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 BRAMPTON	**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: SD-7

Project: ENCORE

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)

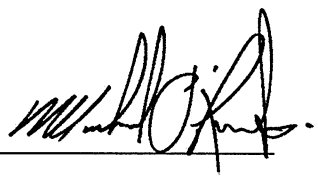
☐ The design work is exempt from the registration and qualification requirements of the Building Code.

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.

HVAC DESIGNS LTD.

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Web: www.hvacdesigns.ca E-mail: info@hvacdesigns.ca

SITE NAME: ENCORE | DATE: Mar-17 | WINTER NATURAL AIR CHANGE RATE 0.326 | HEAT LOSS ΔT °F. 74 | CSA-F280-12

BUILDER: GOLD PARK HOMES | TYPE: SD-7 | GFA: 1979 | LO# 72736 | SUMMER NATURAL AIR CHANGE RATE 0.112 | HEAT GAIN ΔT °F. 14 | SB-12 PACKAGE A1

ROOM USE			MBR			ENS			WIC			BED-2			BED-3			BED-4			BATH		
EXP. WALL			14			22			0			12			17			13			0		
CLG. HT.			9			9			9			9			9			10			9		
	FACTORS																						
GRS.WALL AREA	LOSS	GAIN	126			198			0			108			153			130			0		
GLAZING			LOSS		GAIN	LOSS		GAIN	LOSS		GAIN	LOSS		GAIN	LOSS		GAIN	LOSS		GAIN	LOSS		GAIN
NORTH	20.8	16.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
EAST	20.8	41.9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	51	1060	2136	0	0	0
SOUTH	20.8	25.2	0	0	0	0	0	0	0	0	0	16	332	404	23	478	580	0	0	0	0	0	0
WEST	20.8	41.9	24	499	1005	14	291	586	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
SKYLT.	36.4	102.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
DOORS	24.7	4.7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
NET EXPOSED WALL	4.4	0.8	102	444	84	184	802	151	0	0	0	92	401	76	130	566	107	79	344	65	0	0	0
NET EXPOSED BSMT WALL ABOVE GR	3.5	0.7	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	266	333	162	120	150	73	98	123	60	144	180	88	204	256	124	166	208	101	84	105	51
NO ATTIC EXPOSED CLG	2.7	1.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	44	118	57	0	0	0
EXPOSED FLOOR	2.5	0.5	0	0	0	0	0	0	33	82	16	0	0	0	0	0	0	165	411	78	66	164	31
BASEMENT/CRAWL HEAT LOSS				0			0			0			0			0			0			0	
SLAB ON GRADE HEAT LOSS				0			0			0			0			0			0			0	
SUBTOTAL HT LOSS				1276			1243			205			914			1300			2141			270	
SUB TOTAL HT GAIN					1251			811			75			567			811			2437			82
LEVEL FACTOR / MULTIPLIER			0.20	0.29		0.20	0.29		0.20	0.29		0.20	0.29		0.20	0.29		0.20	0.29		0.20	0.29	
AIR CHANGE HEAT LOSS				371			361			60			266			378			622			78	
AIR CHANGE HEAT GAIN					115			74			7			52			74			223			8
DUCT LOSS				0			0			26			0			0			276			35	
DUCT GAIN					0			0			8			0			0			355			9
HEAT GAIN PEOPLE	240		2		480	0		0	0		0	1		240	1		240	1		240	0		0
HEAT GAIN APPLIANCES/LIGHTS					648			0			0			648			648			648			0
TOTAL HT LOSS BTU/H				1647			1604			291			1179			1678			3039			383	
TOTAL HT GAIN x 1.3 BTU/H					3242			1150			117			1960			2306			5075			128

