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:** 38-7 OPT 2ND - FIN BSMT WUB **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

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 - FIN BSMT WUB | DATE: Apr-21 | WINTER NATURAL AIR CHANGE RATE 0.230 | HEAT LOSS ΔT °F. 78 | CSA-F280-12

BUILDER: ROYAL PINE HOMES | TYPE: 38-7 | GFA: 2152 | LO# 90455 | SUMMER NATURAL AIR CHANGE RATE 0.072 | HEAT GAIN ΔT °F. 13 | SB-12 PERFORMANCE

ROOM USE			MBR			ENS			WIC			BED-2			BED-3			BED-4			BATH			BATH-2					B-BTH		
EXP. WALL			33			20			5			31			26			13			6			5					7		
CLG. HT.			9			9			9			9			9			9			9			9					10		
	FACTORS																														
GRS.WALL AREA	LOSS	GAIN	304			184			46			285			239			120			55			46					49		
GLAZING				LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN			LOSS	GAIN	
NORTH	21.8	16.0	11	240	176	0	0	0	0	0	0	10	218	160	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	28	610	1163	26	566	1080	0	0	0	0	0	0	12	261	499			0	0	0
SOUTH	21.8	24.9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	17	370	423	7	152	174	0	0	0			0	0	0
WEST	21.8	41.6	28	610	1163	16	349	665	0	0	0	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			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			0	0	0
NET EXPOSED WALL	4.2	0.7	265	1113	183	168	707	116	46	193	32	247	1040	171	213	897	148	103	431	71	48	203	33	34	143	24			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	0	0	0			21	77	13
EXPOSED CLG	1.3	0.6	269	354	158	106	139	62	65	85	38	111	146	65	164	216	96	191	251	112	103	135	61	45	59	26			0	0	0
NO ATTIC EXPOSED CLG	2.8	1.3	0	0	0	0	0	0	0	0	0	25	70	31	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	136	355	58	0	0	0	0	0	0	103	269	44	45	117	19			0	0	0
BASEMENT/CRAWL HEAT LOSS			0			0			0			0			0			0			0			0					197		
SLAB ON GRADE HEAT LOSS			0			0			0			0			0			0			0			0					0		
SUBTOTAL HT LOSS			2316			1194			279			2439			1679			1053			759			581					274		
SUB TOTAL HT GAIN					1680			843			70			1649			1324			607			312			568				13	
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				0.50	0.61	
AIR CHANGE HEAT LOSS				409			211			49			430			296			186			134			103					168		
AIR CHANGE HEAT GAIN					94			47			4			92			74			34			17			32				1	
DUCT LOSS				0			0			0			287			0			0			89			68					0		
DUCT GAIN					0			0			0			275			0			0			33			60				0	
HEAT GAIN PEOPLE	240		2		480	0		0	0		0	1		240	1		240	1		240	0		0	0		0			0		0	
HEAT GAIN APPLIANCES/LIGHTS					766			0			0			766			766			766			0			0				0	
TOTAL HT LOSS BTU/H			2725			1405			328			3156			1975			1239			983			752					442		
TOTAL HT GAIN x 1.3 BTU/H					3925			1157			96			3928			3125			2140			472			857				17	

