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**		
VAUGHAN (WOODBRIDGE)				

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:** 5005 - KNIGHTSWOOD **Project:** PINE VALLEY & TESTON

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.

February 25, 2020
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.

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

SITE NAME: PINE VALLEY & TESTON | DATE: Feb-20 | WINTER NATURAL AIR CHANGE RATE 0.350 | HEAT LOSS ΔT °F. 76 | CSA-F280-12
BUILDER: GOLD PARK HOMES | TYPE: 5005 - KNIGHTSWOOD | GFA: 4478 | LO# 77480 | SUMMER NATURAL AIR CHANGE RATE 0.121 | HEAT GAIN ΔT °F. 14 | SB-12 PACKAGE A1

ROOM USE			MBR			ENS			WIC			BED-2			BED-3			BED-4			ENS-2			WIC-2			ENS-3			ENS-4			WIC-3		
EXP. WALL			46			36			13			32			50			19			6			9			4			7			15		
CLG. HT.			11			10			10			11			11			10			10			10			10			10			10		
FACTORS																																			
GRS.WALL AREA	LOSS	GAIN	506			360			130			352			550			190			60			90			40			70			150		
GLAZING				LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN
NORTH	21.3	16.3	0	0	0	0	0	0	6	128	98	18	383	293	0	0	0	0	0	0	8	170	130	0	0	0	0	0	0	0	0	0	0	0	0
EAST	21.3	41.8	0	0	0	0	0	0	0	0	0	70	1490	2928	50	1064	2092	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	20	426	837
SOUTH	21.3	25.2	0	0	0	0	0	0	0	0	0	0	0	0	12	255	302	32	681	806	0	0	0	0	0	0	0	0	0	8	170	201	0	0	0
WEST	21.3	41.8	50	1064	2092	34	724	1422	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
SKYLT.	37.2	102.0	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	0	0	0	0	0	0	0
DOORS	25.2	4.6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
NET EXPOSED WALL	4.5	0.8	456	2035	370	326	1455	264	124	553	100	264	1178	214	488	2178	395	158	705	128	52	232	42	90	402	73	40	179	32	62	277	50	130	580	105
NET EXPOSED BSMT WALL ABOVE GR	3.6	0.7	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	0	0	0	0	0	0
EXPOSED CLG	1.3	0.6	533	684	322	323	415	195	247	317	149	254	326	154	272	349	164	285	366	172	60	77	36	48	62	29	140	180	85	105	135	63	54	69	33
NO ATTIC EXPOSED CLG	2.7	1.3	0	0	0	0	0	0	0	0	0	24	66	31	84	231	109	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	154	393	71	278	709	129	104	265	48	0	0	0	60	153	28	48	122	22	24	61	11	0	0	0	0	0	0
BASEMENT/CRAWL HEAT LOSS				0			0			0			0			0			0			0			0			0			0			0	
SLAB ON GRADE HEAT LOSS				0			0			0			0			0			0			0			0			0			0			0	
SUBTOTAL HT LOSS				3783			2593			1391			4152			4342			1752			632			586			419			582			1075	
SUB TOTAL HT GAIN					2783			1882			419			3748			3111			1106			236			124			128			315			975
LEVEL FACTOR / MULTIPLIER			0.20	0.30		0.20	0.30		0.20	0.30		0.20	0.30		0.20	0.30		0.20	0.30		0.20	0.30		0.20	0.30		0.20	0.30		0.20	0.30		0.20	0.30	
AIR CHANGE HEAT LOSS				1129			774			415			1239			1296			523			189			175			125			174			321	
AIR CHANGE HEAT GAIN					220			149			33			296			246			87			19			10			10			25			77
DUCT LOSS				0			0			181			539			564			0			82			76			54			0			0	
DUCT GAIN					0			0			115			498			429			0			25			13			14			0			0
HEAT GAIN PEOPLE	240		2		480	0		0	0		0	1		240	1		240	1		240	0		0	0		0	0		0	0		0	0		0
HEAT GAIN APPLIANCES/LIGHTS					694			0			694			694			694			694			0			0			0			0			0
TOTAL HT LOSS BTU/H				4912			3367			1986			5930			6202			2275			903			836			599			755			1396	
TOTAL HT GAIN x 1.3 BTU/H					5430			2640			1638			7119			6135			2766			365			192			198			442			1367

ROOM USE			LIB			DIN			KIT/GT			CAB			LAUN			PWD			FOY			MUD									LOD			BAS		
EXP. WALL			31			32			87			45			0			5			35			18									70			240		
CLG. HT.			11			11			11			11			10			11			11			12									10			10		
FACTORS																																						
GRS.WALL AREA	LOSS	GAIN	341			352			957			495			0			55			385			216									700			2100		
GLAZING				LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN							LOSS	GAIN		LOSS	GAIN
NORTH	21.3	16.3	0	0	0	0	0	0	46	979	748	0	0	0	0	0	0	9	192	146	0	0	0	0	0	0							0	0	0	6	128	98
EAST	21.3	41.8	56	1192	2343	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
SOUTH	21.3	25.2	0	0	0	34	724	856	20	426	504	63	1341	1586	0	0	0	0	0	0	0	0	0	0	0	0							0	0	0	6	128	151
WEST	21.3	41.8	0	0	0	0	0	0	115	2447	4811	63	1341	2635	0	0	0	0	0	0	0	0	0	0	0	0							22	468	920	0	0	0
SKYLT.	37.2	102.0	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	0	0	0	0
DOORS	25.2	4.6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	62	1565	284	20	505	92							0	0	0	20	505	92
NET EXPOSED WALL	4.5	0.8	285	1272	231	318	1419	258	776	3463	629	369	1647	299	0	0	0	46	205	37	323	1441	262	196	875	159							0	0	0	0	0	0
NET EXPOSED BSMT WALL ABOVE GR	3.6	0.7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0							398	1432	260	300	1080	196
EXPOSED CLG	1.3	0.6	0	0	0	0	0	0	0	0	0	0	0	0	102	131	62	0	0	0	0	0	0	0	0	0							0	0	0	0	0	0
NO ATTIC EXPOSED CLG	2.7	1.3	0	0	0	0	0	0	0	0	0	203	558	263	0	0	0	40	110	52	41	113	53	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	56	143	26	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			0											8450		
SLAB ON GRADE HEAT LOSS				0			0			0			0			0			0			0			0									0				
SUBTOTAL HT LOSS				2464			2143			7315			4886			274			507			3120			1380									1900			10290		
SUB TOTAL HT GAIN					2574			1114			6691			4784			88			235			599			251									1180			536
LEVEL FACTOR / MULTIPLIER			0.30	0.44		0.30	0.44		0.30	0.44		0.30	0.44		0.20	0.30		0.30	0.44		0.30	0.44		0.30	0.44											0.50	1.32	
AIR CHANGE HEAT LOSS				1091			949			3239			2164			82			224			1382			611												16100		
AIR CHANGE HEAT GAIN					203			88			529			378			7			19			47			20													136
DUCT LOSS				0			0			0			0			36			0			0			0												0		
DUCT GAIN					0			0			0			0			79			0			0			0													0
HEAT GAIN PEOPLE	240		0		0	0		0	0		0	0		0	0		0	0		0	0		0	0		0							0		0	0		0
HEAT GAIN APPLIANCES/LIGHTS					694			694			694			694			694			0			0			694									0			694
TOTAL HT LOSS BTU/H				3555			3092			10554			7050			391			731			4501			1991									1900			26390		
TOTAL HT GAIN x 1.3 BTU/H					4512			2464			10288			7612			1128			330			840			1254									1534			1776

TOTAL HEAT GAIN BTU/H: 60608 TONS: 5.05 LOSS DUE TO VENTILATION LOAD BTU/H: 3181 STRUCTURAL HEAT LOSS: 89316 TOTAL COMBINED HEAT LOSS BTU/H: 92496

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: PINE VALLEY & TESTON
BUILDER: GOLD PARK HOMES

TYPE: 5005 - KNIGHTSWOOD DATE: Feb-20 GFA: 4478 LO# 77480

HEATING CFM	1955		COOLING CFM	1955			furnace pressure	0.6																
TOTAL HEAT LOSS	89,316		TOTAL HEAT GAIN	60,030			furnace filter	0.08																
AIR FLOW RATE CFM	21.89		AIR FLOW RATE CFM	32.57			a/c coil pressure	0.2																
							available pressure																	
							for s/a & r/a	0.32																
							plenum pressure s/a	0.17			r/a pressure	0.15												
							max s/a dif press. loss	0.02			r/a grille press. Loss	0.02												
							min adjusted pressure s/a	0.15			adjusted pressure r/a	0.13												

^LENNOX
EL296UH110XE60C **110**

AFUE = 96 %
INPUT (BTU/H) = 110,000
OUTPUT (BTU/H) = **106,000**

FAN SPEED	
LOW	0
MEDLOW	1380
MEDIUM	1505
MEDIUM HIGH	1685
HIGH	1955

DESIGN CFM = **1955**
CFM @ .6 " E.S.P.

TEMPERATURE RISE 50 °F

RUN COUNT	4th	3rd	2nd	1st	Bas
S/A	0	0	18	13	7
R/A	0	0	5	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	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	ENS-2	WIC-2	ENS-3	MBR	ENS-4	LIB	DIN	KIT/GT	KIT/GT	KIT/GT	LAUN	PWD	FOY	MUD	BAS	BAS	BAS	BAS
RM LOSS MBH.	2.46	2.72	1.99	1.98	3.10	2.27	0.90	0.84	0.60	2.46	0.76	1.78	3.09	2.64	2.64	2.64	0.39	0.73	4.50	1.99	4.04	4.04	4.04	4.04
CFM PER RUN HEAT	54	60	43	43	68	50	20	18	13	54	17	39	68	58	58	58	9	16	99	44	88	88	88	88
RM GAIN MBH.	2.72	2.28	1.64	2.37	3.07	2.77	0.36	0.19	0.20	2.72	0.44	2.26	2.46	2.57	2.57	2.57	1.13	0.33	0.84	1.25	0.47	0.47	0.47	0.47
CFM PER RUN COOLING	88	74	53	77	100	90	12	6	6	88	14	73	80	84	84	84	37	11	27	41	15	15	15	15
ADJUSTED PRESSURE	0.15	0.16	0.16	0.16	0.15	0.15	0.16	0.16	0.16	0.15	0.16	0.16	0.16	0.15	0.15	0.15	0.16	0.16	0.15	0.16	0.15	0.15	0.15	0.15
ACTUAL DUCT LGH.	70	70	53	49	75	48	47	48	53	64	59	57	29	52	69	54	36	73	40	47	67	60	54	38
EQUIVALENT LENGTH	200	200	170	160	170	160	200	150	170	170	150	140	103	120	140	110	200	170	210	160	150	120	103	90
TOTAL EFFECTIVE LENGTH	270	270	223	209	245	208	247	198	223	234	209	197	132	172	209	164	236	243	250	207	217	180	157	128
ADJUSTED PRESSURE	0.05	0.06	0.07	0.07	0.06	0.07	0.06	0.08	0.07	0.06	0.07	0.08	0.12	0.09	0.07	0.09	0.07	0.06	0.06	0.08	0.07	0.08	0.09	0.11
ROUND DUCT SIZE	**6**	**6**	5	**6**	**6**	**6**	4	4	4	**6**	4	5	5	5	**6**	5	4	4	**6**	4	**6**	**6**	5	5
HEATING VELOCITY (ft/min)	275	306	316	219	347	255	229	207	149	275	195	286	499	426	296	426	103	184	505	505	449	449	646	646
COOLING VELOCITY (ft/min)	449	377	389	393	510	459	138	69	69	449	161	536	587	617	428	617	424	126	138	470	76	76	110	110
OUTLET GRILL SIZE	4X10	4X10	3X10	4X10	4X10	4X10	3X10	3X10	3X10	4X10	3X10	3X10	3X10	3X10	4X10	3X10	3X10	3X10	4X10	3X10	4X10	4X10	3X10	3X10
TRUNK	D	C	E	G	F	E	E	G	G	D	E	F	E	D	B	C	G	A	F	C	A	B	D	E

RUN #	25	26	27	28	29	30	31	32	33	34	35	36	37	38
ROOM NAME	BAS	BAS	BED-2	BED-2	BED-3	WIC-3	LIB	KIT/GT	CAB	CAB	CAB	ENS	ENS	BAS
RM LOSS MBH.	4.04	4.04	1.98	1.98	3.10	1.40	1.78	2.64	2.35	2.35	2.35	0.32	0.32	4.04
CFM PER RUN HEAT	88	88	43	43	68	31	39	58	51	51	51	7	7	88
RM GAIN MBH.	0.47	0.47	2.37	2.37	3.07	1.37	2.26	2.57	2.54	2.54	2.54	0.18	0.18	0.47
CFM PER RUN COOLING	15	15	77	77	100	45	73	84	83	83	83	6	6	15
ADJUSTED PRESSURE	0.15	0.15	0.16	0.16	0.15	0.16	0.16	0.15	0.15	0.15	0.15	0.16	0.16	0.15
ACTUAL DUCT LGH.	34	50	52	55	80	63	51	55	69	71	82	56	58	23
EQUIVALENT LENGTH	110	150	170	160	170	200	160	120	150	130	140	200	190	140
TOTAL EFFECTIVE LENGTH	144	200	222	215	250	263	211	175	219	201	222	256	248	163
ADJUSTED PRESSURE	0.1	0.07	0.07	0.07	0.06	0.06	0.07	0.08	0.07	0.07	0.07	0.06	0.06	0.09
ROUND DUCT SIZE	5	**6**	**6**	**6**	**6**	5	5	**6**	**6**	**6**	**6**	4	4	5
HEATING VELOCITY (ft/min)	646	449	219	219	347	228	286	296	260	260	260	80	80	646
COOLING VELOCITY (ft/min)	110	76	393	393	510	330	536	428	423	423	423	69	69	110
OUTLET GRILL SIZE	3X10	4X10	4X10	4X10	4X10	3X10	3X10	4X10	4X10	4X10	4X10	3X10	3X10	3X10
TRUNK	G	F		G	F	F	F	B	A	A	A	C	C	E

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	257	0.06	9.1	10	x	8	463	TRUNK G	646	0.06	12.8	20	x	8	581
TRUNK B	204	0.07	8	8	x	8	459	TRUNK H	1911	0.05	20.1	38	x	10	724
TRUNK C	637	0.06	12.7	20	x	8	573	TRUNK I	0	0.00	0	0	x	8	0
TRUNK D	254	0.05	9.4	10	x	8	457	TRUNK J	0	0.00	0	0	x	8	0
TRUNK E	1265	0.05	17.2	28	x	10	651	TRUNK K	0	0.00	0	0	x	8	0
TRUNK F	432	0.06	11	14	x	8	555	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	1640	0.05	19	34	x	10	695
TRUNK Y	955	0.05	15.5	28	x	8	614
TRUNK Z	480	0.05	12	16	x	8	540
DROP	1955	0.05	20.3	24	x	18	652

RETURN AIR #	1	2	3	4	5	6	7	8								**BR**
	0	0	0	0	2@7"	0	0	0	0	0	0	0	0	0	0	
AIR VOLUME	115	140	115	115	240	200	360	365	0	0	0	0	0	0	0	305
PLENUM PRESSURE	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13
ACTUAL DUCT LGH.	84	51	62	59	47	49	30	51	1	1	1	1	1	1	1	14
EQUIVALENT LENGTH	200	135	195	185	135	140	170	195	0	0	0	0	0	0	0	145
TOTAL EFFECTIVE LH	284	186	257	244	182	189	200	246	1	1	1	1	1	1	1	159
ADJUSTED PRESSURE	0.05	0.07	0.05	0.05	0.07	0.07	0.07	0.05	13.36	13.36	13.36	13.36	13.36	13.36	13.36	0.08
ROUND DUCT SIZE	7	6.9	7	7	8.5	7.9	9.9	10.8	0	0	0	0	0	0	0	9
INLET GRILL SIZE	8	8	8	8	8	8	8	8	0	0	0	0	0	0	0	8
	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
INLET GRILL SIZE	14	14	14	14	30	14	30	30	0	0	0	0	0	0	0	30

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.
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

TYPE: 5005 - KNIGHTSWOOD LO # 77480
SITE NAME: PINE VALLEY & TESTON

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	7	@ 10.6 cfm	74.2	cfm
Other Rooms	7	@ 10.6 cfm	74.2	cfm
Table 9.32.3.A.		TOTAL	222.6	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	222.6	cfm
Less Principal Ventil. Capacity	155	cfm
Required Supplemental Capacity	67.6	cfm

PRINCIPAL EXHAUST FAN CAPACITY

Model: VANEE 65H Location: BSMT

155.0 cfm 3.0 sones [✓] HVI Approved

PRINCIPAL EXHAUST HEAT LOSS CALCULATION

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

SUPPLEMENTAL FANS NUTONE

Location	Model	cfm	HVI	Sones
ENS	QTXEN050C	50	✓	0.3
ENS-2	QTXEN050C	50	✓	0.3
ENS-4	QTXEN050C	50	✓	0.3
PWD	QTXEN050C	50	✓	0.3

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: 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: February-20

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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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#: 77480 Model: 5005 - KNIGHTSWOOD Builder: GOLD PARK HOMES Date: 2020-02-25

Volume Calculation

House Volume

Level	Floor Area (ft²)	Floor Height (ft)	Volume (ft³)
Bsmt	2074	10	20740
First	2074	11	22814
Second	2409	10	24090
Third	0	9	0
Fourth	0	9	0
		Total:	67,644.0 ft³
		Total:	1915.5 m³

Air Change & Delta T Data

WINTER NATURAL AIR CHANGE RATE	0.350
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	23	31	8	14

5.2.3.1 Heat Loss due to Air Leakage

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

0.350 x 532.07 x 42 °C x 1.2 = 9437 W

= **32200 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 532.07 x 8 °C x 1.2 = 592 W

= **2021 Btu/h**

5.2.3.2 Heat Loss due to Mechanical Ventilation

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

155 CFM x 76 °F x 1.08 x 0.25 = **3181 Btu/h**

6.2.7 Sensible heat Gain due to Ventilation

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

155 CFM x 14 °F x 1.08 x 0.25 = **578 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	32,200	12,191	1.321
2	0.3		21,813	0.443
3	0.2		21,580	0.298
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: 5005 - KNIGHTSWOOD **BUILDER:** GOLD PARK HOMES
SFQT: 4478 **LO#** 77480 **SITE:** PINE VALLEY & TESTON

DESIGN ASSUMPTIONS

HEATING	°F	COOLING	°F
OUTDOOR DESIGN TEMP.	-4	OUTDOOR DESIGN TEMP.	88
INDOOR DESIGN TEMP.	72	INDOOR DESIGN TEMP. (MAX 75°F)	74

BUILDING DATA

ATTACHMENT:	DETACHED	# 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):	67644.0	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:	7.0 ft
LENGTH: 75.0 ft	WIDTH: 45.0 ft	EXPOSED PERIMETER:	240.0 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	29.80
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

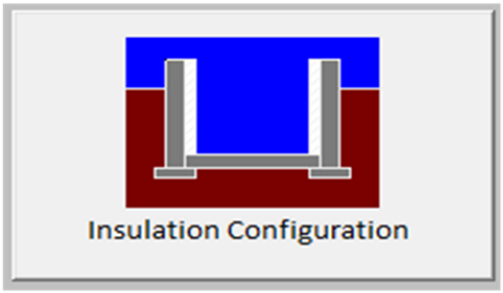


HVAC Designs Ltd.
375 Finley Ave, Suite 202
Ajax ON, L1S 2E2
905-619-2300

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 sand, loam, clay
Water Table:	Normal (7-10 m, 23-33 ft)

Foundation Dimensions		
Floor Length (m):	**22.9**	 Insulation Configuration
Floor Width (m):	**13.7**	
Exposed Perimeter (m):	**0.0**	
Wall Height (m):	**3.0**	
Depth Below Grade (m):	**2.13**	
Window Area (m^2):	**3.2**	
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):	**2476**	

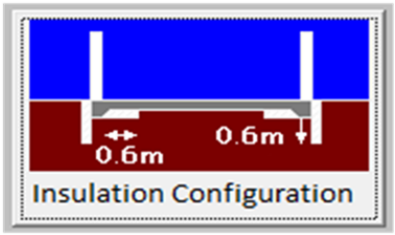
TYPE: 5005 - KNIGHTSWOOD
LO# 77480

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Supplemental tool for CAN/CSA-F280

Weather Station Description	
Province:	Ontario
Region:	Vaughan (Woodbridge)
Site Description	
Soil Conductivity:	Normal conductivity: dry sand, loam, clay
Water Table:	Normal (7-10 m, 23-33 ft)

Foundation Dimensions		
Length (m):	**0.0**	
Width (m):	**0.0**	
Exposed Perimeter (m):	**0.0**	

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

Results	
Heating Load (Watts):	**0**

TYPE: 5005 - KNIGHTSWOOD
LO# 77480

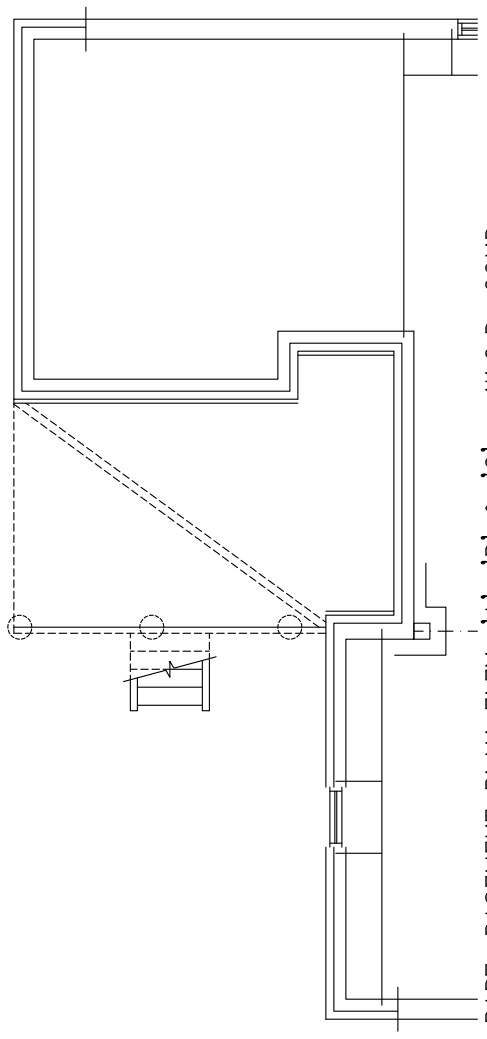
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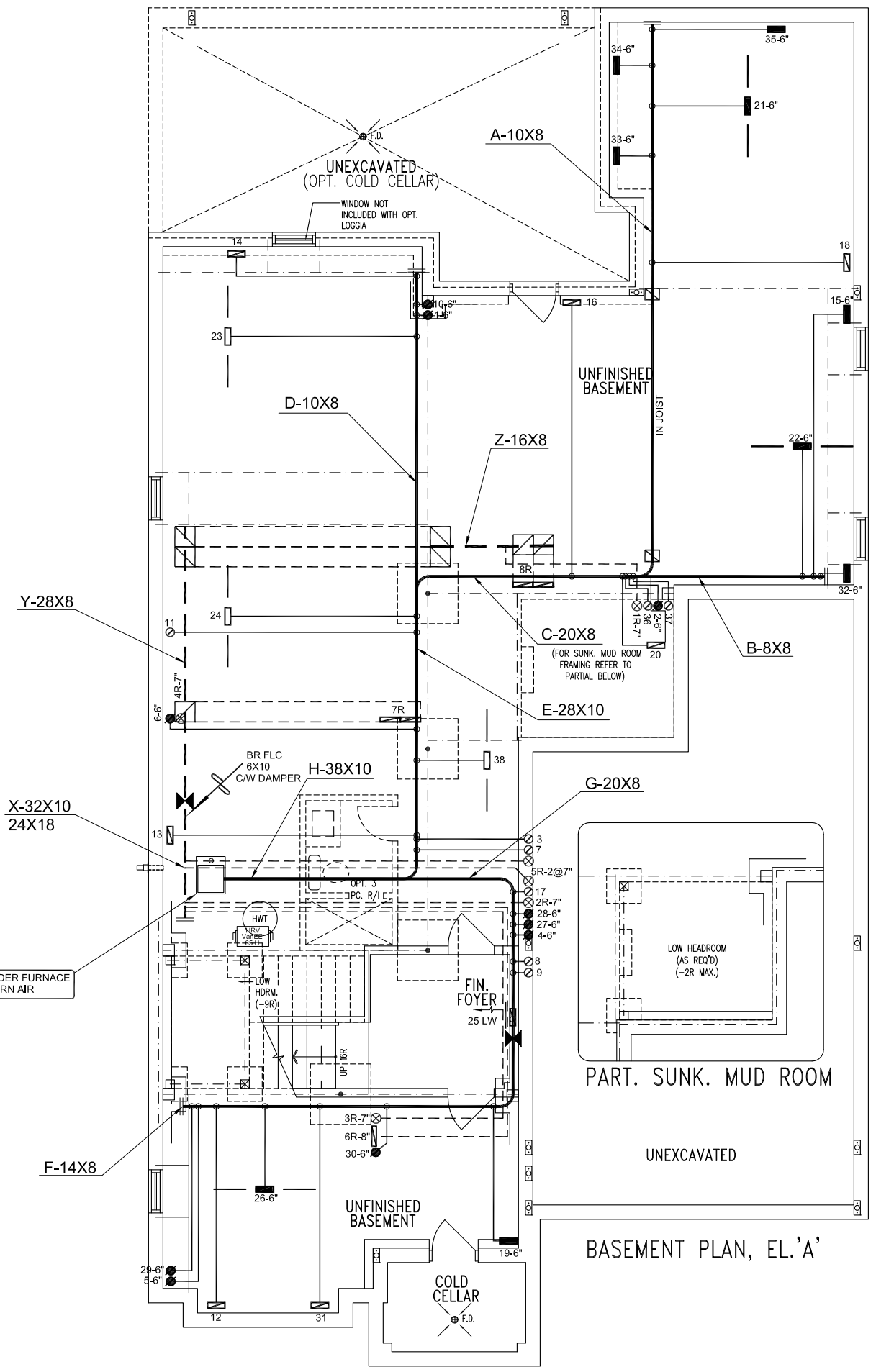
Air Infiltration Residential Load Calculator

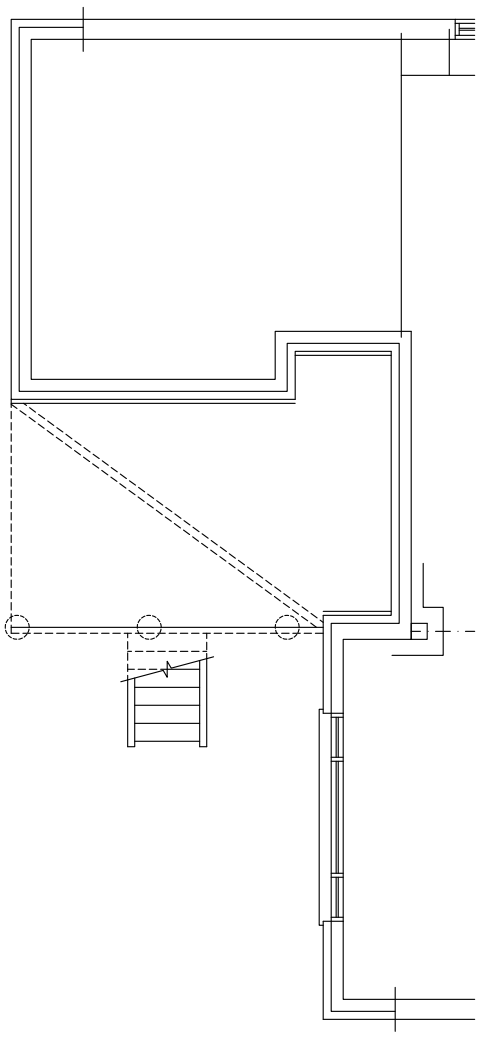
Supplemental tool for CAN/CSA-F280

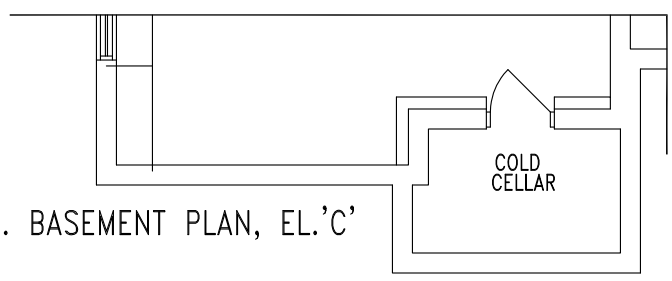
Weather Station Description	
Province:	Ontario
Region:	Vaughan (Woodbridge)
Weather Station Location:	Open flat terrain, grass
Anemometer height (m):	10
Local Shielding	
Building Site:	Suburban, forest
Walls:	Heavy
Flue:	Heavy
Highest Ceiling Height (m):	7.32
Building Configuration	
Type:	Detached
Number of Stories:	Two
Foundation:	Full
House Volume (m^3):	1915.5
Air Leakage/Ventilation	
Air Tightness Type:	Present (1961-) (3.57 ACH)
Custom BDT Data:	ELA @ 10 Pa. 2553.4 cm^2
	3.57 ACH @ 50 Pa
Mechanical Ventilation (L/s):	Total Supply 73.2 / Total Exhaust 73.2
Flue Size	
Flue #:	#1 #2 #3 #4
Diameter (mm):	0 0 0 0
Natural Infiltration Rates	
Heating Air Leakage Rate (ACH/H):	**0.350**
Cooling Air Leakage Rate (ACH/H):	**0.121**

TYPE: 5005 - KNIGHTSWOOD
LO# 77480









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

REVISIONS

No.	Description	Date
3.	REVISED AS PER ARCHITECTURALS	FEB/2020
2.	3R RELOCATED	NOV/2018
1.	DECK CONDITIONS ADDED	SEPT/2018

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Client
GOLDPARK HOMES

Project Name
PINE VALLEY & TESTON
VAUGHAN, ONTARIO

KNIGHTSWOOD
5005 4472 sqft

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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 92496 BTU/H

UNIT DATA

MAKE	LENNOX	
MODEL	EL296UH110XE60C	
INPUT	110	MBTU/H
OUTPUT	106	MBTU/H
COOLING	5.0	TONS
FAN SPEED	1955	cfm @ 0.6" w.c.

# OF RUNS	S/A	R/A	FANS
3RD FLOOR			
2ND FLOOR	18	5	7
1ST FLOOR	13	3	3
BASEMENT	7	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

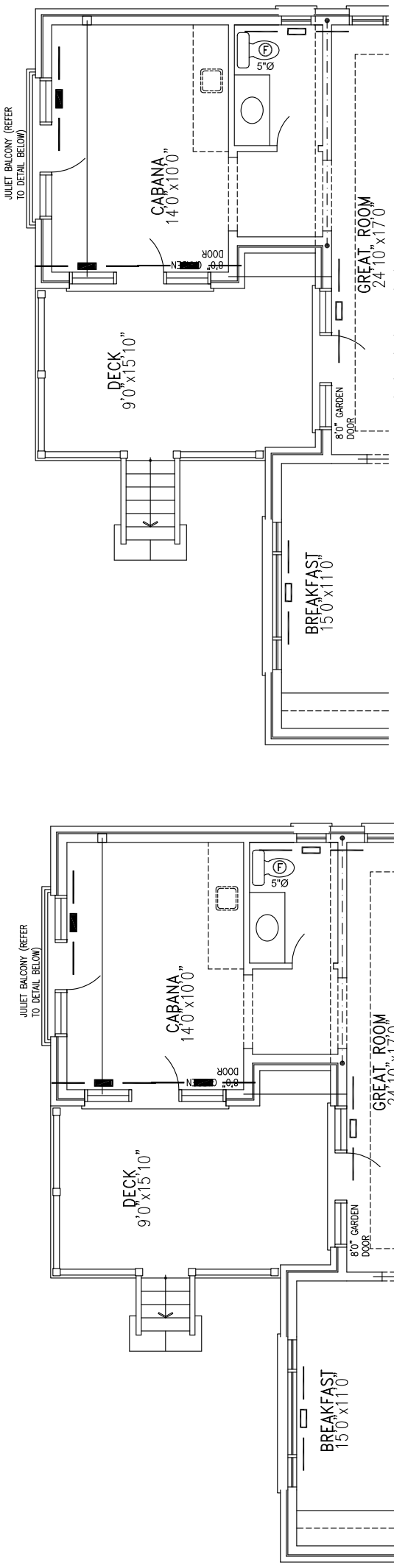
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BASEMENT HEATING LAYOUT

Date JAN/2018

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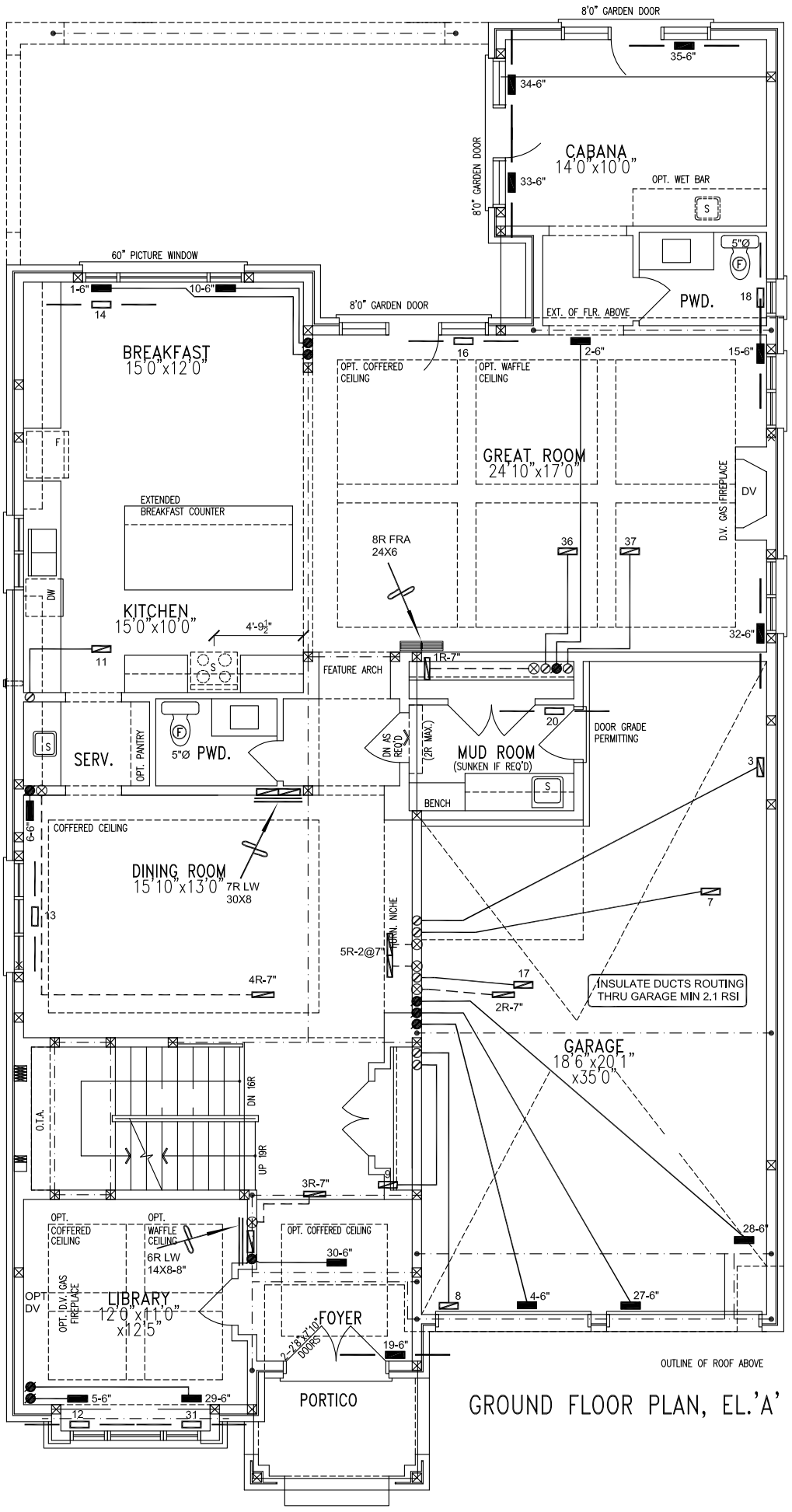
BCIN# 19669

LO# 77480

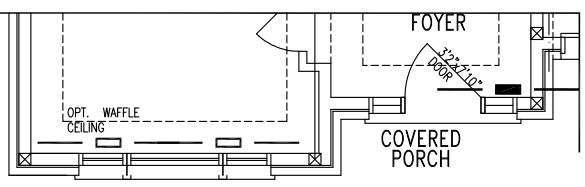


PART. GROUND FLOOR PLAN ELEV. 'A', 'B' & 'C' - L.O.D. COND.

PART. GROUND FLOOR PLAN ELEV. 'A', 'B' & 'C' - W.O.D. COND.



GROUND FLOOR PLAN, EL.'A'



PART. GROUND FLOOR PLAN, EL.'C'

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— ▬ —	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.	REVISED AS PER ARCHITECTURALS	FEB/2020
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GOLDPARK HOMES

Project Name

PINE VALLEY & TESTON
VAUGHAN, ONTARIO

KNIGHTSWOOD
5005 4472 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

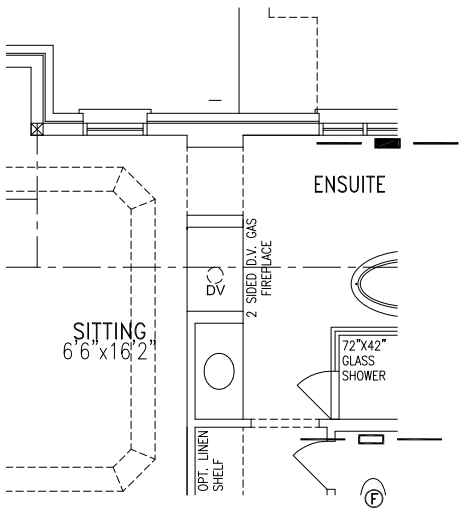
FIRST FLOOR HEATING LAYOUT

Date JAN/2018

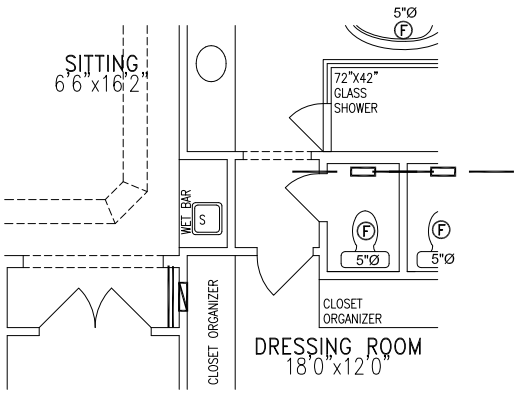
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BCIN# 19669

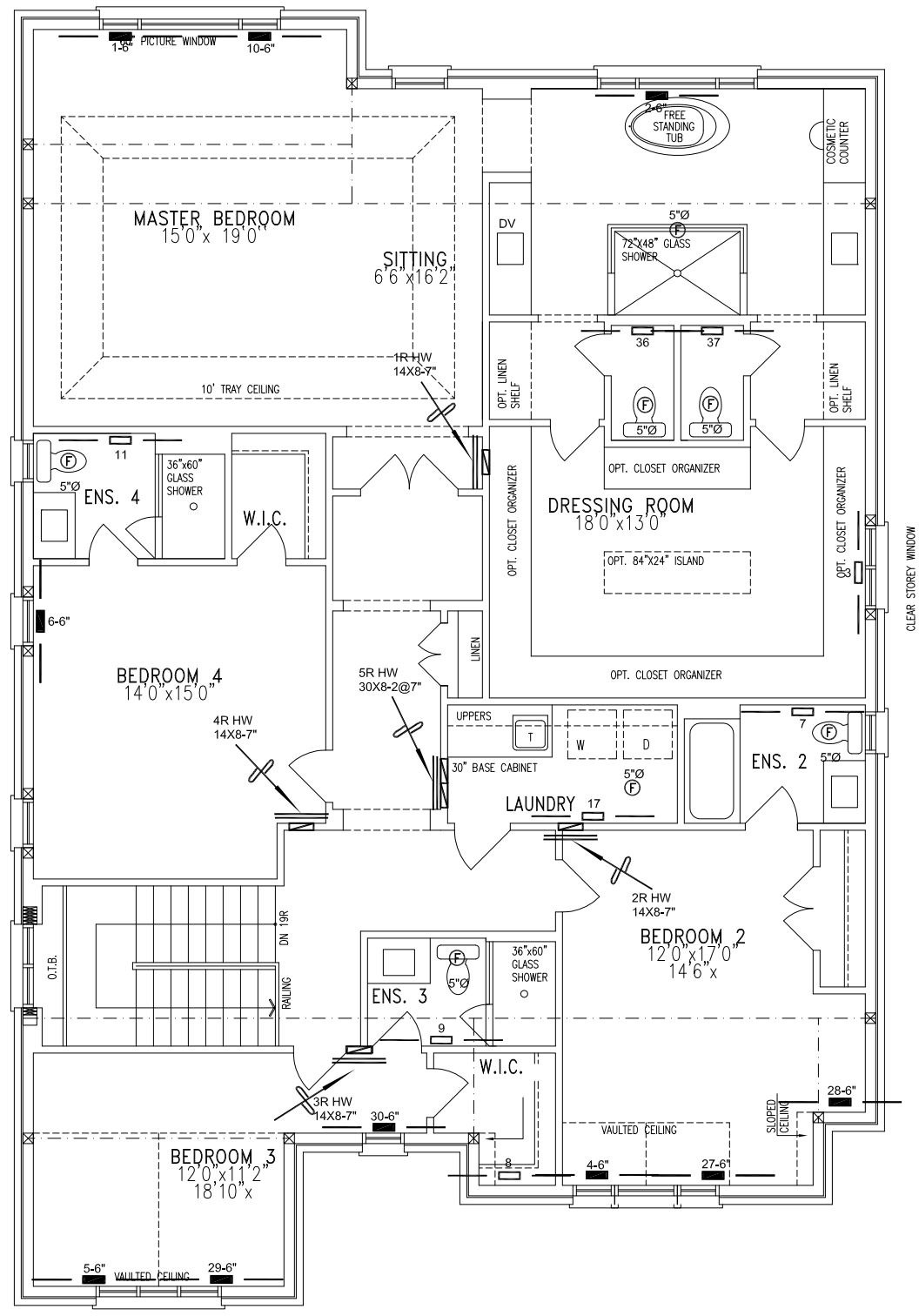
LO# 77480



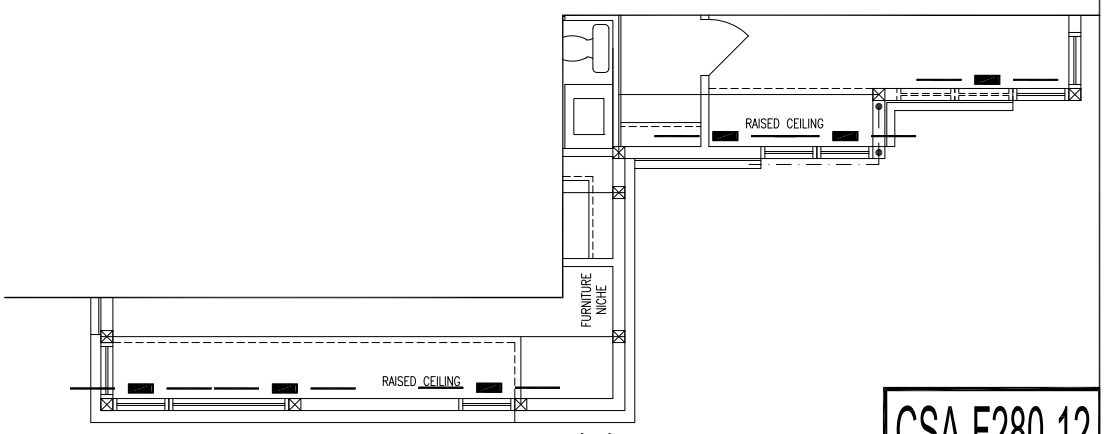
PART. SECOND FLOOR PLAN
OPT. SITTING AREA FIREPLACE



PART. SECOND FLOOR PLAN
OPT. SITTING AREA WET BAR



SECOND FLOOR PLAN, EL.'A'



PART. SECOND FLOOR PLAN, EL.'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

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

REVISIONS

No.	Description	Date
3.	REVISED AS PER ARCHITECTURALS	FEB/2020
2.	3R RELOCATED	NOV/2018
1.	DECK CONDITIONS ADDED	SEPT/2018

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Client
GOLDPARK HOMES

Project Name
PINE VALLEY & TESTON
VAUGHAN, ONTARIO

KNIGHTSWOOD
5005 4472 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.

Sheet Title
SECOND FLOOR HEATING LAYOUT

Date JAN/2018
Scale 1/8" = 1'-0"
BCIN# 19669
LO# 77480

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**		
VAUGHAN (WOODBRIDGE)				

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:** 5005 - KNIGHTSWOOD OPT. 5 BED **Project:** PINE VALLEY & TESTON

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.

September 10, 2018
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.

HVAC DESIGNS LTD.

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

SITE NAME: PINE VALLEY & TESTON | OPT. 5 BED | DATE: Sep-18 | WINTER NATURAL AIR CHANGE RATE 0.350 | HEAT LOSS ΔT °F. 76 | CSA-F280-12
BUILDER: GOLD PARK HOMES | TYPE: 5005 - KNIGHTSWOOD | GFA: 4472 | LO# 77481 | SUMMER NATURAL AIR CHANGE RATE 0.118 | HEAT GAIN ΔT °F. 13 | SB-12 PACKAGE A1

ROOM USE			MBR			ENS			WIC			BED-2			BED-3			BED-4			ENS-2			WIC-2			ENS-3			ENS-4			BED-5		
EXP. WALL			45			29			6			34			37			26			6			9			4			7			14		
CLG. HT.			11			10			10			11			11			10			10			10			10			10			10		
FACTORS																																		
GRS.WALL AREA	LOSS	GAIN	495			290			60			374			407			260			60			90			40			70			140		
GLAZING				LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN
NORTH	21.3	16.0	0	0	0	0	0	0	0	0	0	18	383	288	0	0	0	0	0	0	8	170	128	0	0	0	0	0	0	0	0	0	18	383	288
EAST	21.3	41.6	0	0	0	0	0	0	0	0	0	70	1490	2909	73	1553	3033	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
SOUTH	21.3	24.9	0	0	0	0	0	0	0	0	0	0	0	0	28	596	697	32	681	797	0	0	0	0	0	0	0	0	0	8	170	199	0	0	0
WEST	21.3	41.6	50	1064	2078	34	724	1413	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
SKYLT.	37.2	101.5	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	0	0	0	0	0	0
DOORS	25.2	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	0	0	0	0	0	0
NET EXPOSED WALL	4.5	0.8	445	1986	334	256	1142	192	60	268	45	286	1276	215	306	1366	230	228	1017	171	52	232	39	90	402	68	40	179	30	62	277	47	122	544	92
NET EXPOSED BSMT WALL ABOVE GR	3.6	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	0	0	0	0	0	0	0	0	0
EXPOSED CLG	1.3	0.6	440	565	269	204	262	120	102	131	60	216	277	127	256	329	150	396	508	233	60	77	35	48	62	28	140	180	82	105	135	62	364	467	214
NO ATTIC EXPOSED CLG	2.7	1.3	0	0	0	0	0	0	0	0	0	24	66	30	84	231	106	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	240	612	103	104	265	45	0	0	0	60	153	26	48	122	21	140	357	60	0	0	0	154	393	66
BASEMENT/CRAWL HEAT LOSS				0			0			0			0			0			0			0			0			0			0			0	
SLAB ON GRADE HEAT LOSS				0			0			0			0			0			0			0			0			0			0			0	
SUBTOTAL HT LOSS				3615			2128			399			4104			4340			2207			632			586			715			582			1787	
SUB TOTAL HT GAIN					2671			1725			105			3671			4261			1201			228			116			172			307			669
LEVEL FACTOR / MULTIPLIER			0.20	0.30		0.20	0.30		0.20	0.30		0.20	0.30		0.20	0.30		0.20	0.30		0.20	0.30		0.20	0.30		0.20	0.30		0.20	0.30		0.20	0.30	
AIR CHANGE HEAT LOSS				1080			636			119			1227			1297			660			189			175			214			174			534	
AIR CHANGE HEAT GAIN					191			123			7			262			304			86			16			8			12			22			47
DUCT LOSS				0			0			0			533			564			0			82			76			93			0			232	
DUCT GAIN					0			0			0			481			544			0			24			12			18			0			158
HEAT GAIN PEOPLE	240		2		480	0		0	0		0	1		240	1		240	1		240	0		0	0		0	0		0	0		0	1		240
HEAT GAIN APPLIANCES/LIGHTS					635			0			635			635			635			635			0			0			0			0			635
TOTAL HT LOSS BTU/H				4695			2764			518			5864			6200			2866			903			837			1022			756			2554	
TOTAL HT GAIN x 1.3 BTU/H					5170			2403			972			6877			7781			2811			349			178			264			428			2262

ROOM USE			LIB			DIN			KIT/GT			CAB			LAUN			PWD			FOY			MUD									LOD			BAS		
EXP. WALL			31			32			87			45			0			5			35			18									52			238		
CLG. HT.			11			11			11			11			10			11			11			12									10			10		
FACTORS																																						
GRS.WALL AREA	LOSS	GAIN	341			352			957			495			0			55			385			216									520			1978		
GLAZING				LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN							LOSS	GAIN		LOSS	GAIN
NORTH	21.3	16.0	0	0	0	0	0	0	46	979	735	0	0	0	0	0	0	9	192	144	0	0	0	0	0	0							0	0	0	6	128	96
EAST	21.3	41.6	56	1192	2327	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
SOUTH	21.3	24.9	0	0	0	34	724	847	20	426	498	63	1341	1569	0	0	0	0	0	0	0	0	0	0	0	0							0	0	0	6	128	149
WEST	21.3	41.6	0	0	0	0	0	0	115	2447	4778	63	1341	2618	0	0	0	0	0	0	0	0	0	0	0	0							22	468	914	0	0	0
SKYLT.	37.2	101.5	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	0	0	0
DOORS	25.2	4.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	62	1565	264	20	505	85							0	0	0	20	505	85
NET EXPOSED WALL	4.5	0.8	285	1272	214	318	1419	239	776	3463	583	369	1647	277	0	0	0	46	205	35	323	1441	243	196	875	147							0	0	0	0	0	0
NET EXPOSED BSMT WALL ABOVE GR	3.6	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							280	1044	176	402	1447	244
EXPOSED CLG	1.3	0.6	0	0	0	0	0	0	0	0	0	0	0	0	102	131	60	0	0	0	0	0	0	0	0	0							0	0	0	0	0	0
NO ATTIC EXPOSED CLG	2.7	1.3	0	0	0	0	0	0	0	0	0	203	558	255	0	0	0	40	110	50	41	113	52	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	56	143	24	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			0											8373		
SLAB ON GRADE HEAT LOSS				0			0			0			0			0			0			0			0									0				
SUBTOTAL HT LOSS				2464			2143			7315			4886			274			507			3120			1380									1512			10580		
SUB TOTAL HT GAIN					2541			1086			6595			4719			84			229			558			232									1090			574
LEVEL FACTOR / MULTIPLIER			0.30	0.44		0.30	0.44		0.30	0.44		0.30	0.44		0.20	0.30		0.30	0.44		0.30	0.44		0.30	0.44										0.50	1.32	
AIR CHANGE HEAT LOSS				1082			941			3213			2146			82			223			1370			606											15966		
AIR CHANGE HEAT GAIN					181			78			471			337			6			16			40			17													119
DUCT LOSS				0			0			0			0			36			0			0			0											0		
DUCT GAIN					0			0			0			0			73			0			0			0												0
HEAT GAIN PEOPLE	240		0		0	0		0	0		0	0		0	0		0	0		0	0		0	0		0							0		0	0		0
HEAT GAIN APPLIANCES/LIGHTS					635			635			635			635			635			0			0			635											0		635
TOTAL HT LOSS BTU/H				3546			3084			10527			7032			391			729			4490			1986									1512			26546		
TOTAL HT GAIN x 1.3 BTU/H					4365			2338			10011			7399			1037			319			777			1150									1417			1727

TOTAL HEAT GAIN BTU/H: 60572 TONS: 5.05 LOSS DUE TO VENTILATION LOAD BTU/H: 3181 STRUCTURAL HEAT LOSS: 88820 TOTAL COMBINED HEAT LOSS BTU/H: 92001

I REVIEW AND TAKE RESPONSIBILITY FOR THE DESIGN WORK AND AM QUALIFIED IN THE APPROPRIATE CATEGORY AS AN "OTHER DESIGNER" UNDER DIVISION C, 3.2.5 OF THE BUILDING CODE.

Michael O'Rourke.

INDIVIDUAL BCIN: 19669 MICHAEL O'ROURKE

HVAC DESIGNS LTD.

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SITE NAME: PINE VALLEY & TESTON — OPT. 5 BED
BUILDER: GOLD PARK HOMES — TYPE: 5005 - KNIGHTSWOOD — DATE: Nov-18 — GFA: 4472 — LO# 77481

HEATING CFM	1955		COOLING CFM	1955		furnace pressure	0.6																	
TOTAL HEAT LOSS	88,820		TOTAL HEAT GAIN	60,036		furnace filter	0.08																	
AIR FLOW RATE CFM	22.01		AIR FLOW RATE CFM	32.56		a/c coil pressure	0.2																	
						available pressure																		
						for s/a & r/a	0.32																	
						plenum pressure s/a	0.17		r/a pressure	0.15														
						max s/a dif press. loss	0.02		r/a grille press. Loss	0.02														
						min adjusted pressure s/a	0.15		adjusted pressure r/a	0.13														

^LENNOX
EL296UH110XE60C 110
AFUE = 96 %
INPUT (BTU/H) = 110,000
OUTPUT (BTU/H) = **106,000**

FAN SPEED	
LOW	0
MEDLOW	1380
MEDIUM	1505
MEDIUM HIGH	1685
HIGH	1955

DESIGN CFM = **1955** CFM @ .6 " E.S.P.
TEMPERATURE RISE 50 °F

RUN COUNT	4th	3rd	2nd	1st	Bas
S/A	0	0	18	13	7
R/A	0	0	6	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	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
ROOM NAME	MBR	ENS	BED-5	BED-2	BED-3	BED-4	ENS-2	WIC-2	ENS-3	MBR	ENS-4	LIB	DIN	KIT/GT	KIT/GT	KIT/GT	LAUN	PWD	FOY	MUD	BAS	BAS	BAS	BAS
RM LOSS MBH.	2.35	2.18	2.55	1.95	2.07	2.87	0.90	0.84	1.02	2.35	0.76	1.77	3.08	2.63	2.63	2.63	0.39	0.73	4.49	1.99	4.01	4.01	4.01	4.01
CFM PER RUN HEAT	52	48	56	43	45	63	20	18	22	52	17	39	68	58	58	58	9	16	99	44	88	88	88	88
RM GAIN MBH.	2.58	1.90	2.26	2.29	2.59	2.81	0.35	0.18	0.26	2.58	0.43	2.18	2.34	2.50	2.50	2.50	1.04	0.32	0.78	1.15	0.45	0.45	0.45	0.45
CFM PER RUN COOLING	84	62	74	75	84	92	11	6	9	84	14	71	76	81	81	81	34	10	25	37	15	15	15	15
ADJUSTED PRESSURE	0.15	0.16	0.16	0.16	0.15	0.15	0.16	0.16	0.16	0.15	0.16	0.16	0.16	0.15	0.15	0.15	0.16	0.16	0.15	0.16	0.15	0.15	0.15	0.15
ACTUAL DUCT LGH.	70	70	53	49	75	48	47	48	53	64	59	57	29	52	69	54	36	73	40	47	67	60	54	38
EQUIVALENT LENGTH	200	200	170	160	170	160	200	150	170	170	150	140	103	120	140	110	200	170	210	160	150	120	103	90
TOTAL EFFECTIVE LENGTH	270	270	223	209	245	208	247	198	223	234	209	197	132	172	209	164	236	243	250	207	217	180	157	128
ADJUSTED PRESSURE	0.05	0.06	0.07	0.07	0.06	0.07	0.06	0.08	0.07	0.06	0.07	0.08	0.12	0.09	0.07	0.09	0.07	0.06	0.06	0.08	0.07	0.08	0.09	0.11
ROUND DUCT SIZE	**6**	5	5	5	**6**	**6**	4	4	4	**6**	4	5	5	5	**6**	5	4	4	**6**	4	**6**	**6**	5	5
HEATING VELOCITY (ft/min)	265	352	411	316	229	321	229	207	252	265	195	286	499	426	296	426	103	184	505	505	449	449	646	646
COOLING VELOCITY (ft/min)	428	455	543	551	428	469	126	69	103	428	161	521	558	595	413	595	390	115	127	424	76	76	110	110
OUTLET GRILL SIZE	4X10	3X10	3X10	3X10	4X10	4X10	3X10	3X10	3X10	4X10	3X10	3X10	3X10	3X10	4X10	3X10	3X10	3X10	4X10	3X10	4X10	4X10	3X10	3X10
TRUNK	D	C	E	G	F	E	E	G	G	D	E	F	E	D	B	C	G	A	F	C	A	B	D	E

RUN #	25	26	27	28	29	30	31	32	33	34	35	36	37	38
ROOM NAME	BAS	BAS	BED-2	BED-2	BED-3	BED-3	LIB	KIT/GT	CAB	CAB	CAB	WIC	ENS	BAS
RM LOSS MBH.	4.01	4.01	1.95	1.95	2.07	2.07	1.77	2.63	2.34	2.34	2.34	0.52	0.58	4.01
CFM PER RUN HEAT	88	88	43	43	45	45	39	58	52	52	52	11	13	88
RM GAIN MBH.	0.45	0.45	2.29	2.29	2.59	2.59	2.18	2.50	2.47	2.47	2.47	0.97	0.50	0.45
CFM PER RUN COOLING	15	15	75	75	84	84	71	81	80	80	80	32	16	15
ADJUSTED PRESSURE	0.15	0.15	0.16	0.16	0.15	0.15	0.16	0.15	0.16	0.16	0.16	0.16	0.16	0.15
ACTUAL DUCT LGH.	34	50	52	55	80	63	51	55	69	71	82	56	58	23
EQUIVALENT LENGTH	110	150	170	160	170	200	160	120	150	130	140	200	190	140
TOTAL EFFECTIVE LENGTH	144	200	222	215	250	263	211	175	219	201	222	256	248	163
ADJUSTED PRESSURE	0.1	0.07	0.07	0.07	0.06	0.06	0.07	0.08	0.07	0.08	0.07	0.06	0.06	0.09
ROUND DUCT SIZE	5	**6**	5	5	**6**	**6**	5	5	**6**	5	**6**	4	4	5
HEATING VELOCITY (ft/min)	646	449	316	316	229	229	286	426	265	382	265	126	149	646
COOLING VELOCITY (ft/min)	110	76	551	551	428	428	521	595	408	587	408	367	184	110
OUTLET GRILL SIZE	3X10	4X10	3X10	3X10	4X10	4X10	3X10	3X10	4X10	3X10	4X10	3X10	3X10	3X10
TRUNK	G	F	G	G	F	F	F	B	A	A	A	C	C	E

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	260	0.06	9.1	10	x	8	468	TRUNK G	666	0.06	12.9	20	x	8	599
TRUNK B	204	0.07	8	8	x	8	459	TRUNK H	1955	0.05	20.3	38	x	10	741
TRUNK C	638	0.06	12.7	18	x	8	638	TRUNK I	0	0.00	0	0	x	8	0
TRUNK D	250	0.05	9.4	10	x	8	450	TRUNK J	0	0.00	0	0	x	8	0
TRUNK E	1288	0.05	17.3	28	x	10	662	TRUNK K	0	0.00	0	0	x	8	0
TRUNK F	400	0.06	10.7	14	x	8	514	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	1515	0.05	18.4	32	x	10	682
TRUNK Y	880	0.05	15	26	x	8	609
TRUNK Z	415	0.05	11.3	14	x	8	534
DROP	1955	0.05	20.3	24	x	18	652

RETURN AIR #	1	2	3	4	5	6	7	8	9							BR
	0	0	0	0	2@7"	0	0	0	0	0	0	0	0	0	0	
AIR VOLUME	115	140	115	115	280	185	350	300	85	0	0	0	0	0	0	270
PLENUM PRESSURE	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13
ACTUAL DUCT LGH.	84	51	62	59	47	49	30	51	49	1	1	1	1	1	1	14
EQUIVALENT LENGTH	200	135	195	185	135	140	170	195	175	0	0	0	0	0	0	145
TOTAL EFFECTIVE LH	284	186	257	244	182	189	200	246	224	1	1	1	1	1	1	159
ADJUSTED PRESSURE	0.05	0.07	0.05	0.05	0.07	0.07	0.07	0.05	0.06	13.36	13.36	13.36	13.36	13.36	13.36	0.08
ROUND DUCT SIZE	7	6.9	7	7	9	7.7	9.8	10.1	6	0	0	0	0	0	0	8.6
INLET GRILL SIZE	8	8	8	8	8	8	8	8	8	0	0	0	0	0	0	8
	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
INLET GRILL SIZE	14	14	14	14	30	14	30	30	14	0	0	0	0	0	0	30

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Michael O'Rourke — INDIVIDUAL BCIN: 19669 MICHAEL O'ROURKE

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TYPE: 5005 - KNIGHTSWOOD LO # 77481
SITE NAME: PINE VALLEY & TESTON OPT. 5 BED

RESIDENTIAL MECHANICAL VENTILATION DESIGN SUMMARY

COMBUSTION APPLIANCES 9.32.3.1(1)

- a) [✓] Direct vent (sealed combustion) only
- b) [ ] Positive venting induced draft (except fireplaces)
- c) [ ] Natural draft, B-vent or induced draft gas fireplace
- d) [ ] Solid Fuel (including fireplaces)
- e) [ ] No Combustion Appliances

HEATING SYSTEM

[✓] Forced Air [ ] Non Forced Air

[ ] Electric Space Heat

HOUSE TYPE 9.32.1(2)

- [✓] I Type a) or b) appliance only, no solid fuel
- [ ] II Type I except with solid fuel (including fireplaces)
- [ ] III Any Type c) appliance
- [ ] IV Type I, or II with electric space heat
- [ ] Other: Type I, II or IV no forced air

SYSTEM DESIGN OPTIONS O.N.H.W.P.

- [ ] 1 Exhaust only/Forced Air System
- [ ] 2 HRV with Ducting/Forced Air System
- [✓] 3 HRV Simplified/connected to forced air system
- [ ] 4 HRV with Ducting/non forced air system
- [ ] Part 6 Design

TOTAL VENTILATION CAPACITY 9.32.3.3(1)

Basement + Master Bedroom	2	@ 21.2 cfm	42.4	cfm
Other Bedrooms	4	@ 10.6 cfm	42.4	cfm
Kitchen & Bathrooms	7	@ 10.6 cfm	74.2	cfm
Other Rooms	8	@ 10.6 cfm	84.8	cfm
Table 9.32.3.A.		TOTAL	243.8	cfm

PRINCIPAL VENTILATION CAPACITY REQUIRED 9.32.3.4.(1)

1	Bedroom	31.8	cfm
2	Bedroom	47.7	cfm
3	Bedroom	63.6	cfm
4	Bedroom	79.5	cfm
5	Bedroom	95.4	cfm
	TOTAL	95.4	cfm

SUPPLEMENTAL VENTILATION CAPACITY 9.32.3.5.

Total Ventilation Capacity	243.8	cfm
Less Principal Ventil. Capacity	155	cfm
Required Supplemental Capacity	88.8	cfm

PRINCIPAL EXHAUST FAN CAPACITY

Model: VANEE 65H Location: BSMT

155.0 cfm 3.0 sones [✓] HVI Approved

PRINCIPAL EXHAUST HEAT LOSS CALCULATION

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

SUPPLEMENTAL FANS NUTONE

Location	Model	cfm	HVI	Sones
ENS	QTXEN050C	50	✓	0.3
ENS-2	QTXEN050C	50	✓	0.3
ENS-4	QTXEN050C	50	✓	0.3
PWD	QTXEN050C	50	✓	0.3

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: 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: September-18

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#: 77481 Model: 5005 - KNIGHTSWOOD Builder: GOLD PARK HOMES Date: 9/10/2018

Volume Calculation

House Volume

Level	Floor Area (ft^2)	Floor Height (ft)	Volume (ft^3)
Bsmt	2033	10	20330
First	2033	11	22363
Second	2439	10	24390
Third	0	9	0
Fourth	0	9	0
		Total:	67,083.0 ft^3
		Total:	1899.6 m^3

Air Change & Delta T Data

WINTER NATURAL AIR CHANGE RATE	0.350
SUMMER NATURAL AIR CHANGE RATE	0.118

Design Temperature Difference

	Tin °C	Tout °C	ΔT °C	ΔT °F
Winter DTDh	22	-20	42	76
Summer DTDc	24	31	7	13

5.2.3.1 Heat Loss due to Air Leakage

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

0.350 x 527.66 x 42 °C x 1.2 = 9359 W

= 31933 Btu/h

6.2.6 Sensible Gain due to Air Leakage

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

= 0.118 x 527.66 x 7 °C x 1.2 = 530 W

= 1808 Btu/h

5.2.3.2 Heat Loss due to Mechanical Ventilation

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

155 CFM x 76 °F x 1.08 x 0.25 = 3181 Btu/h

6.2.7 Sensible heat Gain due to Ventilation

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

155 CFM x 13 °F x 1.08 x 0.25 = 536 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	31,933	12,091	1.320
2	0.3		21,813	0.439
3	0.2		21,367	0.299
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:	5005 - KNIGHTSWOOD		OPT. 5 BED	**BUILDER:**	GOLD PARK HOMES
SFQT:	4472	**LO#**	77481	**SITE:**	PINE VALLEY & TESTON

DESIGN ASSUMPTIONS

HEATING	°F	COOLING	°F
OUTDOOR DESIGN TEMP.	-4	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:	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):	67083.0	ASSUMED (Y/N):	Y
INTERNAL SHADING:	BLINDS/CURTAINS	ASSUMED OCCUPANTS:	6
INTERIOR LIGHTING LOAD ($Btu/h/ft^2$):	1.27	DC BRUSHLESS MOTOR (Y/N):	Y
FOUNDATION CONFIGURATION	BCIN_1	DEPTH BELOW GRADE:	7.0 ft
LENGTH: 77.0 ft	WIDTH: 42.0 ft	EXPOSED PERIMETER:	238.0 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	29.80
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

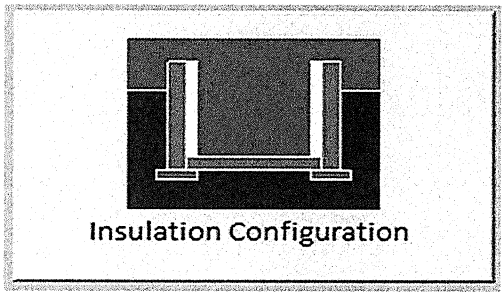
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375 Finley Ave, Suite 202
Ajax ON, L1S 2E2
905-619-2300

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 sand, loam, clay
Water Table:	Normal (7-10 m, 23-33 ft)

Foundation Dimensions		
Floor Length (m):	**23.5**	
Floor Width (m):	**12.8**	
Exposed Perimeter (m):	**0.0**	
Wall Height (m):	**3.0**	
Depth Below Grade (m):	**2.13**	
Window Area (m^2):	**3.2**	
Door Area (m^2):	**1.9**	


Insulation Configuration

Radiant Slab		
Heated Fraction of the Slab:	**0**	
Fluid Temperature (°C):	**33**	
Design Months		
Heating Month	**1**	
Foundation Loads		
Heating Load (Watts):	**2453**	

TYPE: 5005 - KNIGHTSWOOD OPT. 5 BED
LO# 77481

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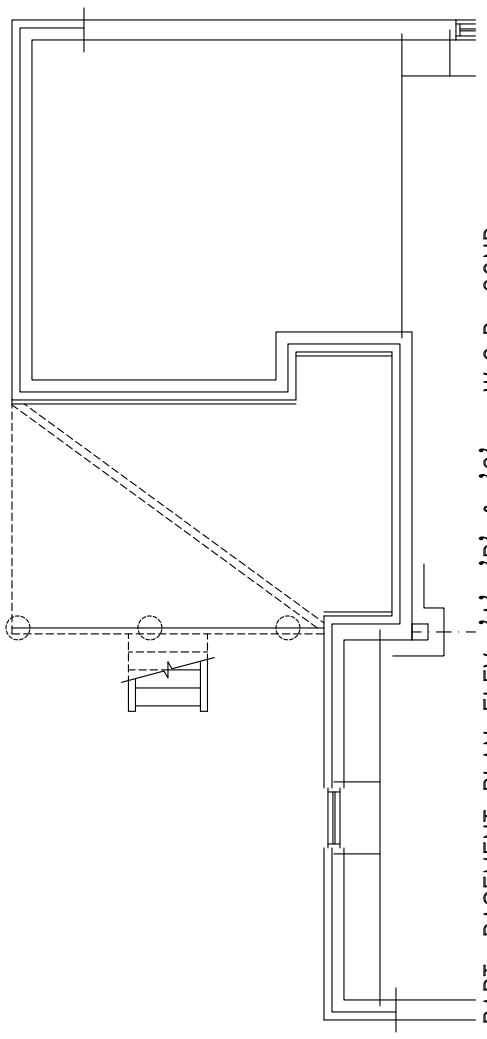
Air Infiltration Residential Load Calculator

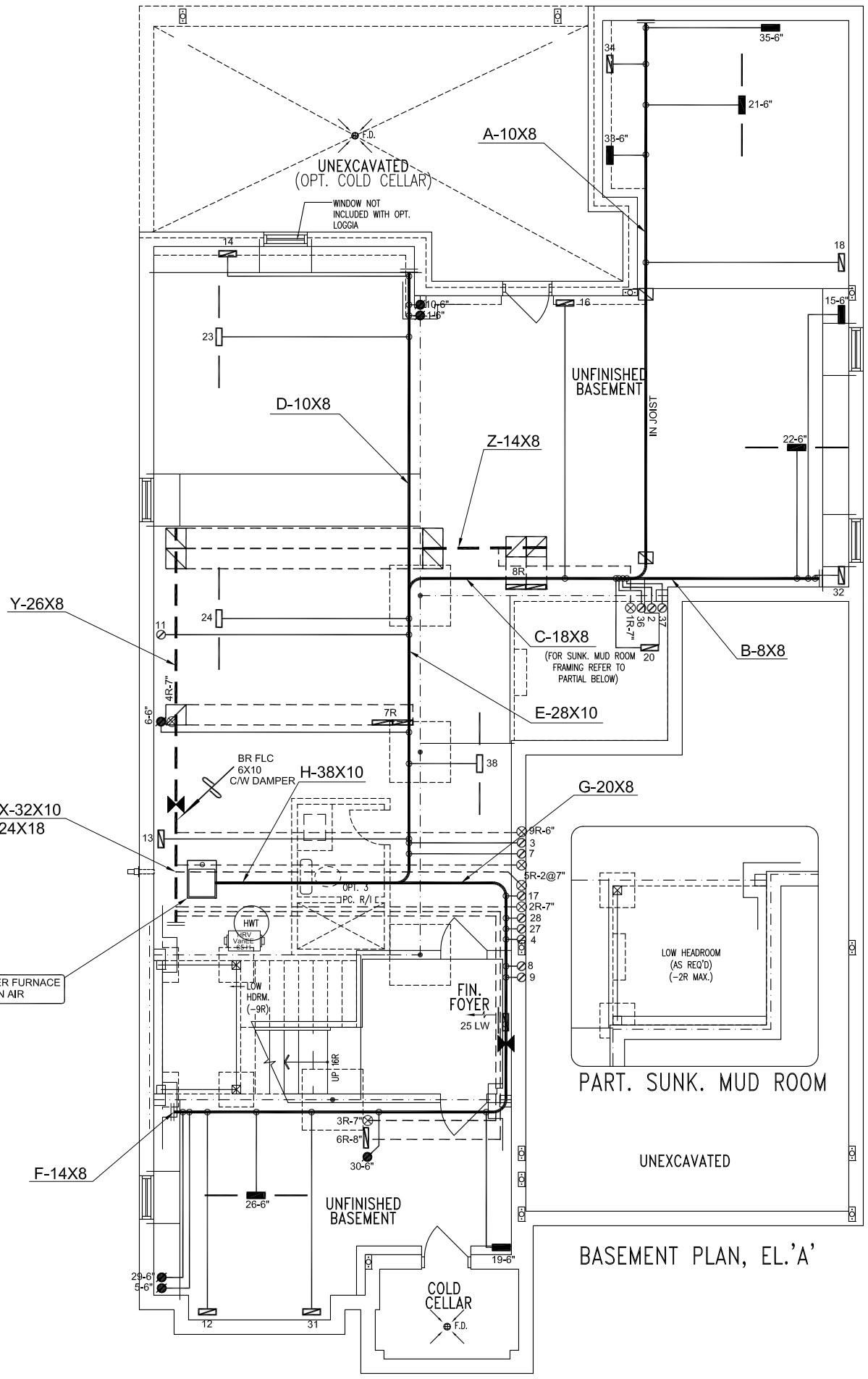
Supplemental tool for CAN/CSA-F280

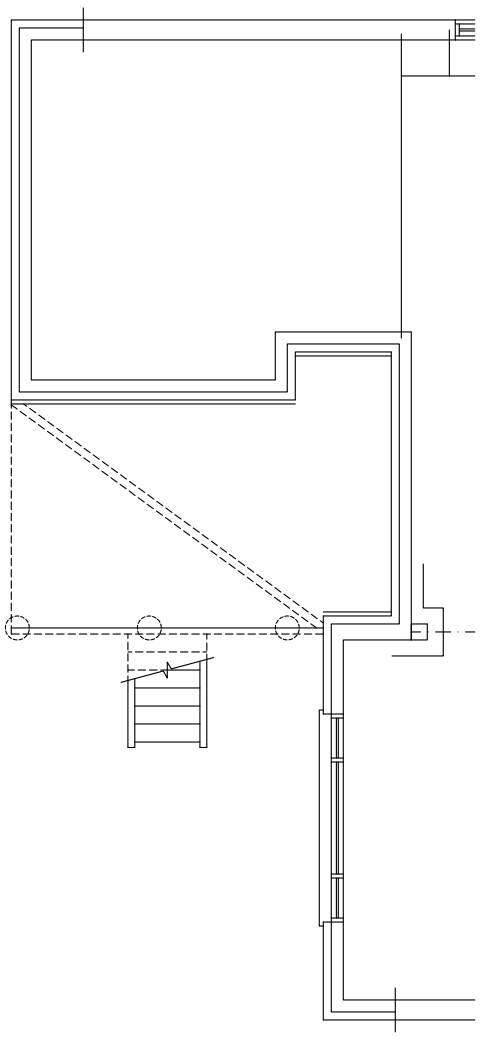
Weather Station Description	
Province:	Ontario
Region:	Vaughan (Woodbridge)
Weather Station Location:	Open flat terrain, grass
Anemometer height (m):	10
Local Shielding	
Building Site:	Suburban, forest
Walls:	Heavy
Flue:	Heavy
Highest Ceiling Height (m):	7.32
Building Configuration	
Type:	Detached
Number of Stories:	Two
Foundation:	Full
House Volume (m^3):	1899.6
Air Leakage/Ventilation	
Air Tightness Type:	Present (1961-) (3.57 ACH)
Custom BDT Data:	ELA @ 10 Pa. 2532.2 cm^2
	3.57 ACH @ 50 Pa
Mechanical Ventilation (L/s):	Total Supply 73.2 / Total Exhaust 73.2
Flue Size	
Flue #:	#1 #2 #3 #4
Diameter (mm):	0 0 0 0
Natural Infiltration Rates	
Heating Air Leakage Rate (ACH/H):	**0.350**
Cooling Air Leakage Rate (ACH/H):	**0.118**

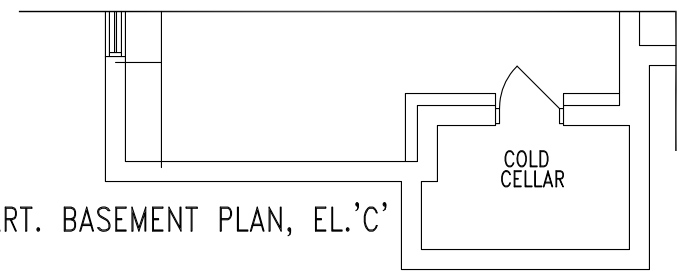
TYPE: 5005 - KNIGHTSWOOD OPT. 5 BED

LO# 77481









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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.	REVISED AS PER ARCHITECTURALS	FEB/2020
2.	3R RELOCATED	NOV/2018
1.	DECK CONDITIONS ADDED	SEPT/2018

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Client
GOLDPARK HOMES

Project Name
PINE VALLEY & TESTON
VAUGHAN, ONTARIO
OPT. 5 BED
KNIGHTSWOOD
5005 4472 sqft

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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 91846 BTU/H		
UNIT DATA		
MAKE	LENNOX	
MODEL	EL296UH110XE60C	
INPUT	110	MBTU/H
OUTPUT	106	MBTU/H
COOLING	5.0	TONS
FAN SPEED	1955	cfm @ 0.6" w.c.

# OF RUNS	S/A	R/A	FANS
3RD FLOOR			
2ND FLOOR	18	6	7
1ST FLOOR	13	3	3
BASEMENT	7	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

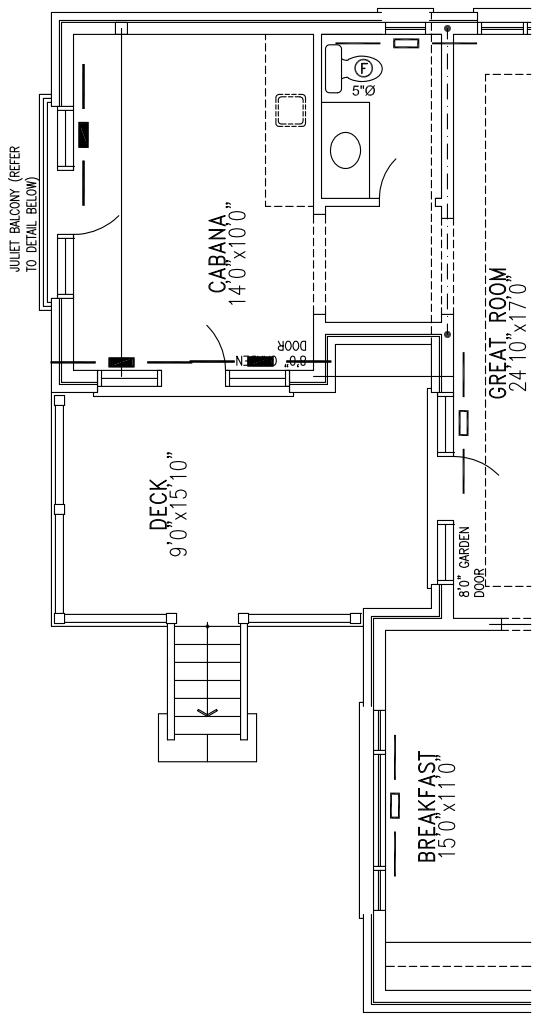
Sheet Title
BASEMENT HEATING LAYOUT

Date JAN/2018

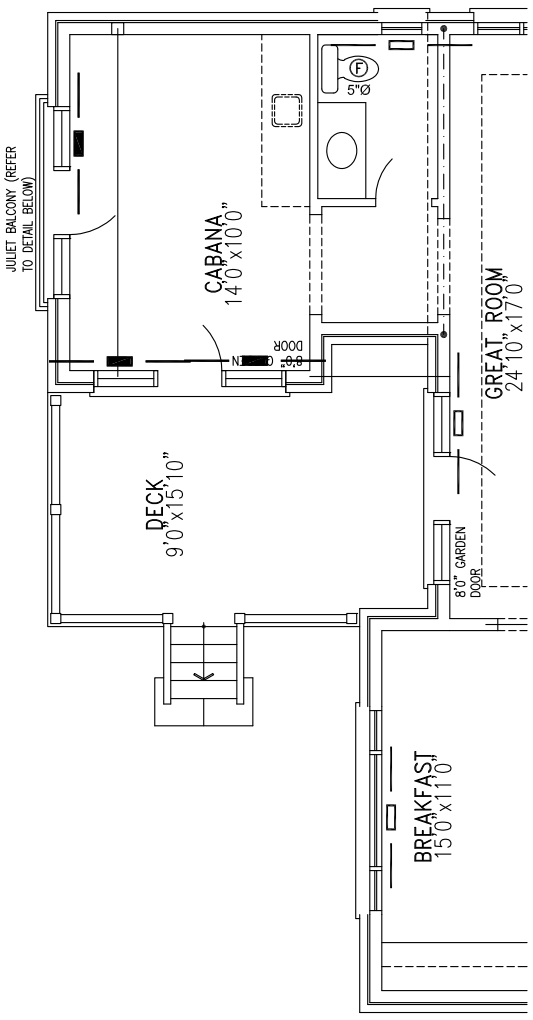
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BCIN# 19669

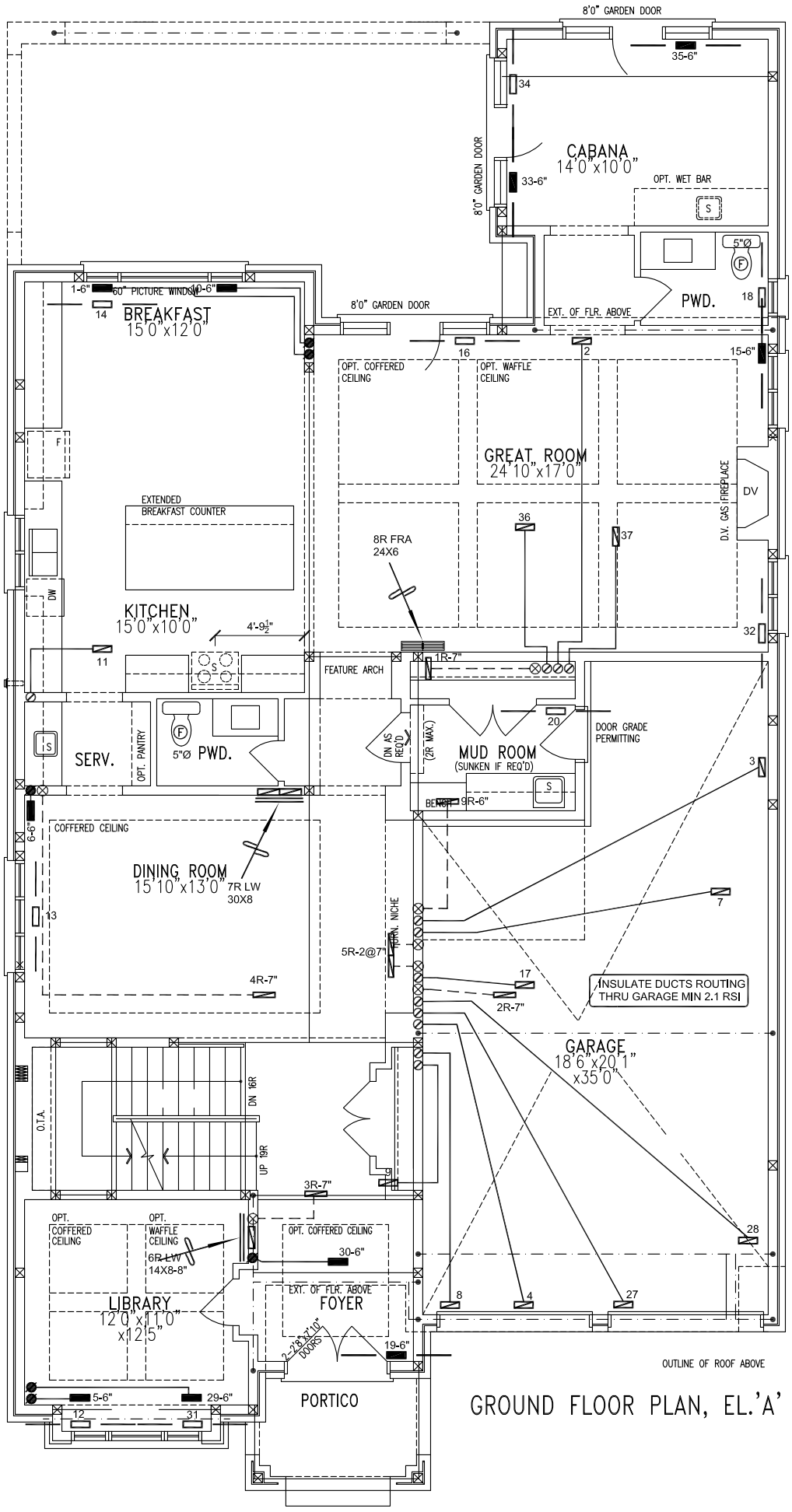
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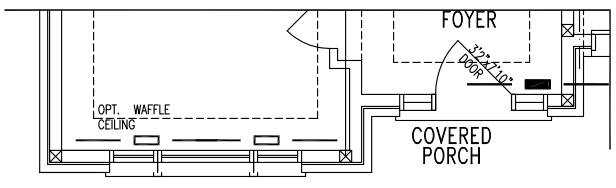
PART. GROUND FLOOR PLAN ELEV. 'A', 'B' & 'C' - L.O.D. COND.



PART. GROUND FLOOR PLAN ELEV. 'A', 'B' & 'C' - W.O.D. COND.



GROUND FLOOR PLAN, EL.'A'



PART. GROUND FLOOR PLAN, EL.'C'

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—▬—	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
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1.	DECK CONDITIONS ADDED	SEPT/2018

REVISIONS

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Client

GOLDPARK HOMES

Project Name

PINE VALLEY & TESTON
VAUGHAN, ONTARIO
OPT. 5 BED
KNIGHTSWOOD
5005 4472 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.

