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 VAUGHAN	**Postal code**	**Plan number/ other description**		

B. Individual who reviews and takes responsibility for design activities

Name		Firm		
MICHAEL O'ROURKE		**HVAC DESIGNS LTD.**		
Street address **375 FINLEY AVE**			**Unit no.** **202**	**Lot/con.** **N/A**
Municipality **AJAX**	**Postal code** **L1S 2E2**	**Province** **ONTARIO**	**E-mail** **info@hvacdesigns.ca**	
Telephone number (**905**) **619-2300**	**Fax number** (**905**) **619-2375**		**Cell number** ( )	

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: 42-2

Project: KLEINBURG GLEN

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 Division 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.

March 7, 2017
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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Web: www.hvacdesigns.ca E-mail: info@hvacdesigns.ca

SITE NAME: KLEINBURG GLEN | DATE: Mar-17 | WINTER NATURAL AIR CHANGE RATE 0.330 | HEAT LOSS ΔT °F. 76 | CSA-F280-12
BUILDER: GOLD PARK HOMES | TYPE: 42-2 | GFA: 3084 | LO# 72996 | SUMMER NATURAL AIR CHANGE RATE 0.121 | HEAT GAIN ΔT °F. 16 | SB-12 PACKAGE A1

ROOM USE			MBR			ENS			WIC			BED-2			BED-3			BED-4			BATH			WIC-2				ENS2		
EXP. WALL			37			26			11			19			13			12			14			12				6		
CLG. HT.			9			9			9			9			9			9			9			9				9		
	FACTORS																													
GRS.WALL AREA	LOSS	GAIN	333			234			99			171			117			108			126			108				54		
GLAZING				LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN			LOSS	GAIN
NORTH	21.3	16.9	0	0	0	7	149	118	0	0	0	0	0	0	0	0	0	16	340	270	7	149	118	0	0	0		0	0	0
EAST	21.3	42.4	32	681	1358	28	596	1189	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		0	0	0
SOUTH	21.3	25.8	0	0	0	0	0	0	0	0	0	16	340	413	0	0	0	0	0	0	0	0	0	0	0	0		7	149	181
WEST	21.3	42.4	0	0	0	0	0	0	0	0	0	0	0	0	33	702	1401	0	0	0	0	0	0	8	170	340		0	0	0
SKYLT.	21.3	87.5	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	25.2	5.3	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	4.5	0.9	301	1343	283	199	888	187	99	442	93	155	692	146	84	375	79	92	411	86	119	531	112	100	446	94		47	210	44
NET EXPOSED BSMT WALL ABOVE GR	3.6	0.8	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
EXPOSED CLG	1.3	0.6	322	413	207	168	216	108	176	226	113	285	366	183	195	250	125	216	277	139	180	231	116	35	45	22		36	46	23
NO ATTIC EXPOSED CLG	2.7	1.4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		0	0	0
EXPOSED FLOOR	2.6	0.5	0	0	0	0	0	0	0	0	0	0	0	0	195	497	105	0	0	0	42	107	23	35	89	19		0	0	0
BASEMENT/CRAWL HEAT LOSS			0			0			0			0			0			0			0			0				0		
SLAB ON GRADE HEAT LOSS			0			0			0			0			0			0			0			0				0		
SUBTOTAL HT LOSS			2438			1848			668			1398			1825			1028			1018			751				405		
SUB TOTAL HT GAIN					1848			1601			206			741			1710			495			368			475			248	
LEVEL FACTOR / MULTIPLIER			0.20	0.34		0.20	0.34		0.20	0.34		0.20	0.34		0.20	0.34		0.20	0.34		0.20	0.34		0.20	0.34			0.20	0.34	
AIR CHANGE HEAT LOSS			822			623			225			471			615			347			343			253				136		
AIR CHANGE HEAT GAIN					145			125			16			58			134			39			29			37			19	
DUCT LOSS			489			0			0			0			244			0			136			100				0		
DUCT GAIN					150			0			0			0			261			0			93			51			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					529			0			0			529			529			529			529			0			0	
TOTAL HT LOSS BTU/H			3748			2471			893			1869			2684			1375			1497			1104				541		
TOTAL HT GAIN x 1.3 BTU/H					4097			2245			289			2039			3736			1694			1324			732			347	