ROOM USE				GRT			KT/BR				LAUN			W/R			FOY			MUD				WUB			BAS		
EXP. WALL				45			32				12			15			37			12				21			120		
CLG. HT.				10			10				9			10			10			10				10			10		
	FACTORS																												
GRS.WALL AREA	LOSS	GAIN		468			333				110			156			385			125				210			840		
GLAZING				LOSS	GAIN		LOSS	GAIN			LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN			LOSS	GAIN		LOSS	GAIN	
NORTH	21.8	16.0		7	152	112	0	0	0		0	0	0	0	0	0	0	0	0	0	0	0		0	0	0	3	65	48
EAST	21.8	41.6		28	610	1163	47	1024	1953		0	0	0	0	0	0	21	457	873	0	0	0		0	0	0	0	0	0
SOUTH	21.8	24.9		0	0	0	12	261	299		0	0	0	8	174	199	0	0	0	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	0	0	0		3	65	125	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	40	1034	170	20	517	85		20	517	85	20	517	85
NET EXPOSED WALL	4.2	0.7		433	1821	300	274	1151	189		110	464	76	148	622	102	324	1362	224	105	441	73		187	786	129	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	360	1326	218
EXPOSED CLG	1.3	0.6		0	0	0	0	0	0		88	116	52	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		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							3962		
SLAB ON GRADE HEAT LOSS				0			0				0			0			0			0				193					
SUBTOTAL HT LOSS				2583			2437				580			797			2853			958				1561			6002		
SUB TOTAL HT GAIN					1575			2441				128			302			1267			158				339			501	
LEVEL FACTOR / MULTIPLIER				0.30	0.30		0.30	0.30			0.20	0.18		0.30	0.30		0.30	0.30		0.30	0.30						0.50	0.61	
AIR CHANGE HEAT LOSS					773			729				102			238			854			287							4634		
AIR CHANGE HEAT GAIN						88			136				7			17			71			9							47	
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	0		0	
HEAT GAIN APPLIANCES/LIGHTS						766			766				766			0			0			0				0			766	
TOTAL HT LOSS BTU/H					3356			3166				682			1035			3707			1244				1561			10635		
TOTAL HT GAIN x 1.3 BTU/H						3157			4345				1171			414			1738			216				441			1707	

TOTAL HEAT GAIN BTU/H: 29181 TONS: 2.43 LOSS DUE TO VENTILATION LOAD BTU/H: 1670 STRUCTURAL HEAT LOSS: 38392 TOTAL COMBINED HEAT LOSS BTU/H: 40062

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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SITE NAME: CENTREFIELD (WEST GORMLEY) | OPT 2ND - FIN BSMT WUB
BUILDER: ROYAL PINE HOMES | TYPE: 38-7 | DATE: Apr-21 | GFA: 2152 | LO# 90455

HEATING CFM	970	COOLING CFM	970	furnace pressure	0.6					**CARRIER		AFUE = 97 %
TOTAL HEAT LOSS	38,392	TOTAL HEAT GAIN	28,907	furnace filter	0.05					59TN6A-060-14V	60	INPUT (BTU/H) = 60,000
AIR FLOW RATE CFM	25.27	AIR FLOW RATE CFM	33.56	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 = **970**
				plenum pressure s/a	0.18	r/a pressure	0.17			MEDIUM	970	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 55 °F

RUN COUNT	4th	3rd	2nd	1st	Bas
S/A	0	0	13	7	4
R/A	0	0	4	1	1

All S/A diffusers 4"x10" unless noted otherwise on layout.
All S/A runs 5"Ø unless noted otherwise on layout.

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	MBR	ENS	WIC	BED-2	BED-3	BED-4	BATH	BATH-2	BED-2	MBR	BED-3	GRT	GRT	KT/BR	KT/BR	BATH	LAUN	W/R	FOY	MUD	BAS	BAS	B-BTH	BAS
RM LOSS MBH.	1.36	1.41	0.33	1.58	0.99	1.24	0.49	0.75	1.58	1.36	0.99	1.68	1.68	1.58	1.58	0.49	0.68	1.04	3.71	1.24	4.07	4.07	0.44	4.07
CFM PER RUN HEAT	34	36	8	40	25	31	12	19	40	34	25	42	42	40	40	12	17	26	94	31	103	103	11	103
RM GAIN MBH.	1.96	1.16	0.10	1.96	1.56	2.14	0.24	0.86	1.96	1.96	1.56	1.58	1.58	2.17	2.17	0.24	1.17	0.41	1.74	0.22	0.72	0.72	0.02	0.72
CFM PER RUN COOLING	66	39	3	66	52	72	8	29	66	66	52	53	53	73	73	8	39	14	58	7	24	24	1	24
ADJUSTED PRESSURE	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.16	0.17	0.16	0.16	0.17	0.16
ACTUAL DUCT LGH.	31	38	39	55	58	21	49	50	50	41	67	32	23	30	22	44	32	37	38	31	40	28	16	40
EQUIVALENT LENGTH	130	190	190	170	150	130	180	130	170	170	160	150	130	120	120	140	130	120	140	120	170	160	130	150
TOTAL EFFECTIVE LENGTH	161	228	229	225	208	151	229	180	220	211	227	182	153	150	142	184	162	157	178	151	210	188	146	190
ADJUSTED PRESSURE	0.11	0.08	0.08	0.08	0.08	0.11	0.08	0.1	0.08	0.08	0.08	0.09	0.11	0.11	0.12	0.09	0.11	0.11	0.09	0.11	0.08	0.09	0.12	0.09
ROUND DUCT SIZE	5	4	4	5	5	**6**	4	4	5	5	5	5	5	5	5	4	4	4	**6**	4	**6**	**6**	5	**6**
HEATING VELOCITY (ft/min)	250	413	92	294	184	158	138	218	294	250	184	308	308	294	294	138	195	298	479	356	525	525	81	525
COOLING VELOCITY (ft/min)	485	447	34	485	382	367	92	333	485	485	382	389	389	536	536	92	447	161	296	80	122	122	7	122
OUTLET GRILL SIZE	3X10	3X10	3X10	3X10	3X10	4X10	3X10	3X10	3X10	3X10	3X10	3X10	3X10	3X10	3X10	3X10	3X10	3X10	4X10	3X10	4X10	4X10	3X10	4X10
TRUNK	A	A	D	B	C	E	C	C	B	A	C	A	D	A	A	C	E	D	B	D	A	A	D	B