Sheet Title

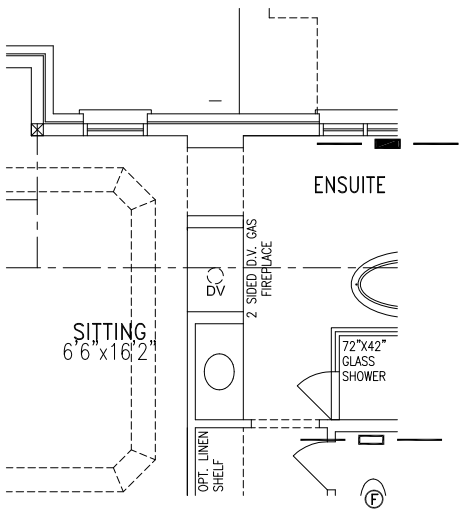
FIRST FLOOR HEATING LAYOUT

Date JAN/2018

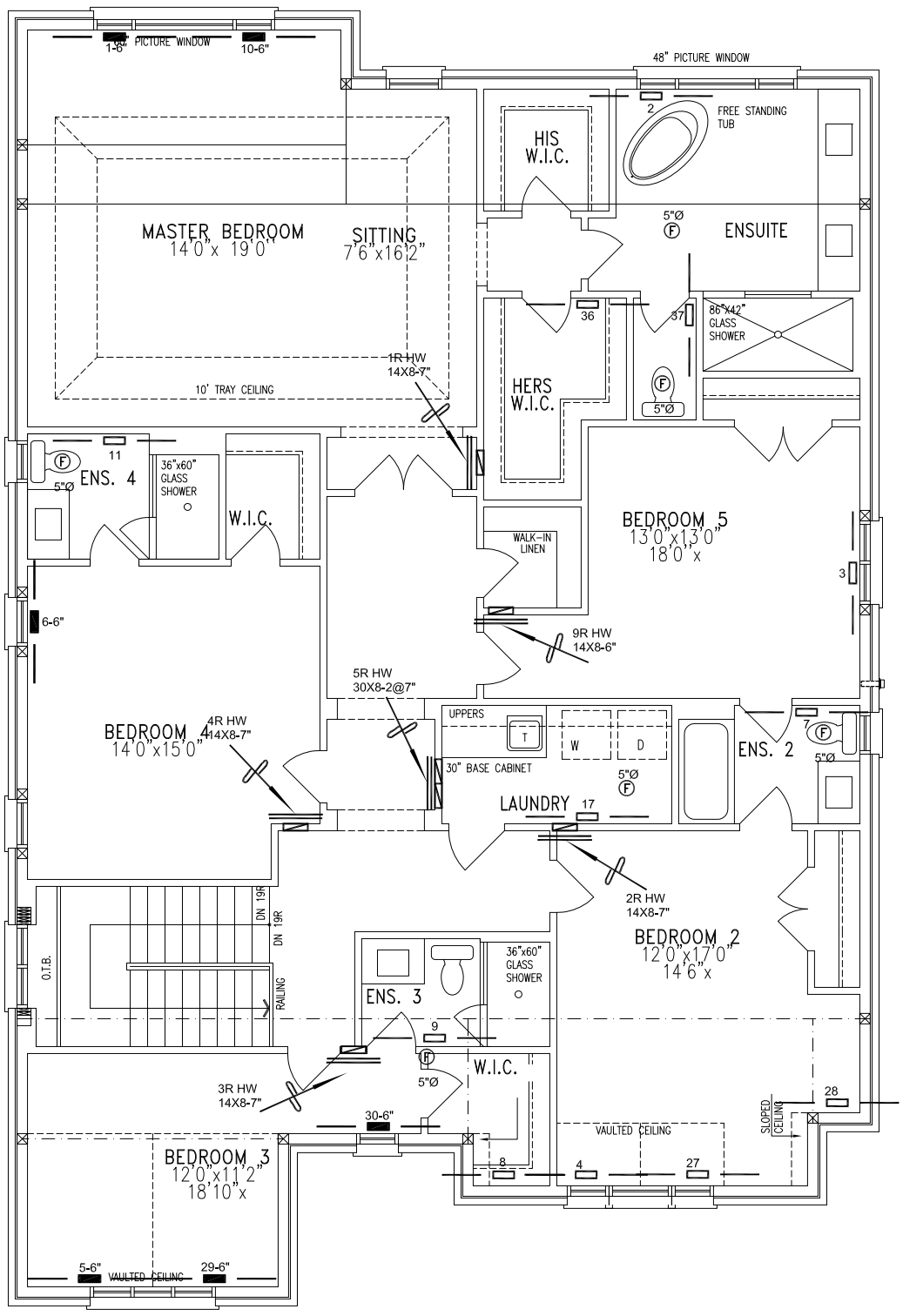
Scale 1/8" = 1'-0"

BCIN# 19669

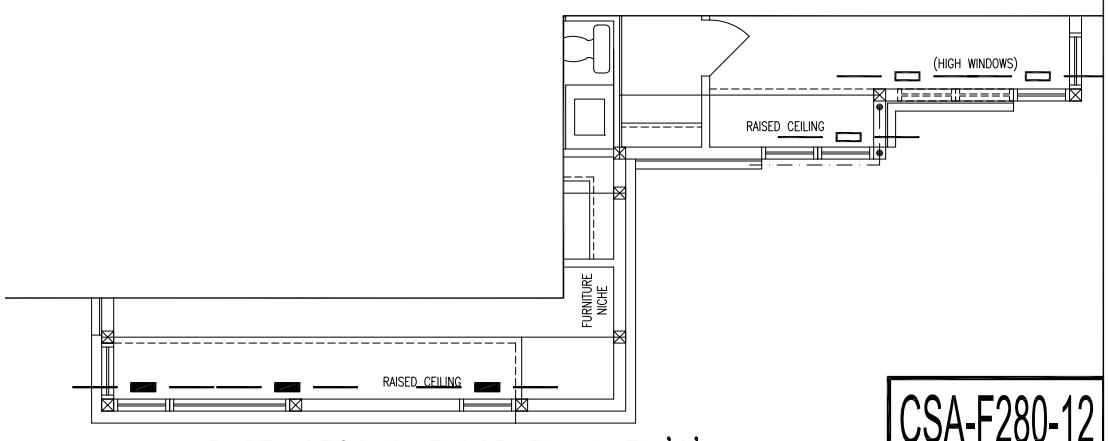
LO# 77481



PART. SECOND FLOOR PLAN
OPT. SITTING AREA FIREPLACE



OPT. 5 BEDROOM SECOND FLOOR PLAN, EL.'A'



PART. SECOND FLOOR PLAN, EL.'C'

CSA-F280-12

PACKAGE A1

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.

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.	REVISED AS PER ARCHITECTURALS	FEB/2020
2.	3R RELOCATED	NOV/2018
1.	DECK CONDITIONS ADDED	SEPT/2018

REVISIONS

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Client
GOLDPARK HOMES

Project Name
PINE VALLEY & TESTON
VAUGHAN, ONTARIO
OPT. 5 BED
KNIGHTSWOOD
5005 4472 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
SECOND FLOOR HEATING LAYOUT

Date JAN/2018
Scale 1/8" = 1'-0"
BCIN# 19669
LO# 77481

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**		
VAUGHAN (WOODBRIDGE)				

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:** 5005 - KNIGHTSWOOD OPT. 5 BED OPT SERV STAIR **Project:** PINE VALLEY & TESTON

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.

February 26, 2020
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: PINE VALLEY & TESTON | OPT. 5 BED OPT SERV STAIR | DATE: Feb-20 | WINTER NATURAL AIR CHANGE RATE 0.350 | HEAT LOSS ΔT °F. 76 | CSA-F280-12
BUILDER: GOLD PARK HOMES | TYPE: 5005 - KNIGHTSWOOD | GFA: 4569 | LO# 85454 | SUMMER NATURAL AIR CHANGE RATE 0.118 | HEAT GAIN ΔT °F. 13 | SB-12 PACKAGE A1

ROOM USE			MBR			ENS			WIC			BED-2			BED-3			BED-4			ENS-2			WIC-2			ENS-3			ENS-4			BED-5		
EXP. WALL			45			29			6			34			37			26			6			9			4			7			14		
CLG. HT.			11			10			10			11			11			10			10			10			10			10			10		
	FACTORS																																	
GRS.WALL AREA	LOSS	GAIN	495			290			60			374			407			260			60			90			40			70			140		
GLAZING			LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN
NORTH	21.3	16.0	0	0	0	0	0	0	0	0	0	18	383	288	0	0	0	0	0	0	8	170	128	0	0	0	0	0	0	0	0	0	18	383	288
EAST	21.3	41.6	0	0	0	0	0	0	0	0	0	70	1490	2909	73	1553	3033	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
SOUTH	21.3	24.9	0	0	0	0	0	0	0	0	0	0	0	0	28	596	697	32	681	797	0	0	0	0	0	0	0	0	0	8	170	199	0	0	0
WEST	21.3	41.6	50	1064	2078	34	724	1413	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
SKYLT.	37.2	101.5	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	0	0	0	0	0	0
DOORS	25.2	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	0	0	0	0	0	0
NET EXPOSED WALL	4.5	0.8	445	1986	334	256	1142	192	60	268	45	286	1276	215	306	1366	230	228	1017	171	52	232	39	90	402	68	40	179	30	62	277	47	122	544	92
NET EXPOSED BSMT WALL ABOVE GR	3.6	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	0	0	0	0	0	0	0	0	0
EXPOSED CLG	1.3	0.6	440	565	259	204	262	120	102	131	60	216	277	127	256	329	150	396	508	233	60	77	35	48	62	28	140	180	82	105	135	62	364	467	214
NO ATTIC EXPOSED CLG	2.7	1.3	0	0	0	0	0	0	0	0	0	24	66	30	84	231	106	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	240	612	103	104	265	45	0	0	0	60	153	26	48	122	21	140	357	60	0	0	0	25	64	11
BASEMENT/CRAWL HEAT LOSS				0			0			0			0			0			0			0			0			0			0			0	
SLAB ON GRADE HEAT LOSS				0			0			0			0			0			0			0			0			0			0			0	
SUBTOTAL HT LOSS				3615			2128			399			4104			4340			2207			632			586			715			582			1458	
SUB TOTAL HT GAIN					2671			1725			105			3671			4261			1201			228			116			172			307			604
LEVEL FACTOR / MULTIPLIER			0.20	0.31		0.20	0.31		0.20	0.31		0.20	0.31		0.20	0.31		0.20	0.31		0.20	0.31		0.20	0.31		0.20	0.31		0.20	0.31		0.20	0.31	
AIR CHANGE HEAT LOSS				1131			666			125			1284			1357			690			198			183			224			182			456	
AIR CHANGE HEAT GAIN					195			126			8			268			312			88			17			9			13			22			44
DUCT LOSS				0			0			0			539			570			0			83			77			94			0			191	
DUCT GAIN					0			0			0			483			547			0			24			12			19			0			154
HEAT GAIN PEOPLE	240		2		480	0		0	0		0	1		240	1		240	1		240	0		0	0		0	0		0	0		0	1		240
HEAT GAIN APPLIANCES/LIGHTS					654			0			654			654			654			654			0			0			0			0			654
TOTAL HT LOSS BTU/H				4745			2793			523			5927			6267			2897			913			846			1033			764			2106	
TOTAL HT GAIN x 1.3 BTU/H					5200			2407			997			6913			7818			2838			350			179			265			429			2206

ROOM USE			LIB			DIN			KIT/GT			CAB			LAUN			PWD			FOY			MUD									LOD			BAS		
EXP. WALL			31			32			77			45			0			5			35			32									52			238		
CLG. HT.			11			11			11			11			10			11			11			12									10			10		
	FACTORS																																				
GRS.WALL AREA	LOSS	GAIN	341			352			847			495			0			55			385			384									520			1978		
GLAZING			LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN								LOSS	GAIN		LOSS	GAIN
NORTH	21.3	16.0	0	0	0	0	0	0	46	979	735	0	0	0	0	0	0	9	192	144	0	0	0	0	0	0							0	0	0	6	128	96
EAST	21.3	41.6	56	1192	2327	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
SOUTH	21.3	24.9	0	0	0	34	724	847	20	426	498	63	1341	1569	0	0	0	0	0	0	0	0	0	0	0	0							0	0	0	6	128	149
WEST	21.3	41.6	0	0	0	0	0	0	115	2447	4778	63	1341	2618	0	0	0	0	0	0	0	0	0	0	0	0							22	468	914	0	0	0
SKYLT.	37.2	101.5	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	0	0	0
DOORS	25.2	4.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	62	1565	264	20	505	85							0	0	0	20	505	85
NET EXPOSED WALL	4.5	0.8	285	1272	214	318	1419	239	666	2972	501	369	1647	277	0	0	0	46	205	35	323	1441	243	364	1624	274							0	0	0	0	0	0
NET EXPOSED BSMT WALL ABOVE GR	3.6	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							290	1044	176	402	1447	244
EXPOSED CLG	1.3	0.6	0	0	0	0	0	0	0	0	0	0	0	0	102	131	60	0	0	0	0	0	0	0	0	0							0	0	0	0	0	0
NO ATTIC EXPOSED CLG	2.7	1.3	0	0	0	0	0	0	0	0	0	203	558	255	0	0	0	40	110	50	41	113	52	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	56	143	24	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			0										8373		
SLAB ON GRADE HEAT LOSS				0			0			0			0			0			0			0			0									0				
SUBTOTAL HT LOSS				2464			2143			6824			4886			274			507			3120			2129									1512			10580		
SUB TOTAL HT GAIN					2541			1086			6512			4719			84			229			558			359									1090			574
LEVEL FACTOR / MULTIPLIER			0.30	0.45		0.30	0.45		0.30	0.45		0.30	0.45		0.20	0.31		0.30	0.45		0.30	0.45		0.30	0.45										0.50	1.36		
AIR CHANGE HEAT LOSS				1102			958			3052			2185			86			227			1395			952												16451		
AIR CHANGE HEAT GAIN					186			79			476			345			6			17			41			26														122
DUCT LOSS				0			0			0			0			36			0			0			0												0		
DUCT GAIN					0			0			0			0			74			0			0			0														0
HEAT GAIN PEOPLE	240		0		0	0		0	0		0	0		0	0		0	0		0	0		0	0		0							0		0	0		0
HEAT GAIN APPLIANCES/LIGHTS					654			654			654			654			654			0			0			654									0				654
TOTAL HT LOSS BTU/H				3565			3101			9876			7071			395			733			4515			3082									1512			27031		
TOTAL HT GAIN x 1.3 BTU/H					4396			2365			9935			7434			1065			319			778			1351									1417			1755

TOTAL HEAT GAIN BTU/H: 60952 | TONS: 5.08 | LOSS DUE TO VENTILATION LOAD BTU/H: 3181 | STRUCTURAL HEAT LOSS: 89694 | TOTAL COMBINED HEAT LOSS BTU/H: 92874

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.

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

SITE NAME: PINE VALLEY & TESTON — OPT. 5 BED OPT SERV STAIR
BUILDER: GOLD PARK HOMES — TYPE: 5005 - KNIGHTSWOOD — DATE: Feb-20 — GFA: 4569 — LO# 85454

HEATING CFM	1955	COOLING CFM	1955	furnace pressure	0.6
TOTAL HEAT LOSS	89,694	TOTAL HEAT GAIN	60,416	furnace filter	0.08
AIR FLOW RATE CFM	21.8	AIR FLOW RATE CFM	32.36	a/c coil pressure	0.2
				available pressure for s/a & r/a	0.32
				plenum pressure s/a	0.17
				max s/a dif press. loss	0.02
				min adjusted pressure s/a	0.15

				r/a pressure	0.15
				r/a grille press. Loss	0.02
				adjusted pressure r/a	0.13

^LENNOX — AFUE = 96 %
EL296UH110XE60C 110 — INPUT (BTU/H) = 110,000
OUTPUT (BTU/H) = **106,000**

FAN SPEED	
LOW	0
MEDLOW	1380
MEDIUM	1505
MEDIUM HIGH	1685
HIGH	1955

DESIGN CFM = **1955** CFM @ .6 " E.S.P.
TEMPERATURE RISE 50 °F

RUN COUNT	4th	3rd	2nd	1st	Bas
S/A	0	0	18	13	7
R/A	0	0	6	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	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
ROOM NAME	MBR	ENS	BED-5	BED-2	BED-3	BED-4	ENS-2	WIC-2	ENS-3	MBR	ENS-4	LIB	DIN	KIT/GT	KIT/GT	KIT/GT	LAUN	PWD	FOY	MUD	BAS	BAS	BAS	BAS
RM LOSS MBH.	2.37	2.20	2.11	1.98	2.09	2.90	0.91	0.85	1.03	2.37	0.76	1.78	3.10	2.47	2.47	2.47	0.40	0.73	4.51	3.08	4.08	4.08	4.08	4.08
CFM PER RUN HEAT	52	48	46	43	46	63	20	18	23	52	17	39	68	54	54	54	9	16	98	67	89	89	89	89
RM GAIN MBH.	2.60	1.90	2.21	2.30	2.61	2.84	0.35	0.18	0.26	2.60	0.43	2.20	2.37	2.48	2.48	2.48	1.06	0.32	0.78	1.35	0.45	0.45	0.45	0.45
CFM PER RUN COOLING	84	62	71	75	84	92	11	6	9	84	14	71	77	80	80	80	34	10	25	44	15	15	15	15
ADJUSTED PRESSURE	0.15	0.16	0.16	0.16	0.15	0.15	0.16	0.16	0.16	0.15	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.15	0.16	0.15	0.15	0.15	0.15
ACTUAL DUCT LGH.	70	70	53	49	75	48	47	48	53	64	59	57	29	52	69	54	36	73	40	65	67	60	54	38
EQUIVALENT LENGTH	200	200	170	160	170	160	200	150	170	170	150	140	103	120	140	110	200	170	210	190	150	120	103	90
TOTAL EFFECTIVE LENGTH	270	270	223	209	245	208	247	198	223	234	209	197	132	172	209	164	236	243	250	255	217	180	157	128
ADJUSTED PRESSURE	0.05	0.06	0.07	0.07	0.06	0.07	0.06	0.08	0.07	0.06	0.07	0.08	0.12	0.09	0.07	0.1	0.07	0.06	0.06	0.06	0.07	0.08	0.09	0.11
ROUND DUCT SIZE	**6**	5	5	5	**6**	**6**	4	4	4	**6**	4	5	5	5	**6**	5	4	4	**6**	5	**6**	**6**	**6**	5
HEATING VELOCITY (ft/min)	265	352	338	316	235	321	229	207	264	265	195	286	499	396	275	396	103	184	500	492	454	454	454	653
COOLING VELOCITY (ft/min)	428	455	521	551	428	469	126	69	103	428	161	521	565	587	408	587	390	115	127	323	76	76	76	110
OUTLET GRILL SIZE	4X10	3X10	3X10	3X10	4X10	4X10	3X10	3X10	3X10	4X10	3X10	3X10	3X10	3X10	4X10	3X10	3X10	3X10	4X10	3X10	4X10	4X10	4X10	3X10
TRUNK	D	C	E	G	F	E	E	G	G	D	E	F	E	D	B	C	G	A	F	B	A	B	D	E

RUN #	25	26	27	28	29	30	31	32	33	34	35	36	37	38
ROOM NAME	BAS	BAS	BED-2	BED-2	BED-3	BED-3	LIB	KIT/GT	CAB	CAB	CAB	WIC	ENS	BAS
RM LOSS MBH.	4.08	4.08	1.98	1.98	2.09	2.09	1.78	2.47	2.36	2.36	2.36	0.52	0.60	4.08
CFM PER RUN HEAT	89	89	43	43	46	46	39	54	51	51	51	11	13	89
RM GAIN MBH.	0.45	0.45	2.30	2.30	2.61	2.61	2.20	2.48	2.48	2.48	2.48	1.00	0.50	0.45
CFM PER RUN COOLING	15	15	75	75	84	84	71	80	80	80	80	32	16	15
ADJUSTED PRESSURE	0.15	0.15	0.16	0.16	0.15	0.15	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.15
ACTUAL DUCT LGH.	34	50	52	55	80	63	51	55	69	71	82	56	58	23
EQUIVALENT LENGTH	110	150	170	160	170	200	160	120	150	130	140	200	190	140
TOTAL EFFECTIVE LENGTH	144	200	222	215	250	263	211	175	219	201	222	256	248	163
ADJUSTED PRESSURE	0.1	0.07	0.07	0.07	0.06	0.06	0.07	0.09	0.07	0.08	0.07	0.06	0.06	0.09
ROUND DUCT SIZE	5	**6**	5	5	**6**	**6**	5	5	**6**	5	**6**	4	4	**6**
HEATING VELOCITY (ft/min)	653	454	316	316	235	235	286	396	260	374	260	126	149	454
COOLING VELOCITY (ft/min)	110	76	551	551	428	428	521	587	408	587	408	367	184	76
OUTLET GRILL SIZE	3X10	4X10	3X10	3X10	4X10	4X10	3X10	3X10	4X10	3X10	4X10	3X10	3X10	4X10
TRUNK	G	F	G	G	F	F	F	B	A	A	A	C	C	E

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	258	0.06	9.1	10	x	8	464	TRUNK G	671	0.06	13	20	x	8	604
TRUNK B	264	0.06	9.2	10	x	8	475	TRUNK H	1955	0.05	20.3	38	x	10	741
TRUNK C	648	0.06	12.8	20	x	8	583	TRUNK I	0	0.00	0	0	x	8	0
TRUNK D	247	0.05	9.3	10	x	8	445	TRUNK J	0	0.00	0	0	x	8	0
TRUNK E	1287	0.05	17.3	28	x	10	662	TRUNK K	0	0.00	0	0	x	8	0
TRUNK F	403	0.06	10.7	14	x	8	518	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	1515	0.05	18.4	32	x	10	682
TRUNK Y	880	0.05	15	26	x	8	609
TRUNK Z	415	0.05	11.3	14	x	8	534
DROP	1955	0.05	20.3	24	x	18	652

RETURN AIR #	1	2	3	4	5	6	7	8	9							BR
	0	0	0	0	2@7"	0	0	0	0	0	0	0	0	0	0	
AIR VOLUME	115	140	115	115	280	185	350	300	85	0	0	0	0	0	0	270
PLENUM PRESSURE	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13
ACTUAL DUCT LGH.	84	51	62	59	47	49	30	51	49	1	1	1	1	1	1	14
EQUIVALENT LENGTH	200	135	195	185	135	140	170	195	175	0	0	0	0	0	0	145
TOTAL EFFECTIVE LH	284	186	257	244	182	189	200	246	224	1	1	1	1	1	1	159
ADJUSTED PRESSURE	0.05	0.07	0.05	0.05	0.07	0.07	0.07	0.05	0.06	13.36	13.36	13.36	13.36	13.36	13.36	0.08
ROUND DUCT SIZE	7	6.9	7	7	9	7.7	9.8	10.1	6	0	0	0	0	0	0	8.6
INLET GRILL SIZE	8	8	8	8	8	8	8	8	8	0	0	0	0	0	0	8
	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
INLET GRILL SIZE	14	14	14	14	30	14	30	30	14	0	0	0	0	0	0	30

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: 5005 - KNIGHTSWOOD LO # 85454
SITE NAME: PINE VALLEY & TESTON OPT. 5 BED OPT SERV STAIR

RESIDENTIAL MECHANICAL VENTILATION DESIGN SUMMARY

COMBUSTION APPLIANCES 9.32.3.1(1)

- a) [✓] Direct vent (sealed combustion) only
- b) [ ] Positive venting induced draft (except fireplaces)
- c) [ ] Natural draft, B-vent or induced draft gas fireplace
- d) [ ] Solid Fuel (including fireplaces)
- e) [ ] No Combustion Appliances

HEATING SYSTEM

[✓] Forced Air [ ] Non Forced Air

[ ] Electric Space Heat

HOUSE TYPE 9.32.1(2)

[✓]	I	Type a) or b) appliance only, no solid fuel
[ ]	II	Type I except with solid fuel (including fireplaces)
[ ]	III	Any Type c) appliance
[ ]	IV	Type I, or II with electric space heat
[ ]	Other: Type I, II or IV no forced air	

SYSTEM DESIGN OPTIONS O.N.H.W.P.

[ ]	1	Exhaust only/Forced Air System
[ ]	2	HRV with Ducting/Forced Air System
[✓]	3	HRV Simplified/connected to forced air system
[ ]	4	HRV with Ducting/non forced air system
[ ]		Part 6 Design

TOTAL VENTILATION CAPACITY 9.32.3.3(1)

Basement + Master Bedroom	2	@ 21.2 cfm	42.4	cfm
Other Bedrooms	4	@ 10.6 cfm	42.4	cfm
Kitchen & Bathrooms	7	@ 10.6 cfm	74.2	cfm
Other Rooms	8	@ 10.6 cfm	84.8	cfm
Table 9.32.3.A.		TOTAL	243.8	cfm

PRINCIPAL VENTILATION CAPACITY REQUIRED 9.32.3.4.(1)

1	Bedroom	31.8	cfm
2	Bedroom	47.7	cfm
3	Bedroom	63.6	cfm
4	Bedroom	79.5	cfm
5	Bedroom	95.4	cfm
	TOTAL	**95.4**	**cfm**

SUPPLEMENTAL VENTILATION CAPACITY 9.32.3.5.

Total Ventilation Capacity	243.8	cfm
Less Principal Ventil. Capacity	155	cfm
Required Supplemental Capacity	88.8	cfm

PRINCIPAL EXHAUST FAN CAPACITY

Model: VANEE 65H Location: BSMT

155.0 cfm 3.0 sones [✓] HVI Approved

PRINCIPAL EXHAUST HEAT LOSS CALCULATION

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

SUPPLEMENTAL FANS NUTONE

Location	Model	cfm	HVI	Sones
ENS	QTXEN050C	50	✓	0.3
ENS-2	QTXEN050C	50	✓	0.3
ENS-4	QTXEN050C	50	✓	0.3
PWD	QTXEN050C	50	✓	0.3

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: 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: February-20

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#: 85454 Model: 5005 - KNIGHTSWOOD Builder: GOLD PARK HOMES Date: 26/02/2020

Volume Calculation

House Volume

Level	Floor Area (ft²)	Floor Height (ft)	Volume (ft³)
Bsmt	2130	10	21300
First	2130	11	23430
Second	2439	10	24390
Third	0	9	0
Fourth	0	9	0
		Total:	69,120.0 ft³
		Total:	1957.3 m³

Air Change & Delta T Data

WINTER NATURAL AIR CHANGE RATE	0.350
SUMMER NATURAL AIR CHANGE RATE	0.118

Design Temperature Difference

	Tin °C	Tout °C	ΔT °C	ΔT °F
Winter DTDh	22	-20	42	76
Summer DTDc	24	31	7	13

5.2.3.1 Heat Loss due to Air Leakage

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

0.350 x 543.68 x 42 °C x 1.2 = 9643 W

= **32903 Btu/h**

6.2.6 Sensible Gain due to Air Leakage

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

= 0.118 x 543.68 x 7 °C x 1.2 = 546 W

= **1863 Btu/h**

5.2.3.2 Heat Loss due to Mechanical Ventilation

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

155 CFM x 76 °F x 1.08 x 0.25 = **3181 Btu/h**

6.2.7 Sensible heat Gain due to Ventilation

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

155 CFM x 13 °F x 1.08 x 0.25 = **536 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	32,903	12,091	1.361
2	0.3		22,072	0.447
3	0.2		21,038	0.313
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: 5005 - KNIGHTSWOOD OPT. 5 BED OPT SERV STAIR **BUILDER:** GOLD PARK HOMES
SFQT: 4569 **LO#** 85454 **SITE:** PINE VALLEY & TESTON

DESIGN ASSUMPTIONS

HEATING	°F	COOLING	°F
OUTDOOR DESIGN TEMP.	-4	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:	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):	69120.0	ASSUMED (Y/N):	Y
INTERNAL SHADING:	BLINDS/CURTAINS	ASSUMED OCCUPANTS:	6
INTERIOR LIGHTING LOAD (Btu/h/ft^2):	1.27	DC BRUSHLESS MOTOR (Y/N):	Y
FOUNDATION CONFIGURATION	BCIN_1	DEPTH BELOW GRADE:	7.0 ft
LENGTH: 77.0 ft	WIDTH: 42.0 ft	EXPOSED PERIMETER:	238.0 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	29.80
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

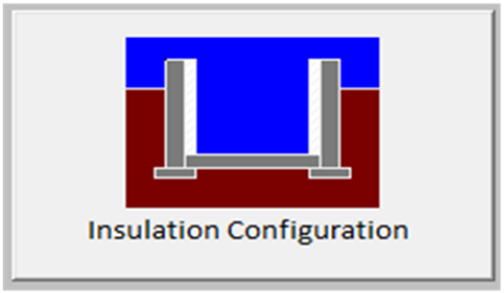


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375 Finley Ave, Suite 202
Ajax ON, L1S 2E2
905-619-2300

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 sand, loam, clay
Water Table:	Normal (7-10 m, 23-33 ft)

Foundation Dimensions		
Floor Length (m):	**23.5**	 Insulation Configuration
Floor Width (m):	**12.8**	
Exposed Perimeter (m):	**0.0**	
Wall Height (m):	**3.0**	
Depth Below Grade (m):	**2.13**	
Window Area (m^2):	**3.2**	
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):	**2453**	

TYPE: 5005 - KNIGHTSWOOD OPT. 5 BED OPT SERV STAIR
LO# 85454

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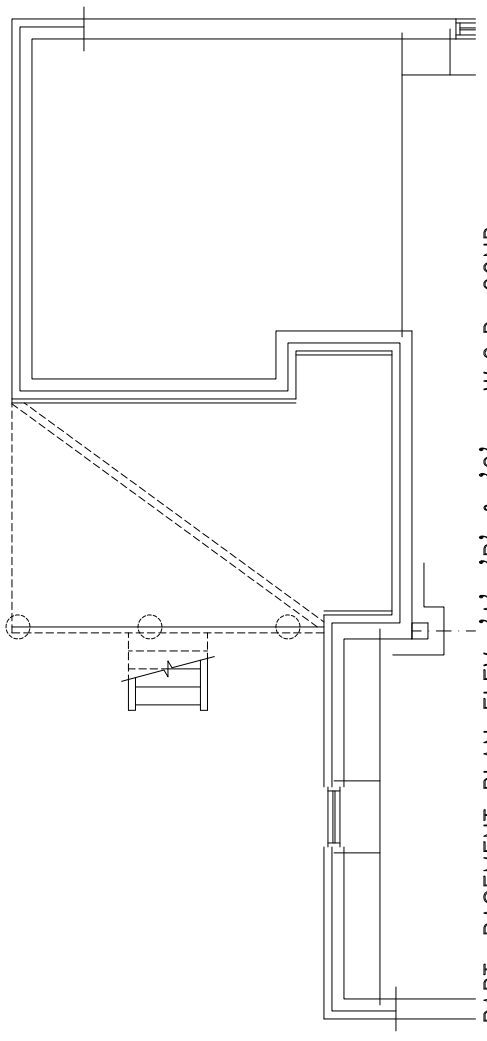
Air Infiltration Residential Load Calculator

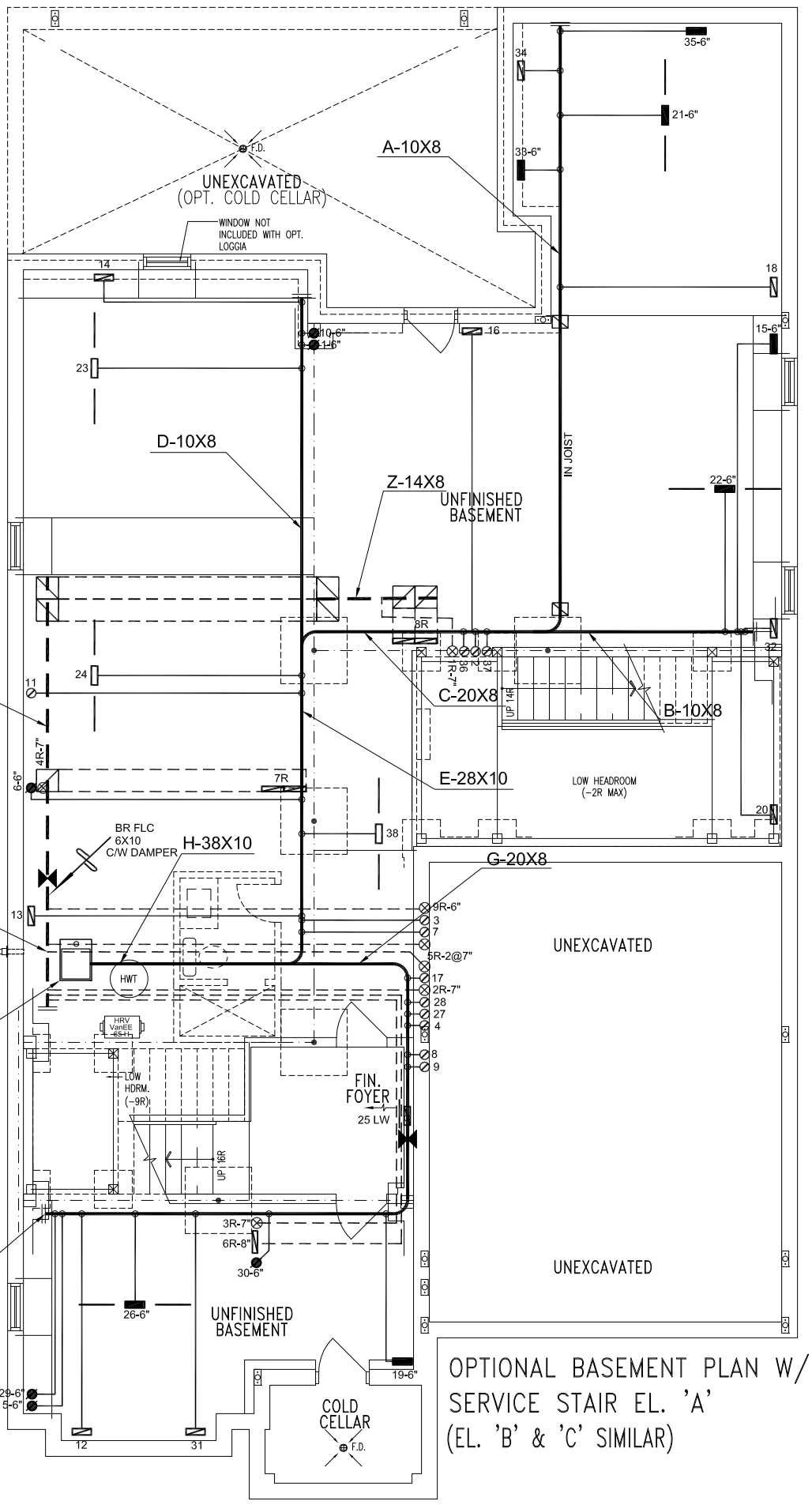
Supplemental tool for CAN/CSA-F280

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):	7.32
Building Configuration	
Type:	Detached
Number of Stories:	Two
Foundation:	Full
House Volume (m^3):	1957.3
Air Leakage/Ventilation	
Air Tightness Type:	Present (1961-) (3.57 ACH)
Custom BDT Data:	ELA @ 10 Pa. 2609.1 cm^2
	3.57 ACH @ 50 Pa
Mechanical Ventilation (L/s):	Total Supply 73.2 / Total Exhaust 73.2
Flue Size	
Flue #:	#1 #2 #3 #4
Diameter (mm):	0 0 0 0
Natural Infiltration Rates	
Heating Air Leakage Rate (ACH/H):	**0.350**
Cooling Air Leakage Rate (ACH/H):	**0.118**

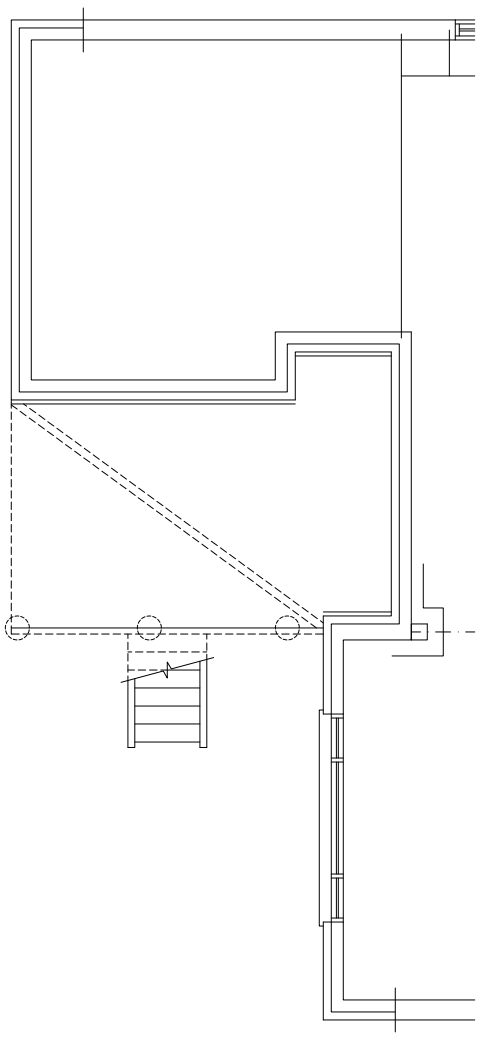
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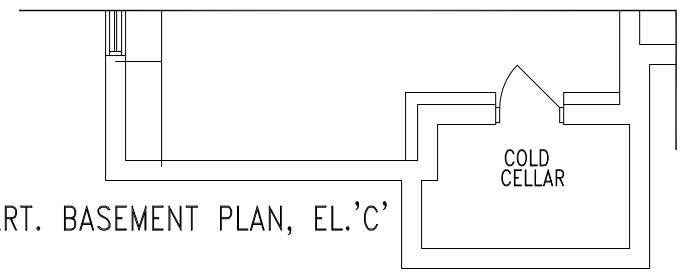
LO# 85454





OPTIONAL BASEMENT PLAN W/ SERVICE STAIR EL. 'A' (EL. 'B' & 'C' SIMILAR)





PART. BASEMENT PLAN, EL.'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

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.		

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Client
GOLDPARK HOMES

Project Name
PINE VALLEY & TESTON
VAUGHAN, ONTARIO
OPT. 5 BED OPT SERV STAIR
KNIGHTSWOOD
5005 4569 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.

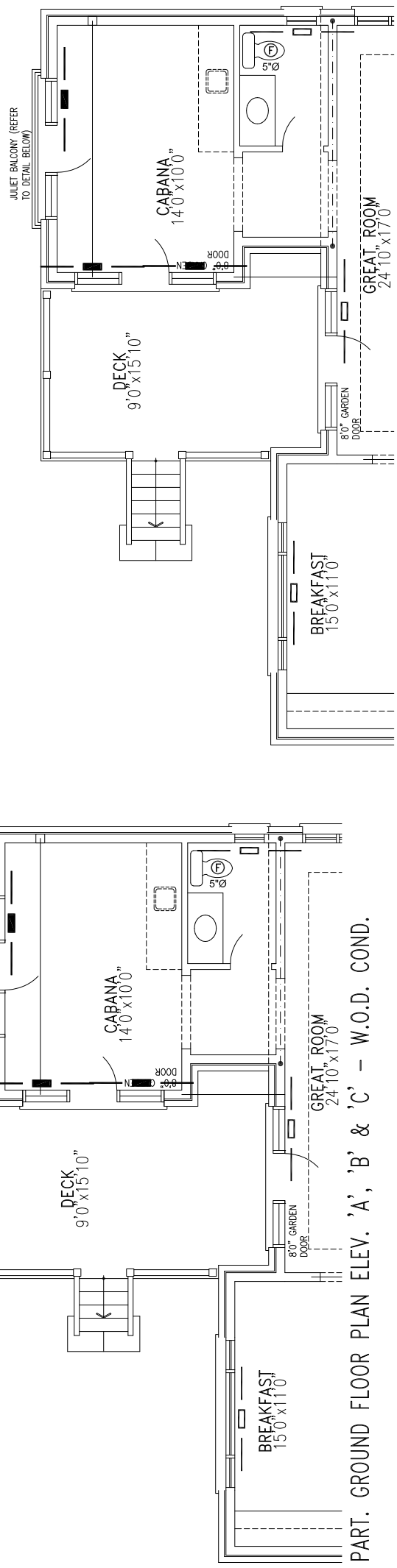
HEAT LOSS 92874 BTU/H		
UNIT DATA		
MAKE	LENNOX	
MODEL	EL296UH110XE60C	
INPUT	110	MBTU/H
OUTPUT	106	MBTU/H
COOLING	5.0	TONS
FAN SPEED	1955	cfm @ 0.6" w.c.

# OF RUNS	S/A	R/A	FANS
3RD FLOOR			
2ND FLOOR	18	6	7
1ST FLOOR	13	3	3
BASEMENT	7	1	0

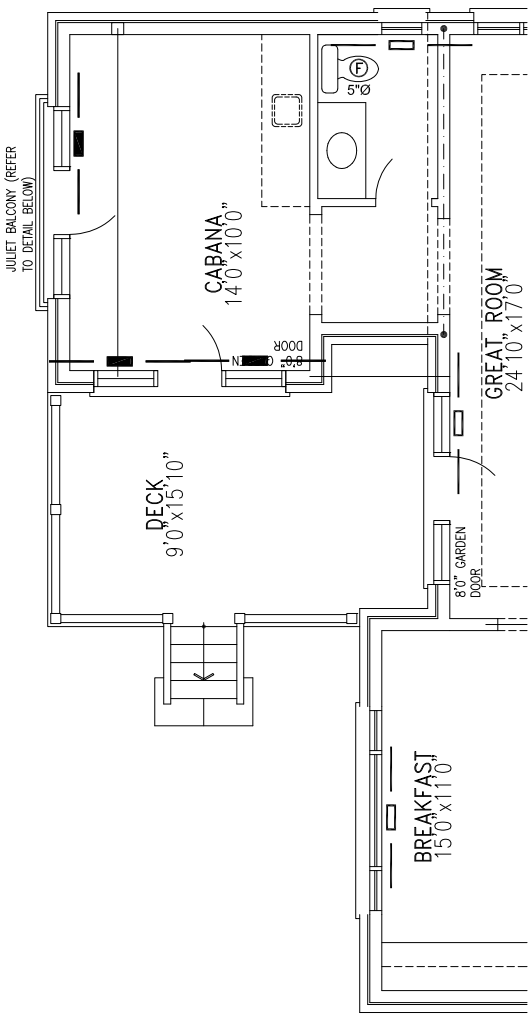
ALL S/A DIFFUSERS 4 "x10" UNLESS NOTED OTHERWISE ON LAYOUT. ALL S/A RUNS 5"Ø UNLESS NOTED OTHERWISE ON LAYOUT. UNDERCUT DOORS 1" min. FOR R/A

Sheet Title
BASEMENT HEATING LAYOUT

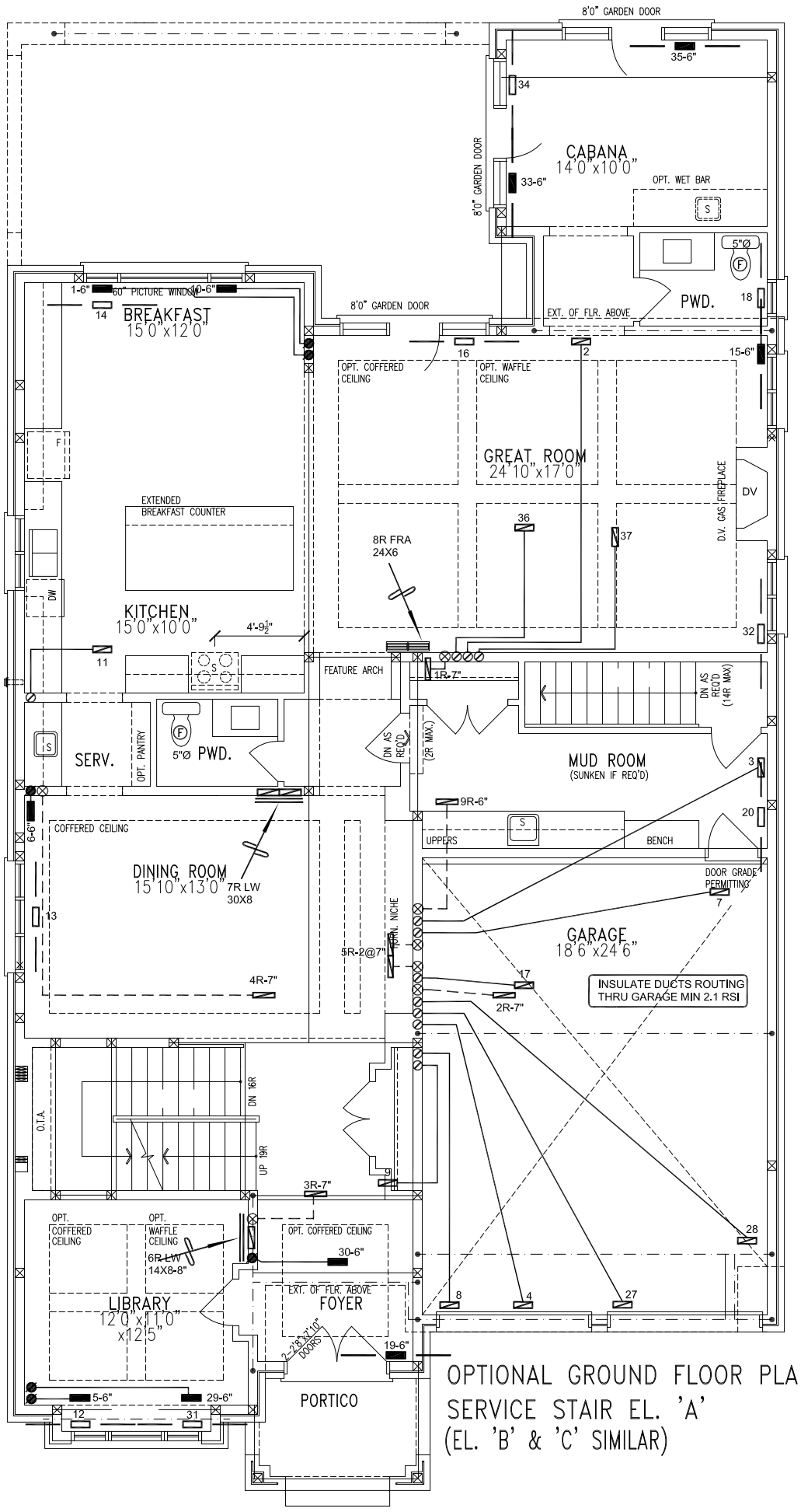
Date FEB/2020
Scale 1/8" = 1'-0"
BCIN# 19669
LO# 85454



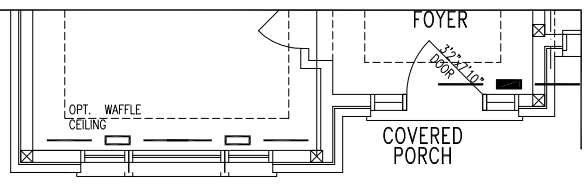
PART. GROUND FLOOR PLAN ELEV. 'A', 'B' & 'C' - L.O.D. COND.



PART. GROUND FLOOR PLAN ELEV. 'A', 'B' & 'C' - W.O.D. COND.



OPTIONAL GROUND FLOOR PLAN W/ SERVICE STAIR EL. 'A'
(EL. 'B' & 'C' SIMILAR)



PART. GROUND FLOOR PLAN, EL.'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

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

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Client

GOLDPARK HOMES

Project Name

PINE VALLEY & TESTON
VAUGHAN, ONTARIO
OPT. 5 BED OPT SERV STAIR
KNIGHTSWOOD
5005 4569 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.

Sheet Title

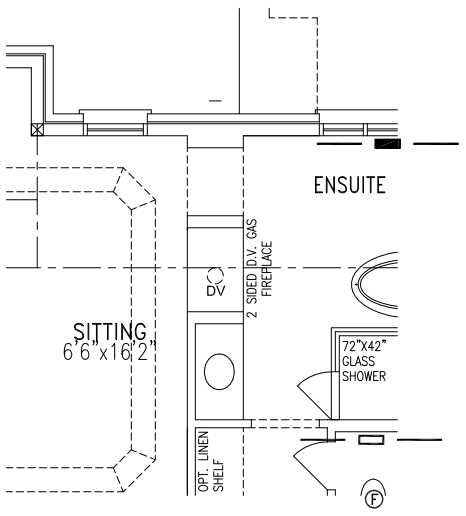
FIRST FLOOR HEATING LAYOUT

Date FEB/2020

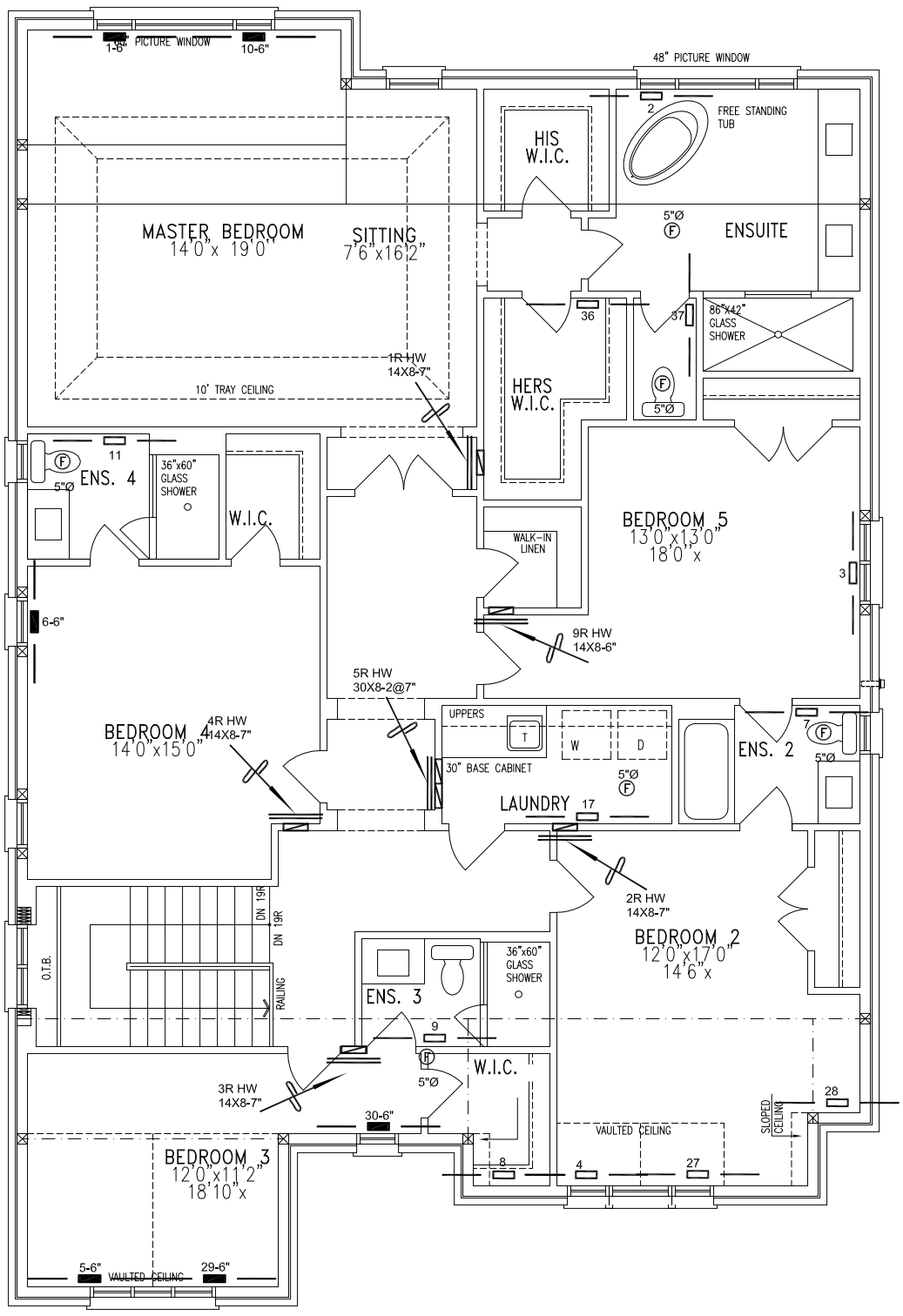
Scale 1/8" = 1'-0"

BCIN# 19669

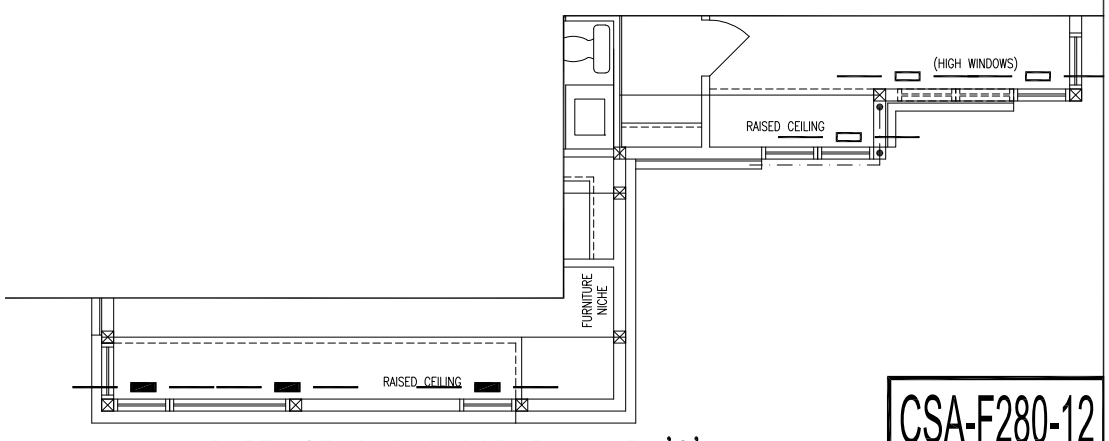
LO# 85454



PART. SECOND FLOOR PLAN
OPT. SITTING AREA FIREPLACE



OPT. 5 BEDROOM SECOND FLOOR PLAN, EL.'A'



PART. SECOND FLOOR PLAN, EL.'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

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

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Client

GOLDPARK HOMES

Project Name

PINE VALLEY & TESTON
VAUGHAN, ONTARIO

OPT. 5 BED OPT SERV STAIR
KNIGHTSWOOD

5005 4569 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.

Sheet Title

SECOND FLOOR HEATING LAYOUT

Date FEB/2020

Scale 1/8" = 1'-0"

BCIN# 19669

LO# 85454

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**		
VAUGHAN (WOODBRIDGE)				

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:** 5005 - KNIGHTSWOOD OPT. 5 BED - WOB **Project:** PINE VALLEY & TESTON

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.

September 12, 2018
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.

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

SITE NAME: PINE VALLEY & TESTON | OPT. 5 BED - WOB | DATE: Sep-18 | WINTER NATURAL AIR CHANGE RATE 0.416 | HEAT LOSS ΔT °F. 76 | CSA-F280-12
BUILDER: GOLD PARK HOMES | TYPE: 5005 - KNIGHTSWOOD | GFA: 4472 | LO# 79982 | SUMMER NATURAL AIR CHANGE RATE 0.139 | HEAT GAIN ΔT °F. 13 | SB-12 PACKAGE A1

ROOM USE			MBR			ENS			WIC			BED-2			BED-3			BED-4			ENS-2			WIC-2			ENS-3			ENS-4			BED-5		
EXP. WALL			45			29			6			34			37			26			6			9			4			7			14		
CLG. HT.			11			10			10			11			11			10			10			10			10			10			10		
	FACTORS																																	
GRS.WALL AREA	LOSS	GAIN	495			290			60			374			407			260			60			90			40			70			140		
GLAZING			LOSS		GAIN	LOSS		GAIN	LOSS		GAIN	LOSS		GAIN	LOSS		GAIN	LOSS		GAIN	LOSS		GAIN	LOSS		GAIN	LOSS		GAIN	LOSS		GAIN	LOSS		GAIN
NORTH	21.3	15.4	0	0	0	0	0	0	0	0	0	18	383	278	0	0	0	0	0	0	8	170	124	0	0	0	0	0	0	0	0	0	18	383	278
EAST	21.3	39.9	0	0	0	0	0	0	0	0	0	70	1490	2795	73	1553	2915	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
SOUTH	21.3	24.0	0	0	0	0	0	0	0	0	0	0	0	0	28	596	672	32	681	768	0	0	0	0	0	0	0	0	0	8	170	192	0	0	0
WEST	21.3	39.9	50	1064	1996	34	724	1357	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
SKYLT.	37.2	101.5	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	0	0	0	0	0	0
DOORS	25.2	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	0	0	0	0	0	0
NET EXPOSED WALL	4.5	0.8	445	1986	334	256	1142	192	60	268	45	286	1276	215	306	1366	230	228	1017	171	52	232	39	90	402	68	40	179	30	62	277	47	122	544	92
NET EXPOSED BSMT WALL ABOVE GR	3.6	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	0	0	0	0	0	0	0	0	0
EXPOSED CLG	1.3	0.6	440	565	259	204	262	120	102	131	60	216	277	127	256	329	150	396	508	233	60	77	35	48	62	28	140	180	82	105	135	62	364	467	214
NO ATTIC EXPOSED CLG	2.7	1.3	0	0	0	0	0	0	0	0	0	24	66	30	84	231	106	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	240	612	103	104	265	45	0	0	0	60	153	26	48	122	21	140	357	60	0	0	0	154	393	66
BASEMENT/CRAWL HEAT LOSS				0			0			0			0			0			0			0			0			0			0			0	
SLAB ON GRADE HEAT LOSS				0			0			0			0			0			0			0			0			0			0			0	
SUBTOTAL HT LOSS				3615			2128			399			4104			4340			2207			632			586			715			582			1787	
SUB TOTAL HT GAIN					2589			1670			105			3548			4117			1172			224			116			172			300			650
LEVEL FACTOR / MULTIPLIER			0.20	0.36		0.20	0.36		0.20	0.36		0.20	0.36		0.20	0.36		0.20	0.36		0.20	0.36		0.20	0.36		0.20	0.36		0.20	0.36		0.20	0.36	
AIR CHANGE HEAT LOSS				1283			756			142			1457			1541			784			225			208			254			207			635	
AIR CHANGE HEAT GAIN					207			133			8			284			329			94			18			9			14			24			52
DUCT LOSS				0			0			0			556			588			0			86			79			97			0			242	
DUCT GAIN					0			0			0			471			532			0			24			13			19			0			158
HEAT GAIN PEOPLE	240		2		480	0		0	0		0	1		240	1		240	1		240	0		0	0		0	0		0	0		0	1		240
HEAT GAIN APPLIANCES/LIGHTS					635			0			635			635			635			635			0			0			0			0			635
TOTAL HT LOSS BTU/H				4898			2883			540			6118			6468			2990			943			873			1066			788			2664	
TOTAL HT GAIN x 1.3 BTU/H					5085			2344			974			6731			7610			2783			345			180			266			421			2265

ROOM USE			LIB			DIN			KIT/GT			CAB			LAUN			PWD			FOY			MUD						WOB			BAS		
EXP. WALL			31			32			87			45			0			5			35			18						52			188		
CLG. HT.			11			11			11			11			10			11			11			12						10			10		
	FACTORS																																		
GRS.WALL AREA	LOSS	GAIN	341			352			957			495			0			55			385			216						520			1302		
GLAZING			LOSS		GAIN	LOSS		GAIN	LOSS		GAIN	LOSS		GAIN	LOSS		GAIN	LOSS		GAIN	LOSS		GAIN	LOSS		GAIN				LOSS		GAIN	LOSS		GAIN
NORTH	21.3	15.4	0	0	0	0	0	0	46	979	710	0	0	0	0	0	0	9	192	139	0	0	0	0	0	0				0	0	0	6	128	93
EAST	21.3	39.9	56	1192	2236	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
SOUTH	21.3	24.0	0	0	0	34	724	816	20	426	480	63	1341	1511	0	0	0	0	0	0	0	0	0	0	0	0				46	979	552	6	128	144
WEST	21.3	39.9	0	0	0	0	0	0	105	2234	4192	63	1341	2515	0	0	0	0	0	0	0	0	0	0	0	0				106	2256	2116	0	0	0
SKYLT.	37.2	101.5	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	0	0	0
DOORS	25.2	4.3	0	0	0	0	0	0	10	252	43	0	0	0	0	0	0	0	0	0	62	1565	264	20	505	85				20	505	85	20	505	85
NET EXPOSED WALL	4.5	0.8	285	1272	214	318	1419	239	776	3463	583	369	1647	277	0	0	0	46	205	35	323	1441	243	196	875	147				348	1553	262	0	0	0
NET EXPOSED BSMT WALL ABOVE GR	3.6	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				0	0	0	558	2008	338
EXPOSED CLG	1.3	0.6	0	0	0	0	0	0	0	0	0	0	0	0	102	131	60	0	0	0	0	0	0	0	0	0				0	0	0	0	0	0
NO ATTIC EXPOSED CLG	2.7	1.3	0	0	0	0	0	0	0	0	0	203	558	255	0	0	0	40	110	50	41	113	52	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	56	143	24	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			0								2977		
SLAB ON GRADE HEAT LOSS				0			0			0			0			0			0			0			0					741					
SUBTOTAL HT LOSS				2464			2143			7354			4886			274			507			3120			1380					6034			5746		
SUB TOTAL HT GAIN					2450			1055			6008			4559			84			224			558			232						3014			660
LEVEL FACTOR / MULTIPLIER			0.30	0.52		0.30	0.52		0.30	0.52		0.30	0.52		0.20	0.36		0.30	0.52		0.30	0.52		0.30	0.52								0.50	1.61	
AIR CHANGE HEAT LOSS				1283			1116			3830			2545			97			264			1625			719									18968	
AIR CHANGE HEAT GAIN					196			84			480			364			7			18			45			19										294
DUCT LOSS				0			0			0			0			37			0			0			0									0	
DUCT GAIN					0			0			0			0			73			0			0			0										0
HEAT GAIN PEOPLE	240		0		0	0		0	0		0	0		0	0		0	0		0	0		0	0		0				0		0	0		0
HEAT GAIN APPLIANCES/LIGHTS					635			635			635			635			635			0			0			635						0			635
TOTAL HT LOSS BTU/H				3747			3259			11185			7431			408			771			4744			2098					6775			24713		
TOTAL HT GAIN x 1.3 BTU/H					4266			2307			9261			7227			1038			314			783			1152						3919			2066

TOTAL HEAT GAIN BTU/H: 61863 TONS: 5.16 LOSS DUE TO VENTILATION LOAD BTU/H: 3181 STRUCTURAL HEAT LOSS: 95361 TOTAL COMBINED HEAT LOSS BTU/H: 98542

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

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

SITE NAME: PINE VALLEY & TESTON — OPT. 5 BED - WOB
BUILDER: GOLD PARK HOMES — TYPE: 5005 - KNIGHTSWOOD — DATE: Nov-18 — GFA: 4472 — LO# 79982

HEATING CFM	1955		COOLING CFM	1955			furnace pressure	0.6																
TOTAL HEAT LOSS	95,361		TOTAL HEAT GAIN	61,327			furnace filter	0.08									^LENNOX			AFUE = 96 %				
AIR FLOW RATE CFM	20.5		AIR FLOW RATE CFM	31.88			a/c coil pressure	0.2									EL296UH110XE60C	110		INPUT (BTU/H) = 110,000				
							available pressure										FAN SPEED			OUTPUT (BTU/H) = **106,000**				
							for s/a & r/a	0.32									LOW	0						
RUN COUNT	4th	3rd	2nd	1st	Bas												MEDLOW	1380		DESIGN CFM = **1955**				
S/A	0	0	18	13	8		plenum pressure s/a	0.17		r/a pressure	0.15						MEDIUM	1505		CFM @ .6 " E.S.P.				
R/A	0	0	6	3	1		max s/a dif press. loss	0.02		r/a grille press. Loss	0.02						MEDIUM HIGH	1685						
All S/A diffusers 4"x10" unless noted otherwise on layout.							min adjusted pressure s/a	0.15		adjusted pressure r/a	0.13						HIGH	1955		TEMPERATURE RISE 50 °F				
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	BED-5	BED-2	BED-3	BED-4	ENS-2	WIC-2	ENS-3	MBR	ENS-4	LIB	DIN	KIT/GT	KIT/GT	KIT/GT	LAUN	PWD	FOY	MUD	BAS	BAS	BAS	BAS
RM LOSS MBH.	2.45	2.24	2.66	2.04	2.16	2.99	0.94	0.87	1.07	2.45	0.79	1.87	3.26	2.80	2.80	2.80	0.41	0.77	4.74	2.10	3.94	3.94	3.94	3.94
CFM PER RUN HEAT	50	46	55	42	44	61	19	18	22	50	16	38	67	57	57	57	8	16	97	43	81	81	81	81
RM GAIN MBH.	2.54	1.87	2.26	2.24	2.54	2.78	0.35	0.18	0.27	2.54	0.42	2.13	2.31	2.32	2.32	2.32	1.04	0.31	0.78	1.15	0.75	0.75	0.75	0.75
CFM PER RUN COOLING	81	60	72	72	81	89	11	6	8	81	13	68	74	74	74	74	33	10	25	37	24	24	24	24
ADJUSTED PRESSURE	0.15	0.16	0.16	0.16	0.15	0.15	0.16	0.16	0.16	0.15	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.15	0.16	0.15	0.15	0.15	0.15
ACTUAL DUCT LGH.	70	70	53	49	75	48	47	48	53	64	59	57	29	52	69	54	36	73	40	47	77	60	69	38
EQUIVALENT LENGTH	200	200	170	160	170	160	200	150	170	170	150	140	103	120	140	110	200	170	210	160	150	120	150	90
TOTAL EFFECTIVE LENGTH	270	270	223	209	245	208	247	198	223	234	209	197	132	172	209	164	236	243	250	207	227	180	219	128
ADJUSTED PRESSURE	0.05	0.06	0.07	0.07	0.06	0.07	0.06	0.08	0.07	0.06	0.07	0.08	0.12	0.09	0.07	0.1	0.07	0.06	0.06	0.08	0.06	0.08	0.07	0.11
ROUND DUCT SIZE	**6**	5	5	5	**6**	**6**	4	4	4	**6**	4	5	5	5	5	5	4	4	**6**	4	**6**	**6**	**6**	5
HEATING VELOCITY (ft/min)	255	338	404	308	224	311	218	207	252	255	184	279	492	419	419	419	92	184	495	493	413	413	413	595
COOLING VELOCITY (ft/min)	413	441	529	529	413	454	126	69	92	413	149	499	543	543	543	543	379	115	127	424	122	122	122	176
OUTLET GRILL SIZE	4X10	3X10	3X10	3X10	4X10	4X10	3X10	3X10	3X10	4X10	3X10	3X10	3X10	3X10	3X10	3X10	3X10	3X10	4X10	3X10	4X10	4X10	4X10	3X10
TRUNK	D	C	E	G	F	E	E	G	G	D	E	F	E	D	B	C	G	A	F	C	A	B	D	E

RUN #	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39
ROOM NAME	BAS	BAS	BED-2	BED-2	BED-3	BED-3	LIB	KIT/GT	CAB	CAB	CAB	WIC	ENS	BAS	BAS
RM LOSS MBH.	3.94	3.94	2.04	2.04	2.16	2.16	1.87	2.80	2.48	2.48	2.48	0.54	0.64	3.94	3.94
CFM PER RUN HEAT	81	81	42	42	44	44	38	57	51	51	51	11	13	81	81
RM GAIN MBH.	0.75	0.75	2.24	2.24	2.54	2.54	2.13	2.32	2.41	2.41	2.41	0.97	0.47	0.75	0.75
CFM PER RUN COOLING	24	24	72	72	81	81	68	74	77	77	77	31	15	24	24
ADJUSTED PRESSURE	0.15	0.15	0.16	0.16	0.15	0.15	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.15	0.15
ACTUAL DUCT LGH.	34	50	52	55	80	63	51	55	69	71	82	56	58	23	58
EQUIVALENT LENGTH	110	150	170	160	170	200	160	120	150	130	140	200	190	140	170
TOTAL EFFECTIVE LENGTH	144	200	222	215	250	263	211	175	219	201	222	256	248	163	228
ADJUSTED PRESSURE	0.1	0.07	0.07	0.07	0.06	0.06	0.07	0.09	0.07	0.08	0.07	0.06	0.06	0.09	0.06
ROUND DUCT SIZE	5	**6**	5	5	**6**	**6**	5	5	**6**	5	**6**	4	4	5	**6**
HEATING VELOCITY (ft/min)	595	413	308	308	224	224	279	419	260	374	260	126	149	595	413
COOLING VELOCITY (ft/min)	176	122	529	529	413	413	499	543	393	565	393	356	172	176	122
OUTLET GRILL SIZE	3X10	4X10	3X10	3X10	4X10	4X10	3X10	3X10	4X10	3X10	4X10	3X10	3X10	3X10	4X10
TRUNK	G	F	G	G	F	F	F	B	A	A	A	C	C	E	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	250	0.06	9	10	x	8	450	TRUNK G	641	0.06	12.8	20	x	8	577
TRUNK B	195	0.07	7.9	8	x	8	439	TRUNK H	1955	0.05	20.3	38	x	10	741
TRUNK C	696	0.06	13.2	20	x	8	626	TRUNK I	0	0.00	0	0	x	8	0
TRUNK D	238	0.05	9.2	10	x	8	428	TRUNK J	0	0.00	0	0	x	8	0
TRUNK E	1314	0.05	17.5	28	x	10	676	TRUNK K	0	0.00	0	0	x	8	0
TRUNK F	386	0.06	10.6	14	x	8	496	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	1515	0.05	18.4	32	x	10	682
TRUNK Y	880	0.05	15	26	x	8	609
TRUNK Z	415	0.05	11.3	14	x	8	534
DROP	1955	0.05	20.3	24	x	18	652

RETURN AIR #	1	2	3	4	5	6	7	8	9							BR
	0	0	0	0	2@7"	0	0	0	0	0	0	0	0	0	0	
AIR VOLUME	115	140	115	115	280	185	350	300	85	0	0	0	0	0	0	270
PLENUM PRESSURE	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13
ACTUAL DUCT LGH.	84	51	62	59	47	49	30	51	49	1	1	1	1	1	1	14
EQUIVALENT LENGTH	200	135	185	185	135	140	170	195	175	0	0	0	0	0	0	145
TOTAL EFFECTIVE LH	284	186	247	244	182	189	200	246	224	1	1	1	1	1	1	159
ADJUSTED PRESSURE	0.05	0.07	0.05	0.05	0.07	0.07	0.07	0.05	0.06	13.36	13.36	13.36	13.36	13.36	13.36	0.08
ROUND DUCT SIZE	7	6.9	7	7	9	7.7	9.8	10.1	6	0	0	0	0	0	0	8.6
INLET GRILL SIZE	8	8	8	8	8	8	8	8	8	0	0	0	0	0	0	8
	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
INLET GRILL SIZE	14	14	14	14	30	14	30	30	14	0	0	0	0	0	0	30

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: 5005 - KNIGHTSWOOD LO # 79982
SITE NAME: PINE VALLEY & TESTON OPT. 5 BED - WOB

RESIDENTIAL MECHANICAL VENTILATION DESIGN SUMMARY

COMBUSTION APPLIANCES 9.32.3.1(1)

- a) [✓] Direct vent (sealed combustion) only
- b) [ ] Positive venting induced draft (except fireplaces)
- c) [ ] Natural draft, B-vent or induced draft gas fireplace
- d) [ ] Solid Fuel (including fireplaces)
- e) [ ] No Combustion Appliances

HEATING SYSTEM

[✓] Forced Air [ ] Non Forced Air

[ ] Electric Space Heat

HOUSE TYPE 9.32.1(2)

- [✓] I Type a) or b) appliance only, no solid fuel
- [ ] II Type I except with solid fuel (including fireplaces)
- [ ] III Any Type c) appliance
- [ ] IV Type I, or II with electric space heat
- [ ] Other: Type I, II or IV no forced air

SYSTEM DESIGN OPTIONS O.N.H.W.P.

- [ ] 1 Exhaust only/Forced Air System
- [ ] 2 HRV with Ducting/Forced Air System
- [✓] 3 HRV Simplified/connected to forced air system
- [ ] 4 HRV with Ducting/non forced air system
- [ ] Part 6 Design

TOTAL VENTILATION CAPACITY 9.32.3.3(1)

Basement + Master Bedroom	2	@ 21.2 cfm	42.4	cfm
Other Bedrooms	4	@ 10.6 cfm	42.4	cfm
Kitchen & Bathrooms	7	@ 10.6 cfm	74.2	cfm
Other Rooms	8	@ 10.6 cfm	84.8	cfm
Table 9.32.3.A.		TOTAL	243.8	cfm

PRINCIPAL VENTILATION CAPACITY REQUIRED 9.32.3.4.(1)

1	Bedroom	31.8	cfm
2	Bedroom	47.7	cfm
3	Bedroom	63.6	cfm
4	Bedroom	79.5	cfm
5	Bedroom	95.4	cfm
	TOTAL	95.4	cfm

SUPPLEMENTAL VENTILATION CAPACITY 9.32.3.5.

Total Ventilation Capacity	243.8	cfm
Less Principal Ventil. Capacity	155	cfm
Required Supplemental Capacity	88.8	cfm

PRINCIPAL EXHAUST FAN CAPACITY

Model: VANEE 65H Location: BSMT

155.0 cfm 3.0 sones [✓] HVI Approved

PRINCIPAL EXHAUST HEAT LOSS CALCULATION

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

SUPPLEMENTAL FANS NUTONE

Location	Model	cfm	HVI	Sones
ENS	QTXEN050C	50	✓	0.3
ENS-2	QTXEN050C	50	✓	0.3
ENS-4	QTXEN050C	50	✓	0.3
PWD	QTXEN050C	50	✓	0.3

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: 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: September-18

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#: 79982 Model: 5005 - KNIGHTSWOOD Builder: GOLD PARK HOMES Date: 9/12/2018

Volume Calculation

House Volume

Level	Floor Area (ft^2)	Floor Height (ft)	Volume (ft^3)
Bsmt	2033	10	20330
First	2033	11	22363
Second	2439	10	24390
Third	0	9	0
Fourth	0	9	0
		Total:	67,083.0 ft^3
		Total:	1899.6 m^3

Air Change & Delta T Data

WINTER NATURAL AIR CHANGE RATE	0.416
SUMMER NATURAL AIR CHANGE RATE	0.139

Design Temperature Difference

	Tin °C	Tout °C	ΔT °C	ΔT °F
Winter DTDh	22	-20	42	76
Summer DTDc	24	31	7	13

5.2.3.1 Heat Loss due to Air Leakage

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

0.416 x 527.66 x 42 °C x 1.2 = 11118 W

= 37935 Btu/h

6.2.6 Sensible Gain due to Air Leakage

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

= 0.139 x 527.66 x 7 °C x 1.2 = 628 W

= 2142 Btu/h

5.2.3.2 Heat Loss due to Mechanical Ventilation

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

155 CFM x 76 °F x 1.08 x 0.25 = 3181 Btu/h

6.2.7 Sensible heat Gain due to Ventilation

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

155 CFM x 13 °F x 1.08 x 0.25 = 536 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	37,935	11,779	1.610
2	0.3		21,853	0.521
3	0.2		21,367	0.355
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: 5005 - KNIGHTSWOOD OPT. 5 BED - WOB **BUILDER:** GOLD PARK HOMES
SFQT: 4472 **LO#** 79982 **SITE:** PINE VALLEY & TESTON

DESIGN ASSUMPTIONS

HEATING	°F	COOLING	°F
OUTDOOR DESIGN TEMP.	-4	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:	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):	67083.0	ASSUMED (Y/N):	Y
INTERNAL SHADING:	BLINDS/CURTAINS	ASSUMED OCCUPANTS:	6
INTERIOR LIGHTING LOAD ($Btu/h/ft^2$):	1.27	DC BRUSHLESS MOTOR (Y/N):	Y
FOUNDATION CONFIGURATION	BCIN_1	DEPTH BELOW GRADE:	7.0 ft
LENGTH: 77.0 ft WIDTH:	42.0 ft	EXPOSED PERIMETER:	186.0 ft
WOB INSULATION CONFIGURATION	SCB_9	WOB EXPOSED PERIMETER	52.0 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	29.80
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

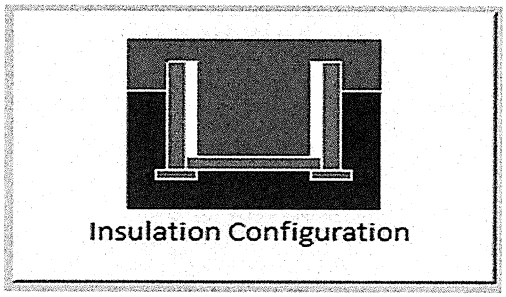
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905-619-2300

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 sand, loam, clay
Water Table:	Normal (7-10 m, 23-33 ft)

Foundation Dimensions		
Floor Length (m):	**4.6**	
Floor Width (m):	**12.8**	
Exposed Perimeter (m):	**56.7**	
Wall Height (m):	**3.0**	
Depth Below Grade (m):	**1.84**	
Window Area (m^2):	**1.1**	
Door Area (m^2):	**1.9**	


Insulation Configuration

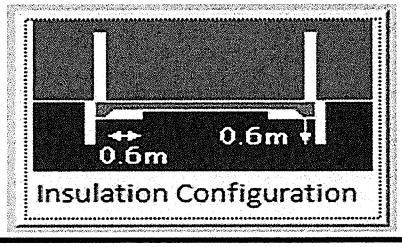
Radiant Slab		
Heated Fraction of the Slab:	**0**	
Fluid Temperature (°C):	**33**	
Design Months		
Heating Month	**1**	
Foundation Loads		
Heating Load (Watts):	**872**	

TYPE: 5005 - KNIGHTSWOOD OPT. 5 BED - WOB
LO# 79982

HVAC Designs Ltd.
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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 sand, loam, clay	
Water Table:	Normal (7-10 m, 23-33 ft)	
Foundation Dimensions		
Length (m):	**1.5**	
Width (m):	**12.8**	
Exposed Perimeter (m):	**15.8**	
Radiant Slab		
Heated Fraction of the Slab:	**0**	
Fluid Temperature (°C):	**33**	
Design Months		
Heating Month	**1**	
Results		
Heating Load (Watts):	**217**	

TYPE: 5005 - KNIGHTSWOOD OPT. 5 BED - WOB
LO# 79982

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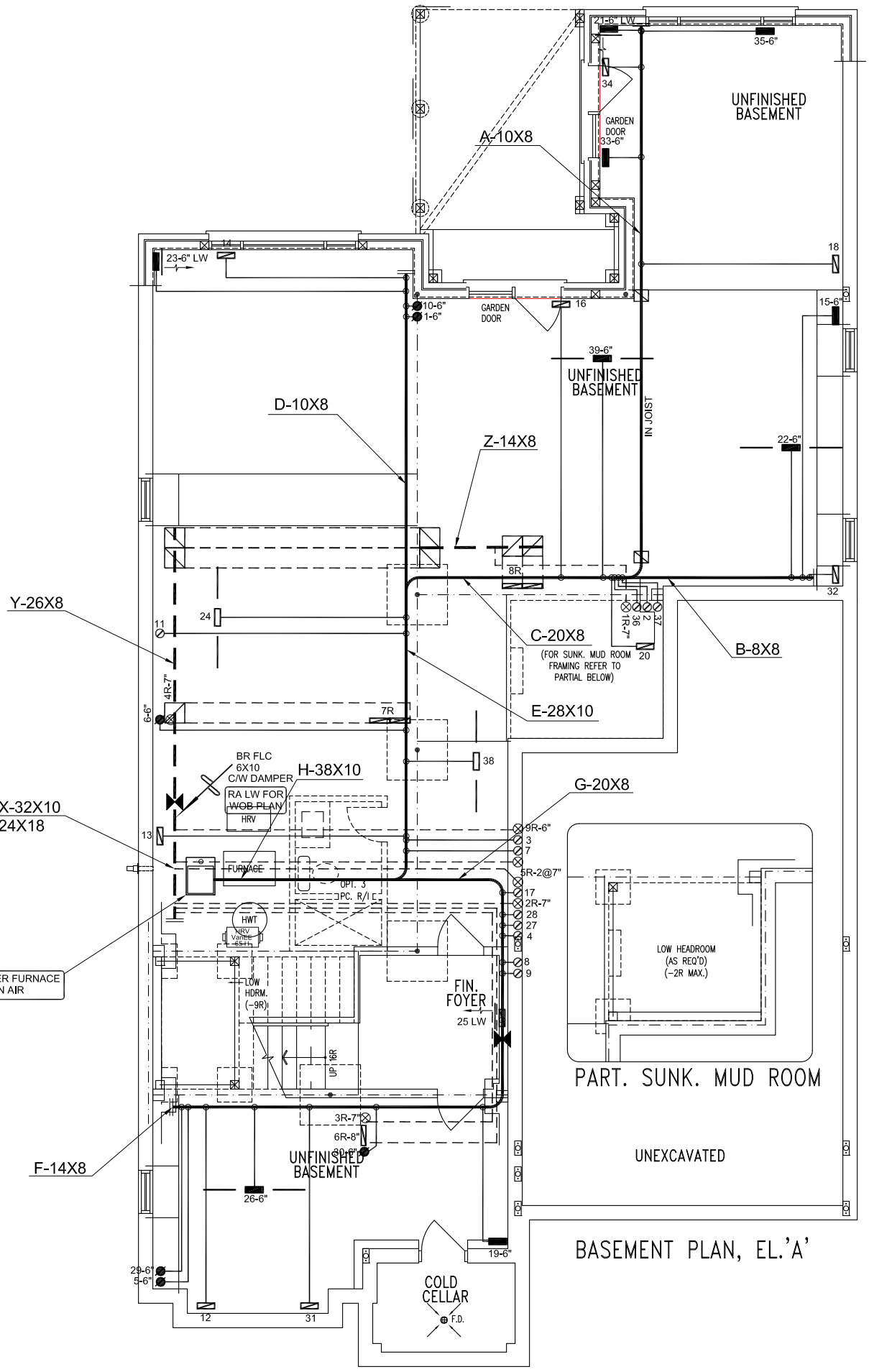
Air Infiltration Residential Load Calculator

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):	9.45	
Building Configuration		
Type:	Detached	
Number of Stories:	Two	
Foundation:	Full	
House Volume (m^3):	1899.6	
Air Leakage/Ventilation		
Air Tightness Type:	Present (1961-) (3.57 ACH)	
Custom BDT Data:	ELA @ 10 Pa.	2532.2 cm^2
	3.57	ACH @ 50 Pa
Mechanical Ventilation (L/s):	Total Supply	Total Exhaust
	73.2	73.2
Flue Size		
Flue #:	#1 #2 #3 #4	
Diameter (mm):	0 0 0 0	
Natural Infiltration Rates		
Heating Air Leakage Rate (ACH/H):	**0.416**	
Cooling Air Leakage Rate (ACH/H):	**0.139**	

TYPE: 5005 - KNIGHTSWOOD OPT. 5 BED - WOB

LO# 79982



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

WOB | **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.	REVISED AS PER ARCHITECTURALS	FEB/2020
1.	3R RELOCATED	NOV/2018

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Client
GOLDPARK HOMES

Project Name
PINE VALLEY & TESTON
VAUGHAN, ONTARIO
OPT. 5 BED
KNIGHTSWOOD - WOB
5005 4472 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.

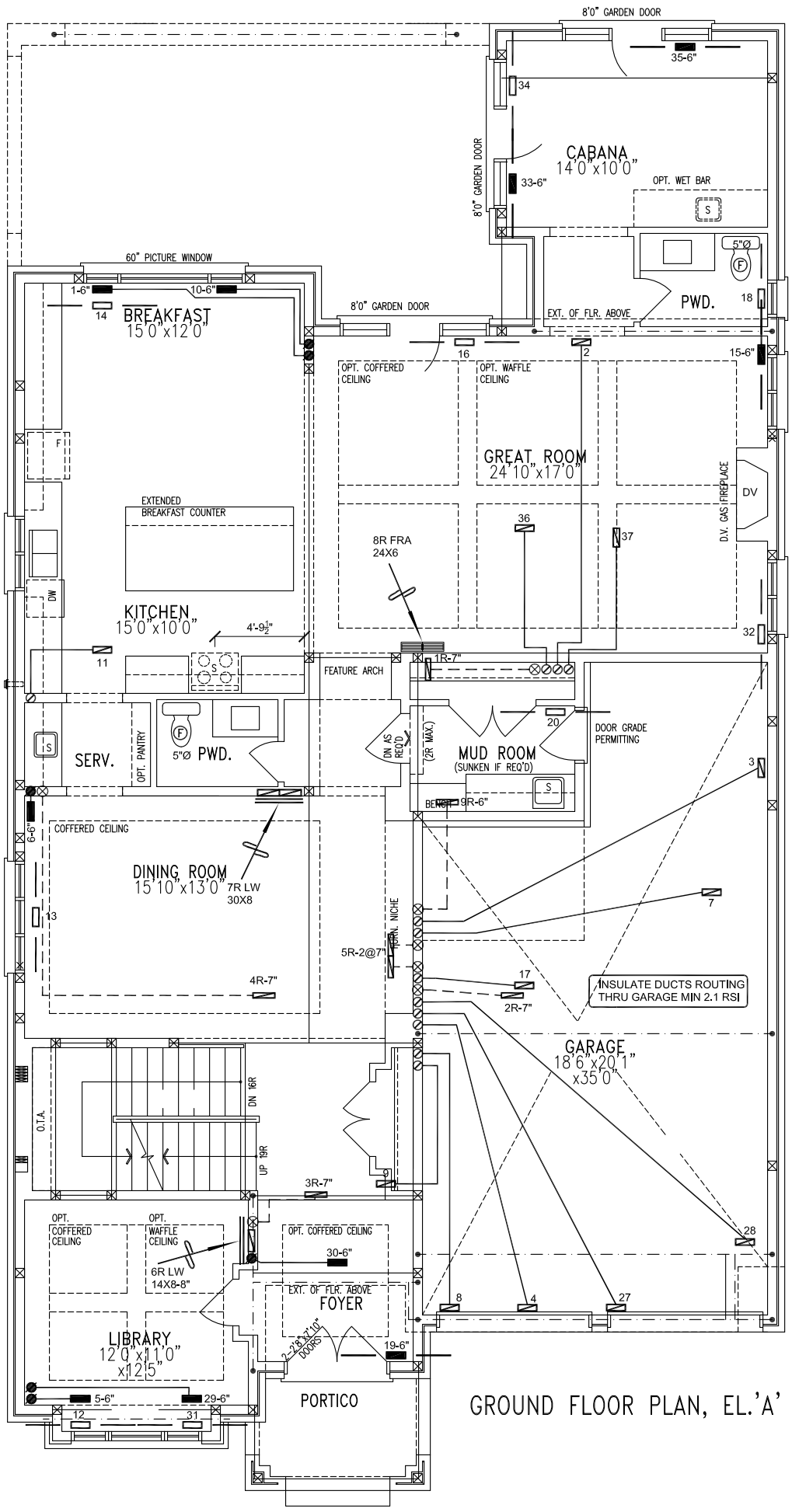
HEAT LOSS 98542 BTU/H	
UNIT DATA	
MAKE	LENNOX
MODEL	EL296UH110XE60C
INPUT	110 MBTU/H
OUTPUT	106 MBTU/H
COOLING	5.0 TONS
FAN SPEED	1955 cfm @ 0.6" w.c.