ROOM USE			FORM				KT/FM				LAUN			PWD			FOY				BAS	
EXP. WALL			31				56				17			12			27				148	
CLG. HT.			10				10				9			10			19				9	
	FACTORS																					
GRS.WALL AREA	LOSS	GAIN	310				560				153			120			513				1082	
GLAZING			LOSS		GAIN		LOSS		GAIN		LOSS		GAIN	LOSS		GAIN	LOSS		GAIN		LOSS	GAIN
NORTH	20.8	16.3	0	0	0		0	0	0		0	0	0	0	0	0	27	561	440		14	291	228
EAST	20.8	41.9	0	0	0		0	0	0		10	208	419	11	229	461	20	416	838		0	0	0
SOUTH	20.8	25.2	20	416	505		0	0	0		7	145	177	0	0	0	0	0	0		0	0	0
WEST	20.8	41.9	0	0	0		82	1704	3435		0	0	0	0	0	0	0	0	0		0	0	0
SKYLT.	36.4	102.1	0	0	0		0	0	0		0	0	0	0	0	0	0	0	0		0	0	0
DOORS	24.7	4.7	0	0	0		0	0	0		0	0	0	0	0	0	60	1479	279		20	493	93
NET EXPOSED WALL	4.4	0.8	290	1264	238		478	2083	393		136	593	112	109	475	90	406	1769	334		0	0	0
NET EXPOSED BSMT WALL ABOVE GR	3.5	0.7	0	0	0		0	0	0		0	0	0	0	0	0	0	0	0		250	878	166
EXPOSED CLG	1.3	0.6	0	0	0		0	0	0		66	83	40	0	0	0	58	73	35		0	0	0
NO ATTIC EXPOSED CLG	2.7	1.3	0	0	0		0	0	0		0	0	0	0	0	0	30	81	39		0	0	0
EXPOSED FLOOR	2.5	0.5	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				3765	
SLAB ON GRADE HEAT LOSS				0				0				0			0			0					
SUBTOTAL HT LOSS				1679				3786				1028			703			4378				5427	
SUB TOTAL HT GAIN					743				3828				747			550			1965				487
LEVEL FACTOR / MULTIPLIER			0.30	0.35			0.30	0.35			0.20	0.29		0.30	0.35		0.30	0.35			0.50	1.12	
AIR CHANGE HEAT LOSS				581				1311				299			244			1516				6087	
AIR CHANGE HEAT GAIN					68				351				69			50			180				45
DUCT LOSS				0				0				0			0			0				0	
DUCT GAIN					0				0				0			0			0				0
HEAT GAIN PEOPLE	240		0		0		1		240		1		240	0		0	0		0		0		0
HEAT GAIN APPLIANCES/LIGHTS					648				648				648			0			0				0
TOTAL HT LOSS BTU/H				2260				5097				1327			947			5894				11514	
TOTAL HT GAIN x 1.3 BTU/H					1898				6587				2216			781			2789				691

TOTAL HEAT GAIN BTU/H: 29466 TONS: 2.46 LOSS DUE TO VENTILATION LOAD BTU/H: 2785 STRUCTURAL HEAT LOSS: 36861 TOTAL COMBINED HEAT LOSS BTU/H: 39646

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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Web: www.hvacdesigns.ca E-mail: info@hvacdesigns.ca

SITE NAME: ENCORE
BUILDER: GOLD PARK HOMES

TYPE: SD-7 DATE: Mar-17 GFA: 1979 LO# 72736

HEATING CFM	950	COOLING CFM	950	furnace pressure	0.6	
TOTAL HEAT LOSS	36,861	TOTAL HEAT GAIN	28,940	furnace filter	0.05	
AIR FLOW RATE CFM	25.77	AIR FLOW RATE CFM	32.83	a/c coil pressure	0.2	
				available pressure for s/a & r/a	0.35	
				plenum pressure s/a	0.18	r/a pressure 0.17
				max s/a dif press. loss	0.02	r/a grille press. Loss 0.02
				min adjusted pressure s/a	0.16	adjusted pressure r/a 0.15