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	432	0.08	10.2	14	x	8	555	TRUNK G	0	0.00	0	0	x	8	0
TRUNK B	277	0.08	8.7	10	x	8	499	TRUNK H	0	0.00	0	0	x	8	0
TRUNK C	370	0.08	9.7	14	x	8	476	TRUNK I	0	0.00	0	0	x	8	0
TRUNK D	488	0.08	10.7	18	x	8	488	TRUNK J	0	0.00	0	0	x	8	0
TRUNK E	968	0.08	13.9	22	x	8	792	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	970	0.05	15.6	28	x	8	624
TRUNK Y	0	0.05	0	0	x	8	0
TRUNK Z	0	0.05	0	0	x	8	0
DROP	970	0.05	15.6	24	x	10	582

RETURN AIR #	1	2	3	4	5											BR
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
AIR VOLUME	130	115	85	135	350	0	0	0	0	0	0	0	0	0	0	155
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.	36	63	60	40	34	1	1	1	1	1	1	1	1	1	1	14
EQUIVALENT LENGTH	215	255	195	175	260	0	0	0	0	0	0	0	0	0	0	135
TOTAL EFFECTIVE LH	251	318	255	215	294	1	1	1	1	1	1	1	1	1	1	149
ADJUSTED PRESSURE	0.06	0.05	0.06	0.07	0.05	14.80	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	6.8	10.6	0	0	0	0	0	0	0	0	0	0	6.6
INLET GRILL SIZE	8	8	8	8	8	0	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	0	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

HVAC DESIGNS LTD.
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TYPE: 38-7 LO # 90455
SITE NAME: CENTREFIELD (WEST GORMLEY) OPT 2ND - FIN BSMT WUB

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	6	@ 10.6 cfm	63.6	cfm
Other Rooms	4	@ 10.6 cfm	42.4	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
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.

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#: 90455 Model: 38-7 Builder: ROYAL PINE HOMES Date: 4/19/2021

Volume Calculation

House Volume

Level	Floor Area (ft²)	Floor Height (ft)	Volume (ft³)
Bsmt	910	10	9100
First	910	10	9464
Second	1242	9	11426.4
Third	0	9	0
Fourth	0	9	0
		Total:	29,990.4 ft³
		Total:	849.2 m³

Air Change & Delta T Data

WINTER NATURAL AIR CHANGE RATE	0.230
SUMMER NATURAL AIR CHANGE RATE	0.072

Design Temperature Difference

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

5.2.3.1 Heat Loss due to Air Leakage

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

0.230 x 235.90 x 43 °C x 1.2 = 2815 W

= **9603 Btu/h**

6.2.6 Sensible Gain due to Air Leakage

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

= 0.072 x 235.90 x 7 °C x 1.2 = 144 W

= **493 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	9,603	7,837	0.613
2	0.3		9,627	0.299
3	0.2		10,879	0.177
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: 38-7 OPT 2ND - FIN BSMT WUB **BUILDER:** ROYAL PINE HOMES
SFQT: 2152 **LO#** 90455 **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):	29990.4	ASSUMED (Y/N):	Y
INTERNAL SHADING:	BLINDS/CURTAINS	ASSUMED OCCUPANTS:	5
INTERIOR LIGHTING LOAD ($Btu/h/ft^2$):	2.00	DC BRUSHLESS MOTOR (Y/N):	Y
FOUNDATION CONFIGURATION	BCIN_1	DEPTH BELOW GRADE:	7.0 ft
LENGTH: 46.0 ft	WIDTH: 28.0 ft	EXPOSED PERIMETER:	127.0 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