# OF RUNS	S/A	R/A	FANS
3RD FLOOR			
2ND FLOOR	18	6	7
1ST FLOOR	13	3	3
BASEMENT	8	1	0

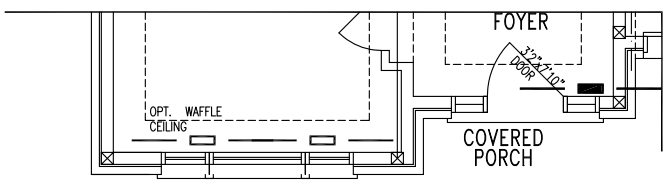
ALL S/A DIFFUSERS 4 "x10" UNLESS NOTED OTHERWISE ON LAYOUT. ALL S/A RUNS 5"Ø UNLESS NOTED OTHERWISE ON LAYOUT. UNDERCUT DOORS 1" min. FOR R/A

Sheet Title
BASEMENT HEATING LAYOUT

Date SEPT/2018
Scale 1/8" = 1'-0"
BCIN# 19669
LO# 79982



GROUND FLOOR PLAN, EL.'A'



PART. GROUND FLOOR PLAN, EL.'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

WOB | 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.	REVISED AS PER ARCHITECTURALS	FEB/2020
1.	3R RELOCATED	NOV/2018

REVISIONS

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Client

GOLDPARK HOMES

Project Name

PINE VALLEY & TESTON
VAUGHAN, ONTARIO
OPT. 5 BED
KNIGHTSWOOD - WOB
5005 4472 sqft

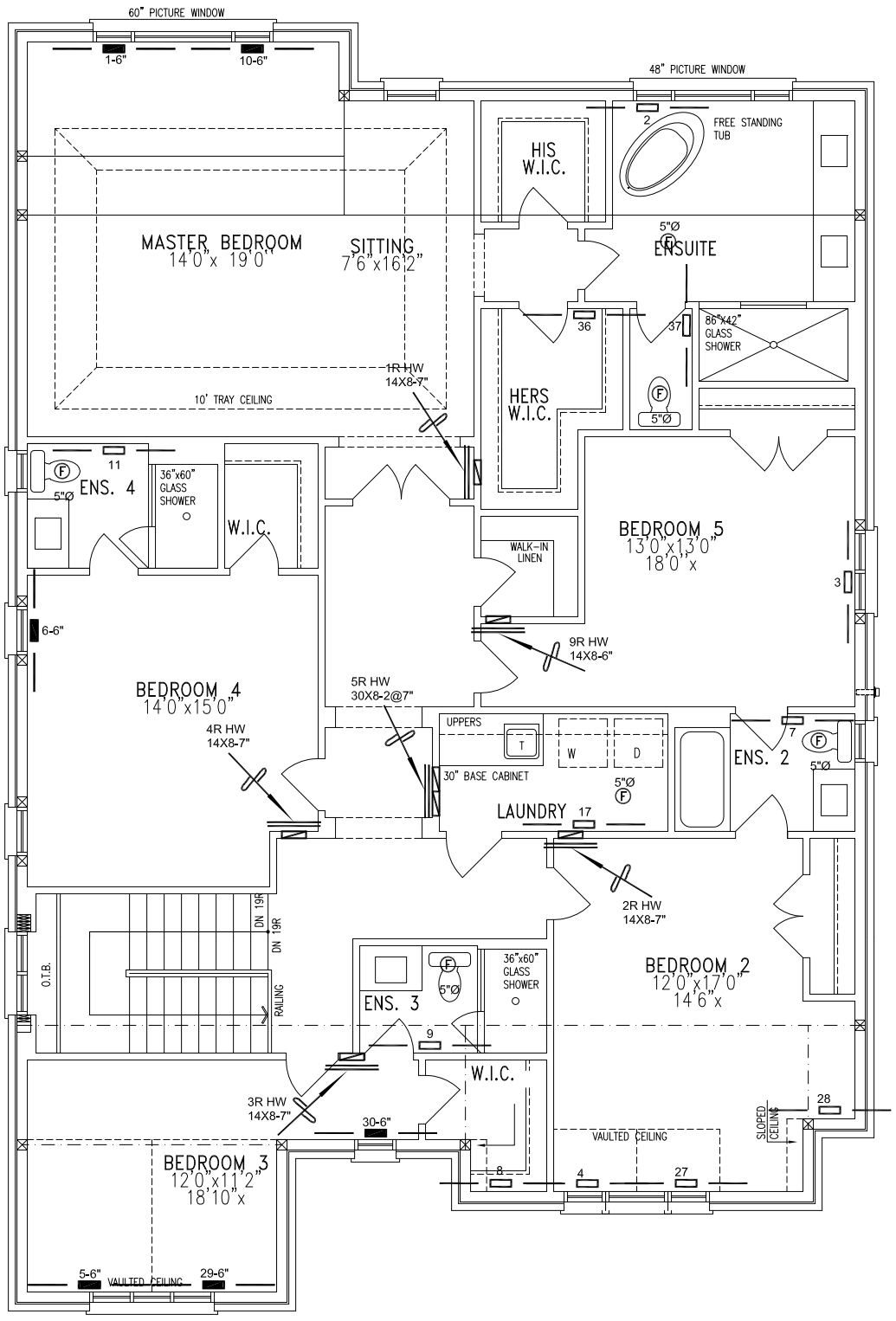
HVAC DESIGNS LTD.
375 Finley Ave. Suite 202 - Ajax, Ontario
L1S 2E2 Tel. 905.619.2300 - 905.420.5300 Fax 905.619.2375
Email: info@hvacdesigns.ca
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Installation to comply with the latest Ontario Building Code. All supply branch outlets shall be equipped with a manual balancing damper. Ductwork which passes through the garage or unheated spaces shall be adequately insulated and be gas-proofed.

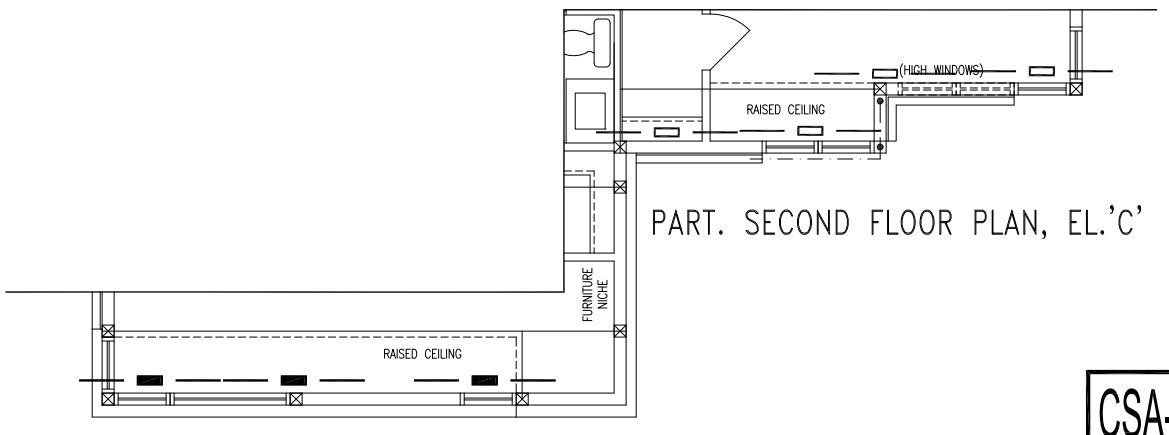
Sheet Title

FIRST FLOOR HEATING LAYOUT

Date SEPT/2018
Scale 1/8" = 1'-0"
BCIN# 19669
LO# 79982



OPT. 5 BEDROOM SECOND FLOOR PLAN, EL.'A'



PART. SECOND FLOOR PLAN, EL.'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

WOB | 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.	REVISED AS PER ARCHITECTURALS	FEB/2020
1.	3R RELOCATED	NOV/2018

REVISIONS

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Client
GOLDPARK HOMES

Project Name
PINE VALLEY & TESTON
VAUGHAN, ONTARIO
OPT. 5 BED
KNIGHTSWOOD - WOB
5005 4472 sqft

HVAC DESIGNS LTD.
375 Finley Ave. Suite 202 - Ajax, Ontario
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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
SECOND FLOOR HEATING LAYOUT

Date SEPT/2018
Scale 1/8" = 1'-0"
BCIN# 19669
LO# 79982

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**		
VAUGHAN (WOODBRIDGE)				

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:** 5005 - KNIGHTSWOOD OPT. 5 BED - WOB **Project:** PINE VALLEY & TESTON

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.

February 26, 2020
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.

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

SITE NAME: PINE VALLEY & TESTON | OPT. 5 BED - WOB | DATE: Feb-20 | WINTER NATURAL AIR CHANGE RATE 0.416 | HEAT LOSS ΔT °F. 76 | CSA-F280-12
BUILDER: GOLD PARK HOMES | TYPE: 5005 - KNIGHTSWOOD | GFA: 4569 | LO# 85456 | SUMMER NATURAL AIR CHANGE RATE 0.139 | HEAT GAIN ΔT °F. 13 | SB-12 PACKAGE A1

ROOM USE			MBR			ENS			WIC			BED-2			BED-3			BED-4			ENS-2			WIC-2			ENS-3			ENS-4			BED-5		
EXP. WALL			45			29			6			34			37			26			6			9			4			7			14		
CLG. HT.			11			10			10			11			11			10			10			10			10			10			10		
	FACTORS																																	
GRS.WALL AREA	LOSS	GAIN	495			290			60			374			407			260			60			90			40			70			140		
GLAZING			LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN
NORTH	21.3	15.4	0	0	0	0	0	0	0	0	0	18	383	278	0	0	0	0	0	0	8	170	124	0	0	0	0	0	0	0	0	0	18	383	278
EAST	21.3	39.9	0	0	0	0	0	0	0	0	0	70	1490	2795	73	1553	2915	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
SOUTH	21.3	24.0	0	0	0	0	0	0	0	0	0	0	0	0	28	596	672	32	681	768	0	0	0	0	0	0	0	0	0	8	170	192	0	0	0
WEST	21.3	39.9	50	1064	1996	34	724	1357	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
SKYLT.	37.2	101.5	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	0	0	0	0	0	0
DOORS	25.2	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	0	0	0	0	0	0
NET EXPOSED WALL	4.5	0.8	445	1986	334	256	1142	192	60	268	45	286	1276	215	306	1366	230	228	1017	171	52	232	39	90	402	68	40	179	30	62	277	47	122	544	92
NET EXPOSED BSMT WALL ABOVE GR	3.6	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	0	0	0	0	0	0	0	0	0
EXPOSED CLG	1.3	0.6	440	565	259	204	262	120	102	131	60	216	277	127	256	329	150	396	508	233	60	77	35	48	62	28	140	180	82	105	135	62	364	467	214
NO ATTIC EXPOSED CLG	2.7	1.3	0	0	0	0	0	0	0	0	0	24	66	30	84	231	106	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	240	612	103	104	265	45	0	0	0	60	153	26	48	122	21	140	357	60	0	0	0	25	64	11
BASEMENT/CRAWL HEAT LOSS				0			0			0			0			0			0			0			0			0			0			0	
SLAB ON GRADE HEAT LOSS				0			0			0			0			0			0			0			0			0			0			0	
SUBTOTAL HT LOSS				3615			2128			399			4104			4340			2207			632			586			715			582			1458	
SUB TOTAL HT GAIN					2589			1670			105			3548			4117			1172			224			116			172			300			594
LEVEL FACTOR / MULTIPLIER			0.20	0.37		0.20	0.37		0.20	0.37		0.20	0.37		0.20	0.37		0.20	0.37		0.20	0.37		0.20	0.37		0.20	0.37		0.20	0.37		0.20	0.37	
AIR CHANGE HEAT LOSS				1343			791			148			1525			1612			820			235			218			266			216			542	
AIR CHANGE HEAT GAIN					212			137			9			291			337			96			18			10			14			25			49
DUCT LOSS				0			0			0			563			595			0			87			80			98			0			200	
DUCT GAIN					0			0			0			473			535			0			24			13			19			0			154
HEAT GAIN PEOPLE	240		2		480	0		0	0		0	1		240	1		240	1		240	0		0	0		0	0		0	0		0	1		240
HEAT GAIN APPLIANCES/LIGHTS					654			0			654			654			654			654			0			0			0			0			654
TOTAL HT LOSS BTU/H				4958			2918			547			6192			6547			3027			954			884			1079			798			2200	
TOTAL HT GAIN x 1.3 BTU/H					5116			2348			999			6768			7648			2811			346			180			267			422			2199

ROOM USE			LIB			DIN			KIT/GT			CAB			LAUN			PWD			FOY			MUD									WOB			BAS		
EXP. WALL			31			32			77			45			0			5			35			32									52			186		
CLG. HT.			11			11			11			11			10			11			11			12									10			10		
	FACTORS																																					
GRS.WALL AREA	LOSS	GAIN	341			352			847			495			0			55			385			384									520			1302		
GLAZING			LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN								LOSS	GAIN		LOSS	GAIN	
NORTH	21.3	15.4	0	0	0	0	0	0	46	979	710	0	0	0	0	0	0	9	192	139	0	0	0	0	0	0							0	0	0	6	128	93
EAST	21.3	39.9	56	1192	2236	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
SOUTH	21.3	24.0	0	0	0	34	724	816	20	426	480	63	1341	1511	0	0	0	0	0	0	0	0	0	0	0	0							46	979	552	6	128	144
WEST	21.3	39.9	0	0	0	0	0	0	105	2234	4192	63	1341	2515	0	0	0	0	0	0	0	0	0	0	0	0							106	2256	2116	0	0	0
SKYLT.	37.2	101.5	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	0	0	0
DOORS	25.2	4.3	0	0	0	0	0	0	10	252	43	0	0	0	0	0	0	0	0	0	62	1565	264	20	505	85							20	505	85	20	505	85
NET EXPOSED WALL	4.5	0.8	285	1272	214	318	1419	239	666	2972	501	369	1647	277	0	0	0	46	205	35	323	1441	243	364	1624	274							348	1553	262	0	0	0
NET EXPOSED BSMT WALL ABOVE GR	3.6	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							0	0	0	558	2008	338
EXPOSED CLG	1.3	0.6	0	0	0	0	0	0	0	0	0	0	0	0	102	131	60	0	0	0	0	0	0	0	0	0							0	0	0	0	0	0
NO ATTIC EXPOSED CLG	2.7	1.3	0	0	0	0	0	0	0	0	0	203	558	255	0	0	0	40	110	50	41	113	52	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	56	143	24	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			0											2977	
SLAB ON GRADE HEAT LOSS				0			0			0			0			0			0			0			0									741				
SUBTOTAL HT LOSS				2464			2143			6864			4886			274			507			3120			2129									6034			5746	
SUB TOTAL HT GAIN					2450			1055			5925			4559			84			224			558			359									3014			660
LEVEL FACTOR / MULTIPLIER			0.30	0.53		0.30	0.53		0.30	0.53		0.30	0.53		0.20	0.37		0.30	0.53		0.30	0.53		0.30	0.53											0.50	1.66	
AIR CHANGE HEAT LOSS				1306			1136			3640			2591			102			269			1654			1129												19544	
AIR CHANGE HEAT GAIN					201			86			485			373			7			18			46			29													301
DUCT LOSS				0			0			0			0			38			0			0			0												0	
DUCT GAIN					0			0			0			0			75			0			0			0													0
HEAT GAIN PEOPLE	240		0		0	0		0	0		0	0		0	0		0	0		0	0		0	0		0							0		0	0		0
HEAT GAIN APPLIANCES/LIGHTS					654			654			654			654			654			0			0			654													654
TOTAL HT LOSS BTU/H				3770			3279			10503			7477			413			775			4774			3259									6775			25289	
TOTAL HT GAIN x 1.3 BTU/H					4297			2334			9184			7263			1066			315			785			1355									3919			2100

TOTAL HEAT GAIN BTU/H: 62257 | TONS: 5.19 | LOSS DUE TO VENTILATION LOAD BTU/H: 3181 | STRUCTURAL HEAT LOSS: 96419 | TOTAL COMBINED HEAT LOSS BTU/H: 99599

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.

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

SITE NAME: PINE VALLEY & TESTON — OPT. 5 BED - WOB
BUILDER: GOLD PARK HOMES — TYPE: 5005 - KNIGHTSWOOD — DATE: Feb-20 — GFA: 4569 — LO# 85456

HEATING CFM	1955	COOLING CFM	1955	furnace pressure	0.6
TOTAL HEAT LOSS	96,419	TOTAL HEAT GAIN	61,721	furnace filter	0.08
AIR FLOW RATE CFM	20.28	AIR FLOW RATE CFM	31.67	a/c coil pressure	0.2
				available pressure for s/a & r/a	0.32
				plenum pressure s/a	0.17
				max s/a dif press. loss	0.02
				min adjusted pressure s/a	0.15

				r/a pressure	0.15
				r/a grille press. Loss	0.02
				adjusted pressure r/a	0.13

^LENNOX — AFUE = 96 %
EL296UH110XE60C 110 — INPUT (BTU/H) = 110,000
FAN SPEED — OUTPUT (BTU/H) = **106,000**

FAN SPEED	
LOW	0
MEDLOW	1380
MEDIUM	1505
MEDIUM HIGH	1685
HIGH	1955

DESIGN CFM = **1955** CFM @ .6 " E.S.P.
TEMPERATURE RISE 50 °F

RUN COUNT	4th	3rd	2nd	1st	Bas
S/A	0	0	18	13	8
R/A	0	0	6	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	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
ROOM NAME	MBR	ENS	BED-5	BED-2	BED-3	BED-4	ENS-2	WIC-2	ENS-3	MBR	ENS-4	LIB	DIN	KIT/GT	KIT/GT	KIT/GT	LAUN	PWD	FOY	MUD	BAS	BAS	BAS	BAS
RM LOSS MBH.	2.48	2.26	2.20	2.06	2.18	3.03	0.95	0.88	1.08	2.48	0.80	1.89	3.28	2.63	2.63	2.63	0.41	0.78	4.77	3.26	4.01	4.01	4.01	4.01
CFM PER RUN HEAT	50	46	45	42	44	61	19	18	22	50	16	38	66	53	53	53	8	16	97	66	81	81	81	81
RM GAIN MBH.	2.56	1.87	2.20	2.26	2.55	2.81	0.35	0.18	0.27	2.56	0.42	2.15	2.33	2.30	2.30	2.30	1.07	0.31	0.78	1.36	0.75	0.75	0.75	0.75
CFM PER RUN COOLING	81	59	70	71	81	89	11	6	8	81	13	68	74	73	73	73	34	10	25	43	24	24	24	24
ADJUSTED PRESSURE	0.15	0.16	0.16	0.16	0.15	0.15	0.16	0.16	0.16	0.15	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.15	0.16	0.15	0.15	0.15	0.15
ACTUAL DUCT LGH.	70	70	53	49	75	48	47	48	53	64	59	57	29	52	69	54	36	73	40	65	77	60	69	38
EQUIVALENT LENGTH	200	200	170	160	170	160	200	150	170	170	150	140	103	120	140	110	200	170	210	190	150	120	150	90
TOTAL EFFECTIVE LENGTH	270	270	223	209	245	208	247	198	223	234	209	197	132	172	209	164	236	243	250	255	227	180	219	128
ADJUSTED PRESSURE	0.05	0.06	0.07	0.07	0.06	0.07	0.06	0.08	0.07	0.06	0.07	0.08	0.12	0.09	0.07	0.1	0.07	0.06	0.06	0.06	0.06	0.08	0.07	0.11
ROUND DUCT SIZE	**6**	5	5	5	**6**	**6**	4	4	4	**6**	4	5	5	5	5	5	4	4	**6**	5	**6**	**6**	**6**	5
HEATING VELOCITY (ft/min)	255	338	330	308	224	311	218	207	252	255	184	279	485	389	389	389	92	184	495	485	413	413	413	595
COOLING VELOCITY (ft/min)	413	433	514	521	413	454	126	69	92	413	149	499	543	536	536	536	390	115	127	316	122	122	122	176
OUTLET GRILL SIZE	4X10	3X10	3X10	3X10	4X10	4X10	3X10	3X10	3X10	4X10	3X10	3X10	3X10	3X10	3X10	3X10	3X10	3X10	4X10	3X10	4X10	4X10	4X10	3X10
TRUNK	D	C	E	G	F	E	E	G	G	D	E	F	E	D	B	C	G	A	F	B	A	B	D	E

RUN #	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39
ROOM NAME	BAS	BAS	BED-2	BED-2	BED-3	BED-3	LIB	KIT/GT	CAB	CAB	CAB	WIC	ENS	BAS	BAS
RM LOSS MBH.	4.01	4.01	2.06	2.06	2.18	2.18	1.89	2.63	2.49	2.49	2.49	0.55	0.66	4.01	4.01
CFM PER RUN HEAT	81	81	42	42	44	44	38	53	51	51	51	11	13	81	81
RM GAIN MBH.	0.75	0.75	2.26	2.26	2.55	2.55	2.15	2.30	2.42	2.42	2.42	1.00	0.47	0.75	0.75
CFM PER RUN COOLING	24	24	71	71	81	81	68	73	77	77	77	32	15	24	24
ADJUSTED PRESSURE	0.15	0.15	0.16	0.16	0.15	0.15	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.15	0.15
ACTUAL DUCT LGH.	34	50	52	55	80	63	51	55	69	71	82	56	58	23	58
EQUIVALENT LENGTH	110	150	170	160	170	200	160	120	150	130	140	200	190	140	170
TOTAL EFFECTIVE LENGTH	144	200	222	215	250	263	211	175	219	201	222	256	248	163	228
ADJUSTED PRESSURE	0.1	0.07	0.07	0.07	0.06	0.06	0.07	0.09	0.07	0.08	0.07	0.06	0.06	0.09	0.06
ROUND DUCT SIZE	5	**6**	5	5	**6**	**6**	5	5	**6**	5	**6**	4	4	5	**6**
HEATING VELOCITY (ft/min)	595	413	308	308	224	224	279	389	260	374	260	126	149	595	413
COOLING VELOCITY (ft/min)	176	122	521	521	413	413	499	536	393	565	393	367	172	176	122
OUTLET GRILL SIZE	3X10	4X10	3X10	3X10	4X10	4X10	3X10	3X10	4X10	3X10	4X10	3X10	3X10	3X10	4X10
TRUNK	G	F	G	G	F	F	F	B	A	A	A	C	C	E	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	250	0.06	9	10	x	8	450	TRUNK G	641	0.06	12.8	20	x	8	577
TRUNK B	253	0.06	9	10	x	8	455	TRUNK H	1955	0.05	20.3	38	x	10	741
TRUNK C	707	0.06	13.2	20	x	8	636	TRUNK I	0	0.00	0	0	x	8	0
TRUNK D	234	0.05	9.2	10	x	8	421	TRUNK J	0	0.00	0	0	x	8	0
TRUNK E	1310	0.05	17.5	28	x	10	674	TRUNK K	0	0.00	0	0	x	8	0
TRUNK F	386	0.06	10.6	14	x	8	496	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	1515	0.05	18.4	32	x	10	682
TRUNK Y	880	0.05	15	26	x	8	609
TRUNK Z	415	0.05	11.3	14	x	8	534
DROP	1955	0.05	20.3	24	x	18	652

RETURN AIR #	1	2	3	4	5	6	7	8	9							**BR**
	0	0	0	0	2@7"	0	0	0	0	0	0	0	0	0	0	
AIR VOLUME	115	140	115	115	280	185	350	300	85	0	0	0	0	0	0	270
PLENUM PRESSURE	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13
ACTUAL DUCT LGH.	84	51	62	59	47	49	30	51	49	1	1	1	1	1	1	14
EQUIVALENT LENGTH	200	135	185	185	135	140	170	195	175	0	0	0	0	0	0	145
TOTAL EFFECTIVE LH	284	186	247	244	182	189	200	246	224	1	1	1	1	1	1	159
ADJUSTED PRESSURE	0.05	0.07	0.05	0.05	0.07	0.07	0.07	0.05	0.06	13.36	13.36	13.36	13.36	13.36	13.36	0.08
ROUND DUCT SIZE	7	6.9	7	7	9	7.7	9.8	10.1	6	0	0	0	0	0	0	8.6
INLET GRILL SIZE	8	8	8	8	8	8	8	8	8	0	0	0	0	0	0	8
	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
INLET GRILL SIZE	14	14	14	14	30	14	30	30	14	0	0	0	0	0	0	30

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: 5005 - KNIGHTSWOOD LO # 85456
SITE NAME: PINE VALLEY & TESTON OPT. 5 BED - WOB

RESIDENTIAL MECHANICAL VENTILATION DESIGN SUMMARY

COMBUSTION APPLIANCES 9.32.3.1(1)

- a) [✓] Direct vent (sealed combustion) only
- b) [ ] Positive venting induced draft (except fireplaces)
- c) [ ] Natural draft, B-vent or induced draft gas fireplace
- d) [ ] Solid Fuel (including fireplaces)
- e) [ ] No Combustion Appliances

HEATING SYSTEM

[✓] Forced Air [ ] Non Forced Air

[ ] Electric Space Heat

HOUSE TYPE 9.32.1(2)

- [✓] I Type a) or b) appliance only, no solid fuel
- [ ] II Type I except with solid fuel (including fireplaces)
- [ ] III Any Type c) appliance
- [ ] IV Type I, or II with electric space heat
- [ ] Other: Type I, II or IV no forced air

SYSTEM DESIGN OPTIONS O.N.H.W.P.

- [ ] 1 Exhaust only/Forced Air System
- [ ] 2 HRV with Ducting/Forced Air System
- [✓] 3 HRV Simplified/connected to forced air system
- [ ] 4 HRV with Ducting/non forced air system
- [ ] Part 6 Design

TOTAL VENTILATION CAPACITY 9.32.3.3(1)

Basement + Master Bedroom	2	@ 21.2 cfm	42.4	cfm
Other Bedrooms	4	@ 10.6 cfm	42.4	cfm
Kitchen & Bathrooms	7	@ 10.6 cfm	74.2	cfm
Other Rooms	8	@ 10.6 cfm	84.8	cfm
Table 9.32.3.A.		TOTAL	243.8	cfm

PRINCIPAL VENTILATION CAPACITY REQUIRED 9.32.3.4.(1)

1	Bedroom	31.8	cfm
2	Bedroom	47.7	cfm
3	Bedroom	63.6	cfm
4	Bedroom	79.5	cfm
5	Bedroom	95.4	cfm
	TOTAL	**95.4**	**cfm**

SUPPLEMENTAL VENTILATION CAPACITY 9.32.3.5.

Total Ventilation Capacity	243.8	cfm
Less Principal Ventil. Capacity	155	cfm
Required Supplemental Capacity	88.8	cfm

PRINCIPAL EXHAUST FAN CAPACITY

Model: VANEE 65H Location: BSMT

155.0 cfm 3.0 sones [✓] HVI Approved

PRINCIPAL EXHAUST HEAT LOSS CALCULATION

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

SUPPLEMENTAL FANS NUTONE

Location	Model	cfm	HVI	Sones
ENS	QTXEN050C	50	✓	0.3
ENS-2	QTXEN050C	50	✓	0.3
ENS-4	QTXEN050C	50	✓	0.3
PWD	QTXEN050C	50	✓	0.3

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: 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: February-20

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
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CSA F280-12 Residential Heat Loss and Heat Gain Calculations

Formula Sheet (For Air Leakage / Ventiliation Calculation)

LO#: 85456 Model: 5005 - KNIGHTSWOOD Builder: GOLD PARK HOMES Date: 26/02/2020

Volume Calculation

House Volume

Level	Floor Area (ft²)	Floor Height (ft)	Volume (ft³)
Bsmt	2130	10	21300
First	2130	11	23430
Second	2439	10	24390
Third	0	9	0
Fourth	0	9	0
		Total:	69,120.0 ft³
		Total:	1957.3 m³

Air Change & Delta T Data

WINTER NATURAL AIR CHANGE RATE	0.416
SUMMER NATURAL AIR CHANGE RATE	0.139

Design Temperature Difference

	Tin °C	Tout °C	ΔT °C	ΔT °F
Winter DTDh	22	-20	42	76
Summer DTDc	24	31	7	13

5.2.3.1 Heat Loss due to Air Leakage

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

0.416 x 543.68 x 42 °C x 1.2 = 11456 W

= **39087 Btu/h**

6.2.6 Sensible Gain due to Air Leakage

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

= 0.139 x 543.68 x 7 °C x 1.2 = 647 W

= **2207 Btu/h**

5.2.3.2 Heat Loss due to Mechanical Ventilation

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

155 CFM x 76 °F x 1.08 x 0.25 = **3181 Btu/h**

6.2.7 Sensible heat Gain due to Ventilation

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

155 CFM x 13 °F x 1.08 x 0.25 = **536 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	39,087	11,779	1.659
2	0.3		22,112	0.530
3	0.2		21,038	0.372
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: 5005 - KNIGHTSWOOD OPT. 5 BED - WOB **BUILDER:** GOLD PARK HOMES
SFQT: 4569 **LO#** 85456 **SITE:** PINE VALLEY & TESTON

DESIGN ASSUMPTIONS

HEATING	°F	COOLING	°F
OUTDOOR DESIGN TEMP.	-4	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:	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):	69120.0	ASSUMED (Y/N):	Y
INTERNAL SHADING:	BLINDS/CURTAINS	ASSUMED OCCUPANTS:	6
INTERIOR LIGHTING LOAD (Btu/h/ft^2):	1.27	DC BRUSHLESS MOTOR (Y/N):	Y
FOUNDATION CONFIGURATION	BCIN_1	DEPTH BELOW GRADE:	7.0 ft
LENGTH: 77.0 ft	WIDTH: 42.0 ft	EXPOSED PERIMETER:	186.0 ft
WOB INSULATION CONFIGURATION	SCB_9	WOB EXPOSED PERIMETER	52.0 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	29.80
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

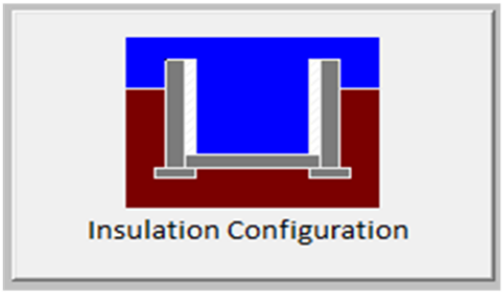


HVAC Designs Ltd.
375 Finley Ave, Suite 202
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905-619-2300

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 sand, loam, clay
Water Table:	Normal (7-10 m, 23-33 ft)

Foundation Dimensions		
Floor Length (m):	**4.6**	 Insulation Configuration
Floor Width (m):	**12.8**	
Exposed Perimeter (m):	**56.7**	
Wall Height (m):	**3.0**	
Depth Below Grade (m):	**1.84**	
Window Area (m^2):	**1.1**	
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):	**872**	

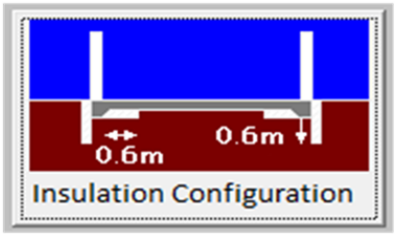
TYPE: 5005 - KNIGHTSWOOD OPT. 5 BED - WOB
LO# 85456

HVAC Designs Ltd.
375 Finley Ave, Suite 202
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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 sand, loam, clay
Water Table:	Normal (7-10 m, 23-33 ft)

Foundation Dimensions		
Length (m):	**1.5**	
Width (m):	**12.8**	
Exposed Perimeter (m):	**15.8**	

Radiant Slab		
Heated Fraction of the Slab:	**0**	
Fluid Temperature (°C):	**33**	
Design Months		
Heating Month	**1**	
Results		
Heating Load (Watts):	**217**	

TYPE: 5005 - KNIGHTSWOOD OPT. 5 BED - WOB
LO# 85456

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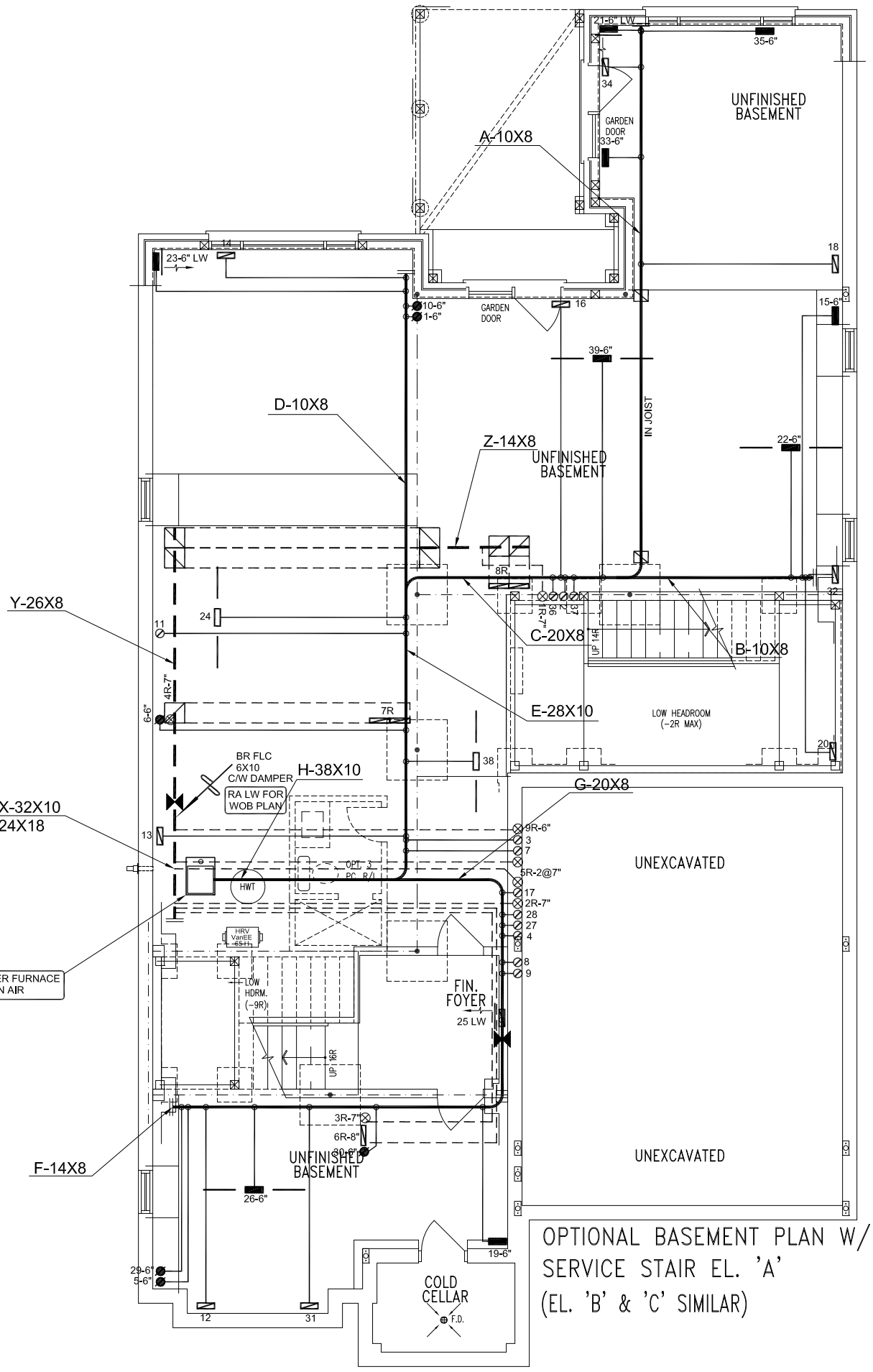
Air Infiltration Residential Load Calculator

Supplemental tool for CAN/CSA-F280

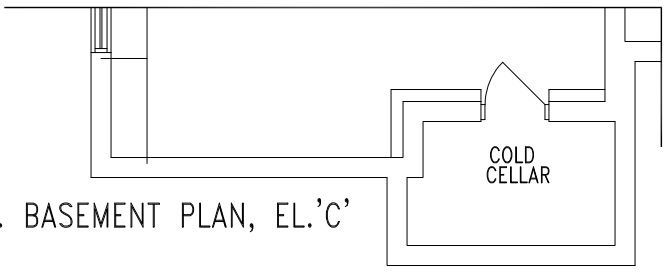
Weather Station Description	
Province:	Ontario
Region:	Vaughan (Woodbridge)
Weather Station Location:	Open flat terrain, grass
Anemometer height (m):	10
Local Shielding	
Building Site:	Suburban, forest
Walls:	Heavy
Flue:	Heavy
Highest Ceiling Height (m):	9.45
Building Configuration	
Type:	Detached
Number of Stories:	Two
Foundation:	Full
House Volume (m^3):	1957.3
Air Leakage/Ventilation	
Air Tightness Type:	Present (1961-) (3.57 ACH)
Custom BDT Data:	ELA @ 10 Pa. 2609.1 cm^2
	3.57 ACH @ 50 Pa
Mechanical Ventilation (L/s):	Total Supply 73.2 / Total Exhaust 73.2
Flue Size	
Flue #:	#1 #2 #3 #4
Diameter (mm):	0 0 0 0
Natural Infiltration Rates	
Heating Air Leakage Rate (ACH/H):	**0.416**
Cooling Air Leakage Rate (ACH/H):	**0.139**

TYPE: 5005 - KNIGHTSWOOD OPT. 5 BED - WOB

LO# 85456



OPTIONAL BASEMENT PLAN W/ SERVICE STAIR EL. 'A'
(EL. 'B' & 'C' SIMILAR)



PART. BASEMENT PLAN, EL.'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

WOB | **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

ALL DRAWINGS, CALCULATIONS AND SPECIFICATIONS ARE THE PROPERTY OF HVAC DESIGNS LTD.© AND MAY NOT BE REPRODUCED, MODIFIED OR ALTERED WITHOUT EXPRESSED WRITTEN CONSENT. THE DRAWINGS ARE DATED AND USE OF THESE DRAWINGS AFTER ONE YEAR FROM THE DATED NOTED IS NOT AUTHORIZED. CONTRACTOR SHALL CHECK ALL CONDITIONS BEFORE PROCEEDING WITH WORK. LATEST MUNICIPAL APPROVED DRAWINGS ONLY TO BE USED DURING INSTALLATION OF HEATING SYSTEM. HVAC DESIGNS LTD. IS NOT LIABLE FOR ANY CLAIMS ARISING FROM UNAUTHORIZED USE OF THE DRAWINGS OR FROM ANY CHANGES TO ACCEPTED STANDARDS AND/OR THE ONTARIO BUILDING CODE.

Client
GOLDPARK HOMES

Project Name
PINE VALLEY & TESTON
VAUGHAN, ONTARIO
OPT. 5 BED OPT SERV STAIR
KNIGHTSWOOD
5005 WOB 4569 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.

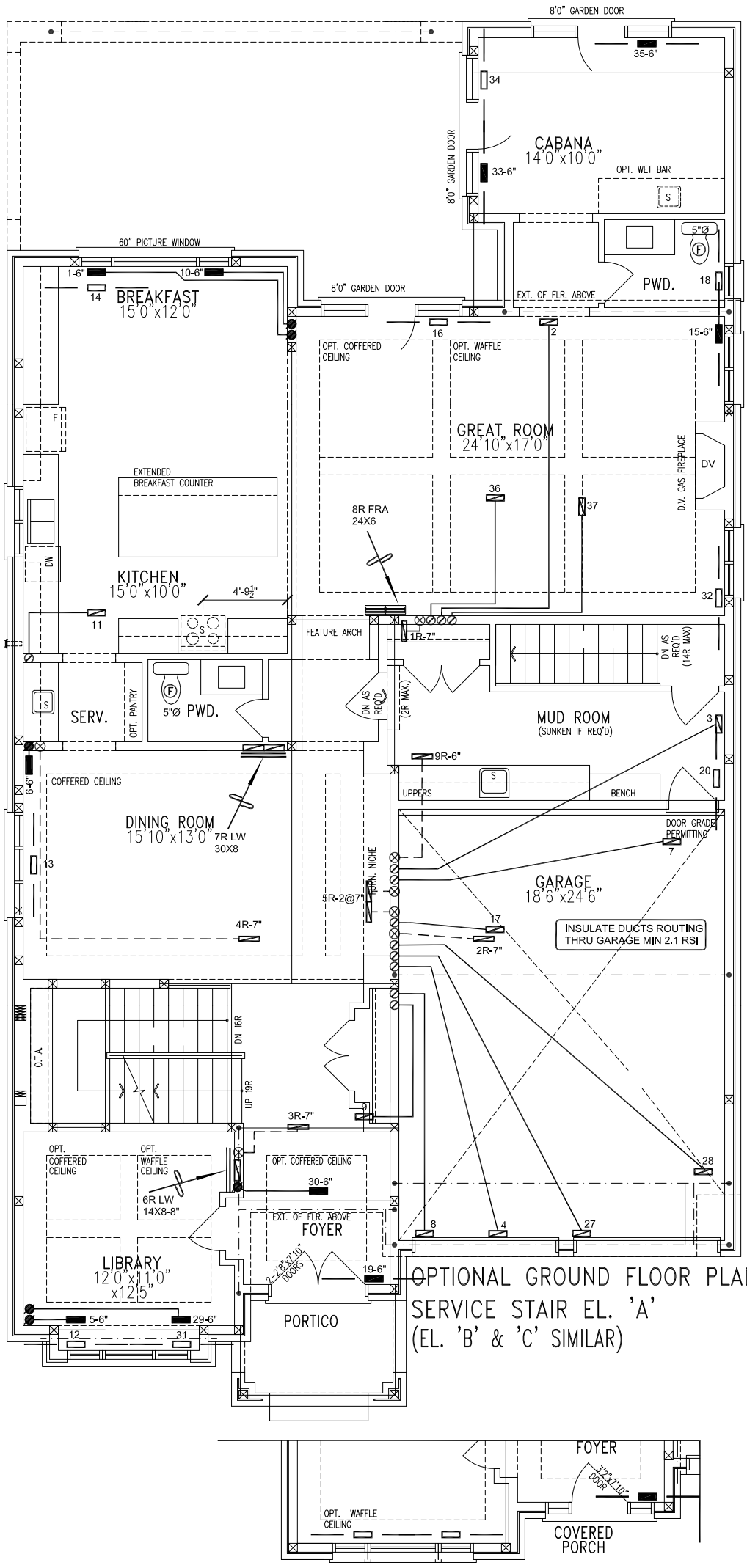
HEAT LOSS 98542 BTU/H	
UNIT DATA	
MAKE	LENNOX
MODEL	EL296UH110XE60C
INPUT	110 MBTU/H
OUTPUT	106 MBTU/H
COOLING	5.0 TONS
FAN SPEED	1955 cfm @ 0.6" w.c.

# OF RUNS	S/A	R/A	FANS
3RD FLOOR			
2ND FLOOR	18	6	7
1ST FLOOR	13	3	3
BASEMENT	8	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 FEB/2020
Scale 1/8" = 1'-0"
BCIN# 19669
LO# 85456



OPTIONAL GROUND FLOOR PLAN W/ SERVICE STAIR EL. 'A'
(EL. 'B' & 'C' SIMILAR)

PART. GROUND FLOOR PLAN, EL.'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

WOB | 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

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Client
GOLDPARK HOMES

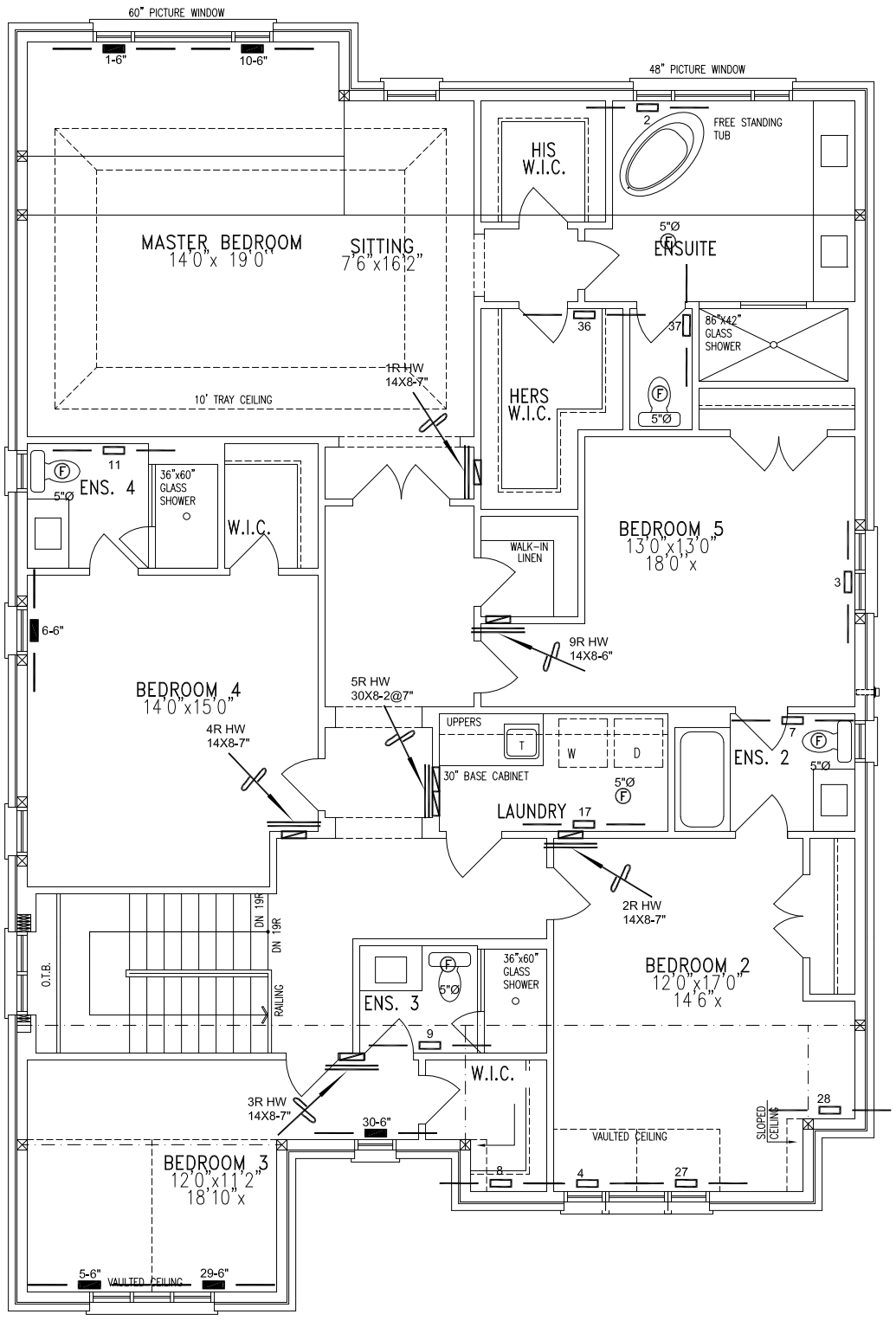
Project Name
PINE VALLEY & TESTON
VAUGHAN, ONTARIO
OPT. 5 BED OPT SERV STAIR
KNIGHTSWOOD
5005 WOB 4569 sqft

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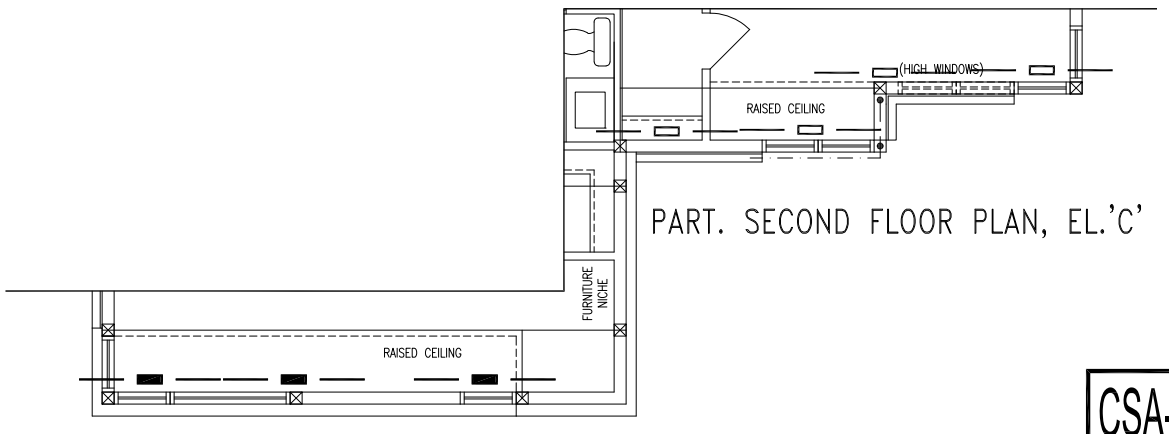
Installation to comply with the latest Ontario Building Code. All supply branch outlets shall be equipped with a manual balancing damper. Ductwork which passes through the garage or unheated spaces shall be adequately insulated and be gas-proofed.

Sheet Title
FIRST FLOOR HEATING LAYOUT

Date FEB/2020
Scale 1/8" = 1'-0"
BCIN# 19669
LO# 85456



OPT. 5 BEDROOM SECOND FLOOR PLAN, EL.'A'



PART. SECOND FLOOR PLAN, EL.'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

WOB | **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

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Client
GOLDPARK HOMES

Project Name
PINE VALLEY & TESTON
VAUGHAN, ONTARIO
OPT. 5 BED OPT SERV STAIR
KNIGHTSWOOD
5005 WOB 4569 sqft

HVAC DESIGNS LTD.
375 Finley Ave. Suite 202 - Ajax, Ontario
L1S 2E2 Tel. 905.619.2300 - 905.420.5300 Fax 905.619.2375
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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.

Sheet Title
SECOND FLOOR HEATING LAYOUT

Date FEB/2020
Scale 1/8" = 1'-0"
BCIN# 19669
LO# 85456

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**		
VAUGHAN (WOODBRIDGE)				

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:** 5005 - KNIGHTSWOOD OPT. 5 BED & ELEVATOR **Project:** PINE VALLEY & TESTON

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.

September 10, 2018
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.

HVA 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

SITE NAME: PINE VALLEY & TESTON | OPT. 5 BED & ELEVATOR | DATE: Sep-18 | WINTER NATURAL AIR CHANGE RATE 0.350 | HEAT LOSS ΔT °F. 76 | CSA-F280-12
BUILDER: GOLD PARK HOMES | TYPE: 5005 - KNIGHTSWOOD | GFA: 4483 | LO# 77483 | SUMMER NATURAL AIR CHANGE RATE 0.118 | HEAT GAIN ΔT °F. 13 | SB-12 PACKAGE A1

ROOM USE			MBR			ENS			WIC			BED-2			BED-3			BED-4			ENS-2			WIC-2			ENS-3			ENS-4			BED-5		
EXP. WALL			45			29			6			34			37			26			6			9			4			7			14		
CLG. HT.			11			10			10			11			11			10			10			10			10			10			10		
	FACTORS																																	
GRS.WALL AREA	LOSS	GAIN	495			290			60			374			407			260			60			90			40			70			140		
GLAZING			LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN
NORTH	21.3	16.0	0	0	0	0	0	0	0	0	0	18	383	288	0	0	0	0	0	0	8	170	128	0	0	0	0	0	0	0	0	0	18	383	288
EAST	21.3	41.6	0	0	0	0	0	0	0	0	0	70	1490	2909	73	1553	3033	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
SOUTH	21.3	24.9	0	0	0	0	0	0	0	0	0	0	0	0	28	596	697	32	681	797	0	0	0	0	0	0	0	0	0	8	170	199	0	0	0
WEST	21.3	41.6	50	1064	2078	34	724	1413	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
SKYLT.	37.2	101.5	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	0	0	0	0	0	0
DOORS	25.2	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	0	0	0	0	0	0
NET EXPOSED WALL	4.5	0.8	445	1986	334	256	1142	192	60	268	45	286	1276	215	306	1366	230	228	1017	171	52	232	39	90	402	68	40	179	30	62	277	47	122	544	92
NET EXPOSED BSMT WALL ABOVE GR	3.6	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	0	0	0	0	0	0	0	0	0
EXPOSED CLG	1.3	0.6	440	565	259	204	262	120	102	131	60	216	277	127	256	329	150	396	508	233	60	77	35	48	62	28	140	180	82	105	135	62	364	467	214
NO ATTIC EXPOSED CLG	2.7	1.3	0	0	0	0	0	0	0	0	0	24	66	30	84	231	106	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	240	612	103	104	265	45	0	0	0	60	153	26	48	122	21	140	357	60	0	0	0	154	393	66
BASEMENT/CRAWL HEAT LOSS				0			0			0			0			0			0			0			0			0			0			0	
SLAB ON GRADE HEAT LOSS				0			0			0			0			0			0			0			0			0			0			0	
SUBTOTAL HT LOSS				3615			2128			399			4104			4340			2207			632			586			715			582			1787	
SUB TOTAL HT GAIN					2671			1725			105			3671			4261			1201			228			116			172			307			669
LEVEL FACTOR / MULTIPLIER			0.20	0.30		0.20	0.30		0.20	0.30		0.20	0.30		0.20	0.30		0.20	0.30		0.20	0.30		0.20	0.30		0.20	0.30		0.20	0.30		0.20	0.30	
AIR CHANGE HEAT LOSS				1087			640			120			1234			1305			663			190			176			215			175			537	
AIR CHANGE HEAT GAIN					192			124			8			263			306			86			16			8			12			22			47
DUCT LOSS				0			0			0			534			564			0			82			76			93			0			232	
DUCT GAIN					0			0			0			481			545			0			24			12			18			0			159
HEAT GAIN PEOPLE	240		2		480	0		0	0		0	1		240	1		240	1		240	0		0	0		0	0		0	0		0	1		240
HEAT GAIN APPLIANCES/LIGHTS					639			0			639			639			639			639			0			0			0			0			639
TOTAL HT LOSS BTU/H				4701			2768			519			5872			6209			2870			905			838			1023			757			2557	
TOTAL HT GAIN x 1.3 BTU/H					5176			2403			977			6884			7788			2816			349			178			264			428			2268

ROOM USE			LIB			DIN			KIT/GT			CAB			LAUN			PWD			FOY			MUD									LOD			BAS		
EXP. WALL			31			32			87			46			0			5			35			18									52			238		
CLG. HT.			11			11			11			11			10			11			11			12									10			10		
	FACTORS																																					
GRS.WALL AREA	LOSS	GAIN	341			352			957			495			0			55			385			216									520			1978		
GLAZING			LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN								LOSS	GAIN		LOSS	GAIN	
NORTH	21.3	16.0	0	0	0	0	0	0	46	979	735	0	0	0	0	0	0	9	192	144	0	0	0	0	0	0							0	0	0	6	128	96
EAST	21.3	41.6	56	1192	2327	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
SOUTH	21.3	24.9	0	0	0	34	724	847	20	426	498	63	1341	1569	0	0	0	0	0	0	0	0	0	0	0	0							0	0	0	6	128	149
WEST	21.3	41.6	0	0	0	0	0	0	115	2447	4778	63	1341	2618	0	0	0	0	0	0	0	0	0	0	0	0							22	468	914	0	0	0
SKYLT.	37.2	101.5	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	0	0	0
DOORS	25.2	4.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	62	1565	264	20	505	85							0	0	0	20	505	85
NET EXPOSED WALL	4.5	0.8	285	1272	214	316	1419	239	776	3463	583	369	1647	277	0	0	0	46	205	35	323	1441	243	196	875	147							0	0	0	0	0	0
NET EXPOSED BSMT WALL ABOVE GR	3.6	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							290	1044	176	402	1447	244
EXPOSED CLG	1.3	0.6	0	0	0	0	0	0	0	0	0	0	0	0	102	131	60	0	0	0	0	0	0	0	0	0							0	0	0	0	0	0
NO ATTIC EXPOSED CLG	2.7	1.3	0	0	0	0	0	0	0	0	0	203	558	255	0	0	0	40	110	50	41	113	52	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	56	143	24	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			0											8373	
SLAB ON GRADE HEAT LOSS				0			0			0			0			0			0			0			0									0				
SUBTOTAL HT LOSS				2464			2143			7315			4886			274			507			3120			1380									1512			10580	
SUB TOTAL HT GAIN					2541			1086			6595			4719			84			229			558			232									1090			574
LEVEL FACTOR / MULTIPLIER			0.30	0.44		0.30	0.44		0.30	0.44		0.30	0.44		0.20	0.30		0.30	0.44		0.30	0.44		0.30	0.44										0.60	1.33	
AIR CHANGE HEAT LOSS				1088			947			3232			2159			82			224			1378			610											16061	
AIR CHANGE HEAT GAIN					182			78			473			339			6			16			40			17												119
DUCT LOSS				0			0			0			0			36			0			0			0											0		
DUCT GAIN					0			0			0			0			73			0			0			0												0
HEAT GAIN PEOPLE	240		0		0	0		0	0		0	0		0	0		0	0		0	0		0	0		0							0		0	0		0
HEAT GAIN APPLIANCES/LIGHTS					639			639			639			639			639			0			0			639												639
TOTAL HT LOSS BTU/H				3552			3089			10546			7045			392			731			4498			1989									1512			26641	
TOTAL HT GAIN x 1.3 BTU/H					4371			2343			10019			7406			1043			319			777			1155									1417			1732

TOTAL HEAT GAIN BTU/H: 60651 TONS: 5.05 LOSS DUE TO VENTILATION LOAD BTU/H: 3181 STRUCTURAL HEAT LOSS: 89012 TOTAL COMBINED HEAT LOSS BTU/H: 92193

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

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

SITE NAME: PINE VALLEY & TESTON — OPT. 5 BED & ELEVATOR
BUILDER: GOLD PARK HOMES — TYPE: 5005 - KNIGHTSWOOD — DATE: Nov-18 — GFA: 4483 — LO# 77483

HEATING CFM	1955		COOLING CFM	1955		furnace pressure	0.6																	
TOTAL HEAT LOSS	89,012		TOTAL HEAT GAIN	60,115		furnace filter	0.08																	
AIR FLOW RATE CFM	21.96		AIR FLOW RATE CFM	32.52		a/c coil pressure	0.2																	
						available pressure																		
						for s/a & r/a	0.32																	
						plenum pressure s/a	0.17			r/a pressure	0.15													
						max s/a dif press. loss	0.02			r/a grille press. Loss	0.02													
						min adjusted pressure s/a	0.15			adjusted pressure r/a	0.13													

^LENNOX
EL296UH110XE60C 110

AFUE = 96 %
INPUT (BTU/H) = 110,000
OUTPUT (BTU/H) = **106,000**

FAN SPEED	
LOW	0
MEDLOW	1380
MEDIUM	1505
MEDIUM HIGH	1685
HIGH	1955

DESIGN CFM = **1955** CFM @ .6 " E.S.P.

TEMPERATURE RISE 50 °F

RUN COUNT	4th	3rd	2nd	1st	Bas
S/A	0	0	18	13	7
R/A	0	0	6	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	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
ROOM NAME	MBR	ENS	BED-5	BED-2	BED-3	BED-4	ENS-2	WIC-2	ENS-3	MBR	ENS-4	LIB	DIN	KIT/GT	KIT/GT	KIT/GT	LAUN	PWD	FOY	MUD	BAS	BAS	BAS	BAS
RM LOSS MBH.	2.35	2.18	2.56	1.96	2.07	2.87	0.90	0.84	1.02	2.35	0.76	1.78	3.09	2.64	2.64	2.64	0.39	0.73	4.50	1.99	4.02	4.02	4.02	4.02
CFM PER RUN HEAT	52	48	56	43	45	63	20	18	22	52	17	39	68	58	58	58	9	16	99	44	88	88	88	88
RM GAIN MBH.	2.59	1.90	2.27	2.29	2.60	2.82	0.35	0.18	0.26	2.59	0.43	2.19	2.34	2.50	2.50	2.50	1.04	0.32	0.78	1.15	0.45	0.45	0.45	0.45
CFM PER RUN COOLING	84	62	74	75	84	92	11	6	9	84	14	71	76	81	81	81	34	10	25	38	15	15	15	15
ADJUSTED PRESSURE	0.15	0.16	0.16	0.16	0.15	0.15	0.16	0.16	0.16	0.15	0.16	0.16	0.16	0.15	0.15	0.15	0.16	0.16	0.15	0.16	0.15	0.15	0.15	0.15
ACTUAL DUCT LGH.	70	70	53	49	75	48	47	48	53	64	59	57	29	52	69	54	36	73	40	47	67	60	54	38
EQUIVALENT LENGTH	200	200	170	160	170	160	160	150	170	170	150	140	103	120	140	110	200	170	210	160	150	120	103	90
TOTAL EFFECTIVE LENGTH	270	270	223	209	245	208	207	198	223	234	209	197	132	172	209	164	236	243	250	207	217	180	157	128
ADJUSTED PRESSURE	0.05	0.06	0.07	0.07	0.06	0.07	0.08	0.08	0.07	0.06	0.07	0.08	0.12	0.09	0.07	0.09	0.07	0.06	0.06	0.08	0.07	0.08	0.09	0.11
ROUND DUCT SIZE	**6**	5	5	5	**6**	**6**	4	4	4	**6**	4	5	5	5	**6**	5	4	4	**6**	4	**6**	**6**	5	5
HEATING VELOCITY (ft/min)	265	352	411	316	229	321	229	207	252	265	195	286	499	426	296	426	103	184	505	505	449	449	646	646
COOLING VELOCITY (ft/min)	428	455	543	551	428	469	126	69	103	428	161	521	558	595	413	595	390	115	127	436	76	76	110	110
OUTLET GRILL SIZE	4X10	3X10	3X10	3X10	4X10	4X10	3X10	3X10	3X10	4X10	3X10	3X10	3X10	3X10	4X10	3X10	3X10	3X10	4X10	3X10	4X10	4X10	3X10	3X10
TRUNK	D	C	C	G	F	E	C	G	G	D	E	F	E	D	B	C	G	A	F	C	A	B	D	E

RUN #	25	26	27	28	29	30	31	32	33	34	35	36	37	38
ROOM NAME	BAS	BAS	BED-2	BED-2	BED-3	BED-3	LIB	KIT/GT	CAB	CAB	CAB	WIC	ENS	BAS
RM LOSS MBH.	4.02	4.02	1.96	1.96	2.07	2.07	1.78	2.64	2.35	2.35	2.35	0.52	0.58	4.02
CFM PER RUN HEAT	88	88	43	43	45	45	39	58	52	52	52	11	13	88
RM GAIN MBH.	0.45	0.45	2.29	2.29	2.60	2.60	2.19	2.50	2.47	2.47	2.47	0.98	0.50	0.45
CFM PER RUN COOLING	15	15	75	75	84	84	71	81	80	80	80	32	16	15
ADJUSTED PRESSURE	0.15	0.15	0.16	0.16	0.15	0.15	0.16	0.15	0.16	0.16	0.16	0.16	0.16	0.15
ACTUAL DUCT LGH.	34	50	52	55	80	63	51	55	69	71	82	56	58	23
EQUIVALENT LENGTH	110	150	170	160	170	200	160	120	150	130	140	200	190	140
TOTAL EFFECTIVE LENGTH	144	200	222	215	250	263	211	175	219	201	222	256	248	163
ADJUSTED PRESSURE	0.1	0.07	0.07	0.07	0.06	0.06	0.07	0.08	0.07	0.08	0.07	0.06	0.06	0.09
ROUND DUCT SIZE	5	**6**	5	5	**6**	**6**	5	5	**6**	5	**6**	4	4	5
HEATING VELOCITY (ft/min)	646	449	316	316	229	229	286	426	265	382	265	126	149	646
COOLING VELOCITY (ft/min)	110	76	551	551	428	428	521	595	408	587	408	367	184	110
OUTLET GRILL SIZE	3X10	4X10	3X10	3X10	4X10	4X10	3X10	3X10	4X10	3X10	4X10	3X10	3X10	3X10
TRUNK	G	F	G	G	F	F	F	B	A	A	A	C	C	E

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	260	0.06	9.1	10	x	8	468	TRUNK G	666	0.06	12.9	20	x	8	599
TRUNK B	204	0.07	8	8	x	8	459	TRUNK H	1955	0.05	20.3	38	x	10	741
TRUNK C	714	0.06	13.3	20	x	8	643	TRUNK I	0	0.00	0	0	x	8	0
TRUNK D	250	0.05	9.4	10	x	8	450	TRUNK J	0	0.00	0	0	x	8	0
TRUNK E	1288	0.05	17.3	28	x	10	662	TRUNK K	0	0.00	0	0	x	8	0
TRUNK F	400	0.06	10.7	14	x	8	514	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	1515	0.05	18.4	32	x	10	682
TRUNK Y	880	0.05	15	26	x	8	609
TRUNK Z	415	0.05	11.3	14	x	8	534
DROP	1955	0.05	20.3	24	x	18	652

RETURN AIR #	1	2	3	4	5	6	7	8	9							BR
	0	0	0	0	2@7"	0	0	0	0	0	0	0	0	0	0	
AIR VOLUME	115	140	115	115	280	185	350	300	85	0	0	0	0	0	0	270
PLENUM PRESSURE	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13
ACTUAL DUCT LGH.	84	51	62	59	47	49	30	51	49	1	1	1	1	1	1	14
EQUIVALENT LENGTH	200	135	195	185	135	140	170	195	220	0	0	0	0	0	0	145
TOTAL EFFECTIVE LH	284	186	257	244	182	189	200	246	269	1	1	1	1	1	1	159
ADJUSTED PRESSURE	0.05	0.07	0.05	0.05	0.07	0.07	0.07	0.05	0.05	13.36	13.36	13.36	13.36	13.36	13.36	0.08
ROUND DUCT SIZE	7	6.9	7	7	9	7.7	9.8	10.1	6.3	0	0	0	0	0	0	8.6
INLET GRILL SIZE	8	8	8	8	8	8	8	8	8	0	0	0	0	0	0	8
	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
INLET GRILL SIZE	14	14	14	14	30	14	30	30	14	0	0	0	0	0	0	30

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: 5005 - KNIGHTSWOOD LO # 77483
SITE NAME: PINE VALLEY & TESTON OPT. 5 BED & ELEVATOR

RESIDENTIAL MECHANICAL VENTILATION DESIGN SUMMARY

COMBUSTION APPLIANCES 9.32.3.1(1)

- a) [✓] Direct vent (sealed combustion) only
- b) [ ] Positive venting induced draft (except fireplaces)
- c) [ ] Natural draft, B-vent or induced draft gas fireplace
- d) [ ] Solid Fuel (including fireplaces)
- e) [ ] No Combustion Appliances

HEATING SYSTEM

[✓] Forced Air [ ] Non Forced Air

[ ] Electric Space Heat

HOUSE TYPE 9.32.1(2)

- [✓] I Type a) or b) appliance only, no solid fuel
- [ ] II Type I except with solid fuel (including fireplaces)
- [ ] III Any Type c) appliance
- [ ] IV Type I. or II with electric space heat
- [ ] Other: Type I, II or IV no forced air

SYSTEM DESIGN OPTIONS O.N.H.W.P.

- [ ] 1 Exhaust only/Forced Air System
- [ ] 2 HRV with Ducting/Forced Air System
- [✓] 3 HRV Simplified/connected to forced air system
- [ ] 4 HRV with Ducting/non forced air system
- [ ] Part 6 Design

TOTAL VENTILATION CAPACITY 9.32.3.3(1)

Basement + Master Bedroom	2	@ 21.2 cfm	42.4	cfm
Other Bedrooms	4	@ 10.6 cfm	42.4	cfm
Kitchen & Bathrooms	7	@ 10.6 cfm	74.2	cfm
Other Rooms	8	@ 10.6 cfm	84.8	cfm
Table 9.32.3.A.		TOTAL	243.8	cfm

PRINCIPAL VENTILATION CAPACITY REQUIRED 9.32.3.4.(1)

1	Bedroom	31.8	cfm
2	Bedroom	47.7	cfm
3	Bedroom	63.6	cfm
4	Bedroom	79.5	cfm
5	Bedroom	95.4	cfm
	TOTAL	95.4	cfm

SUPPLEMENTAL VENTILATION CAPACITY 9.32.3.5.

Total Ventilation Capacity	243.8	cfm
Less Principal Ventil. Capacity	155	cfm
Required Supplemental Capacity	88.8	cfm

PRINCIPAL EXHAUST FAN CAPACITY

Model: VANEE 65H Location: BSMT

155.0 cfm 3.0 sones [✓] HVI Approved

PRINCIPAL EXHAUST HEAT LOSS CALCULATION

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

SUPPLEMENTAL FANS NUTONE

Location	Model	cfm	HVI	Sones
ENS	QTXEN050C	50	✓	0.3
ENS-2	QTXEN050C	50	✓	0.3
ENS-4	QTXEN050C	50	✓	0.3
PWD	QTXEN050C	50	✓	0.3

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: 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: September-18

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#: 77483 Model: 5005 - KNIGHTSWOOD Builder: GOLD PARK HOMES Date: 9/10/2018

Volume Calculation

House Volume

Level	Floor Area (ft^2)	Floor Height (ft)	Volume (ft^3)
Bsmt	2052	10	20520
First	2052	11	22572
Second	2439	10	24390
Third	0	9	0
Fourth	0	9	0
		Total:	67,482.0 ft^3
		Total:	1910.9 m^3

Air Change & Delta T Data

WINTER NATURAL AIR CHANGE RATE	0.350
SUMMER NATURAL AIR CHANGE RATE	0.118

Design Temperature Difference

	Tin °C	Tout °C	ΔT °C	ΔT °F
Winter DTDh	22	-20	42	76
Summer DTDc	24	31	7	13

5.2.3.1 Heat Loss due to Air Leakage

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

0.350 x 530.80 x 42 °C x 1.2 = 9415 W

= 32123 Btu/h

6.2.6 Sensible Gain due to Air Leakage

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

= 0.118 x 530.80 x 7 °C x 1.2 = 533 W

= 1819 Btu/h

5.2.3.2 Heat Loss due to Mechanical Ventilation

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

155 CFM x 76 °F x 1.08 x 0.25 = 3181 Btu/h

6.2.7 Sensible heat Gain due to Ventilation

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

155 CFM x 13 °F x 1.08 x 0.25 = 536 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	32,123	12,091	1.328
2	0.3		21,813	0.442
3	0.2		21,367	0.301
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: 5005 - KNIGHTSWOOD OPT. 5 BED & ELEVATOR **BUILDER:** GOLD PARK HOMES
SFQT: 4483 **LO#** 77483 **SITE:** PINE VALLEY & TESTON

DESIGN ASSUMPTIONS

HEATING	°F	COOLING	°F
OUTDOOR DESIGN TEMP.	-4	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:	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):	67482.0	ASSUMED (Y/N):	Y
INTERNAL SHADING:	BLINDS/CURTAINS	ASSUMED OCCUPANTS:	6
INTERIOR LIGHTING LOAD ($Btu/h/ft^2$):	1.27	DC BRUSHLESS MOTOR (Y/N):	Y
FOUNDATION CONFIGURATION	BCIN_1	DEPTH BELOW GRADE:	7.0 ft
LENGTH: 77.0 ft	WIDTH: 42.0 ft	EXPOSED PERIMETER:	238.0 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	29.80
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.

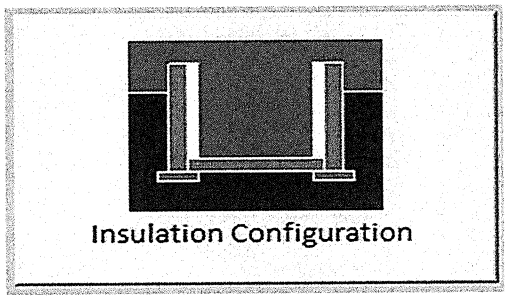
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Ajax ON, L1S 2E2
905-619-2300

Residential Foundation Thermal Load Calculator

Supplemental tool for CAN/CSA-F280

Weather Station Description	
Province:	Ontario
Region:	Vaughan (Woodbridge)
Site Description	
Soil Conductivity:	Normal conductivity: dry sand, loam, clay
Water Table:	Normal (7-10 m, 23-33 ft)

Foundation Dimensions		
Floor Length (m):	23.5	
Floor Width (m):	12.8	
Exposed Perimeter (m):	0.0	
Wall Height (m):	3.0	
Depth Below Grade (m):	2.13	
Window Area (m^2):	3.2	
Door Area (m^2):	1.9	


Insulation Configuration

Radiant Slab		
Heated Fraction of the Slab:	0	
Fluid Temperature (°C):	33	
Design Months		
Heating Month	1	
Foundation Loads		
Heating Load (Watts):	**2453**	

TYPE: 5005 - KNIGHTSWOOD OPT. 5 BED & ELEVATOR
LO# 77483

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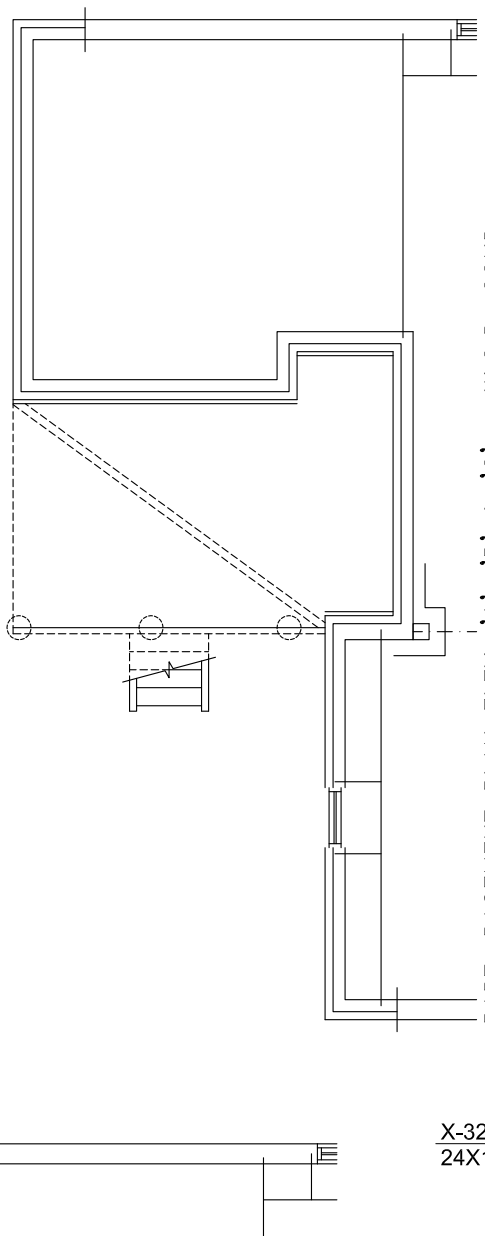
Air Infiltration Residential Load Calculator

Supplemental tool for CAN/CSA-F280

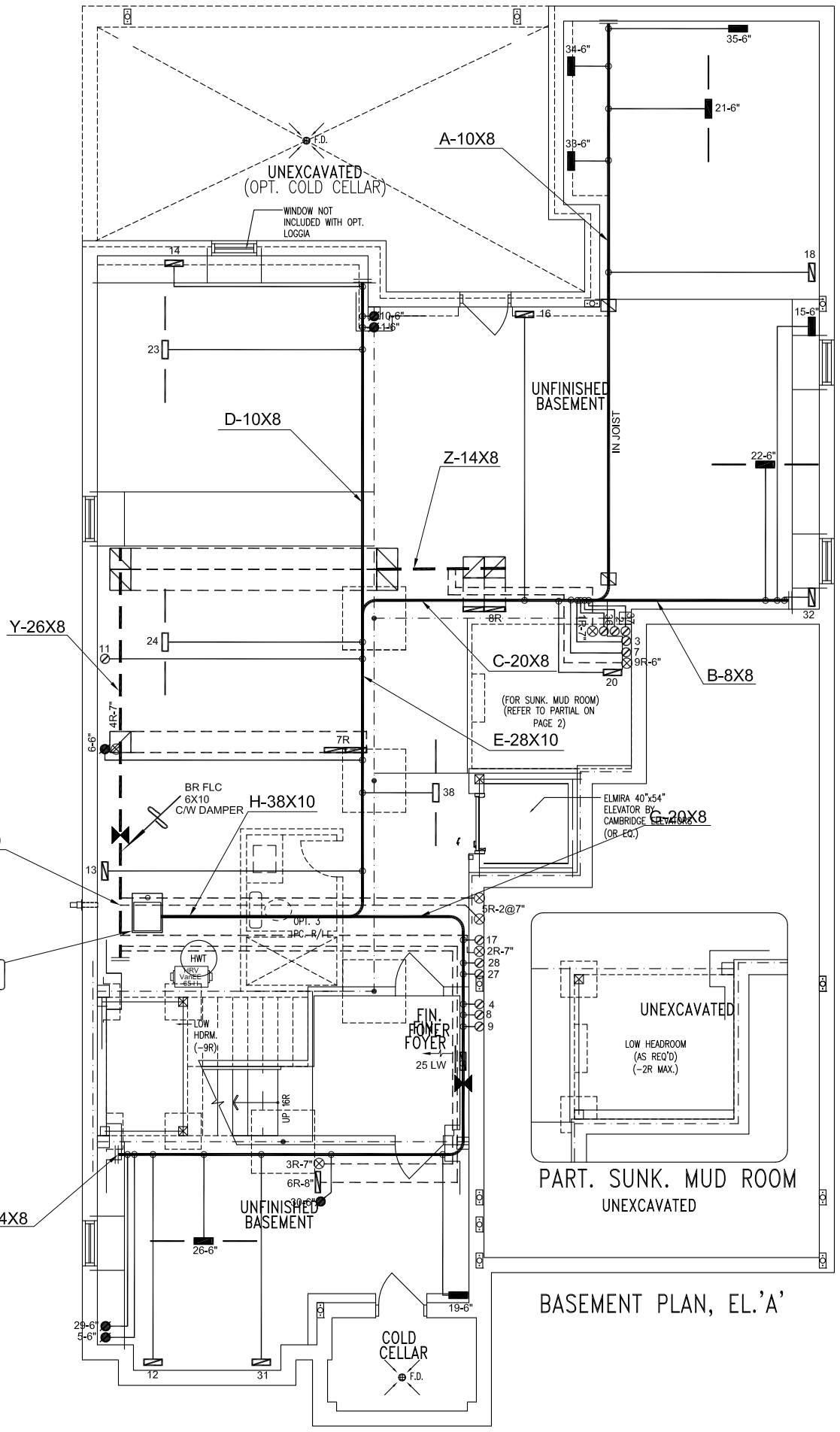
Weather Station Description	
Province:	Ontario
Region:	Vaughan (Woodbridge)
Weather Station Location:	Open flat terrain, grass
Anemometer height (m):	10
Local Shielding	
Building Site:	Suburban, forest
Walls:	Heavy
Flue:	Heavy
Highest Ceiling Height (m):	7.32
Building Configuration	
Type:	Detached
Number of Stories:	Two
Foundation:	Full
House Volume (m^3):	1910.9
Air Leakage/Ventilation	
Air Tightness Type:	Present (1961-) (3.57 ACH)
Custom BDT Data:	ELA @ 10 Pa. 2547.3 cm^2
	3.57 ACH @ 50 Pa
Mechanical Ventilation (L/s):	Total Supply 73.2 Total Exhaust 73.2
Flue Size	
Flue #:	#1 #2 #3 #4
Diameter (mm):	0 0 0 0
Natural Infiltration Rates	
Heating Air Leakage Rate (ACH/H):	**0.350**
Cooling Air Leakage Rate (ACH/H):	**0.118**

TYPE: 5005 - KNIGHTSWOOD OPT. 5 BED & ELEVATOR

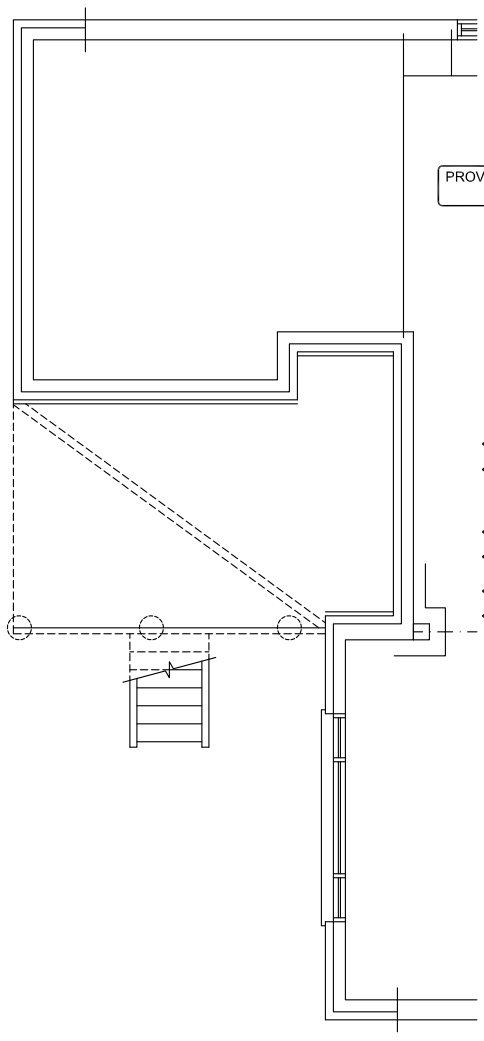
LO# 77483



PART. BASEMENT PLAN ELEV. 'A', 'B' & 'C' – W.O.D. COND.

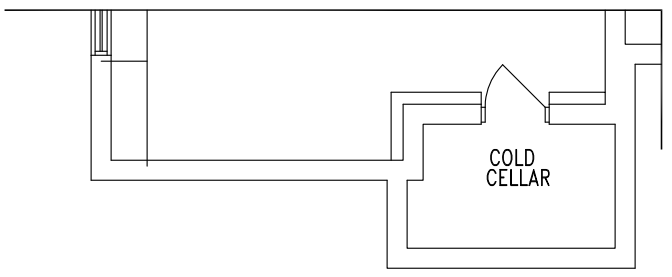


BASEMENT PLAN, EL.'A'



PART. BASEMENT PLAN ELEV. 'A', 'B' & 'C' – L.O.D. COND.

PART. SUNK. MUD ROOM
UNEXCAVATED



PART. BASEMENT PLAN, EL.'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

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.	REVISED AS PER ARCHITECTURALS	FEB/2020
2.	3R RELOCATED	NOV/2018
1.	DECK CONDITIONS ADDED	SEPT/2018

REVISIONS

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Client

GOLDPARK HOMES

Project Name

PINE VALLEY & TESTON
VAUGHAN, ONTARIO

OPT. 5 BED & ELEVATOR
KNIGHTSWOOD

5005 4483 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	92193 BTU/H
UNIT DATA	
MAKE	LENNOX
MODEL	EL296UH110XE60C
INPUT	110 MBTU/H
OUTPUT	106 MBTU/H
COOLING	5.0 TONS
FAN SPEED	1955 cfm @ 0.6" w.c.

# OF RUNS	S/A	R/A	FANS
3RD FLOOR			
2ND FLOOR	18	6	7
1ST FLOOR	13	3	3
BASEMENT	7	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

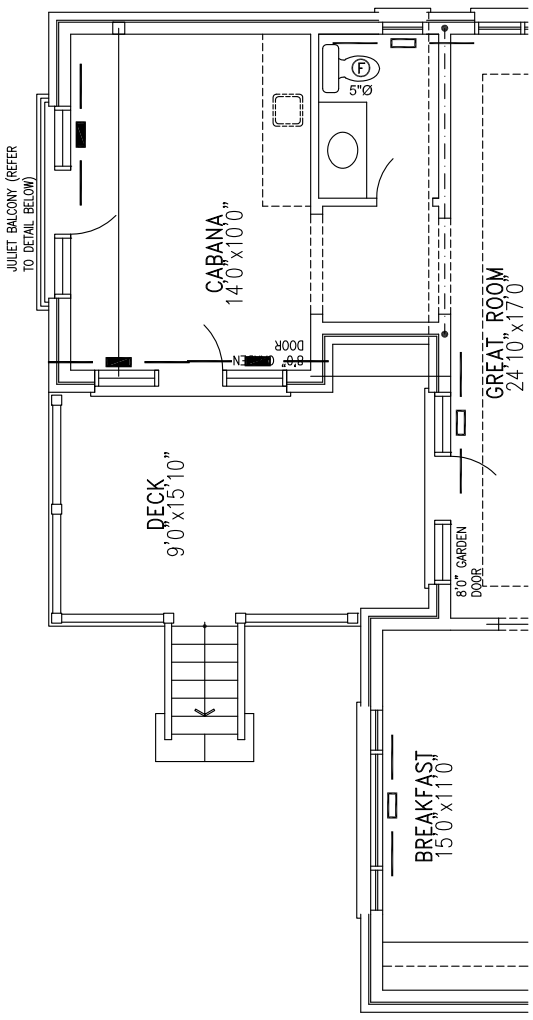
BASEMENT HEATING LAYOUT

Date JAN/2018

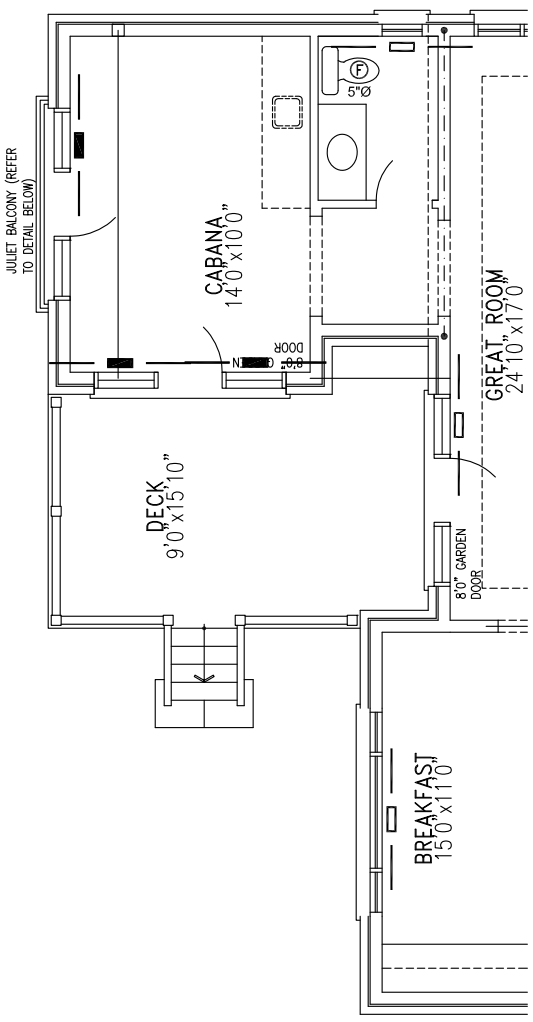
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BCIN# 19669

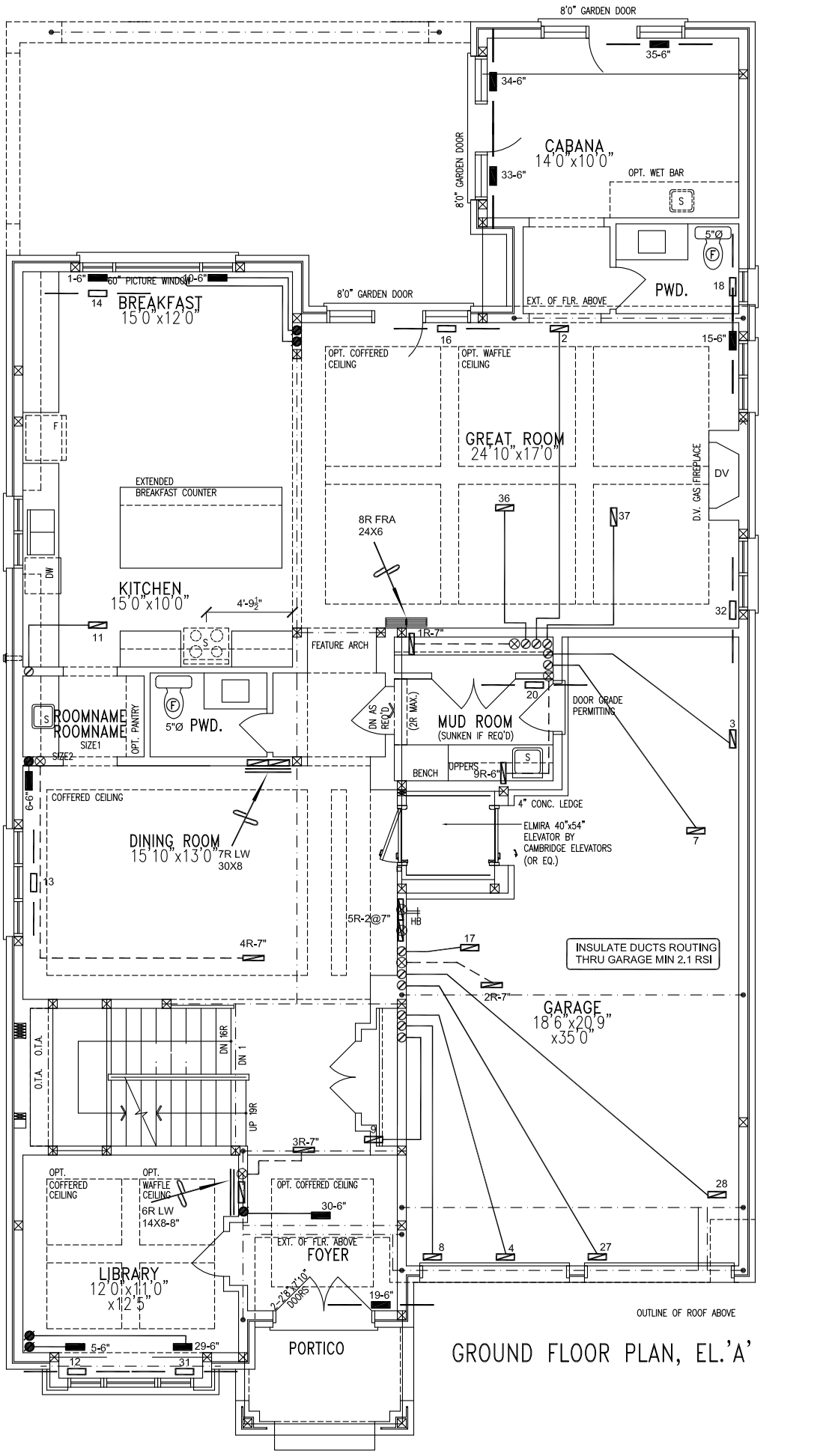
LO# 77483



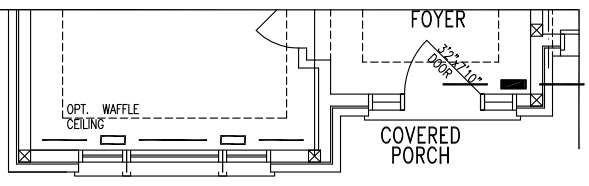
PART. GROUND FLOOR PLAN ELEV. 'A', 'B' & 'C' - L.O.D. COND.