ROOM USE			LIV			DIN			KIT/GRT			DEN			LAUN				FOY			MUD					BAS		
EXP. WALL			22			12			70			12			18				34			11					180		
CLG. HT.			10			10			10			10			10				19			10					9		
	FACTORS																												
GRS.WALL AREA	LOSS	GAIN	220			120			700			120			180				646			110					1080		
GLAZING				LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN			LOSS	GAIN		LOSS	GAIN				LOSS	GAIN
NORTH	21.3	16.9	0	0	0	0	0	0	0	0	0	0	0	0	8	170	135		0	0	0	0	0	0			3	64	51
EAST	21.3	42.4	0	0	0	0	0	0	129	2745	5476	0	0	0	0	0	0		0	0	0	0	0	0			6	128	255
SOUTH	21.3	25.8	22	468	567	22	468	567	0	0	0	18	383	464	0	0	0		0	0	0	0	0	0			6	128	155
WEST	21.3	42.4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		23	489	976	0	0	0			0	0	0
SKYLT.	21.3	87.5	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	25.2	5.3	0	0	0	0	0	0	0	0	0	0	0	0	20	505	106		40	1010	213	20	505	106			0	0	0
NET EXPOSED WALL	4.5	0.9	198	884	186	98	437	92	571	2548	536	102	455	96	152	678	143		583	2602	548	90	402	85			0	0	0
NET EXPOSED BSMT WALL ABOVE GR	3.6	0.8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0			540	1943	409
EXPOSED CLG	1.3	0.6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		75	96	48	0	0	0			0	0	0
NO ATTIC EXPOSED CLG	2.7	1.4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0			0	0	0
EXPOSED FLOOR	2.6	0.5	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					6165		
SLAB ON GRADE HEAT LOSS			0			0			0			0			0				0			0							
SUBTOTAL HT LOSS			1352			906			5293			838			1354				4197			907					8428		
SUB TOTAL HT GAIN					754			660			6012			560			384			1785			191						869
LEVEL FACTOR / MULTIPLIER			0.30	0.39		0.30	0.39		0.30	0.39		0.30	0.39		0.30	0.39			0.30	0.39		0.30	0.39				0.50	1.14	
AIR CHANGE HEAT LOSS			524			351			2051			325			524				1626			351					9587		
AIR CHANGE HEAT GAIN					59			52			470			44			30			140			15						68
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					529			529			529			529			529			0			529						0
TOTAL HT LOSS BTU/H			1876			1256			7344			1163			1878				5824			1258					18015		
TOTAL HT GAIN x 1.3 BTU/H					1744			1612			9115			1473			1226			2502			955						1218

TOTAL HEAT GAIN BTU/H: 36948 TONS: 3.08 LOSS DUE TO VENTILATION LOAD BTU/H: 2852 STRUCTURAL HEAT LOSS: 54796 TOTAL COMBINED HEAT LOSS BTU/H: 57649

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: KLEINBURG GLEN
BUILDER: GOLD PARK HOMES

TYPE: 42-2 DATE: Mar-17 GFA: 3084 LO# 72996

HEATING CFM	1100	COOLING CFM	1100	furnace pressure	0.6				
TOTAL HEAT LOSS	54,796	TOTAL HEAT GAIN	36,348	furnace filter	0.05			^LENNOX	
AIR FLOW RATE CFM	20.07	AIR FLOW RATE CFM	30.26	a/c coil pressure	0.2			EL296UH070XE36B	70
				available pressure for s/a & r/a	0.35			FAN SPEED	
								LOW	0
								MEDLOW	0
				plenum pressure s/a	0.18	r/a pressure	0.17	MEDIUM	995
				max s/a dif press. loss	0.03	r/a grille press. Loss	0.02	MEDIUM HIGH	1100
				min adjusted pressure s/a	0.15	adjusted pressure r/a	0.15	HIGH	0

AFUE = 96 %
INPUT (BTU/H) = 66,000
OUTPUT (BTU/H) = **64,000**
DESIGN CFM = 1100
CFM @ .6 " E.S.P.
TEMPERATURE RISE 54 °F