Michael O'Rourke

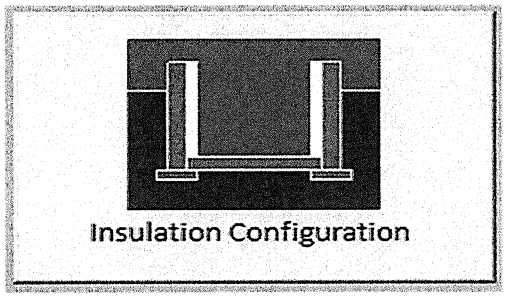
HVAC Designs Ltd.
375 Finley Ave, Suite 202
Ajax ON, L1S 2E2
905-619-2300

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):	**14.0**	
Floor Width (m):	**8.5**	
Exposed Perimeter (m):	**38.7**	
Wall Height (m):	**3.0**	
Depth Below Grade (m):	**2.13**	
Window Area (m^2):	**1.1**	
Door Area (m^2):	**3.7**	


Insulation Configuration

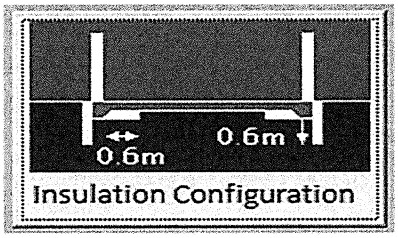
Radiant Slab		
Heated Fraction of the Slab:	**0**	
Fluid Temperature (°C):	**33**	
Design Months		
Heating Month	**1**	
Foundation Loads		
Heating Load (Watts):	**1219**	

TYPE: 38-7 OPT 2ND - FIN BSMT WUB
LO# 90455

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

Residential Slab on Grade 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		
Length (m):	**0.6**	
Width (m):	**5.8**	
Exposed Perimeter (m):	**6.4**	
Radiant Slab		
Heated Fraction of the Slab:	**0**	
Fluid Temperature (°C):	**33**	
Design Months		
Heating Month	**1**	
Results		
Heating Load (Watts):	**56**	

