				507			251			58			237			481			569			91						108				
AIR CHANGE HEAT GAIN					114			56			4			34			124			136			13						6			
DUCT LOSS				0			0			0			154			313			370			59						71				
DUCT GAIN					0			0			0			175			362			387			28						13			
HEAT GAIN PEOPLE	240		2		480	0		0	0		0	1		240	1		240	1		240	0		0				0		0			
HEAT GAIN APPLIANCES/LIGHTS					790			0			0			790			790			790			0						0			
TOTAL HT LOSS BTU/H				3299			1635			377			1693			3446			4074			650						776				
TOTAL HT GAIN x 1.3 BTU/H					4738			1515			107			2500			5173			5541			395						189			

ROOM USE				FAM			KT/BR			LV/DN			LAUN			PWD			FOY			MUD						BAS		
EXP. WALL				32			35			39			0			6			29			15						168		
CLG. HT.				10			10			10			9			10			11			11						10		
	FACTORS																													
GRS.WALL AREA	LOSS	GAIN		323			354			394			0			61			322			167						1176		
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	0	0	
EAST	21.8	41.6		22	479	914	63	1372	2618	0	0	0	0	0	0	0	0	0	0	0	0	0	0				9	196	374	
SOUTH	21.8	24.9		0	0	0	0	0	0	38	828	946	0	0	0	9	196	224	0	0	0	0	0	0				6	131	149	
WEST	21.8	41.6		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	18	392	748	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	40	1034	170	20	517	85				20	517	85	
NET EXPOSED WALL	4.2	0.7		301	1267	208	291	1222	201	356	1497	246	0	0	0	52	217	36	264	1110	183	147	616	101				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	0	0	0				504	1857	305	
EXPOSED CLG	1.3	0.6		0	0	0	0	0	0	0	0	0	95	125	56	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				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				0	0	0	
BASEMENT/CRAWL HEAT LOSS					0			0			0			0			0			0			0						5684		
SLAB ON GRADE HEAT LOSS					0			0			0			0			0			0			0								
SUBTOTAL HT LOSS					1746			2594			2324			125			413			2536			1133						8384		
SUB TOTAL HT GAIN						1123			2819			1192			56			260			1101			186						914	
LEVEL FACTOR / MULTIPLIER				0.30	0.32		0.30	0.32		0.30	0.32		0.20	0.18		0.30	0.32		0.30	0.32		0.30	0.32					0.50	0.69		
AIR CHANGE HEAT LOSS					567			842			755			23			134			823			368						5814		
AIR CHANGE HEAT GAIN						56			142			60			3			13			55			9						46	
DUCT LOSS					0			0			0			0			0			0			0					0			
DUCT GAIN						0			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				0		0	
HEAT GAIN APPLIANCES/LIGHTS						790			790			790			0			0			0			0						790	
TOTAL HT LOSS BTU/H					2313			3436			3079			148			547			3359			1501						14199		
TOTAL HT GAIN x 1.3 BTU/H						2559			4875			2654			76			355			1503			255						2274	

TOTAL HEAT GAIN BTU/H: 34984 TONS: 2.92 LOSS DUE TO VENTILATION LOAD BTU/H: 1670 STRUCTURAL HEAT LOSS: 44531 TOTAL COMBINED HEAT LOSS BTU/H: 46201

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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SITE NAME: CENTREFIELD (WEST GORMLEY)
BUILDER: ROYAL PINE HOMES — TYPE: 38-11 — DATE: Apr-21 — GFA: 2674 — LO# 87614