RUN COUNT	4th	3rd	2nd	1st	Bas
S/A	0	0	11	9	5
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	6	7	8	9	10	11	12	13	14	15	16	17	19	20	21	22	23	24
ROOM NAME	MBR	ENS	WIC	BED-2	BED-4	BATH	WIC-2	ENS	MBR	ENS2	LIV	DIN	KIT/GRT	KIT/GRT	DEN	LAUN	FOY	MUD	BAS	BAS	BAS	BAS
RM LOSS MBH.	1.87	1.24	0.89	1.87	1.37	1.50	1.10	1.24	1.87	0.54	1.88	1.26	2.45	2.45	1.16	1.88	5.82	1.26	3.60	3.60	3.60	3.60
CFM PER RUN HEAT	38	25	18	38	28	30	22	25	38	11	38	25	49	49	23	38	117	25	72	72	72	72
RM GAIN MBH.	2.05	1.12	0.29	2.04	1.69	1.32	0.73	1.12	2.05	0.35	1.74	1.61	3.04	3.04	1.47	1.23	2.50	0.96	0.24	0.24	0.24	0.24
CFM PER RUN COOLING	62	34	9	62	51	40	22	34	62	11	53	49	92	92	45	37	76	29	7	7	7	7
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	0.16	0.16	0.17	0.17	0.15	0.17	0.17	0.17	0.17	0.17
ACTUAL DUCT LGH.	43	50	17	29	40	37	47	49	40	15	21	9	36	31	9	25	34	27	25	42	7	10
EQUIVALENT LENGTH	160	150	160	130	130	180	180	130	170	120	110	140	120	130	150	120	110	110	140	100	100	110
TOTAL EFFECTIVE LENGTH	203	200	177	159	170	217	227	179	210	135	131	149	156	161	159	145	144	137	165	142	107	120
ADJUSTED PRESSURE	0.08	0.09	0.1	0.11	0.1	0.08	0.08	0.1	0.08	0.13	0.13	0.12	0.1	0.1	0.11	0.12	0.11	0.13	0.1	0.12	0.16	0.14
ROUND DUCT SIZE	5	4	4	5	4	4	4	4	5	4	4	4	5	5	4	4	6	4	5	5	4	5
HEATING VELOCITY (ft/min)	279	287	207	279	321	344	252	287	279	126	436	287	360	360	264	436	597	287	529	529	826	529
COOLING VELOCITY (ft/min)	455	390	103	455	585	459	252	390	455	126	608	562	675	675	516	424	388	333	51	51	80	51
OUTLET GRILL SIZE	3X10	3X10	3X10	3X10	3X10	3X10	3X10	3X10	3X10	3X10	3X10	3X10	3X10	3X10	3X10	3X10	4X10	3X10	3X10	3X10	3X10	3X10
TRUNK	B	A	B	D	B	D	D	A	E	E	C	E	A	B	D	B	C	B	B	A	E	D

RUN #	25	26	27
ROOM NAME	BED-3	KIT/GRT	BAS
RM LOSS MBH.	2.68	2.45	3.60
CFM PER RUN HEAT	54	49	72
RM GAIN MBH.	3.74	3.04	0.24
CFM PER RUN COOLING	113	92	7
ADJUSTED PRESSURE	0.15	0.16	0.17
ACTUAL DUCT LGH.	55	47	29
EQUIVALENT LENGTH	170	100	100
TOTAL EFFECTIVE LENGTH	225	147	129
ADJUSTED PRESSURE	0.07	0.11	0.13
ROUND DUCT SIZE	6	5	5
HEATING VELOCITY (ft/min)	275	360	529
COOLING VELOCITY (ft/min)	576	675	51
OUTLET GRILL SIZE	4X10	3X10	3X10
TRUNK	D	A	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	220	0.09	7.7	8	x	8	495	TRUNK G	0	0.00	0	0	x	8	0
TRUNK B	488	0.08	10.7	14	x	8	627	TRUNK H	0	0.00	0	0	x	8	0
TRUNK C	227	0.11	7.4	6	x	8	681	TRUNK I	0	0.00	0	0	x	8	0
TRUNK D	466	0.07	10.9	14	x	8	599	TRUNK J	0	0.00	0	0	x	8	0
TRUNK E	146	0.08	6.8	6	x	8	438	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 #	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	175	95	75	75	195	145	160	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.	37	38	45	48	21	16	23	1	1	1	1	1	1	1	1	14
EQUIVALENT LENGTH	175	185	225	230	135	215	225	0	0	0	0	0	0	0	0	145
TOTAL EFFECTIVE LH	212	223	270	278	156	231	248	1	1	1	1	1	1	1	1	159
ADJUSTED PRESSURE	0.07	0.07	0.05	0.05	0.09	0.06	0.06	14.80	14.80	14.80	14.80	14.80	14.80	14.80	14.80	0.09
ROUND DUCT SIZE	7.5	6	6	6	7.4	7.3	7.6	0	0	0	0	0	0	0	0	7.2
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	14	24	0	0	0	0	0	0	0	0	14