TYPE: 38-7
LO# 90455

OPT 2ND - FIN BSMT WUB

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

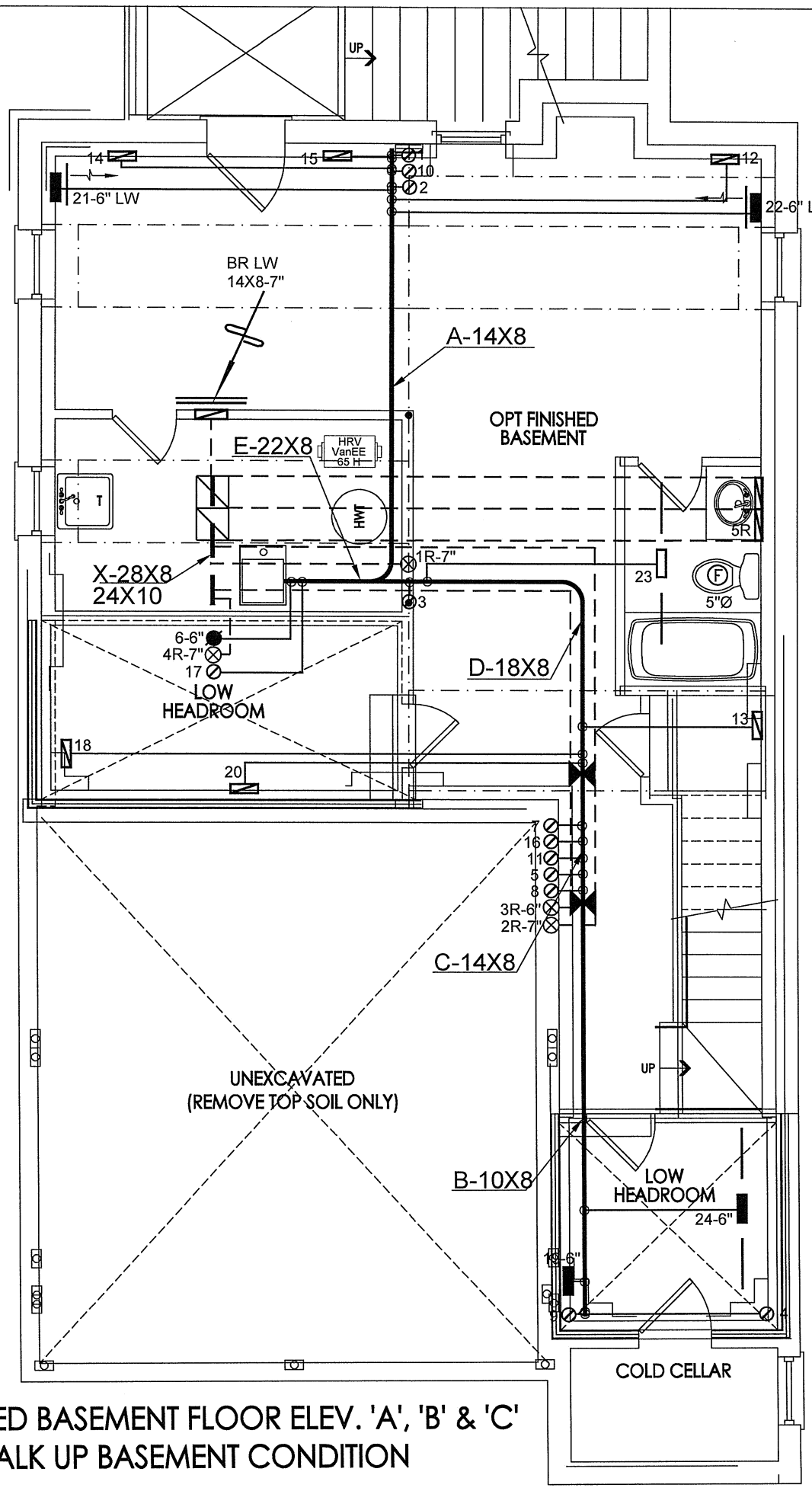
Air Infiltration Residential Load Calculator

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):	6.89
Building Configuration	
Type:	Detached
Number of Stories:	Two
Foundation:	Full
House Volume (m^3):	849.2
Air Leakage/Ventilation	
Air Tightness Type:	Energy Star Detached (2.5 ACH)
Custom BDT Data:	ELA @ 10 Pa. 792.8 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):	**0.230**
Cooling Air Leakage Rate (ACH/H):	**0.072**

TYPE: 38-7 OPT 2ND - FIN BSMT WUB

LO# 90455



OPT FINISHED BASEMENT FLOOR ELEV. 'A', 'B' & 'C'
W/ OPT. WALK UP BASEMENT CONDITION

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

WUB 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.		
1.		

REVISIONS

Client
ROYAL PINE HOMES

Project Name
CENTREFIELD (WEST GORMLEY)
RICHMOND HILL, ONTARIO

FIN BSMT WUB
38-7 - OPT 2ND 2152 sqft

HVAC DESIGNS LTD.
375 Finley Ave. Suite 202 - Ajax, Ontario
L1S 2E2 Tel. 905.619.2300 - 905.420.5300 Fax 905.619.2375
Email: info@hvacdesigns.ca
Web: www.hvacdesigns.ca
Specializing in Residential Mechanical Design Services