PART. GROUND FLOOR PLAN ELEV. 'A', 'B' & 'C' - W.O.D. COND.



GROUND FLOOR PLAN, EL.'A'



PART. GROUND FLOOR PLAN, EL.'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

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.	REVISED AS PER ARCHITECTURALS	FEB/2020
2.	3R RELOCATED	NOV/2018
1.	DECK CONDITIONS ADDED	SEPT/2018

REVISIONS

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Client

GOLDPARK HOMES

Project Name

PINE VALLEY & TESTON
VAUGHAN, ONTARIO
OPT. 5 BED & ELEVATOR
KNIGHTSWOOD
5005 4483 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

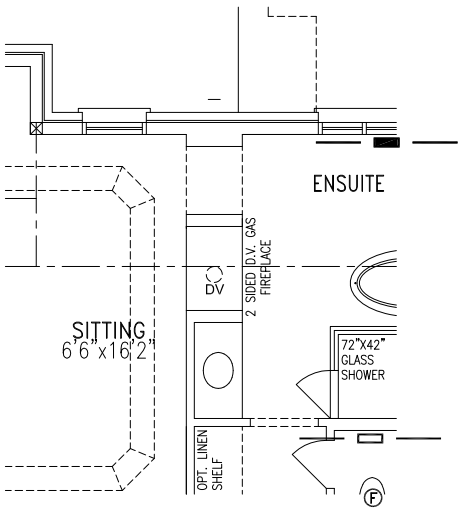
FIRST FLOOR HEATING LAYOUT

Date JAN/2018

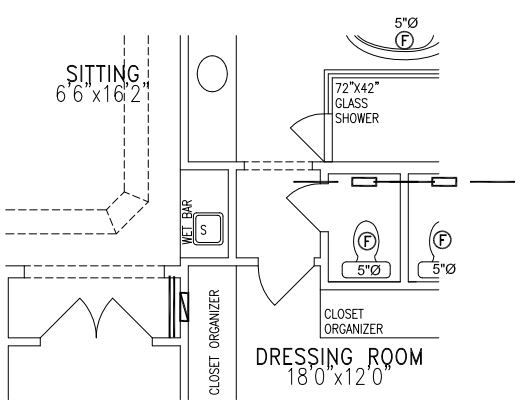
Scale 1/8" = 1'-0"

BCIN# 19669

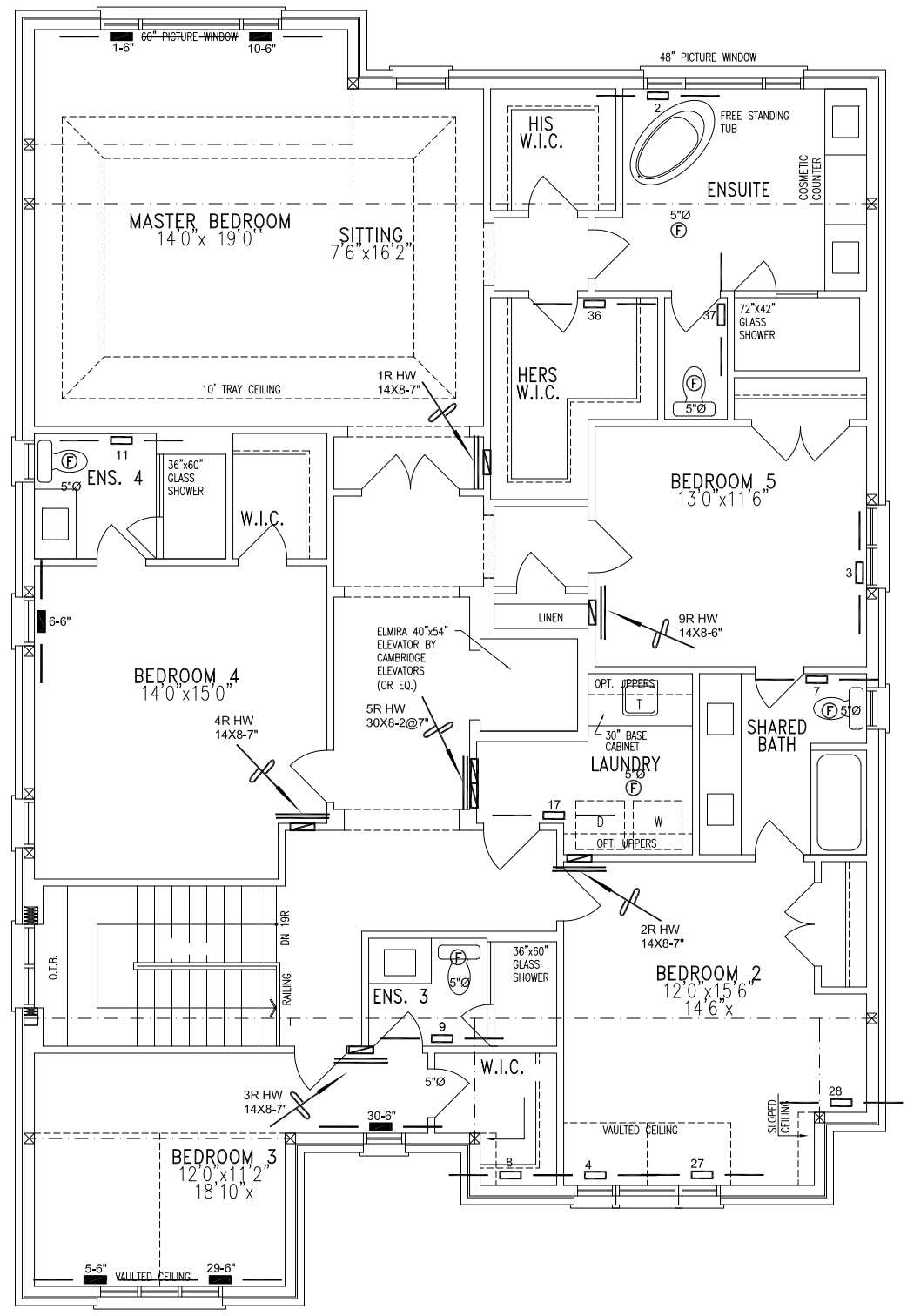
LO# 77483



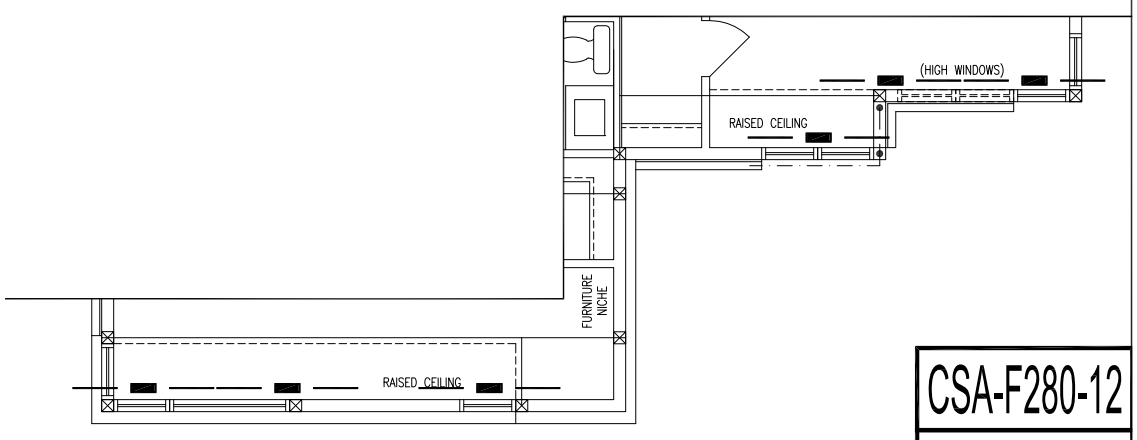
PART. SECOND FLOOR PLAN
OPT. SITTING AREA FIREPLACE



PART. SECOND FLOOR PLAN
OPT. SITTING AREA WET BAR



SECOND FLOOR PLAN, EL.'A'



PART. SECOND FLOOR PLAN, EL.'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

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.	REVISED AS PER ARCHITECTURALS	FEB/2020
2.	3R RELOCATED	NOV/2018
1.	DECK CONDITIONS ADDED	SEPT/2018

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Client

GOLDPARK HOMES

Project Name

PINE VALLEY & TESTON
VAUGHAN, ONTARIO
OPT. 5 BED & ELEVATOR
KNIGHTSWOOD
5005 4483 sqft

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Sheet Title

SECOND FLOOR
HEATING
LAYOUT

Date JAN/2018

Scale 1/8" = 1'-0"

BCIN# 19669

LO# 77483

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
VAUGHAN (WOODBRIDGE)		

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:** 5005 - KNIGHTSWOOD OPT. 5 BED & ELEVATOR - WOB **Project:** PINE VALLEY & TESTON

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.

September 11, 2018
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.

HVAC DESIGNS LTD.

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

SITE NAME: PINE VALLEY & TESTON | OPT. 5 BED & ELEVATOR - WOB | DATE: Sep-18 | WINTER NATURAL AIR CHANGE RATE 0.416 | HEAT LOSS ΔT °F. 76 | CSA-F280-12
BUILDER: GOLD PARK HOMES | TYPE: 5005 - KNIGHTSWOOD | GFA: 4483 | LO# 79984 | SUMMER NATURAL AIR CHANGE RATE 0.139 | HEAT GAIN ΔT °F. 13 | SB-12 PACKAGE A1

ROOM USE			MBR			ENS			WIC			BED-2			BED-3			BED-4			ENS-2			WIC-2			ENS-3			ENS-4			BED-5			
EXP. WALL			45			29			6			34			37			26			6			9			4			7			14			
CLG. HT.			11			10			10			11			11			10			10			10			10			10			10			
	FACTORS																																			
GRS.WALL AREA	LOSS	GAIN	495			290			60			374			407			260			60			90			40			70			140			
GLAZING				LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN	
NORTH	21.3	15.4	0	0	0	0	0	0	0	0	0	18	383	278	0	0	0	0	0	0	8	170	124	0	0	0	0	0	0	0	0	0	18	383	278	
EAST	21.3	39.9	0	0	0	0	0	0	0	0	0	70	1490	2795	73	1553	2915	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
SOUTH	21.3	24.0	0	0	0	0	0	0	0	0	0	0	0	0	28	596	672	32	681	768	0	0	0	0	0	0	0	0	0	8	170	192	0	0	0	
WEST	21.3	39.9	50	1064	1996	34	724	1357	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	
SKYLT.	37.2	101.5	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	0	0	0	0	0	0	
DOORS	25.2	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	0	0	0	0	0	0	
NET EXPOSED WALL	4.5	0.8	445	1986	334	256	1142	192	60	268	45	286	1276	215	306	1366	230	228	1017	171	52	232	39	90	402	68	40	179	30	62	277	47	122	544	92	
NET EXPOSED BSMT WALL ABOVE GR	3.6	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	0	0	0	0	0	0	0	0	0	
EXPOSED CLG	1.3	0.6	440	565	259	204	262	120	102	131	60	216	277	127	256	329	150	396	508	233	60	77	35	48	62	28	140	180	82	105	135	62	364	467	214	
NO ATTIC EXPOSED CLG	2.7	1.3	0	0	0	0	0	0	0	0	0	24	66	30	84	231	106	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	240	612	103	104	265	45	0	0	0	60	153	26	48	122	21	140	357	60	0	0	0	154	393	66	
BASEMENT/CRAWL HEAT LOSS				0			0			0			0			0			0			0			0			0			0			0		
SLAB ON GRADE HEAT LOSS				0			0			0			0			0			0			0			0			0			0			0		
SUBTOTAL HT LOSS				3615			2128			399			4104			4340			2207			632			586			715			582			1787		
SUB TOTAL HT GAIN					2589			1670			105			3548			4117			1172			224			116			172			300			550	
LEVEL FACTOR / MULTIPLIER			0.20	0.36		0.20	0.36		0.20	0.36		0.20	0.36		0.20	0.36		0.20	0.36		0.20	0.36		0.20	0.36		0.20	0.36		0.20	0.36		0.20	0.36	
AIR CHANGE HEAT LOSS				1291			760			142			1466			1550			788			226			209			255			208			638		
AIR CHANGE HEAT GAIN					208			134			8			285			331			94			18			9			14			24			52	
DUCT LOSS				0			0			0			557			589			0			86			79			97			0			243		
DUCT GAIN					0			0			0			471			533			0			24			13			19			0			158	
HEAT GAIN PEOPLE	240		2		480	0		0	0		0	1		240	1		240	1		240	0		0	0		0	0		0	0		0	1		240	
HEAT GAIN APPLIANCES/LIGHTS					639			0			639			639			639			639			0			0			0			0			639	
TOTAL HT LOSS BTU/H				4906			2888			541			6127			6479			2995			944			874			1068			789			2668		
TOTAL HT GAIN x 1.3 BTU/H					6091			2345			978			6738			7617			2788			346			180			266			422			2261	

ROOM USE			LIB			DIN			KIT/GT			CAB			LAUN			PWD			FOY			MUD									WOB			BAS		
EXP. WALL			31			32			87			45			0			5			35			18									52			186		
CLG. HT.			11			11			11			11			10			11			11			12									10			10		
	FACTORS																																					
GRS.WALL AREA	LOSS	GAIN	341			352			957			495			0			55			385			216									520			1302		
GLAZING				LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN							LOSS	GAIN		LOSS	GAIN	
NORTH	21.3	15.4	0	0	0	0	0	0	46	979	710	0	0	0	0	0	0	9	192	139	0	0	0	0	0	0							0	0	0	6	128	93
EAST	21.3	39.9	56	1192	2236	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
SOUTH	21.3	24.0	0	0	0	34	724	816	20	426	480	63	1341	1511	0	0	0	0	0	0	0	0	0	0	0	0							46	979	552	6	128	144
WEST	21.3	39.9	0	0	0	0	0	0	105	2234	4192	63	1341	2515	0	0	0	0	0	0	0	0	0	0	0	0							106	2256	2116	0	0	0
SKYLT.	37.2	101.5	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	0	0	0
DOORS	25.2	4.3	0	0	0	0	0	0	10	252	43	0	0	0	0	0	0	0	0	0	62	1565	264	20	505	85							20	505	85	20	505	85
NET EXPOSED WALL	4.5	0.8	285	1272	214	318	1419	239	776	3463	583	369	1647	277	0	0	0	46	205	35	323	1441	243	196	875	147							348	1553	262	0	0	0
NET EXPOSED BSMT WALL ABOVE GR	3.6	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							0	0	0	558	2008	338
EXPOSED CLG	1.3	0.6	0	0	0	0	0	0	0	0	0	0	0	0	102	131	60	0	0	0	0	0	0	0	0	0							0	0	0	0	0	0
NO ATTIC EXPOSED CLG	2.7	1.3	0	0	0	0	0	0	0	0	0	203	558	255	0	0	0	40	110	50	41	113	52	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	56	143	24	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			0											2977		
SLAB ON GRADE HEAT LOSS				0			0			0			0			0			0			0			0									741				
SUBTOTAL HT LOSS				2464			2143			7354			4886			274			507			3120			1380									6034			5746		
SUB TOTAL HT GAIN					2450			1055			6008			4559			84			224			558			232									3014			660	
LEVEL FACTOR / MULTIPLIER			0.30	0.52		0.30	0.52		0.30	0.52		0.30	0.52		0.20	0.36		0.30	0.52		0.30	0.52		0.30	0.52											0.50	1.62	
AIR CHANGE HEAT LOSS				1291			1123			3853			2560			98			265			1634			723												19080		
AIR CHANGE HEAT GAIN					197			85			482			366			7			18			45			19													295	
DUCT LOSS				0			0			0			0			37			0			0			0												0		
DUCT GAIN					0			0			0			0			73			0			0			0													0	
HEAT GAIN PEOPLE	240		0		0	0		0	0		0	0		0	0		0	0		0	0		0	0		0							0		0	0		0	
HEAT GAIN APPLIANCES/LIGHTS					639			639			639			639			639			0			0			639											0		639	
TOTAL HT LOSS BTU/H				3754			3265			11207			7446			409			772			4754			2102									6775			24826		
TOTAL HT GAIN x 1.3 BTU/H					4272			2312			9268			7234			1044			314			784			1157											3919			2072

TOTAL HEAT GAIN BTU/H: 61945 TONS: 5.16 LOSS DUE TO VENTILATION LOAD BTU/H: 3181 STRUCTURAL HEAT LOSS: 95590 TOTAL COMBINED HEAT LOSS BTU/H: 98770

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

HVAC DESIGNS LTD.

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

SITE NAME: PINE VALLEY & TESTON — OPT. 5 BED & ELEVATOR - WOB
BUILDER: GOLD PARK HOMES — TYPE: 5005 - KNIGHTSWOOD — DATE: Nov-18 — GFA: 4483 — LO# 79984

HEATING CFM	1955		COOLING CFM	1955			furnace pressure	0.6																
TOTAL HEAT LOSS	95,590		TOTAL HEAT GAIN	61,409			furnace filter	0.08									^LENNOX			AFUE = 96 %				
AIR FLOW RATE CFM	20.45		AIR FLOW RATE CFM	31.84			a/c coil pressure	0.2									EL296UH110XE60C	110		INPUT (BTU/H) = 110,000				
							available pressure										FAN SPEED			OUTPUT (BTU/H) = **106,000**				
							for s/a & r/a	0.32									LOW	0						
RUN COUNT	4th	3rd	2nd	1st	Bas												MEDLOW	1380		DESIGN CFM = **1955**				
S/A	0	0	18	13	8		plenum pressure s/a	0.17		r/a pressure	0.15						MEDIUM	1505		CFM @ .6 " E.S.P.				
R/A	0	0	6	3	1		max s/a dif press. loss	0.02		r/a grille press. Loss	0.02						MEDIUM HIGH	1685						
All S/A diffusers 4"x10" unless noted otherwise on layout.							min adjusted pressure s/a	0.15		adjusted pressure r/a	0.13						HIGH	1955		TEMPERATURE RISE 50 °F				
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	BED-5	BED-2	BED-3	BED-4	ENS-2	WIC-2	ENS-3	MBR	ENS-4	LIB	DIN	KIT/GT	KIT/GT	KIT/GT	LAUN	PWD	FOY	MUD	BAS	BAS	BAS	BAS
RM LOSS MBH.	2.45	2.24	2.67	2.04	2.16	2.99	0.94	0.87	1.07	2.45	0.79	1.88	3.27	2.80	2.80	2.80	0.41	0.77	4.75	2.10	3.95	3.95	3.95	3.95
CFM PER RUN HEAT	50	46	55	42	44	61	19	18	22	50	16	38	67	57	57	57	8	16	97	43	81	81	81	81
RM GAIN MBH.	2.55	1.87	2.26	2.25	2.54	2.79	0.35	0.18	0.27	2.55	0.42	2.14	2.31	2.32	2.32	2.32	1.04	0.31	0.78	1.16	0.75	0.75	0.75	0.75
CFM PER RUN COOLING	81	60	72	72	81	89	11	6	8	81	13	68	74	74	74	74	33	10	25	37	24	24	24	24
ADJUSTED PRESSURE	0.15	0.16	0.16	0.16	0.15	0.15	0.16	0.16	0.16	0.15	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.15	0.16	0.15	0.15	0.15	0.15
ACTUAL DUCT LGH.	70	70	53	49	75	48	47	48	53	64	59	57	29	52	69	54	36	73	40	47	77	60	69	38
EQUIVALENT LENGTH	200	200	170	160	170	160	160	150	170	170	150	140	103	120	140	110	200	170	210	160	150	120	150	90
TOTAL EFFECTIVE LENGTH	270	270	223	209	245	208	207	198	223	234	209	197	132	172	209	164	236	243	250	207	227	180	219	128
ADJUSTED PRESSURE	0.05	0.06	0.07	0.07	0.06	0.07	0.08	0.08	0.07	0.06	0.07	0.08	0.12	0.09	0.07	0.1	0.07	0.06	0.06	0.08	0.06	0.08	0.07	0.11
ROUND DUCT SIZE	**6**	5	5	5	**6**	**6**	4	4	4	**6**	4	5	5	5	5	5	4	4	**6**	4	**6**	**6**	**6**	5
HEATING VELOCITY (ft/min)	255	338	404	308	224	311	218	207	252	255	184	279	492	419	419	419	92	184	495	493	413	413	413	595
COOLING VELOCITY (ft/min)	413	441	529	529	413	454	126	69	92	413	149	499	543	543	543	543	379	115	127	424	122	122	122	176
OUTLET GRILL SIZE	4X10	3X10	3X10	3X10	4X10	4X10	3X10	3X10	3X10	4X10	3X10	3X10	3X10	3X10	3X10	3X10	3X10	3X10	4X10	3X10	4X10	4X10	4X10	3X10
TRUNK	D	C	C	G	F	E	C	G	G	D	E	F	E	D	B	C	G	A	F	C	A	B	D	E

RUN #	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39
ROOM NAME	BAS	BAS	BED-2	BED-2	BED-3	BED-3	LIB	KIT/GT	CAB	CAB	CAB	WIC	ENS	BAS	BAS
RM LOSS MBH.	3.95	3.95	2.04	2.04	2.16	2.16	1.88	2.80	2.48	2.48	2.48	0.54	0.64	3.95	3.95
CFM PER RUN HEAT	81	81	42	42	44	44	38	57	51	51	51	11	13	81	81
RM GAIN MBH.	0.75	0.75	2.25	2.25	2.54	2.54	2.14	2.32	2.41	2.41	2.41	0.98	0.47	0.75	0.75
CFM PER RUN COOLING	24	24	72	72	81	81	68	74	77	77	77	31	15	24	24
ADJUSTED PRESSURE	0.15	0.15	0.16	0.16	0.15	0.15	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.15	0.15
ACTUAL DUCT LGH.	34	50	52	55	80	63	51	55	69	71	82	56	58	23	58
EQUIVALENT LENGTH	110	150	170	160	170	200	160	120	150	130	140	200	190	140	170
TOTAL EFFECTIVE LENGTH	144	200	222	215	250	263	211	175	219	201	222	256	248	163	228
ADJUSTED PRESSURE	0.1	0.07	0.07	0.07	0.06	0.06	0.07	0.09	0.07	0.08	0.07	0.06	0.06	0.09	0.06
ROUND DUCT SIZE	5	**6**	5	5	**6**	**6**	5	5	**6**	5	**6**	4	4	5	**6**
HEATING VELOCITY (ft/min)	595	413	308	308	224	224	279	419	260	374	260	126	149	595	413
COOLING VELOCITY (ft/min)	176	122	529	529	413	413	499	543	393	565	393	356	172	176	122
OUTLET GRILL SIZE	3X10	4X10	3X10	3X10	4X10	4X10	3X10	3X10	4X10	3X10	4X10	3X10	3X10	3X10	4X10
TRUNK	G	F	G	G	F	F	F	B	A	A	A	C	C	E	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	250	0.06	9	10	x	8	450	TRUNK G	641	0.06	12.8	20	x	8	577
TRUNK B	195	0.07	7.9	8	x	8	439	TRUNK H	1955	0.05	20.3	38	x	10	741
TRUNK C	770	0.06	13.7	22	x	8	630	TRUNK I	0	0.00	0	0	x	8	0
TRUNK D	238	0.05	9.2	10	x	8	428	TRUNK J	0	0.00	0	0	x	8	0
TRUNK E	1314	0.05	17.5	28	x	10	676	TRUNK K	0	0.00	0	0	x	8	0
TRUNK F	386	0.06	10.6	14	x	8	496	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	1515	0.05	18.4	32	x	10	682
TRUNK Y	880	0.05	15	26	x	8	609
TRUNK Z	415	0.05	11.3	14	x	8	534
DROP	1955	0.05	20.3	24	x	18	652

RETURN AIR #	1	2	3	4	5	6	7	8	9							BR
	0	0	0	0	2@7"	0	0	0	0	0	0	0	0	0	0	
AIR VOLUME	115	140	115	115	280	185	350	300	85	0	0	0	0	0	0	270
PLENUM PRESSURE	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13
ACTUAL DUCT LGH.	84	51	62	59	47	49	30	51	49	1	1	1	1	1	1	14
EQUIVALENT LENGTH	200	135	185	185	135	140	170	195	220	0	0	0	0	0	0	145
TOTAL EFFECTIVE LH	284	186	247	244	182	189	200	246	269	1	1	1	1	1	1	159
ADJUSTED PRESSURE	0.05	0.07	0.05	0.05	0.07	0.07	0.07	0.05	0.05	13.36	13.36	13.36	13.36	13.36	13.36	0.08
ROUND DUCT SIZE	7	6.9	7	7	9	7.7	9.8	10.1	6.3	0	0	0	0	0	0	8.6
INLET GRILL SIZE	8	8	8	8	8	8	8	8	8	0	0	0	0	0	0	8
	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
INLET GRILL SIZE	14	14	14	14	30	14	30	30	14	0	0	0	0	0	0	30

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: 5005 - KNIGHTSWOOD LO # 79984
SITE NAME: PINE VALLEY & TESTON OPT. 5 BED & ELEVATOR - WOB

RESIDENTIAL MECHANICAL VENTILATION DESIGN SUMMARY

COMBUSTION APPLIANCES 9.32.3.1(1)

- a) [✓] Direct vent (sealed combustion) only
- b) [ ] Positive venting induced draft (except fireplaces)
- c) [ ] Natural draft, B-vent or induced draft gas fireplace
- d) [ ] Solid Fuel (including fireplaces)
- e) [ ] No Combustion Appliances

HEATING SYSTEM

[✓] Forced Air [ ] Non Forced Air

[ ] Electric Space Heat

HOUSE TYPE 9.32.1(2)

[✓]	I	Type a) or b) appliance only, no solid fuel
[ ]	II	Type I except with solid fuel (including fireplaces)
[ ]	III	Any Type c) appliance
[ ]	IV	Type I, or II with electric space heat
[ ]	Other: Type I, II or IV no forced air	

SYSTEM DESIGN OPTIONS O.N.H.W.P.

[ ]	1	Exhaust only/Forced Air System
[ ]	2	HRV with Ducting/Forced Air System
[✓]	3	HRV Simplified/connected to forced air system
[ ]	4	HRV with Ducting/non forced air system
[ ]		Part 6 Design

TOTAL VENTILATION CAPACITY 9.32.3.3(1)

Basement + Master Bedroom	2	@ 21.2 cfm	42.4	cfm
Other Bedrooms	4	@ 10.6 cfm	42.4	cfm
Kitchen & Bathrooms	7	@ 10.6 cfm	74.2	cfm
Other Rooms	8	@ 10.6 cfm	84.8	cfm
Table 9.32.3.A.		TOTAL	243.8	cfm

PRINCIPAL VENTILATION CAPACITY REQUIRED 9.32.3.4.(1)

1	Bedroom	31.8	cfm
2	Bedroom	47.7	cfm
3	Bedroom	63.6	cfm
4	Bedroom	79.5	cfm
5	Bedroom	95.4	cfm
	TOTAL	95.4	cfm

SUPPLEMENTAL VENTILATION CAPACITY 9.32.3.5.

Total Ventilation Capacity	243.8	cfm
Less Principal Ventil. Capacity	155	cfm
Required Supplemental Capacity	88.8	cfm

PRINCIPAL EXHAUST FAN CAPACITY

Model: VANEE 65H Location: BSMT

155.0 cfm 3.0 sones [✓] HVI Approved

PRINCIPAL EXHAUST HEAT LOSS CALCULATION

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

SUPPLEMENTAL FANS NUTONE

Location	Model	cfm	HVI	Sones
ENS	QTXEN050C	50	✓	0.3
ENS-2	QTXEN050C	50	✓	0.3
ENS-4	QTXEN050C	50	✓	0.3
PWD	QTXEN050C	50	✓	0.3

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: 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: September-18

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#: 79984 Model: 5005 - KNIGHTSWOOD Builder: GOLD PARK HOMES Date: 9/11/2018

Volume Calculation

House Volume

Level	Floor Area (ft²)	Floor Height (ft)	Volume (ft³)
Bsmt	2052	10	20520
First	2052	11	22572
Second	2439	10	24390
Third	0	9	0
Fourth	0	9	0
		Total:	67,482.0 ft³
		Total:	1910.9 m³

Air Change & Delta T Data

WINTER NATURAL AIR CHANGE RATE	0.416
SUMMER NATURAL AIR CHANGE RATE	0.139

Design Temperature Difference

	Tin °C	Tout °C	ΔT °C	ΔT °F
Winter DTDh	22	-20	42	76
Summer DTDc	24	31	7	13

5.2.3.1 Heat Loss due to Air Leakage

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

0.416 x 530.80 x 42 °C x 1.2 = 11184 W

= 38161 Btu/h

6.2.6 Sensible Gain due to Air Leakage

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

= 0.139 x 530.80 x 7 °C x 1.2 = 632 W

= 2155 Btu/h

5.2.3.2 Heat Loss due to Mechanical Ventilation

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

155 CFM x 76 °F x 1.08 x 0.25 = 3181 Btu/h

6.2.7 Sensible heat Gain due to Ventilation

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

155 CFM x 13 °F x 1.08 x 0.25 = 536 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	38,161	11,779	1.620
2	0.3		21,853	0.524
3	0.2		21,367	0.357
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: 5005 - KNIGHTSWOOD OPT. 5 BED & ELEVATOR - WOB **BUILDER:** GOLD PARK HOMES
SFQT: 4483 **LO#** 79984 **SITE:** PINE VALLEY & TESTON

DESIGN ASSUMPTIONS

HEATING	°F	COOLING	°F
OUTDOOR DESIGN TEMP.	-4	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:	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):	67482.0	ASSUMED (Y/N):	Y
INTERNAL SHADING:	BLINDS/CURTAINS	ASSUMED OCCUPANTS:	6
INTERIOR LIGHTING LOAD ($Btu/h/ft^2$):	1.27	DC BRUSHLESS MOTOR (Y/N):	Y
FOUNDATION CONFIGURATION	BCIN_1	DEPTH BELOW GRADE:	7.0 ft
LENGTH: 77.0 ft WIDTH:	42.0 ft	EXPOSED PERIMETER:	186.0 ft
WOB INSULATION CONFIGURATION	SCB_9	WOB EXPOSED PERIMETER	52.0 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	29.80
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

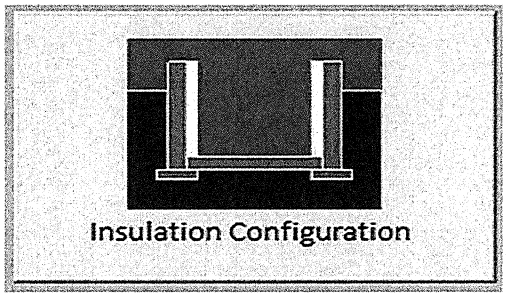
Michael O'Rourke

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375 Finley Ave, Suite 202
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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 sand, loam, clay
Water Table:	Normal (7-10 m, 23-33 ft)

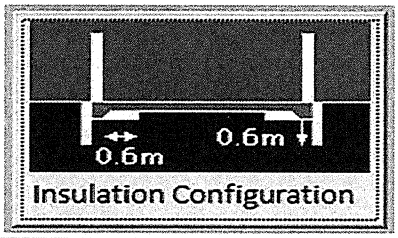
Foundation Dimensions		
Floor Length (m):	**4.6**	 Insulation Configuration
Floor Width (m):	**12.8**	
Exposed Perimeter (m):	**56.7**	
Wall Height (m):	**3.0**	
Depth Below Grade (m):	**1.84**	
Window Area (m^2):	**1.1**	
Door Area (m^2):	**1.9**	
Radiant Slab		
Heated Fraction of the Slab:	**0**	
Fluid Temperature (°C):	**33**	
Design Months		
Heating Month	**1**	
Foundation Loads		
Heating Load (Watts):		**872**

TYPE: 5005 - KNIGHTSWOOD OPT. 5 BED & ELEVATOR - WOB
LO# 79984

HVAC Designs Ltd.
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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 sand, loam, clay	
Water Table:	Normal (7-10 m, 23-33 ft)	
Foundation Dimensions		
Length (m):	**1.5**	
Width (m):	**12.8**	
Exposed Perimeter (m):	**15.8**	
Radiant Slab		
Heated Fraction of the Slab:	**0**	
Fluid Temperature (°C):	**33**	
Design Months		
Heating Month	**1**	
Results		
Heating Load (Watts):	**217**	

TYPE: 5005 - KNIGHTSWOOD OPT. 5 BED & ELEVATOR - WOB
LO# 79984

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Ajax ON, L1S 2E2
905-619-2300

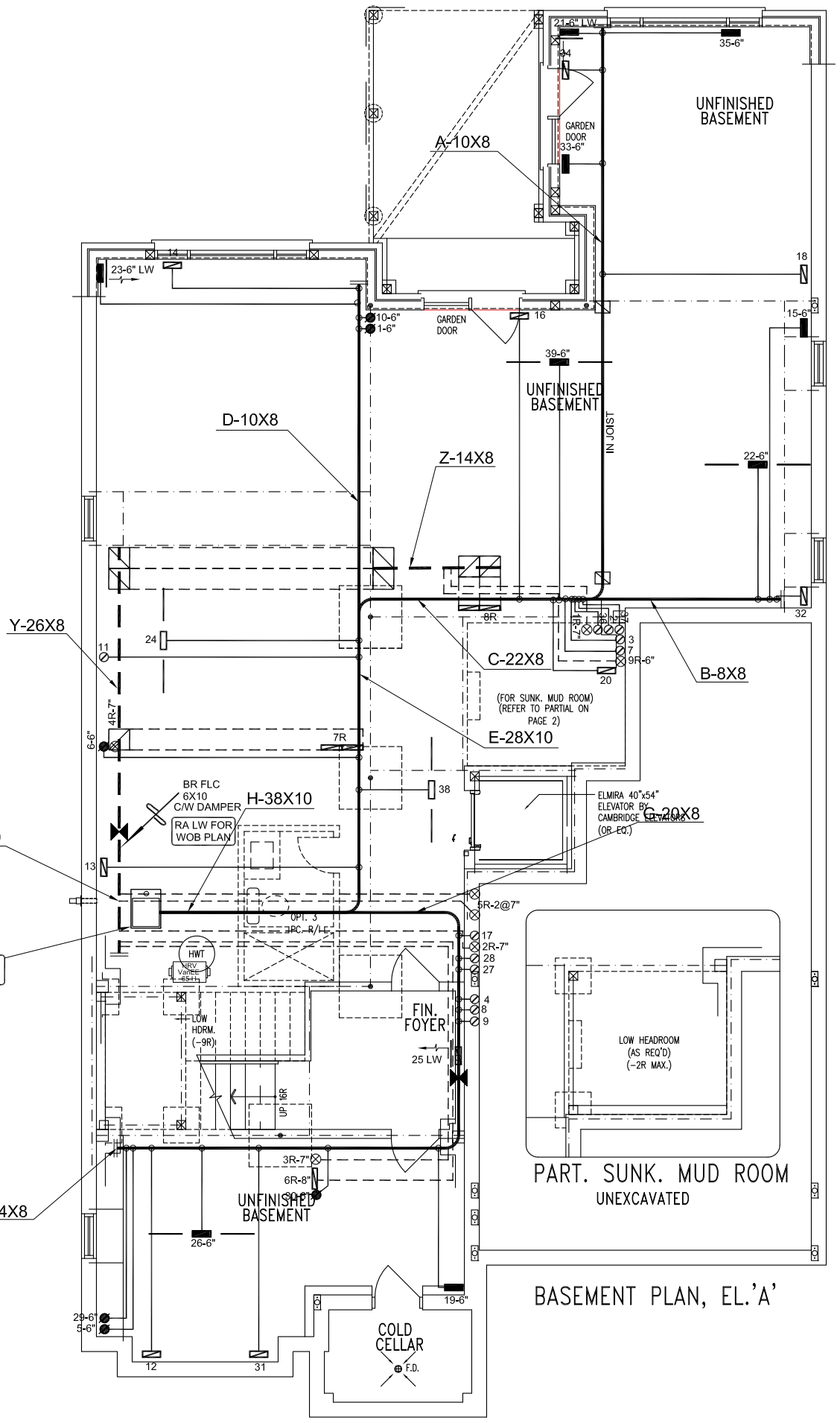
Air Infiltration Residential Load Calculator

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):	9.45
Building Configuration	
Type:	Detached
Number of Stories:	Two
Foundation:	Full
House Volume (m^3):	1910.9
Air Leakage/Ventilation	
Air Tightness Type:	Present (1961-) (3.57 ACH)
Custom BDT Data:	ELA @ 10 Pa. 2547.3 cm^2
	3.57 ACH @ 50 Pa
Mechanical Ventilation (L/s):	Total Supply 73.2 / Total Exhaust 73.2
Flue Size	
Flue #:	#1 #2 #3 #4
Diameter (mm):	0 0 0 0
Natural Infiltration Rates	
Heating Air Leakage Rate (ACH/H):	**0.416**
Cooling Air Leakage Rate (ACH/H):	**0.139**

TYPE: 5005 - KNIGHTSWOOD OPT. 5 BED & ELEVATOR - WOB

LO# 79984



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

WOB 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.	REVISED AS PER ARCHITECTURALS	FEB/2020
1.	3R RELOCATED	NOV/2018

REVISIONS

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Client
GOLDPARK HOMES

Project Name
PINE VALLEY & TESTON
VAUGHAN, ONTARIO
OPT. 5 BED & ELEVATOR
KNIGHTSWOOD - WOB
5005 4483 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.

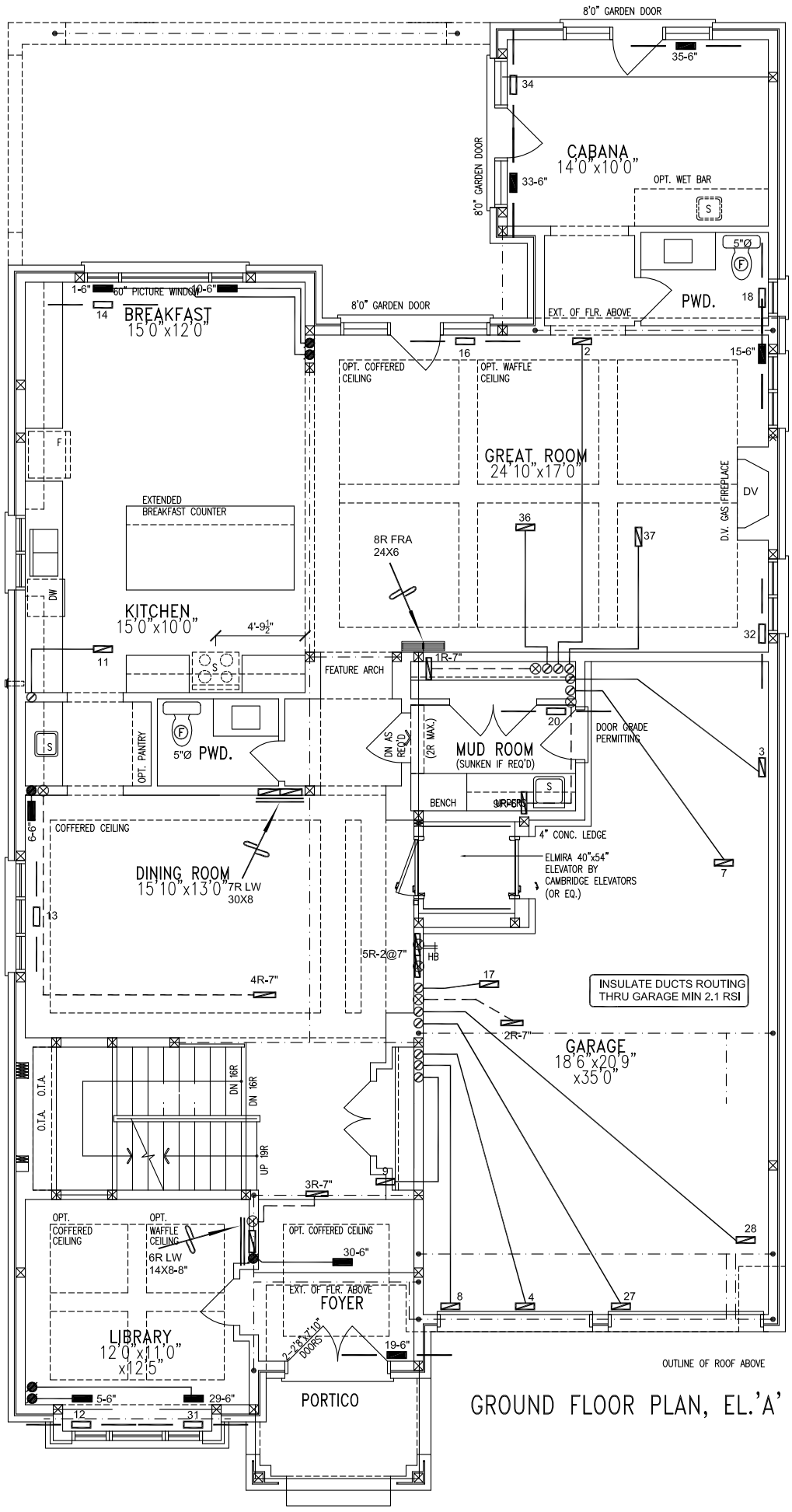
HEAT LOSS 98770 BTU/H		
UNIT DATA		
MAKE	LENNOX	
MODEL	EL296UH110XE60C	
INPUT	110	MBTU/H
OUTPUT	106	MBTU/H
COOLING	5.0	TONS
FAN SPEED	1955	cfm @ 0.6" w.c.

# OF RUNS	S/A	R/A	FANS
3RD FLOOR			
2ND FLOOR	18	6	7
1ST FLOOR	13	3	3
BASEMENT	8	1	0

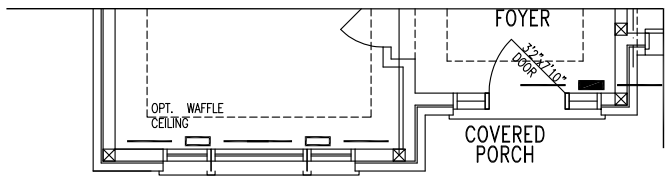
ALL S/A DIFFUSERS 4 "x10" UNLESS NOTED OTHERWISE ON LAYOUT. ALL S/A RUNS 5"Ø UNLESS NOTED OTHERWISE ON LAYOUT. UNDERCUT DOORS 1" min. FOR R/A

Sheet Title
BASEMENT HEATING LAYOUT

Date SEPT/2018
Scale 1/8" = 1'-0"
BCIN# 19669
LO# 79984



GROUND FLOOR PLAN, EL.'A'



PART. GROUND FLOOR PLAN, EL.'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

WOB | 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.	REVISED AS PER ARCHITECTURALS	FEB/2020
1.	3R RELOCATED	NOV/2018

REVISIONS

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Client
GOLDPARK HOMES

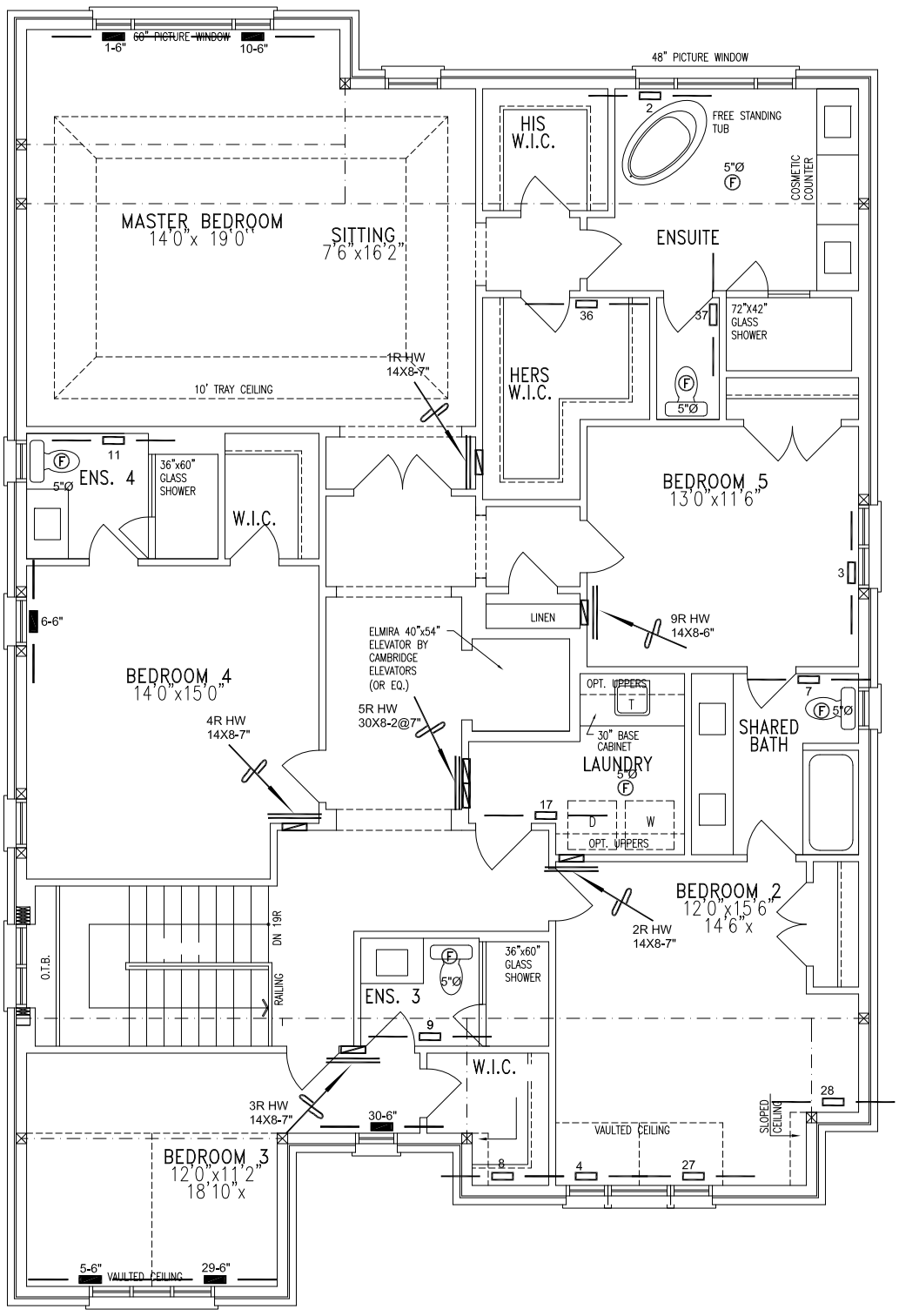
Project Name
PINE VALLEY & TESTON
VAUGHAN, ONTARIO
OPT. 5 BED & ELEVATOR
KNIGHTSWOOD - WOB
5005 4483 sqft

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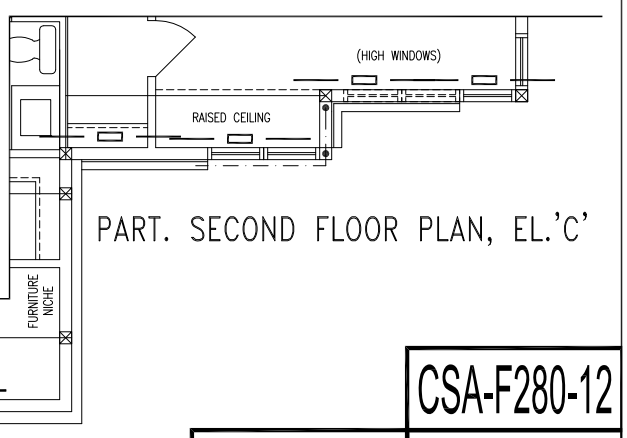
Installation to comply with the latest Ontario Building Code. All supply branch outlets shall be equipped with a manual balancing damper. Ductwork which passes through the garage or unheated spaces shall be adequately insulated and be gas-proofed.

Sheet Title
FIRST FLOOR HEATING LAYOUT

Date SEPT/2018
Scale 1/8" = 1'-0"
BCIN# 19669
LO# 79984



OPT. 5 BEDROOM SECOND FLOOR PLAN, EL.'A'



PART. SECOND FLOOR PLAN, EL.'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

WOB | **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.	REVISED AS PER ARCHITECTURALS	FEB/2020
1.	3R RELOCATED	NOV/2018

REVISIONS

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Client

GOLDPARK HOMES

Project Name

PINE VALLEY & TESTON
VAUGHAN, ONTARIO
OPT. 5 BED & ELEVATOR
KNIGHTSWOOD - WOB
5005 4483 sqft

HVAC DESIGNS LTD.
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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

SECOND FLOOR HEATING LAYOUT

Date SEPT/2018

Scale 1/8" = 1'-0"

BCIN# 19669

LO# 79984

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**		
VAUGHAN (WOODBRIDGE)				

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:** 5005 - KNIGHTSWOOD OPT. ELEVATOR **Project:** PINE VALLEY & TESTON

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.

September 10, 2018
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.

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

SITE NAME: PINE VALLEY & TESTON | OPT. ELEVATOR | DATE: Sep-18 | WINTER NATURAL AIR CHANGE RATE 0.350 | HEAT LOSS ΔT °F. 76 | CSA-F280-12

BUILDER: GOLD PARK HOMES | TYPE: 5005 - KNIGHTSWOOD | GFA: 4483 | LO# 77482 | SUMMER NATURAL AIR CHANGE RATE 0.118 | HEAT GAIN ΔT °F. 13 | SB-12 PACKAGE A1

ROOM USE			MBR			ENS			WIC			BED-2			BED-3			BED-4			ENS-2			WIC-2			ENS-3			ENS-4		
EXP. WALL			46			36			13			32			50			19			6			9			4			7		
CLG. HT.			11			10			10			11			11			10			10			10			10			10		
FACTORS																																
GRS.WALL AREA	LOSS	GAIN	506			360			130			352			550			190			60			90			40			70		
GLAZING				LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN
NORTH	21.3	16.0	0	0	0	0	0	0	6	128	96	18	383	288	0	0	0	0	0	0	8	170	128	0	0	0	0	0	0	0	0	0
EAST	21.3	41.6	0	0	0	0	0	0	0	0	0	70	1490	2909	73	1553	3033	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
SOUTH	21.3	24.9	0	0	0	0	0	0	0	0	0	0	0	0	28	596	697	32	681	797	0	0	0	0	0	0	0	0	0	8	170	199
WEST	21.3	41.6	50	1064	2078	34	724	1413	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
SKYLT.	37.2	101.5	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	0	0	0
DOORS	25.2	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	0	0	0
NET EXPOSED WALL	4.5	0.8	456	2035	343	326	1455	245	124	553	93	264	1178	198	449	2004	337	168	705	119	52	232	39	90	402	68	40	179	30	62	277	47
NET EXPOSED BSMT WALL ABOVE GR	3.6	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	0	0	0	0	0	0
EXPOSED CLG	1.3	0.6	533	684	313	323	415	190	247	317	145	254	326	149	272	349	160	285	366	167	60	77	35	48	62	28	140	180	82	105	135	62
NO ATTIC EXPOSED CLG	2.7	1.3	0	0	0	0	0	0	0	0	0	24	66	30	84	231	106	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	154	393	66	278	709	119	104	265	45	0	0	0	60	153	26	48	122	21	24	61	10	0	0	0
BASEMENT/CRAWL HEAT LOSS				0			0			0			0			0			0			0			0			0			0	
SLAB ON GRADE HEAT LOSS				0			0			0			0			0			0			0			0			0			0	
SUBTOTAL HT LOSS				3783			2593			1391			4152			4998			1752			632			586			419			582	
SUB TOTAL HT GAIN					2734			1848			400			3693			4378			1083			228			116			123			307
LEVEL FACTOR / MULTIPLIER			0.20	0.30		0.20	0.30		0.20	0.30		0.20	0.30		0.20	0.30		0.20	0.30		0.20	0.30		0.20	0.30		0.20	0.30		0.20	0.30	
AIR CHANGE HEAT LOSS				1149			787			422			1260			1517			532			192			178			127			177	
AIR CHANGE HEAT GAIN					197			133			29			267			316			78			16			8			9			22
DUCT LOSS				0			0			181			541			652			0			82			76			55			0	
DUCT GAIN					0			0			112			489			563			0			24			12			13			0
HEAT GAIN PEOPLE	240		2		480	0		0	0		0	1		240	1		240	1		240	0		0	0		0	0		0	0		0
HEAT GAIN APPLIANCES/LIGHTS					692			0			692			692			692			692			0			0			0			0
TOTAL HT LOSS BTU/H				4932			3380			1994			5953			7167			2284			907			840			601			758	
TOTAL HT GAIN x 1.3 BTU/H					5334			2675			1604			6998			8046			2722			349			179			188			429

ROOM USE			LIB			DIN			KIT/GT			CAB			LAUN			PWD			FOY			MUD						LOD			BAS		
EXP. WALL			31			32			87			45			0			5			35			18						52			238		
CLG. HT.			11			11			11			11			10			11			11			12						10			10		
FACTORS																																			
GRS.WALL AREA	LOSS	GAIN	341			352			957			495			0			55			385			216						520			1978		
GLAZING				LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN					LOSS	GAIN		LOSS	GAIN
NORTH	21.3	16.0	0	0	0	0	0	0	46	979	736	0	0	0	0	0	0	9	192	144	0	0	0	0	0	0				0	0	0	6	128	96
EAST	21.3	41.6	56	1192	2327	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
SOUTH	21.3	24.9	0	0	0	34	724	847	20	426	498	63	1341	1569	0	0	0	0	0	0	0	0	0	0	0	0				0	0	0	6	128	149
WEST	21.3	41.6	0	0	0	0	0	0	115	2447	4778	63	1341	2618	0	0	0	0	0	0	0	0	0	0	0	0				22	468	914	0	0	0
SKYLT.	37.2	101.5	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	0	0	0
DOORS	25.2	4.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	62	1565	264	20	505	85				0	0	0	20	505	85
NET EXPOSED WALL	4.5	0.8	285	1272	214	318	1419	239	776	3463	583	369	1647	277	0	0	0	46	205	35	323	1441	243	196	875	147				0	0	0	0	0	0
NET EXPOSED BSMT WALL ABOVE GR	3.6	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				290	1044	176	402	1447	244
EXPOSED CLG	1.3	0.6	0	0	0	0	0	0	0	0	0	0	0	0	102	131	60	0	0	0	0	0	0	0	0	0				0	0	0	0	0	0
NO ATTIC EXPOSED CLG	2.7	1.3	0	0	0	0	0	0	0	0	0	203	558	255	0	0	0	40	110	50	41	113	52	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	56	143	24	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			0									8373	
SLAB ON GRADE HEAT LOSS				0			0			0			0			0			0			0			0						0				
SUBTOTAL HT LOSS				2464			2143			7316			4886			274			507			3120			1380						1512			10580	
SUB TOTAL HT GAIN					2541			1086			6595			4719			84			229			558			232						1090			574
LEVEL FACTOR / MULTIPLIER			0.30	0.44		0.30	0.44		0.30	0.44		0.30	0.44		0.20	0.30		0.30	0.44		0.30	0.44		0.30	0.44								0.50	1.33	
AIR CHANGE HEAT LOSS				1088			947			3232			2169			83			224			1378			610									16061	
AIR CHANGE HEAT GAIN					183			78			476			341			6			17			40			17									120
DUCT LOSS				0			0			0			0			36			0			0			0									0	
DUCT GAIN					0			0			0			0			78			0			0			0									0
HEAT GAIN PEOPLE	240		0		0	0		0	0		0	0		0	0		0	0		0	0		0	0		0				0		0	0		0
HEAT GAIN APPLIANCES/LIGHTS					692			692			692			692			692			0			0			692						0			692
TOTAL HT LOSS BTU/H				3552			3089			10546			7045			393			731			4498			1989						1512			26641	
TOTAL HT GAIN x 1.3 BTU/H					4442			2413			10092			7478			1119			319			778			1224						1417			1802

TOTAL HEAT GAIN BTU/H: 60043 TONS: 5.00 LOSS DUE TO VENTILATION LOAD BTU/H: 3161 STRUCTURAL HEAT LOSS: 88812 TOTAL COMBINED HEAT LOSS BTU/H: 91992

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

HVAC DESIGNS LTD.

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SITE NAME: PINE VALLEY & TESTON
BUILDER: GOLD PARK HOMES

OPT. ELEVATOR
TYPE: 5005 - KNIGHTSWOOD

DATE: Nov-18

GFA: 4483 LO# 77482

HEATING CFM	1955	COOLING CFM	1955	furnace pressure	0.6
TOTAL HEAT LOSS	88,812	TOTAL HEAT GAIN	59,507	furnace filter	0.08
AIR FLOW RATE CFM	22.01	AIR FLOW RATE CFM	32.85	a/c coil pressure	0.2
				available pressure for s/a & r/a	0.32
				plenum pressure s/a	0.17
				max s/a dif press. loss	0.02
				min adjusted pressure s/a	0.15

				r/a pressure	0.15
				r/a grille press. Loss	0.02
				adjusted pressure r/a	0.13

^LENNOX
EL296UH110XE60C 110

FAN SPEED	
LOW	0
MEDLOW	1380
MEDIUM	1505
MEDIUM HIGH	1685
HIGH	1955

AFUE = 96 %
INPUT (BTU/H) = 110,000
OUTPUT (BTU/H) = **106,000**

DESIGN CFM = **1955**
CFM @ .6 " E.S.P.

TEMPERATURE RISE 50 °F

RUN COUNT	4th	3rd	2nd	1st	Bas
S/A	0	0	18	13	7
R/A	0	0	5	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	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	ENS-2	WIC-2	ENS-3	MBR	ENS-4	LIB	DIN	KIT/GT	KIT/GT	KIT/GT	LAUN	PWD	FOY	MUD	BAS	BAS	BAS	BAS
RM LOSS MBH.	2.47	2.73	1.99	1.98	2.39	2.28	0.91	0.84	0.60	2.47	0.76	1.78	3.09	2.64	2.64	2.64	0.39	0.73	4.50	1.99	4.02	4.02	4.02	4.02
CFM PER RUN HEAT	54	60	44	44	53	50	20	18	13	54	17	39	68	58	58	58	9	16	99	44	89	89	89	89
RM GAIN MBH.	2.67	2.26	1.60	2.33	2.68	2.72	0.35	0.18	0.19	2.67	0.43	2.22	2.41	2.52	2.52	2.52	1.12	0.32	0.78	1.22	0.46	0.46	0.46	0.46
CFM PER RUN COOLING	88	74	53	77	88	89	11	6	6	88	14	73	79	83	83	83	37	10	26	40	15	15	15	15
ADJUSTED PRESSURE	0.15	0.16	0.16	0.16	0.15	0.15	0.16	0.16	0.16	0.15	0.16	0.16	0.16	0.15	0.15	0.15	0.16	0.16	0.15	0.16	0.15	0.15	0.15	0.15
ACTUAL DUCT LGH.	70	70	53	49	75	48	47	48	53	64	59	57	29	52	69	54	36	73	40	47	60	60	54	38
EQUIVALENT LENGTH	200	200	170	160	170	160	160	150	170	170	150	140	103	120	140	110	200	170	210	160	150	120	130	90
TOTAL EFFECTIVE LENGTH	270	270	223	209	245	208	207	198	223	234	209	197	132	172	209	164	236	243	250	207	210	180	184	128
ADJUSTED PRESSURE	0.05	0.06	0.07	0.07	0.06	0.07	0.08	0.08	0.07	0.06	0.07	0.08	0.12	0.09	0.07	0.09	0.07	0.06	0.06	0.08	0.07	0.08	0.08	0.11
ROUND DUCT SIZE	**6**	**6**	5	**6**	**6**	**6**	4	4	4	**6**	4	5	5	5	**6**	5	4	4	**6**	4	**6**	**6**	**6**	5
HEATING VELOCITY (ft/min)	275	306	323	224	270	255	229	207	149	275	195	286	499	426	296	426	103	184	505	505	454	454	454	653
COOLING VELOCITY (ft/min)	449	377	389	393	449	454	126	69	69	449	161	536	580	609	423	609	424	115	133	459	76	76	76	110
OUTLET GRILL SIZE	4X10	4X10	3X10	4X10	4X10	4X10	3X10	3X10	3X10	4X10	3X10	3X10	3X10	3X10	4X10	3X10	3X10	3X10	4X10	3X10	4X10	4X10	4X10	3X10
TRUNK	D	C	C	G	F	E	C	G	G	D	E	F	E	D	B	C	G	A	F	C	A	B	D	E

RUN #	25	26	27	28	29	30	31	32	33	34	35	36	37	38
ROOM NAME	BAS	BAS	BED-2	BED-2	BED-3	BED-3	LIB	KIT/GT	CAB	CAB	CAB	ENS	ENS	BAS
RM LOSS MBH.	4.02	4.02	1.98	1.98	2.39	2.39	1.78	2.64	2.35	2.35	2.35	0.33	0.33	4.02
CFM PER RUN HEAT	89	89	44	44	53	53	39	58	52	52	52	7	7	89
RM GAIN MBH.	0.46	0.46	2.33	2.33	2.68	2.68	2.22	2.52	2.49	2.49	2.49	0.16	0.16	0.46
CFM PER RUN COOLING	15	15	77	77	88	88	73	83	82	82	82	5	5	15
ADJUSTED PRESSURE	0.15	0.15	0.16	0.16	0.15	0.15	0.16	0.15	0.15	0.15	0.15	0.16	0.16	0.15
ACTUAL DUCT LGH.	34	50	52	55	80	63	51	55	69	71	82	56	58	23
EQUIVALENT LENGTH	110	150	170	160	170	200	160	120	150	130	140	200	190	140
TOTAL EFFECTIVE LENGTH	144	200	222	215	250	263	211	175	219	201	222	256	248	163
ADJUSTED PRESSURE	0.1	0.07	0.07	0.07	0.06	0.06	0.07	0.08	0.07	0.07	0.07	0.06	0.06	0.09
ROUND DUCT SIZE	5	**6**	**6**	**6**	**6**	**6**	5	**6**	**6**	**6**	**6**	4	4	**6**
HEATING VELOCITY (ft/min)	653	454	224	224	270	270	286	296	265	265	265	80	80	454
COOLING VELOCITY (ft/min)	110	76	393	393	449	449	536	423	418	418	418	57	57	76
OUTLET GRILL SIZE	3X10	4X10	4X10	4X10	4X10	4X10	3X10	4X10	4X10	4X10	4X10	3X10	3X10	4X10
TRUNK	G	F	G	G	F	F	F	B	A	A	A	C	C	E

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	261	0.06	9.1	10	x	8	470	TRUNK G	686	0.06	13.1	20	x	8	617
TRUNK B	205	0.07	8	8	x	8	461	TRUNK H	1960	0.05	20.3	38	x	10	743
TRUNK C	706	0.06	13.2	20	x	8	635	TRUNK I	0	0.00	0	0	x	8	0
TRUNK D	255	0.05	9.5	10	x	8	459	TRUNK J	0	0.00	0	0	x	8	0
TRUNK E	1274	0.05	17.3	28	x	10	655	TRUNK K	0	0.00	0	0	x	8	0
TRUNK F	425	0.06	10.9	14	x	8	546	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	1640	0.05	19	34	x	10	695
TRUNK Y	955	0.05	15.5	28	x	8	614
TRUNK Z	480	0.05	12	16	x	8	540
DROP	1955	0.05	20.3	24	x	18	652

RETURN AIR #	1	2	3	4	5	6	7	8								BR
	0	0	0	0	2@7"	0	0	0	0	0	0	0	0	0	0	
AIR VOLUME	115	140	115	115	240	200	360	365	0	0	0	0	0	0	0	305
PLENUM PRESSURE	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13
ACTUAL DUCT LGH.	84	51	62	59	47	49	30	51	1	1	1	1	1	1	1	14
EQUIVALENT LENGTH	200	135	195	185	135	140	170	195	0	0	0	0	0	0	0	145
TOTAL EFFECTIVE LH	284	186	257	244	182	189	200	246	1	1	1	1	1	1	1	159
ADJUSTED PRESSURE	0.05	0.07	0.05	0.05	0.07	0.07	0.07	0.05	13.36	13.36	13.36	13.36	13.36	13.36	13.36	0.08
ROUND DUCT SIZE	7	6.9	7	7	8.5	7.9	9.9	10.8	0	0	0	0	0	0	0	9
INLET GRILL SIZE	8	8	8	8	8	8	8	8	0	0	0	0	0	0	0	8
	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
INLET GRILL SIZE	14	14	14	14	30	14	30	30	0	0	0	0	0	0	0	30

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: 5005 - KNIGHTSWOOD LO # 77482
SITE NAME: PINE VALLEY & TESTON OPT. ELEVATOR

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	7	@ 10.6 cfm	74.2	cfm
Other Rooms	8	@ 10.6 cfm	84.8	cfm
Table 9.32.3.A.		TOTAL	233.2	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	233.2	cfm
Less Principal Ventil. Capacity	155	cfm
Required Supplemental Capacity	78.2	cfm

PRINCIPAL EXHAUST FAN CAPACITY

Model: VANEE 65H Location: BSMT

155.0 cfm 3.0 sones [✓] HVI Approved

PRINCIPAL EXHAUST HEAT LOSS CALCULATION

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

SUPPLEMENTAL FANS NUTONE

Location	Model	cfm	HVI	Sones
ENS	QTXEN050C	50	✓	0.3
ENS-2	QTXEN050C	50	✓	0.3
ENS-4	QTXEN050C	50	✓	0.3
PWD	QTXEN050C	50	✓	0.3

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: 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: September-18

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: 19569 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#: 77482 Model: 5005 - KNIGHTSWOOD Builder: GOLD PARK HOMES Date: 9/10/2018

Volume Calculation

House Volume

Level	Floor Area (ft^2)	Floor Height (ft)	Volume (ft^3)
Bsmt	2052	10	20520
First	2052	11	22572
Second	2439	10	24390
Third	0	9	0
Fourth	0	9	0
		Total:	67,482.0 ft^3
		Total:	1910.9 m^3

Air Change & Delta T Data

WINTER NATURAL AIR CHANGE RATE	0.350
SUMMER NATURAL AIR CHANGE RATE	0.118

Design Temperature Difference

	Tin °C	Tout °C	ΔT °C	ΔT °F
Winter DTDh	22	-20	42	76
Summer DTDc	24	31	7	13

5.2.3.1 Heat Loss due to Air Leakage

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

0.350 x 530.80 x 42 °C x 1.2 = 9415 W

= 32123 Btu/h

6.2.6 Sensible Gain due to Air Leakage

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

= 0.118 x 530.80 x 7 °C x 1.2 = 533 W

= 1819 Btu/h

5.2.3.2 Heat Loss due to Mechanical Ventilation

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

155 CFM x 76 °F x 1.08 x 0.25 = 3181 Btu/h

6.2.7 Sensible heat Gain due to Ventilation

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

155 CFM x 13 °F x 1.08 x 0.25 = 536 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	32,123	12,091	1.328
2	0.3		21,813	0.442
3	0.2		21,161	0.304
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: 5005 - KNIGHTSWOOD OPT. ELEVATOR **BUILDER:** GOLD PARK HOMES
SFQT: 4483 **LO#** 77482 **SITE:** PINE VALLEY & TESTON

DESIGN ASSUMPTIONS

HEATING	°F	COOLING	°F
OUTDOOR DESIGN TEMP.	-4	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:	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):	67482.0	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:	7.0 ft
LENGTH: 77.0 ft	WIDTH: 42.0 ft	EXPOSED PERIMETER:	238.0 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	29.80
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

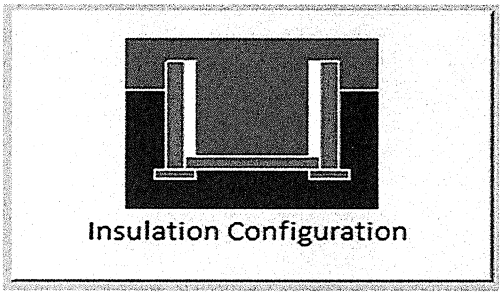
Michael O'Rourke

HVAC Designs Ltd.
375 Finley Ave, Suite 202
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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 sand, loam, clay
Water Table:	Normal (7-10 m, 23-33 ft)

Foundation Dimensions		
Floor Length (m):	**23.5**	 Insulation Configuration
Floor Width (m):	**12.8**	
Exposed Perimeter (m):	**0.0**	
Wall Height (m):	**3.0**	
Depth Below Grade (m):	**2.13**	
Window Area (m^2):	**3.2**	
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):		**2453**

TYPE: 5005 - KNIGHTSWOOD OPT. ELEVATOR
LO# 77482

HVAC Designs Ltd.
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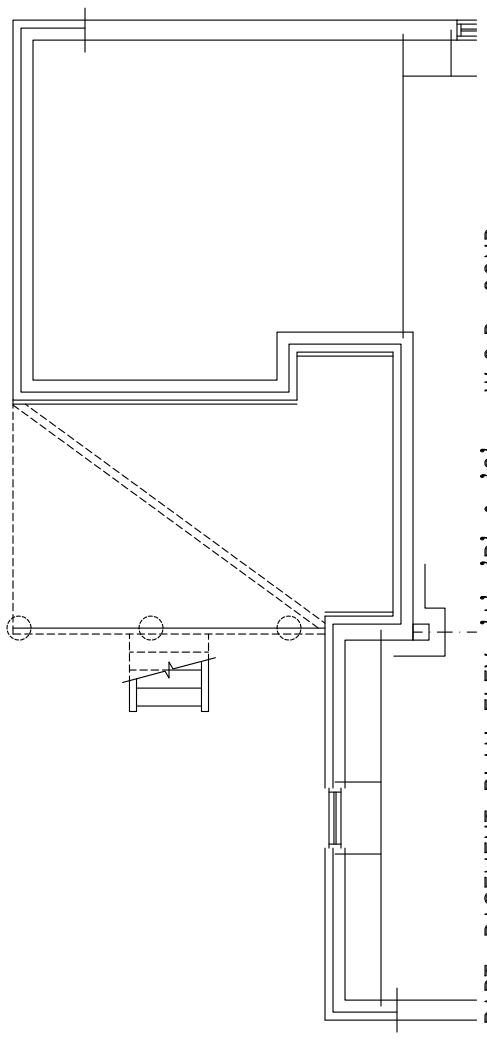
Air Infiltration Residential Load Calculator

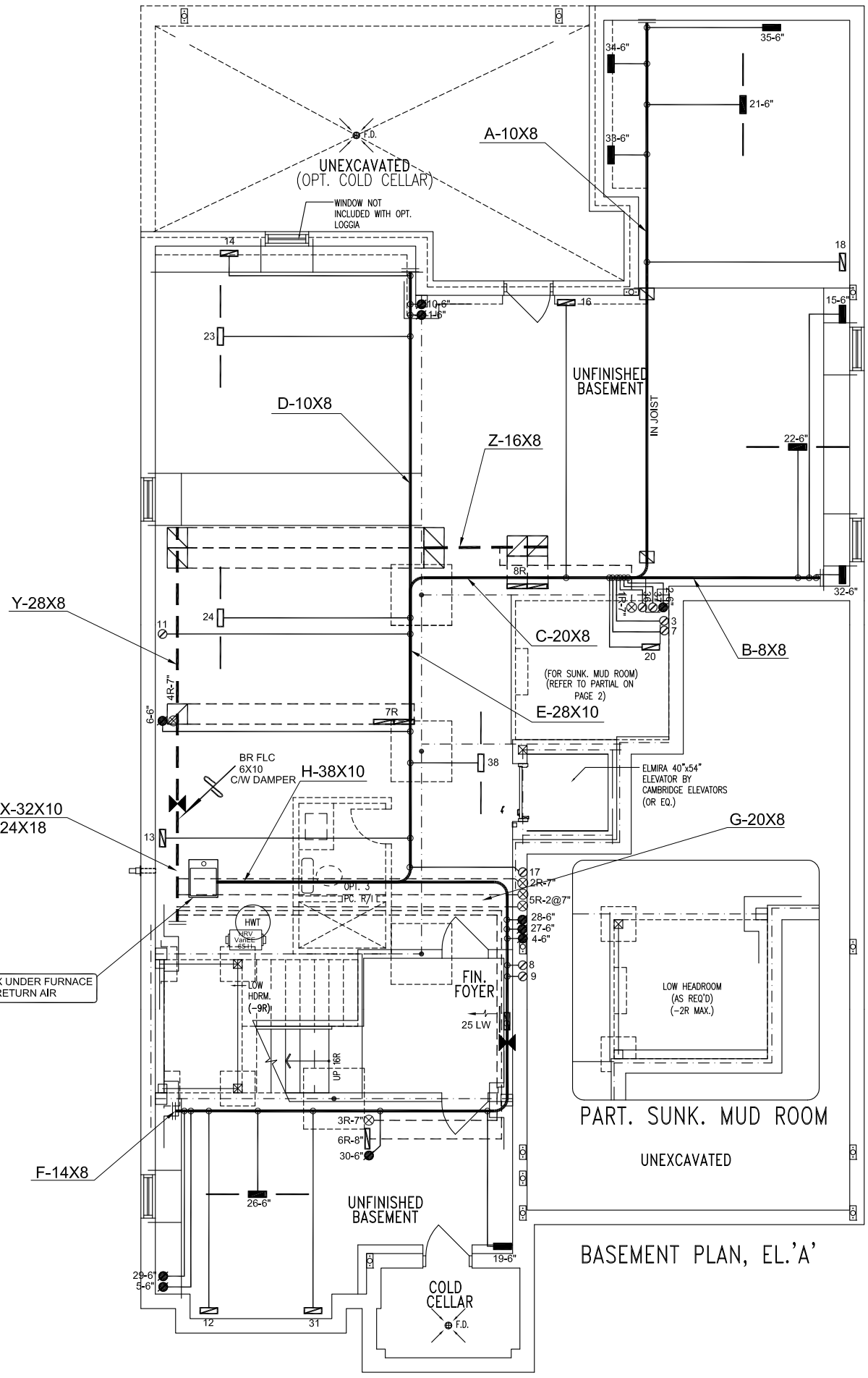
Supplemental tool for CAN/CSA-F280

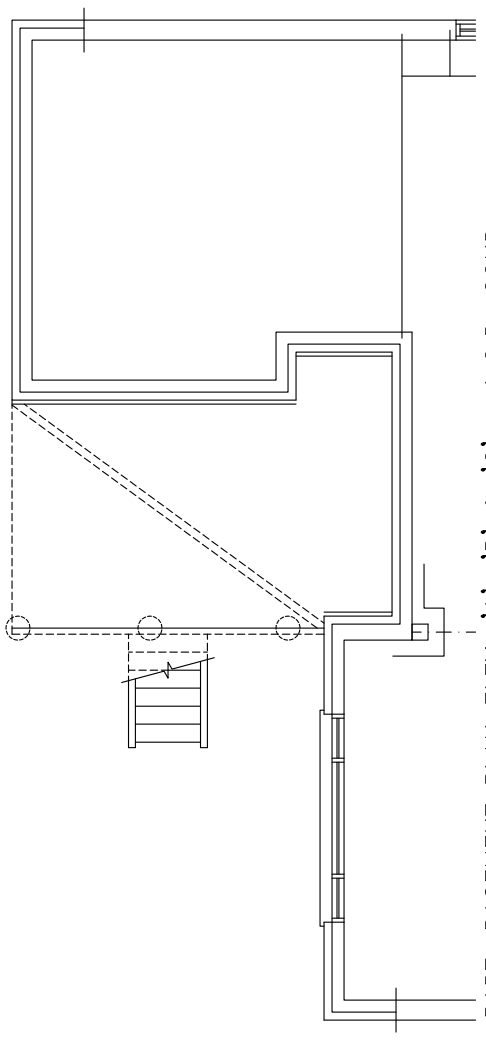
Weather Station Description	
Province:	Ontario
Region:	Vaughan (Woodbridge)
Weather Station Location:	Open flat terrain, grass
Anemometer height (m):	10
Local Shielding	
Building Site:	Suburban, forest
Walls:	Heavy
Flue:	Heavy
Highest Ceiling Height (m):	7.32
Building Configuration	
Type:	Detached
Number of Stories:	Two
Foundation:	Full
House Volume (m^3):	1910.9
Air Leakage/Ventilation	
Air Tightness Type:	Present (1961-) (3.57 ACH)
Custom BDT Data:	ELA @ 10 Pa. 2547.3 cm^2
	3.57 ACH @ 50 Pa
Mechanical Ventilation (L/s):	Total Supply: 73.2 Total Exhaust: 73.2
Flue Size	
Flue #:	#1 #2 #3 #4
Diameter (mm):	0 0 0 0
Natural Infiltration Rates	
Heating Air Leakage Rate (ACH/H):	**0.350**
Cooling Air Leakage Rate (ACH/H):	**0.118**

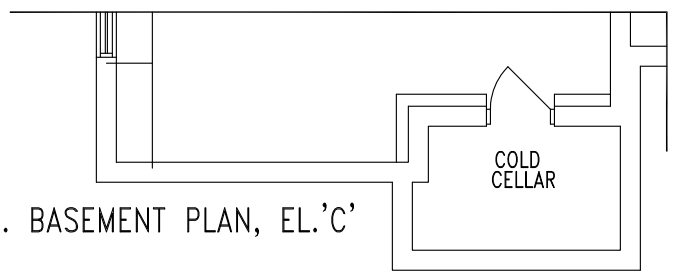
TYPE: 5005 - KNIGHTSWOOD OPT. ELEVATOR

LO# 77482









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.	REVISED AS PER ARCHITECTURALS	FEB/2020
2.	3R RELOCATED	NOV/2018
1.	DECK CONDITIONS ADDED	SEPT/2018

REVISIONS

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Client
GOLDPARK HOMES

Project Name
PINE VALLEY & TESTON
VAUGHAN, ONTARIO
OPT. ELEVATOR
KNIGHTSWOOD
5005 4483 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 91992 BTU/H

UNIT DATA

MAKE	LENNOX	
MODEL	EL296UH110XE60C	
INPUT	110	MBTU/H
OUTPUT	106	MBTU/H
COOLING	5.0	TONS
FAN SPEED	1955	cfm @ 0.6" w.c.

# OF RUNS	S/A	R/A	FANS
3RD FLOOR			
2ND FLOOR	18	5	7
1ST FLOOR	13	3	3
BASEMENT	7	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

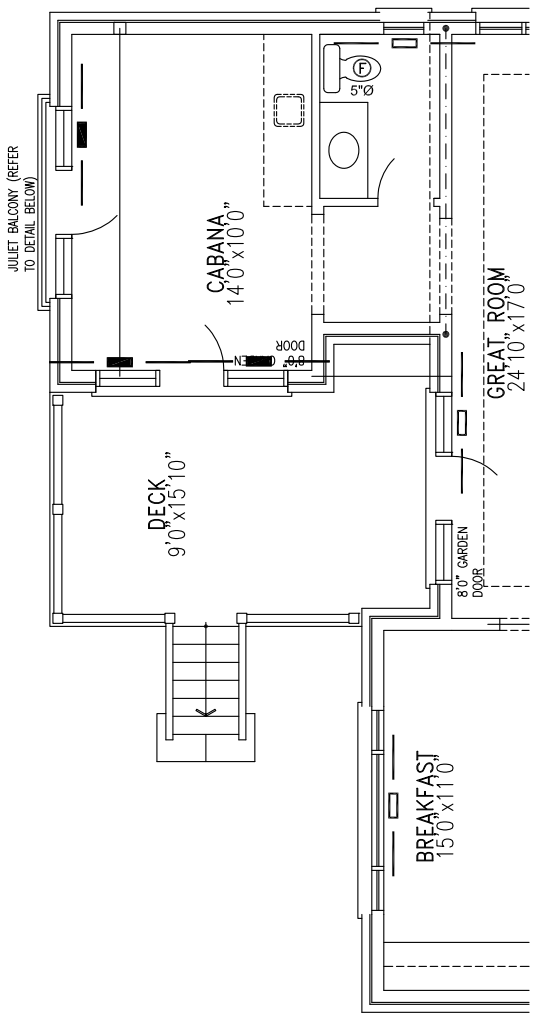
Sheet Title
BASEMENT HEATING LAYOUT

Date JAN/2018

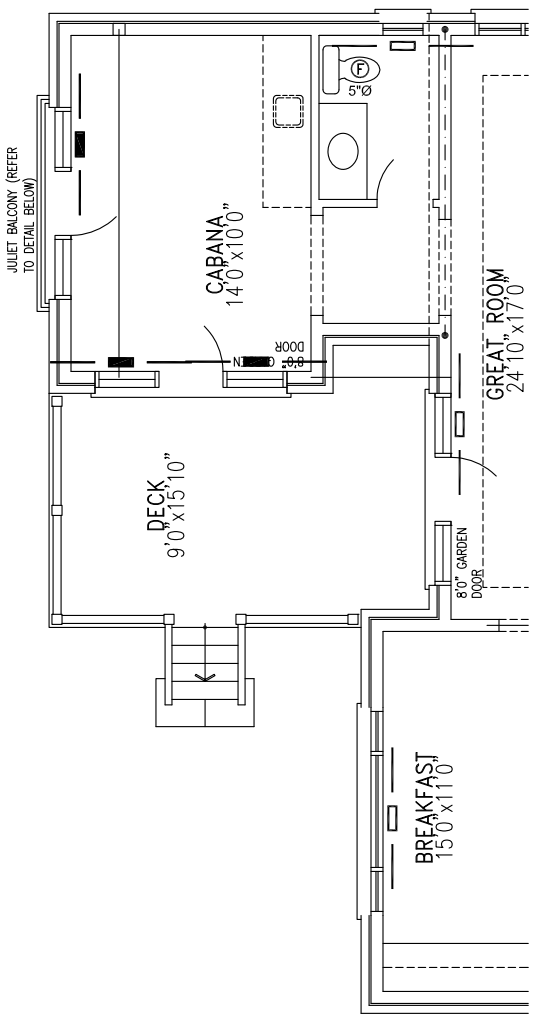
Scale 1/8" = 1'-0"

BCIN# 19669

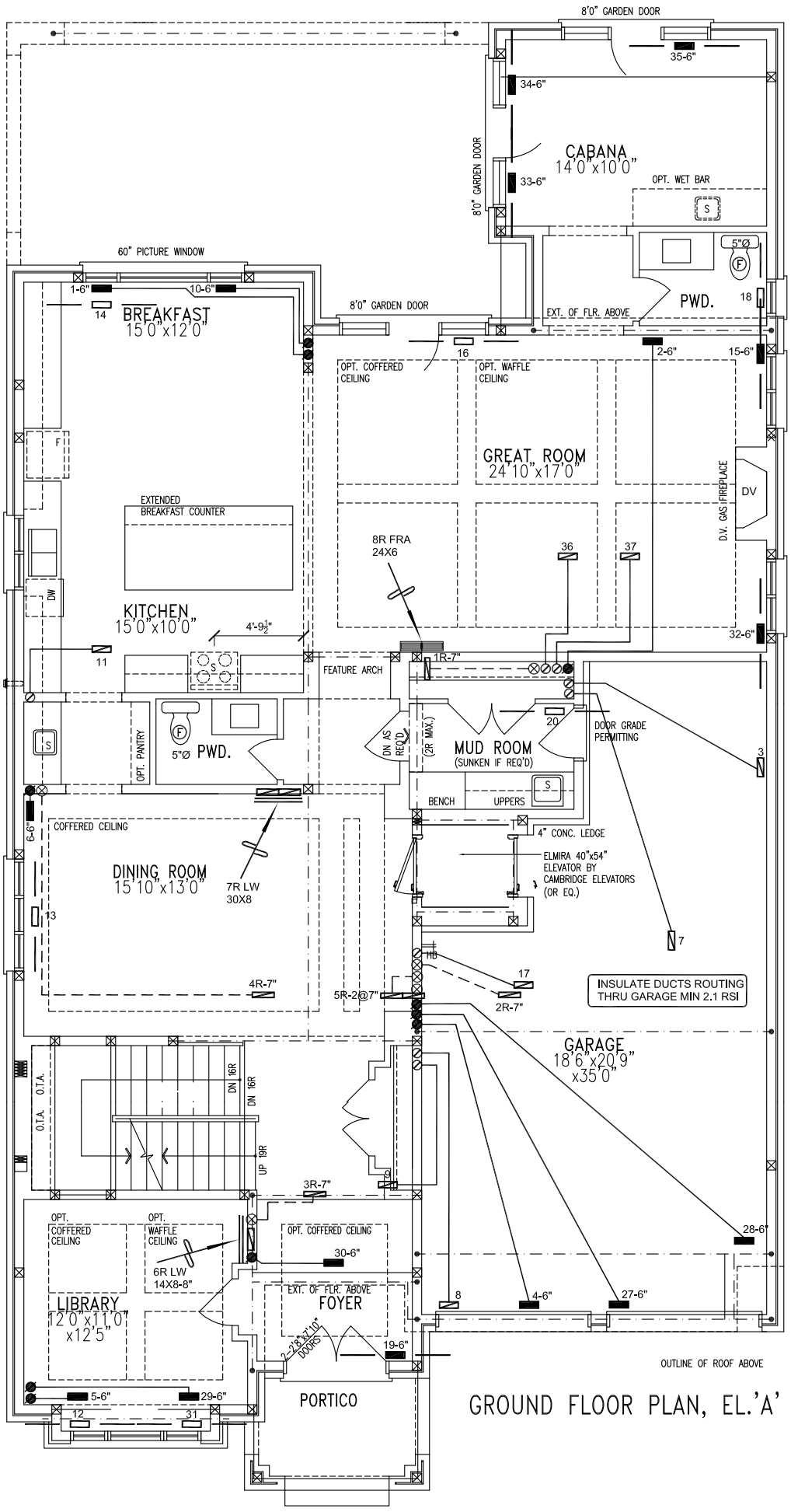
LO# 77482



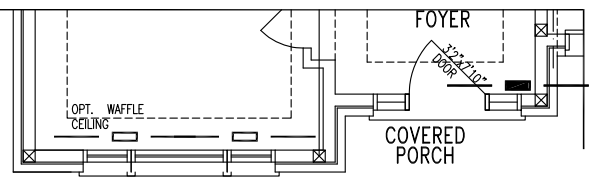
PART. GROUND FLOOR PLAN ELEV. 'A', 'B' & 'C' - L.O.D. COND.