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	1100	0.05	16.3	30	x	8	660
TRUNK Y	405	0.05	11.2	14	x	8	521
TRUNK Z	0	0.05	0	0	x	8	0
DROP	1100	0.05	16.3	24	x	10	660

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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Tel: 905.619.2300 Fax: 905.619.2375
Web: www.hvacdesigns.ca E-mail: info@hvacdesigns.ca

TYPE: 42-2 LO # 72996
SITE NAME: KLEINBURG GLEN

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	6	@ 10.6 cfm	63.6	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
More than 5 - Part 6	**TOTAL**	**79.5**	**cfm**

SUPPLEMENTAL VENTILATION CAPACITY 9.32.3.5.

Total Ventilation Capacity	190.8	cfm
Less Principal Ventil. Capacity	139	cfm
Required Supplemental Capacity	51.8	cfm

PRINCIPAL EXHAUST FAN CAPACITY

Model: VANEE 60H-V+ Location: BSMT

139.0 cfm 3.0 sones [✓] HVI Approved

PRINCIPAL EXHAUST HEAT LOSS CALCULATION

CFM		ΔT °F		FACTOR		% LOSS
139.0 CFM	X	76 F	X	1.08	X	0.25

SUPPLEMENTAL FANS NUTONE

Location	Model	cfm	HVI	Sones
ENS	QTXEN050C	50	✓	0.3
BATH	QTXEN050C	50	✓	0.3
ENS2	QTXEN050C	50	✓	0.3
PWD	QTXEN050C	50	✓	0.3

HEAT RECOVERY VENTILATOR 9.32.3.11.

Model: VANEE 60H-V+

139 cfm high 50 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: GOLD PARK 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: March-17

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#: 72996 Model: 42-2 Builder: GOLD PARK HOMES Date: 3/7/2017

Volume Calculation

House Volume

Level	Floor Area (ft²)	Floor Height (ft)	Volume (ft³)
Bsmt	1439	9	12951
First	1439	10	14390
Second	1712	9	15408
Third	0	9	0
Fourth	0	9	0
		Total:	42,749.0 ft³
		Total:	1210.5 m³

Air Change & Delta T Data

WINTER NATURAL AIR CHANGE RATE	0.330
SUMMER NATURAL AIR CHANGE RATE	0.121

Design Temperature Difference

	Tin °C	Tout °C	ΔT °C	ΔT °F
Winter DTDh	22	-20	42	76
Summer DTDc	22	31	9	16

5.2.3.1 Heat Loss due to Air Leakage

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

0.330 x 336.25 x 42 °C x 1.2 = 5620 W

= **19174 Btu/h**

6.2.6 Sensible Gain due to Air Leakage

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

= 0.121 x 336.25 x 9 °C x 1.2 = 433 W

= **1479 Btu/h**

5.2.3.2 Heat Loss due to Mechanical Ventilation

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

139 CFM x 76 °F x 1.08 x 0.25 = **2852 Btu/h**

6.2.7 Sensible heat Gain due to Ventilation

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

139 CFM x 16 °F x 1.08 x 0.25 = **600 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	19,174	8,428	1.138
2	0.3		14,846	0.387
3	0.2		11,379	0.337
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: 42-2 **BUILDER:** GOLD PARK HOMES
SFQT: 3084 **LO#** 72996 **SITE:** KLEINBURG GLEN

DESIGN ASSUMPTIONS

HEATING	°F	COOLING	°F
OUTDOOR DESIGN TEMP.	-4	OUTDOOR DESIGN TEMP.	88
INDOOR DESIGN TEMP.	72	INDOOR DESIGN TEMP. (MAX 75°F)	72

BUILDING DATA

ATTACHMENT:	DETACHED	# OF STORIES (+BASEMENT):	3
FRONT FACES:	WEST	ASSUMED (Y/N):	Y
AIR CHANGES PER HOUR:	3.57	ASSUMED (Y/N):	Y
AIR TIGHTNESS CATEGORY:	AVERAGE	ASSUMED (Y/N):	Y
WIND EXPOSURE:	SHELTERED	ASSUMED (Y/N):	Y
HOUSE VOLUME (ft^3):	42749.0	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:	6.0 ft
LENGTH: 57.0 ft	WIDTH: 33.0 ft	EXPOSED PERIMETER:	180.0 ft