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

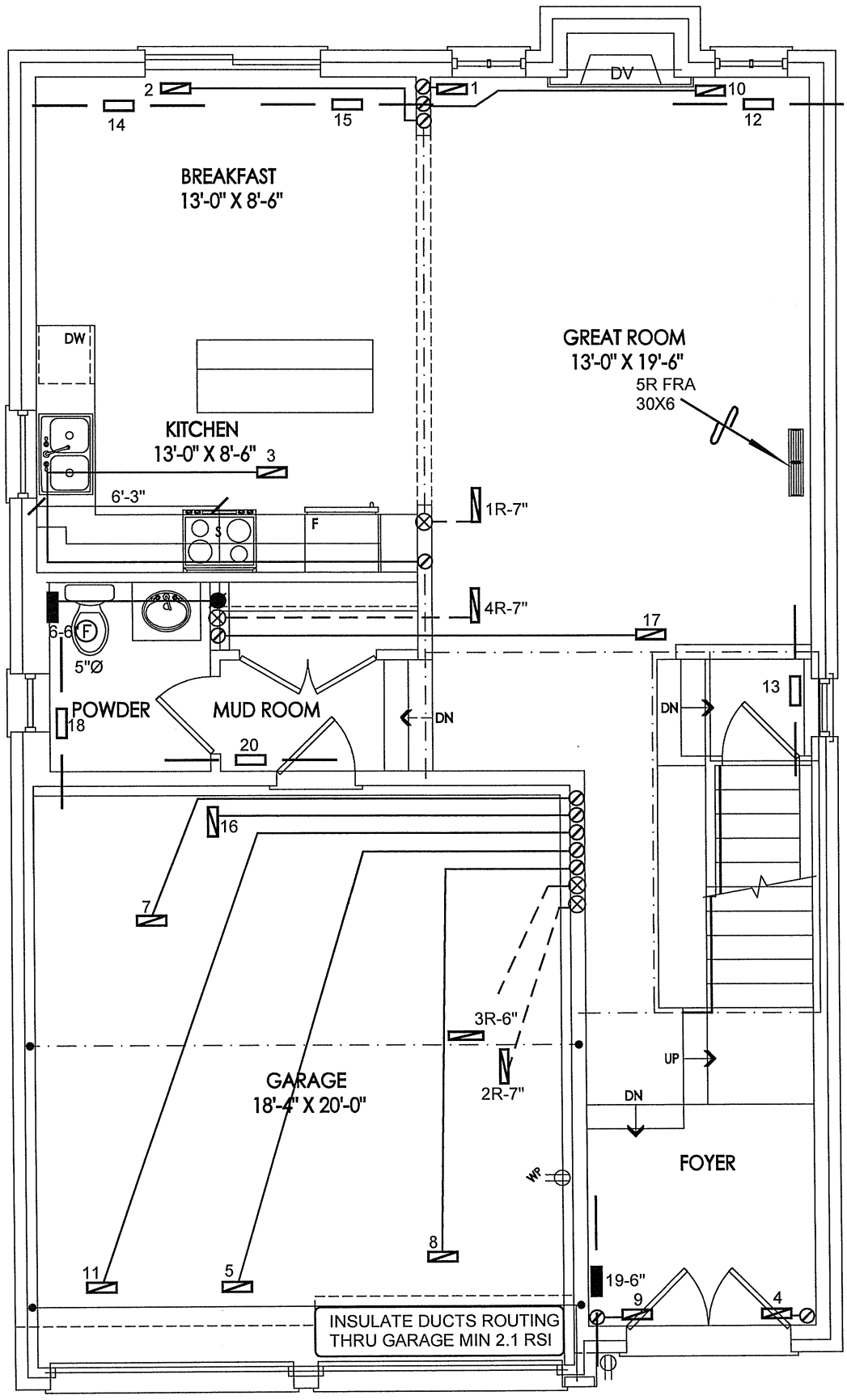
HEAT LOSS 40062 BTU/H		
UNIT DATA		
MAKE	CARRIER	
MODEL	59TN6A-060-14V	
INPUT	60	MBTU/H
OUTPUT	58	MBTU/H
COOLING	2.5	TONS
FAN SPEED	970	cfm @ 0.6" w.c.