HEATING CFM	1145		COOLING CFM	1145			furnace pressure	0.6																
TOTAL HEAT LOSS	44,531		TOTAL HEAT GAIN	34,710			furnace filter	0.05									**CARRIER			AFUE = 97 %			
AIR FLOW RATE CFM	25.71		AIR FLOW RATE CFM	32.99			a/c coil pressure	0.2									59TN6A-060-14V	60		INPUT (BTU/H) = 60,000			
							available pressure										FAN SPEED			OUTPUT (BTU/H) = **58,000**			
							for s/a & r/a	0.35									LOW	820					
RUN COUNT	4th	3rd	2nd	1st	Bas												MEDLOW	0		DESIGN CFM = **1145**			
S/A	0	0	12	7	4		plenum pressure s/a	0.18	r/a pressure	0.17							MEDIUM	1145		CFM @ .6 " E.S.P.			
R/A	0	0	5	2	1		max s/a dif press. loss	0.02	r/a grille press. Loss	0.02							MEDIUM HIGH	0					
All S/A diffusers 4"x10" unless noted otherwise on layout.							min adjusted pressure s/a	0.16	adjusted pressure r/a	0.15							HIGH	1520		TEMPERATURE RISE 47 °F			
All S/A runs 5"Ø unless noted otherwise on layout.																								

RUN #	1	2	3	4	5	6	7	8	9	10	11	13	14	15	16	17	18	19	20	21	22	23	24
ROOM NAME	MBR	ENS	WIC	BED-2	BED-3	BED-4	BATH	BED-3	BED-4	MBR	ENS-4	FAM	KT/BR	KT/BR	LV/DN	LAUN	PWD	FOY	MUD	BAS	BAS	BAS	BAS
RM LOSS MBH.	1.65	1.63	0.38	1.69	1.72	2.04	0.65	1.72	2.04	1.65	0.78	2.31	1.72	1.72	3.08	0.15	0.55	3.36	1.50	3.55	3.55	3.55	3.55
CFM PER RUN HEAT	42	42	10	44	44	52	17	44	52	42	20	59	44	44	79	4	14	86	39	91	91	91	91
RM GAIN MBH.	2.37	1.51	0.11	2.50	2.59	2.77	0.40	2.59	2.77	2.37	0.19	2.56	2.44	2.44	2.65	0.08	0.35	1.50	0.25	0.57	0.57	0.57	0.57
CFM PER RUN COOLING	78	50	4	82	85	91	13	85	91	78	6	84	80	80	88	3	12	50	8	19	19	19	19
ADJUSTED PRESSURE	0.17	0.17	0.17	0.16	0.16	0.16	0.17	0.16	0.16	0.17	0.17	0.16	0.17	0.17	0.16	0.17	0.17	0.16	0.17	0.16	0.16	0.16	0.16
ACTUAL DUCT LGH.	69	37	30	32	34	40	32	42	46	56	36	53	42	35	14	32	14	30	45	48	29	8	20
EQUIVALENT LENGTH	130	140	120	150	140	120	120	150	130	190	160	130	150	100	120	180	130	130	140	130	110	130	120
TOTAL EFFECTIVE LENGTH	199	177	150	182	174	160	152	192	176	246	196	183	192	135	134	212	144	160	185	178	139	138	140
ADJUSTED PRESSURE	0.09	0.1	0.11	0.09	0.09	0.1	0.11	0.08	0.09	0.07	0.09	0.09	0.09	0.13	0.12	0.08	0.12	0.1	0.09	0.09	0.12	0.12	0.12
ROUND DUCT SIZE	**6**	5	4	**6**	**6**	**6**	4	**6**	**6**	**6**	4	**6**	**6**	**6**	**6**	4	4	**6**	4	**6**	**6**	**6**	**6**
HEATING VELOCITY (ft/min)	214	308	115	224	224	265	195	224	265	214	229	301	224	224	403	46	161	438	447	464	464	464	464
COOLING VELOCITY (ft/min)	398	367	46	418	433	464	149	433	464	398	69	428	408	408	449	34	138	255	92	97	97	97	97
OUTLET GRILL SIZE	4X10	3X10	3X10	4X10	4X10	4X10	3X10	4X10	4X10	4X10	3X10	4X10	4X10	4X10	4X10	3X10	3X10	4X10	3X10	4X10	4X10	4X10	4X10
TRUNK	A	B	B	D	C	D	D	C	D	A	D	A	A	B	D	B	C	C	A	A	B	B	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	317	0.07	9.4	10	x	8	571	TRUNK G	0	0.00	0	0	x	8	0
TRUNK B	599	0.07	12	16	x	8	674	TRUNK H	0	0.00	0	0	x	8	0
TRUNK C	279	0.08	8.7	10	x	8	502	TRUNK I	0	0.00	0	0	x	8	0
TRUNK D	543	0.08	11.2	16	x	8	611	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	1145	0.05	16.6	32	x	8	644
TRUNK Y	340	0.05	10.5	14	x	8	437
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	130	130	75	75	85	340	130	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.	49	41	39	46	45	24	39	1	1	1	1	1	1	1	1	14
EQUIVALENT LENGTH	195	175	275	235	195	120	215	0	0	0	0	0	0	0	0	135
TOTAL EFFECTIVE LH	244	216	314	281	240	144	254	1	1	1	1	1	1	1	1	149
ADJUSTED PRESSURE	0.06	0.07	0.05	0.05	0.06	0.10	0.06	14.80	14.80	14.80	14.80	14.80	14.80	14.80	14.80	0.10
ROUND DUCT SIZE	7	6.8	6	6	6	8.9	7	0	0	0	0	0	0	0	0	7
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.