PART. GROUND FLOOR PLAN ELEV. 'A', 'B' & 'C' - W.O.D. COND.



GROUND FLOOR PLAN, EL.'A'



PART. GROUND FLOOR PLAN, EL.'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

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.	REVISED AS PER ARCHITECTURALS	FEB/2020
2.	3R RELOCATED	NOV/2018
1.	DECK CONDITIONS ADDED	SEPT/2018

REVISIONS

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Client

GOLDPARK HOMES

Project Name

PINE VALLEY & TESTON
VAUGHAN, ONTARIO
OPT. ELEVATOR
KNIGHTSWOOD
5005 4483 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

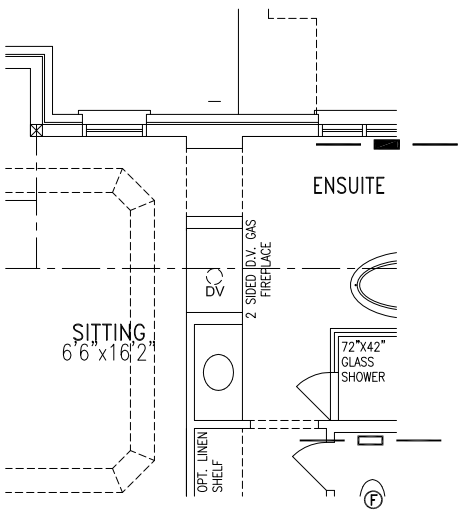
FIRST FLOOR HEATING LAYOUT

Date JAN/2018

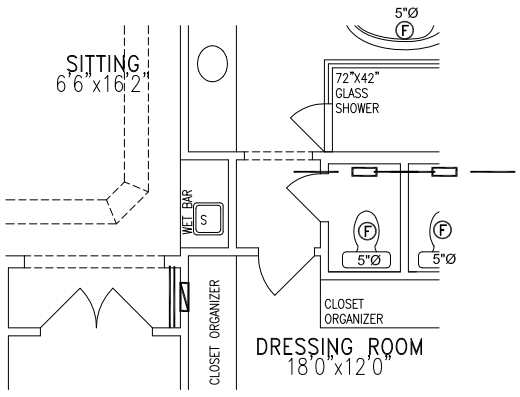
Scale 1/8" = 1'-0"

BCIN# 19669

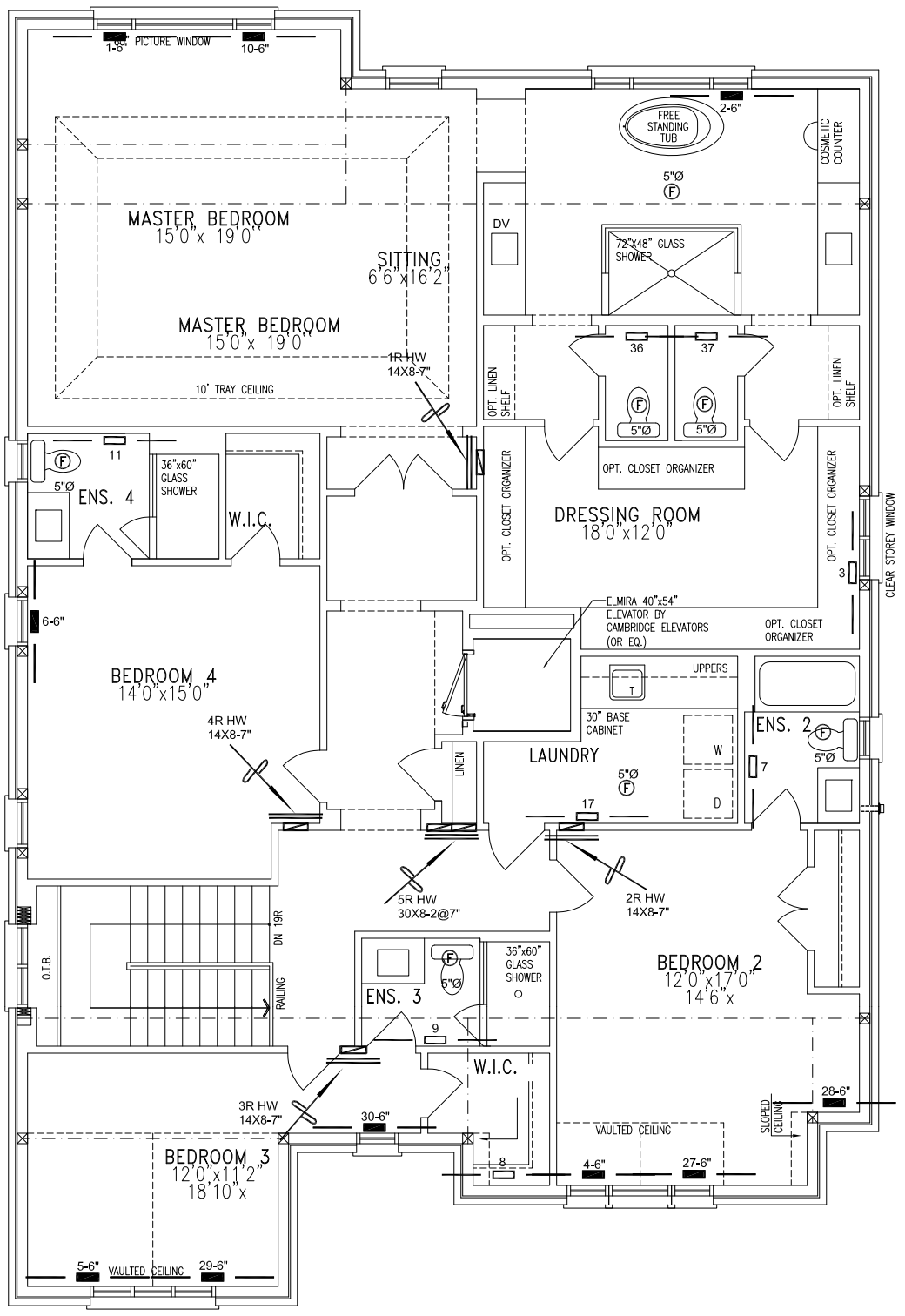
LO# 77482



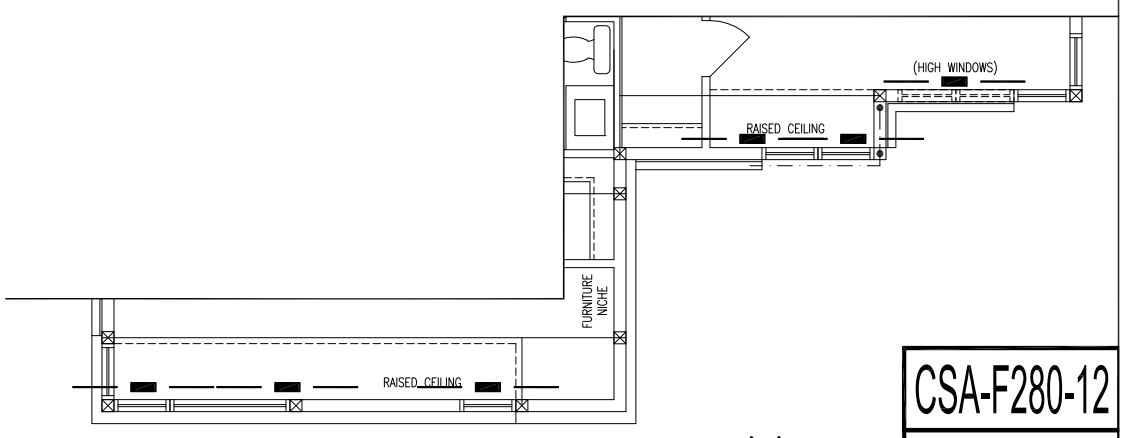
PART. SECOND FLOOR PLAN
OPT. SITTING AREA FIREPLACE



PART. SECOND FLOOR PLAN
OPT. SITTING AREA WET BAR



SECOND FLOOR PLAN, EL.'A'



PART. SECOND FLOOR PLAN, EL.'C'

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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.	REVISED AS PER ARCHITECTURALS	FEB/2020
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Client

GOLDPARK HOMES

Project Name

PINE VALLEY & TESTON
VAUGHAN, ONTARIO
OPT. ELEVATOR
KNIGHTSWOOD
5005 4483 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

SECOND FLOOR HEATING LAYOUT

Date JAN/2018

Scale 1/8" = 1'-0"

BCIN# 19669

LO# 77482

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**		
VAUGHAN (WOODBRIDGE)				

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:** 5005 - KNIGHTSWOOD OPT 5 BED & ELEVATOR OPT SERV STAIR **Project:** PINE VALLEY & TESTON

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.

February 26, 2020
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.

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

SITE NAME: PINE VALLEY & TESTON | OPT 5 BED & ELEVATOR OPT SERV STAIR | DATE: Feb-20 | WINTER NATURAL AIR CHANGE RATE 0.350 | HEAT LOSS ΔT °F. 76 | CSA-F280-12

BUILDER: GOLD PARK HOMES | TYPE: 5005 - KNIGHTSWOOD | GFA: 4580 | LO# 85459 | SUMMER NATURAL AIR CHANGE RATE 0.118 | HEAT GAIN ΔT °F. 13 | SB-12 PACKAGE A1

ROOM USE			MBR			ENS			WIC			BED-2			BED-3			BED-4			ENS-2			WIC-2			ENS-3			ENS-4			BED-5		
EXP. WALL			45			29			6			34			37			26			6			9			4			7			14		
CLG. HT.			11			10			10			11			11			10			10			10			10			10			10		
	FACTORS																																		
GRS.WALL AREA	LOSS	GAIN	495			290			60			374			407			260			60			90			40			70			140		
GLAZING				LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN
NORTH	21.3	16.0	0	0	0	0	0	0	0	0	0	18	383	288	0	0	0	0	0	0	8	170	128	0	0	0	0	0	0	0	0	0	18	383	288
EAST	21.3	41.6	0	0	0	0	0	0	0	0	0	70	1490	2909	73	1553	3033	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
SOUTH	21.3	24.9	0	0	0	0	0	0	0	0	0	0	0	0	28	596	697	32	681	797	0	0	0	0	0	0	0	0	0	8	170	199	0	0	0
WEST	21.3	41.6	50	1064	2078	34	724	1413	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
SKYLT.	37.2	101.5	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	0	0	0	0	0	0
DOORS	25.2	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	0	0	0	0	0	0
NET EXPOSED WALL	4.5	0.8	445	1986	334	256	1142	192	60	268	45	286	1276	215	306	1366	230	228	1017	171	52	232	39	90	402	68	40	179	30	62	277	47	122	544	92
NET EXPOSED BSMT WALL ABOVE GR	3.6	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	0	0	0	0	0	0	0	0	0
EXPOSED CLG	1.3	0.6	440	565	259	204	262	120	102	131	60	216	277	127	256	329	150	396	508	233	60	77	35	48	62	28	140	180	82	105	135	62	364	467	214
NO ATTIC EXPOSED CLG	2.7	1.3	0	0	0	0	0	0	0	0	0	24	66	30	84	231	106	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	240	612	103	104	265	45	0	0	0	60	153	26	48	122	21	140	357	60	0	0	0	25	64	11
BASEMENT/CRAWL HEAT LOSS				0			0			0			0			0			0			0			0			0			0			0	
SLAB ON GRADE HEAT LOSS				0			0			0			0			0			0			0			0			0			0			0	
SUBTOTAL HT LOSS				3615			2128			399			4104			4340			2207			632			586			715			582			1458	
SUB TOTAL HT GAIN					2671			1725			105			3671			4261			1201			228			116			172			307			604
LEVEL FACTOR / MULTIPLIER			0.20	0.31		0.20	0.31		0.20	0.31		0.20	0.31		0.20	0.31		0.20	0.31		0.20	0.31		0.20	0.31		0.20	0.31		0.20	0.31		0.20	0.31	
AIR CHANGE HEAT LOSS				1137			669			125			1291			1365			694			199			184			225			183			459	
AIR CHANGE HEAT GAIN					196			127			8			270			313			88			17			9			13			23			44
DUCT LOSS				0			0			0			540			570			0			83			77			94			0			192	
DUCT GAIN					0			0			0			484			547			0			24			13			19			0			155
HEAT GAIN PEOPLE	240		2		480	0		0	0		0	1		240	1		240	1		240	0		0	0		0	0		0	0		0	1		240
HEAT GAIN APPLIANCES/LIGHTS					658			0			658			658			658			658			0			0			0			0			658
TOTAL HT LOSS BTU/H				4752			2797			524			5935			6275			2901			914			847			1034			765			2109	
TOTAL HT GAIN x 1.3 BTU/H					5206			2407			1002			6920			7825			2843			350			179			265			429			2211

ROOM USE			LIB			DIN			KIT/GT			CAB			LAUN			PWD			FOY			MUD									LOD			BAS	
EXP. WALL			31			32			77			45			0			5			35			32									52			238	
CLG. HT.			11			11			11			11			10			11			11			12									10			10	
	FACTORS																																				
GRS.WALL AREA	LOSS	GAIN	341			352			847			495			0			55			385			384									520			1978	
GLAZING				LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN							LOSS	GAIN		LOSS	GAIN
NORTH	21.3	16.0	0	0	0	0	0	0	46	979	735	0	0	0	0	0	0	9	192	144	0	0	0	0	0	0							0	0	0	6	128	96
EAST	21.3	41.6	56	1192	2327	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
SOUTH	21.3	24.9	0	0	0	34	724	847	20	426	498	63	1341	1569	0	0	0	0	0	0	0	0	0	0	0	0							0	0	0	6	128	149
WEST	21.3	41.6	0	0	0	0	0	0	115	2447	4778	63	1341	2618	0	0	0	0	0	0	0	0	0	0	0	0							22	468	914	0	0	0
SKYLT.	37.2	101.5	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	0	0	0
DOORS	25.2	4.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	62	1565	264	20	505	85							0	0	0	20	505	85
NET EXPOSED WALL	4.5	0.8	285	1272	214	318	1419	239	666	2972	501	369	1647	277	0	0	0	46	205	35	323	1441	243	364	1624	274							0	0	0	0	0	0
NET EXPOSED BSMT WALL ABOVE GR	3.6	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							290	1044	176	402	1447	244
EXPOSED CLG	1.3	0.6	0	0	0	0	0	0	0	0	0	0	0	0	102	131	60	0	0	0	0	0	0	0	0	0							0	0	0	0	0	0
NO ATTIC EXPOSED CLG	2.7	1.3	0	0	0	0	0	0	0	0	0	203	558	255	0	0	0	40	110	50	41	113	52	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	56	143	24	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			0										8373	
SLAB ON GRADE HEAT LOSS				0			0			0			0			0			0			0			0									0			
SUBTOTAL HT LOSS				2464			2143			6824			4886			274			507			3120			2129									1512			10580	
SUB TOTAL HT GAIN					2541			1086			6512			4719			84			229			558			359									1090			574
LEVEL FACTOR / MULTIPLIER			0.30	0.45		0.30	0.45		0.30	0.45		0.30	0.45		0.20	0.31		0.30	0.45		0.30	0.45		0.30	0.45										0.50	1.37	
AIR CHANGE HEAT LOSS				1108			964			3069			2198			86			228			1403			958												16546	
AIR CHANGE HEAT GAIN					187			80			478			347			6			17			41			26													122
DUCT LOSS				0			0			0			0			36			0			0			0												0	
DUCT GAIN					0			0			0			0			75			0			0			0													0
HEAT GAIN PEOPLE	240		0		0	0		0	0		0	0		0	0		0	0		0	0		0	0		0							0		0	0		0
HEAT GAIN APPLIANCES/LIGHTS					658			658			658			658			658			0			0			0									0			658
TOTAL HT LOSS BTU/H				3572			3106			9893			7084			396			735			4523			3087									1512			27126	
TOTAL HT GAIN x 1.3 BTU/H					4402			2370			9943			7441			1070			319			779			1356									1417			1761

TOTAL HEAT GAIN BTU/H: 61031 | TONS: 5.09 | LOSS DUE TO VENTILATION LOAD BTU/H: 3181 | STRUCTURAL HEAT LOSS: 89886 | TOTAL COMBINED HEAT LOSS BTU/H: 93067

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: PINE VALLEY & TESTON — OPT 5 BED & ELEVATOR OPT SERV STAIR
BUILDER: GOLD PARK HOMES — TYPE: 5005 - KNIGHTSWOOD — DATE: Feb-20 — GFA: 4580 — LO# 85459

HEATING CFM	1955		COOLING CFM	1955			furnace pressure	0.6																
TOTAL HEAT LOSS	89,886		TOTAL HEAT GAIN	60,495			furnace filter	0.08									^LENNOX			AFUE = 96 %				
AIR FLOW RATE CFM	21.75		AIR FLOW RATE CFM	32.32			a/c coil pressure	0.2									EL296UH110XE60C	110		INPUT (BTU/H) = 110,000				
							available pressure										FAN SPEED			OUTPUT (BTU/H) = **106,000**				
							for s/a & r/a	0.32									LOW	0						
RUN COUNT	4th	3rd	2nd	1st	Bas												MEDLOW	1380		DESIGN CFM = **1955**				
S/A	0	0	18	13	7		plenum pressure s/a	0.17		r/a pressure	0.15						MEDIUM	1505		CFM @ .6 " E.S.P.				
R/A	0	0	6	3	1		max s/a dif press. loss	0.02		r/a grille press. Loss	0.02						MEDIUM HIGH	1685						
All S/A diffusers 4"x10" unless noted otherwise on layout.							min adjusted pressure s/a	0.15		adjusted pressure r/a	0.13						HIGH	1955		TEMPERATURE RISE 50 °F				
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	BED-5	BED-2	BED-3	BED-4	ENS-2	WIC-2	ENS-3	MBR	ENS-4	LIB	DIN	KIT/GT	KIT/GT	KIT/GT	LAUN	PWD	FOY	MUD	BAS	BAS	BAS	BAS
RM LOSS MBH.	2.38	2.20	2.11	1.98	2.09	2.90	0.91	0.85	1.03	2.38	0.76	1.79	3.11	2.47	2.47	2.47	0.40	0.73	4.52	3.09	4.09	4.09	4.09	4.09
CFM PER RUN HEAT	52	48	46	43	45	63	20	18	22	52	17	39	68	54	54	54	9	16	98	67	89	89	89	89
RM GAIN MBH.	2.60	1.90	2.21	2.31	2.61	2.84	0.35	0.18	0.26	2.60	0.43	2.20	2.37	2.49	2.49	2.49	1.07	0.32	0.78	1.36	0.45	0.45	0.45	0.45
CFM PER RUN COOLING	84	62	71	75	84	92	11	6	9	84	14	71	77	80	80	80	35	10	25	44	15	15	15	15
ADJUSTED PRESSURE	0.15	0.16	0.16	0.16	0.15	0.15	0.16	0.16	0.16	0.15	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.15	0.16	0.15	0.15	0.15	0.15
ACTUAL DUCT LGH.	70	70	68	49	75	48	79	48	53	64	59	57	29	52	69	54	36	73	40	65	67	60	54	38
EQUIVALENT LENGTH	200	200	150	160	170	160	150	150	170	170	150	140	103	120	140	110	200	170	210	190	150	120	103	90
TOTAL EFFECTIVE LENGTH	270	270	218	209	245	208	229	198	223	234	209	197	132	172	209	164	236	243	250	255	217	180	157	128
ADJUSTED PRESSURE	0.05	0.06	0.07	0.07	0.06	0.07	0.07	0.08	0.07	0.06	0.07	0.08	0.12	0.09	0.07	0.1	0.07	0.06	0.06	0.06	0.07	0.08	0.09	0.11
ROUND DUCT SIZE	**6**	5	5	5	**6**	**6**	4	4	4	**6**	4	5	5	5	**6**	5	4	4	**6**	5	**6**	**6**	**6**	5
HEATING VELOCITY (ft/min)	265	352	338	316	229	321	229	207	252	265	195	286	499	396	275	396	103	184	500	492	454	454	454	653
COOLING VELOCITY (ft/min)	428	455	521	551	428	469	126	69	103	428	161	521	565	587	408	587	402	115	127	323	76	76	76	110
OUTLET GRILL SIZE	4X10	3X10	3X10	3X10	4X10	4X10	3X10	3X10	3X10	4X10	3X10	3X10	3X10	3X10	4X10	3X10	3X10	3X10	4X10	3X10	4X10	4X10	4X10	3X10
TRUNK	D	C	B	G	F	E	B	G	G	D	E	F	E	D	B	C	G	A	F	B	A	B	D	E

RUN #	25	26	27	28	29	30	31	32	33	34	35	36	37	38
ROOM NAME	BAS	BAS	BED-2	BED-2	BED-3	BED-3	LIB	KIT/GT	CAB	CAB	CAB	WIC	ENS	BAS
RM LOSS MBH.	4.09	4.09	1.98	1.98	2.09	2.09	1.79	2.47	2.36	2.36	2.36	0.52	0.60	4.09
CFM PER RUN HEAT	89	89	43	43	45	45	39	54	51	51	51	11	13	89
RM GAIN MBH.	0.45	0.45	2.31	2.31	2.61	2.61	2.20	2.49	2.48	2.48	2.48	1.00	0.50	0.45
CFM PER RUN COOLING	15	15	75	75	84	84	71	80	80	80	80	32	16	15
ADJUSTED PRESSURE	0.15	0.15	0.16	0.16	0.15	0.15	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.15
ACTUAL DUCT LGH.	34	50	52	55	80	63	51	55	69	71	82	56	58	23
EQUIVALENT LENGTH	110	150	170	160	170	200	160	120	150	130	140	200	190	140
TOTAL EFFECTIVE LENGTH	144	200	222	215	250	263	211	175	219	201	222	256	248	163
ADJUSTED PRESSURE	0.1	0.07	0.07	0.07	0.06	0.06	0.07	0.09	0.07	0.08	0.07	0.06	0.06	0.09
ROUND DUCT SIZE	5	**6**	5	5	**6**	**6**	5	5	**6**	5	**6**	4	4	**6**
HEATING VELOCITY (ft/min)	653	454	316	316	229	229	286	396	260	374	260	126	149	454
COOLING VELOCITY (ft/min)	110	76	551	551	428	428	521	587	408	587	408	367	184	76
OUTLET GRILL SIZE	3X10	4X10	3X10	3X10	4X10	4X10	3X10	3X10	4X10	3X10	4X10	3X10	3X10	4X10
TRUNK	G	F	G	G	F	F	F	B	A	A	A	C	C	E

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	258	0.06	9.1	10	x	8	464	TRUNK G	667	0.06	12.9	20	x	8	600
TRUNK B	330	0.06	9.9	12	x	8	495	TRUNK H	1955	0.05	20.3	38	x	10	741
TRUNK C	714	0.06	13.3	20	x	8	643	TRUNK I	0	0.00	0	0	x	8	0
TRUNK D	247	0.05	9.3	10	x	8	445	TRUNK J	0	0.00	0	0	x	8	0
TRUNK E	1287	0.05	17.3	28	x	10	662	TRUNK K	0	0.00	0	0	x	8	0
TRUNK F	400	0.06	10.7	14	x	8	514	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	1515	0.05	18.4	32	x	10	682
TRUNK Y	880	0.05	15	26	x	8	609
TRUNK Z	415	0.05	11.3	14	x	8	534
DROP	1955	0.05	20.3	24	x	18	652

RETURN AIR #	1	2	3	4	5	6	7	8	9							**BR**
	0	0	0	0	2@7"	0	0	0	0	0	0	0	0	0	0	
AIR VOLUME	115	140	115	115	280	185	350	300	85	0	0	0	0	0	0	270
PLENUM PRESSURE	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13
ACTUAL DUCT LGH.	84	51	62	59	47	49	30	51	67	1	1	1	1	1	1	14
EQUIVALENT LENGTH	200	135	195	185	135	140	170	195	220	0	0	0	0	0	0	145
TOTAL EFFECTIVE LH	284	186	257	244	182	189	200	246	287	1	1	1	1	1	1	159
ADJUSTED PRESSURE	0.05	0.07	0.05	0.05	0.07	0.07	0.07	0.05	0.05	13.36	13.36	13.36	13.36	13.36	13.36	0.08
ROUND DUCT SIZE	7	6.9	7	7	9	7.7	9.8	10.1	6.3	0	0	0	0	0	0	8.6
INLET GRILL SIZE	8	8	8	8	8	8	8	8	8	0	0	0	0	0	0	8
	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
INLET GRILL SIZE	14	14	14	14	30	14	30	30	14	0	0	0	0	0	0	30

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Michael O'Rourke — INDIVIDUAL BCIN: 19669 MICHAEL O'ROURKE

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TYPE: 5005 - KNIGHTSWOOD LO # 85459
SITE NAME: PINE VALLEY & TESTON OPT 5 BED & ELEVATOR OPT SERV STAIR

RESIDENTIAL MECHANICAL VENTILATION DESIGN SUMMARY

COMBUSTION APPLIANCES 9.32.3.1(1)

- a) [✓] Direct vent (sealed combustion) only
- b) [ ] Positive venting induced draft (except fireplaces)
- c) [ ] Natural draft, B-vent or induced draft gas fireplace
- d) [ ] Solid Fuel (including fireplaces)
- e) [ ] No Combustion Appliances

HEATING SYSTEM

[✓] Forced Air [ ] Non Forced Air

[ ] Electric Space Heat

HOUSE TYPE 9.32.1(2)

- [✓] I Type a) or b) appliance only, no solid fuel
- [ ] II Type I except with solid fuel (including fireplaces)
- [ ] III Any Type c) appliance
- [ ] IV Type I, or II with electric space heat
- [ ] Other: Type I, II or IV no forced air

SYSTEM DESIGN OPTIONS O.N.H.W.P.

- [ ] 1 Exhaust only/Forced Air System
- [ ] 2 HRV with Ducting/Forced Air System
- [✓] 3 HRV Simplified/connected to forced air system
- [ ] 4 HRV with Ducting/non forced air system
- [ ] Part 6 Design

TOTAL VENTILATION CAPACITY 9.32.3.3(1)

Basement + Master Bedroom	2	@ 21.2 cfm	42.4	cfm
Other Bedrooms	4	@ 10.6 cfm	42.4	cfm
Kitchen & Bathrooms	7	@ 10.6 cfm	74.2	cfm
Other Rooms	8	@ 10.6 cfm	84.8	cfm
Table 9.32.3.A.		TOTAL	243.8	cfm

PRINCIPAL VENTILATION CAPACITY REQUIRED 9.32.3.4.(1)

1	Bedroom	31.8	cfm
2	Bedroom	47.7	cfm
3	Bedroom	63.6	cfm
4	Bedroom	79.5	cfm
5	Bedroom	95.4	cfm
	TOTAL	**95.4**	**cfm**

SUPPLEMENTAL VENTILATION CAPACITY 9.32.3.5.

Total Ventilation Capacity	243.8	cfm
Less Principal Ventil. Capacity	155	cfm
Required Supplemental Capacity	88.8	cfm

PRINCIPAL EXHAUST FAN CAPACITY

Model: VANEE 65H Location: BSMT

155.0 cfm 3.0 sones [✓] HVI Approved

PRINCIPAL EXHAUST HEAT LOSS CALCULATION

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

SUPPLEMENTAL FANS NUTONE

Location	Model	cfm	HVI	Sones
ENS	QTXEN050C	50	✓	0.3
ENS-2	QTXEN050C	50	✓	0.3
ENS-4	QTXEN050C	50	✓	0.3
PWD	QTXEN050C	50	✓	0.3

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: 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: February-20

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#: 85459 Model: 5005 - KNIGHTSWOOD Builder: GOLD PARK HOMES Date: 26/02/2020

Volume Calculation

House Volume

Level	Floor Area (ft²)	Floor Height (ft)	Volume (ft³)
Bsmt	2149	10	21490
First	2149	11	23639
Second	2439	10	24390
Third	0	9	0
Fourth	0	9	0
		Total:	69,519.0 ft³
		Total:	1968.6 m³

Air Change & Delta T Data

WINTER NATURAL AIR CHANGE RATE	0.350
SUMMER NATURAL AIR CHANGE RATE	0.118

Design Temperature Difference

	Tin °C	Tout °C	ΔT °C	ΔT °F
Winter DTDh	22	-20	42	76
Summer DTDc	24	31	7	13

5.2.3.1 Heat Loss due to Air Leakage

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

0.350 x 546.82 x 42 °C x 1.2 = 9699 W

= **33093 Btu/h**

6.2.6 Sensible Gain due to Air Leakage

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

= 0.118 x 546.82 x 7 °C x 1.2 = 549 W

= **1874 Btu/h**

5.2.3.2 Heat Loss due to Mechanical Ventilation

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

155 CFM x 76 °F x 1.08 x 0.25 = **3181 Btu/h**

6.2.7 Sensible heat Gain due to Ventilation

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

155 CFM x 13 °F x 1.08 x 0.25 = **536 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	33,093	12,091	1.368
2	0.3		22,072	0.450
3	0.2		21,038	0.315
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: 5005 - KNIGHTSWOOD OPT 5 BED & ELEVATOR OPT SERV **BUILDER:** GOLD PARK HOMES
SFQT: 4580 **LO#** 85459 **SITE:** PINE VALLEY & TESTON

DESIGN ASSUMPTIONS

HEATING	°F	COOLING	°F
OUTDOOR DESIGN TEMP.	-4	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:	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):	69519.0	ASSUMED (Y/N):	Y
INTERNAL SHADING:	BLINDS/CURTAINS	ASSUMED OCCUPANTS:	6
INTERIOR LIGHTING LOAD (Btu/h/ft^2):	1.27	DC BRUSHLESS MOTOR (Y/N):	Y
FOUNDATION CONFIGURATION	BCIN_1	DEPTH BELOW GRADE:	7.0 ft
LENGTH: 77.0 ft	WIDTH: 42.0 ft	EXPOSED PERIMETER:	238.0 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	29.80
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

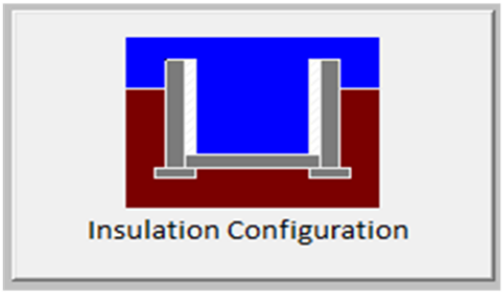


HVAC Designs Ltd.
375 Finley Ave, Suite 202
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905-619-2300

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 sand, loam, clay
Water Table:	Normal (7-10 m, 23-33 ft)

Foundation Dimensions		
Floor Length (m):	**23.5**	 Insulation Configuration
Floor Width (m):	**12.8**	
Exposed Perimeter (m):	**0.0**	
Wall Height (m):	**3.0**	
Depth Below Grade (m):	**2.13**	
Window Area (m^2):	**3.2**	
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):	**2453**	

TYPE: 5005 - KNIGHTSWOOD OPT 5 BED & ELEVATOR OPT SERV STAIR
LO# 85459

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

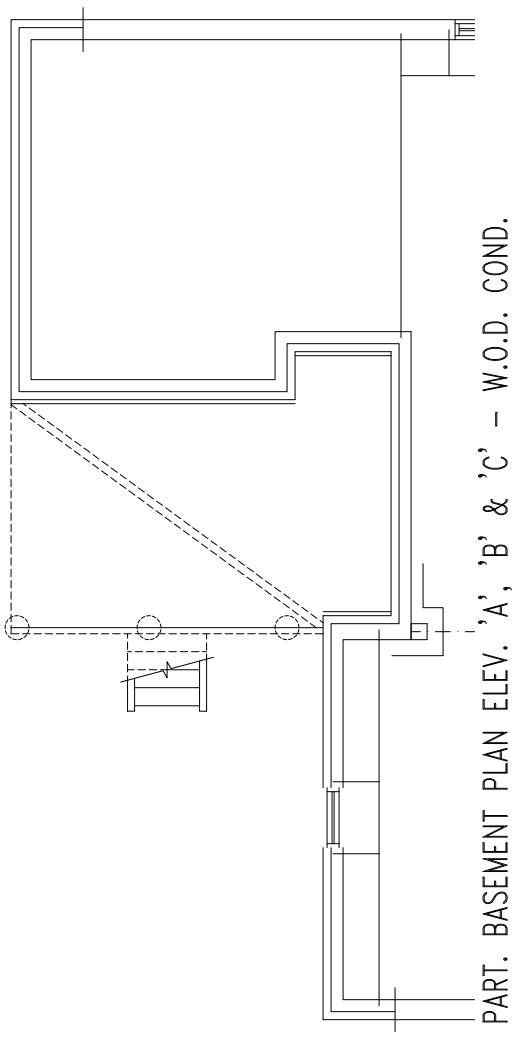
Air Infiltration Residential Load Calculator

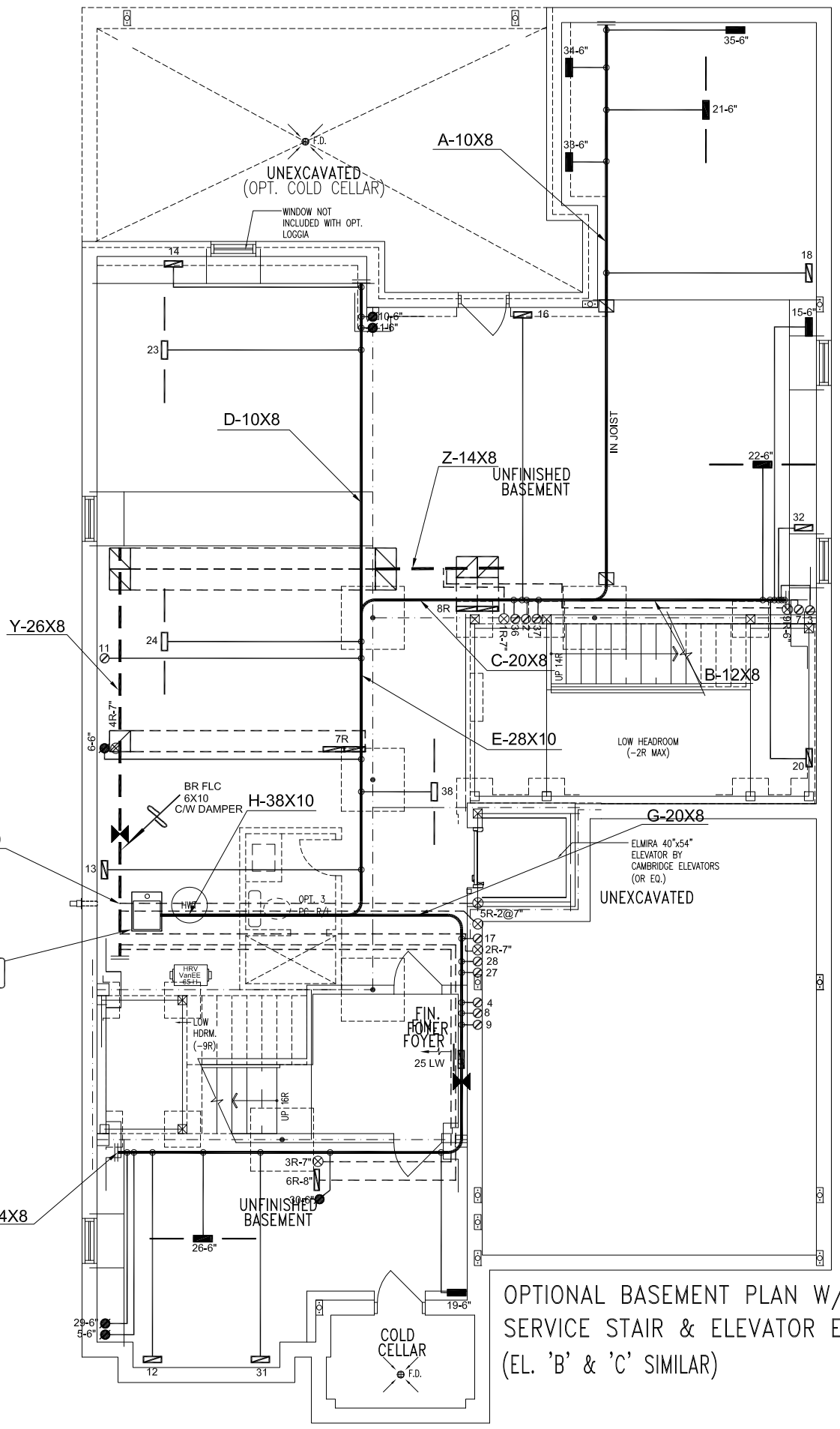
Supplemental tool for CAN/CSA-F280

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):	7.32
Building Configuration	
Type:	Detached
Number of Stories:	Two
Foundation:	Full
House Volume (m^3):	1968.6
Air Leakage/Ventilation	
Air Tightness Type:	Present (1961-) (3.57 ACH)
Custom BDT Data:	ELA @ 10 Pa. 2624.1 cm^2
	3.57 ACH @ 50 Pa
Mechanical Ventilation (L/s):	Total Supply: 73.2 / Total Exhaust: 73.2
Flue Size	
Flue #:	#1 #2 #3 #4
Diameter (mm):	0 0 0 0
Natural Infiltration Rates	
Heating Air Leakage Rate (ACH/H):	**0.350**
Cooling Air Leakage Rate (ACH/H):	**0.118**

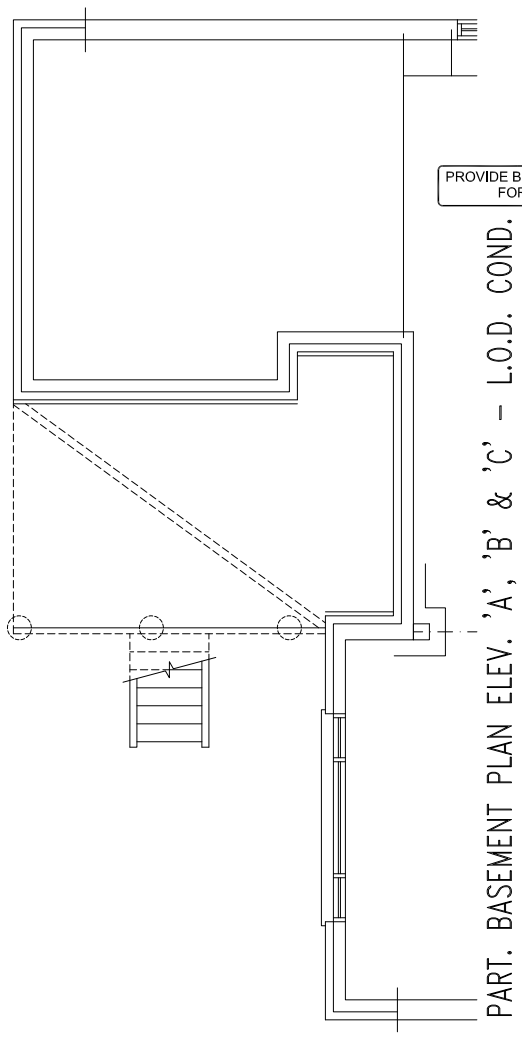
TYPE: 5005 - KNIGHTSWOOD OPT 5 BED & ELEVATOR OPT SERV STAI

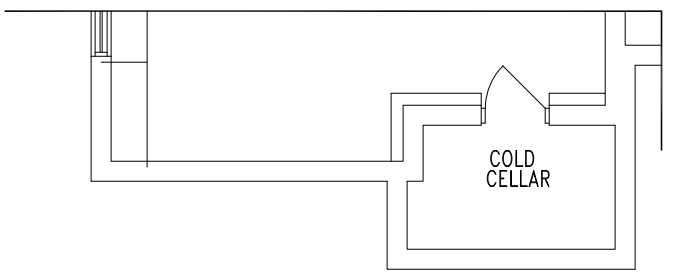
LO# 85459





OPTIONAL BASEMENT PLAN W/ SERVICE STAIR & ELEVATOR EL. 'A' (EL. 'B' & 'C' SIMILAR)





PART. BASEMENT PLAN, EL.'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

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

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Client

GOLDPARK HOMES

Project Name

PINE VALLEY & TESTON
VAUGHAN, ONTARIO

OPT. 5 BED & ELEVATOR
KNIGHTSWOOD OPT SERV STAIR

5005 4580 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 92193 BTU/H	
UNIT DATA	
MAKE	LENNOX
MODEL	EL296UH110XE60C
INPUT	110 MBTU/H
OUTPUT	106 MBTU/H
COOLING	5.0 TONS
FAN SPEED	1955 cfm @ 0.6" w.c.

# OF RUNS	S/A	R/A	FANS
3RD FLOOR			
2ND FLOOR	18	6	7
1ST FLOOR	13	3	3
BASEMENT	7	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

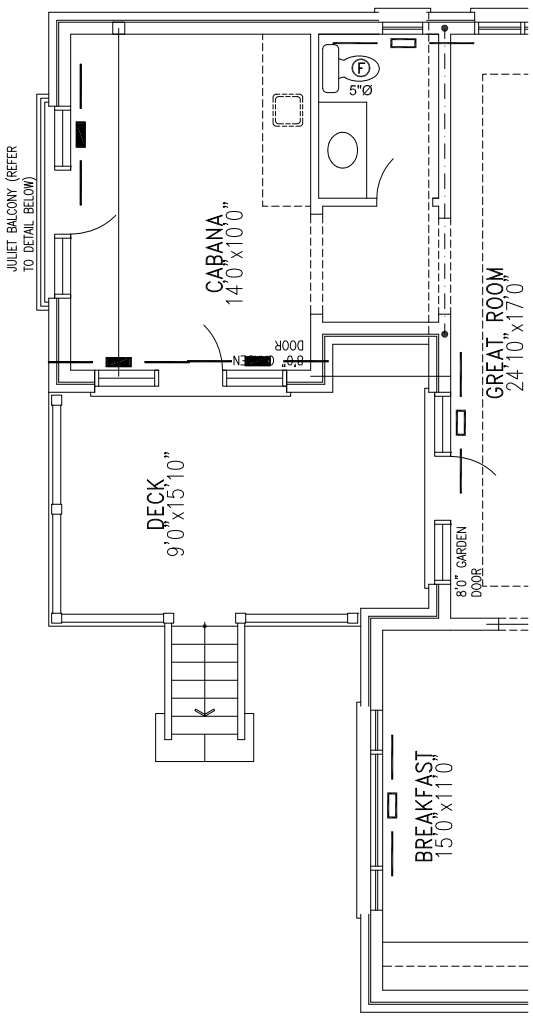
BASEMENT HEATING LAYOUT

Date FEB/2020

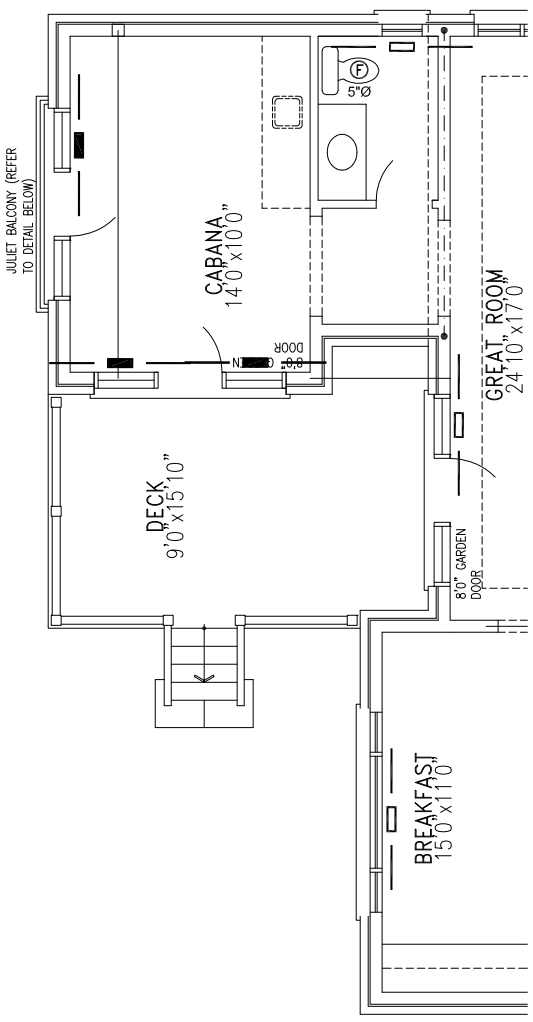
Scale 1/8" = 1'-0"

BCIN# 19669

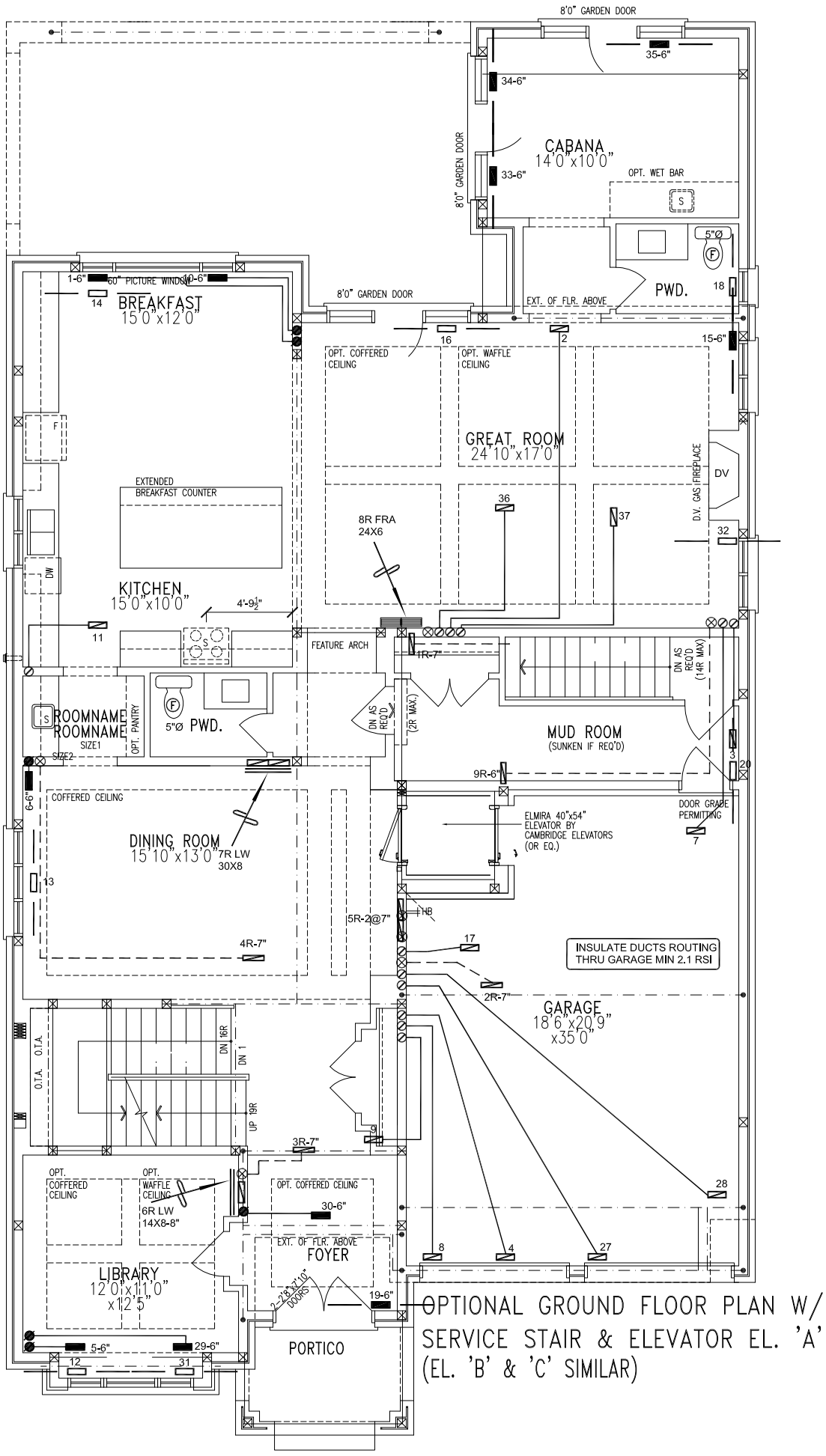
LO# 85459



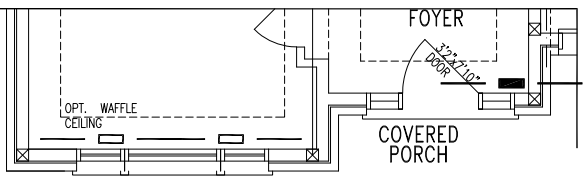
PART. GROUND FLOOR PLAN ELEV. 'A', 'B' & 'C' - L.O.D. COND.



PART. GROUND FLOOR PLAN ELEV. 'A', 'B' & 'C' - W.O.D. COND.



OPTIONAL GROUND FLOOR PLAN W/ SERVICE STAIR & ELEVATOR EL. 'A' (EL. 'B' & 'C' SIMILAR)



PART. GROUND FLOOR PLAN, EL.'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

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
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Client

GOLDPARK HOMES

Project Name

PINE VALLEY & TESTON
VAUGHAN, ONTARIO
OPT. 5 BED & ELEVATOR
KNIGHTSWOOD OPT SERV STAIR
5005 4580 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

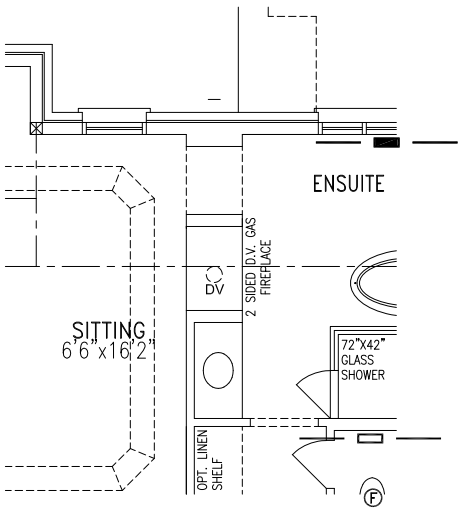
FIRST FLOOR HEATING LAYOUT

Date FEB/2020

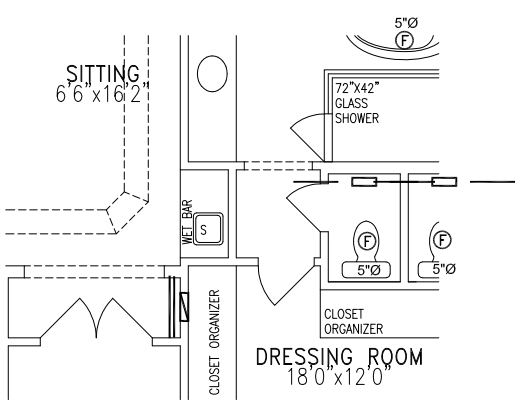
Scale 1/8" = 1'-0"

BCIN# 19669

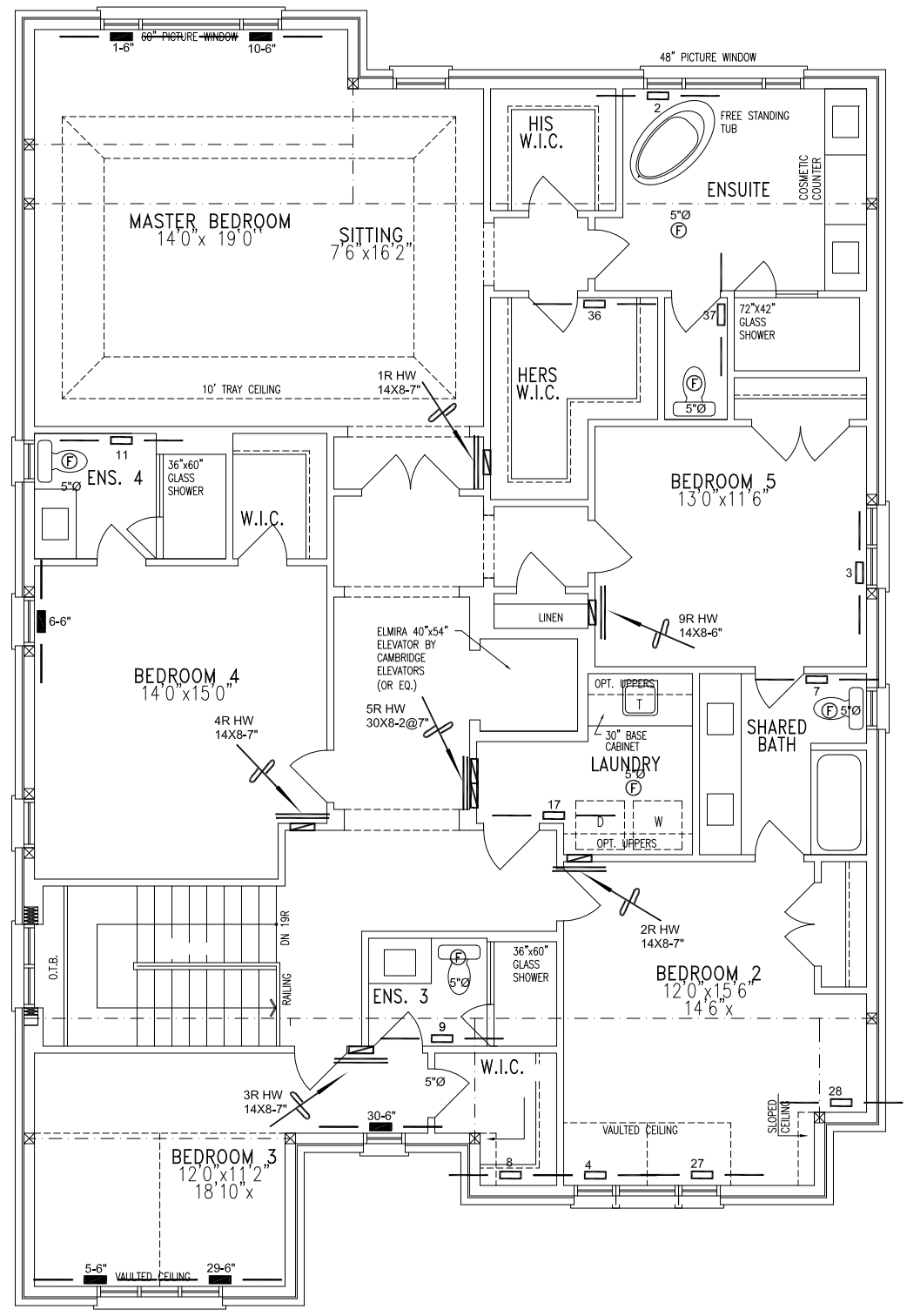
LO# 85459



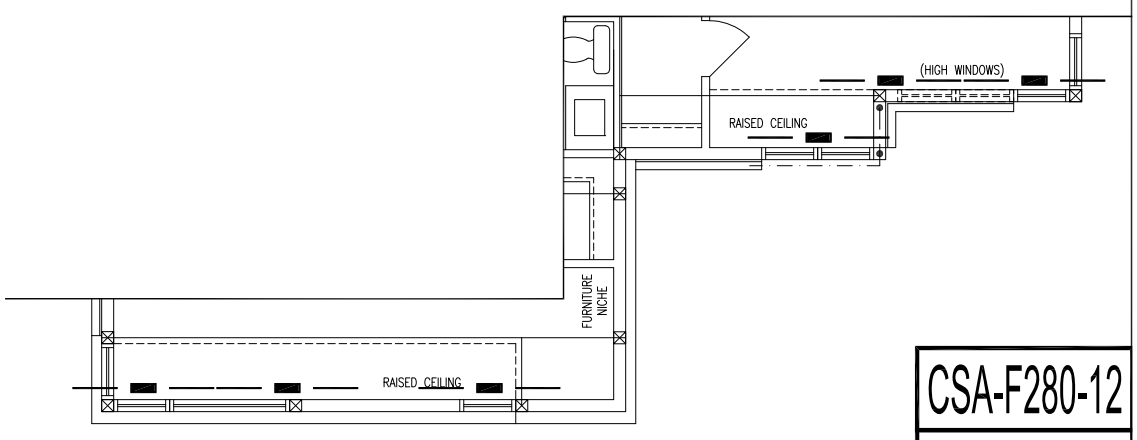
PART. SECOND FLOOR PLAN
OPT. SITTING AREA FIREPLACE



PART. SECOND FLOOR PLAN
OPT. SITTING AREA WET BAR



SECOND FLOOR PLAN, EL.'A'



PART. SECOND FLOOR PLAN, EL.'C'

CSA-F280-12

PACKAGE A1

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.

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.		

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Client

GOLDPARK HOMES

Project Name

PINE VALLEY & TESTON
VAUGHAN, ONTARIO
OPT. 5 BED & ELEVATOR
KNIGHTSWOOD OPT SERV STAIR
5005 4580 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
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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

SECOND FLOOR
HEATING
LAYOUT

Date FEB/2020

Scale 1/8" = 1'-0"

BCIN# 19669

LO# 85459

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**		
VAUGHAN (WOODBRIDGE)				

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:** 5005 - KNIGHTSWOOD OPT 5 BED & ELEVATOR WOB OPT SERV STAIR **Project:** PINE VALLEY & TESTON

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.

February 26, 2020
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.

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

SITE NAME: PINE VALLEY & TESTON | OPT 5 BED & ELEVATOR WOB OPT SERV STAIR | DATE: Feb-20 | WINTER NATURAL AIR CHANGE RATE 0.416 | HEAT LOSS ΔT °F. 76 | CSA-F280-12

BUILDER: GOLD PARK HOMES | TYPE: 5005 - KNIGHTSWOOD | GFA: 4580 | LO# 85460 | SUMMER NATURAL AIR CHANGE RATE 0.139 | HEAT GAIN ΔT °F. 13 | SB-12 PACKAGE A1

ROOM USE			MBR			ENS			WIC			BED-2			BED-3			BED-4			ENS-2			WIC-2			ENS-3			ENS-4			BED-5		
EXP. WALL			45			29			6			34			37			26			6			9			4			7			14		
CLG. HT.			11			10			10			11			11			10			10			10			10			10			10		
	FACTORS																																	
GRS.WALL AREA	LOSS	GAIN	495			290			60			374			407			260			60			90			40			70			140		
GLAZING			LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN
NORTH	21.3	15.4	0	0	0	0	0	0	0	0	0	18	383	278	0	0	0	0	0	0	8	170	124	0	0	0	0	0	0	0	0	0	18	383	278
EAST	21.3	39.9	0	0	0	0	0	0	0	0	0	70	1490	2795	73	1553	2915	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
SOUTH	21.3	24.0	0	0	0	0	0	0	0	0	0	0	0	0	28	596	672	32	681	768	0	0	0	0	0	0	0	0	0	8	170	192	0	0	0
WEST	21.3	39.9	50	1064	1996	34	724	1357	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
SKYLT.	37.2	101.5	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	0	0	0	0	0	0
DOORS	25.2	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	0	0	0	0	0	0
NET EXPOSED WALL	4.5	0.8	445	1986	334	256	1142	192	60	268	45	286	1276	215	306	1366	230	228	1017	171	52	232	39	90	402	68	40	179	30	62	277	47	122	544	92
NET EXPOSED BSMT WALL ABOVE GR	3.6	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	0	0	0	0	0	0	0	0	0
EXPOSED CLG	1.3	0.6	440	565	259	204	262	120	102	131	60	216	277	127	256	329	150	396	508	233	60	77	35	48	62	28	140	180	82	105	135	62	364	467	214
NO ATTIC EXPOSED CLG	2.7	1.3	0	0	0	0	0	0	0	0	0	24	66	30	84	231	106	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	240	612	103	104	265	45	0	0	0	60	153	26	48	122	21	140	357	60	0	0	0	25	64	11
BASEMENT/CRAWL HEAT LOSS				0			0			0			0			0			0			0			0			0			0			0	
SLAB ON GRADE HEAT LOSS				0			0			0			0			0			0			0			0			0			0			0	
SUBTOTAL HT LOSS				3615			2128			399			4104			4340			2207			632			586			715			582			1458	
SUB TOTAL HT GAIN					2589			1670			105			3548			4117			1172			224			116			172			300			594
LEVEL FACTOR / MULTIPLIER			0.20	0.37		0.20	0.37		0.20	0.37		0.20	0.37		0.20	0.37		0.20	0.37		0.20	0.37		0.20	0.37		0.20	0.37		0.20	0.37		0.20	0.37	
AIR CHANGE HEAT LOSS				1351			795			149			1534			1622			825			236			219			267			217			545	
AIR CHANGE HEAT GAIN					213			137			9			292			339			96			18			10			14			25			49
DUCT LOSS				0			0			0			564			596			0			87			80			98			0			200	
DUCT GAIN					0			0			0			474			535			0			24			13			19			0			154
HEAT GAIN PEOPLE	240		2		480	0		0	0		0	1		240	1		240	1		240	0		0	0		0	0		0	0		0	1		240
HEAT GAIN APPLIANCES/LIGHTS					658			0			658			658			658			658			0			0			0			0			658
TOTAL HT LOSS BTU/H				4965			2923			548			6202			6557			3031			955			885			1081			799			2204	
TOTAL HT GAIN x 1.3 BTU/H					5123			2349			1003			6775			7656			2816			346			180			267			422			2204

ROOM USE			LIB			DIN			KIT/GT			CAB			LAUN			PWD			FOY			MUD									WOB			BAS		
EXP. WALL			31			32			77			45			0			5			35			32									52			186		
CLG. HT.			11			11			11			11			10			11			11			12									10			10		
	FACTORS																																				
GRS.WALL AREA	LOSS	GAIN	341			352			847			495			0			55			385			384									520			1302		
GLAZING			LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN								LOSS	GAIN		LOSS	GAIN
NORTH	21.3	15.4	0	0	0	0	0	0	46	979	710	0	0	0	0	0	0	9	192	139	0	0	0	0	0	0							0	0	0	6	128	93
EAST	21.3	39.9	56	1192	2236	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
SOUTH	21.3	24.0	0	0	0	34	724	816	20	426	480	63	1341	1511	0	0	0	0	0	0	0	0	0	0	0	0							46	979	552	6	128	144
WEST	21.3	39.9	0	0	0	0	0	0	105	2234	4192	63	1341	2515	0	0	0	0	0	0	0	0	0	0	0	0							106	2256	2116	0	0	0
SKYLT.	37.2	101.5	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	0	0	0
DOORS	25.2	4.3	0	0	0	0	0	0	10	252	43	0	0	0	0	0	0	0	0	0	62	1565	264	20	505	85							20	505	85	20	505	85
NET EXPOSED WALL	4.5	0.8	285	1272	214	318	1419	239	666	2972	501	369	1647	277	0	0	0	46	205	35	323	1441	243	364	1624	274							348	1553	262	0	0	0
NET EXPOSED BSMT WALL ABOVE GR	3.6	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							0	0	0	558	2008	338
EXPOSED CLG	1.3	0.6	0	0	0	0	0	0	0	0	0	0	0	0	102	131	60	0	0	0	0	0	0	0	0	0							0	0	0	0	0	0
NO ATTIC EXPOSED CLG	2.7	1.3	0	0	0	0	0	0	0	0	0	203	558	255	0	0	0	40	110	50	41	113	52	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	56	143	24	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			0											2977	
SLAB ON GRADE HEAT LOSS				0			0			0			0			0			0			0			0									741				
SUBTOTAL HT LOSS				2464			2143			6864			4886			274			507			3120			2129									6034			5746	
SUB TOTAL HT GAIN					2450			1055			5925			4559			84			224			558			359									3014			660
LEVEL FACTOR / MULTIPLIER			0.30	0.53		0.30	0.53		0.30	0.53		0.30	0.53		0.20	0.37		0.30	0.53		0.30	0.53		0.30	0.53											0.50	1.67	
AIR CHANGE HEAT LOSS				1314			1143			3661			2606			102			270			1664			1136												19656	
AIR CHANGE HEAT GAIN					202			87			487			375			7			18			46			30													302
DUCT LOSS				0			0			0			0			38			0			0			0												0	
DUCT GAIN					0			0			0			0			75			0			0			0													0
HEAT GAIN PEOPLE	240		0		0	0		0	0		0	0		0	0		0	0		0	0		0	0		0							0		0	0		0
HEAT GAIN APPLIANCES/LIGHTS					658			658			658			658			658			0			0			658										0			658
TOTAL HT LOSS BTU/H				3778			3286			10524			7492			414			777			4784			3265									6775			25402	
TOTAL HT GAIN x 1.3 BTU/H					4303			2339			9192			7270			1071			315			785			1360										3919			2106

TOTAL HEAT GAIN BTU/H: 62338 | TONS: 5.19 | LOSS DUE TO VENTILATION LOAD BTU/H: 3181 | STRUCTURAL HEAT LOSS: 96647 | TOTAL COMBINED HEAT LOSS BTU/H: 99827

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: PINE VALLEY & TESTON — OPT 5 BED & ELEVATOR WOB OPT SERV STAIR
BUILDER: GOLD PARK HOMES — TYPE: 5005 - KNIGHTSWOOD — DATE: Feb-20 — GFA: 4580 — LO# 85460

HEATING CFM	1955		COOLING CFM	1955			furnace pressure	0.6																
TOTAL HEAT LOSS	96,647		TOTAL HEAT GAIN	61,803			furnace filter	0.08									^LENNOX			AFUE = 96 %				
AIR FLOW RATE CFM	20.23		AIR FLOW RATE CFM	31.63			a/c coil pressure	0.2									EL296UH110XE60C	110		INPUT (BTU/H) = 110,000				
							available pressure										FAN SPEED			OUTPUT (BTU/H) = **106,000**				
							for s/a & r/a	0.32									LOW	0						
RUN COUNT	4th	3rd	2nd	1st	Bas												MEDLOW	1380		DESIGN CFM = **1955**				
S/A	0	0	18	13	8		plenum pressure s/a	0.17		r/a pressure	0.15						MEDIUM	1505		CFM @ .6 " E.S.P.				
R/A	0	0	6	3	1		max s/a dif press. loss	0.02		r/a grille press. Loss	0.02						MEDIUM HIGH	1685						
All S/A diffusers 4"x10" unless noted otherwise on layout.							min adjusted pressure s/a	0.15		adjusted pressure r/a	0.13						HIGH	1955		TEMPERATURE RISE 50 °F				
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	BED-5	BED-2	BED-3	BED-4	ENS-2	WIC-2	ENS-3	MBR	ENS-4	LIB	DIN	KIT/GT	KIT/GT	KIT/GT	LAUN	PWD	FOY	MUD	BAS	BAS	BAS	BAS
RM LOSS MBH.	2.48	2.26	2.20	2.07	2.19	3.03	0.96	0.88	1.08	2.48	0.80	1.89	3.29	2.63	2.63	2.63	0.41	0.78	4.78	3.27	4.02	4.02	4.02	4.02
CFM PER RUN HEAT	50	46	45	42	44	61	19	18	22	50	16	38	66	53	53	53	8	16	97	66	81	81	81	81
RM GAIN MBH.	2.56	1.87	2.20	2.26	2.55	2.82	0.35	0.18	0.27	2.56	0.42	2.15	2.34	2.30	2.30	2.30	1.07	0.32	0.79	1.36	0.75	0.75	0.75	0.75
CFM PER RUN COOLING	81	59	70	71	81	89	11	6	8	81	13	68	74	73	73	73	34	10	25	43	24	24	24	24
ADJUSTED PRESSURE	0.15	0.16	0.16	0.16	0.15	0.15	0.16	0.16	0.16	0.15	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.15	0.16	0.15	0.15	0.15	0.15
ACTUAL DUCT LGH.	70	70	68	49	75	48	79	48	53	64	59	57	29	52	69	54	36	73	40	65	77	60	69	38
EQUIVALENT LENGTH	200	200	150	160	170	160	150	150	170	170	150	140	103	120	140	110	200	170	210	190	150	120	150	90
TOTAL EFFECTIVE LENGTH	270	270	218	209	245	208	229	198	223	234	209	197	132	172	209	164	236	243	250	255	227	180	219	128
ADJUSTED PRESSURE	0.05	0.06	0.07	0.07	0.06	0.07	0.07	0.08	0.07	0.06	0.07	0.08	0.12	0.09	0.07	0.1	0.07	0.06	0.06	0.06	0.06	0.08	0.07	0.11
ROUND DUCT SIZE	**6**	5	5	5	**6**	**6**	4	4	4	**6**	4	5	5	5	5	5	4	4	**6**	5	**6**	**6**	**6**	5
HEATING VELOCITY (ft/min)	255	338	330	308	224	311	218	207	252	255	184	279	485	389	389	389	92	184	495	485	413	413	413	595
COOLING VELOCITY (ft/min)	413	433	514	521	413	454	126	69	92	413	149	499	543	536	536	536	390	115	127	316	122	122	122	176
OUTLET GRILL SIZE	4X10	3X10	3X10	3X10	4X10	4X10	3X10	3X10	3X10	4X10	3X10	3X10	3X10	3X10	3X10	3X10	3X10	3X10	4X10	3X10	4X10	4X10	4X10	3X10
TRUNK	D	C	B	G	F	E	B	G	G	D	E	F	E	D	B	C	G	A	F	B	A	B	D	E

RUN #	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39
ROOM NAME	BAS	BAS	BED-2	BED-2	BED-3	BED-3	LIB	KIT/GT	CAB	CAB	CAB	WIC	ENS	BAS	BAS
RM LOSS MBH.	4.02	4.02	2.07	2.07	2.19	2.19	1.89	2.63	2.50	2.50	2.50	0.55	0.66	4.02	4.02
CFM PER RUN HEAT	81	81	42	42	44	44	38	53	51	51	51	11	13	81	81
RM GAIN MBH.	0.75	0.75	2.26	2.26	2.55	2.55	2.15	2.30	2.42	2.42	2.42	1.00	0.47	0.75	0.75
CFM PER RUN COOLING	24	24	71	71	81	81	68	73	77	77	77	32	15	24	24
ADJUSTED PRESSURE	0.15	0.15	0.16	0.16	0.15	0.15	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.15	0.15
ACTUAL DUCT LGH.	34	50	52	55	80	63	51	59	69	71	82	56	58	23	58
EQUIVALENT LENGTH	110	150	170	160	170	200	160	120	150	130	140	200	190	140	170
TOTAL EFFECTIVE LENGTH	144	200	222	215	250	263	211	179	219	201	222	256	248	163	228
ADJUSTED PRESSURE	0.1	0.07	0.07	0.07	0.06	0.06	0.07	0.09	0.07	0.08	0.07	0.06	0.06	0.09	0.06
ROUND DUCT SIZE	5	**6**	5	5	**6**	**6**	5	5	**6**	5	**6**	4	4	5	**6**
HEATING VELOCITY (ft/min)	595	413	308	308	224	224	279	389	260	374	260	126	149	595	413
COOLING VELOCITY (ft/min)	176	122	521	521	413	413	499	536	393	565	393	367	172	176	122
OUTLET GRILL SIZE	3X10	4X10	3X10	3X10	4X10	4X10	3X10	3X10	4X10	3X10	4X10	3X10	3X10	3X10	4X10
TRUNK	G	F	G	G	F	F	F	B	A	A	A	C	C	E	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	250	0.06	9	10	x	8	450	TRUNK G	641	0.06	12.8	20	x	8	577
TRUNK B	317	0.06	9.8	12	x	8	476	TRUNK H	1955	0.05	20.3	38	x	10	741
TRUNK C	771	0.06	13.7	22	x	8	631	TRUNK I	0	0.00	0	0	x	8	0
TRUNK D	234	0.05	9.2	10	x	8	421	TRUNK J	0	0.00	0	0	x	8	0
TRUNK E	1310	0.05	17.5	28	x	10	674	TRUNK K	0	0.00	0	0	x	8	0
TRUNK F	386	0.06	10.6	14	x	8	496	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	1515	0.05	18.4	32	x	10	682
TRUNK Y	880	0.05	15	26	x	8	609
TRUNK Z	415	0.05	11.3	14	x	8	534
DROP	1955	0.05	20.3	24	x	18	652

RETURN AIR #	1	2	3	4	5	6	7	8	9							**BR**
	0	0	0	0	2@7"	0	0	0	0	0	0	0	0	0	0	
AIR VOLUME	115	140	115	115	280	185	350	300	85	0	0	0	0	0	0	270
PLENUM PRESSURE	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13
ACTUAL DUCT LGH.	84	51	62	59	47	49	30	51	67	1	1	1	1	1	1	14
EQUIVALENT LENGTH	200	135	185	185	135	140	170	195	220	0	0	0	0	0	0	145
TOTAL EFFECTIVE LH	284	186	247	244	182	189	200	246	287	1	1	1	1	1	1	159
ADJUSTED PRESSURE	0.05	0.07	0.05	0.05	0.07	0.07	0.07	0.05	0.05	13.36	13.36	13.36	13.36	13.36	13.36	0.08
ROUND DUCT SIZE	7	6.9	7	7	9	7.7	9.8	10.1	6.3	0	0	0	0	0	0	8.6
INLET GRILL SIZE	8	8	8	8	8	8	8	8	8	0	0	0	0	0	0	8
	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
INLET GRILL SIZE	14	14	14	14	30	14	30	30	14	0	0	0	0	0	0	30

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: 5005 - KNIGHTSWOOD LO # 85460
SITE NAME: PINE VALLEY & TESTON OPT 5 BED & ELEVATOR WOB OPT SERV STAIR

RESIDENTIAL MECHANICAL VENTILATION DESIGN SUMMARY

COMBUSTION APPLIANCES 9.32.3.1(1)

- a) [✓] Direct vent (sealed combustion) only
- b) [ ] Positive venting induced draft (except fireplaces)
- c) [ ] Natural draft, B-vent or induced draft gas fireplace
- d) [ ] Solid Fuel (including fireplaces)
- e) [ ] No Combustion Appliances

HEATING SYSTEM

[✓] Forced Air [ ] Non Forced Air

[ ] Electric Space Heat

HOUSE TYPE 9.32.1(2)

- [✓] I Type a) or b) appliance only, no solid fuel
- [ ] II Type I except with solid fuel (including fireplaces)
- [ ] III Any Type c) appliance
- [ ] IV Type I, or II with electric space heat
- [ ] Other: Type I, II or IV no forced air

SYSTEM DESIGN OPTIONS O.N.H.W.P.

- [ ] 1 Exhaust only/Forced Air System
- [ ] 2 HRV with Ducting/Forced Air System
- [✓] 3 HRV Simplified/connected to forced air system
- [ ] 4 HRV with Ducting/non forced air system
- [ ] Part 6 Design

TOTAL VENTILATION CAPACITY 9.32.3.3(1)

Basement + Master Bedroom	2	@ 21.2 cfm	42.4	cfm
Other Bedrooms	4	@ 10.6 cfm	42.4	cfm
Kitchen & Bathrooms	7	@ 10.6 cfm	74.2	cfm
Other Rooms	8	@ 10.6 cfm	84.8	cfm
Table 9.32.3.A.		TOTAL	243.8	cfm

PRINCIPAL VENTILATION CAPACITY REQUIRED 9.32.3.4.(1)

1	Bedroom	31.8	cfm
2	Bedroom	47.7	cfm
3	Bedroom	63.6	cfm
4	Bedroom	79.5	cfm
5	Bedroom	95.4	cfm
	TOTAL	**95.4**	**cfm**

SUPPLEMENTAL VENTILATION CAPACITY 9.32.3.5.

Total Ventilation Capacity	243.8	cfm
Less Principal Ventil. Capacity	155	cfm
Required Supplemental Capacity	88.8	cfm

PRINCIPAL EXHAUST FAN CAPACITY

Model: VANEE 65H Location: BSMT

155.0 cfm 3.0 sones [✓] HVI Approved

PRINCIPAL EXHAUST HEAT LOSS CALCULATION

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

SUPPLEMENTAL FANS NUTONE

Location	Model	cfm	HVI	Sones
ENS	QTXEN050C	50	✓	0.3
ENS-2	QTXEN050C	50	✓	0.3
ENS-4	QTXEN050C	50	✓	0.3
PWD	QTXEN050C	50	✓	0.3

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: 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: February-20

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.

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CSA F280-12 Residential Heat Loss and Heat Gain Calculations

Formula Sheet (For Air Leakage / Ventiliation Calculation)

LO#: 85460 Model: 5005 - KNIGHTSWOOD Builder: GOLD PARK HOMES Date: 26/02/2020

Volume Calculation

House Volume

Level	Floor Area (ft²)	Floor Height (ft)	Volume (ft³)
Bsmt	2149	10	21490
First	2149	11	23639
Second	2439	10	24390
Third	0	9	0
Fourth	0	9	0
		Total:	69,519.0 ft³
		Total:	1968.6 m³

Air Change & Delta T Data

WINTER NATURAL AIR CHANGE RATE	0.416
SUMMER NATURAL AIR CHANGE RATE	0.139

Design Temperature Difference

	Tin °C	Tout °C	ΔT °C	ΔT °F
Winter DTDh	22	-20	42	76
Summer DTDc	24	31	7	13

5.2.3.1 Heat Loss due to Air Leakage

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

0.416 x 546.82 x 42 °C x 1.2 = 11522 W

= **39313 Btu/h**

6.2.6 Sensible Gain due to Air Leakage

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

= 0.139 x 546.82 x 7 °C x 1.2 = 651 W

= **2220 Btu/h**

5.2.3.2 Heat Loss due to Mechanical Ventilation

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

155 CFM x 76 °F x 1.08 x 0.25 = **3181 Btu/h**

6.2.7 Sensible heat Gain due to Ventilation

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

155 CFM x 13 °F x 1.08 x 0.25 = **536 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	39,313	11,779	1.669
2	0.3		22,112	0.533
3	0.2		21,038	0.374
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: 5005 - KNIGHTSWOOD OPT 5 BED & ELEVATOR WOB OPT **BUILDER:** GOLD PARK HOMES
SFQT: 4580 **LO#** 85460 **SITE:** PINE VALLEY & TESTON

DESIGN ASSUMPTIONS

HEATING	°F	COOLING	°F
OUTDOOR DESIGN TEMP.	-4	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:	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):	69519.0	ASSUMED (Y/N):	Y
INTERNAL SHADING:	BLINDS/CURTAINS	ASSUMED OCCUPANTS:	6
INTERIOR LIGHTING LOAD (Btu/h/ft^2):	1.27	DC BRUSHLESS MOTOR (Y/N):	Y
FOUNDATION CONFIGURATION	BCIN_1	DEPTH BELOW GRADE:	7.0 ft
LENGTH: 77.0 ft	WIDTH: 42.0 ft	EXPOSED PERIMETER:	186.0 ft
WOB INSULATION CONFIGURATION	SCB_9	WOB EXPOSED PERIMETER	52.0 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	29.80
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

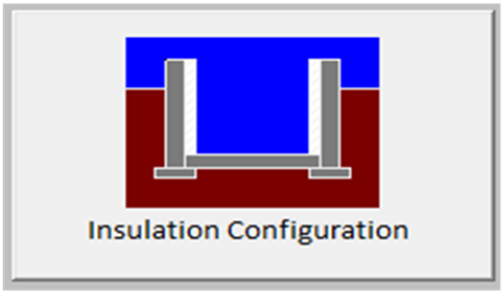
Michael O'Rourke

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 sand, loam, clay
Water Table:	Normal (7-10 m, 23-33 ft)

Foundation Dimensions		
Floor Length (m):	**4.6**	 Insulation Configuration
Floor Width (m):	**12.8**	
Exposed Perimeter (m):	**56.7**	
Wall Height (m):	**3.0**	
Depth Below Grade (m):	**1.84**	
Window Area (m^2):	**1.1**	
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):	**872**	

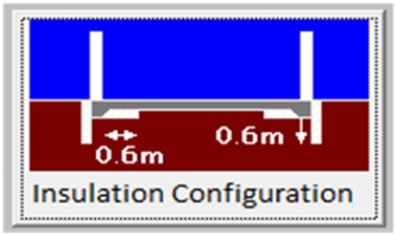
TYPE: 5005 - KNIGHTSWOOD OPT 5 BED & ELEVATOR WOB OPT SERV STAIR
LO# 85460

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 sand, loam, clay
Water Table:	Normal (7-10 m, 23-33 ft)

Foundation Dimensions		
Length (m):	**1.5**	
Width (m):	**12.8**	
Exposed Perimeter (m):	**15.8**	
Radiant Slab		
Heated Fraction of the Slab:	**0**	
Fluid Temperature (°C):	**33**	
Design Months		
Heating Month	**1**	

Results	
Heating Load (Watts):	**217**

TYPE: 5005 - KNIGHTSWOOD OPT 5 BED & ELEVATOR WOB OPT SERV STAIR
LO# 85460

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

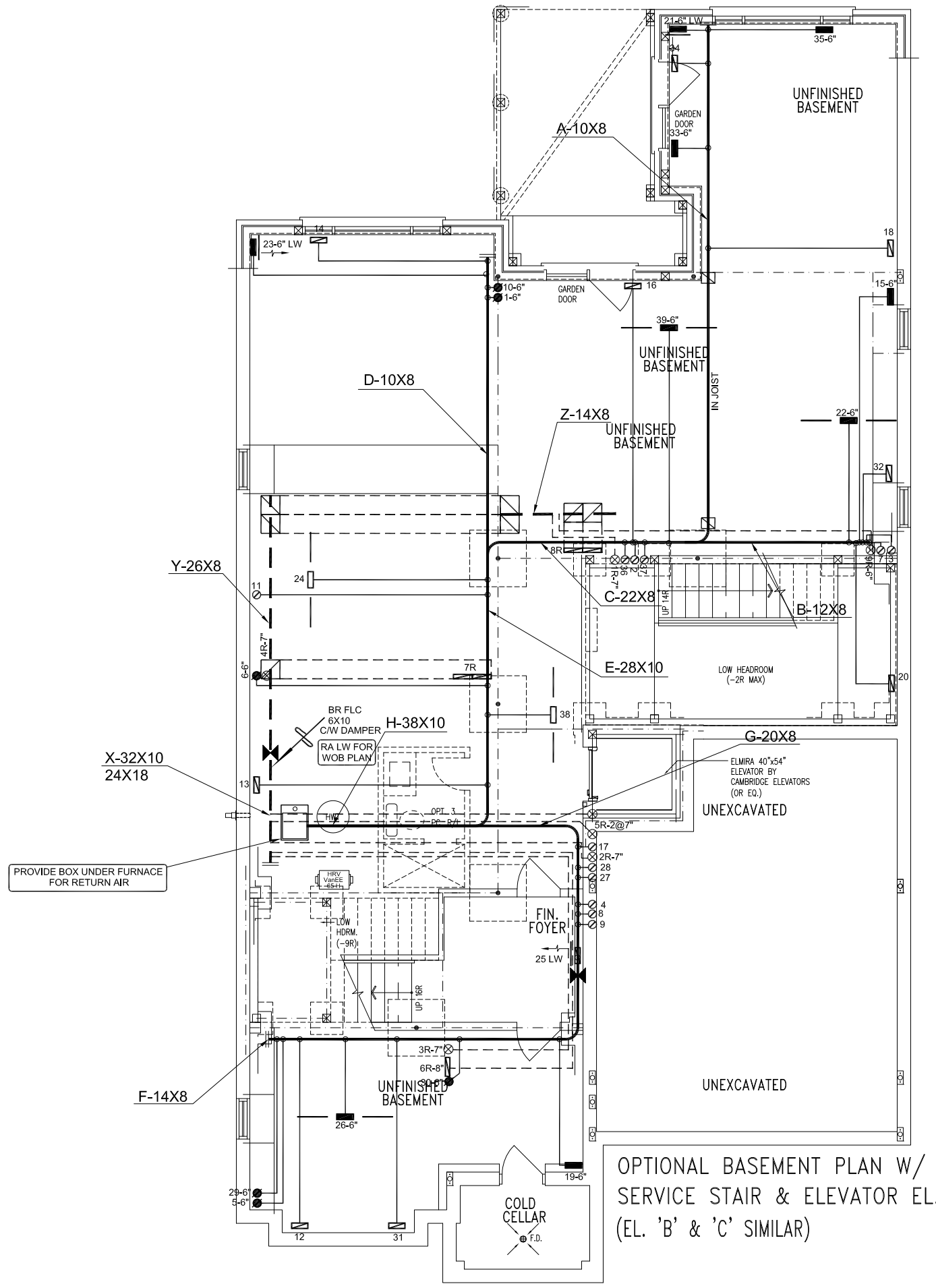
Air Infiltration Residential Load Calculator

Supplemental tool for CAN/CSA-F280

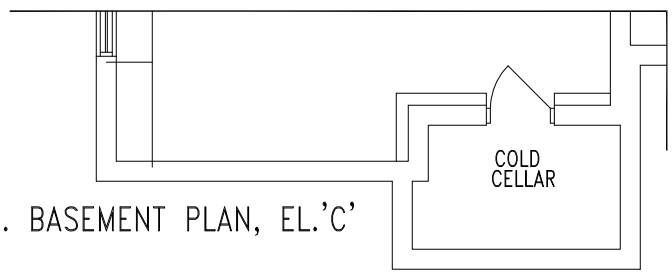
Weather Station Description	
Province:	Ontario
Region:	Vaughan (Woodbridge)
Weather Station Location:	Open flat terrain, grass
Anemometer height (m):	10
Local Shielding	
Building Site:	Suburban, forest
Walls:	Heavy
Flue:	Heavy
Highest Ceiling Height (m):	9.45
Building Configuration	
Type:	Detached
Number of Stories:	Two
Foundation:	Full
House Volume (m^3):	1968.6
Air Leakage/Ventilation	
Air Tightness Type:	Present (1961-) (3.57 ACH)
Custom BDT Data:	ELA @ 10 Pa. 2624.1 cm^2
	3.57 ACH @ 50 Pa
Mechanical Ventilation (L/s):	Total Supply: 73.2 / Total Exhaust: 73.2
Flue Size	
Flue #:	#1 #2 #3 #4
Diameter (mm):	0 0 0 0
Natural Infiltration Rates	
Heating Air Leakage Rate (ACH/H):	**0.416**
Cooling Air Leakage Rate (ACH/H):	**0.139**

TYPE: 5005 - KNIGHTSWOOD OPT 5 BED & ELEVATOR WOB OPT SER\

LO# 85460



OPTIONAL BASEMENT PLAN W/ SERVICE STAIR & ELEVATOR EL. 'A' (EL. 'B' & 'C' SIMILAR)



PART. BASEMENT PLAN, EL.'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

WOB 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.		

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Client

GOLDPARK HOMES

Project Name

PINE VALLEY & TESTON
VAUGHAN, ONTARIO
OPT. 5 BED & ELEVATOR
KNIGHTSWOOD OPT SERV STAIR
5005 WOB 4580 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 98770 BTU/H		
UNIT DATA		
MAKE	LENNOX	
MODEL	EL296UH110XE60C	
INPUT	110	MBTU/H
OUTPUT	106	MBTU/H
COOLING	5.0	TONS
FAN SPEED	1955	cfm @ 0.6" w.c.