# OF RUNS	S/A	R/A	FANS
3RD FLOOR			
2ND FLOOR	13	4	4
1ST FLOOR	7	1	2
BASEMENT	4	1	1

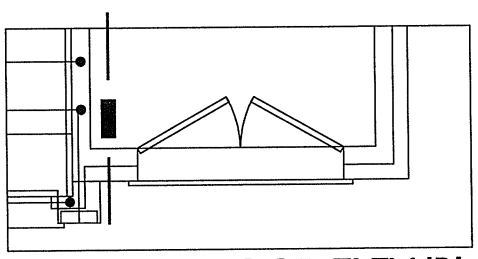
ALL S/A DIFFUSERS 4 "x10" UNLESS NOTED OTHERWISE ON LAYOUT. ALL S/A RUNS 5"Ø UNLESS NOTED OTHERWISE ON LAYOUT. UNDERCUT DOORS 1" min. FOR R/A

Sheet Title
BASEMENT HEATING LAYOUT

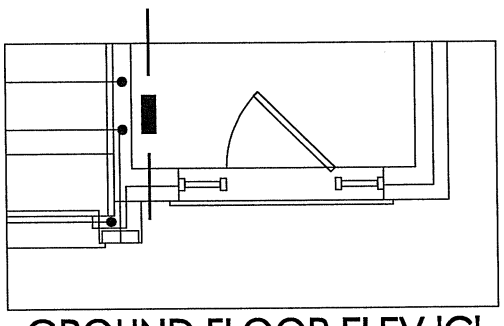
Date APRIL/2021
Scale 3/16" = 1'-0"
BCIN# 19669
LO# 90455



GROUND FLOOR ELEV 'A'



GROUND FLOOR ELEV 'B'



GROUND FLOOR ELEV 'C'

1 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

WUB 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.		
1.		

REVISIONS

Client
ROYAL PINE HOMES

Project Name
CENTREFIELD (WEST GORMLEY)
RICHMOND HILL, ONTARIO

FIN BSMT WUB
38-7 - OPT 2ND 2152 sqft

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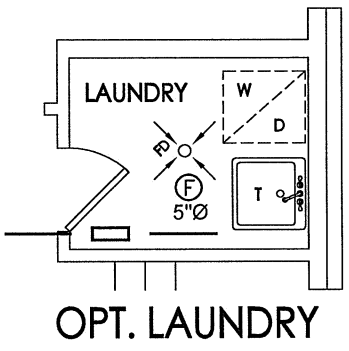
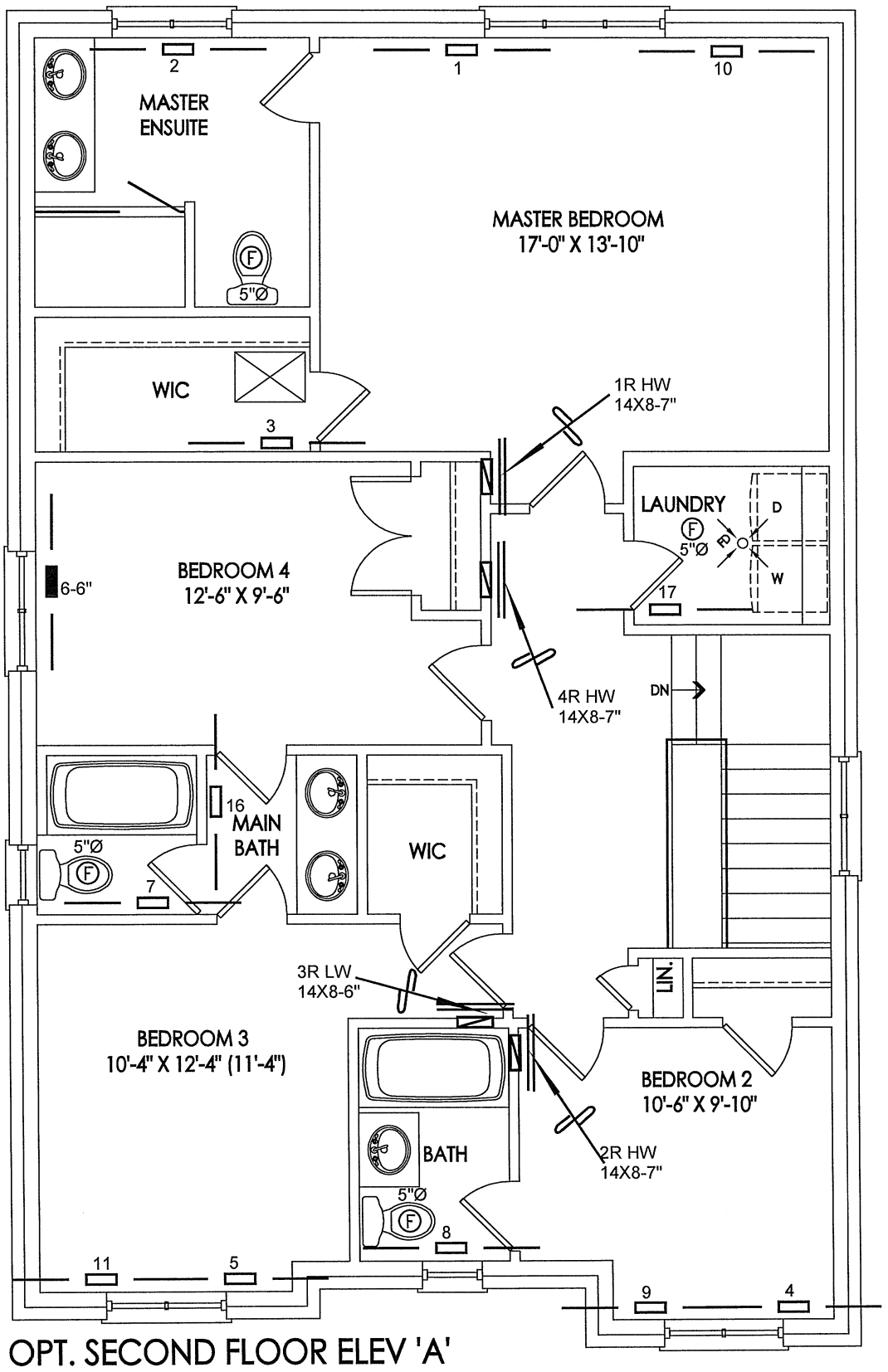
Installation to comply with the latest Ontario Building Code. All supply branch outlets shall be equipped with a manual balancing damper. Ductwork which passes through the garage or unheated spaces shall be adequately insulated and be gas-proofed.