2012 OBC - COMPLIANCE PACKAGE **Component**	**Compliance Package A1**	
	Nominal	**Min. Eff.**
Ceiling with Attic Space Minimum RSI (R)-Value	60	59.22
Ceiling Without Attic Space Minimum RSI (R)-Value	31	27.65
Exposed Floor Minimum RSI (R)-Value	31	29.8
Walls Above Grade Minimum RSI (R)-Value	22	17.03
Basement Walls Minimum RSI (R)-Value	20 ci	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	0.28	-
Skylights Maximum U-Value	0.49	-
Space Heating Equipment Minimum AFUE	0.96	-
HRV Minimum Efficiency	75%	-
Domestic Hot Water Heater Minimum EF	0.8	-

INDIVIDUAL BCIN: 19669
MICHAEL O'ROURKE

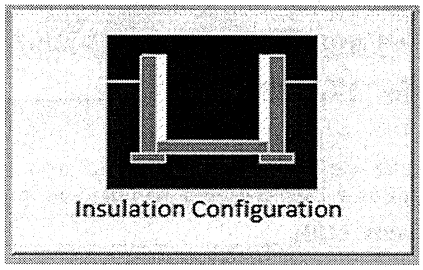
Michael O'Rourke

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:	Vaughan (Woodbridge)
Site Description	
Soil Conductivity:	Normal conductivity: dry dand, loam, clay
Water Table:	Normal (7-10 m, 23-33 ft)

Foundation Dimensions		
Floor Length (m):	**17.4**	 Insulation Configuration
Floor Width (m):	**10.1**	
Exposed Perimeter (m):	**0.0**	
Wall Height (m):	**2.7**	
Depth Below Grade (m):	**1.8**	
Window Area (m^2):	**1.4**	
Door Area (m^2):	**0.0**	
Radiant Slab		
Heated Fraction of the Slab:	**0**	
Fluid Temperature (°C):	**33**	
Design Months		
Heating Month	**1**	
Foundation Loads		
Heating Load (Watts):		**1806**

TYPE: 42-2
LO# 72996

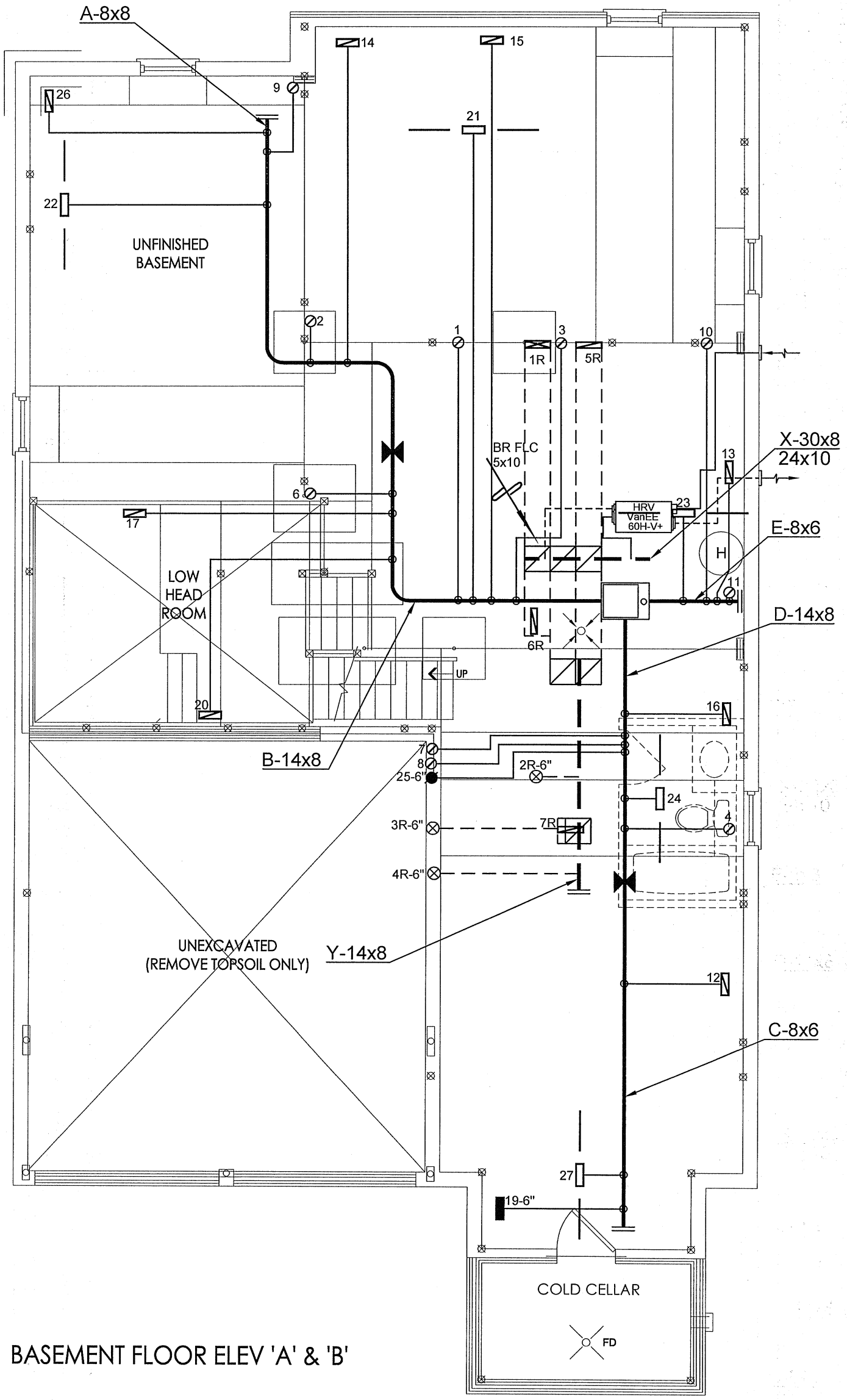
HVAC Designs Ltd.
375 Finley Ave, Suite 202
Ajax ON, L1S 2E2
905-619-2300