^LENNOX
EL296UH045XE36B 45
AFUE = 96 %
INPUT (BTU/H) = 44,000
OUTPUT (BTU/H) = 43,000

FAN SPEED	
LOW	0
MEDLOW	650
MEDIUM	950
MEDIUM HIGH	1060
HIGH	0

DESIGN CFM = 950 CFM @ .6 " E.S.P.
TEMPERATURE RISE 42 °F

RUN COUNT	4th	3rd	2nd	1st	Bas
S/A	0	0	9	7	4
R/A	0	0	3	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	12	14	15	16	17	18	19	20	21	22	23	24
ROOM NAME	MBR	ENS	WIC	BED-2	BED-3	BED-4	BATH	BED-4	FORM	KT/FM	KT/FM	KT/FM	LAUN	PWD	FOY	FOY	BAS	BAS	BAS	BAS
RM LOSS MBH.	1.65	1.60	0.29	1.18	1.68	1.52	0.38	1.52	2.26	1.70	1.70	1.70	1.33	0.95	2.95	2.95	2.88	2.88	2.88	2.88
CFM PER RUN HEAT	42	41	7	30	43	39	10	39	58	44	44	44	34	24	76	76	74	74	74	74
RM GAIN MBH.	3.24	1.15	0.12	1.96	2.31	2.54	0.13	2.54	1.90	2.20	2.20	2.20	2.22	0.78	1.39	1.39	0.17	0.17	0.17	0.17
CFM PER RUN COOLING	106	38	4	64	76	83	4	83	62	72	72	72	73	26	46	46	6	6	6	6
ADJUSTED PRESSURE	0.16	0.17	0.17	0.17	0.17	0.16	0.17	0.16	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17
ACTUAL DUCT LGH.	41	51	30	35	27	34	23	41	16	32	29	34	42	30	32	26	24	17	25	14
EQUIVALENT LENGTH	140	170	160	150	140	120	130	140	80	130	110	150	150	130	120	160	100	100	140	120
TOTAL EFFECTIVE LENGTH	181	221	190	185	167	154	153	181	96	162	139	184	192	160	152	186	124	117	165	134
ADJUSTED PRESSURE	0.09	0.08	0.09	0.09	0.1	0.11	0.11	0.09	0.18	0.11	0.12	0.09	0.09	0.11	0.11	0.09	0.14	0.15	0.1	0.13
ROUND DUCT SIZE	6	4	4	5	5	5	4	5	4	5	5	5	5	4	5	5	5	5	5	5
HEATING VELOCITY (ft/min)	214	470	80	220	316	286	115	286	665	323	323	323	250	275	558	558	543	543	543	543
COOLING VELOCITY (ft/min)	540	436	46	470	558	609	46	609	711	529	529	529	536	298	338	338	44	44	44	44
OUTLET GRILL SIZE	4X10	3X10	3X10	3X10	3X10	3X10	3X10	3X10	3X10	3X10	3X10	3X10	3X10	3X10	3X10	3X10	3X10	3X10	3X10	3X10
TRUNK	A	A	B	B	D	D	D	D	D	A	A	A	C	C	C	C	B	B	C	D

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	215	0.08	7.9	8	x	8	484	TRUNK G	0	0.00	0	0	x	8	0
TRUNK B	400	0.08	9.9	12	x	8	600	TRUNK H	0	0.00	0	0	x	8	0
TRUNK C	284	0.09	8.5	8	x	8	639	TRUNK I	0	0.00	0	0	x	8	0
TRUNK D	547	0.09	10.9	16	x	8	615	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	0.06	0	0	x	8	0
TRUNK P	0	0.06	0	0	x	8	0
TRUNK Q	0	0.06	0	0	x	8	0
TRUNK R	0	0.06	0	0	x	8	0
TRUNK S	0	0.06	0	0	x	8	0
TRUNK T	0	0.06	0	0	x	8	0
TRUNK U	0	0.06	0	0	x	8	0
TRUNK V	0	0.06	0	0	x	8	0
TRUNK W	0	0.06	0	0	x	8	0
TRUNK X	950	0.06	14.8	26	x	8	658
TRUNK Y	0	0.06	0	0	x	8	0
TRUNK Z	0	0.06	0	0	x	8	0
DROP	950	0.06	14.8	24	x	10	570

RETURN AIR #	1	2	3	4												BR
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
AIR VOLUME	125	185	95	400	0	0	0	0	0	0	0	0	0	0	0	145
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.	48	36	40	15	1	1	1	1	1	1	1	1	1	1	1	14
EQUIVALENT LENGTH	180	160	165	135	0	0	0	0	0	0	0	0	0	0	0	145
TOTAL EFFECTIVE LH	228	196	205	150	1	1	1	1	1	1	1	1	1	1	1	159
ADJUSTED PRESSURE	0.06	0.08	0.07	0.10	14.80	14.80	14.80	14.80	14.80	14.80	14.80	14.80	14.80	14.80	14.80	0.09
ROUND DUCT SIZE	6.9	7.5	6	9.4	0	0	0	0	0	0	0	0	0	0	0	6.6
INLET GRILL SIZE	8	8	8	8	0	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	30	0	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

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TYPE: SD-7 LO # 72736
SITE NAME: ENCORE

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	4	@ 10.6 cfm	42.4	cfm
Other Rooms	4	@ 10.6 cfm	42.4	cfm
Table 9.32.3.A.		TOTAL	159.0	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	159	cfm
Less Principal Ventil. Capacity	139	cfm
Required Supplemental Capacity	20.0	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	74 F	X	1.08	X	0.25

SUPPLEMENTAL FANS

Location	Model	NUTONE cfm	HVI	Sones
ENS	QTXEN050C	50	✓	0.3
BATH	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