Sheet Title
FIRST FLOOR HEATING LAYOUT

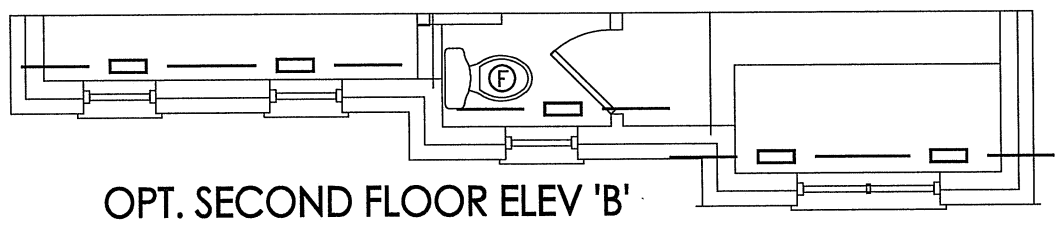
Date APRIL/2021
Scale 3/16" = 1'-0"
BCIN# 19669
LO# 90455



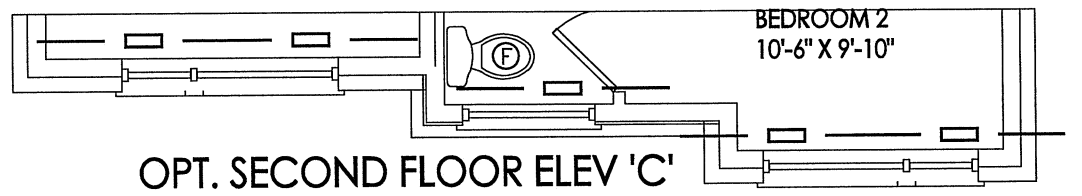
OPT. LAUNDRY



OPT. SECOND FLOOR ELEV 'A'



OPT. SECOND FLOOR ELEV 'B'



OPT. SECOND FLOOR 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

WUB 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.		
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REVISIONS

Client
ROYAL PINE HOMES

Project Name
CENTREFIELD (WEST GORMLEY)
RICHMOND HILL, ONTARIO

FIN BSMT WUB
38-7 - OPT 2ND 2152 sqft

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Sheet Title
SECOND FLOOR HEATING LAYOUT

Date APRIL/2021
Scale 3/16" = 1'-0"
BCIN# 19669
LO# 90455