# OF RUNS	S/A	R/A	FANS
3RD FLOOR			
2ND FLOOR	18	6	7
1ST FLOOR	13	3	3
BASEMENT	8	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

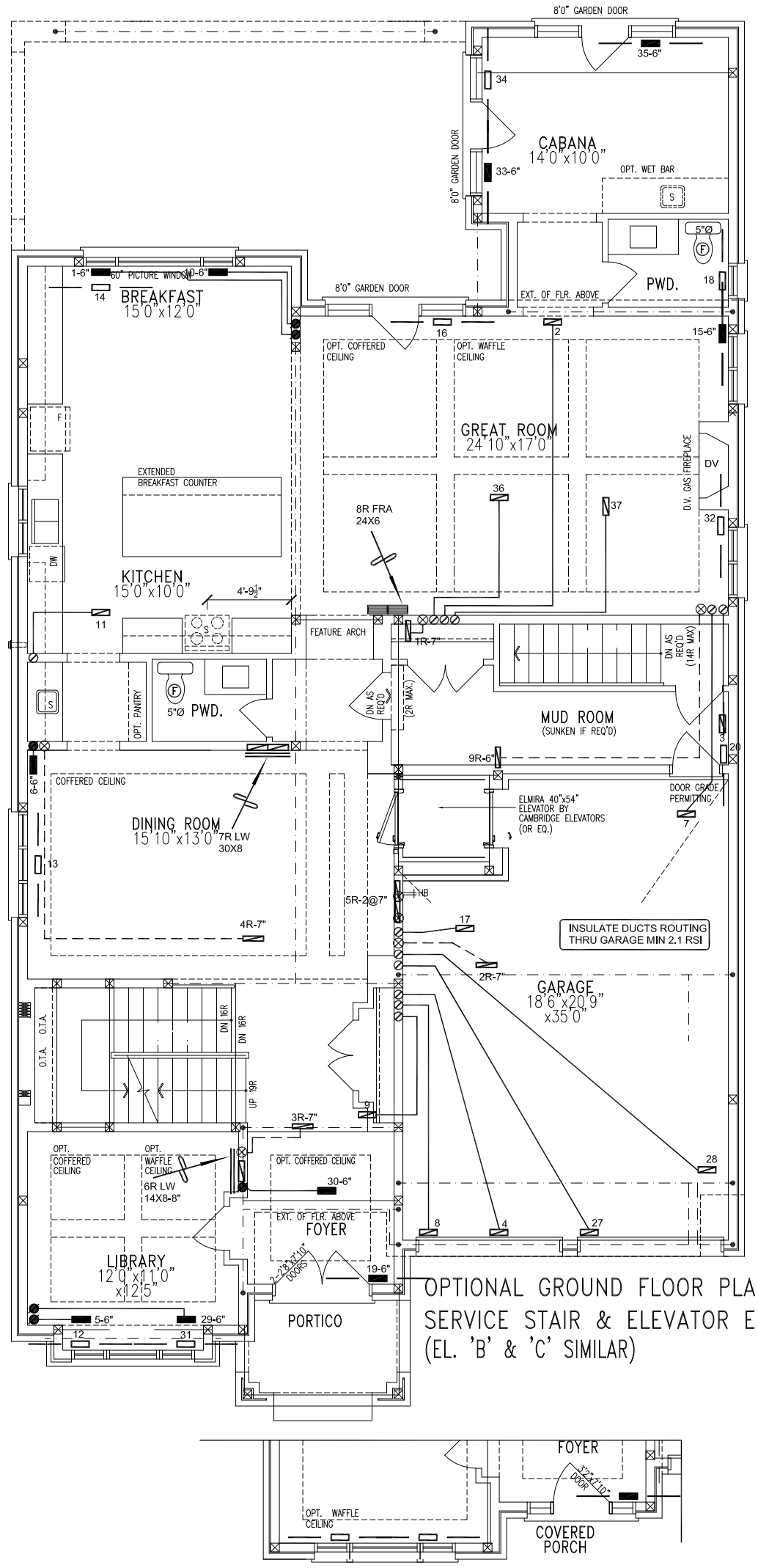
BASEMENT HEATING LAYOUT

Date FEB/2020

Scale 1/8" = 1'-0"

BCIN# 19669

LO# 85460



OPTIONAL GROUND FLOOR PLAN W/ SERVICE STAIR & ELEVATOR EL. 'A' (EL. 'B' & 'C' SIMILAR)

PART. GROUND FLOOR PLAN, EL.'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

WOB | 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.		

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Client
GOLDPARK HOMES

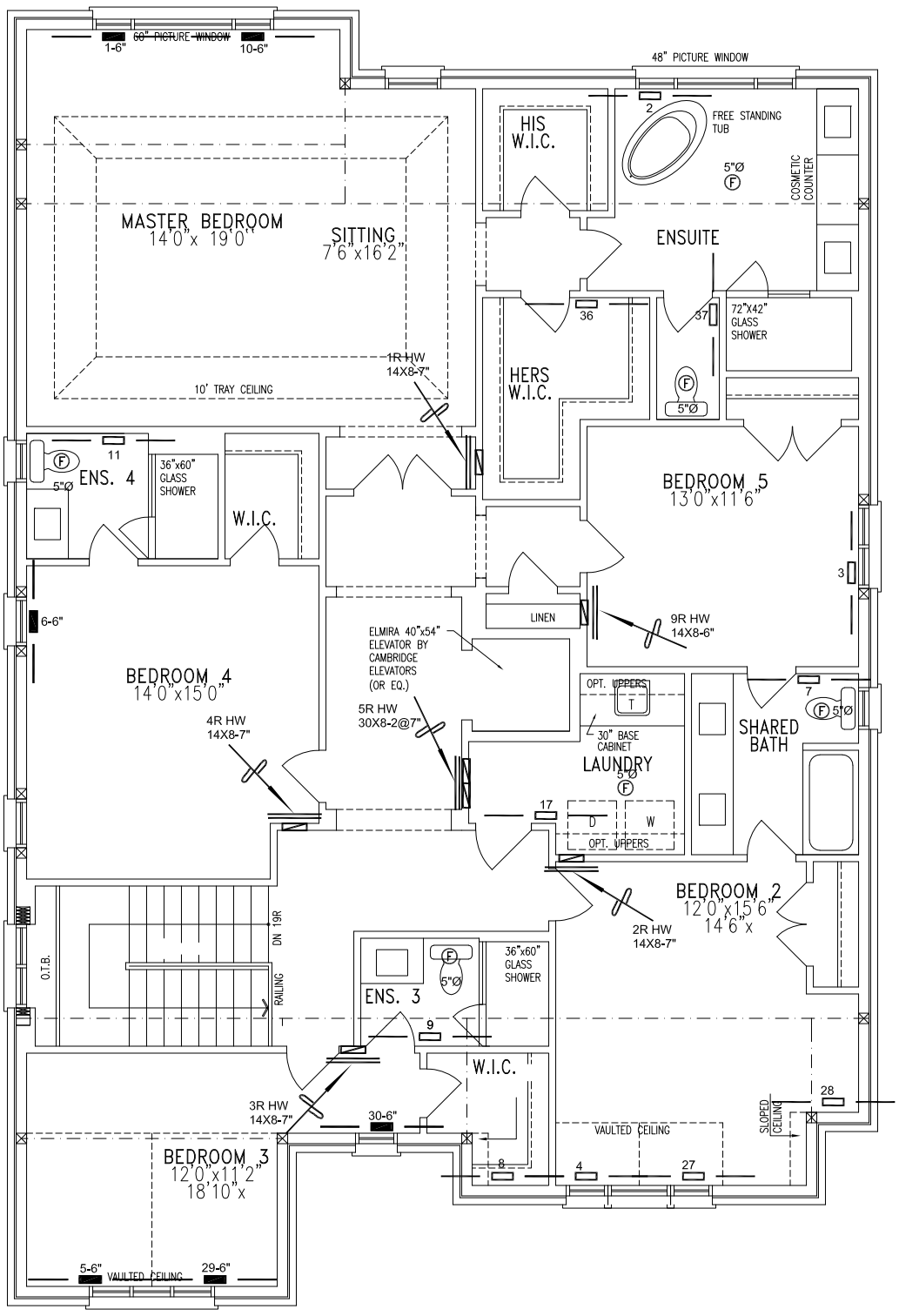
Project Name
PINE VALLEY & TESTON
VAUGHAN, ONTARIO
OPT. 5 BED & ELEVATOR
KNIGHTSWOOD OPT SERV STAIR
5005 WOB 4580 sqft

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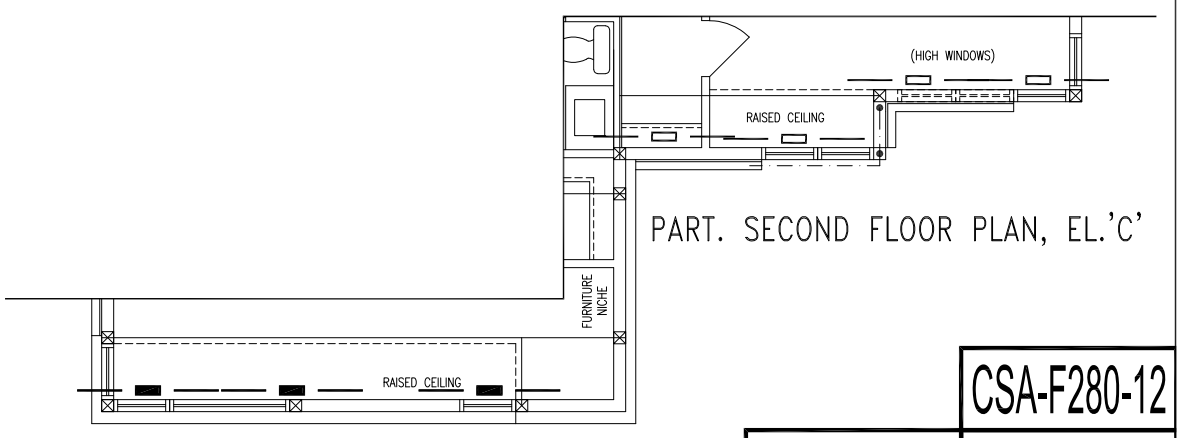
Installation to comply with the latest Ontario Building Code. All supply branch outlets shall be equipped with a manual balancing damper. Ductwork which passes through the garage or unheated spaces shall be adequately insulated and be gas-proofed.

Sheet Title
FIRST FLOOR HEATING LAYOUT

Date FEB/2020
Scale 1/8" = 1'-0"
BCIN# 19669
LO# 85460



OPT. 5 BEDROOM SECOND FLOOR PLAN, EL.'A'



PART. SECOND FLOOR PLAN, EL.'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

WOB | 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.		

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Client

GOLDPARK HOMES

Project Name

PINE VALLEY & TESTON
VAUGHAN, ONTARIO
OPT. 5 BED & ELEVATOR
KNIGHTSWOOD OPT SERV STAIR
5005 WOB 4580 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.

Sheet Title

SECOND FLOOR HEATING LAYOUT

Date FEB/2020

Scale 1/8" = 1'-0"

BCIN# 19669

LO# 85460

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**		
VAUGHAN (WOODBRIDGE)				

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:** 5005 - KNIGHTSWOOD OPT. ELEVATOR OPT SERV STAIR **Project:** PINE VALLEY & TESTON

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.

February 26, 2020
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.

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

SITE NAME: PINE VALLEY & TESTON | OPT. ELEVATOR OPT SERV STAIR | DATE: Feb-20 | WINTER NATURAL AIR CHANGE RATE 0.350 | HEAT LOSS ΔT °F. 76 | CSA-F280-12
BUILDER: GOLD PARK HOMES | TYPE: 5005 - KNIGHTSWOOD | GFA: 4580 | LO# 85457 | SUMMER NATURAL AIR CHANGE RATE 0.118 | HEAT GAIN ΔT °F. 13 | SB-12 PACKAGE A1

ROOM USE			MBR			ENS			WIC			BED-2			BED-3			BED-4			ENS-2			WIC-2			ENS-3			ENS-4		
EXP. WALL			46			36			13			32			50			19			6			9			4			7		
CLG. HT.			11			10			10			11			11			10			10			10			10			10		
	FACTORS																															
GRS.WALL AREA	LOSS	GAIN	506			360			130			352			550			190			60			90			40			70		
GLAZING			LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN	
NORTH	21.3	16.0	0	0	0	0	0	0	6	128	96	18	383	288	0	0	0	0	0	0	8	170	128	0	0	0	0	0	0	0	0	0
EAST	21.3	41.6	0	0	0	0	0	0	0	0	0	70	1490	2909	73	1553	3033	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
SOUTH	21.3	24.9	0	0	0	0	0	0	0	0	0	0	0	0	28	596	697	32	681	797	0	0	0	0	0	0	0	0	0	8	170	199
WEST	21.3	41.6	50	1064	2078	34	724	1413	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
SKYLT.	37.2	101.5	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	0	0	0
DOORS	25.2	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	0	0	0
NET EXPOSED WALL	4.5	0.8	456	2035	343	326	1455	245	124	553	93	264	1178	198	449	2004	337	158	705	119	52	232	39	90	402	68	40	179	30	62	277	47
NET EXPOSED BSMT WALL ABOVE GR	3.6	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	0	0	0	0	0	0
EXPOSED CLG	1.3	0.6	533	684	313	323	415	190	247	317	145	254	326	149	272	349	160	285	366	167	60	77	35	48	62	28	140	180	82	105	135	62
NO ATTIC EXPOSED CLG	2.7	1.3	0	0	0	0	0	0	0	0	0	24	66	30	84	231	106	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	25	64	11	278	709	119	104	265	45	0	0	0	60	153	26	48	122	21	24	61	10	0	0	0
BASEMENT/CRAWL HEAT LOSS				0			0			0			0			0			0			0			0			0			0	
SLAB ON GRADE HEAT LOSS				0			0			0			0			0			0			0			0			0			0	
SUBTOTAL HT LOSS				3783			2593			1062			4152			4998			1752			632			586			419			582	
SUB TOTAL HT GAIN					2734			1848			345			3693			4378			1083			228			116			123			307
LEVEL FACTOR / MULTIPLIER			0.20	0.32		0.20	0.32		0.20	0.32		0.20	0.32		0.20	0.32		0.20	0.32		0.20	0.32		0.20	0.32		0.20	0.32		0.20	0.32	
AIR CHANGE HEAT LOSS				1202			824			337			1319			1588			557			201			186			133			185	
AIR CHANGE HEAT GAIN					202			137			25			273			324			80			17			9			9			23
DUCT LOSS				0			0			140			547			659			0			83			77			55			0	
DUCT GAIN					0			0			108			492			565			0			24			13			13			0
HEAT GAIN PEOPLE	240		2		480	0		0	0		0	1		240	1		240	1		240	0		0	0		0	0		0	0		0
HEAT GAIN APPLIANCES/LIGHTS					713			0			713			713			713			713			0			0			0			0
TOTAL HT LOSS BTU/H				4985			3417			1539			6018			7245			2308			917			849			608			766	
TOTAL HT GAIN x 1.3 BTU/H					5367			2579			1549			7035			8086			2751			350			179			188			429

ROOM USE			LIB			DIN			KIT/GT			CAB			LAUN			PWD			FOY			MUD						LOD			BAS		
EXP. WALL			31			32			77			45			0			5			35			32						70			238		
CLG. HT.			11			11			11			11			10			11			11			12						10			10		
	FACTORS																																		
GRS.WALL AREA	LOSS	GAIN	341			352			847			495			0			55			385			384						700			2086		
GLAZING			LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN					LOSS	GAIN		LOSS	GAIN	
NORTH	21.3	16.0	0	0	0	0	0	0	46	979	735	0	0	0	0	0	0	9	192	144	0	0	0	0	0	0				0	0	0	6	128	96
EAST	21.3	41.6	56	1192	2327	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
SOUTH	21.3	24.9	0	0	0	34	724	847	20	426	498	63	1341	1569	0	0	0	0	0	0	0	0	0	0	0	0				0	0	0	6	128	149
WEST	21.3	41.6	0	0	0	0	0	0	115	2447	4778	63	1341	2618	0	0	0	0	0	0	0	0	0	0	0	0				22	468	914	0	0	0
SKYLT.	37.2	101.5	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	0	0	0
DOORS	25.2	4.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	62	1565	264	20	505	85				0	0	0	20	505	85
NET EXPOSED WALL	4.5	0.8	285	1272	214	318	1419	239	666	2972	501	369	1647	277	0	0	0	46	205	35	323	1441	243	364	1624	274				0	0	0	0	0	0
NET EXPOSED BSMT WALL ABOVE GR	3.6	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				398	1432	241	294	1058	178
EXPOSED CLG	1.3	0.6	0	0	0	0	0	0	0	0	0	0	0	0	102	131	60	0	0	0	0	0	0	0	0	0				0	0	0	0	0	0
NO ATTIC EXPOSED CLG	2.7	1.3	0	0	0	0	0	0	0	0	0	203	558	255	0	0	0	40	110	50	41	113	52	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	56	143	24	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			0								8373		
SLAB ON GRADE HEAT LOSS				0			0			0			0			0			0			0			0						0				
SUBTOTAL HT LOSS				2464			2143			6824			4886			274			507			3120			2129						1900			10191		
SUB TOTAL HT GAIN					2541			1086			6512			4719			84			229			558			359						1155			508
LEVEL FACTOR / MULTIPLIER			0.30	0.45		0.30	0.45		0.30	0.45		0.30	0.45		0.20	0.32		0.30	0.45		0.30	0.45		0.30	0.45								0.50	1.37	
AIR CHANGE HEAT LOSS				1108			964			3069			2198			87			228			1403			958									16546	
AIR CHANGE HEAT GAIN					188			80			481			349			6			17			41			27										123
DUCT LOSS				0			0			0			0			36			0			0			0									0		
DUCT GAIN					0			0			0			0			80			0			0			0										0
HEAT GAIN PEOPLE	240		0		0	0		0	0		0	0		0	0		0	0		0	0		0	0		0				0		0	0		0
HEAT GAIN APPLIANCES/LIGHTS					713			713			713			713			713			0			0			713						0				713
TOTAL HT LOSS BTU/H				3572			3106			9893			7084			397			735			4523			3087						1900			26737		
TOTAL HT GAIN x 1.3 BTU/H					4474			2442			10018			7515			1149			319			779			1428						1502				1748

TOTAL HEAT GAIN BTU/H: 60424 | TONS: 5.04 | LOSS DUE TO VENTILATION LOAD BTU/H: 3181 | STRUCTURAL HEAT LOSS: 89685 | TOTAL COMBINED HEAT LOSS BTU/H: 92866

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: PINE VALLEY & TESTON — OPT. ELEVATOR OPT SERV STAIR
BUILDER: GOLD PARK HOMES — TYPE: 5005 - KNIGHTSWOOD — DATE: Feb-20 — GFA: 4580 — LO# 85457

HEATING CFM	1955		COOLING CFM	1955			furnace pressure	0.6																
TOTAL HEAT LOSS	89,685		TOTAL HEAT GAIN	59,888			furnace filter	0.08																
AIR FLOW RATE CFM	21.8		AIR FLOW RATE CFM	32.64			a/c coil pressure	0.2																
							available pressure																	
							for s/a & r/a	0.32																
							plenum pressure s/a	0.17			r/a pressure	0.15												
							max s/a dif press. loss	0.02			r/a grille press. Loss	0.02												
							min adjusted pressure s/a	0.15			adjusted pressure r/a	0.13												

^LENNOX
EL296UH110XE60C 110

AFUE = 96 %
INPUT (BTU/H) = 110,000
OUTPUT (BTU/H) = **106,000**

FAN SPEED	
LOW	0
MEDLOW	1380
MEDIUM	1505
MEDIUM HIGH	1685
HIGH	1955

DESIGN CFM = **1955** CFM @ .6 " E.S.P.

TEMPERATURE RISE 50 °F

RUN COUNT	4th	3rd	2nd	1st	Bas
S/A	0	0	18	13	7
R/A	0	0	5	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	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	ENS-2	WIC-2	ENS-3	MBR	ENS-4	LIB	DIN	KIT/GT	KIT/GT	KIT/GT	LAUN	PWD	FOY	MUD	BAS	BAS	BAS	BAS
RM LOSS MBH.	2.49	2.74	1.54	2.01	2.41	2.31	0.92	0.85	0.61	2.49	0.77	1.79	3.11	2.47	2.47	2.47	0.40	0.73	4.52	3.09	4.09	4.09	4.09	4.09
CFM PER RUN HEAT	54	60	34	44	53	50	20	19	13	54	17	39	68	54	54	54	9	16	99	67	89	89	89	89
RM GAIN MBH.	2.68	2.26	1.55	2.34	2.70	2.75	0.35	0.18	0.19	2.68	0.43	2.24	2.44	2.50	2.50	2.50	1.15	0.32	0.78	1.43	0.46	0.46	0.46	0.46
CFM PER RUN COOLING	88	74	51	77	88	90	11	6	6	88	14	73	80	82	82	82	37	10	25	47	15	15	15	15
ADJUSTED PRESSURE	0.15	0.16	0.16	0.16	0.15	0.15	0.16	0.16	0.16	0.15	0.16	0.16	0.16	0.15	0.15	0.15	0.16	0.16	0.15	0.16	0.15	0.15	0.15	0.15
ACTUAL DUCT LGH.	70	70	68	49	75	48	79	48	53	64	59	57	29	52	69	54	36	73	40	65	60	60	54	38
EQUIVALENT LENGTH	200	200	150	160	170	160	150	150	170	170	150	140	103	120	140	110	200	170	210	190	150	120	130	90
TOTAL EFFECTIVE LENGTH	270	270	218	209	245	208	229	198	223	234	209	197	132	172	209	164	236	243	250	255	210	180	184	128
ADJUSTED PRESSURE	0.05	0.06	0.07	0.07	0.06	0.07	0.07	0.08	0.07	0.06	0.07	0.08	0.12	0.09	0.07	0.09	0.07	0.06	0.06	0.06	0.07	0.08	0.08	0.11
ROUND DUCT SIZE	**6**	**6**	5	**6**	**6**	**6**	4	4	4	**6**	4	5	5	5	**6**	5	4	4	**6**	5	**6**	**6**	**6**	5
HEATING VELOCITY (ft/min)	275	306	250	224	270	255	229	218	149	275	195	286	499	396	275	396	103	184	505	492	454	454	454	653
COOLING VELOCITY (ft/min)	449	377	374	393	449	459	126	69	69	449	161	536	587	602	418	602	424	115	127	345	76	76	76	110
OUTLET GRILL SIZE	4X10	4X10	3X10	4X10	4X10	4X10	3X10	3X10	3X10	4X10	3X10	3X10	3X10	3X10	4X10	3X10	3X10	3X10	4X10	3X10	4X10	4X10	4X10	3X10
TRUNK	D	C	B	G	F	E	B	G	G	D	E	F	E	D	B	C	G	A	F	B	A	B	D	E

RUN #	25	26	27	28	29	30	31	32	33	34	35	36	37	38
ROOM NAME	BAS	BAS	BED-2	BED-2	BED-3	BED-3	LIB	KIT/GT	CAB	CAB	CAB	ENS	ENS	BAS
RM LOSS MBH.	4.09	4.09	2.01	2.01	2.41	2.41	1.79	2.47	2.36	2.36	2.36	0.34	0.34	4.09
CFM PER RUN HEAT	89	89	44	44	53	53	39	54	51	51	51	7	7	89
RM GAIN MBH.	0.46	0.46	2.34	2.34	2.70	2.70	2.24	2.50	2.51	2.51	2.51	0.16	0.16	0.46
CFM PER RUN COOLING	15	15	77	77	88	88	73	82	82	82	82	5	5	15
ADJUSTED PRESSURE	0.15	0.15	0.16	0.16	0.15	0.15	0.16	0.15	0.15	0.15	0.15	0.16	0.16	0.15
ACTUAL DUCT LGH.	34	50	52	55	80	63	51	59	69	71	82	56	58	23
EQUIVALENT LENGTH	110	150	170	160	170	200	160	120	150	130	140	200	190	140
TOTAL EFFECTIVE LENGTH	144	200	222	215	250	263	211	179	219	201	222	256	248	163
ADJUSTED PRESSURE	0.1	0.07	0.07	0.07	0.06	0.06	0.07	0.08	0.07	0.07	0.07	0.06	0.06	0.09
ROUND DUCT SIZE	5	**6**	**6**	**6**	**6**	**6**	5	5	**6**	**6**	**6**	4	4	**6**
HEATING VELOCITY (ft/min)	653	454	224	224	270	270	286	396	260	260	260	80	80	454
COOLING VELOCITY (ft/min)	110	76	393	393	449	449	536	602	418	418	418	57	57	76
OUTLET GRILL SIZE	3X10	4X10	4X10	4X10	4X10	4X10	3X10	3X10	4X10	4X10	4X10	3X10	3X10	4X10
TRUNK	G	F	G	G	F	F	F	B	A	A	A	C	C	E

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	258	0.06	9.1	10	x	8	464	TRUNK G	687	0.06	13.1	20	x	8	618
TRUNK B	318	0.06	9.8	12	x	8	477	TRUNK H	1955	0.05	20.3	38	x	10	741
TRUNK C	704	0.06	13.2	20	x	8	634	TRUNK I	0	0.00	0	0	x	8	0
TRUNK D	251	0.05	9.4	10	x	8	452	TRUNK J	0	0.00	0	0	x	8	0
TRUNK E	1268	0.05	17.2	28	x	10	652	TRUNK K	0	0.00	0	0	x	8	0
TRUNK F	425	0.06	10.9	14	x	8	546	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	1640	0.05	19	34	x	10	695
TRUNK Y	955	0.05	15.5	28	x	8	614
TRUNK Z	480	0.05	12	16	x	8	540
DROP	1955	0.05	20.3	24	x	18	652

RETURN AIR #	1	2	3	4	5	6	7	8								BR
	0	0	0	0	2@7"	0	0	0	0	0	0	0	0	0	0	
AIR VOLUME	115	140	115	115	240	200	360	365	0	0	0	0	0	0	0	305
PLENUM PRESSURE	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13
ACTUAL DUCT LGH.	84	51	62	59	47	49	30	51	1	1	1	1	1	1	1	14
EQUIVALENT LENGTH	200	135	195	185	135	140	170	195	0	0	0	0	0	0	0	145
TOTAL EFFECTIVE LH	284	186	257	244	182	189	200	246	1	1	1	1	1	1	1	159
ADJUSTED PRESSURE	0.05	0.07	0.05	0.05	0.07	0.07	0.07	0.05	13.36	13.36	13.36	13.36	13.36	13.36	13.36	0.08
ROUND DUCT SIZE	7	6.9	7	7	8.5	7.9	9.9	10.8	0	0	0	0	0	0	0	9
INLET GRILL SIZE	8	8	8	8	8	8	8	8	0	0	0	0	0	0	0	8
	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
INLET GRILL SIZE	14	14	14	14	30	14	30	30	0	0	0	0	0	0	0	30

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Michael O'Rourke — INDIVIDUAL BCIN: 19669 MICHAEL O'ROURKE

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TYPE: 5005 - KNIGHTSWOOD LO # 85457
SITE NAME: PINE VALLEY & TESTON OPT. ELEVATOR OPT SERV STAIR

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	7	@ 10.6 cfm	74.2	cfm
Other Rooms	8	@ 10.6 cfm	84.8	cfm
Table 9.32.3.A.		TOTAL	233.2	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	233.2	cfm
Less Principal Ventil. Capacity	155	cfm
Required Supplemental Capacity	78.2	cfm

PRINCIPAL EXHAUST FAN CAPACITY

Model: VANEE 65H Location: BSMT

155.0 cfm 3.0 sones [✓] HVI Approved

PRINCIPAL EXHAUST HEAT LOSS CALCULATION

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

SUPPLEMENTAL FANS

Location	Model	NUTONE cfm	HVI	Sones
ENS	QTXEN050C	50	✓	0.3
ENS-2	QTXEN050C	50	✓	0.3
ENS-4	QTXEN050C	50	✓	0.3
PWD	QTXEN050C	50	✓	0.3

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: 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: February-20

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#: 85457 Model: 5005 - KNIGHTSWOOD Builder: GOLD PARK HOMES Date: 26/02/2020

Volume Calculation

House Volume

Level	Floor Area (ft²)	Floor Height (ft)	Volume (ft³)
Bsmt	2149	10	21490
First	2149	11	23639
Second	2439	10	24390
Third	0	9	0
Fourth	0	9	0
		Total:	69,519.0 ft³
		Total:	1968.6 m³

Air Change & Delta T Data

WINTER NATURAL AIR CHANGE RATE	0.350
SUMMER NATURAL AIR CHANGE RATE	0.118

Design Temperature Difference

	Tin °C	Tout °C	ΔT °C	ΔT °F
Winter DTDh	22	-20	42	76
Summer DTDc	24	31	7	13

5.2.3.1 Heat Loss due to Air Leakage

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

0.350 x 546.82 x 42 °C x 1.2 = 9699 W

= **33093 Btu/h**

6.2.6 Sensible Gain due to Air Leakage

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

= 0.118 x 546.82 x 7 °C x 1.2 = 549 W

= **1874 Btu/h**

5.2.3.2 Heat Loss due to Mechanical Ventilation

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

155 CFM x 76 °F x 1.08 x 0.25 = **3181 Btu/h**

6.2.7 Sensible heat Gain due to Ventilation

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

155 CFM x 13 °F x 1.08 x 0.25 = **536 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	33,093	12,091	1.368
2	0.3		22,072	0.450
3	0.2		20,832	0.318
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: 5005 - KNIGHTSWOOD OPT. ELEVATOR OPT SERV STAIR **BUILDER:** GOLD PARK HOMES
SFQT: 4580 **LO#** 85457 **SITE:** PINE VALLEY & TESTON

DESIGN ASSUMPTIONS

HEATING	°F	COOLING	°F
OUTDOOR DESIGN TEMP.	-4	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:	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):	69519.0	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:	7.0 ft
LENGTH: 77.0 ft	WIDTH: 42.0 ft	EXPOSED PERIMETER:	238.0 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	29.80
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

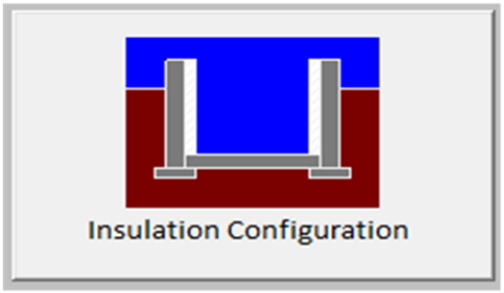


HVAC Designs Ltd.
375 Finley Ave, Suite 202
Ajax ON, L1S 2E2
905-619-2300

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 sand, loam, clay
Water Table:	Normal (7-10 m, 23-33 ft)

Foundation Dimensions		
Floor Length (m):	**23.5**	 Insulation Configuration
Floor Width (m):	**12.8**	
Exposed Perimeter (m):	**0.0**	
Wall Height (m):	**3.0**	
Depth Below Grade (m):	**2.13**	
Window Area (m^2):	**3.2**	
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):	**2453**	

TYPE: 5005 - KNIGHTSWOOD OPT. ELEVATOR OPT SERV STAIR
LO# 85457

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

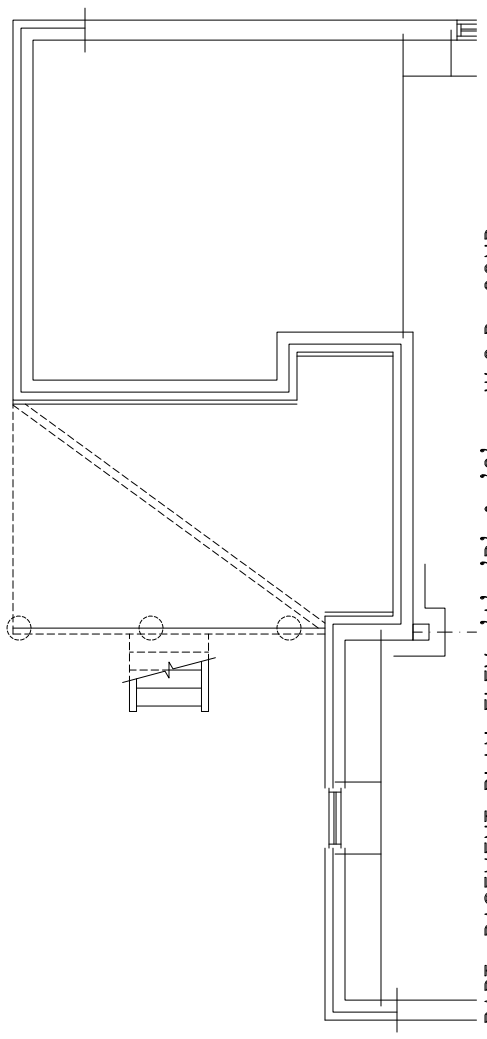
Air Infiltration Residential Load Calculator

Supplemental tool for CAN/CSA-F280

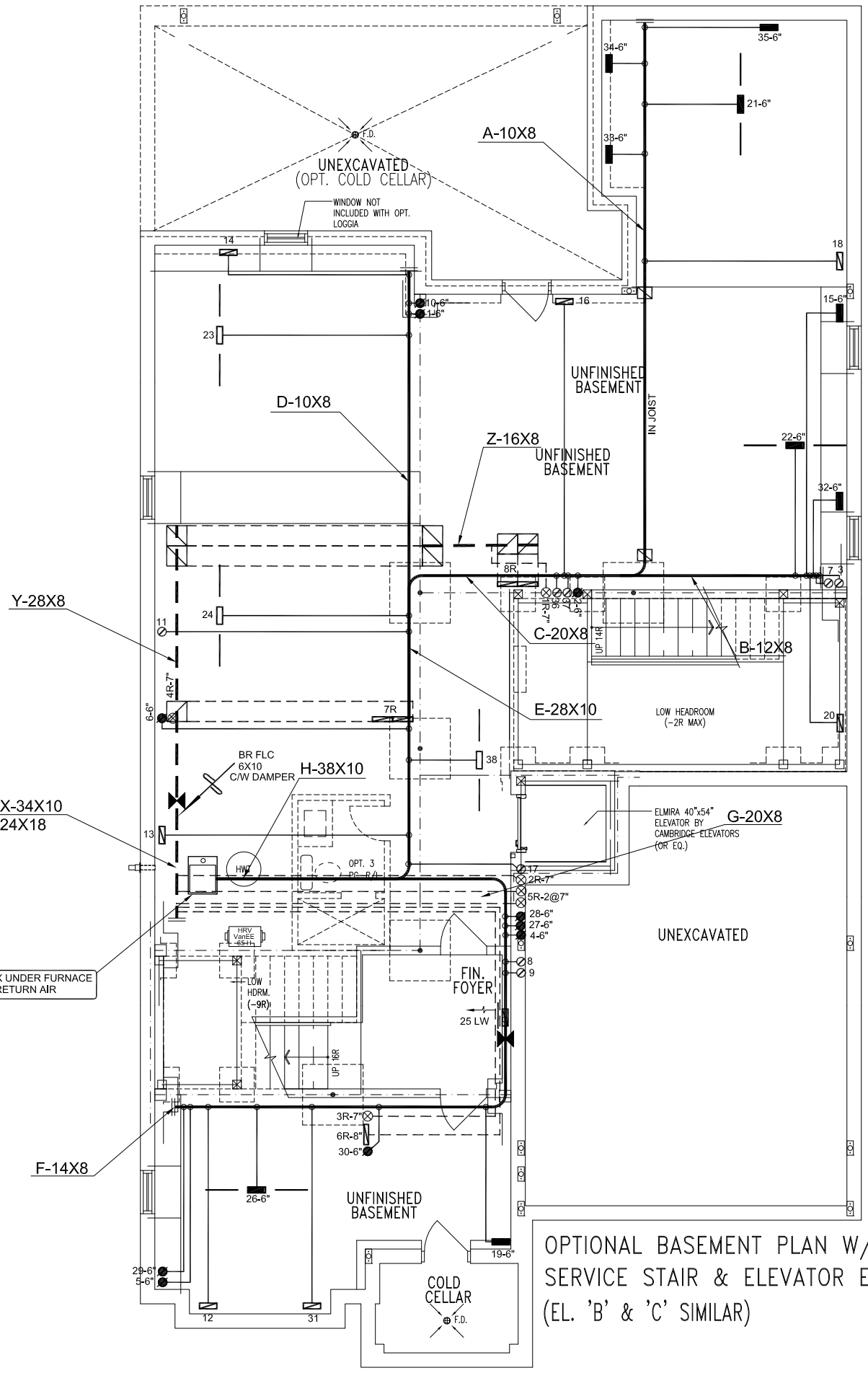
Weather Station Description	
Province:	Ontario
Region:	Vaughan (Woodbridge)
Weather Station Location:	Open flat terrain, grass
Anemometer height (m):	10
Local Shielding	
Building Site:	Suburban, forest
Walls:	Heavy
Flue:	Heavy
Highest Ceiling Height (m):	7.32
Building Configuration	
Type:	Detached
Number of Stories:	Two
Foundation:	Full
House Volume (m^3):	1968.6
Air Leakage/Ventilation	
Air Tightness Type:	Present (1961-) (3.57 ACH)
Custom BDT Data:	ELA @ 10 Pa. 2624.1 cm^2
	3.57 ACH @ 50 Pa
Mechanical Ventilation (L/s):	Total Supply 73.2 / Total Exhaust 73.2
Flue Size	
Flue #:	#1 #2 #3 #4
Diameter (mm):	0 0 0 0
Natural Infiltration Rates	
Heating Air Leakage Rate (ACH/H):	**0.350**
Cooling Air Leakage Rate (ACH/H):	**0.118**

TYPE: 5005 - KNIGHTSWOOD OPT. ELEVATOR OPT SERV STAIR

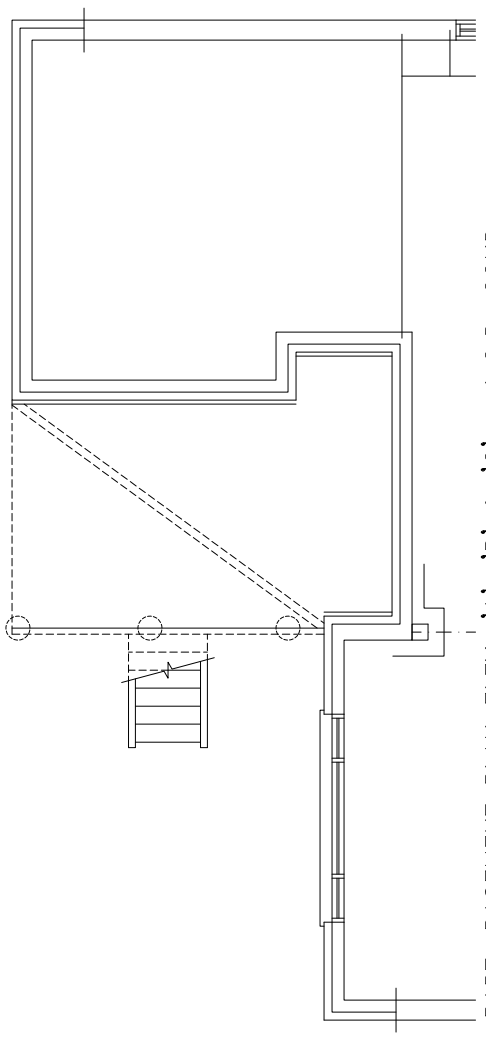
LO# 85457



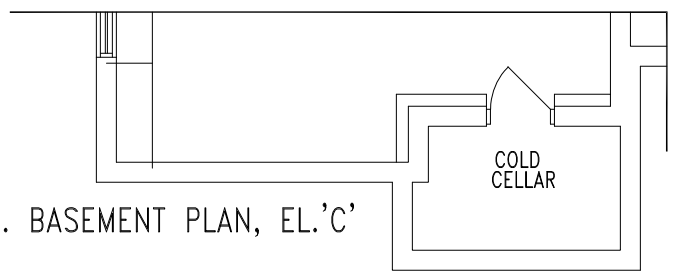
PART. BASEMENT PLAN ELEV. 'A', 'B' & 'C' – W.O.D. COND.



OPTIONAL BASEMENT PLAN W/ SERVICE STAIR & ELEVATOR EL. 'A' (EL. 'B' & 'C' SIMILAR)



PART. BASEMENT PLAN ELEV. 'A', 'B' & 'C' – L.O.D. COND.



PART. BASEMENT PLAN, EL.'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

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.		

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Client
GOLDPARK HOMES

Project Name
PINE VALLEY & TESTON
VAUGHAN, ONTARIO
OPT. ELEVATOR
KNIGHTSWOOD OPT SERV STAIR
5005 4580 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 91992 BTU/H

UNIT DATA

MAKE	LENNOX	
MODEL	EL296UH110XE60C	
INPUT	110	MBTU/H
OUTPUT	106	MBTU/H
COOLING	5.0	TONS
FAN SPEED	1955	cfm @ 0.6" w.c.

# OF RUNS	S/A	R/A	FANS
3RD FLOOR			
2ND FLOOR	18	5	7
1ST FLOOR	13	3	3
BASEMENT	7	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

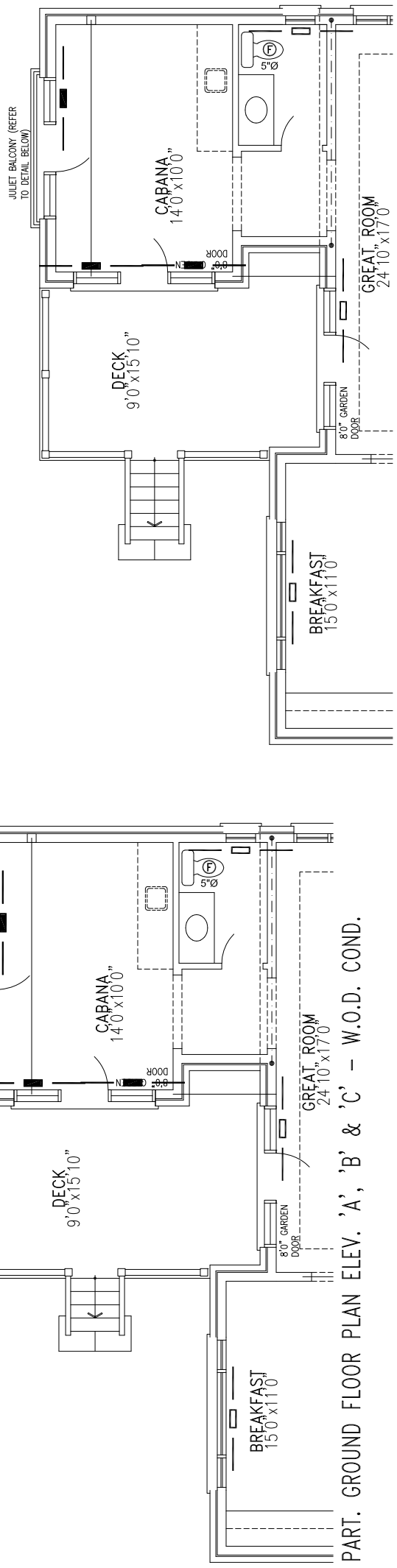
Sheet Title
BASEMENT HEATING LAYOUT

Date FEB/2020

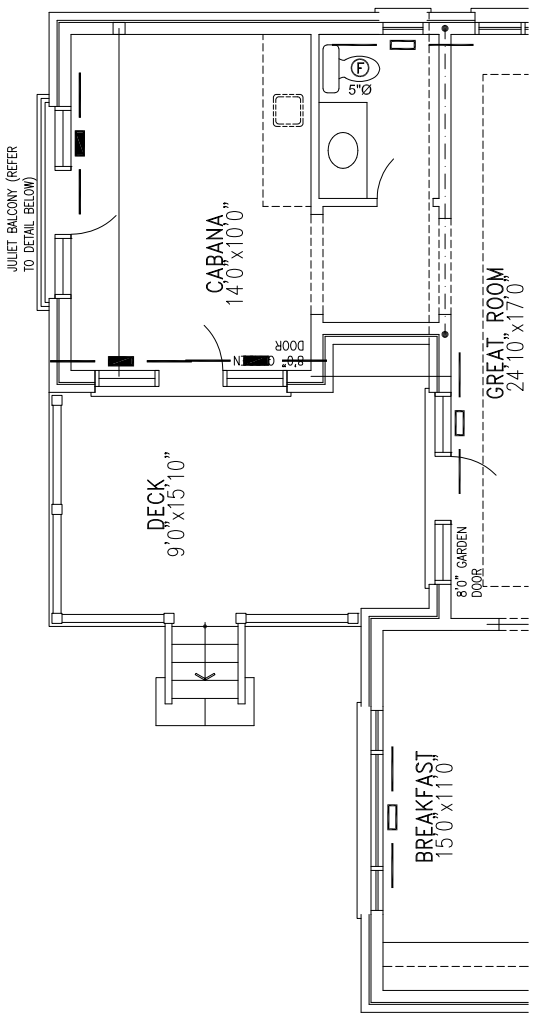
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BCIN# 19669

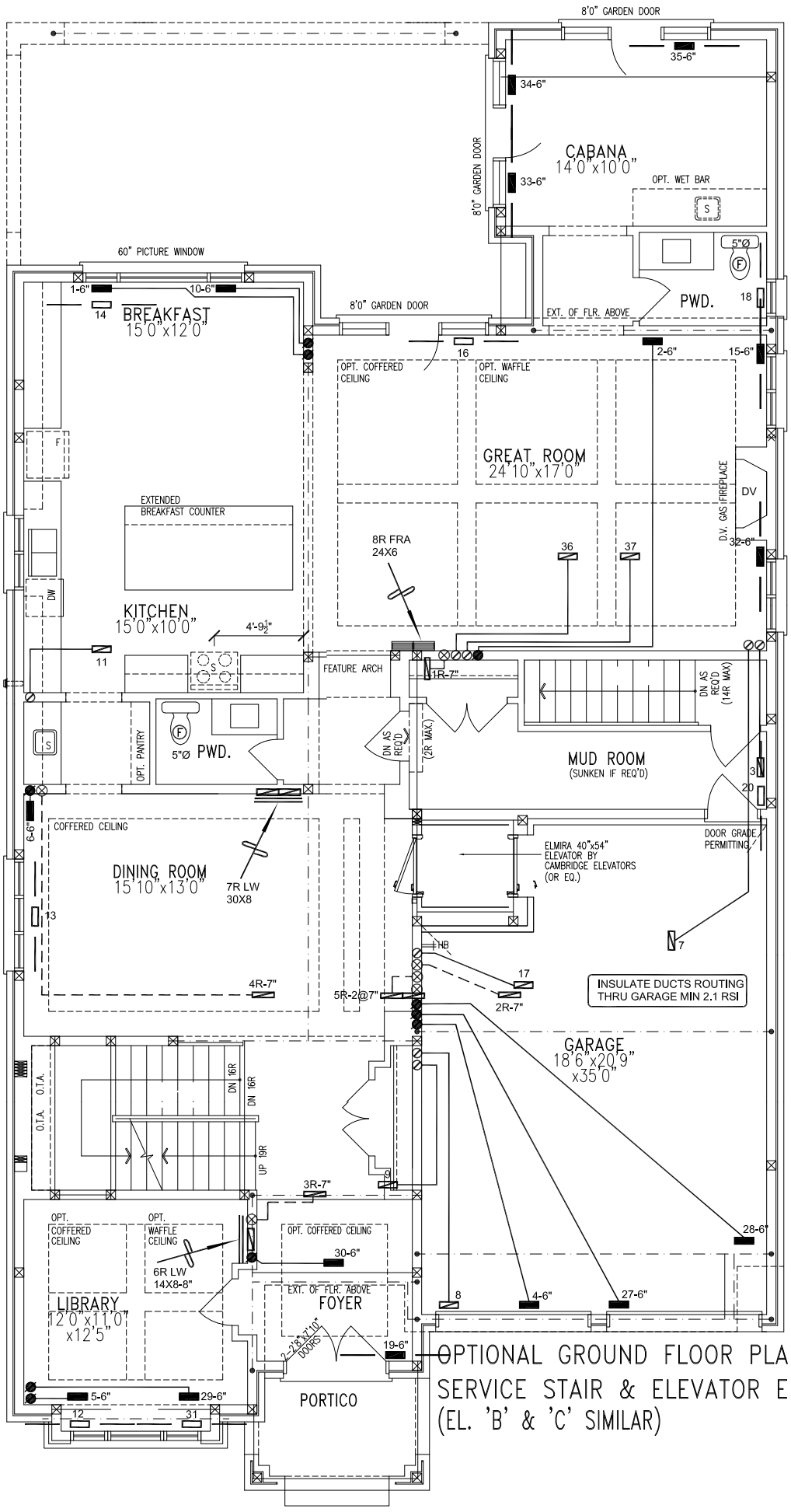
LO# 85457



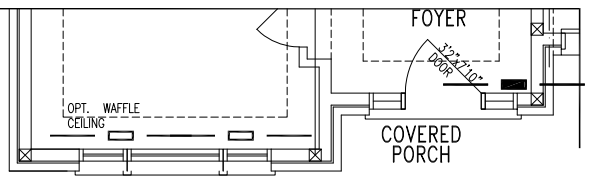
PART. GROUND FLOOR PLAN ELEV. 'A', 'B' & 'C' - L.O.D. COND.



PART. GROUND FLOOR PLAN ELEV. 'A', 'B' & 'C' - W.O.D. COND.



OPTIONAL GROUND FLOOR PLAN W/ SERVICE STAIR & ELEVATOR EL. 'A' (EL. 'B' & 'C' SIMILAR)



PART. GROUND FLOOR PLAN, EL.'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

PACKAGE A1

HVAC LEGEND

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— ▬ —	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
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Client

GOLDPARK HOMES

Project Name

PINE VALLEY & TESTON
VAUGHAN, ONTARIO
OPT. ELEVATOR
KNIGHTSWOOD OPT SERV STAIR
5005 4580 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

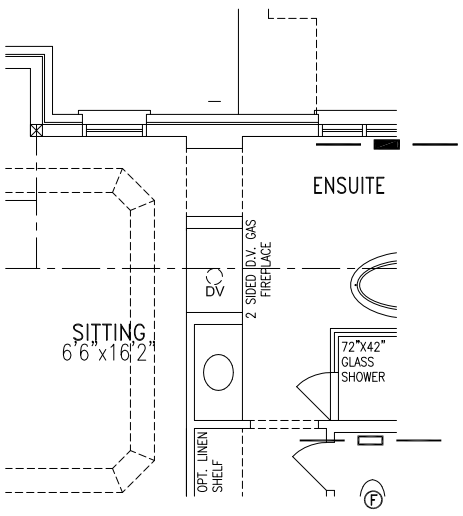
FIRST FLOOR HEATING LAYOUT

Date FEB/2020

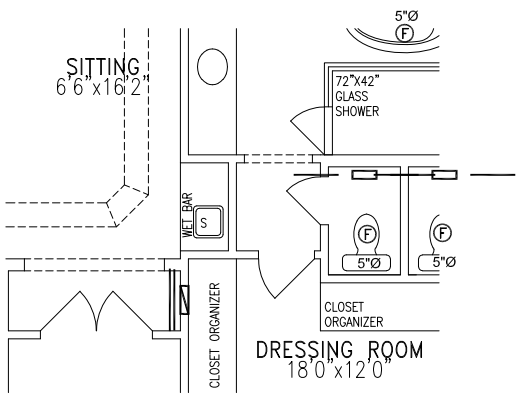
Scale 1/8" = 1'-0"

BCIN# 19669

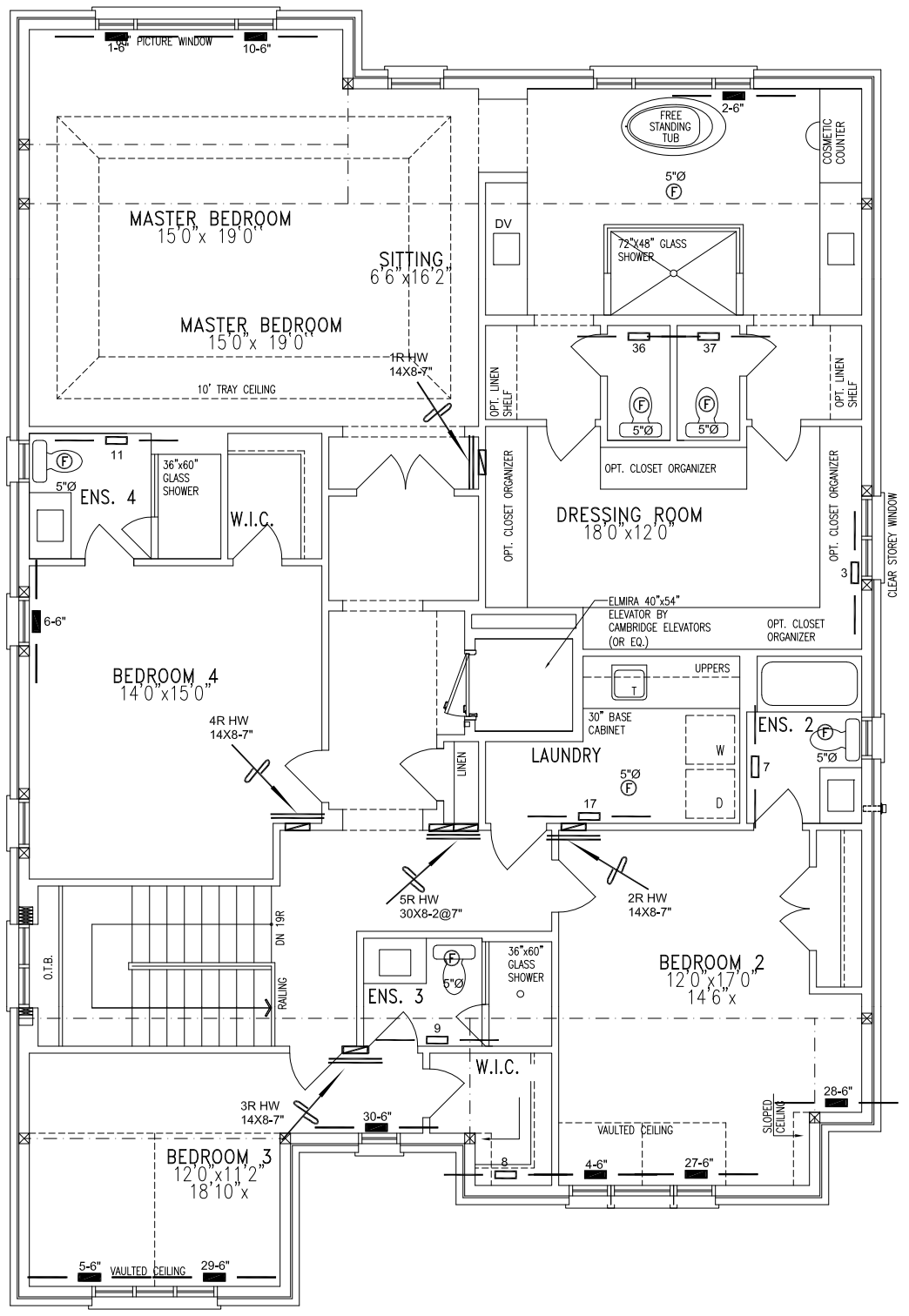
LO# 85457



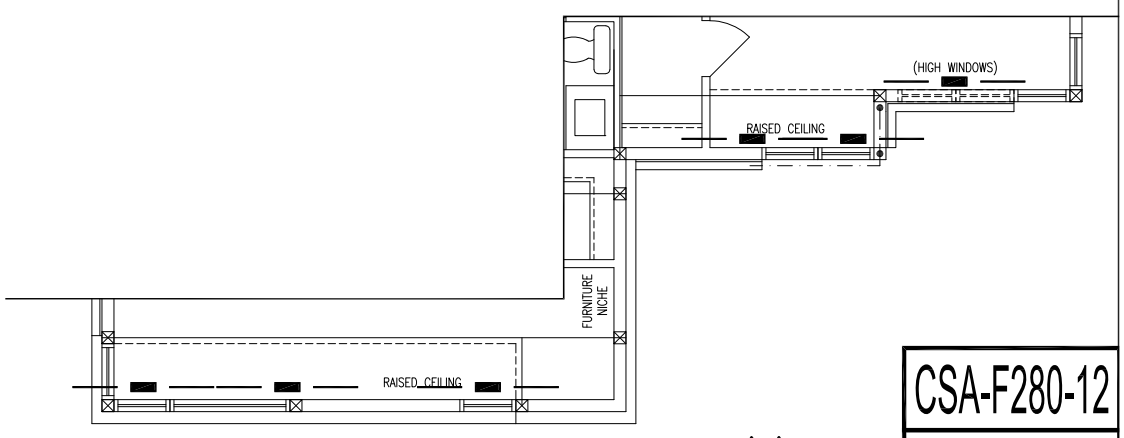
PART. SECOND FLOOR PLAN
OPT. SITTING AREA FIREPLACE



PART. SECOND FLOOR PLAN
OPT. SITTING AREA WET BAR



SECOND FLOOR PLAN, EL.'A'



PART. SECOND FLOOR PLAN, EL.'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

PACKAGE A1

HVAC LEGEND

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	FLOOR SUPPLY AIR GRILLE		6" SUPPLY AIR BOOT ABOVE		14"x8" RETURN AIR GRILLE		RETURN AIR STACK ABOVE
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	SUPPLY AIR BOOT ABOVE		6" SUPPLY AIR STACK 2nd FLOOR		FRA- FLOOR RETURN AIR GRILLE		REDUCER

No.	Description	Date
3.		
2.		
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Client

GOLDPARK HOMES

Project Name

PINE VALLEY & TESTON
VAUGHAN, ONTARIO
OPT. ELEVATOR
KNIGHTSWOOD OPT SERV STAIR
5005 4580 sqft

HVAC DESIGNS LTD.
375 Finley Ave. Suite 202 - Ajax, Ontario
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Email: info@hvacdesigns.ca
Web: www.hvacdesigns.ca
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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

SECOND FLOOR HEATING LAYOUT

Date FEB/2020

Scale 1/8" = 1'-0"

BCIN# 19669

LO# 85457

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**		
VAUGHAN (WOODBRIDGE)				

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:** 5005 - KNIGHTSWOOD OPT. ELEVATOR - WOB **Project:** PINE VALLEY & TESTON

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.

September 11, 2018
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.

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

SITE NAME: PINE VALLEY & TESTON — OPT. ELEVATOR - WOB — DATE: Sep-18 — WINTER NATURAL AIR CHANGE RATE 0.416 — HEAT LOSS ΔT °F. 76 — CSA-F280-12
BUILDER: GOLD PARK HOMES — TYPE: 5005 - KNIGHTSWOOD — GFA: 4483 — LO# 79983 — SUMMER NATURAL AIR CHANGE RATE 0.139 — HEAT GAIN ΔT °F. 13 — SB-12 PACKAGE A1

ROOM USE			MBR			ENS			WIC			BED-2			BED-3			BED-4			ENS-2			WIC-2			ENS-3			ENS-4		
EXP. WALL			46			36			13			32			50			19			6			9			4			7		
CLG. HT.			11			10			10			11			11			10			10			10			10			10		
FACTORS																																
GRS.WALL AREA	LOSS	GAIN	506			360			130			352			550			190			60			90			40			70		
GLAZING				LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN
NORTH	21.3	15.4	0	0	0	0	0	0	6	128	93	18	383	278	0	0	0	0	0	0	8	170	124	0	0	0	0	0	0	0	0	0
EAST	21.3	39.9	0	0	0	0	0	0	0	0	0	70	1490	2795	73	1553	2915	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
SOUTH	21.3	24.0	0	0	0	0	0	0	0	0	0	0	0	0	28	596	672	32	681	768	0	0	0	0	0	0	0	0	0	8	170	192
WEST	21.3	39.9	50	1064	1996	34	724	1357	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
SKYLT.	37.2	101.5	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	0	0	0
DOORS	25.2	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	0	0	0
NET EXPOSED WALL	4.5	0.8	456	2035	343	326	1455	245	124	553	93	264	1178	198	449	2004	337	168	705	119	52	232	39	90	402	68	40	179	30	62	277	47
NET EXPOSED BSMT WALL ABOVE GR	3.6	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	0	0	0	0	0	0
EXPOSED CLG	1.3	0.6	533	684	313	323	415	190	247	317	145	254	326	149	272	349	160	285	366	167	60	77	35	48	62	28	140	180	82	105	135	62
NO ATTIC EXPOSED CLG	2.7	1.3	0	0	0	0	0	0	0	0	0	24	66	30	84	231	106	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	154	393	66	278	709	119	104	265	45	0	0	0	60	153	26	48	122	21	24	61	10	0	0	0
BASEMENT/CRAWL HEAT LOSS				0			0			0			0			0			0			0			0			0			0	
SLAB ON GRADE HEAT LOSS				0			0			0			0			0			0			0			0			0			0	
SUBTOTAL HT LOSS				3783			2593			1391			4152			4998			1752			632			586			419			582	
SUB TOTAL HT GAIN					2652			1792			397			3570			4234			1054			224			116			123			300
LEVEL FACTOR / MULTIPLIER			0.20	0.36		0.20	0.36		0.20	0.36		0.20	0.36		0.20	0.36		0.20	0.36		0.20	0.36		0.20	0.36		0.20	0.36		0.20	0.36	
AIR CHANGE HEAT LOSS				1364			935			502			1497			1803			632			228			211			151			210	
AIR CHANGE HEAT GAIN					214			145			32			288			342			85			18			9			10			24
DUCT LOSS				0			0			189			565			680			0			86			80			57			0	
DUCT GAIN					0			0			112			479			551			0			24			13			13			0
HEAT GAIN PEOPLE	240		2		480	0		0	0		0	1		240	1		240	1		240	0		0	0		0	0		0	0		0
HEAT GAIN APPLIANCES/LIGHTS					692			0			692			692			692			692			0			0			0			0
TOTAL HT LOSS BTU/H				5147			3528			2082			6214			7481			2384			946			877			628			791	
TOTAL HT GAIN x 1.3 BTU/H					5251			2518			1604			6851			7877			2693			346			180			190			422

ROOM USE			LIB			DIN			KIT/GT			CAB			LAUN			PWD			FOY			MUD						WOB			BAS		
EXP. WALL			31			32			87			45			0			5			35			18						52			186		
CLG. HT.			11			11			11			11			10			11			11			12						10			10		
FACTORS																																			
GRS.WALL AREA	LOSS	GAIN	341			352			957			495			0			55			385			216						520			1302		
GLAZING				LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN					LOSS	GAIN		LOSS	GAIN
NORTH	21.3	15.4	0	0	0	0	0	0	46	979	710	0	0	0	0	0	0	9	192	139	0	0	0	0	0	0				0	0	0	6	128	93
EAST	21.3	39.9	56	1192	2236	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
SOUTH	21.3	24.0	0	0	0	34	724	816	20	426	480	63	1341	1511	0	0	0	0	0	0	0	0	0	0	0	0				46	979	552	6	128	144
WEST	21.3	39.9	0	0	0	0	0	0	105	2234	4192	63	1341	2515	0	0	0	0	0	0	0	0	0	0	0	0				106	2256	2116	0	0	0
SKYLT.	37.2	101.5	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	0	0	0
DOORS	25.2	4.3	0	0	0	0	0	0	10	252	43	0	0	0	0	0	0	0	0	0	62	1565	264	20	505	85				20	505	85	20	505	85
NET EXPOSED WALL	4.5	0.8	285	1272	214	318	1419	239	776	3463	583	369	1647	277	0	0	0	46	205	35	323	1441	243	196	875	147				348	1553	262	0	0	0
NET EXPOSED BSMT WALL ABOVE GR	3.6	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				0	0	0	558	2008	338
EXPOSED CLG	1.3	0.6	0	0	0	0	0	0	0	0	0	0	0	0	102	131	60	0	0	0	0	0	0	0	0	0				0	0	0	0	0	0
NO ATTIC EXPOSED CLG	2.7	1.3	0	0	0	0	0	0	0	0	0	203	558	255	0	0	0	40	110	50	41	113	52	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	56	143	24	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			0								2977		
SLAB ON GRADE HEAT LOSS				0			0			0			0			0			0			0			0						741				
SUBTOTAL HT LOSS				2464			2143			7354			4886			274			507			3120			1380						6034			5746		
SUB TOTAL HT GAIN					2450			1055			6008			4559			84			224			558			232						3014			660
LEVEL FACTOR / MULTIPLIER			0.30	0.52		0.30	0.52		0.30	0.52		0.30	0.52		0.20	0.36		0.30	0.52		0.30	0.52		0.30	0.52								0.50	1.62	
AIR CHANGE HEAT LOSS				1291			1123			3853			2560			99			265			1634			723									19080		
AIR CHANGE HEAT GAIN					198			85			485			368			7			18			45			19										297
DUCT LOSS				0			0			0			0			37			0			0			0									0		
DUCT GAIN					0			0			0			0			78			0			0			0										0
HEAT GAIN PEOPLE	240		0		0	0		0	0		0	0		0	0		0	0		0	0		0	0		0				0		0	0		0
HEAT GAIN APPLIANCES/LIGHTS					692			692			692			692			692			0			0			692						0			692
TOTAL HT LOSS BTU/H				3754			3265			11207			7446			410			772			4754			2102						6775			24826		
TOTAL HT GAIN x 1.3 BTU/H					4343			2382			9342			7306			1120			315			784			1227						3919			2144

TOTAL HEAT GAIN BTU/H: 61346 — TONS: 5.11 — LOSS DUE TO VENTILATION LOAD BTU/H: 3181 — STRUCTURAL HEAT LOSS: 95390 — TOTAL COMBINED HEAT LOSS BTU/H: 98570

I REVIEW AND TAKE RESPONSIBILITY FOR THE DESIGN WORK AND AM QUALIFIED IN THE APPROPRIATE CATEGORY AS AN "OTHER DESIGNER" UNDER DIVISION C, 3.2.5 OF THE BUILDING CODE.

Michael O'Rourke

INDIVIDUAL BCIN: 19669 MICHAEL O'ROURKE

HVAC DESIGNS LTD.

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SITE NAME: PINE VALLEY & TESTON
BUILDER: GOLD PARK HOMES

OPT. ELEVATOR - WOB
TYPE: 5005 - KNIGHTSWOOD

DATE: Nov-18

GFA: 4483 LO# 79983

HEATING CFM	1955	COOLING CFM	1955
TOTAL HEAT LOSS	95,390	TOTAL HEAT GAIN	60,810
AIR FLOW RATE CFM	20.49	AIR FLOW RATE CFM	32.15

furnace pressure	0.6
furnace filter	0.08
a/c coil pressure	0.2
available pressure for s/a & r/a	0.32
plenum pressure s/a	0.17
max s/a dif press. loss	0.02
min adjusted pressure s/a	0.15
r/a pressure	0.15
r/a grille press. Loss	0.02
adjusted pressure r/a	0.13

^LENNOX
EL296UH110XE60C 110

FAN SPEED	
LOW	0
MEDLOW	1380
MEDIUM	1505
MEDIUM HIGH	1685
HIGH	1955

AFUE = 96 %
INPUT (BTU/H) = 110,000
OUTPUT (BTU/H) = **106,000**

DESIGN CFM = **1955**
CFM @ .6 " E.S.P.

TEMPERATURE RISE 50 °F

RUN COUNT	4th	3rd	2nd	1st	Bas
S/A	0	0	18	13	8
R/A	0	0	5	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	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	ENS-2	WIC-2	ENS-3	MBR	ENS-4	LIB	DIN	KIT/GT	KIT/GT	KIT/GT	LAUN	PWD	FOY	MUD	BAS	BAS	BAS	BAS
RM LOSS MBH.	2.57	2.78	2.08	2.07	2.49	2.38	0.95	0.88	0.63	2.57	0.79	1.88	3.27	2.80	2.80	2.80	0.41	0.77	4.75	2.10	3.95	3.95	3.95	3.95
CFM PER RUN HEAT	53	57	43	42	51	49	19	18	13	53	16	38	67	57	57	57	8	16	97	43	81	81	81	81
RM GAIN MBH.	2.63	2.24	1.60	2.28	2.63	2.69	0.35	0.18	0.19	2.63	0.42	2.17	2.38	2.34	2.34	2.34	1.12	0.31	0.78	1.23	0.76	0.76	0.76	0.76
CFM PER RUN COOLING	84	72	52	73	84	87	11	6	6	84	14	70	77	75	75	75	36	10	25	39	24	24	24	24
ADJUSTED PRESSURE	0.15	0.16	0.16	0.16	0.15	0.15	0.16	0.16	0.16	0.15	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.15	0.16	0.15	0.15	0.15	0.15
ACTUAL DUCT LGH.	70	70	53	49	75	48	47	48	53	64	59	57	29	52	69	54	36	73	40	47	77	60	69	38
EQUIVALENT LENGTH	200	200	170	160	170	160	160	150	170	170	150	140	103	120	140	110	200	170	210	160	150	120	150	90
TOTAL EFFECTIVE LENGTH	270	270	223	209	245	208	207	198	223	234	209	197	132	172	209	164	236	243	250	207	227	180	219	128
ADJUSTED PRESSURE	0.05	0.06	0.07	0.07	0.06	0.07	0.08	0.08	0.07	0.06	0.07	0.08	0.12	0.09	0.07	0.1	0.07	0.06	0.06	0.08	0.06	0.08	0.07	0.11
ROUND DUCT SIZE	**6**	**6**	5	5	**6**	**6**	4	4	4	**6**	4	5	5	5	5	5	4	4	**6**	4	**6**	5	**6**	5
HEATING VELOCITY (ft/min)	270	291	316	308	260	250	218	207	149	270	184	279	492	419	419	419	92	184	495	493	413	595	413	595
COOLING VELOCITY (ft/min)	428	367	382	536	428	444	126	69	69	428	161	514	565	551	551	551	413	115	127	447	122	176	122	176
OUTLET GRILL SIZE	4X10	4X10	3X10	3X10	4X10	4X10	3X10	3X10	3X10	4X10	3X10	3X10	3X10	3X10	3X10	3X10	3X10	3X10	4X10	3X10	4X10	3X10	4X10	3X10
TRUNK	D	C	C	G	F	E	C	G	G	D	E	F	E	D	B	C	G	A	F	C	A	B	D	E

RUN #	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39
ROOM NAME	BAS	BAS	BED-2	BED-2	BED-3	BED-3	LIB	KIT/GT	CAB	CAB	CAB	ENS	ENS	BAS	BAS
RM LOSS MBH.	3.95	3.95	2.07	2.07	2.49	2.49	1.88	2.80	2.48	2.48	2.48	0.38	0.38	3.95	3.95
CFM PER RUN HEAT	81	81	42	42	51	51	38	57	51	51	51	8	8	81	81
RM GAIN MBH.	0.76	0.76	2.28	2.28	2.63	2.63	2.17	2.34	2.44	2.44	2.44	0.14	0.14	0.76	0.76
CFM PER RUN COOLING	24	24	73	73	84	84	70	75	78	78	78	4	4	24	24
ADJUSTED PRESSURE	0.15	0.15	0.16	0.16	0.15	0.15	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.15	0.15
ACTUAL DUCT LGH.	34	50	52	55	80	63	51	55	69	71	82	56	58	23	58
EQUIVALENT LENGTH	110	150	170	160	170	200	160	120	150	130	140	200	190	140	170
TOTAL EFFECTIVE LENGTH	144	200	222	215	250	263	211	175	219	201	222	256	248	163	228
ADJUSTED PRESSURE	0.1	0.07	0.07	0.07	0.06	0.06	0.07	0.09	0.07	0.08	0.07	0.06	0.06	0.09	0.06
ROUND DUCT SIZE	5	**6**	5	5	**6**	**6**	5	5	**6**	5	**6**	4	4	5	**6**
HEATING VELOCITY (ft/min)	595	413	308	308	260	260	279	419	260	374	260	92	92	595	413
COOLING VELOCITY (ft/min)	176	122	536	536	428	428	514	551	398	573	398	46	46	176	122
OUTLET GRILL SIZE	3X10	4X10	3X10	3X10	4X10	4X10	3X10	3X10	4X10	3X10	4X10	3X10	3X10	3X10	4X10
TRUNK	G	F	G	G	F	F	F	B	A	A	A	C	C	E	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	250	0.06	9	10	x	8	450	TRUNK G	653	0.06	12.8	20	x	8	588
TRUNK B	195	0.07	7.9	8	x	8	439	TRUNK H	1952	0.05	20.3	38	x	10	740
TRUNK C	761	0.06	13.6	22	x	8	623	TRUNK I	0	0.00	0	0	x	8	0
TRUNK D	244	0.05	9.3	10	x	8	439	TRUNK J	0	0.00	0	0	x	8	0
TRUNK E	1299	0.05	17.4	28	x	10	668	TRUNK K	0	0.00	0	0	x	8	0
TRUNK F	407	0.06	10.8	14	x	8	523	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	1640	0.05	19	34	x	10	695
TRUNK Y	955	0.05	15.5	28	x	8	614
TRUNK Z	480	0.05	12	16	x	8	540
DROP	1955	0.05	20.3	24	x	18	652

RETURN AIR #	1	2	3	4	5	6	7	8								BR
	0	0	0	0	2@7"	0	0	0	0	0	0	0	0	0	0	
AIR VOLUME	115	140	115	115	240	200	360	365	0	0	0	0	0	0	0	305
PLENUM PRESSURE	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13
ACTUAL DUCT LGH.	84	51	62	59	47	49	30	51	1	1	1	1	1	1	1	14
EQUIVALENT LENGTH	200	135	185	185	135	140	170	195	0	0	0	0	0	0	0	145
TOTAL EFFECTIVE LH	284	186	247	244	182	189	200	246	1	1	1	1	1	1	1	159
ADJUSTED PRESSURE	0.05	0.07	0.05	0.05	0.07	0.07	0.07	0.05	13.36	13.36	13.36	13.36	13.36	13.36	13.36	0.08
ROUND DUCT SIZE	7	6.9	7	7	8.5	7.9	9.9	10.8	0	0	0	0	0	0	0	9
INLET GRILL SIZE	8	8	8	8	8	8	8	8	0	0	0	0	0	0	0	8
	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
INLET GRILL SIZE	14	14	14	14	30	14	30	30	0	0	0	0	0	0	0	30

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: 5005 - KNIGHTSWOOD LO # 79983
SITE NAME: PINE VALLEY & TESTON OPT. ELEVATOR - WOB

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	7	@ 10.6 cfm	74.2	cfm
Other Rooms	8	@ 10.6 cfm	84.8	cfm
Table 9.32.3.A.		TOTAL	233.2	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	233.2	cfm
Less Principal Ventil. Capacity	155	cfm
Required Supplemental Capacity	78.2	cfm

PRINCIPAL EXHAUST FAN CAPACITY

Model: VANEE 65H Location: BSMT

155.0 cfm 3.0 sones [✓] HVI Approved

PRINCIPAL EXHAUST HEAT LOSS CALCULATION

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

SUPPLEMENTAL FANS NUTONE

Location	Model	cfm	HVI	Sones
ENS	QTXEN050C	50	✓	0.3
ENS-2	QTXEN050C	50	✓	0.3
ENS-4	QTXEN050C	50	✓	0.3
PWD	QTXEN050C	50	✓	0.3

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: 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: September-18

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#: 79983 Model: 5005 - KNIGHTSWOOD Builder: GOLD PARK HOMES Date: 9/11/2018

Volume Calculation

House Volume

Level	Floor Area (ft²)	Floor Height (ft)	Volume (ft³)
Bsmt	2052	10	20520
First	2052	11	22572
Second	2439	10	24390
Third	0	9	0
Fourth	0	9	0
		Total:	67,482.0 ft³
		Total:	1910.9 m³

Air Change & Delta T Data

WINTER NATURAL AIR CHANGE RATE	0.416
SUMMER NATURAL AIR CHANGE RATE	0.139

Design Temperature Difference

	Tin °C	Tout °C	ΔT °C	ΔT °F
Winter DTDh	22	-20	42	76
Summer DTDc	24	31	7	13

5.2.3.1 Heat Loss due to Air Leakage

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

0.416 x 530.80 x 42 °C x 1.2 = 11184 W

= 38161 Btu/h

6.2.6 Sensible Gain due to Air Leakage

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

= 0.139 x 530.80 x 7 °C x 1.2 = 632 W

= 2155 Btu/h

5.2.3.2 Heat Loss due to Mechanical Ventilation

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

155 CFM x 76 °F x 1.08 x 0.25 = 3181 Btu/h

6.2.7 Sensible heat Gain due to Ventilation

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

155 CFM x 13 °F x 1.08 x 0.25 = 536 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	38,161	11,779	1.620
2	0.3		21,853	0.524
3	0.2		21,161	0.361
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.
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

HEAT LOSS AND GAIN SUMMARY SHEET

MODEL: 5005 - KNIGHTSWOOD OPT. ELEVATOR - WOB **BUILDER:** GOLD PARK HOMES
SFQT: 4483 **LO#** 79983 **SITE:** PINE VALLEY & TESTON

DESIGN ASSUMPTIONS

HEATING	°F	COOLING	°F
OUTDOOR DESIGN TEMP.	-4	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:	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):	67482.0	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:	7.0 ft
LENGTH: 77.0 ft	WIDTH: 42.0 ft	EXPOSED PERIMETER:	186.0 ft
WOB INSULATION CONFIGURATION	SCB_9	WOB EXPOSED PERIMETER	52.0 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	29.80
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

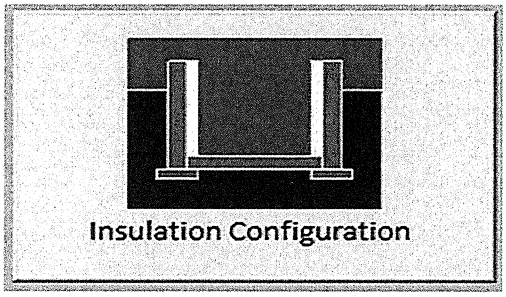
Michael O'Rourke

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 sand, loam, clay
Water Table:	Normal (7-10 m, 23-33 ft)

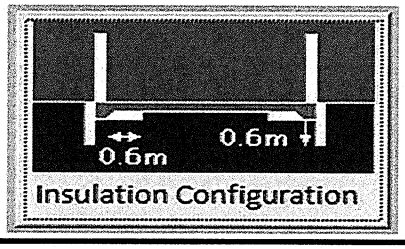
Foundation Dimensions		
Floor Length (m):	**4.6**	 Insulation Configuration
Floor Width (m):	**12.8**	
Exposed Perimeter (m):	**56.7**	
Wall Height (m):	**3.0**	
Depth Below Grade (m):	**1.84**	
Window Area (m^2):	**1.1**	
Door Area (m^2):	**1.9**	
Radiant Slab		
Heated Fraction of the Slab:	**0**	
Fluid Temperature (°C):	**33**	
Design Months		
Heating Month	**1**	
Foundation Loads		
Heating Load (Watts):		**872**

TYPE: 5005 - KNIGHTSWOOD OPT. ELEVATOR - WOB
LO# 79983

HVAC Designs Ltd.
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Ajax ON, L1S 2E2
905-619-2300

Residential Foundation Thermal Load Calculator

Supplemental tool for CAN/CSA-F280

Weather Station Description		
Province:	Ontario	
Region:	Vaughan (Woodbridge)	
Site Description		
Soil Conductivity:	Normal conductivity: dry sand, loam, clay	
Water Table:	Normal (7-10 m, 23-33 ft)	
Foundation Dimensions		
Length (m):	1.5	
Width (m):	12.8	
Exposed Perimeter (m):	15.8	
Radiant Slab		
Heated Fraction of the Slab:	0	
Fluid Temperature (°C):	33	
Design Months		
Heating Month	1	
Results		
Heating Load (Watts):	**217**	

TYPE: 5005 - KNIGHTSWOOD OPT. ELEVATOR - WOB
LO# 79983

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Ajax ON, L1S 2E2
905-619-2300

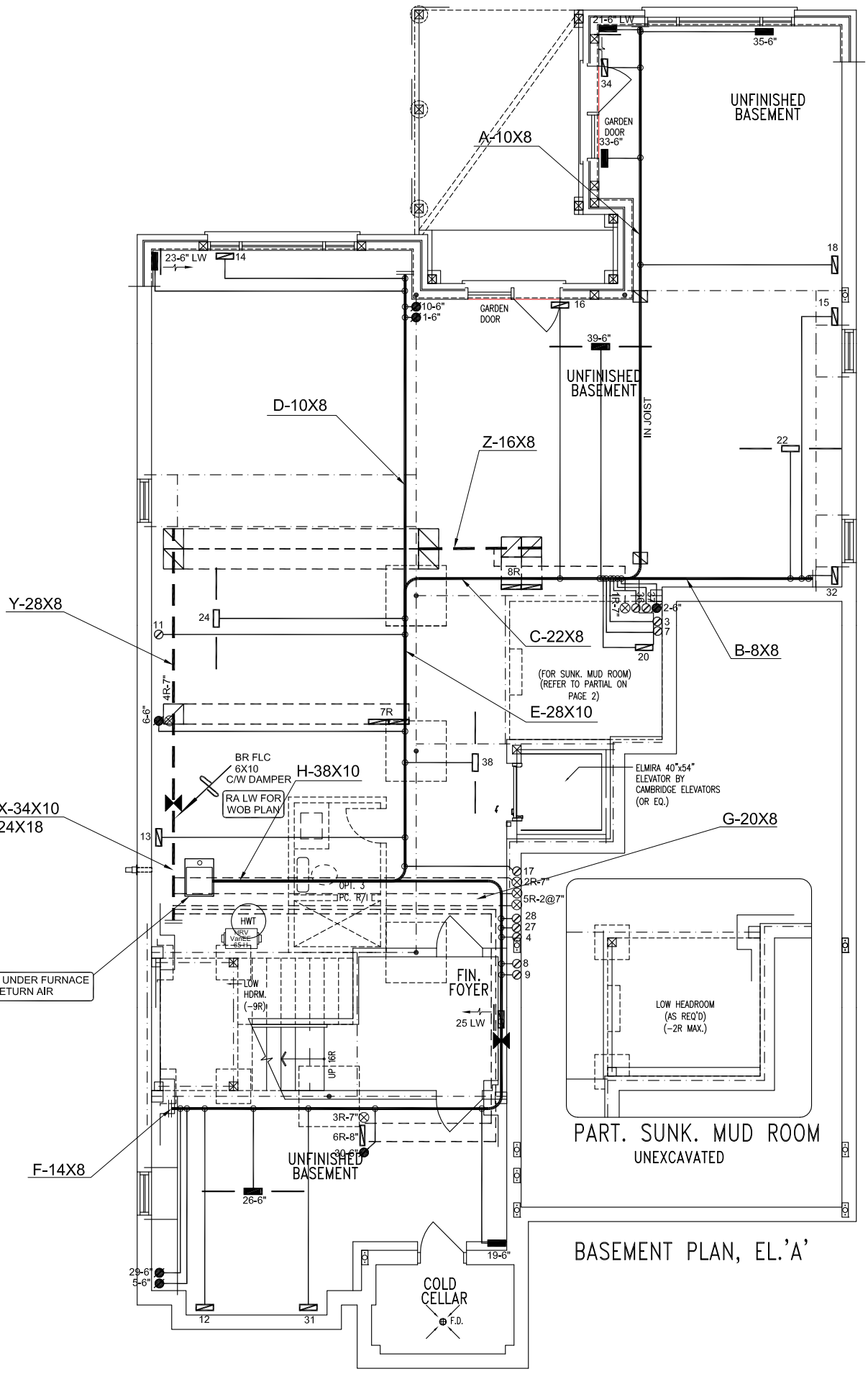
Air Infiltration Residential Load Calculator

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):	9.45				
Building Configuration					
Type:	Detached				
Number of Stories:	Two				
Foundation:	Full				
House Volume (m^3):	1910.9				
Air Leakage/Ventilation					
Air Tightness Type:	Present (1961-) (3.57 ACH)				
Custom BDT Data:	ELA @ 10 Pa.				2547.3 cm^2
	3.57				ACH @ 50 Pa
Mechanical Ventilation (L/s):	Total Supply				Total Exhaust
	73.2				73.2
Flue Size					
Flue #:	#1	#2	#3	#4	
Diameter (mm):	0	0	0	0	
Natural Infiltration Rates					
Heating Air Leakage Rate (ACH/H):	**0.416**				
Cooling Air Leakage Rate (ACH/H):	**0.139**				

TYPE: 5005 - KNIGHTSWOOD OPT. ELEVATOR - WOB

LO# 79983



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

WOB | 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.	REVISED AS PER ARCHITECTURALS	FEB/2020
1.	3R RELOCATED	NOV/2018

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Client
GOLDPARK HOMES

Project Name
PINE VALLEY & TESTON
VAUGHAN, ONTARIO
OPT. ELEVATOR
KNIGHTSWOOD - WOB
5005 4483 sqft

HVAC DESIGNS LTD.
375 Finley Ave. Suite 202 - Ajax, Ontario
L1S 2E2 Tel. 905.619.2300 - 905.420.5300 Fax 905.619.2375
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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.

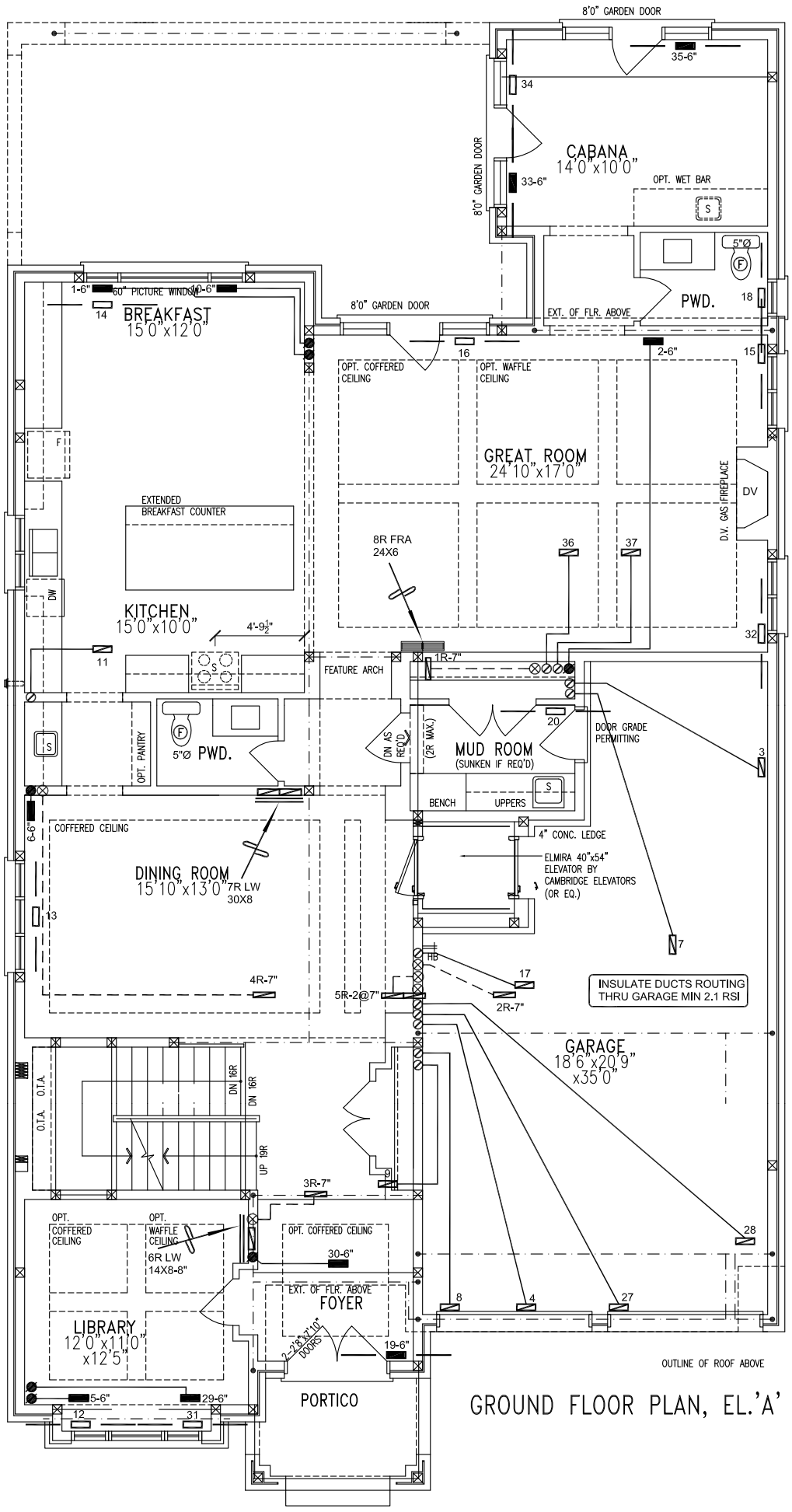
HEAT LOSS 98570 BTU/H		
UNIT DATA		
MAKE	LENNOX	
MODEL	EL296UH110XE60C	
INPUT	110	MBTU/H
OUTPUT	106	MBTU/H
COOLING	5.0	TONS
FAN SPEED	1955	cfm @ 0.6" w.c.