Air Infiltration Residential Load Calculator

Supplemental tool for CAN/CSA-F280

Weather Station Description		
Province:	Ontario	
Region:	Vaughan (Woodbridge)	
Weather Station Location:	Open flat terrain, grass	
Anemometer height (m):	10	
Local Shielding		
Building Site:	Suburban, forest	
Walls:	Heavy	
Flue:	Heavy	
Highest Ceiling Height (m):	6.71	
Building Configuration		
Type:	Detached	
Number of Stories:	Two	
Foundation:	Full	
House Volume (m^3):	1210.5	
Air Leakage/Ventilation		
Air Tightness Type:	Present (1961-) (3.57 ACH)	
Custom BDT Data:	ELA @ 10 Pa.	1613.7 cm^2
	3.57	ACH @ 50 Pa
Mechanical Ventilation (L/s):	Total Supply	Total Exhaust
	65.6	65.6
Flue Size		
Flue #:	#1 #2 #3 #4	
Diameter (mm):	0 0 0 0	
Natural Infiltration Rates		
Heating Air Leakage Rate (ACH/H):	**0.330**	
Cooling Air Leakage Rate (ACH/H):	**0.121**	

TYPE: 42-2
LO# 72996



BASEMENT FLOOR ELEV 'A' & '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

PACKAGE A1

HVAC LEGEND

SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION
	FLOOR SUPPLY AIR GRILLE		6" SUPPLY AIR BOOT ABOVE		14"x8" RETURN AIR GRILLE		RETURN AIR STACK ABOVE
	FLOOR 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
GOLD PARK HOMES

Project Name
KLEINBURG GLEN
VAUGHAN, ONTARIO

42-2 3084 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 57649 BTU/H

UNIT DATA

MAKE	LENNOX	
MODEL	EL296UH070XE36B	
INPUT	66	MBTU/H
OUTPUT	64	MBTU/H
COOLING	3.0	TONS
FAN SPEED	1100	cfm @ 0.6" w.c.

# OF RUNS	S/A	R/A	FANS
3RD FLOOR			
2ND FLOOR	11	4	4
1ST FLOOR	9	3	2
BASEMENT	5	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