Michael O'Rourke

INDIVIDUAL BCIN: 19669 MICHAEL O'ROURKE

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TYPE: 38-11 LO # 87614
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	4	@ 10.6 cfm	42.4	cfm
Table 9.32.3.A.		TOTAL	169.6	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	**79.5**	**cfm**

SUPPLEMENTAL VENTILATION CAPACITY 9.32.3.5.

Total Ventilation Capacity	169.6	cfm
Less Principal Ventil. Capacity	79.5	cfm
Required Supplemental Capacity	90.1	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
BATH	BY INSTALLING CONTRACTOR	50	✓	3.5
ENS-4	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

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#: 87614 Model: 38-11 Builder: ROYAL PINE HOMES Date: 4/19/2021

Volume Calculation

House Volume

Level	Floor Area (ft²)	Floor Height (ft)	Volume (ft³)
Bsmt	1154	10	11540
First	1154	10	11655.4
Second	1520	9	13680
Third	0	9	0
Fourth	0	9	0
		Total:	36,875.4 ft³
		Total:	1044.2 m³

Air Change & Delta T Data

WINTER NATURAL AIR CHANGE RATE	0.227
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

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

0.227 x 290.05 x 43 °C x 1.2 = 3408 W

= **11629 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 290.05 x 7 °C x 1.2 = 175 W

= **597 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	11,629	8,384	0.693
2	0.3		10,746	0.325
3	0.2		12,804	0.182
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: 38-11 **BUILDER:** ROYAL PINE HOMES
SFQT: 2674 **LO#** 87614 **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):	36875.4	ASSUMED (Y/N):	Y
INTERNAL SHADING:	BLINDS/CURTAINS	ASSUMED OCCUPANTS:	5
INTERIOR LIGHTING LOAD (Btu/h/ft^2):	1.65	DC BRUSHLESS MOTOR (Y/N):	Y
FOUNDATION CONFIGURATION	BCIN_1	DEPTH BELOW GRADE:	7.0 ft
LENGTH: 52.0 ft	WIDTH: 32.0 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%	-

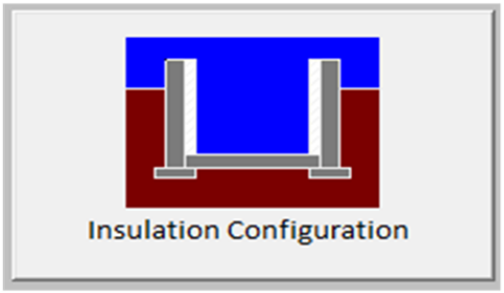
INDIVIDUAL BCIN: 19669
MICHAEL O'ROURKE

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):	**9.8**	
Exposed Perimeter (m):	**0.0**	
Wall Height (m):	**3.0**	
Depth Below Grade (m):	**2.13**	
Window Area (m^2):	**1.4**	
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):		**1665**