# OF RUNS	S/A	R/A	FANS
3RD FLOOR			
2ND FLOOR	18	5	7
1ST FLOOR	13	3	3
BASEMENT	8	1	0

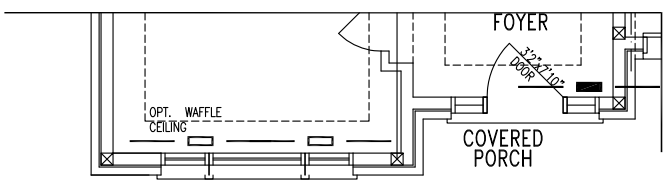
ALL S/A DIFFUSERS 4 "x10" UNLESS NOTED OTHERWISE ON LAYOUT. ALL S/A RUNS 5"Ø UNLESS NOTED OTHERWISE ON LAYOUT. UNDERCUT DOORS 1" min. FOR R/A

Sheet Title
BASEMENT HEATING LAYOUT

Date SEPT/2018
Scale 1/8" = 1'-0"
BCIN# 19669
LO# 79983



GROUND FLOOR PLAN, EL.'A'



PART. GROUND FLOOR PLAN, EL.'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

WOB | 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.	REVISED AS PER ARCHITECTURALS	FEB/2020
1.	3R RELOCATED	NOV/2018

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Client
GOLDPARK HOMES

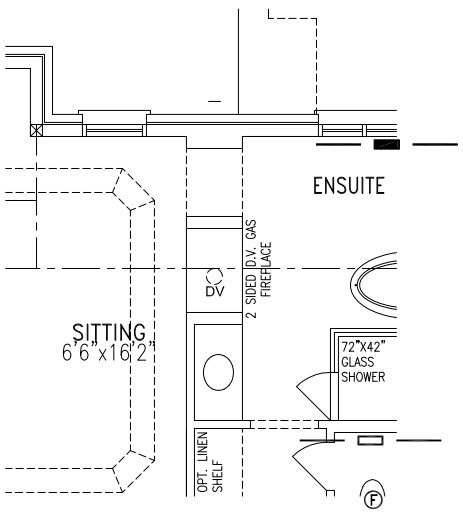
Project Name
PINE VALLEY & TESTON
VAUGHAN, ONTARIO
OPT. ELEVATOR
KNIGHTSWOOD - WOB
5005 4483 sqft

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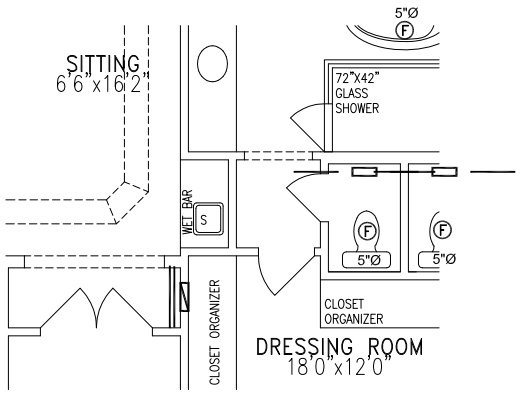
Installation to comply with the latest Ontario Building Code. All supply branch outlets shall be equipped with a manual balancing damper. Ductwork which passes through the garage or unheated spaces shall be adequately insulated and be gas-proofed.

Sheet Title
FIRST FLOOR HEATING LAYOUT

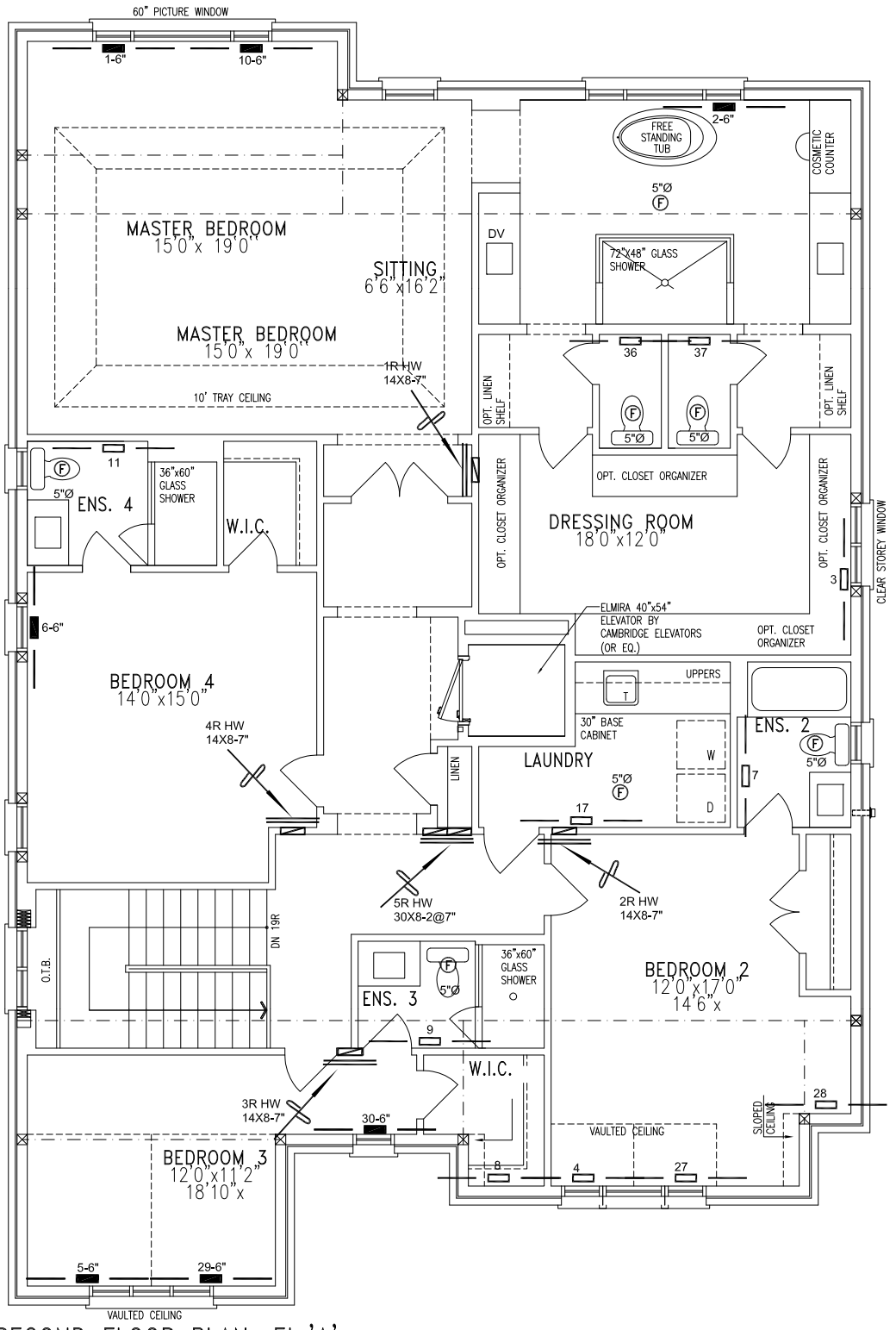
Date SEPT/2018
Scale 1/8" = 1'-0"
BCIN# 19669
LO# 79983



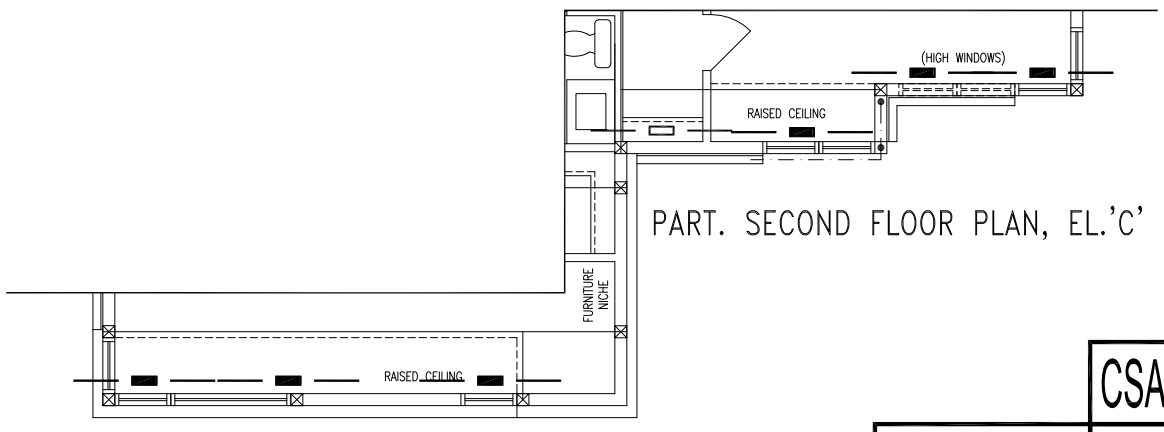
PART. SECOND FLOOR PLAN
OPT. SITTING AREA FIREPLACE



PART. SECOND FLOOR PLAN
OPT. SITTING AREA WET BAR



SECOND FLOOR PLAN, EL.'A'



PART. SECOND FLOOR PLAN, EL.'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

WOB | **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.	REVISED AS PER ARCHITECTURALS	FEB/2020
1.	3R RELOCATED	NOV/2018

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Client
GOLDPARK HOMES

Project Name
PINE VALLEY & TESTON
VAUGHAN, ONTARIO
OPT. ELEVATOR
KNIGHTSWOOD - WOB
5005 4483 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
SECOND FLOOR HEATING LAYOUT

Date SEPT/2018
Scale 1/8" = 1'-0"
BCIN# 19669
LO# 79983

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
VAUGHAN (WOODBRIDGE)		

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:** 5005 - KNIGHTSWOOD OPT ELEVATOR WOB OPT SERV STAIR **Project:** PINE VALLEY & TESTON

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.

February 26, 2020
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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Tel: 905.619.2300 Fax: 905.619.2375
Web: www.hvacdesigns.ca E-mail: info@hvacdesigns.ca

SITE NAME: PINE VALLEY & TESTON | OPT ELEVATOR WOB OPT SERV STAIR | DATE: Feb-20 | WINTER NATURAL AIR CHANGE RATE 0.416 | HEAT LOSS ΔT °F. 76 | CSA-F280-12

BUILDER: GOLD PARK HOMES | TYPE: 5005 - KNIGHTSWOOD | GFA: 4580 | LO# 85458 | SUMMER NATURAL AIR CHANGE RATE 0.139 | HEAT GAIN ΔT °F. 13 | SB-12 PACKAGE A1

ROOM USE			MBR			ENS			WIC			BED-2			BED-3			BED-4			ENS-2			WIC-2			ENS-3			ENS-4		
EXP. WALL			46			36			13			32			50			19			6			9			4			7		
CLG. HT.			11			10			10			11			11			10			10			10			10			10		
	FACTORS																															
GRS.WALL AREA	LOSS	GAIN	506			360			130			352			550			190			60			90			40			70		
GLAZING			LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN	
NORTH	21.3	15.4	0	0	0	0	0	0	6	128	93	18	383	278	0	0	0	0	0	0	8	170	124	0	0	0	0	0	0	0	0	0
EAST	21.3	39.9	0	0	0	0	0	0	0	0	0	70	1490	2795	73	1553	2915	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
SOUTH	21.3	24.0	0	0	0	0	0	0	0	0	0	0	0	0	28	596	672	32	681	768	0	0	0	0	0	0	0	0	0	8	170	192
WEST	21.3	39.9	50	1064	1996	34	724	1357	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
SKYLT.	37.2	101.5	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	0	0	0
DOORS	25.2	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	0	0	0
NET EXPOSED WALL	4.5	0.8	456	2035	343	326	1455	245	124	553	93	264	1178	198	449	2004	337	158	705	119	52	232	39	90	402	68	40	179	30	62	277	47
NET EXPOSED BSMT WALL ABOVE GR	3.6	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	0	0	0	0	0	0
EXPOSED CLG	1.3	0.6	533	684	313	323	415	190	247	317	145	254	326	149	272	349	160	285	366	167	60	77	35	48	62	28	140	180	82	105	135	62
NO ATTIC EXPOSED CLG	2.7	1.3	0	0	0	0	0	0	0	0	0	24	66	30	84	231	106	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	25	64	11	278	709	119	104	265	45	0	0	0	60	153	26	48	122	21	24	61	10	0	0	0
BASEMENT/CRAWL HEAT LOSS				0			0			0			0			0			0			0			0			0			0	
SLAB ON GRADE HEAT LOSS				0			0			0			0			0			0			0			0			0			0	
SUBTOTAL HT LOSS				3783			2593			1062			4152			4998			1752			632			586			419			582	
SUB TOTAL HT GAIN					2652			1792			342			3570			4234			1054			224			116			123			300
LEVEL FACTOR / MULTIPLIER			0.20	0.38		0.20	0.38		0.20	0.38		0.20	0.38		0.20	0.38		0.20	0.38		0.20	0.38		0.20	0.38		0.20	0.38		0.20	0.38	
AIR CHANGE HEAT LOSS				1428			979			401			1567			1886			661			239			221			158			220	
AIR CHANGE HEAT GAIN					220			148			28			295			350			87			19			10			10			25
DUCT LOSS				0			0			146			572			688			0			87			81			58			0	
DUCT GAIN					0			0			108			482			554			0			24			13			13			0
HEAT GAIN PEOPLE	240		2		480	0		0	0		0	1		240	1		240	1		240	0		0	0		0	0		0	0		0
HEAT GAIN APPLIANCES/LIGHTS					713			0			713			713			713			713			0			0			0			0
TOTAL HT LOSS BTU/H				5211			3572			1609			6291			7573			2413			958			887			635			801	
TOTAL HT GAIN x 1.3 BTU/H					5284			2523			1549			6890			7918			2722			346			180			190			423

ROOM USE			LIB			DIN			KIT/GT			CAB			LAUN			PWD			FOY			MUD						WOB			BAS		
EXP. WALL			31			32			77			45			0			5			35			32						52			186		
CLG. HT.			11			11			11			11			10			11			11			12						10			10		
	FACTORS																																		
GRS.WALL AREA	LOSS	GAIN	341			352			847			495			0			55			385			384						520			1302		
GLAZING			LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN					LOSS	GAIN		LOSS	GAIN	
NORTH	21.3	15.4	0	0	0	0	0	0	46	979	710	0	0	0	0	0	0	9	192	139	0	0	0	0	0	0				0	0	0	6	128	93
EAST	21.3	39.9	56	1192	2236	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
SOUTH	21.3	24.0	0	0	0	34	724	816	20	426	480	63	1341	1511	0	0	0	0	0	0	0	0	0	0	0	0				46	979	552	6	128	144
WEST	21.3	39.9	0	0	0	0	0	0	105	2234	4192	63	1341	2515	0	0	0	0	0	0	0	0	0	0	0	0				106	2256	2116	0	0	0
SKYLT.	37.2	101.5	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	0	0	0
DOORS	25.2	4.3	0	0	0	0	0	0	10	252	43	0	0	0	0	0	0	0	0	0	62	1565	264	20	505	85				20	505	85	20	505	85
NET EXPOSED WALL	4.5	0.8	285	1272	214	318	1419	239	666	2972	501	369	1647	277	0	0	0	46	205	35	323	1441	243	364	1624	274				348	1553	262	0	0	0
NET EXPOSED BSMT WALL ABOVE GR	3.6	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				0	0	0	558	2008	338
EXPOSED CLG	1.3	0.6	0	0	0	0	0	0	0	0	0	0	0	0	102	131	60	0	0	0	0	0	0	0	0	0				0	0	0	0	0	0
NO ATTIC EXPOSED CLG	2.7	1.3	0	0	0	0	0	0	0	0	0	203	558	255	0	0	0	40	110	50	41	113	52	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	56	143	24	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			0								2977		
SLAB ON GRADE HEAT LOSS				0			0			0			0			0			0			0			0					741					
SUBTOTAL HT LOSS				2464			2143			6864			4886			274			507			3120			2129					6034			5746		
SUB TOTAL HT GAIN					2450			1055			5925			4559			84			224			558			359					3014			660
LEVEL FACTOR / MULTIPLIER			0.30	0.53		0.30	0.53		0.30	0.53		0.30	0.53		0.20	0.38		0.30	0.53		0.30	0.53		0.30	0.53								0.50	1.67	
AIR CHANGE HEAT LOSS				1314			1143			3661			2606			103			270			1664			1136									19656	
AIR CHANGE HEAT GAIN					203			87			490			377			7			19			46			30									304
DUCT LOSS				0			0			0			0			38			0			0			0								0		
DUCT GAIN					0			0			0			0			80			0			0			0									0
HEAT GAIN PEOPLE	240		0		0	0		0	0		0	0		0	0		0	0		0	0		0	0		0				0		0	0		0
HEAT GAIN APPLIANCES/LIGHTS					713			713			713			713			713			0			0			713						0			713
TOTAL HT LOSS BTU/H				3778			3286			10524			7492			415			777			4784			3265					6775			25402	
TOTAL HT GAIN x 1.3 BTU/H					4376			2411			9267			7344			1150			315			785			1432						3919			2180

TOTAL HEAT GAIN BTU/H: 61740 TONS: 5.15 LOSS DUE TO VENTILATION LOAD BTU/H: 3181 STRUCTURAL HEAT LOSS: 96447 TOTAL COMBINED HEAT LOSS BTU/H: 99628

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: PINE VALLEY & TESTON — OPT ELEVATOR WOB OPT SERV STAIR
BUILDER: GOLD PARK HOMES — TYPE: 5005 - KNIGHTSWOOD — DATE: Feb-20 — GFA: 4580 — LO# 85458

HEATING CFM	1955	COOLING CFM	1955	furnace pressure	0.6					^LENNOX		AFUE = 96 %
TOTAL HEAT LOSS	96,447	TOTAL HEAT GAIN	61,205	furnace filter	0.08					EL296UH110XE60C	110	INPUT (BTU/H) = 110,000
AIR FLOW RATE CFM	20.27	AIR FLOW RATE CFM	31.94	a/c coil pressure	0.2					FAN SPEED		OUTPUT (BTU/H) = **106,000**
				available pressure for s/a & r/a	0.32					LOW	0	
										MEDLOW	1380	DESIGN CFM = **1955**
				plenum pressure s/a	0.17	r/a pressure	0.15			MEDIUM	1505	CFM @ .6 " E.S.P.
				max s/a dif press. loss	0.02	r/a grille press. Loss	0.02			MEDIUM HIGH	1685	
				min adjusted pressure s/a	0.15	adjusted pressure r/a	0.13			HIGH	1955	TEMPERATURE RISE 50 °F

RUN COUNT	4th	3rd	2nd	1st	Bas
S/A	0	0	18	13	8
R/A	0	0	5	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	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	ENS-2	WIC-2	ENS-3	MBR	ENS-4	LIB	DIN	KIT/GT	KIT/GT	KIT/GT	LAUN	PWD	FOY	MUD	BAS	BAS	BAS	BAS
RM LOSS MBH.	2.61	2.79	1.61	2.10	2.52	2.41	0.96	0.89	0.64	2.61	0.80	1.89	3.29	2.63	2.63	2.63	0.41	0.78	4.78	3.27	4.02	4.02	4.02	4.02
CFM PER RUN HEAT	53	57	33	43	51	49	19	18	13	53	16	38	67	53	53	53	8	16	97	66	82	82	82	82
RM GAIN MBH.	2.64	2.24	1.55	2.30	2.64	2.72	0.35	0.18	0.19	2.64	0.42	2.19	2.41	2.32	2.32	2.32	1.15	0.32	0.79	1.43	0.76	0.76	0.76	0.76
CFM PER RUN COOLING	84	72	49	73	84	87	11	6	6	84	13	70	77	74	74	74	37	10	25	46	24	24	24	24
ADJUSTED PRESSURE	0.15	0.16	0.16	0.16	0.15	0.15	0.16	0.16	0.16	0.15	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.15	0.16	0.15	0.15	0.15	0.15
ACTUAL DUCT LGH.	70	70	68	49	75	48	79	48	53	64	59	57	29	52	69	54	36	73	40	65	77	60	69	38
EQUIVALENT LENGTH	200	200	150	160	170	160	150	150	170	170	150	140	103	120	140	110	200	170	210	190	150	120	150	90
TOTAL EFFECTIVE LENGTH	270	270	218	209	245	208	229	198	223	234	209	197	132	172	209	164	236	243	250	255	227	180	219	128
ADJUSTED PRESSURE	0.05	0.06	0.07	0.07	0.06	0.07	0.07	0.08	0.07	0.06	0.07	0.08	0.12	0.09	0.07	0.1	0.07	0.06	0.06	0.06	0.06	0.08	0.07	0.11
ROUND DUCT SIZE	**6**	**6**	5	5	**6**	**6**	4	4	4	**6**	4	5	5	5	5	5	4	4	**6**	5	**6**	5	**6**	5
HEATING VELOCITY (ft/min)	270	291	242	316	260	250	218	207	149	270	184	279	492	389	389	389	92	184	495	485	418	602	418	602
COOLING VELOCITY (ft/min)	428	367	360	536	428	444	126	69	69	428	149	514	565	543	543	543	424	115	127	338	122	176	122	176
OUTLET GRILL SIZE	4X10	4X10	3X10	3X10	4X10	4X10	3X10	3X10	3X10	4X10	3X10	3X10	3X10	3X10	3X10	3X10	3X10	3X10	4X10	3X10	4X10	3X10	4X10	3X10
TRUNK	D	C	B	G	F	E	B	G	G	D	E	F	E	D	B	C	G	A	F	B	A	B	D	E

RUN #	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39
ROOM NAME	BAS	BAS	BED-2	BED-2	BED-3	BED-3	LIB	KIT/GT	CAB	CAB	CAB	ENS	ENS	BAS	BAS
RM LOSS MBH.	4.02	4.02	2.10	2.10	2.52	2.52	1.89	2.63	2.50	2.50	2.50	0.39	0.39	4.02	4.02
CFM PER RUN HEAT	82	82	43	43	51	51	38	53	51	51	51	8	8	82	82
RM GAIN MBH.	0.76	0.76	2.30	2.30	2.64	2.64	2.19	2.32	2.45	2.45	2.45	0.14	0.14	0.76	0.76
CFM PER RUN COOLING	24	24	73	73	84	84	70	74	78	78	78	5	5	24	24
ADJUSTED PRESSURE	0.15	0.15	0.16	0.16	0.15	0.15	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.15	0.15
ACTUAL DUCT LGH.	34	50	52	55	80	63	51	59	69	71	82	56	58	23	58
EQUIVALENT LENGTH	110	150	170	160	170	200	160	120	150	130	140	200	190	140	170
TOTAL EFFECTIVE LENGTH	144	200	222	215	250	263	211	179	219	201	222	256	248	163	228
ADJUSTED PRESSURE	0.1	0.07	0.07	0.07	0.06	0.06	0.07	0.09	0.07	0.08	0.07	0.06	0.06	0.09	0.06
ROUND DUCT SIZE	5	**6**	5	5	**6**	**6**	5	5	**6**	5	**6**	4	4	5	**6**
HEATING VELOCITY (ft/min)	602	418	316	316	260	260	279	389	260	374	260	92	92	602	418
COOLING VELOCITY (ft/min)	176	122	536	536	428	428	514	543	398	573	398	57	57	176	122
OUTLET GRILL SIZE	3X10	4X10	3X10	3X10	4X10	4X10	3X10	3X10	4X10	3X10	4X10	3X10	3X10	3X10	4X10
TRUNK	G	F	G	G	F	F	F	B	A	A	A	C	C	E	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	251	0.06	9	10	x	8	452	TRUNK G	658	0.06	12.9	20	x	8	592
TRUNK B	306	0.06	9.7	12	x	8	459	TRUNK H	1960	0.05	20.3	38	x	10	743
TRUNK C	765	0.06	13.6	22	x	8	626	TRUNK I	0	0.00	0	0	x	8	0
TRUNK D	241	0.05	9.3	10	x	8	434	TRUNK J	0	0.00	0	0	x	8	0
TRUNK E	1302	0.05	17.4	28	x	10	670	TRUNK K	0	0.00	0	0	x	8	0
TRUNK F	408	0.06	10.8	14	x	8	525	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	1640	0.05	19	34	x	10	695
TRUNK Y	955	0.05	15.5	28	x	8	614
TRUNK Z	480	0.05	12	16	x	8	540
DROP	1955	0.05	20.3	24	x	18	652

RETURN AIR #	1	2	3	4	5	6	7	8								**BR**
	0	0	0	0	2@7"	0	0	0	0	0	0	0	0	0	0	
AIR VOLUME	115	140	115	115	240	200	360	365	0	0	0	0	0	0	0	305
PLENUM PRESSURE	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13
ACTUAL DUCT LGH.	84	51	62	59	47	49	30	51	1	1	1	1	1	1	1	14
EQUIVALENT LENGTH	200	135	185	185	135	140	170	195	0	0	0	0	0	0	0	145
TOTAL EFFECTIVE LH	284	186	247	244	182	189	200	246	1	1	1	1	1	1	1	159
ADJUSTED PRESSURE	0.05	0.07	0.05	0.05	0.07	0.07	0.07	0.05	13.36	13.36	13.36	13.36	13.36	13.36	13.36	0.08
ROUND DUCT SIZE	7	6.9	7	7	8.5	7.9	9.9	10.8	0	0	0	0	0	0	0	9
INLET GRILL SIZE	8	8	8	8	8	8	8	8	0	0	0	0	0	0	0	8
	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
INLET GRILL SIZE	14	14	14	14	30	14	30	30	0	0	0	0	0	0	0	30

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: 5005 - KNIGHTSWOOD LO # 85458
SITE NAME: PINE VALLEY & TESTON OPT ELEVATOR WOB OPT SERV STAIR

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	7	@ 10.6 cfm	74.2	cfm
Other Rooms	8	@ 10.6 cfm	84.8	cfm
Table 9.32.3.A.		TOTAL	233.2	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	233.2	cfm
Less Principal Ventil. Capacity	155	cfm
Required Supplemental Capacity	78.2	cfm

PRINCIPAL EXHAUST FAN CAPACITY

Model: VANEE 65H Location: BSMT

155.0 cfm 3.0 sones [✓] HVI Approved

PRINCIPAL EXHAUST HEAT LOSS CALCULATION

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

SUPPLEMENTAL FANS NUTONE

Location	Model	cfm	HVI	Sones
ENS	QTXEN050C	50	✓	0.3
ENS-2	QTXEN050C	50	✓	0.3
ENS-4	QTXEN050C	50	✓	0.3
PWD	QTXEN050C	50	✓	0.3

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: 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: February-20

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#: 85458 Model: 5005 - KNIGHTSWOOD Builder: GOLD PARK HOMES Date: 26/02/2020

Volume Calculation

House Volume

Level	Floor Area (ft²)	Floor Height (ft)	Volume (ft³)
Bsmt	2149	10	21490
First	2149	11	23639
Second	2439	10	24390
Third	0	9	0
Fourth	0	9	0
		Total:	69,519.0 ft³
		Total:	1968.6 m³

Air Change & Delta T Data

WINTER NATURAL AIR CHANGE RATE	0.416
SUMMER NATURAL AIR CHANGE RATE	0.139

Design Temperature Difference

	Tin °C	Tout °C	ΔT °C	ΔT °F
Winter DTDh	22	-20	42	76
Summer DTDc	24	31	7	13

5.2.3.1 Heat Loss due to Air Leakage

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

0.416 x 546.82 x 42 °C x 1.2 = 11522 W

= **39313 Btu/h**

6.2.6 Sensible Gain due to Air Leakage

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

= 0.139 x 546.82 x 7 °C x 1.2 = 651 W

= **2220 Btu/h**

5.2.3.2 Heat Loss due to Mechanical Ventilation

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

155 CFM x 76 °F x 1.08 x 0.25 = **3181 Btu/h**

6.2.7 Sensible heat Gain due to Ventilation

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

155 CFM x 13 °F x 1.08 x 0.25 = **536 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	39,313	11,779	1.669
2	0.3		22,112	0.533
3	0.2		20,832	0.377
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

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

HEAT LOSS AND GAIN SUMMARY SHEET

MODEL: 5005 - KNIGHTSWOOD OPT ELEVATOR WOB OPT SERV S **BUILDER:** GOLD PARK HOMES
SFQT: 4580 **LO#** 85458 **SITE:** PINE VALLEY & TESTON

DESIGN ASSUMPTIONS

HEATING	°F	COOLING	°F
OUTDOOR DESIGN TEMP.	-4	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:	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):	69519.0	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:	7.0 ft
LENGTH: 77.0 ft	WIDTH: 42.0 ft	EXPOSED PERIMETER:	186.0 ft
WOB INSULATION CONFIGURATION	SCB_9	WOB EXPOSED PERIMETER	52.0 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	29.80
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

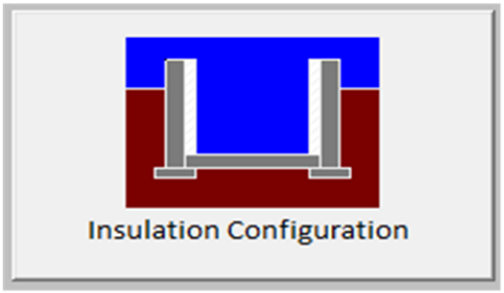
Michael O'Rourke

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 sand, loam, clay
Water Table:	Normal (7-10 m, 23-33 ft)

Foundation Dimensions		
Floor Length (m):	**4.6**	 Insulation Configuration
Floor Width (m):	**12.8**	
Exposed Perimeter (m):	**56.7**	
Wall Height (m):	**3.0**	
Depth Below Grade (m):	**1.84**	
Window Area (m^2):	**1.1**	
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):	**872**	

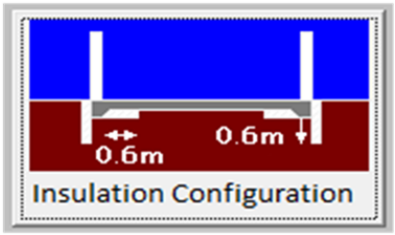
TYPE: 5005 - KNIGHTSWOOD OPT ELEVATOR WOB OPT SERV STAIR
LO# 85458

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 sand, loam, clay
Water Table:	Normal (7-10 m, 23-33 ft)

Foundation Dimensions		
Length (m):	**1.5**	
Width (m):	**12.8**	
Exposed Perimeter (m):	**15.8**	

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

Results	
Heating Load (Watts):	**217**

TYPE: 5005 - KNIGHTSWOOD OPT ELEVATOR WOB OPT SERV STAIR
LO# 85458

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

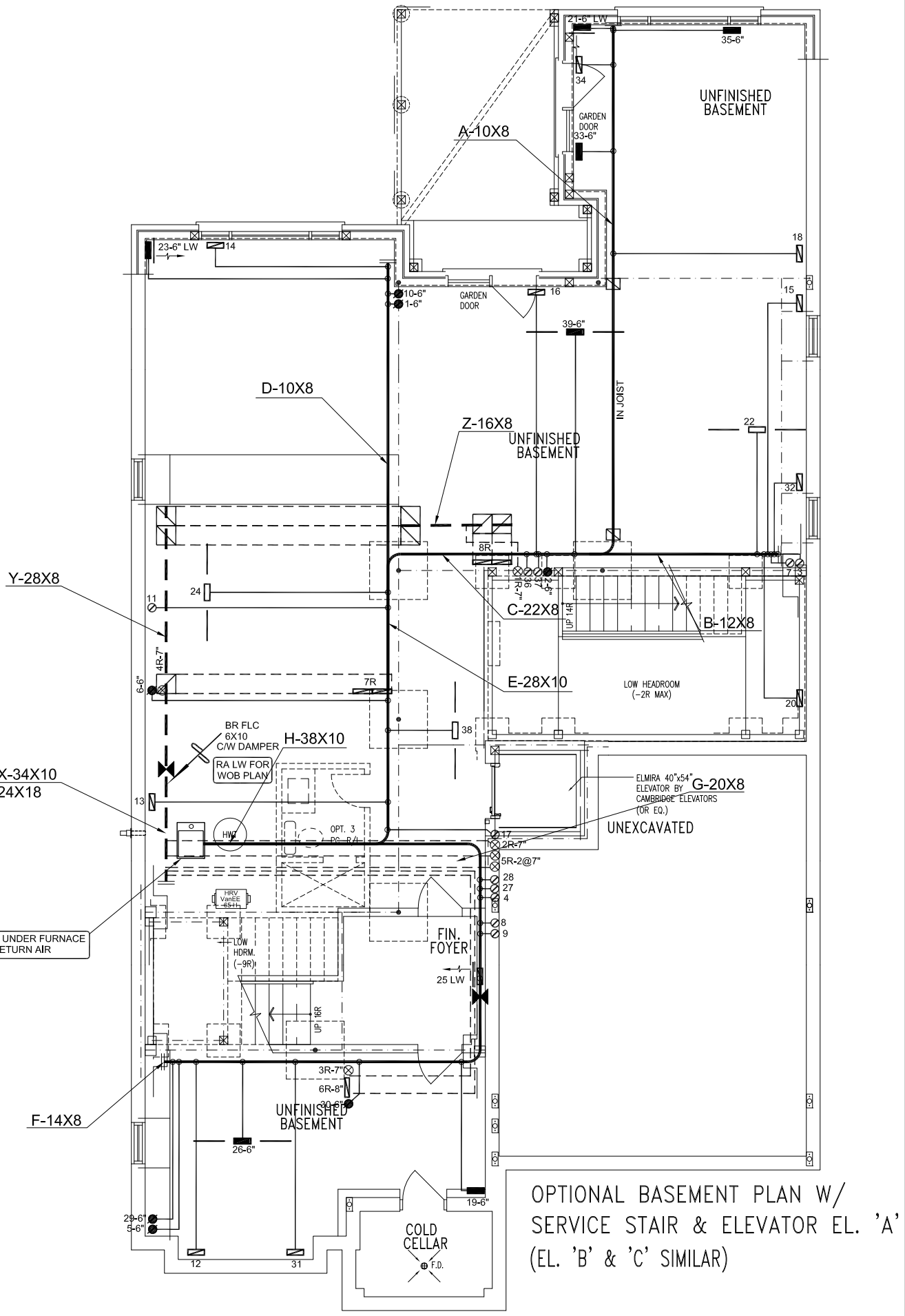
Air Infiltration Residential Load Calculator

Supplemental tool for CAN/CSA-F280

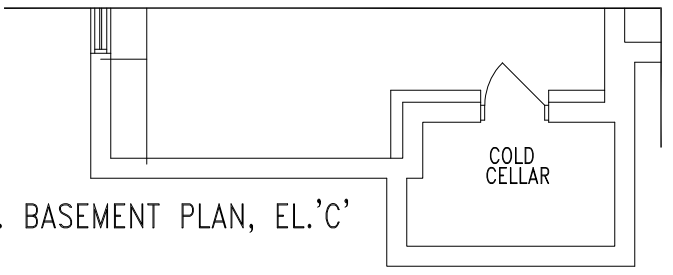
Weather Station Description	
Province:	Ontario
Region:	Vaughan (Woodbridge)
Weather Station Location:	Open flat terrain, grass
Anemometer height (m):	10
Local Shielding	
Building Site:	Suburban, forest
Walls:	Heavy
Flue:	Heavy
Highest Ceiling Height (m):	9.45
Building Configuration	
Type:	Detached
Number of Stories:	Two
Foundation:	Full
House Volume (m^3):	1968.6
Air Leakage/Ventilation	
Air Tightness Type:	Present (1961-) (3.57 ACH)
Custom BDT Data:	ELA @ 10 Pa. 2624.1 cm^2
	3.57 ACH @ 50 Pa
Mechanical Ventilation (L/s):	Total Supply 73.2 / Total Exhaust 73.2
Flue Size	
Flue #:	#1 #2 #3 #4
Diameter (mm):	0 0 0 0
Natural Infiltration Rates	
Heating Air Leakage Rate (ACH/H):	**0.416**
Cooling Air Leakage Rate (ACH/H):	**0.139**

TYPE: 5005 - KNIGHTSWOOD OPT ELEVATOR WOB OPT SERV STAIR

LO# 85458



OPTIONAL BASEMENT PLAN W/ SERVICE STAIR & ELEVATOR EL. 'A' (EL. 'B' & 'C' SIMILAR)



PART. BASEMENT PLAN, EL.'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

WOB 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.		

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Client
GOLDPARK HOMES

Project Name
PINE VALLEY & TESTON
VAUGHAN, ONTARIO
OPT. ELEVATOR
KNIGHTSWOOD OPT SERV STAIR
5005 WOB 4580 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.

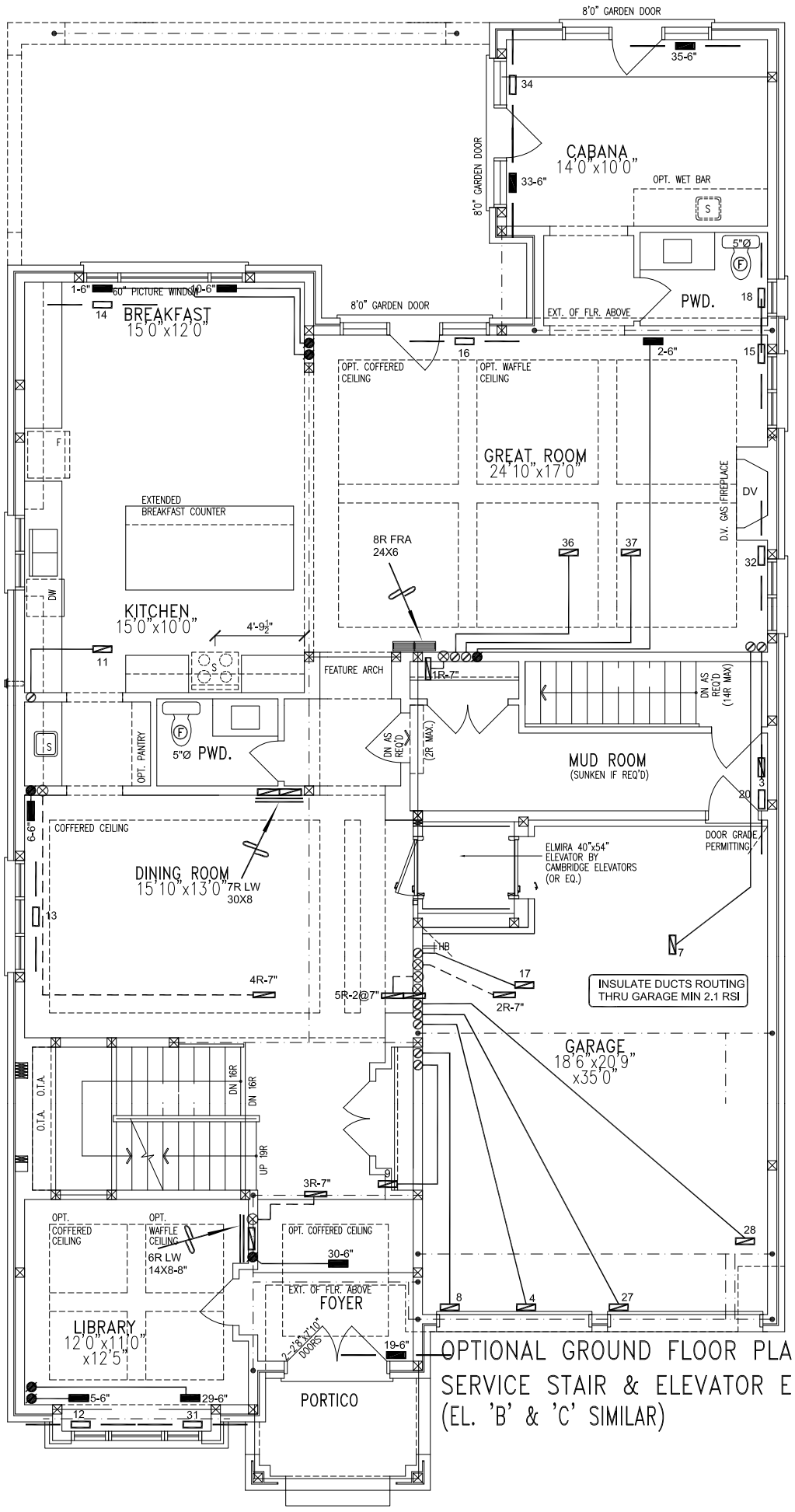
HEAT LOSS 98570 BTU/H		
UNIT DATA		
MAKE	LENNOX	
MODEL	EL296UH110XE60C	
INPUT	110	MBTU/H
OUTPUT	106	MBTU/H
COOLING	5.0	TONS
FAN SPEED	1955	cfm @ 0.6" w.c.

# OF RUNS	S/A	R/A	FANS
3RD FLOOR			
2ND FLOOR	18	5	7
1ST FLOOR	13	3	3
BASEMENT	8	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 FEB/2020
Scale 1/8" = 1'-0"
BCIN# 19669
LO# 85458



OPTIONAL GROUND FLOOR PLAN W/ SERVICE STAIR & ELEVATOR EL. 'A' (EL. 'B' & 'C' SIMILAR)

PART. GROUND FLOOR PLAN, EL.'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

WOB | 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.		

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Client
GOLDPARK HOMES

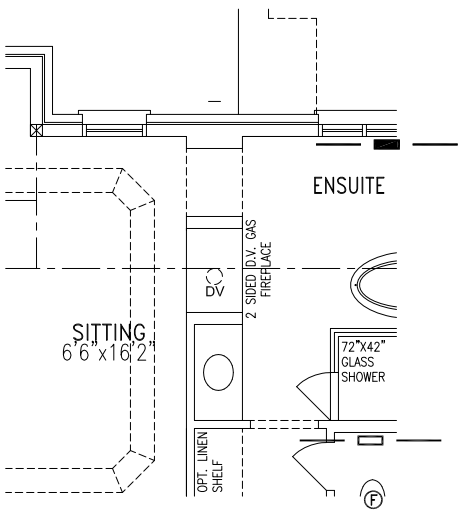
Project Name
PINE VALLEY & TESTON
VAUGHAN, ONTARIO
OPT. ELEVATOR
KNIGHTSWOOD OPT SERV STAIR
5005 WOB 4580 sqft

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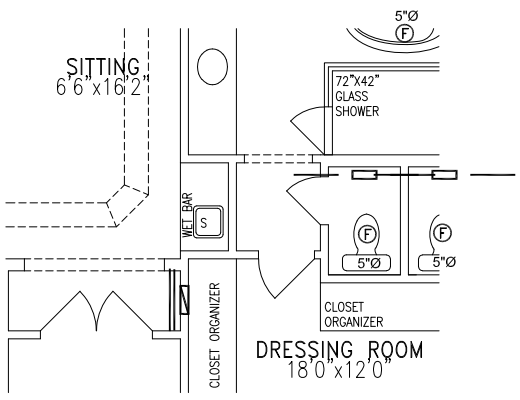
Installation to comply with the latest Ontario Building Code. All supply branch outlets shall be equipped with a manual balancing damper. Ductwork which passes through the garage or unheated spaces shall be adequately insulated and be gas-proofed.

Sheet Title
FIRST FLOOR HEATING LAYOUT

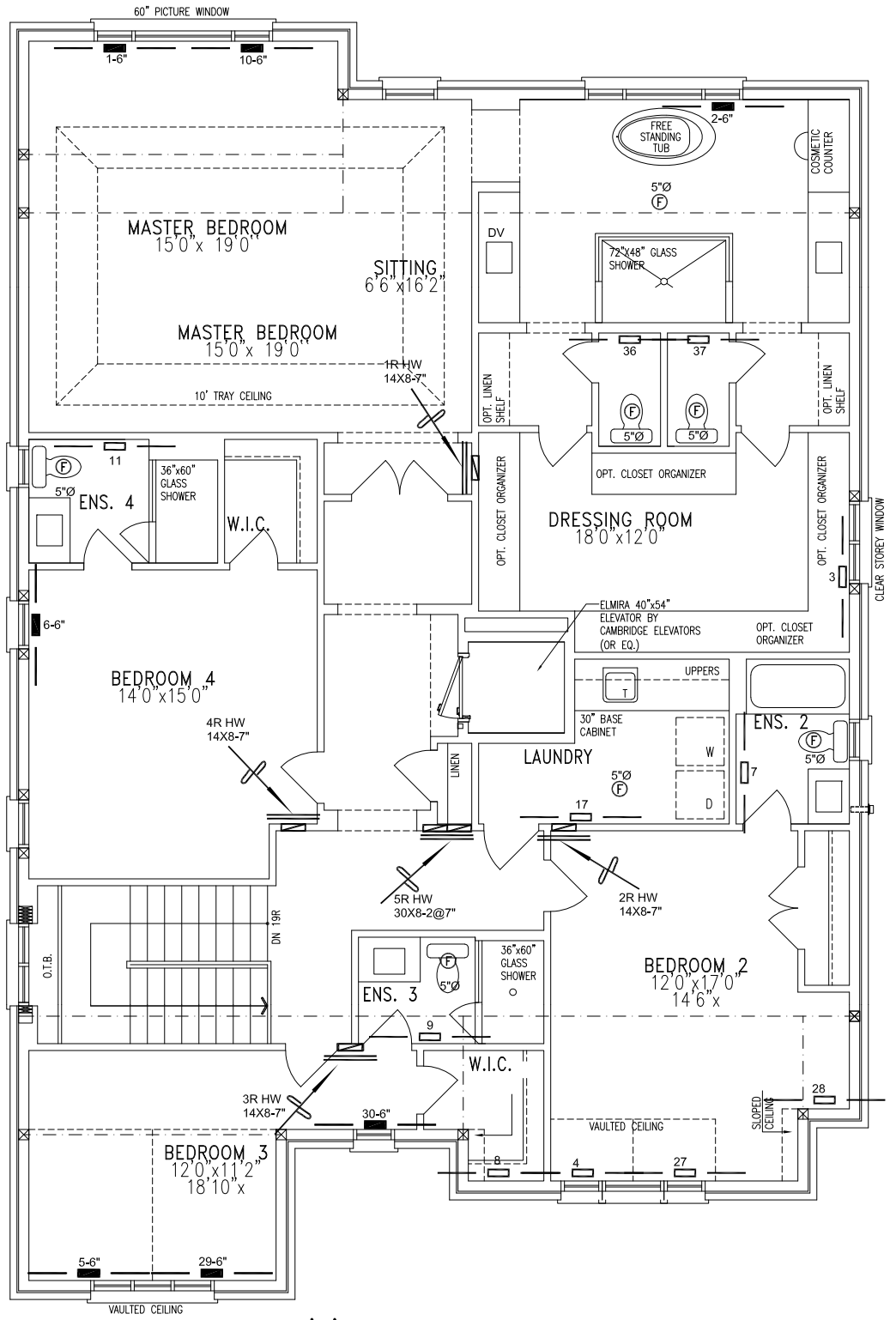
Date FEB/2020
Scale 1/8" = 1'-0"
BCIN# 19669
LO# 85458



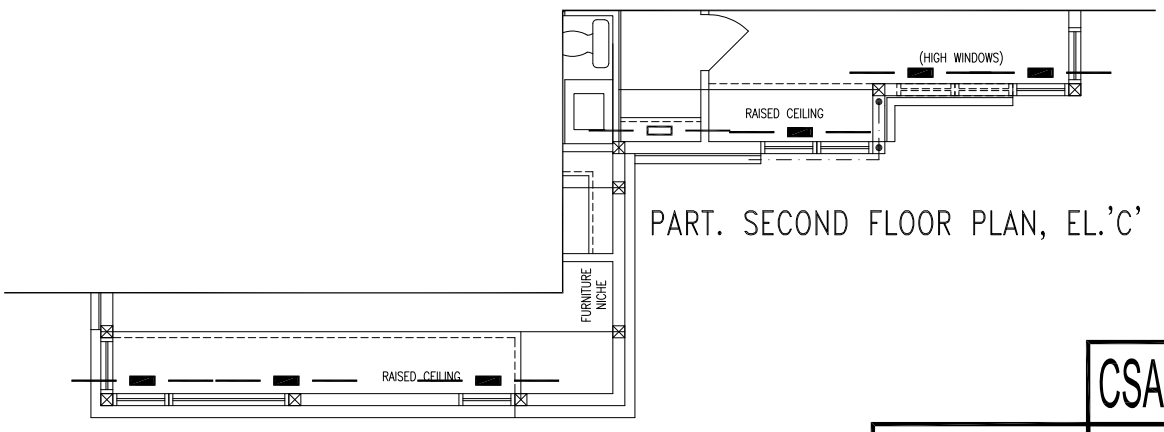
PART. SECOND FLOOR PLAN
OPT. SITTING AREA FIREPLACE



PART. SECOND FLOOR PLAN
OPT. SITTING AREA WET BAR



SECOND FLOOR PLAN, EL.'A'



PART. SECOND FLOOR PLAN, EL.'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

WOB | 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.		

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Client
GOLDPARK HOMES

Project Name
PINE VALLEY & TESTON
VAUGHAN, ONTARIO
OPT. ELEVATOR
KNIGHTSWOOD OPT SERV STAIR
5005 WOB 4580 sqft

HVAC DESIGNS LTD.
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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
SECOND FLOOR HEATING LAYOUT

Date FEB/2020
Scale 1/8" = 1'-0"
BCIN# 19669
LO# 85458

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**		
VAUGHAN (WOODBRIDGE)				

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:** 5005 - KNIGHTSWOOD OPT SERV STAIR **Project:** PINE VALLEY & TESTON

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.

February 26, 2020
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.

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

SITE NAME: PINE VALLEY & TESTON | OPT SERV STAIR | DATE: Feb-20 | WINTER NATURAL AIR CHANGE RATE 0.350 | HEAT LOSS ΔT °F. 76 | CSA-F280-12
BUILDER: GOLD PARK HOMES | TYPE: 5005 - KNIGHTSWOOD | GFA: 4575 | LO# 85453 | SUMMER NATURAL AIR CHANGE RATE 0.121 | HEAT GAIN ΔT °F. 14 | SB-12 PACKAGE A1

ROOM USE			MBR			ENS			WIC			BED-2			BED-3			BED-4			ENS-2			WIC-2			ENS-3			ENS-4			WIC-3		
EXP. WALL			46			36			13			32			50			19			6			9			4			7			15		
CLG. HT.			11			10			10			11			11			10			10			10			10			10			10		
	FACTORS																																		
GRS.WALL AREA	LOSS	GAIN	506			360			130			352			550			190			60			90			40			70			150		
GLAZING				LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN
NORTH	21.3	16.3	0	0	0	0	0	0	6	128	98	18	383	293	0	0	0	0	0	0	8	170	130	0	0	0	0	0	0	0	0	0	0	0	0
EAST	21.3	41.8	0	0	0	0	0	0	0	0	0	70	1490	2928	50	1064	2092	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	20	426	837
SOUTH	21.3	25.2	0	0	0	0	0	0	0	0	0	0	0	0	12	255	302	32	681	806	0	0	0	0	0	0	0	0	0	8	170	201	0	0	0
WEST	21.3	41.8	50	1064	2092	34	724	1422	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
SKYLT.	37.2	102.0	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	0	0	0	0	0	0	0
DOORS	25.2	4.6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
NET EXPOSED WALL	4.5	0.8	456	2035	370	326	1455	264	124	553	100	264	1178	214	488	2178	395	158	705	128	52	232	42	90	402	73	40	179	32	62	277	50	130	580	105
NET EXPOSED BSMT WALL ABOVE GR	3.6	0.7	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	0	0	0	0	0	0
EXPOSED CLG	1.3	0.6	533	684	322	323	415	195	247	317	149	254	326	154	272	349	164	285	366	172	60	77	36	48	62	29	140	180	85	105	135	63	54	69	33
NO ATTIC EXPOSED CLG	2.7	1.3	0	0	0	0	0	0	0	0	0	24	66	31	84	231	109	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	25	64	12	278	709	129	104	265	48	0	0	0	60	153	28	48	122	22	24	61	11	0	0	0	0	0	0
BASEMENT/CRAWL HEAT LOSS				0			0			0			0			0			0			0			0			0			0			0	
SLAB ON GRADE HEAT LOSS				0			0			0			0			0			0			0			0			0			0			0	
SUBTOTAL HT LOSS				3783			2593			1062			4152			4342			1752			632			586			419			582			1075	
SUB TOTAL HT GAIN					2783			1882			359			3748			3111			1106			236			124			128			315			975
LEVEL FACTOR / MULTIPLIER			0.20	0.31		0.20	0.31		0.20	0.31		0.20	0.31		0.20	0.31		0.20	0.31		0.20	0.31		0.20	0.31		0.20	0.31		0.20	0.31		0.20	0.31	
AIR CHANGE HEAT LOSS				1181			809			331			1296			1356			547			197			183			131			182			336	
AIR CHANGE HEAT GAIN					225			152			29			303			252			90			19			10			10			26			79
DUCT LOSS				0			0			139			545			570			0			83			77			55			0			0	
DUCT GAIN					0			0			110			501			432			0			26			13			14			0			0
HEAT GAIN PEOPLE	240		2		480	0		0	0		0	1		240	1		240	1		240	0		0	0		0	0		0	0		0	0		0
HEAT GAIN APPLIANCES/LIGHTS					714			0			714			714			714			714			0			0			0			0			0
TOTAL HT LOSS BTU/H				4964			3402			1533			5993			6268			2299			913			845			605			763			1411	
TOTAL HT GAIN x 1.3 BTU/H					5464			2644			1576			7158			6173			2795			365			192			198			443			1370

ROOM USE			LIB			DIN			KIT/GT			CAB			LAUN			PWD			FOY			MUD									LOD			BAS		
EXP. WALL			31			32			77			45			0			5			35			32									70			240		
CLG. HT.			11			11			11			11			10			11			11			12									10			10		
	FACTORS																																					
GRS.WALL AREA	LOSS	GAIN	341			352			847			495			0			55			385			384									700			2100		
GLAZING				LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN								LOSS	GAIN		LOSS	GAIN
NORTH	21.3	16.3	0	0	0	0	0	0	46	979	748	0	0	0	0	0	0	9	192	146	0	0	0	0	0	0							0	0	0	6	128	98
EAST	21.3	41.8	56	1192	2343	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
SOUTH	21.3	25.2	0	0	0	34	724	856	20	426	504	63	1341	1586	0	0	0	0	0	0	0	0	0	0	0	0							0	0	0	6	128	151
WEST	21.3	41.8	0	0	0	0	0	0	115	2447	4811	63	1341	2635	0	0	0	0	0	0	0	0	0	0	0	0							22	468	920	0	0	0
SKYLT.	37.2	102.0	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	0	0	0	0
DOORS	25.2	4.6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	62	1565	284	20	505	92							0	0	0	20	505	92
NET EXPOSED WALL	4.5	0.8	285	1272	231	318	1419	258	666	2972	540	369	1647	299	0	0	0	46	205	37	323	1441	262	364	1624	295							0	0	0	0	0	0
NET EXPOSED BSMT WALL ABOVE GR	3.6	0.7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0							398	1432	260	300	1080	196
EXPOSED CLG	1.3	0.6	0	0	0	0	0	0	0	0	0	0	0	0	102	131	62	0	0	0	0	0	0	0	0	0							0	0	0	0	0	0
NO ATTIC EXPOSED CLG	2.7	1.3	0	0	0	0	0	0	0	0	0	203	558	263	0	0	0	40	110	52	41	113	53	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	56	143	26	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			0											8450		
SLAB ON GRADE HEAT LOSS				0			0			0			0			0			0			0			0									0				
SUBTOTAL HT LOSS				2464			2143			6824			4886			274			507			3120			2129									1900			10290		
SUB TOTAL HT GAIN					2574			1114			6602			4784			88			235			599			387									1180			536	
LEVEL FACTOR / MULTIPLIER			0.30	0.45		0.30	0.45		0.30	0.45		0.30	0.45		0.20	0.31		0.30	0.45		0.30	0.45		0.30	0.45										0.50	1.36		
AIR CHANGE HEAT LOSS				1111			966			3076			2203			85			228			1406			960											16585		
AIR CHANGE HEAT GAIN					208			90			534			387			7			19			48			31													139
DUCT LOSS				0			0			0			0			36			0			0			0											0		
DUCT GAIN					0			0			0			0			81			0			0			0													0
HEAT GAIN PEOPLE	240		0		0	0		0	0		0	0		0	0		0	0		0	0		0	0		0							0		0	0		0
HEAT GAIN APPLIANCES/LIGHTS					714			714			714			714			714			0			0			714									0			714
TOTAL HT LOSS BTU/H				3574			3109			9900			7089			395			735			4526			3089									1900			26875		
TOTAL HT GAIN x 1.3 BTU/H					4545			2494			10206			7651			1157			331			842			1472									1534			1807

TOTAL HEAT GAIN BTU/H: 60995 | TONS: 5.08 | LOSS DUE TO VENTILATION LOAD BTU/H: 3181 | STRUCTURAL HEAT LOSS: 90188 | TOTAL COMBINED HEAT LOSS BTU/H: 93369

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

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SITE NAME: PINE VALLEY & TESTON — OPT SERV STAIR
BUILDER: GOLD PARK HOMES — TYPE: 5005 - KNIGHTSWOOD — DATE: Feb-20 — GFA: 4575 — LO# 85453

HEATING CFM	1955		COOLING CFM	1955			furnace pressure	0.6																
TOTAL HEAT LOSS	90,188		TOTAL HEAT GAIN	60,417			furnace filter	0.08									^LENNOX		AFUE = 96 %					
AIR FLOW RATE CFM	21.68		AIR FLOW RATE CFM	32.36			a/c coil pressure	0.2									EL296UH110XE60C	110	INPUT (BTU/H) = 110,000					
							available pressure										FAN SPEED		OUTPUT (BTU/H) = **106,000**					
							for s/a & r/a	0.32									LOW	0						
RUN COUNT	4th	3rd	2nd	1st	Bas												MEDLOW	1380	DESIGN CFM = **1955**					
S/A	0	0	18	13	7		plenum pressure s/a	0.17		r/a pressure	0.15						MEDIUM	1505	CFM @ .6 " E.S.P.					
R/A	0	0	5	3	1		max s/a dif press. loss	0.02		r/a grille press. Loss	0.02						MEDIUM HIGH	1685						
All S/A diffusers 4"x10" unless noted otherwise on layout.							min adjusted pressure s/a	0.15		adjusted pressure r/a	0.13						HIGH	1955	TEMPERATURE RISE 50 °F					
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	ENS-2	WIC-2	ENS-3	MBR	ENS-4	LIB	DIN	KIT/GT	KIT/GT	KIT/GT	LAUN	PWD	FOY	MUD	BAS	BAS	BAS	BAS
RM LOSS MBH.	2.48	2.73	1.53	2.00	3.13	2.30	0.91	0.85	0.61	2.48	0.76	1.79	3.11	2.48	2.48	2.48	0.40	0.74	4.53	3.09	4.11	4.11	4.11	4.11
CFM PER RUN HEAT	54	59	33	43	68	50	20	18	13	54	17	39	67	54	54	54	9	16	98	67	89	89	89	89
RM GAIN MBH.	2.73	2.28	1.58	2.39	3.09	2.80	0.37	0.19	0.20	2.73	0.44	2.27	2.49	2.55	2.55	2.55	1.16	0.33	0.84	1.47	0.48	0.48	0.48	0.48
CFM PER RUN COOLING	88	74	51	77	100	90	12	6	6	88	14	74	81	83	83	83	37	11	27	48	15	15	15	15
ADJUSTED PRESSURE	0.15	0.16	0.16	0.16	0.15	0.15	0.16	0.16	0.16	0.15	0.16	0.16	0.15	0.15	0.15	0.15	0.16	0.16	0.15	0.16	0.15	0.15	0.15	0.15
ACTUAL DUCT LGH.	70	70	53	49	75	48	47	48	53	64	59	57	29	52	69	54	36	73	40	65	67	60	54	38
EQUIVALENT LENGTH	200	200	170	160	170	160	200	150	170	170	150	140	103	120	140	110	200	170	210	190	150	120	103	90
TOTAL EFFECTIVE LENGTH	270	270	223	209	245	208	247	198	223	234	209	197	132	172	209	164	236	243	250	255	217	180	157	128
ADJUSTED PRESSURE	0.05	0.06	0.07	0.07	0.06	0.07	0.06	0.08	0.07	0.06	0.07	0.08	0.11	0.09	0.07	0.09	0.07	0.06	0.06	0.06	0.07	0.08	0.09	0.11
ROUND DUCT SIZE	**6**	**6**	5	**6**	**6**	**6**	4	4	4	**6**	4	5	5	5	**6**	5	4	4	**6**	5	**6**	**6**	**6**	5
HEATING VELOCITY (ft/min)	275	301	242	219	347	255	229	207	149	275	195	286	492	396	275	396	103	184	500	492	454	454	454	653
COOLING VELOCITY (ft/min)	449	377	374	393	510	459	138	69	69	449	161	543	595	609	423	609	424	126	138	352	76	76	76	110
OUTLET GRILL SIZE	4X10	4X10	3X10	4X10	4X10	4X10	3X10	3X10	3X10	4X10	3X10	3X10	3X10	3X10	4X10	3X10	3X10	3X10	4X10	3X10	4X10	4X10	4X10	3X10
TRUNK	D	C	E	G	F	E	E	G	G	D	E	F	E	D	B	C	G	A	F	B	A	B	D	E

RUN #	25	26	27	28	29	30	31	32	33	34	35	36	37	38
ROOM NAME	BAS	BAS	BED-2	BED-2	BED-3	WIC-3	LIB	KIT/GT	CAB	CAB	CAB	ENS	ENS	BAS
RM LOSS MBH.	4.11	4.11	2.00	2.00	3.13	1.41	1.79	2.48	2.36	2.36	2.36	0.33	0.33	4.11
CFM PER RUN HEAT	89	89	43	43	68	31	39	54	51	51	51	7	7	89
RM GAIN MBH.	0.48	0.48	2.39	2.39	3.09	1.37	2.27	2.55	2.55	2.55	2.55	0.18	0.18	0.48
CFM PER RUN COOLING	15	15	77	77	100	44	74	83	83	83	83	6	6	15
ADJUSTED PRESSURE	0.15	0.15	0.16	0.16	0.15	0.16	0.16	0.15	0.15	0.15	0.15	0.16	0.16	0.15
ACTUAL DUCT LGH.	34	50	52	55	80	63	51	55	69	71	82	56	58	23
EQUIVALENT LENGTH	110	150	170	160	170	200	160	120	150	130	140	200	190	140
TOTAL EFFECTIVE LENGTH	144	200	222	215	250	263	211	175	219	201	222	256	248	163
ADJUSTED PRESSURE	0.1	0.07	0.07	0.07	0.06	0.06	0.07	0.08	0.07	0.07	0.07	0.06	0.06	0.09
ROUND DUCT SIZE	5	**6**	**6**	**6**	**6**	5	5	**6**	**6**	**6**	**6**	4	4	**6**
HEATING VELOCITY (ft/min)	653	454	219	219	347	228	286	275	260	260	260	80	80	454
COOLING VELOCITY (ft/min)	110	76	393	393	510	323	543	423	423	423	423	69	69	76
OUTLET GRILL SIZE	3X10	4X10	4X10	4X10	4X10	3X10	3X10	4X10	4X10	4X10	4X10	3X10	3X10	4X10
TRUNK	G	F		G	F	F	F	B	A	A	A	C	C	E

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	258	0.06	9.1	10	x	8	464	TRUNK G	647	0.06	12.8	20	x	8	582
TRUNK B	264	0.06	9.2	10	x	8	475	TRUNK H	1912	0.05	20.1	38	x	10	725
TRUNK C	649	0.06	12.8	22	x	8	531	TRUNK I	0	0.00	0	0	x	8	0
TRUNK D	251	0.05	9.4	10	x	8	452	TRUNK J	0	0.00	0	0	x	8	0
TRUNK E	1265	0.05	17.2	28	x	10	651	TRUNK K	0	0.00	0	0	x	8	0
TRUNK F	432	0.06	11	14	x	8	555	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	1640	0.05	19	34	x	10	695
TRUNK Y	955	0.05	15.5	28	x	8	614
TRUNK Z	480	0.05	12	16	x	8	540
DROP	1955	0.05	20.3	24	x	18	652

RETURN AIR #	1	2	3	4	5	6	7	8								**BR**
	0	0	0	0	2@7"	0	0	0	0	0	0	0	0	0	0	
AIR VOLUME	115	140	115	115	240	200	360	365	0	0	0	0	0	0	0	305
PLENUM PRESSURE	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13
ACTUAL DUCT LGH.	84	51	62	59	47	49	30	51	1	1	1	1	1	1	1	14
EQUIVALENT LENGTH	200	135	195	185	135	140	170	195	0	0	0	0	0	0	0	145
TOTAL EFFECTIVE LH	284	186	257	244	182	189	200	246	1	1	1	1	1	1	1	159
ADJUSTED PRESSURE	0.05	0.07	0.05	0.05	0.07	0.07	0.07	0.05	13.36	13.36	13.36	13.36	13.36	13.36	13.36	0.08
ROUND DUCT SIZE	7	6.9	7	7	8.5	7.9	9.9	10.8	0	0	0	0	0	0	0	9
INLET GRILL SIZE	8	8	8	8	8	8	8	8	0	0	0	0	0	0	0	8
	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
INLET GRILL SIZE	14	14	14	14	30	14	30	30	0	0	0	0	0	0	0	30

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: 5005 - KNIGHTSWOOD LO # 85453
SITE NAME: PINE VALLEY & TESTON OPT SERV STAIR

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	7	@ 10.6 cfm	74.2	cfm
Other Rooms	7	@ 10.6 cfm	74.2	cfm
Table 9.32.3.A.		TOTAL	222.6	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	222.6	cfm
Less Principal Ventil. Capacity	155	cfm
Required Supplemental Capacity	67.6	cfm

PRINCIPAL EXHAUST FAN CAPACITY

Model: VANEE 65H Location: BSMT

155.0 cfm 3.0 sones [✓] HVI Approved

PRINCIPAL EXHAUST HEAT LOSS CALCULATION

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

SUPPLEMENTAL FANS NUTONE

Location	Model	cfm	HVI	Sones
ENS	QTXEN050C	50	✓	0.3
ENS-2	QTXEN050C	50	✓	0.3
ENS-4	QTXEN050C	50	✓	0.3
PWD	QTXEN050C	50	✓	0.3

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: 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: February-20

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#: 85453 Model: 5005 - KNIGHTSWOOD Builder: GOLD PARK HOMES Date: 26/02/2020

Volume Calculation

House Volume

Level	Floor Area (ft²)	Floor Height (ft)	Volume (ft³)
Bsmt	2171	10	21710
First	2171	11	23881
Second	2409	10	24090
Third	0	9	0
Fourth	0	9	0
		Total:	69,681.0 ft³
		Total:	1973.1 m³

Air Change & Delta T Data

WINTER NATURAL AIR CHANGE RATE	0.350
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	23	31	8	14

5.2.3.1 Heat Loss due to Air Leakage

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

0.350 x 548.10 x 42 °C x 1.2 = 9721 W

= **33170 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 548.10 x 8 °C x 1.2 = 610 W

= **2082 Btu/h**

5.2.3.2 Heat Loss due to Mechanical Ventilation

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

155 CFM x 76 °F x 1.08 x 0.25 = **3181 Btu/h**

6.2.7 Sensible heat Gain due to Ventilation

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

155 CFM x 14 °F x 1.08 x 0.25 = **578 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	33,170	12,191	1.360
2	0.3		22,072	0.451
3	0.2		21,251	0.312
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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Web: www.hvacdesigns.ca E-mail: info@hvacdesigns.ca

HEAT LOSS AND GAIN SUMMARY SHEET

MODEL: 5005 - KNIGHTSWOOD OPT SERV STAIR **BUILDER:** GOLD PARK HOMES
SFQT: 4575 **LO#** 85453 **SITE:** PINE VALLEY & TESTON

DESIGN ASSUMPTIONS

HEATING	°F	COOLING	°F
OUTDOOR DESIGN TEMP.	-4	OUTDOOR DESIGN TEMP.	88
INDOOR DESIGN TEMP.	72	INDOOR DESIGN TEMP. (MAX 75°F)	74

BUILDING DATA

ATTACHMENT:	DETACHED	# 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):	69681.0	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:	7.0 ft
LENGTH: 75.0 ft	WIDTH: 45.0 ft	EXPOSED PERIMETER:	240.0 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	29.80
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



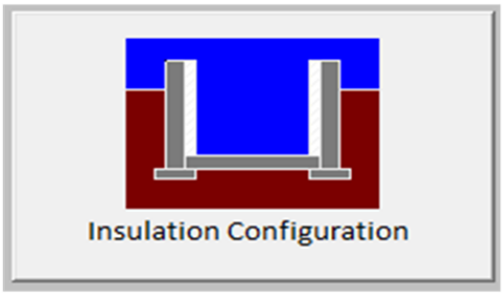
HVAC Designs Ltd.
375 Finley Ave, Suite 202
Ajax ON, L1S 2E2
905-619-2300

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 sand, loam, clay
Water Table:	Normal (7-10 m, 23-33 ft)

Foundation Dimensions		
Floor Length (m):	**22.9**	
Floor Width (m):	**13.7**	
Exposed Perimeter (m):	**0.0**	
Wall Height (m):	**3.0**	
Depth Below Grade (m):	**2.13**	
Window Area (m^2):	**3.2**	
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):	**2476**	

TYPE: 5005 - KNIGHTSWOOD OPT SERV STAIR
LO# 85453

HVAC Designs Ltd.
375 Finley Ave, Suite 202
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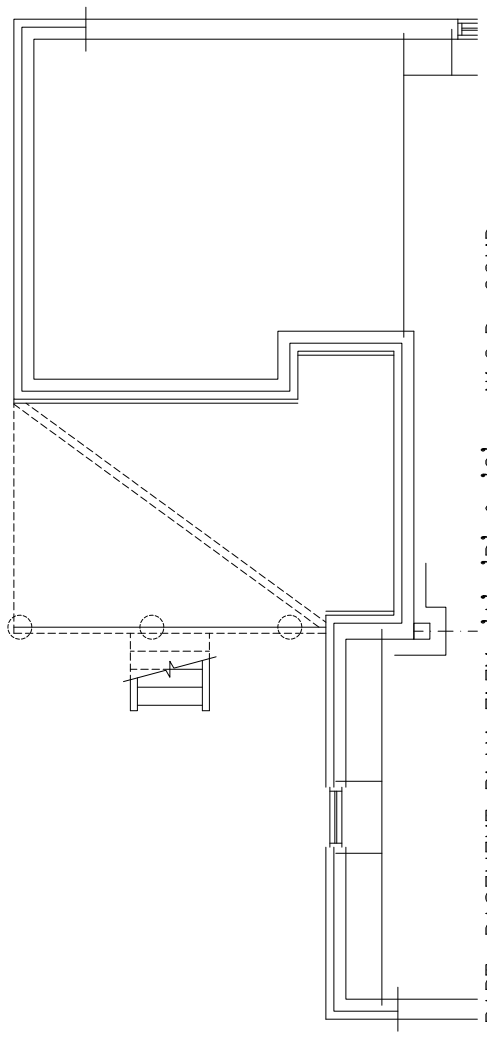
Air Infiltration Residential Load Calculator

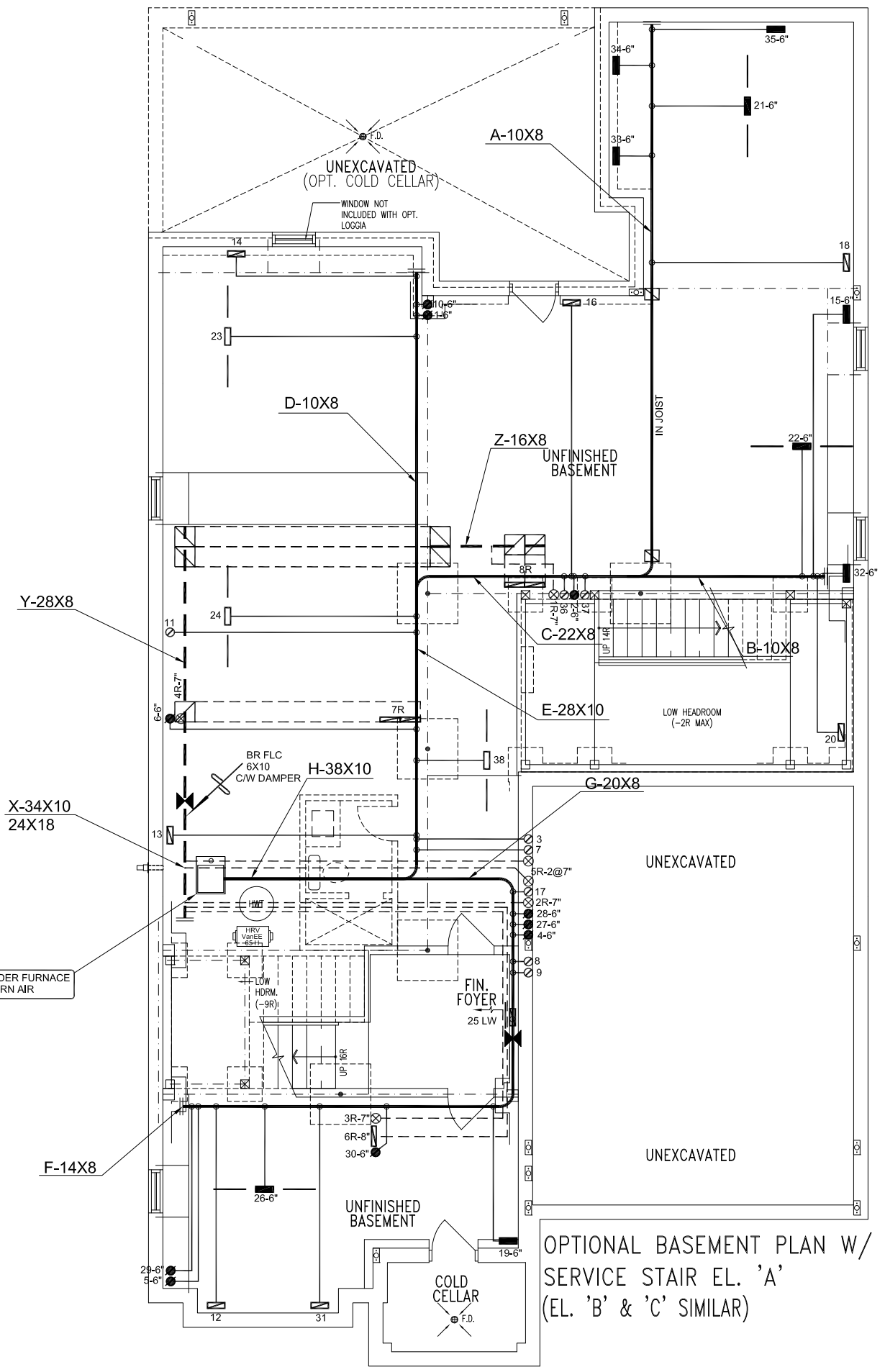
Supplemental tool for CAN/CSA-F280

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):	7.32
Building Configuration	
Type:	Detached
Number of Stories:	Two
Foundation:	Full
House Volume (m^3):	1973.1
Air Leakage/Ventilation	
Air Tightness Type:	Present (1961-) (3.57 ACH)
Custom BDT Data:	ELA @ 10 Pa. 2630.3 cm^2
	3.57 ACH @ 50 Pa
Mechanical Ventilation (L/s):	Total Supply 73.2 / Total Exhaust 73.2
Flue Size	
Flue #:	#1 #2 #3 #4
Diameter (mm):	0 0 0 0
Natural Infiltration Rates	
Heating Air Leakage Rate (ACH/H):	**0.350**
Cooling Air Leakage Rate (ACH/H):	**0.121**

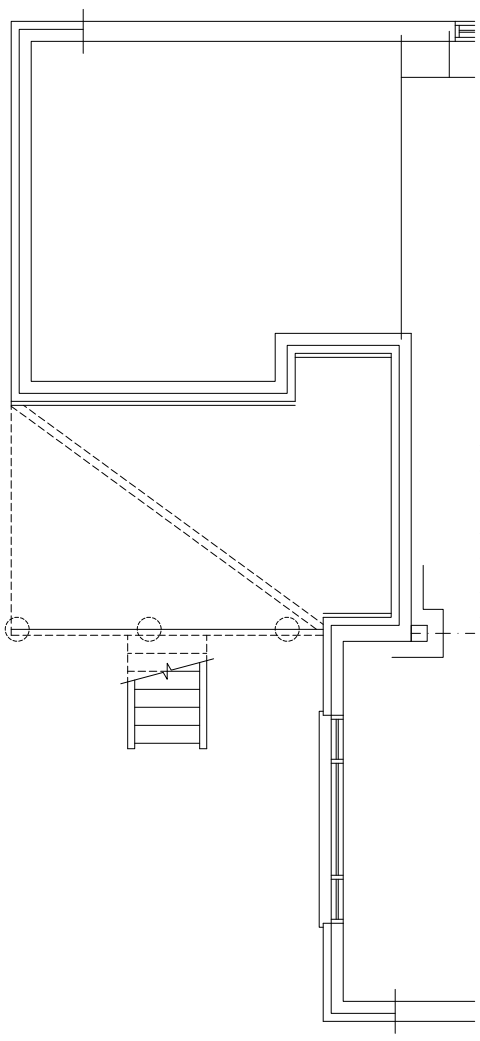
TYPE: 5005 - KNIGHTSWOOD OPT SERV STAIR

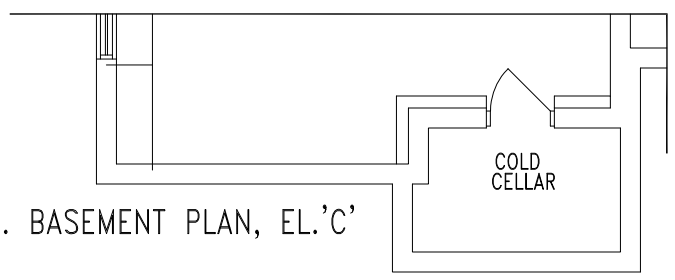
LO# 85453





OPTIONAL BASEMENT PLAN W/ SERVICE STAIR EL. 'A'
(EL. 'B' & 'C' SIMILAR)





PART. BASEMENT PLAN, EL.'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

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

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Client
GOLDPARK HOMES

Project Name
PINE VALLEY & TESTON
VAUGHAN, ONTARIO
OPT SERV STAIR
KNIGHTSWOOD
5005 4575 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 92496 BTU/H

UNIT DATA

MAKE	LENNOX	
MODEL	EL296UH110XE60C	
INPUT	110	MBTU/H
OUTPUT	106	MBTU/H
COOLING	5.0	TONS
FAN SPEED	1955	cfm @ 0.6" w.c.

# OF RUNS	S/A	R/A	FANS
3RD FLOOR			
2ND FLOOR	18	5	7
1ST FLOOR	13	3	3
BASEMENT	7	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

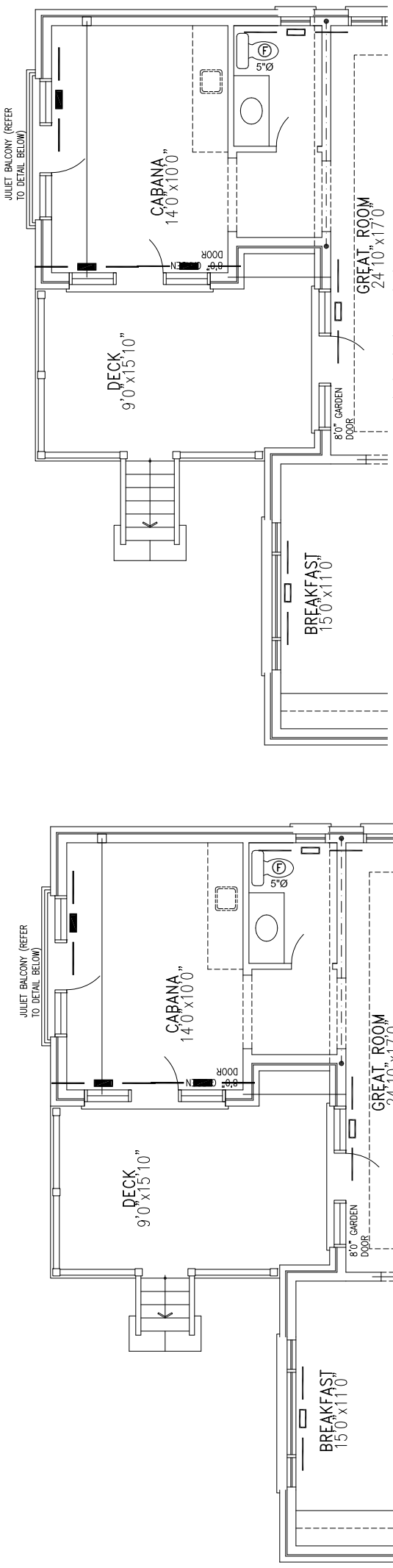
Sheet Title
BASEMENT HEATING LAYOUT

Date FEB/2020

Scale 1/8" = 1'-0"

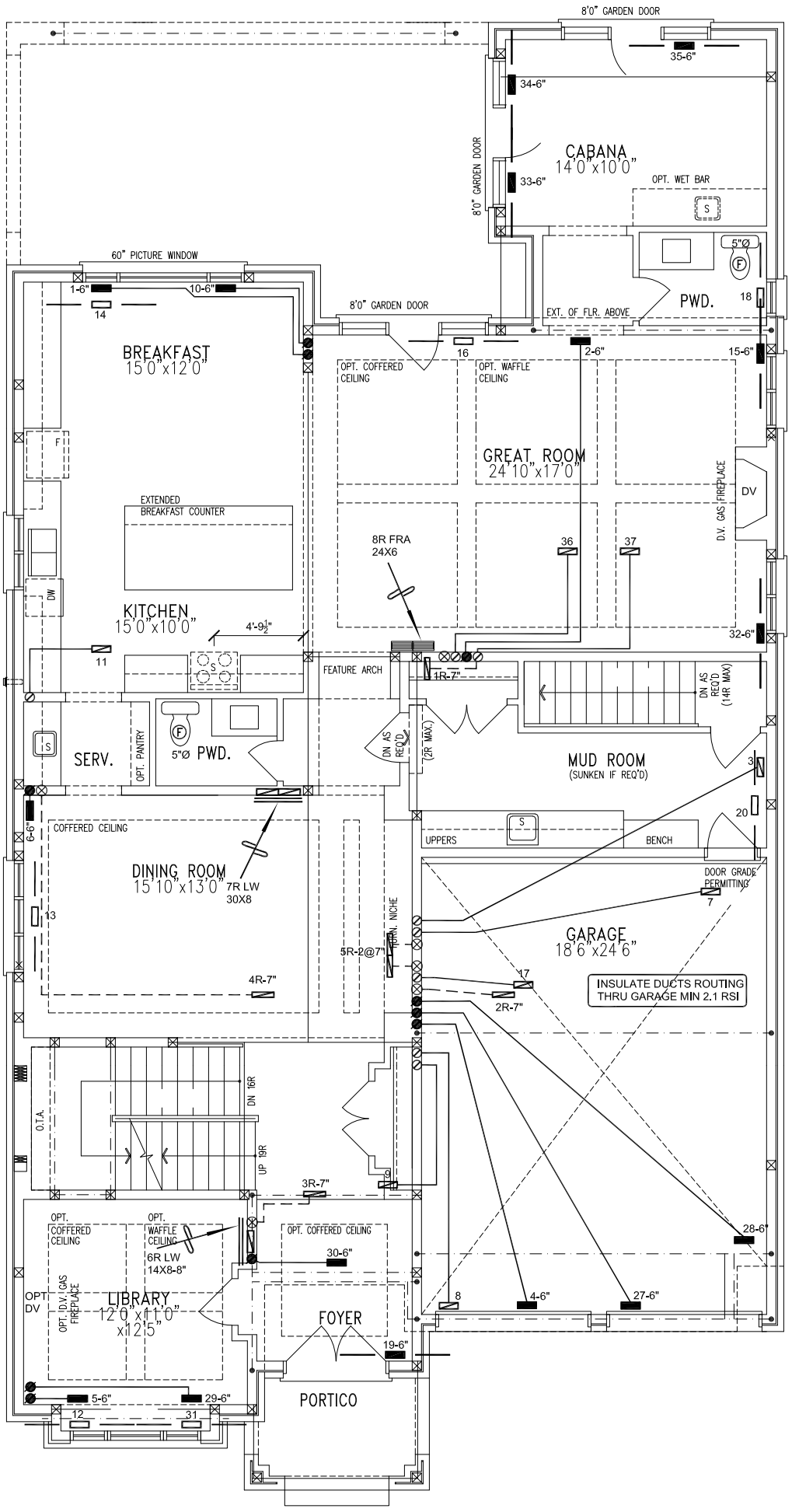
BCIN# 19669

LO# 85453

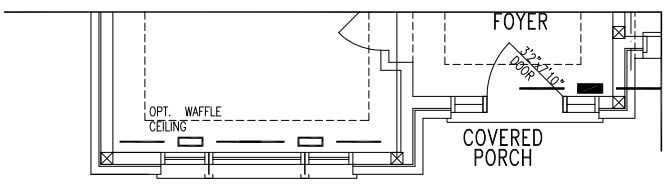


PART. GROUND FLOOR PLAN ELEV. 'A', 'B' & 'C' - L.O.D. COND.

PART. GROUND FLOOR PLAN ELEV. 'A', 'B' & 'C' - W.O.D. COND.



OPTIONAL GROUND FLOOR PLAN W/ SERVICE STAIR EL. 'A'



PART. GROUND FLOOR PLAN, EL.'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

PACKAGE A1

HVAC LEGEND

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	SUPPLY AIR BOOT ABOVE		6" SUPPLY AIR STACK 2nd FLOOR		FRA- FLOOR RETURN AIR GRILLE		REDUCER

No.	Description	Date
3.		
2.		
1.		

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Client

GOLDPARK HOMES

Project Name

PINE VALLEY & TESTON
VAUGHAN, ONTARIO
OPT SERV STAIR
KNIGHTSWOOD
5005 4575 sqft

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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.