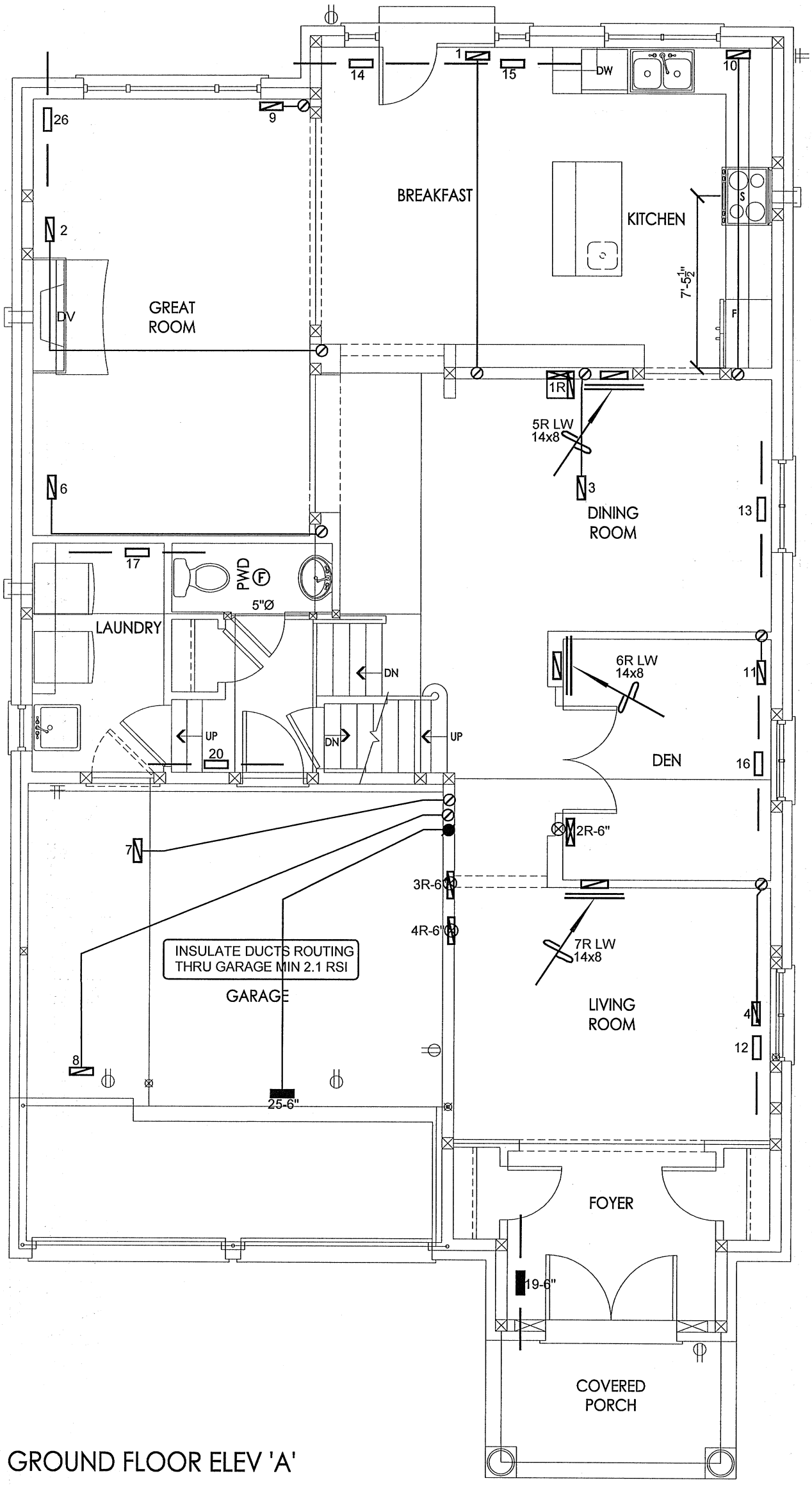
Sheet Title
BASEMENT HEATING LAYOUT

Date MAR/2017

Scale 3/16" = 1'-0"

BCIN# 19669

LO# 72996



GROUND FLOOR ELEV 'A'

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Michael O'Rourke, BCIN# 19669
HVAC DESIGNS LTD.

CSA-F280-12
PACKAGE A1

HVAC LEGEND

SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION
—▭—	FLOOR SUPPLY AIR GRILLE	▬	6" SUPPLY AIR BOOT ABOVE	▨	14"x8" RETURN AIR GRILLE	▨	RETURN AIR STACK ABOVE
—▬—	FLOOR 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
GOLD PARK HOMES