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CSA F280-12 Residential Heat Loss and Heat Gain Calculations

Formula Sheet (For Air Leakage / Ventiliation Calculation)

LO#: 72736 Model: SD-7 Builder: GOLD PARK HOMES Date: 3/7/2017

Volume Calculation

House Volume			
Level	Floor Area (ft²)	Floor Height (ft)	Volume (ft³)
Bsmt	936	9	8424
First	936	10	9360
Second	1154	9	10386
Third	0	9	0
Fourth	0	9	0
		Total:	28,170.0 ft³
		Total:	797.7 m³

Air Change & Delta T Data

WINTER NATURAL AIR CHANGE RATE	0.326
SUMMER NATURAL AIR CHANGE RATE	0.112

Design Temperature Difference				
	Tin °C	Tout °C	ΔT °C	ΔT °F
Winter DTDh	22	-19	41	74
Summer DTDc	22	30	8	14

5.2.3.1 Heat Loss due to Air Leakage

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

0.326 x 221.58 x 41 °C x 1.2 = 3568 W

= **12173 Btu/h**

6.2.6 Sensible Gain due to Air Leakage

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

= 0.112 x 221.58 x 8 °C x 1.2 = 232 W

= **790 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 74 °F x 1.08 x 0.25 = **2785 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 14 °F x 1.08 x 0.25 = **525 Btu/h**

5.2.3.3 Calculation of Air Change Heat Loss for Each Room (Floor Multiplier Section)

$$HL_{airr} = Level\ Factor \times HL_{airbv} \times \{(HL_{agcr} + HL_{bgcr}) \div (HL_{agclevel} + HL_{bgclevel})\}$$

Level	Level Factor (LF)	HLairve Air Leakage + Ventilation Heat Loss (Btu/h)	Level Conductive Heat Loss: (HL_{clevel})	Air Leakage Heat Loss Multiplier (LF x HLairbv / HLlevel)
1	0.5	12,173	5,427	1.122
2	0.3		10,546	0.346
3	0.2		8,376	0.291
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

HVAC DESIGNS LTD.
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HEAT LOSS AND GAIN SUMMARY SHEET

MODEL: SD-7 **BUILDER:** GOLD PARK HOMES
SFQT: 1979 **LO#** 72736 **SITE:** ENCORE

DESIGN ASSUMPTIONS

HEATING	°F	COOLING	°F
OUTDOOR DESIGN TEMP.	-2	OUTDOOR DESIGN TEMP.	86
INDOOR DESIGN TEMP.	72	INDOOR DESIGN TEMP. (MAX 75°F)	72

BUILDING DATA

ATTACHMENT:	ATTACHED	# OF STORIES (+BASEMENT):	3
FRONT FACES:	EAST	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):	28170.0	ASSUMED (Y/N):	Y
INTERNAL SHADING:	BLINDS/CURTAINS	ASSUMED OCCUPANTS:	5
INTERIOR LIGHTING LOAD ($Btu/h/ft^2$):	1.50	DC BRUSHLESS MOTOR (Y/N):	Y
FOUNDATION CONFIGURATION	BCIN_1	DEPTH BELOW GRADE:	7.0 ft
LENGTH: 49.0 ft	WIDTH: 25.0 ft	EXPOSED PERIMETER:	125.0 ft

2012 OBC - COMPLIANCE PACKAGE	**Compliance Package A1**	
Component	**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

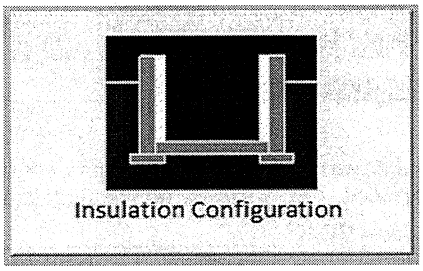
Michael O'Rourke

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

Foundation Dimensions		
Floor Length (m):	**14.9**	 Insulation Configuration
Floor Width (m):	**7.6**	
Exposed Perimeter (m):	**38.1**	
Wall Height (m):	**2.7**	
Depth Below Grade (m):	**2.1**	
Window Area (m^2):	**1.3**	
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):		**1103**