TYPE: 38-11
LO# 87614

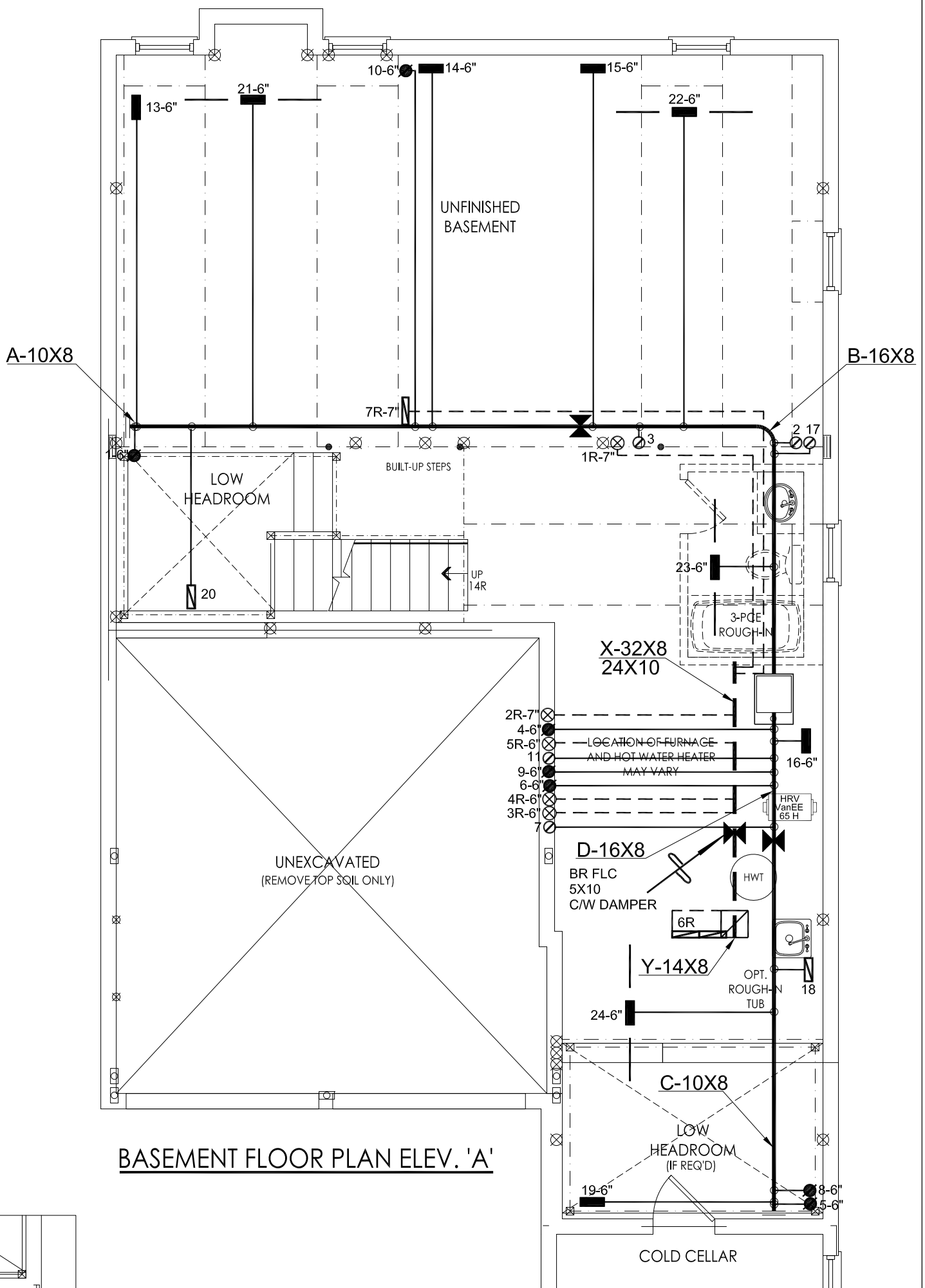
HVAC Designs Ltd.
375 Finley Ave, Suite 202
Ajax ON, L1S 2E2
905-619-2300