Project Name
KLEINBURG GLEN
VAUGHAN, ONTARIO

42-2 3084 sqft

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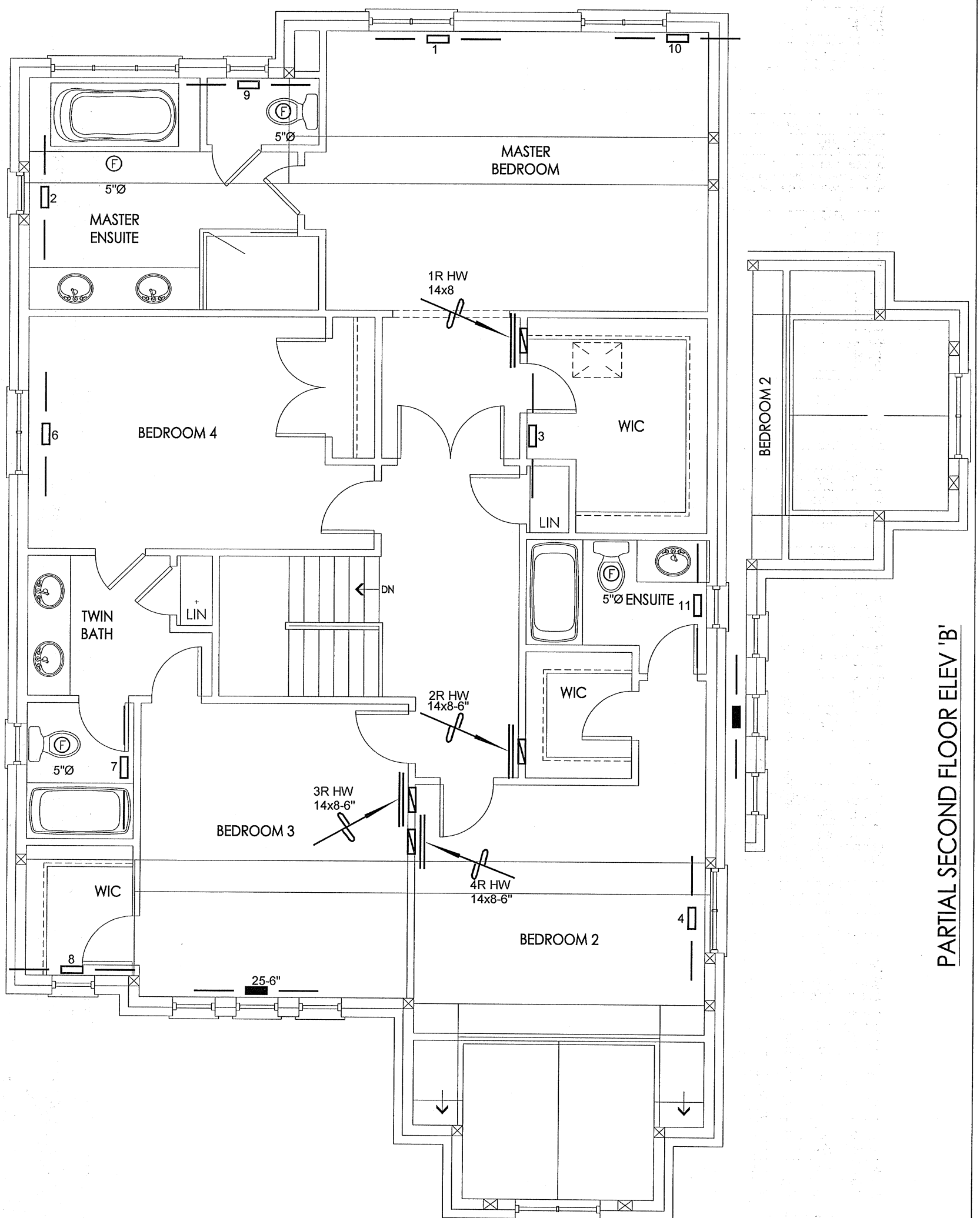
Installation to comply with the latest Ontario Building Code. All supply branch outlets shall be equipped with a manual balancing damper. Ductwork which passes through the garage or unheated spaces shall be adequately insulated and be gas-proofed.

Sheet Title
FIRST FLOOR HEATING LAYOUT

Date MAR/2017
Scale 3/16" = 1'-0"
BCIN# 19669
LO# 72996



PARTIAL SECOND FLOOR ELEV '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.

SECOND FLOOR ELEV 'A'

CSA-F280-12

PACKAGE A1

HVAC LEGEND

SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION
— ▭ —	FLOOR SUPPLY AIR GRILLE	▬	6" SUPPLY AIR BOOT ABOVE	▨	14"x8" RETURN AIR GRILLE	▨	RETURN AIR STACK ABOVE
— ▬ —	FLOOR 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
GOLD PARK HOMES

Project Name
KLEINBURG GLEN
VAUGHAN, ONTARIO

42-2 3084 sqft

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Sheet Title
SECOND FLOOR HEATING LAYOUT

Date MAR/2017
Scale 3/16" = 1'-0"
BCIN# 19669
LO# 72996