TYPE: SD-7
LO# 72736

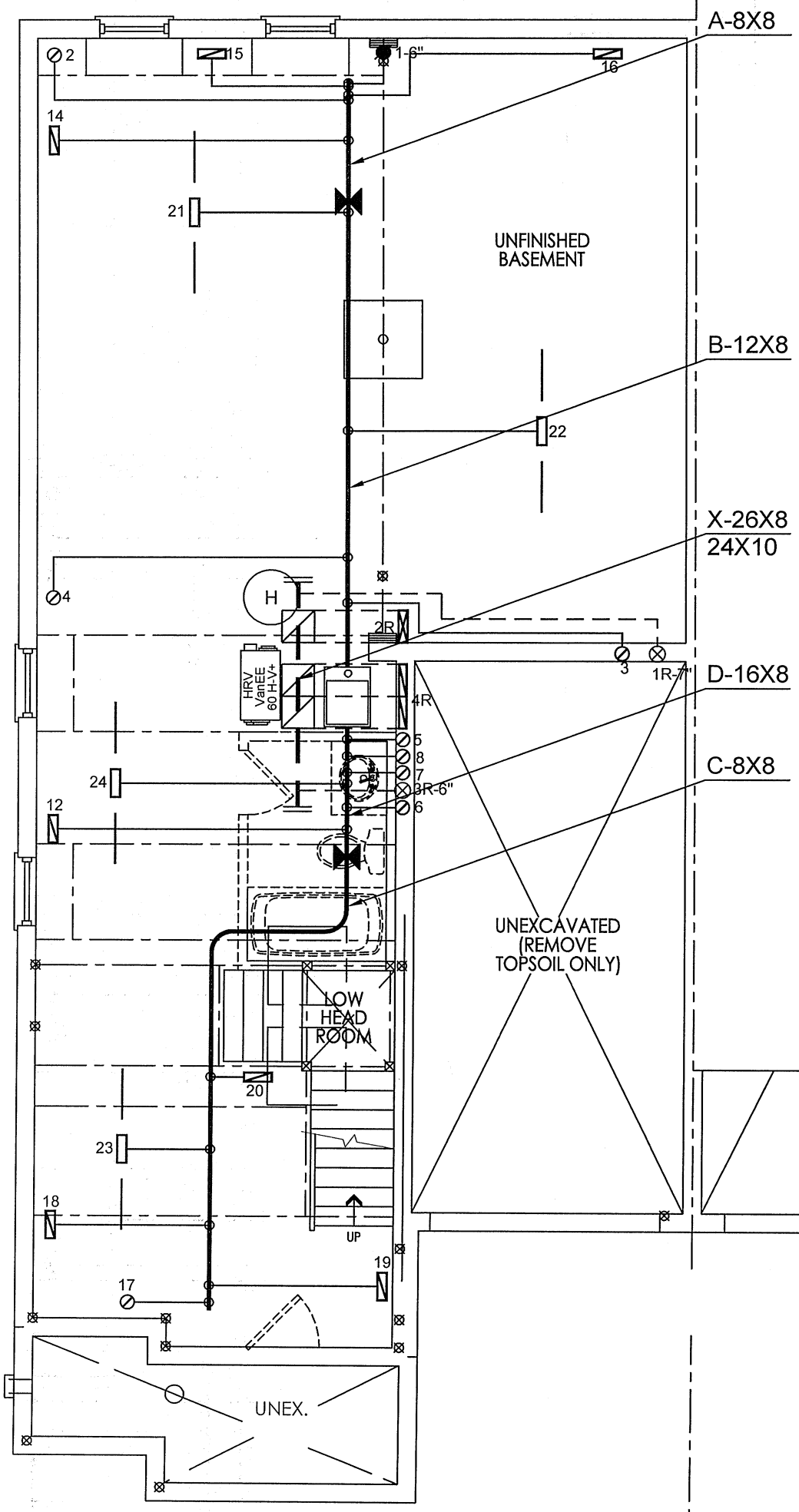
HVAC Designs Ltd.
375 Finley Ave, Suite 202
Ajax ON, L1S 2E2
905-619-2300

Air Infiltration Residential Load Calculator

Supplemental tool for CAN/CSA-F280

Weather Station Description					
Province:	Ontario				
Region:	Brampton				
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):	6.40				
Building Configuration					
Type:	Semi				
Number of Stories:	Two				
Foundation:	Full				
House Volume (m^3):	797.7				
Air Leakage/Ventilation					
Air Tightness Type:	Present (1961-) (3.57 ACH)				
Custom BDT Data:	ELA @ 10 Pa.				1063.3 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):	**0.326**				
Cooling Air Leakage Rate (ACH/H):	**0.112**				

TYPE: SD-7
LO# 72736



BASEMENT FLOOR ELEV. 'A'

BASEMENT 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.