Air Infiltration Residential Load Calculator

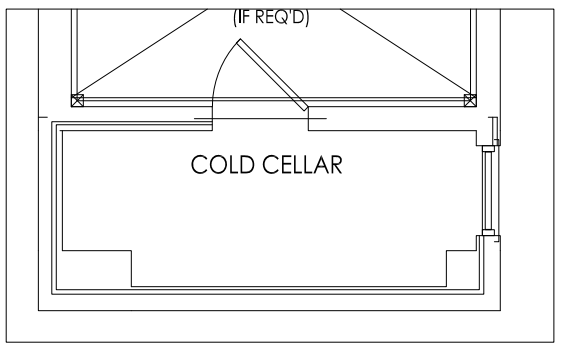
Supplemental tool for CAN/CSA-F280

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:	Detached
Number of Stories:	Two
Foundation:	Full
House Volume (m^3):	1044.2
Air Leakage/Ventilation	
Air Tightness Type:	Energy Star Detached (2.5 ACH)
Custom BDT Data:	ELA @ 10 Pa. 974.8 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):	**0.227**
Cooling Air Leakage Rate (ACH/H):	**0.071**

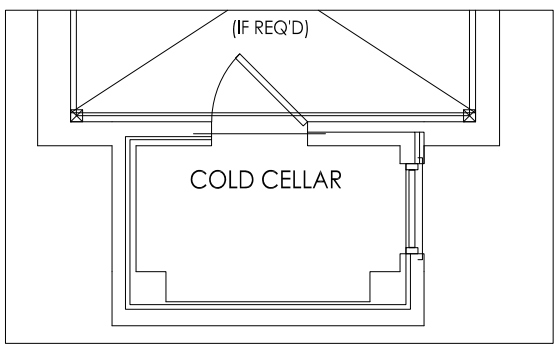
TYPE: 38-11
LO# 87614



BASEMENT FLOOR PLAN ELEV. 'A'



BASEMENT FLOOR PLAN ELEV. 'B'



BASEMENT FLOOR PLAN ELEV. '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

38-11 2674 sqft

HVAC DESIGNS LTD.
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L1S 2E2 Tel. 905.619.2300 - 905.420.5300 Fax 905.619.2375
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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.

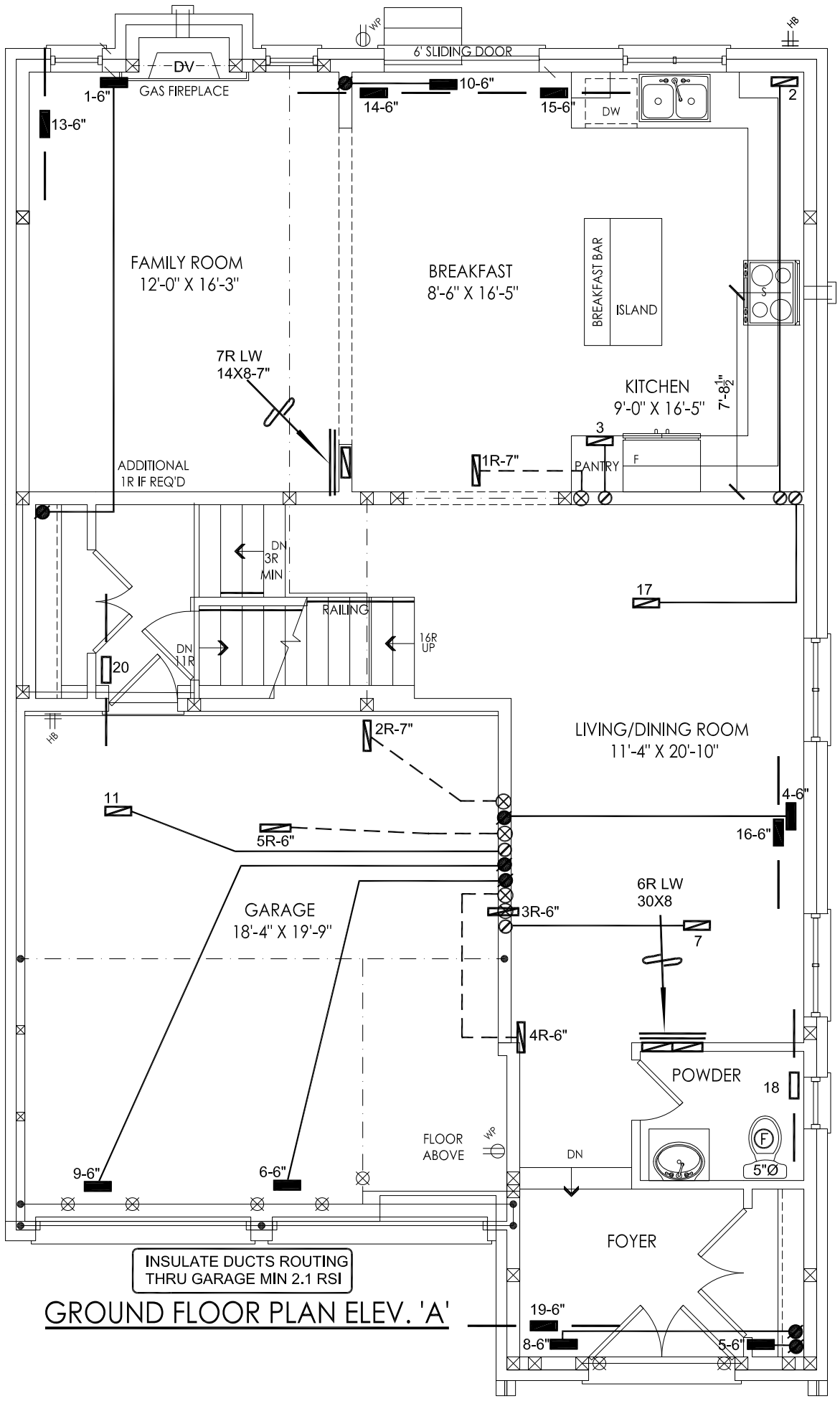
HEAT LOSS 46201 BTU/H	
UNIT DATA	
MAKE	CARRIER
MODEL	59TN6A-060-14V
INPUT	60 MBTU/H
OUTPUT	58 MBTU/H
COOLING	3.0 TONS
FAN SPEED	1145 cfm @ 0.6" w.c.