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

ENCORE
BRAMPTON, ONTARIO

SD-7 1979 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 39646 BTU/H	
UNIT DATA	
MAKE	LENNOX
MODEL	EL296UH045XE36B
INPUT	44 MBTU/H
OUTPUT	43 MBTU/H
COOLING	2.5 TONS
FAN SPEED	950 cfm @ 0.6" w.c.

# OF RUNS	S/A	R/A	FANS
3RD FLOOR			
2ND FLOOR	9	3	2
1ST FLOOR	7	1	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

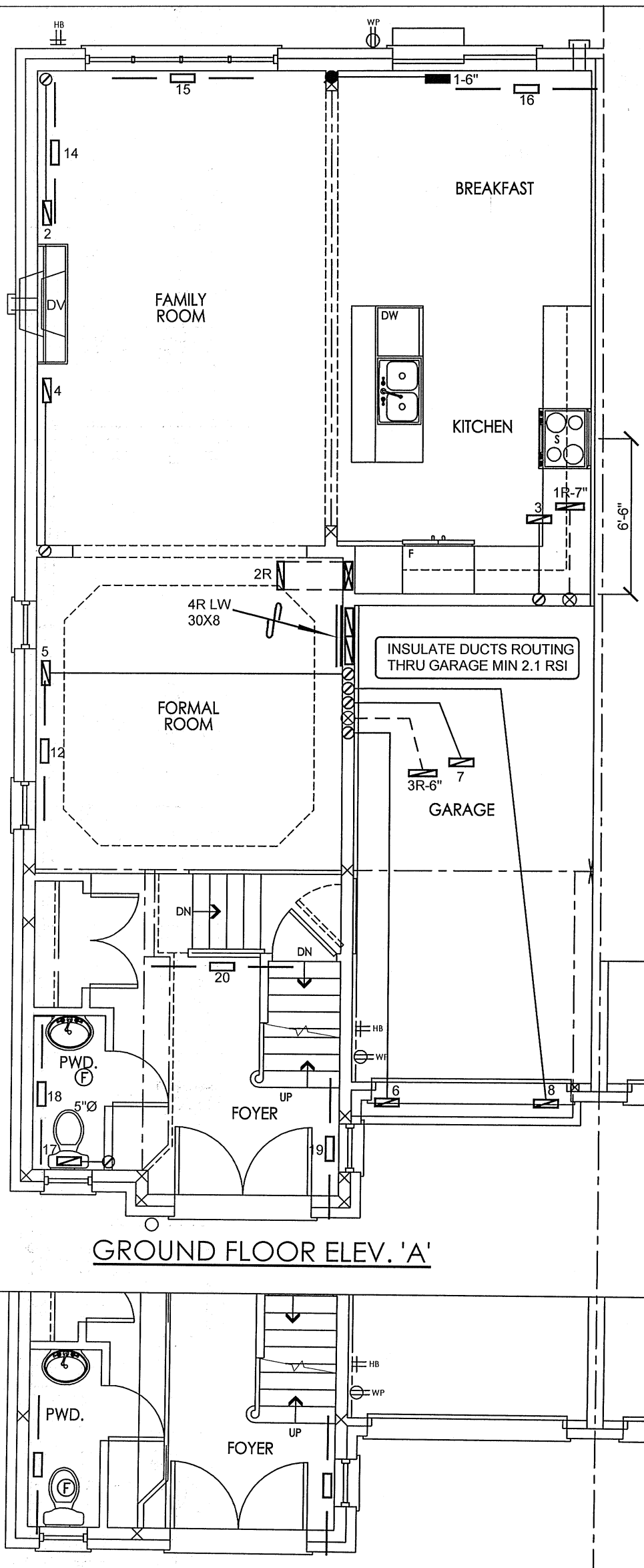
BASEMENT HEATING LAYOUT

Date MAR/2017

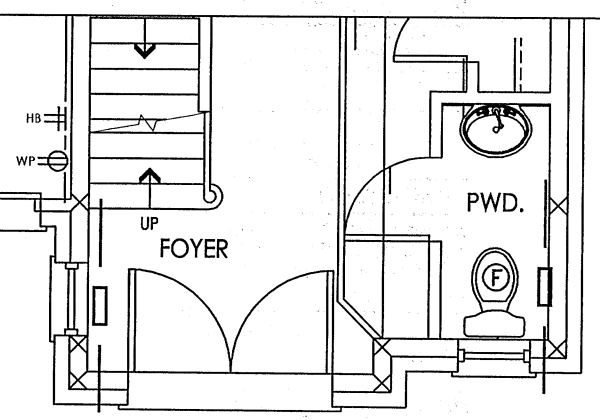
Scale 3/16" = 1'-0"