# OF RUNS	S/A	R/A	FANS
3RD FLOOR			
2ND FLOOR	12	5	4
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

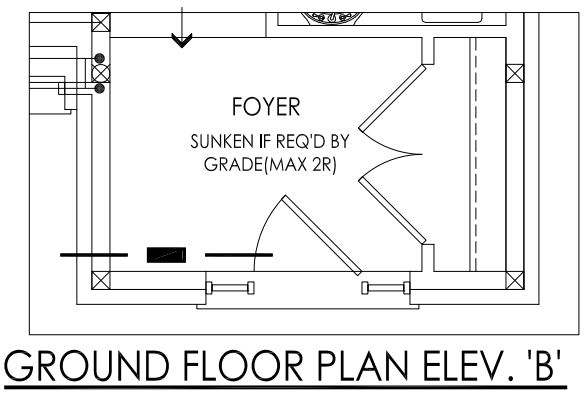
Sheet Title
BASEMENT HEATING LAYOUT

Date SEPT/2020
Scale 3/16" = 1'-0"
BCIN# 19669
LO# 87614

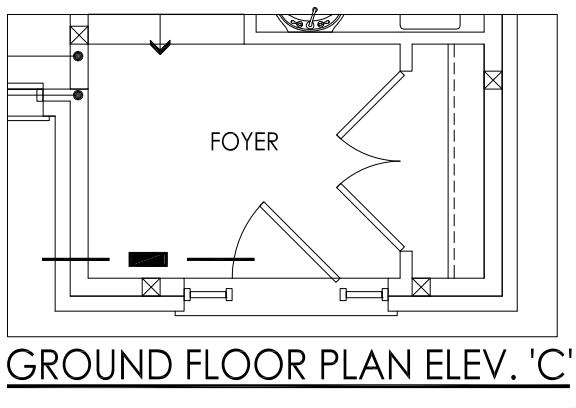


INSULATE DUCTS ROUTING THRU GARAGE MIN 2.1 RSI

GROUND FLOOR PLAN ELEV. 'A'



GROUND FLOOR PLAN ELEV. 'B'



GROUND FLOOR PLAN ELEV. 'C'

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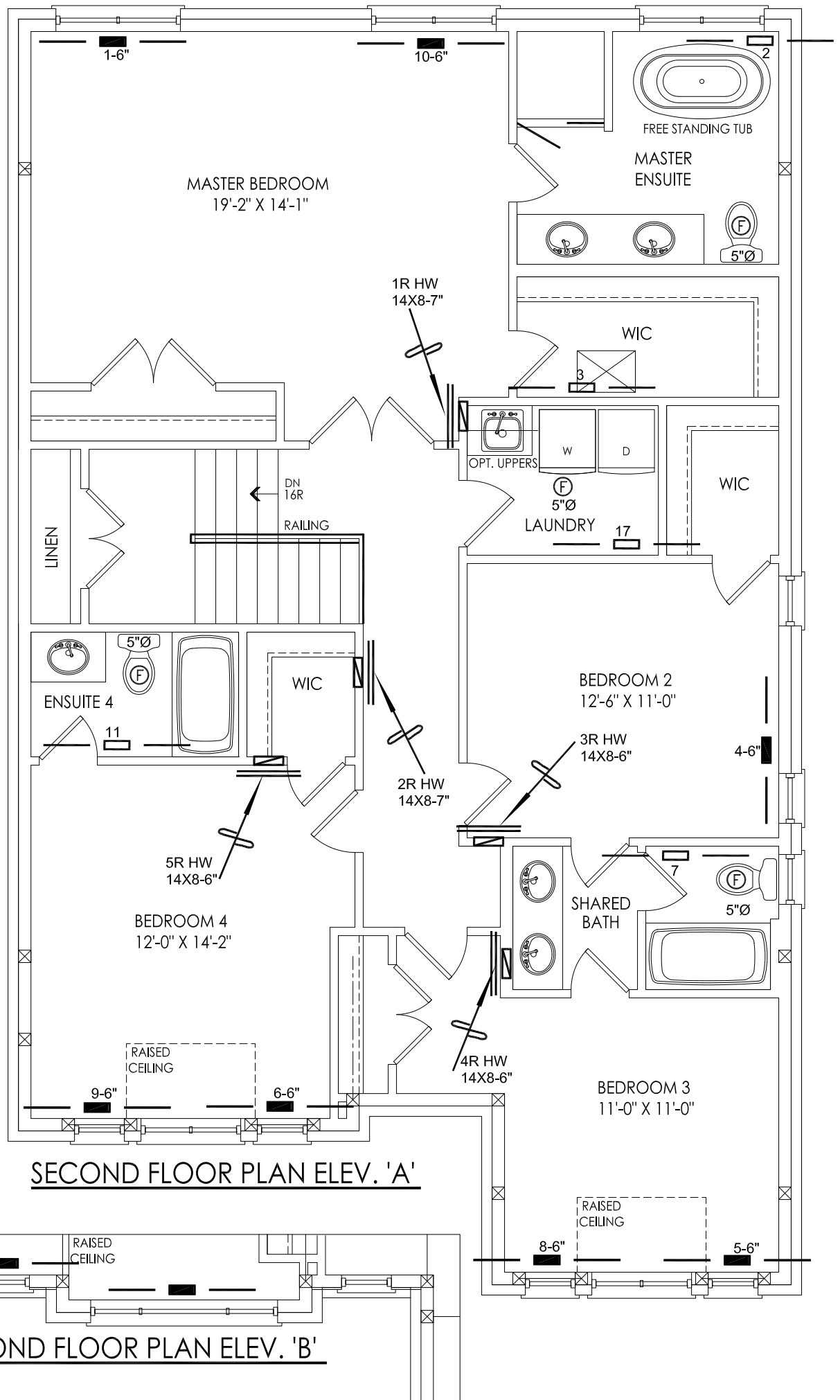
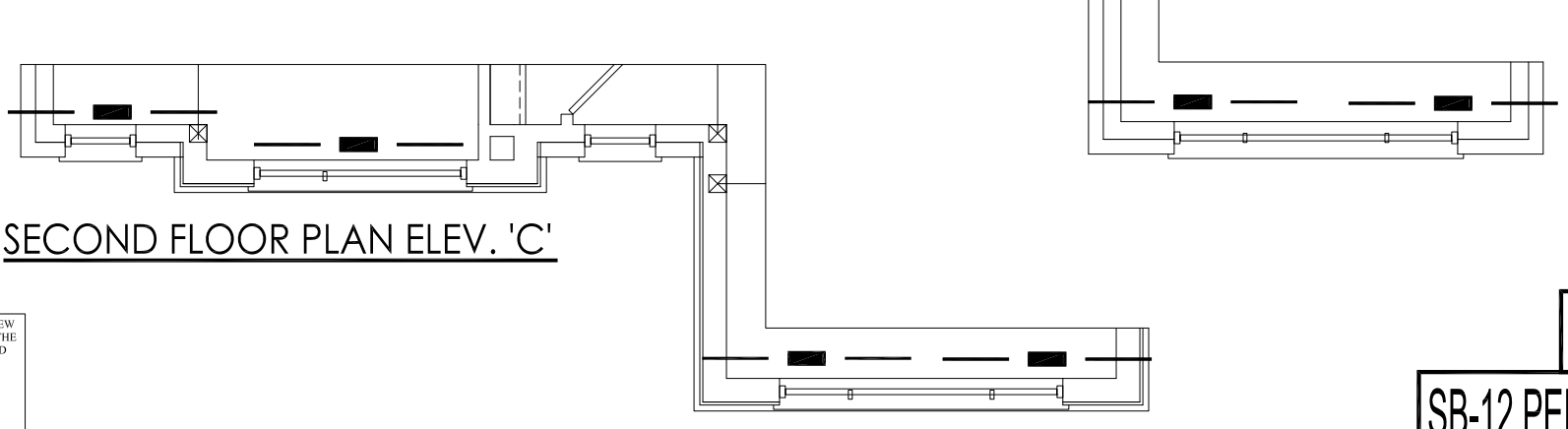
Sheet Title
FIRST FLOOR HEATING LAYOUT

Date SEPT/2020
Scale 3/16" = 1'-0"
BCIN# 19669
LO# 87614



SECOND FLOOR PLAN ELEV. 'A'

SECOND FLOOR PLAN ELEV. 'B'



SECOND FLOOR PLAN ELEV. 'C'

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Sheet Title

SECOND FLOOR HEATING LAYOUT

Date SEPT/2020

Scale 3/16" = 1'-0"

BCIN# 19669

LO# 87614