BCIN# 19669

LO# 72736

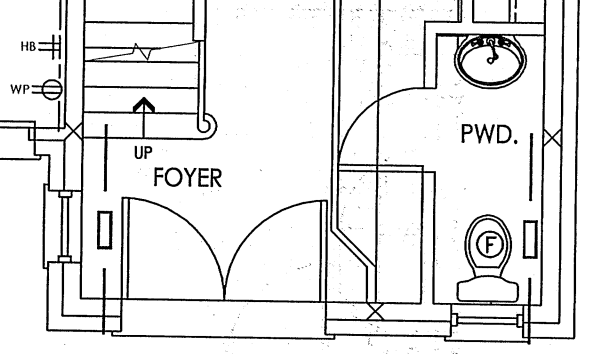


GROUND FLOOR ELEV. 'A'



GROUND FLOOR ELEV. 'B'

PART. GROUND FLOOR ELEV. 'C'



PART. GROUND FLOOR ELEV. 'D'

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CSA-F280-12

PACKAGE A1

HVAC LEGEND

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No.	Description	Date
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GOLD PARK HOMES

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SD-7 1979 sqft

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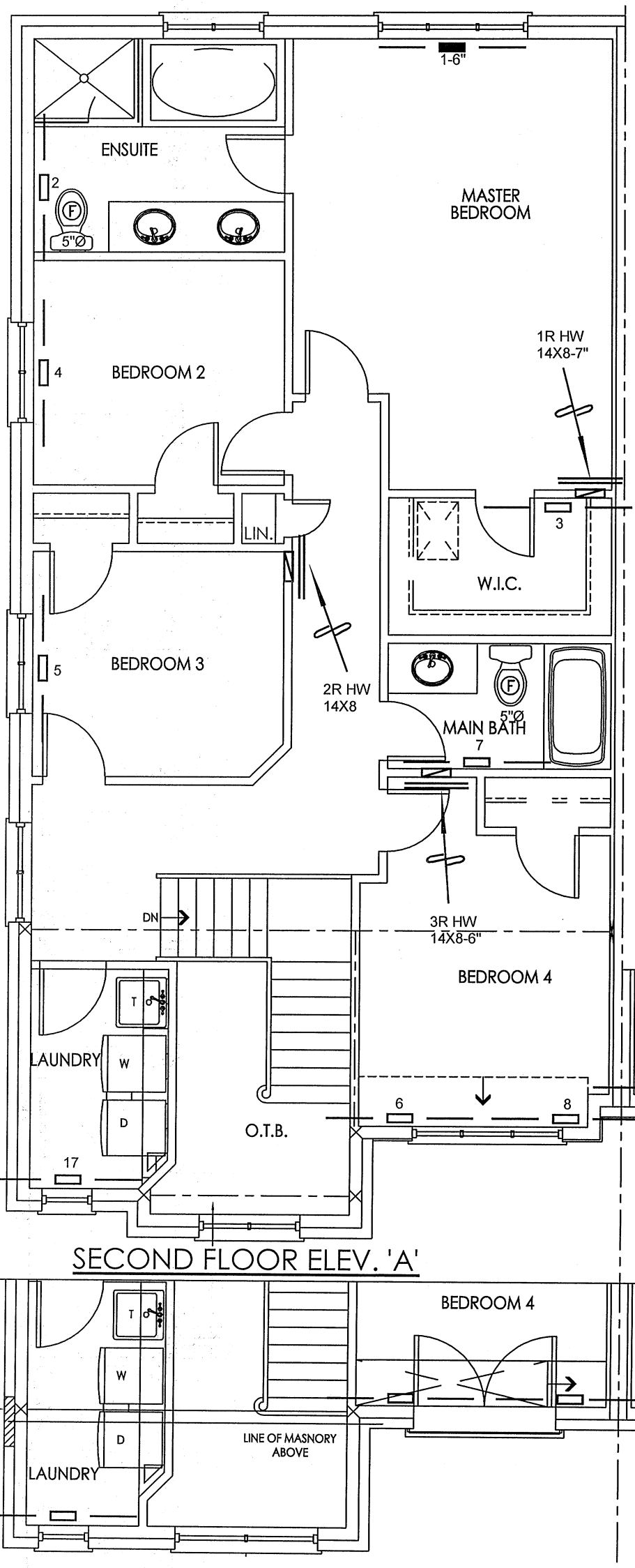
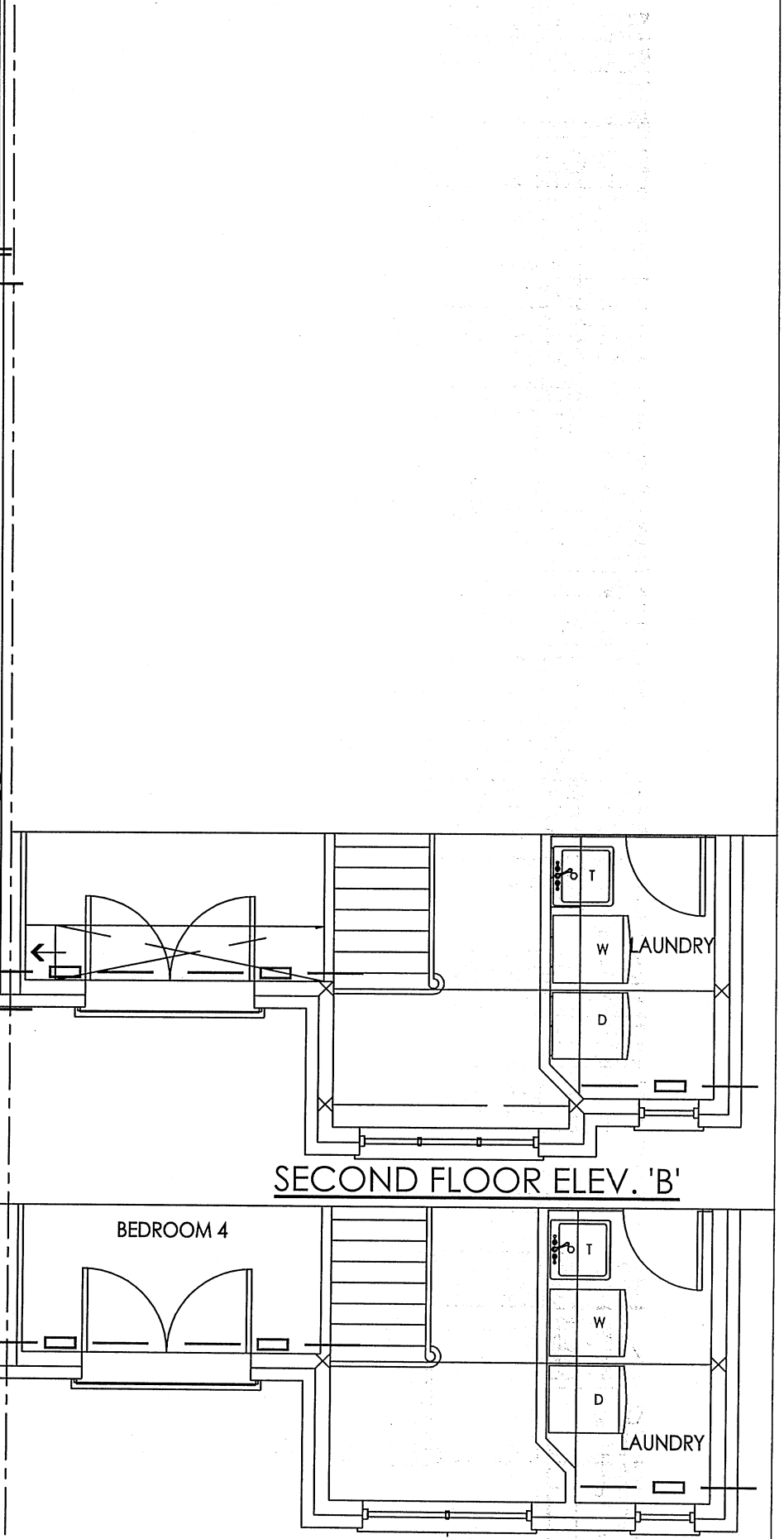
Sheet Title
FIRST FLOOR HEATING LAYOUT

Date MAR/2017
Scale 3/16" = 1'-0"
BCIN# 19669
LO# 72736



SECOND FLOOR ELEV. 'A'



SECOND FLOOR ELEV. 'B'

PART. SECOND FLOOR ELEV. 'C'

PART. SECOND FLOOR ELEV. 'D'

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CSA-F280-12

PACKAGE A1

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Sheet Title

SECOND FLOOR HEATING LAYOUT

Date MAR/2017

Scale 3/16" = 1'-0"

BCIN# 19669

LO# 72736