Sheet Title

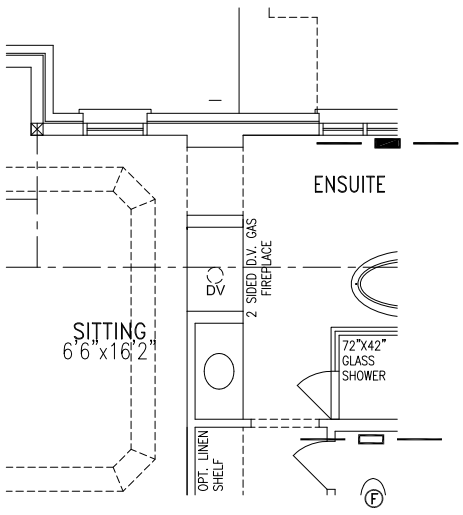
FIRST FLOOR HEATING LAYOUT

Date FEB/2020

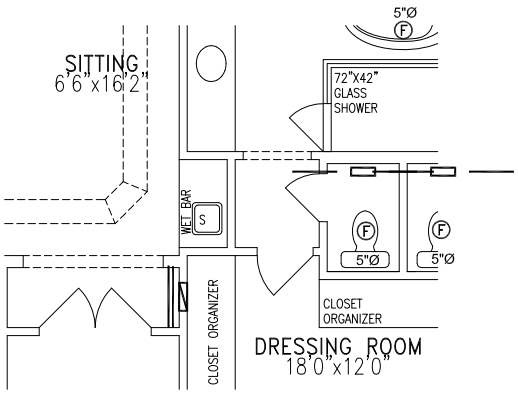
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BCIN# 19669

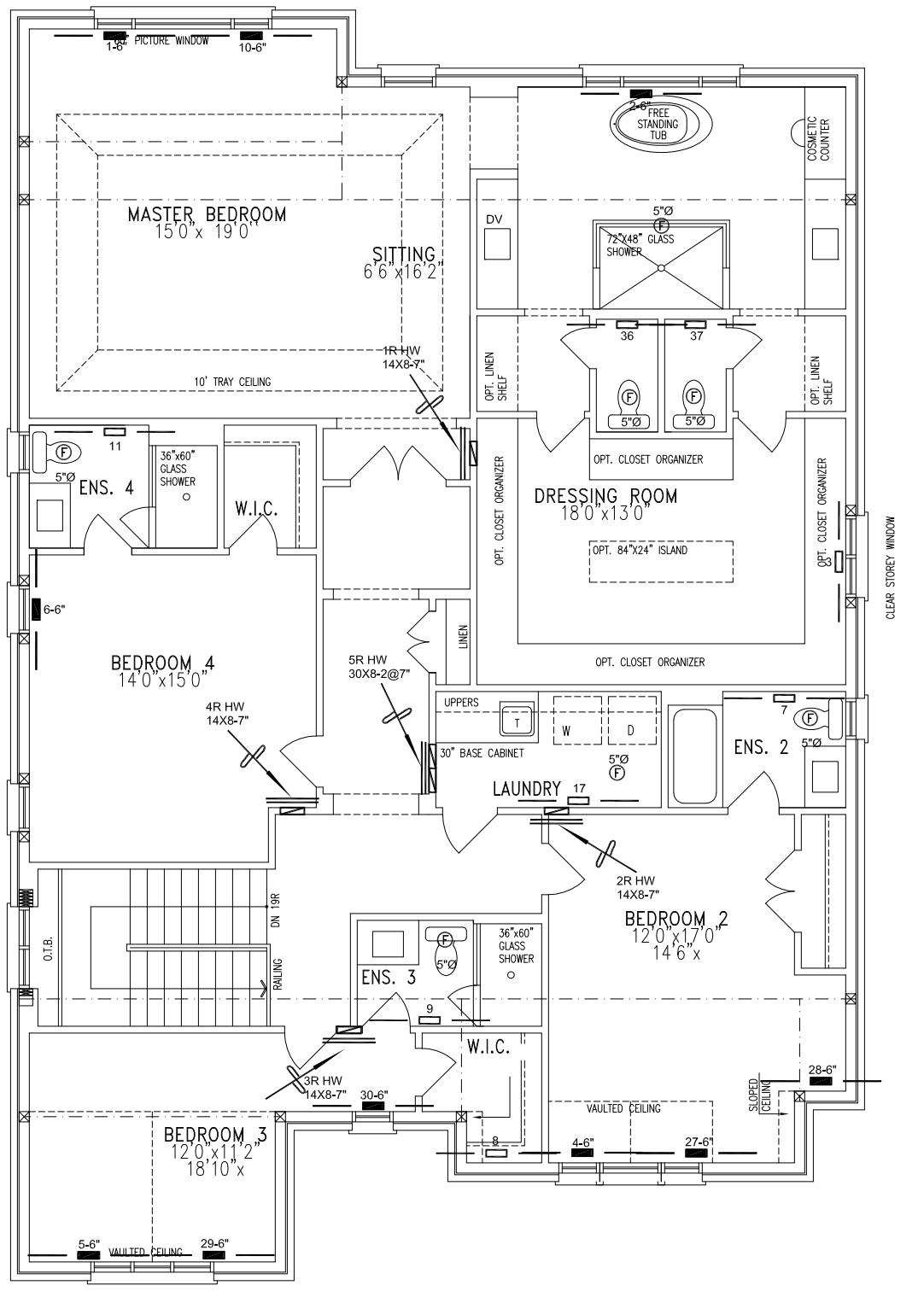
LO# 85453



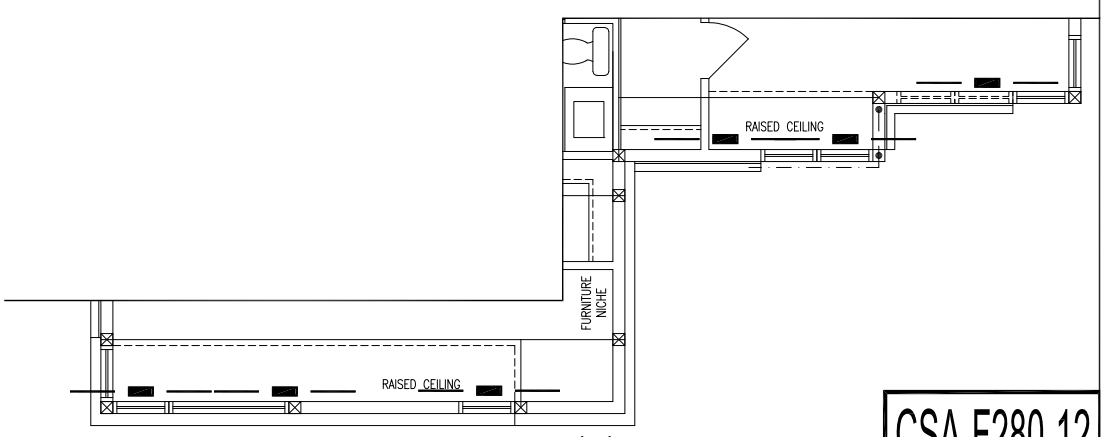
PART. SECOND FLOOR PLAN
OPT. SITTING AREA FIREPLACE



PART. SECOND FLOOR PLAN
OPT. SITTING AREA WET BAR



SECOND FLOOR PLAN, EL.'A'



PART. SECOND FLOOR PLAN, EL.'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

PACKAGE A1

HVAC LEGEND

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Client
GOLDPARK HOMES

Project Name
PINE VALLEY & TESTON
VAUGHAN, ONTARIO
OPT SERV STAIR
KNIGHTSWOOD
5005 4575 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
SECOND FLOOR HEATING LAYOUT

Date FEB/2020
Scale 1/8" = 1'-0"
BCIN# 19669
LO# 85453

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**		
VAUGHAN (WOODBRIDGE)				

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:** 5005 - KNIGHTSWOOD WOB **Project:** PINE VALLEY & TESTON

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.

September 12, 2018
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.

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

SITE NAME: PINE VALLEY & TESTON — WOB — DATE: Sep-18 — WINTER NATURAL AIR CHANGE RATE 0.416 — HEAT LOSS ΔT °F. 76 — CSA-F280-12
BUILDER: GOLD PARK HOMES — TYPE: 5005 - KNIGHTSWOOD — GFA: 4478 — LO# 79981 — SUMMER NATURAL AIR CHANGE RATE 0.139 — HEAT GAIN ΔT °F. 13 — SB-12 PACKAGE A1

ROOM USE			MBR			ENS			WIC			BED-2			BED-3			BED-4			ENS-2			WIC-2			ENS-3			ENS-4			WIC-3		
EXP. WALL			46			36			13			32			50			19			6			9			4			7			15		
CLG. HT.			11			10			10			11			11			10			10			10			10			10			10		
	FACTORS																																		
GRS.WALL AREA	LOSS	GAIN	506			360			130			352			550			190			60			90			40			70			150		
GLAZING				LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN
NORTH	21.3	15.6	0	0	0	0	0	0	6	128	94	18	383	281	0	0	0	0	0	0	8	170	125	0	0	0	0	0	0	0	0	0	0	0	0	0
EAST	21.3	40.5	0	0	0	0	0	0	0	0	0	70	1490	2833	50	1064	2023	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	20	426	809
SOUTH	21.3	24.3	0	0	0	0	0	0	0	0	0	0	0	0	12	255	291	32	681	777	0	0	0	0	0	0	0	0	0	8	170	194	0	0	0
WEST	21.3	40.5	50	1064	2023	34	724	1376	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
SKYLT.	37.2	101.5	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	0	0	0	0	0	0
DOORS	25.2	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	0	0	0	0	0	0
NET EXPOSED WALL	4.5	0.8	456	2035	343	326	1455	245	124	553	93	264	1178	198	488	2178	367	168	705	119	52	232	39	90	402	68	40	179	30	62	277	47	130	580	98
NET EXPOSED BSMT WALL ABOVE GR	3.6	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	0	0	0	0	0	0	0	0	0
EXPOSED CLG	1.3	0.6	533	684	313	323	416	190	247	317	145	254	326	149	272	349	160	285	366	167	60	77	35	48	62	28	140	180	82	105	135	62	54	69	32
NO ATTIC EXPOSED CLG	2.7	1.3	0	0	0	0	0	0	0	0	0	24	66	30	84	231	106	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	154	393	66	278	709	119	104	265	45	0	0	0	60	153	26	48	122	21	24	61	10	0	0	0	0	0	0
BASEMENT/CRAWL HEAT LOSS				0			0			0			0			0			0			0			0			0			0			0	
SLAB ON GRADE HEAT LOSS				0			0			0			0			0			0			0			0			0			0			0	
SUBTOTAL HT LOSS				3783			2593			1391			4152			4342			1752			632			586			419			582			1075	
SUB TOTAL HT GAIN					2679			1811			398			3611			2992			1064			225			116			123			303			939
LEVEL FACTOR / MULTIPLIER			0.20	0.35		0.20	0.35		0.20	0.35		0.20	0.35		0.20	0.35		0.20	0.35		0.20	0.35		0.20	0.35		0.20	0.35		0.20	0.35		0.20	0.35	
AIR CHANGE HEAT LOSS				1341			919			493			1472			1539			621			224			208			149			206			381	
AIR CHANGE HEAT GAIN					215			146			32			290			240			85			18			9			10			24			75
DUCT LOSS				0			0			188			562			588			0			86			79			57			0			0	
DUCT GAIN					0			0			112			484			417			0			24			13			13			0			0
HEAT GAIN PEOPLE	240		2		480	0		0	0		0	1		240	1		240	1		240	0		0	0		0	0		0	0		0	0		0
HEAT GAIN APPLIANCES/LIGHTS					694			0			694			694			694			694			0			0			0			0			0
TOTAL HT LOSS BTU/H				5124			3512			2072			6186			6470			2373			942			873			625			788			1456	
TOTAL HT GAIN x 1.3 BTU/H					5289			2543			1608			6914			5958			2708			348			180			189			426			1318

ROOM USE			LIB			DIN			KIT/GT			CAB			LAUN			PWD			FOY			MUD									WOB			BAS		
EXP. WALL			31			32			87			45			0			5			35			18									65			175		
CLG. HT.			11			11			11			11			10			11			11			12									10			10		
	FACTORS																																				
GRS.WALL AREA	LOSS	GAIN	341			352			957			495			0			55			385			216									650			1225		
GLAZING				LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN								LOSS	GAIN		LOSS	GAIN
NORTH	21.3	15.6	0	0	0	0	0	0	46	979	719	0	0	0	0	0	0	9	192	141	0	0	0	0	0	0							0	0	0	6	128	94
EAST	21.3	40.5	56	1192	2266	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
SOUTH	21.3	24.3	0	0	0	34	724	826	20	426	486	63	1341	1530	0	0	0	0	0	0	0	0	0	0	0	0							46	979	559	6	128	146
WEST	21.3	40.5	0	0	0	0	0	0	105	2234	4249	63	1341	2549	0	0	0	0	0	0	0	0	0	0	0	0							116	2468	2347	0	0	0
SKYLT.	37.2	101.5	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	0	0	0
DOORS	25.2	4.3	0	0	0	0	0	0	10	252	43	0	0	0	0	0	0	0	0	0	62	1565	264	20	505	85							10	252	43	20	505	85
NET EXPOSED WALL	4.5	0.8	285	1272	214	318	1419	239	776	3463	583	369	1647	277	0	0	0	46	205	35	323	1441	243	196	875	147							478	2133	359	0	0	0
NET EXPOSED BSMT WALL ABOVE GR	3.6	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							0	0	0	525	1889	318
EXPOSED CLG	1.3	0.6	0	0	0	0	0	0	0	0	0	0	0	0	102	131	60	0	0	0	0	0	0	0	0	0							0	0	0	0	0	0
NO ATTIC EXPOSED CLG	2.7	1.3	0	0	0	0	0	0	0	0	0	203	558	255	0	0	0	40	110	50	41	113	52	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	56	143	24	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			0										3211		
SLAB ON GRADE HEAT LOSS				0			0			0			0			0			0			0			0									1014				
SUBTOTAL HT LOSS				2464			2143			7354			4886			274			507			3120			1380									6847			5860		
SUB TOTAL HT GAIN					2480			1065			6079			4613			84			225			558			232									3308			643
LEVEL FACTOR / MULTIPLIER			0.30	0.53		0.30	0.53		0.30	0.53		0.30	0.53		0.20	0.35		0.30	0.53		0.30	0.53		0.30	0.53										0.50	1.51	
AIR CHANGE HEAT LOSS				1294			1125			3862			2566			97			266			1638			725											19126		
AIR CHANGE HEAT GAIN					199			86			489			371			7			18			45			19												317	
DUCT LOSS				0			0			0			0			37			0			0			0											0		
DUCT GAIN					0			0			0			0			78			0			0			0												0	
HEAT GAIN PEOPLE	240		0		0	0		0	0		0	0		0	0		0	0		0	0		0	0		0							0		0	0		0
HEAT GAIN APPLIANCES/LIGHTS					694			694			694			694			694			0			0			694									0			694
TOTAL HT LOSS BTU/H				3757			3268			11217			7452			408			773			4758			2104									7861			24986		
TOTAL HT GAIN x 1.3 BTU/H					4386			2398			9440			7380			1122			317			784			1228									4300			2150

TOTAL HEAT GAIN BTU/H: 61521 — TONS: 5.13 — LOSS DUE TO VENTILATION LOAD BTU/H: 3181 — STRUCTURAL HEAT LOSS: 97005 — TOTAL COMBINED HEAT LOSS BTU/H: 100185

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

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SITE NAME: PINE VALLEY & TESTON — WOB
BUILDER: GOLD PARK HOMES — TYPE: 5005 - KNIGHTSWOOD — DATE: Nov-18 — GFA: 4478 — LO# 79981

HEATING CFM	1955	COOLING CFM	1955	furnace pressure	0.6
TOTAL HEAT LOSS	97,005	TOTAL HEAT GAIN	60,985	furnace filter	0.08
AIR FLOW RATE CFM	20.15	AIR FLOW RATE CFM	32.06	a/c coil pressure	0.2
				available pressure for s/a & r/a	0.32
				plenum pressure s/a	0.17
				max s/a dif press. loss	0.02
				min adjusted pressure s/a	0.15
				r/a pressure	0.15
				r/a grille press. Loss	0.02
				adjusted pressure r/a	0.13

^LENNOX
EL296UH110XE60C 110

FAN SPEED	
LOW	0
MEDLOW	1380
MEDIUM	1505
MEDIUM HIGH	1685
HIGH	1955

AFUE = 96 %
INPUT (BTU/H) = 110,000
OUTPUT (BTU/H) = **106,000**

DESIGN CFM = **1955** CFM @ .6 " E.S.P.

TEMPERATURE RISE 50 °F

RUN COUNT	4th	3rd	2nd	1st	Bas
S/A	0	0	18	13	8
R/A	0	0	5	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	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	ENS-2	WIC-2	ENS-3	MBR	ENS-4	LIB	DIN	KIT/GT	KIT/GT	KIT/GT	LAUN	PWD	FOY	MUD	BAS	BAS	BAS	BAS
RM LOSS MBH.	2.56	2.77	2.07	2.06	3.23	2.37	0.94	0.87	0.62	2.56	0.79	1.88	3.27	2.80	2.80	2.80	0.41	0.77	4.76	2.10	4.11	4.11	4.11	4.11
CFM PER RUN HEAT	52	56	42	42	65	48	19	18	13	52	16	38	66	57	57	57	8	16	96	42	83	83	83	83
RM GAIN MBH.	2.64	2.25	1.61	2.30	2.98	2.71	0.35	0.18	0.19	2.64	0.43	2.19	2.40	2.36	2.36	2.36	1.12	0.32	0.78	1.23	0.81	0.81	0.81	0.81
CFM PER RUN COOLING	85	72	52	74	96	87	11	6	6	85	14	70	77	76	76	76	36	10	25	39	26	26	26	26
ADJUSTED PRESSURE	0.15	0.16	0.16	0.16	0.15	0.15	0.16	0.16	0.16	0.15	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.15	0.16	0.15	0.15	0.15	0.15
ACTUAL DUCT LGH.	70	70	53	49	75	48	47	48	53	64	59	57	29	52	69	54	36	73	40	47	77	60	69	38
EQUIVALENT LENGTH	200	200	170	160	170	160	200	150	170	170	150	140	103	120	140	110	200	170	210	160	150	140	150	90
TOTAL EFFECTIVE LENGTH	270	270	223	209	245	208	247	198	223	234	209	197	132	172	209	164	236	243	250	207	227	200	219	128
ADJUSTED PRESSURE	0.05	0.06	0.07	0.07	0.06	0.07	0.06	0.08	0.07	0.06	0.07	0.08	0.12	0.09	0.07	0.1	0.07	0.06	0.06	0.08	0.06	0.07	0.07	0.11
ROUND DUCT SIZE	**6**	**6**	5	5	**6**	**6**	4	4	4	**6**	4	5	5	5	**6**	5	4	4	**6**	4	**6**	**6**	**6**	5
HEATING VELOCITY (ft/min)	265	286	308	308	331	245	218	207	149	265	184	279	485	419	291	419	92	184	489	482	423	423	423	609
COOLING VELOCITY (ft/min)	433	367	382	543	489	444	126	69	69	433	161	514	565	558	388	558	413	115	127	447	133	133	133	191
OUTLET GRILL SIZE	4X10	4X10	3X10	3X10	4X10	4X10	3X10	3X10	3X10	4X10	3X10	3X10	3X10	3X10	4X10	3X10	3X10	3X10	4X10	3X10	4X10	4X10	4X10	3X10
TRUNK	D	C	E	G	F	E	E	G	G	D	E	F	E	D	B	C	G	A	F	C	A	B	D	E

RUN #	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39
ROOM NAME	BAS	BAS	BED-2	BED-2	BED-3	WIC-3	LIB	KIT/GT	CAB	CAB	CAB	ENS	ENS	BAS	BAS
RM LOSS MBH.	4.11	4.11	2.06	2.06	3.23	1.46	1.88	2.80	2.48	2.48	2.48	0.37	0.37	4.11	4.11
CFM PER RUN HEAT	83	83	42	42	65	29	38	57	50	50	50	7	7	83	83
RM GAIN MBH.	0.81	0.81	2.30	2.30	2.98	1.32	2.19	2.36	2.46	2.46	2.46	0.15	0.15	0.81	0.81
CFM PER RUN COOLING	26	26	74	74	96	42	70	76	79	79	79	5	5	26	26
ADJUSTED PRESSURE	0.15	0.15	0.16	0.16	0.15	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.15	0.15
ACTUAL DUCT LGH.	34	50	52	55	80	63	51	55	69	71	82	56	58	23	58
EQUIVALENT LENGTH	110	150	170	160	170	200	160	120	150	130	140	200	190	140	170
TOTAL EFFECTIVE LENGTH	144	200	222	215	250	263	211	175	219	201	222	256	248	163	228
ADJUSTED PRESSURE	0.1	0.07	0.07	0.07	0.06	0.06	0.07	0.09	0.07	0.08	0.07	0.06	0.06	0.09	0.06
ROUND DUCT SIZE	5	**6**	5	5	**6**	5	5	5	**6**	5	**6**	4	4	5	**6**
HEATING VELOCITY (ft/min)	609	423	308	308	331	213	279	419	255	367	255	80	80	609	423
COOLING VELOCITY (ft/min)	191	133	543	543	489	308	514	558	403	580	403	57	57	191	133
OUTLET GRILL SIZE	3X10	4X10	3X10	3X10	4X10	3X10	3X10	3X10	4X10	3X10	4X10	3X10	3X10	3X10	4X10
TRUNK	G	F	G	G	F	F	F	B	A	A	A	C	C	E	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	249	0.06	9	10	x	8	448	TRUNK G	662	0.06	12.9	20	x	8	596
TRUNK B	197	0.07	7.9	8	x	8	443	TRUNK H	1961	0.05	20.3	38	x	10	743
TRUNK C	698	0.06	13.2	20	x	8	628	TRUNK I	0	0.00	0	0	x	8	0
TRUNK D	244	0.05	9.3	10	x	8	439	TRUNK J	0	0.00	0	0	x	8	0
TRUNK E	1299	0.05	17.4	28	x	10	668	TRUNK K	0	0.00	0	0	x	8	0
TRUNK F	414	0.06	10.8	14	x	8	532	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	1640	0.05	19	34	x	10	695
TRUNK Y	955	0.05	15.5	28	x	8	614
TRUNK Z	480	0.05	12	16	x	8	540
DROP	1955	0.05	20.3	24	x	18	652

RETURN AIR #	1	2	3	4	5	6	7	8								BR
	0	0	0	0	2@7"	0	0	0	0	0	0	0	0	0	0	
AIR VOLUME	115	140	115	115	240	200	360	365	0	0	0	0	0	0	0	305
PLENUM PRESSURE	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13
ACTUAL DUCT LGH.	84	51	62	59	47	49	30	51	1	1	1	1	1	1	1	14
EQUIVALENT LENGTH	200	135	185	185	135	140	170	195	0	0	0	0	0	0	0	145
TOTAL EFFECTIVE LH	284	186	247	244	182	189	200	246	1	1	1	1	1	1	1	159
ADJUSTED PRESSURE	0.05	0.07	0.05	0.05	0.07	0.07	0.07	0.05	13.36	13.36	13.36	13.36	13.36	13.36	13.36	0.08
ROUND DUCT SIZE	7	6.9	7	7	8.5	7.9	9.9	10.8	0	0	0	0	0	0	0	9
INLET GRILL SIZE	8	8	8	8	8	8	8	8	0	0	0	0	0	0	0	8
	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
INLET GRILL SIZE	14	14	14	14	30	14	30	30	0	0	0	0	0	0	0	30

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: 5005 - KNIGHTSWOOD LO # 79981
SITE NAME: PINE VALLEY & TESTON WOB

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	7	@ 10.6 cfm	74.2	cfm
Other Rooms	7	@ 10.6 cfm	74.2	cfm
Table 9.32.3.A.		TOTAL	222.6	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	222.6	cfm
Less Principal Ventil. Capacity	155	cfm
Required Supplemental Capacity	67.6	cfm

PRINCIPAL EXHAUST FAN CAPACITY

Model: VANEE 65H Location: BSMT

155.0 cfm 3.0 sones [✓] HVI Approved

PRINCIPAL EXHAUST HEAT LOSS CALCULATION

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

SUPPLEMENTAL FANS NUTONE

Location	Model	cfm	HVI	Sones
ENS	QTXEN050C	50	✓	0.3
ENS-2	QTXEN050C	50	✓	0.3
ENS-4	QTXEN050C	50	✓	0.3
PWD	QTXEN050C	50	✓	0.3

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: 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: September-18

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#: 79981 Model: 5005 - KNIGHTSWOOD Builder: GOLD PARK HOMES Date: 9/12/2018

Volume Calculation

House Volume

Level	Floor Area (ft^2)	Floor Height (ft)	Volume (ft^3)
Bsmt	2074	10	20740
First	2074	11	22814
Second	2409	10	24090
Third	0	9	0
Fourth	0	9	0
		Total:	67,644.0 ft^3
		Total:	1915.5 m^3

Air Change & Delta T Data

WINTER NATURAL AIR CHANGE RATE	0.416
SUMMER NATURAL AIR CHANGE RATE	0.139

Design Temperature Difference

	Tin °C	Tout °C	ΔT °C	ΔT °F
Winter DTDh	22	-20	42	76
Summer DTDc	24	31	7	13

5.2.3.1 Heat Loss due to Air Leakage

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

0.416 x 532.07 x 42 °C x 1.2 = 11211 W

= 38253 Btu/h

6.2.6 Sensible Gain due to Air Leakage

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

= 0.139 x 532.07 x 7 °C x 1.2 = 633 W

= 2160 Btu/h

5.2.3.2 Heat Loss due to Mechanical Ventilation

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

155 CFM x 76 °F x 1.08 x 0.25 = 3181 Btu/h

6.2.7 Sensible heat Gain due to Ventilation

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

155 CFM x 13 °F x 1.08 x 0.25 = 536 Btu/h

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

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

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	38,253	12,707	1.505
2	0.3		21,853	0.525
3	0.2		21,580	0.355
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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Tel: 905.619.2300 Fax: 905.619.2375
Web: www.hvacdesigns.ca E-mail: info@hvacdesigns.ca

HEAT LOSS AND GAIN SUMMARY SHEET

MODEL: 5005 - KNIGHTSWOOD WOB **BUILDER:** GOLD PARK HOMES
SFQT: 4478 **LO#** 79981 **SITE:** PINE VALLEY & TESTON

DESIGN ASSUMPTIONS

HEATING	°F	COOLING	°F
OUTDOOR DESIGN TEMP.	-4	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:	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):	67644.0	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:	7.0 ft
LENGTH: 75.0 ft WIDTH:	45.0 ft	EXPOSED PERIMETER:	175.0 ft
WOB INSULATION CONFIGURATION	SCB_9	WOB EXPOSED PERIMETER	65.0 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	29.80
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

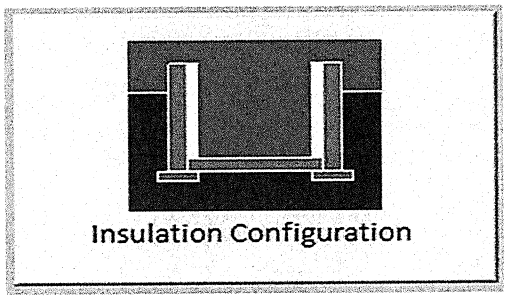
HVAC Designs Ltd.
375 Finley Ave, Suite 202
Ajax ON, L1S 2E2
905-619-2300

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 sand, loam, clay
Water Table:	Normal (7-10 m, 23-33 ft)

Foundation Dimensions		
Floor Length (m):	6.1	
Floor Width (m):	13.7	
Exposed Perimeter (m):	53.3	
Wall Height (m):	3.0	
Depth Below Grade (m):	1.88	
Window Area (m^2):	1.1	
Door Area (m^2):	1.9	


Insulation Configuration

Radiant Slab		
Heated Fraction of the Slab:	0	
Fluid Temperature (°C):	33	
Design Months		
Heating Month	1	
Foundation Loads		
Heating Load (Watts):	**941**	

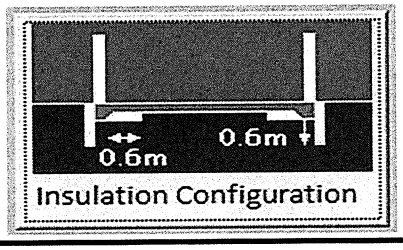
TYPE: 5005 - KNIGHTSWOOD WOB
LO# 79981

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 sand, loam, clay
Water Table:	Normal (7-10 m, 23-33 ft)

Foundation Dimensions		
Length (m):	3.0	
Width (m):	13.7	
Exposed Perimeter (m):	19.8	

Radiant Slab		
Heated Fraction of the Slab:	0	
Fluid Temperature (°C):	33	
Design Months		
Heating Month	1	
Results		
Heating Load (Watts):	**297**	

TYPE: 5005 - KNIGHTSWOOD WOB
LO# 79981

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905-619-2300

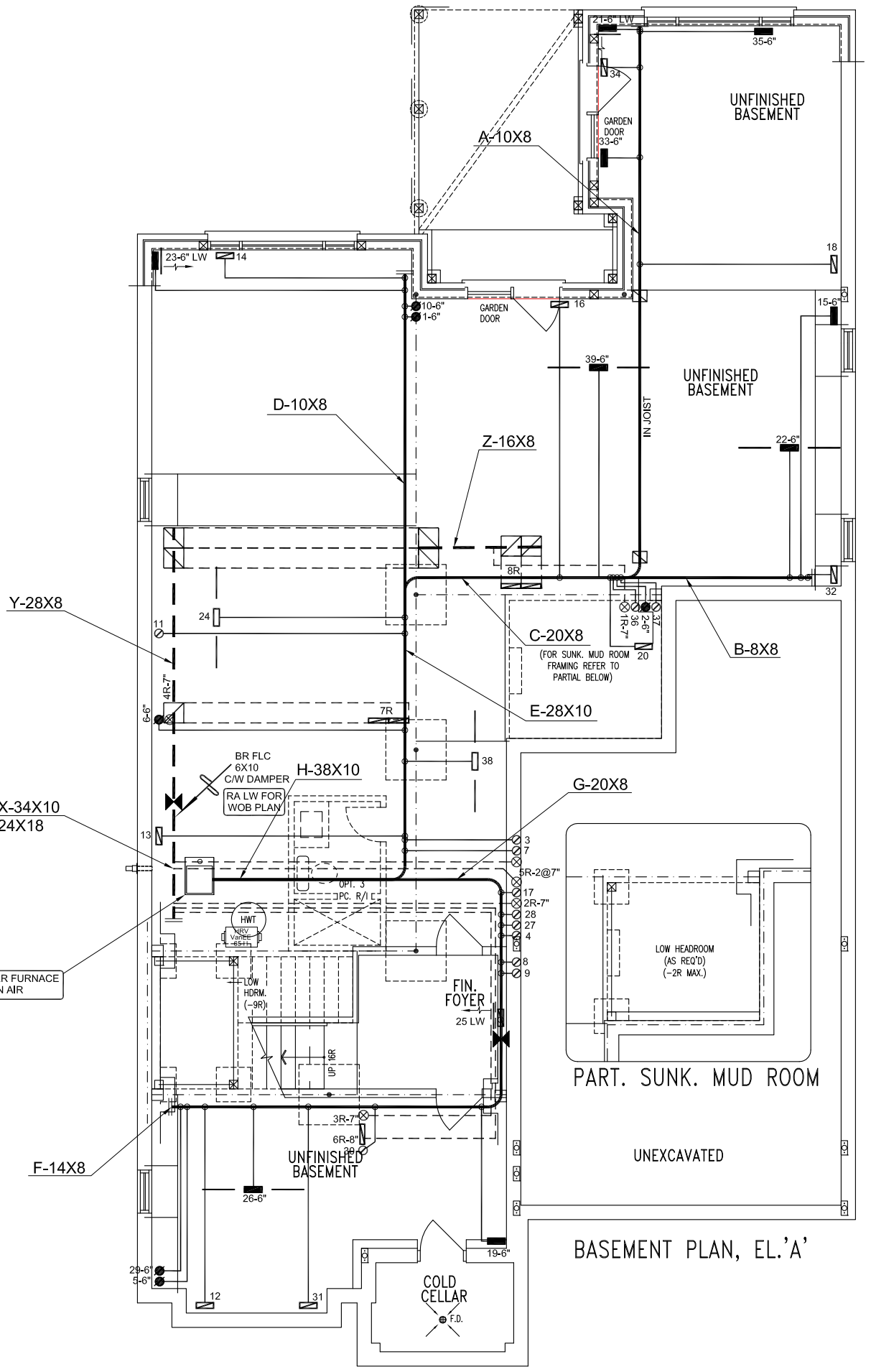
Air Infiltration Residential Load Calculator

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):	9.45
Building Configuration	
Type:	Detached
Number of Stories:	Two
Foundation:	Full
House Volume (m^3):	1915.5
Air Leakage/Ventilation	
Air Tightness Type:	Present (1961-) (3.57 ACH)
Custom BDT Data:	ELA @ 10 Pa. 2553.4 cm^2
	3.57 ACH @ 50 Pa
Mechanical Ventilation (L/s):	Total Supply 73.2 / Total Exhaust 73.2
Flue Size	
Flue #:	#1 #2 #3 #4
Diameter (mm):	0 0 0 0
Natural Infiltration Rates	
Heating Air Leakage Rate (ACH/H):	**0.416**
Cooling Air Leakage Rate (ACH/H):	**0.139**

TYPE: 5005 - KNIGHTSWOOD WOB

LO# 79981



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

WOB | **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.	REVISED AS PER ARCHITECTURALS	FEB/2020
1.	3R RELOCATED	NOV/2018

REVISIONS

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Client
GOLDPARK HOMES

Project Name
PINE VALLEY & TESTON
VAUGHAN, ONTARIO

KNIGHTSWOOD - WOB
5005 4472 sqft

HVAC DESIGNS LTD.
375 Finley Ave. Suite 202 - Ajax, Ontario
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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 100185 BTU/H

UNIT DATA

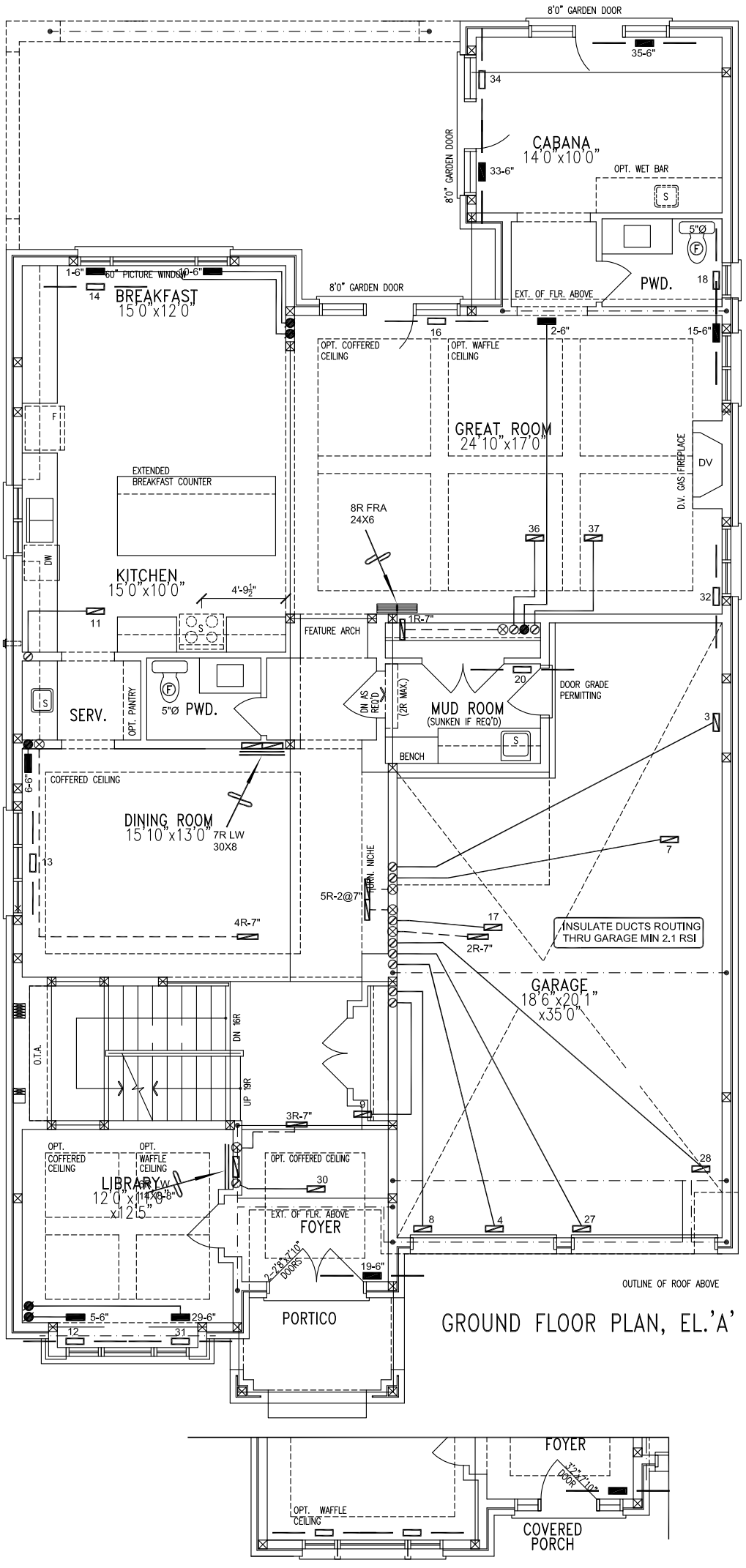
MAKE	LENNOX	
MODEL	EL296UH110XE60C	
INPUT	110	MBTU/H
OUTPUT	106	MBTU/H
COOLING	5.0	TONS
FAN SPEED	1955	cfm @ 0.6" w.c.

# OF RUNS	S/A	R/A	FANS
3RD FLOOR			
2ND FLOOR	18	5	7
1ST FLOOR	13	3	3
BASEMENT	8	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/2018
Scale 1/8" = 1'-0"
BCIN# 19669
LO# 79981



GROUND FLOOR PLAN, EL.'A'

PART. GROUND FLOOR PLAN, EL.'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

WOB | 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.	REVISED AS PER ARCHITECTURALS	FEB/2020
1.	3R RELOCATED	NOV/2018

REVISIONS

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Client
GOLDPARK HOMES

Project Name
PINE VALLEY & TESTON
VAUGHAN, ONTARIO

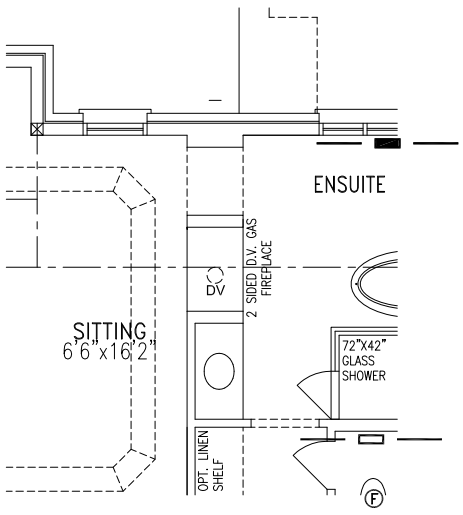
KNIGHTSWOOD - WOB
5005 4472 sqft

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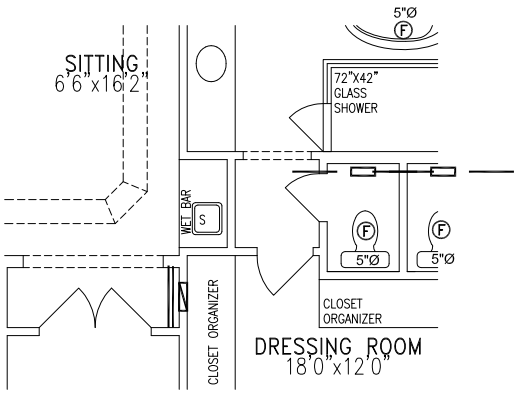
Installation to comply with the latest Ontario Building Code. All supply branch outlets shall be equipped with a manual balancing damper. Ductwork which passes through the garage or unheated spaces shall be adequately insulated and be gas-proofed.

Sheet Title
FIRST FLOOR HEATING LAYOUT

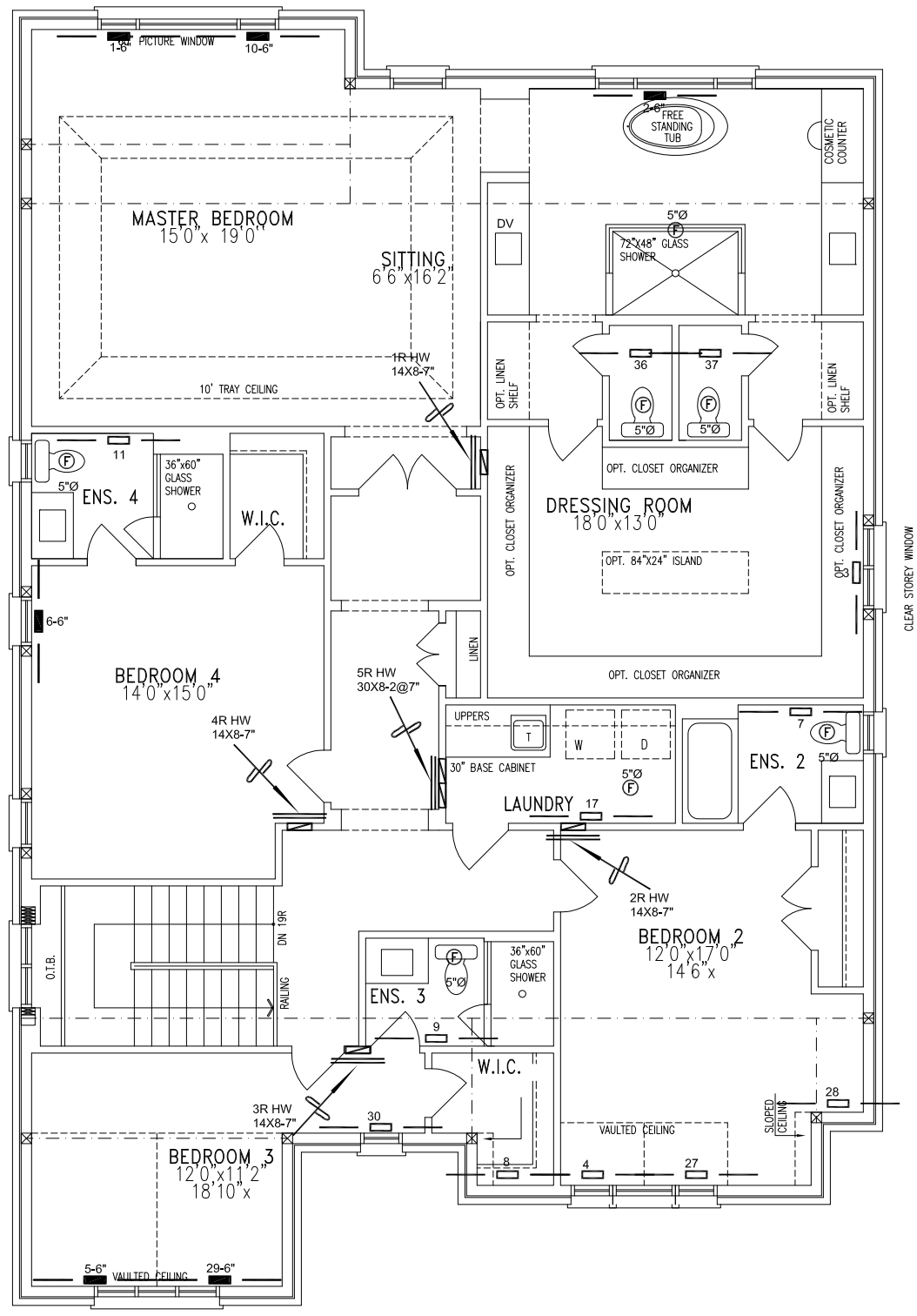
Date SEPT/2018
Scale 1/8" = 1'-0"
BCIN# 19669
LO# 79981



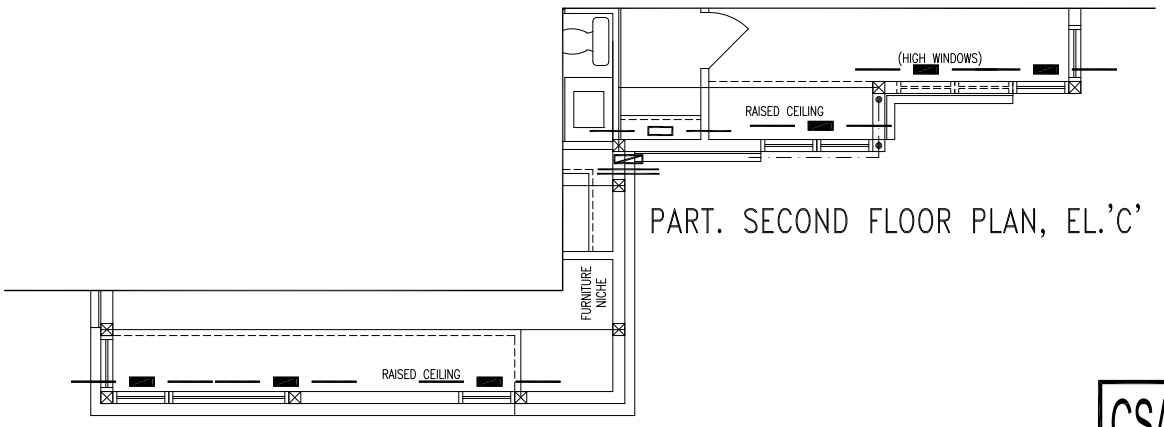
PART. SECOND FLOOR PLAN
OPT. SITTING AREA FIREPLACE



PART. SECOND FLOOR PLAN
OPT. SITTING AREA WET BAR



SECOND FLOOR PLAN, EL.'A'



PART. SECOND FLOOR PLAN, EL.'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

WOB | 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
	REVISIONS	
3.		
2.	REVISED AS PER ARCHITECTURALS	FEB/2020
1.	3R RELOCATED	NOV/2018

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Client
GOLDPARK HOMES

Project Name
PINE VALLEY & TESTON
VAUGHAN, ONTARIO

KNIGHTSWOOD - WOB
5005 4472 sqft

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L1S 2E2 Tel. 905.619.2300 - 905.420.5300 Fax 905.619.2375
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Sheet Title
SECOND FLOOR HEATING LAYOUT

Date SEPT/2018
Scale 1/8" = 1'-0"
BCIN# 19669
LO# 79981

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**		
VAUGHAN (WOODBRIDGE)				

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:** 5005 - KNIGHTSWOOD WOB OPT SERV STAIR **Project:** PINE VALLEY & TESTON

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.

February 26, 2020
Date

Michael O'Rourke
Signature of Designer

NOTE:

1. For the purposes of this form, "individual" means the "person" referred to in Clause 3.2.4.7(1) d).of Division C, Article 3.2.5.1. of Division C, and all other persons who are exempt from qualification under Subsections 3.2.4. and 3.2.5. of Division C.
2. Schedule 1 is not required to be completed by a holder of a license, temporary license, or a certificate of authorization, issued by the Ontario Association of Architects. Schedule 1 is also not required to be completed by a holder of a license to practise, a limited license to practise, or a certificate of authorization, issued by the Association of Professional Engineers of Ontario.

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SITE NAME: PINE VALLEY & TESTON | WOB OPT SERV STAIR | DATE: Feb-20 | WINTER NATURAL AIR CHANGE RATE 0.416 | HEAT LOSS ΔT °F. 76 | CSA-F280-12

BUILDER: GOLD PARK HOMES | TYPE: 5005 - KNIGHTSWOOD | GFA: 4575 | LO# 85455 | SUMMER NATURAL AIR CHANGE RATE 0.139 | HEAT GAIN ΔT °F. 13 | SB-12 PACKAGE A1

ROOM USE			MBR			ENS			WIC			BED-2			BED-3			BED-4			ENS-2			WIC-2			ENS-3			ENS-4			WIC-3		
EXP. WALL			46			36			13			32			50			19			6			9			4			7			15		
CLG. HT.			11			10			10			11			11			10			10			10			10			10			10		
	FACTORS																																		
GRS.WALL AREA	LOSS	GAIN	506			360			130			352			550			190			60			90			40			70			150		
GLAZING			LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN	
NORTH	21.3	15.6	0	0	0	0	0	0	6	128	94	18	383	281	0	0	0	0	0	0	8	170	125	0	0	0	0	0	0	0	0	0	0	0	0
EAST	21.3	40.5	0	0	0	0	0	0	0	0	0	70	1490	2833	50	1064	2023	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	20	426	809
SOUTH	21.3	24.3	0	0	0	0	0	0	0	0	0	0	0	0	12	255	291	32	681	777	0	0	0	0	0	0	0	0	0	8	170	194	0	0	0
WEST	21.3	40.5	50	1064	2023	34	724	1376	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
SKYLT.	37.2	101.5	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	0	0	0	0	0	0
DOORS	25.2	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	0	0	0	0	0	0
NET EXPOSED WALL	4.5	0.8	456	2035	343	326	1455	245	124	553	93	264	1178	198	488	2178	367	158	705	119	52	232	39	90	402	68	40	179	30	62	277	47	130	580	98
NET EXPOSED BSMT WALL ABOVE GR	3.6	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	0	0	0	0	0	0	0	0	0
EXPOSED CLG	1.3	0.6	533	684	313	323	415	190	247	317	145	254	326	149	272	349	160	285	366	167	60	77	35	48	62	28	140	180	82	105	135	62	54	69	32
NO ATTIC EXPOSED CLG	2.7	1.3	0	0	0	0	0	0	0	0	0	24	66	30	84	231	106	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	25	64	11	278	709	119	104	265	45	0	0	0	60	153	26	48	122	21	24	61	10	0	0	0	0	0	0
BASEMENT/CRAWL HEAT LOSS				0			0			0			0			0			0			0			0			0			0			0	
SLAB ON GRADE HEAT LOSS				0			0			0			0			0			0			0			0			0			0			0	
SUBTOTAL HT LOSS				3783			2593			1062			4152			4342			1752			632			586			419			582			1075	
SUB TOTAL HT GAIN					2679			1811			343			3611			2992			1064			225			116			123			303			939
LEVEL FACTOR / MULTIPLIER			0.20	0.37		0.20	0.37		0.20	0.37		0.20	0.37		0.20	0.37		0.20	0.37		0.20	0.37		0.20	0.37		0.20	0.37		0.20	0.37		0.20	0.37	
AIR CHANGE HEAT LOSS				1403			962			394			1540			1610			650			234			217			156			216			399	
AIR CHANGE HEAT GAIN					221			149			28			297			246			88			19			10			10			25			77
DUCT LOSS				0			0			146			569			595			0			87			80			57			0			0	
DUCT GAIN					0			0			109			486			419			0			24			13			13			0			0
HEAT GAIN PEOPLE	240		2		480	0		0	0		0	1		240	1		240	1		240	0		0	0		0	0		0	0		0	0		0
HEAT GAIN APPLIANCES/LIGHTS					714			0			714			714			714			714			0			0			0			0			0
TOTAL HT LOSS BTU/H				5186			3554			1601			6260			6548			2401			953			883			632			797			1474	
TOTAL HT GAIN x 1.3 BTU/H					5323			2548			1552			6954			5995			2737			348			180			190			426			1321

ROOM USE			LIB			DIN			KIT/GT			CAB			LAUN			PWD			FOY			MUD									WOB			BAS		
EXP. WALL			31			32			77			45			0			5			35			32									65			175		
CLG. HT.			11			11			11			11			10			11			11			12									10			10		
	FACTORS																																					
GRS.WALL AREA	LOSS	GAIN	341			352			847			495			0			55			385			384									650			1225		
GLAZING			LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN								LOSS	GAIN		LOSS	GAIN	
NORTH	21.3	15.6	0	0	0	0	0	0	46	979	719	0	0	0	0	0	0	9	192	141	0	0	0	0	0	0							0	0	0	6	128	94
EAST	21.3	40.5	56	1192	2266	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
SOUTH	21.3	24.3	0	0	0	34	724	826	20	426	486	63	1341	1530	0	0	0	0	0	0	0	0	0	0	0	0							46	979	559	6	128	146
WEST	21.3	40.5	0	0	0	0	0	0	105	2234	4249	63	1341	2549	0	0	0	0	0	0	0	0	0	0	0	0							116	2468	2347	0	0	0
SKYLT.	37.2	101.5	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	0	0	0
DOORS	25.2	4.3	0	0	0	0	0	0	10	252	43	0	0	0	0	0	0	0	0	0	62	1565	264	20	505	85							10	252	43	20	505	85
NET EXPOSED WALL	4.5	0.8	285	1272	214	318	1419	239	666	2972	501	369	1647	277	0	0	0	46	205	35	323	1441	243	364	1624	274							478	2133	359	0	0	0
NET EXPOSED BSMT WALL ABOVE GR	3.6	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							0	0	0	525	1889	318
EXPOSED CLG	1.3	0.6	0	0	0	0	0	0	0	0	0	0	0	0	102	131	60	0	0	0	0	0	0	0	0	0							0	0	0	0	0	0
NO ATTIC EXPOSED CLG	2.7	1.3	0	0	0	0	0	0	0	0	0	203	558	255	0	0	0	40	110	50	41	113	52	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	56	143	24	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			0											3211		
SLAB ON GRADE HEAT LOSS				0			0			0			0			0			0			0			0									1014				
SUBTOTAL HT LOSS				2464			2143			6864			4886			274			507			3120			2129									6847			5860		
SUB TOTAL HT GAIN					2480			1065			5996			4613			84			225			558			359									3308			643
LEVEL FACTOR / MULTIPLIER			0.30	0.53		0.30	0.53		0.30	0.53		0.30	0.53		0.20	0.37		0.30	0.53		0.30	0.53		0.30	0.53											0.50	1.55	
AIR CHANGE HEAT LOSS				1317			1146			3669			2612			102			271			1668			1138												19702		
AIR CHANGE HEAT GAIN					204			88			494			380			7			19			46			30													325
DUCT LOSS				0			0			0			0			38			0			0			0												0		
DUCT GAIN					0			0			0			0			81			0			0			0													0
HEAT GAIN PEOPLE	240		0		0	0		0	0		0	0		0	0		0	0		0	0		0	0		0							0		0	0		0
HEAT GAIN APPLIANCES/LIGHTS					714			714			714			714			714			0			0			714									0			714
TOTAL HT LOSS BTU/H				3781			3288			10533			7498			413			778			4787			3268									7861			25562		
TOTAL HT GAIN x 1.3 BTU/H					4419			2427			9366			7419			1152			317			785			1433									4300			2187

TOTAL HEAT GAIN BTU/H: 61915 | TONS: 5.16 | LOSS DUE TO VENTILATION LOAD BTU/H: 3181 | STRUCTURAL HEAT LOSS: 98061 | TOTAL COMBINED HEAT LOSS BTU/H: 101241

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: PINE VALLEY & TESTON — WOB OPT SERV STAIR
BUILDER: GOLD PARK HOMES — TYPE: 5005 - KNIGHTSWOOD — DATE: Feb-20 — GFA: 4575 — LO# 85455

HEATING CFM	1955		COOLING CFM	1955			furnace pressure	0.6																
TOTAL HEAT LOSS	98,061		TOTAL HEAT GAIN	61,380			furnace filter	0.08									^LENNOX			AFUE = 96 %			
AIR FLOW RATE CFM	19.94		AIR FLOW RATE CFM	31.85			a/c coil pressure	0.2									EL296UH110XE60C	110		INPUT (BTU/H) = 110,000			
							available pressure										FAN SPEED			OUTPUT (BTU/H) = **106,000**			
							for s/a & r/a	0.32									LOW	0					
RUN COUNT	4th	3rd	2nd	1st	Bas												MEDLOW	1380		DESIGN CFM = **1955**			
S/A	0	0	18	13	8		plenum pressure s/a	0.17		r/a pressure	0.15						MEDIUM	1505		CFM @ .6 " E.S.P.			
R/A	0	0	5	3	1		max s/a dif press. loss	0.02		r/a grille press. Loss	0.02						MEDIUM HIGH	1685					
All S/A diffusers 4"x10" unless noted otherwise on layout.							min adjusted pressure s/a	0.15		adjusted pressure r/a	0.13						HIGH	1955		TEMPERATURE RISE 50 °F			
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	ENS-2	WIC-2	ENS-3	MBR	ENS-4	LIB	DIN	KIT/GT	KIT/GT	KIT/GT	LAUN	PWD	FOY	MUD	BAS	BAS	BAS	BAS
RM LOSS MBH.	2.59	2.78	1.60	2.09	3.27	2.40	0.95	0.88	0.63	2.59	0.80	1.89	3.29	2.63	2.63	2.63	0.41	0.78	4.79	3.27	4.18	4.18	4.18	4.18
CFM PER RUN HEAT	52	56	32	42	65	48	19	18	13	52	16	38	66	53	53	53	8	16	95	65	83	83	83	83
RM GAIN MBH.	2.66	2.25	1.55	2.32	3.00	2.74	0.35	0.18	0.19	2.66	0.43	2.21	2.43	2.34	2.34	2.34	1.15	0.32	0.79	1.43	0.81	0.81	0.81	0.81
CFM PER RUN COOLING	85	72	49	74	95	87	11	6	6	85	14	70	77	75	75	75	37	10	25	46	26	26	26	26
ADJUSTED PRESSURE	0.15	0.16	0.16	0.16	0.15	0.15	0.16	0.16	0.16	0.15	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.15	0.16	0.15	0.15	0.15	0.15
ACTUAL DUCT LGH.	70	70	53	49	75	48	47	48	53	64	59	57	29	52	69	54	36	73	40	65	77	60	69	38
EQUIVALENT LENGTH	200	200	170	160	170	160	200	150	170	170	150	140	103	120	140	110	200	170	210	190	150	140	150	90
TOTAL EFFECTIVE LENGTH	270	270	223	209	245	208	247	198	223	234	209	197	132	172	209	164	236	243	250	255	227	200	219	128
ADJUSTED PRESSURE	0.05	0.06	0.07	0.07	0.06	0.07	0.06	0.08	0.07	0.06	0.07	0.08	0.12	0.09	0.07	0.1	0.07	0.06	0.06	0.06	0.06	0.07	0.07	0.11
ROUND DUCT SIZE	**6**	**6**	5	5	**6**	**6**	4	4	4	**6**	4	5	5	5	5	5	4	4	**6**	5	**6**	**6**	**6**	5
HEATING VELOCITY (ft/min)	265	286	235	308	331	245	218	207	149	265	184	279	485	389	389	389	92	184	484	477	423	423	423	609
COOLING VELOCITY (ft/min)	433	367	360	543	484	444	126	69	69	433	161	514	565	551	551	551	424	115	127	338	133	133	133	191
OUTLET GRILL SIZE	4X10	4X10	3X10	3X10	4X10	4X10	3X10	3X10	3X10	4X10	3X10	3X10	3X10	3X10	3X10	3X10	3X10	3X10	4X10	3X10	4X10	4X10	4X10	3X10
TRUNK	D	C	E	G	F	E	E	G	G	D	E	F	E	D	B	C	G	A	F	B	A	B	D	E

RUN #	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39
ROOM NAME	BAS	BAS	BED-2	BED-2	BED-3	WIC-3	LIB	KIT/GT	CAB	CAB	CAB	ENS	ENS	BAS	BAS
RM LOSS MBH.	4.18	4.18	2.09	2.09	3.27	1.47	1.89	2.63	2.50	2.50	2.50	0.38	0.38	4.18	4.18
CFM PER RUN HEAT	83	83	42	42	65	29	38	53	50	50	50	8	8	83	83
RM GAIN MBH.	0.81	0.81	2.32	2.32	3.00	1.32	2.21	2.34	2.47	2.47	2.47	0.15	0.15	0.81	0.81
CFM PER RUN COOLING	26	26	74	74	95	42	70	75	79	79	79	5	5	26	26
ADJUSTED PRESSURE	0.15	0.15	0.16	0.16	0.15	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.15	0.15
ACTUAL DUCT LGH.	34	50	52	55	80	63	51	55	69	71	82	56	58	23	58
EQUIVALENT LENGTH	110	150	170	160	170	200	160	120	150	130	140	200	190	140	170
TOTAL EFFECTIVE LENGTH	144	200	222	215	250	263	211	175	219	201	222	256	248	163	228
ADJUSTED PRESSURE	0.1	0.07	0.07	0.07	0.06	0.06	0.07	0.09	0.07	0.08	0.07	0.06	0.06	0.09	0.06
ROUND DUCT SIZE	5	**6**	5	5	**6**	5	5	5	**6**	5	**6**	4	4	5	**6**
HEATING VELOCITY (ft/min)	609	423	308	308	331	213	279	389	255	367	255	92	92	609	423
COOLING VELOCITY (ft/min)	191	133	543	543	484	308	514	551	403	580	403	57	57	191	133
OUTLET GRILL SIZE	3X10	4X10	3X10	3X10	4X10	3X10	3X10	3X10	4X10	3X10	4X10	3X10	3X10	3X10	4X10
TRUNK	G	F	G	G	F	F	F	B	A	A	A	C	C	E	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	249	0.06	9	10	x	8	448	TRUNK G	661	0.06	12.9	20	x	8	595
TRUNK B	254	0.06	9	10	x	8	457	TRUNK H	1959	0.05	20.3	38	x	10	742
TRUNK C	711	0.06	13.3	20	x	8	640	TRUNK I	0	0.00	0	0	x	8	0
TRUNK D	240	0.05	9.2	10	x	8	432	TRUNK J	0	0.00	0	0	x	8	0
TRUNK E	1298	0.05	17.4	28	x	10	668	TRUNK K	0	0.00	0	0	x	8	0
TRUNK F	413	0.06	10.8	14	x	8	531	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	1640	0.05	19	34	x	10	695
TRUNK Y	955	0.05	15.5	28	x	8	614
TRUNK Z	480	0.05	12	16	x	8	540
DROP	1955	0.05	20.3	24	x	18	652

RETURN AIR #	1	2	3	4	5	6	7	8								**BR**
	0	0	0	0	2@7"	0	0	0	0	0	0	0	0	0	0	
AIR VOLUME	115	140	115	115	240	200	360	365	0	0	0	0	0	0	0	305
PLENUM PRESSURE	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13
ACTUAL DUCT LGH.	84	51	62	59	47	49	30	51	1	1	1	1	1	1	1	14
EQUIVALENT LENGTH	200	135	185	185	135	140	170	195	0	0	0	0	0	0	0	145
TOTAL EFFECTIVE LH	284	186	247	244	182	189	200	246	1	1	1	1	1	1	1	159
ADJUSTED PRESSURE	0.05	0.07	0.05	0.05	0.07	0.07	0.07	0.05	13.36	13.36	13.36	13.36	13.36	13.36	13.36	0.08
ROUND DUCT SIZE	7	6.9	7	7	8.5	7.9	9.9	10.8	0	0	0	0	0	0	0	9
INLET GRILL SIZE	8	8	8	8	8	8	8	8	0	0	0	0	0	0	0	8
	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
INLET GRILL SIZE	14	14	14	14	30	14	30	30	0	0	0	0	0	0	0	30

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: 5005 - KNIGHTSWOOD LO # 85455
SITE NAME: PINE VALLEY & TESTON WOB OPT SERV STAIR

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	7	@ 10.6 cfm	74.2	cfm
Other Rooms	7	@ 10.6 cfm	74.2	cfm
Table 9.32.3.A.		TOTAL	222.6	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	222.6	cfm
Less Principal Ventil. Capacity	155	cfm
Required Supplemental Capacity	67.6	cfm

PRINCIPAL EXHAUST FAN CAPACITY

Model: VANEE 65H Location: BSMT

155.0 cfm 3.0 sones [✓] HVI Approved

PRINCIPAL EXHAUST HEAT LOSS CALCULATION

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

SUPPLEMENTAL FANS NUTONE

Location	Model	cfm	HVI	Sones
ENS	QTXEN050C	50	✓	0.3
ENS-2	QTXEN050C	50	✓	0.3
ENS-4	QTXEN050C	50	✓	0.3
PWD	QTXEN050C	50	✓	0.3

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: 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: February-20

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#: 85455 Model: 5005 - KNIGHTSWOOD Builder: GOLD PARK HOMES Date: 26/02/2020

Volume Calculation

House Volume

Level	Floor Area (ft²)	Floor Height (ft)	Volume (ft³)
Bsmt	2171	10	21710
First	2171	11	23881
Second	2409	10	24090
Third	0	9	0
Fourth	0	9	0
		Total:	69,681.0 ft³
		Total:	1973.1 m³

Air Change & Delta T Data

WINTER NATURAL AIR CHANGE RATE	0.416
SUMMER NATURAL AIR CHANGE RATE	0.139

Design Temperature Difference

	Tin °C	Tout °C	ΔT °C	ΔT °F
Winter DTDh	22	-20	42	76
Summer DTDc	24	31	7	13

5.2.3.1 Heat Loss due to Air Leakage

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

0.416 x 548.10 x 42 °C x 1.2 = 11549 W

= **39404 Btu/h**

6.2.6 Sensible Gain due to Air Leakage

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

= 0.139 x 548.10 x 7 °C x 1.2 = 652 W

= **2225 Btu/h**

5.2.3.2 Heat Loss due to Mechanical Ventilation

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

155 CFM x 76 °F x 1.08 x 0.25 = **3181 Btu/h**

6.2.7 Sensible heat Gain due to Ventilation

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

155 CFM x 13 °F x 1.08 x 0.25 = **536 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	39,404	12,707	1.550
2	0.3		22,112	0.535
3	0.2		21,251	0.371
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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Web: www.hvacdesigns.ca E-mail: info@hvacdesigns.ca

HEAT LOSS AND GAIN SUMMARY SHEET

MODEL: 5005 - KNIGHTSWOOD WOB OPT SERV STAIR **BUILDER:** GOLD PARK HOMES
SFQT: 4575 **LO#** 85455 **SITE:** PINE VALLEY & TESTON

DESIGN ASSUMPTIONS

HEATING	°F	COOLING	°F
OUTDOOR DESIGN TEMP.	-4	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:	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):	69681.0	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:	7.0 ft
LENGTH: 75.0 ft	WIDTH: 45.0 ft	EXPOSED PERIMETER:	175.0 ft
WOB INSULATION CONFIGURATION	SCB_9	WOB EXPOSED PERIMETER	65.0 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	29.80
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

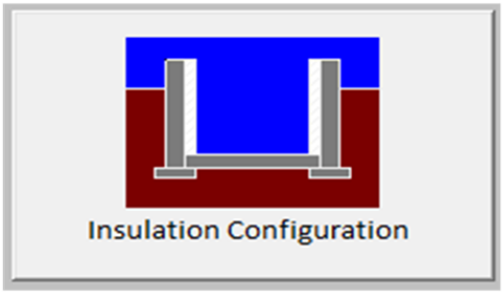
Michael O'Rourke

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 sand, loam, clay
Water Table:	Normal (7-10 m, 23-33 ft)

Foundation Dimensions		
Floor Length (m):	**6.1**	 Insulation Configuration
Floor Width (m):	**13.7**	
Exposed Perimeter (m):	**53.3**	
Wall Height (m):	**3.0**	
Depth Below Grade (m):	**1.88**	
Window Area (m^2):	**1.1**	
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):	**941**	

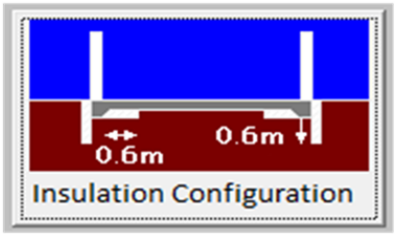
TYPE: 5005 - KNIGHTSWOOD WOB OPT SERV STAIR
LO# 85455

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 sand, loam, clay
Water Table:	Normal (7-10 m, 23-33 ft)

Foundation Dimensions		
Length (m):	**3.0**	
Width (m):	**13.7**	
Exposed Perimeter (m):	**19.8**	

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

Results	
Heating Load (Watts):	**297**

TYPE: 5005 - KNIGHTSWOOD WOB OPT SERV STAIR
LO# 85455

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905-619-2300

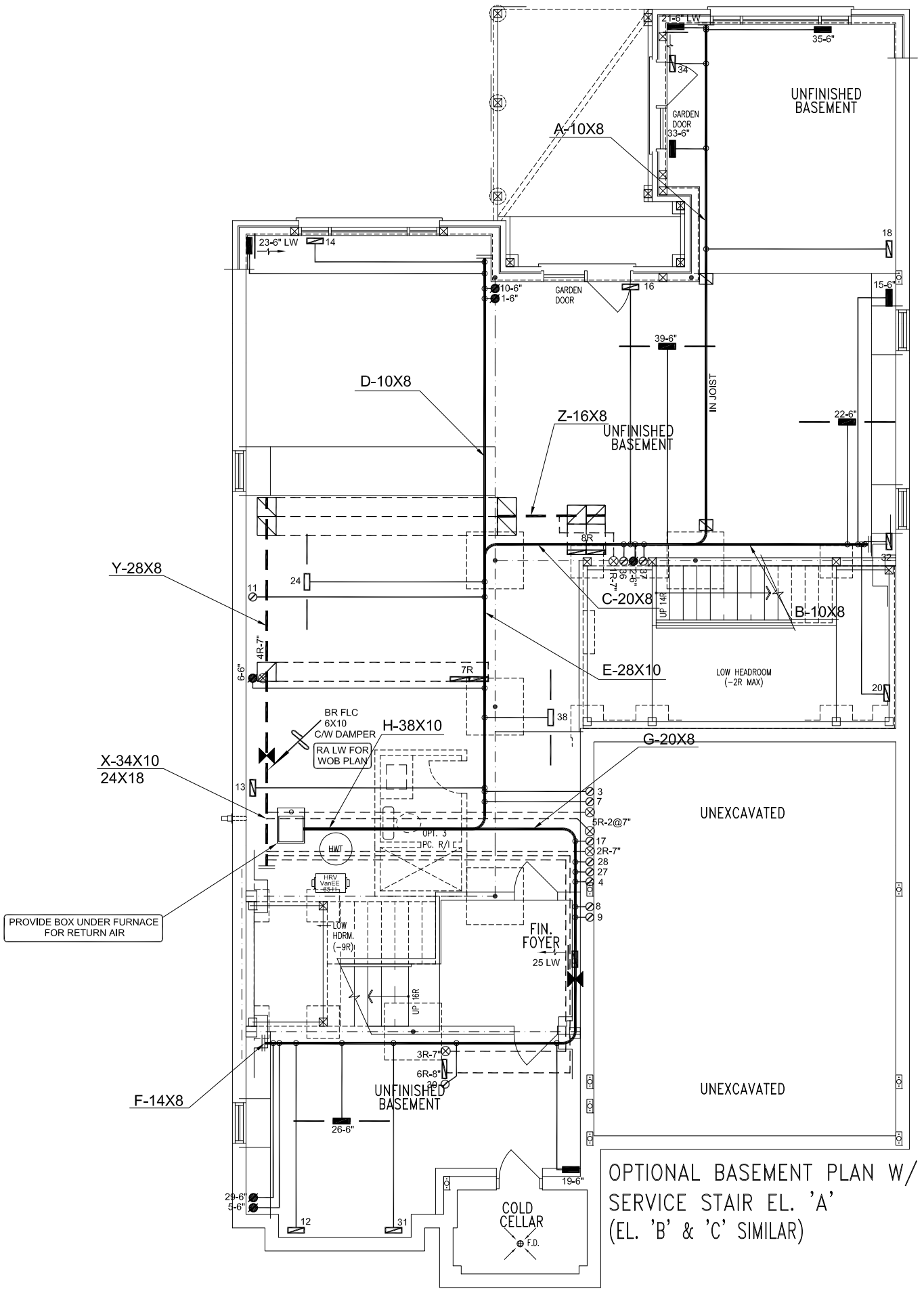
Air Infiltration Residential Load Calculator

Supplemental tool for CAN/CSA-F280

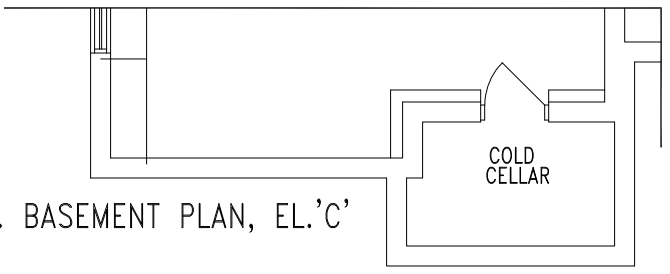
Weather Station Description	
Province:	Ontario
Region:	Vaughan (Woodbridge)
Weather Station Location:	Open flat terrain, grass
Anemometer height (m):	10
Local Shielding	
Building Site:	Suburban, forest
Walls:	Heavy
Flue:	Heavy
Highest Ceiling Height (m):	9.45
Building Configuration	
Type:	Detached
Number of Stories:	Two
Foundation:	Full
House Volume (m^3):	1973.1
Air Leakage/Ventilation	
Air Tightness Type:	Present (1961-) (3.57 ACH)
Custom BDT Data:	ELA @ 10 Pa. 2630.3 cm^2
	3.57 ACH @ 50 Pa
Mechanical Ventilation (L/s):	Total Supply 73.2 / Total Exhaust 73.2
Flue Size	
Flue #:	#1 #2 #3 #4
Diameter (mm):	0 0 0 0
Natural Infiltration Rates	
Heating Air Leakage Rate (ACH/H):	**0.416**
Cooling Air Leakage Rate (ACH/H):	**0.139**

TYPE: 5005 - KNIGHTSWOOD WOB OPT SERV STAIR

LO# 85455



OPTIONAL BASEMENT PLAN W/ SERVICE STAIR EL. 'A' (EL. 'B' & 'C' SIMILAR)



PART. BASEMENT PLAN, EL.'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

WOB | **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.		

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Client
GOLDPARK HOMES

Project Name
PINE VALLEY & TESTON
VAUGHAN, ONTARIO
OPT SERV STAIR
KNIGHTSWOOD
5005 WOB 4575 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 100185 BTU/H

UNIT DATA

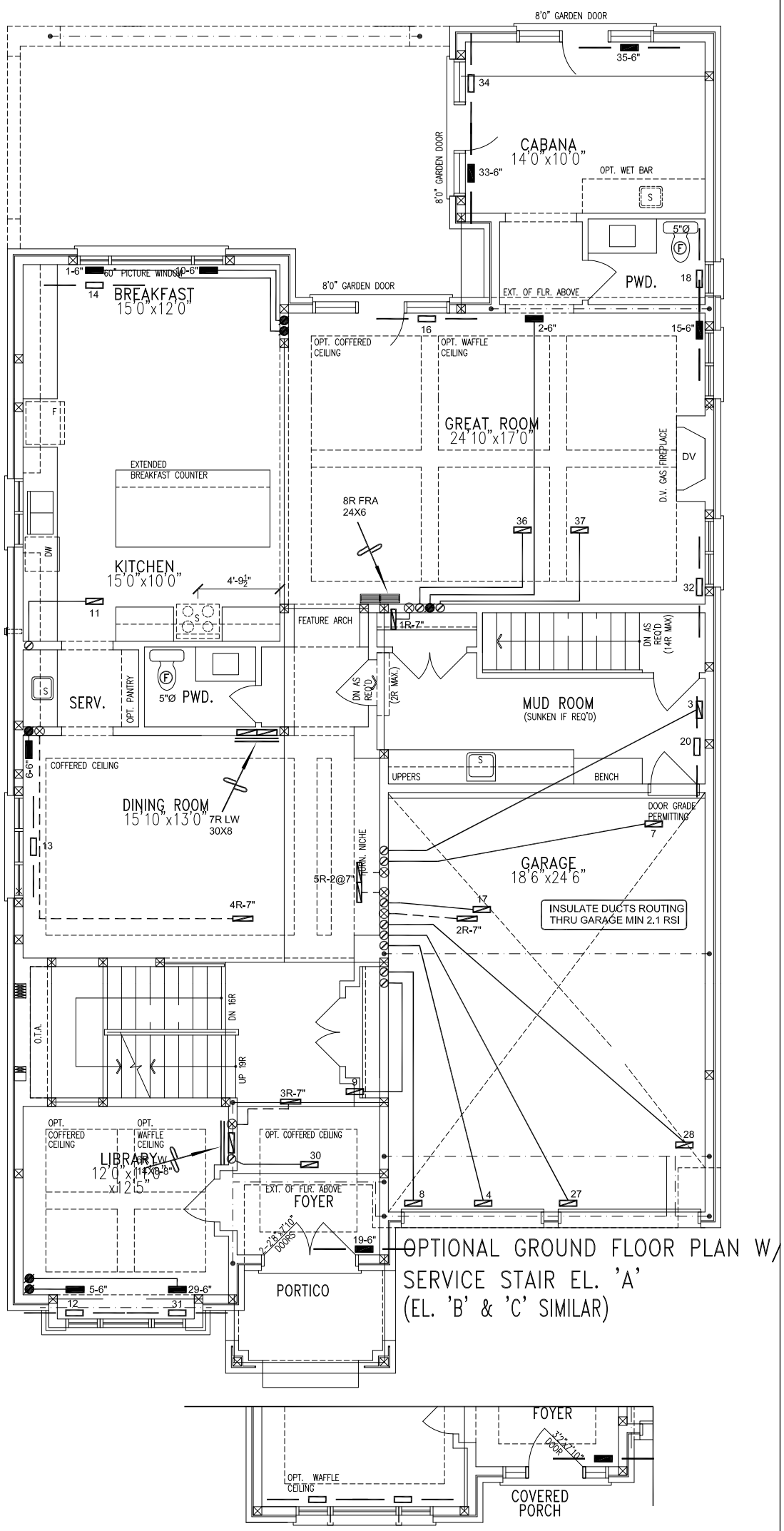
MAKE	LENNOX	
MODEL	EL296UH110XE60C	
INPUT	110	MBTU/H
OUTPUT	106	MBTU/H
COOLING	5.0	TONS
FAN SPEED	1955	cfm @ 0.6" w.c.

# OF RUNS	S/A	R/A	FANS
3RD FLOOR			
2ND FLOOR	18	5	7
1ST FLOOR	13	3	3
BASEMENT	8	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 FEB/2020
Scale 1/8" = 1'-0"
BCIN# 19669
LO# 85455



OPTIONAL GROUND FLOOR PLAN W/ SERVICE STAIR EL. 'A' (EL. 'B' & 'C' SIMILAR)

PART. GROUND FLOOR PLAN, EL.'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

WOB | 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.		
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1.		

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Client
GOLDPARK HOMES

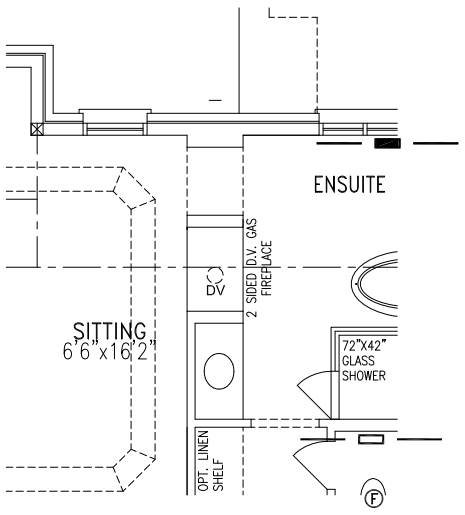
Project Name
PINE VALLEY & TESTON
VAUGHAN, ONTARIO
OPT SERV STAIR
KNIGHTSWOOD
5005 WOB 4575 sqft

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Specializing in Residential Mechanical Design Services

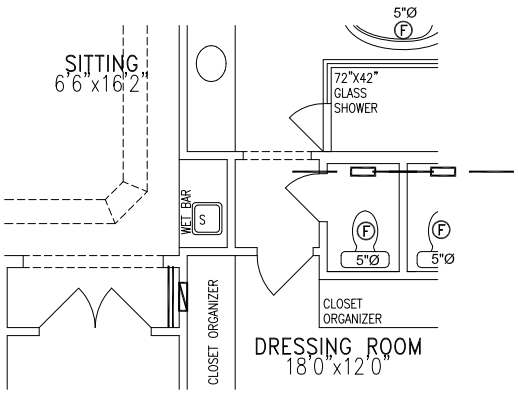
Installation to comply with the latest Ontario Building Code. All supply branch outlets shall be equipped with a manual balancing damper. Ductwork which passes through the garage or unheated spaces shall be adequately insulated and be gas-proofed.

Sheet Title
FIRST FLOOR HEATING LAYOUT

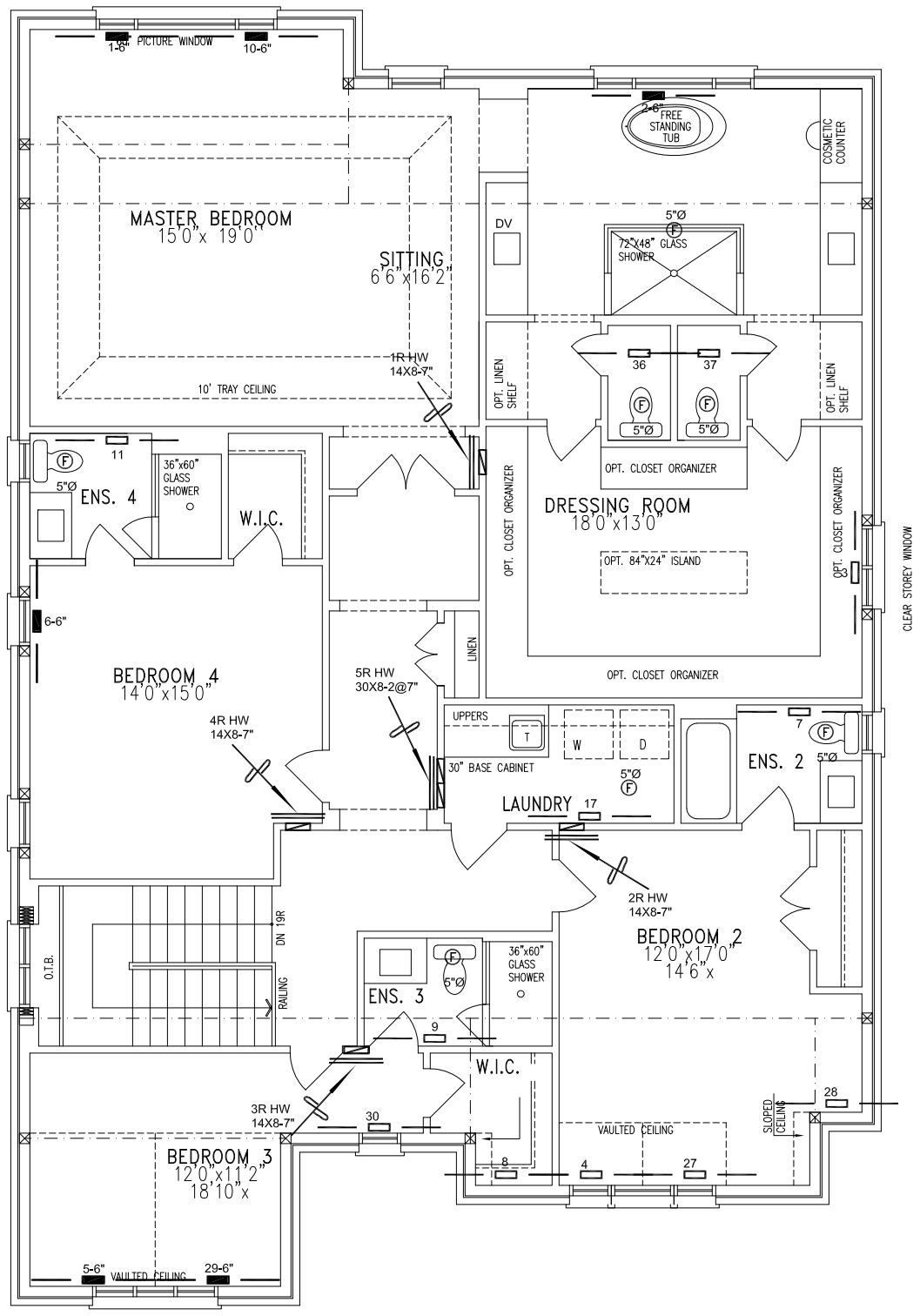
Date FEB/2020
Scale 1/8" = 1'-0"
BCIN# 19669
LO# 85455



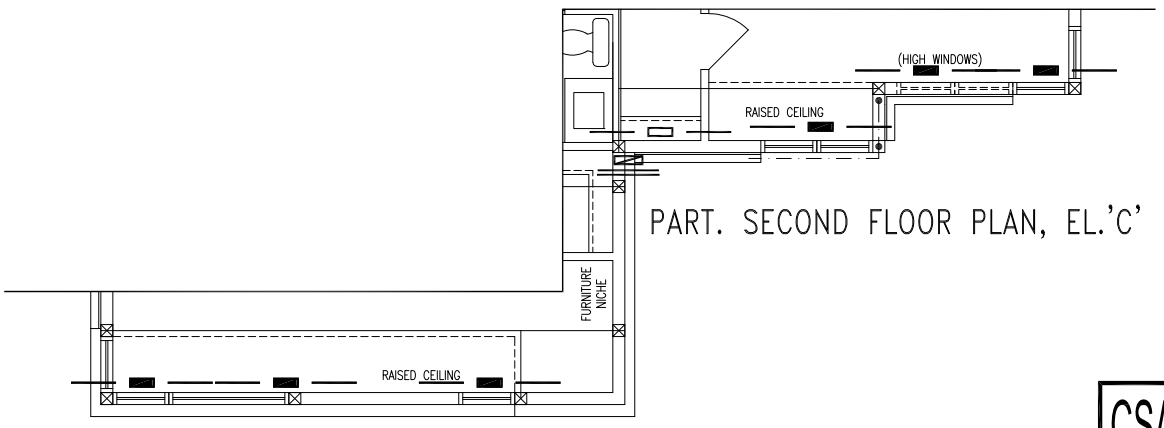
PART. SECOND FLOOR PLAN
OPT. SITTING AREA FIREPLACE



PART. SECOND FLOOR PLAN
OPT. SITTING AREA WET BAR



SECOND FLOOR PLAN, EL.'A'



PART. SECOND FLOOR PLAN, EL.'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

WOB | 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
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Client
GOLDPARK HOMES

Project Name
PINE VALLEY & TESTON
VAUGHAN, ONTARIO
OPT SERV STAIR
KNIGHTSWOOD
5005 WOB 4575 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
SECOND FLOOR HEATING LAYOUT

Date FEB/2020
Scale 1/8" = 1'-0"
BCIN# 19669
LO# 85455

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**		
VAUGHAN (WOODBRIDGE)				

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:** 5005 - KNIGHTSWOOD ELEV B & B CNR **Project:** PINE VALLEY & TESTON

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.

February 25, 2020
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.

HVAC DESIGNS LTD.
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SITE NAME: PINE VALLEY & TESTON — ELEV B & B CNR — DATE: Feb-20 — WINTER NATURAL AIR CHANGE RATE 0.350 — HEAT LOSS ΔT °F. 76 — CSA-F280-12

BUILDER: GOLD PARK HOMES — TYPE: 5005 - KNIGHTSWOOD — GFA: 4380 — LO# 77532 — SUMMER NATURAL AIR CHANGE RATE 0.121 — HEAT GAIN ΔT °F. 14 — SB-12 PACKAGE A1

ROOM USE			MBR			ENS			WIC			BED-2			BED-3			BED-4			ENS-2			WIC-2			ENS-3			ENS-4			WIC-3		
EXP. WALL			46			36			13			36			36			19			6			3			4			7			14		
CLG. HT.			11			10			10			11			11			10			10			10			10			10			10		
	FACTORS																																		
GRS.WALL AREA	LOSS	GAIN	506			360			130			396			396			190			60			30			40			70			140		
GLAZING			LOSS		GAIN	LOSS		GAIN	LOSS		GAIN	LOSS		GAIN	LOSS		GAIN	LOSS		GAIN	LOSS		GAIN	LOSS		GAIN	LOSS		GAIN	LOSS		GAIN	LOSS		GAIN
NORTH	21.3	16.3	0	0	0	0	0	0	6	128	98	0	0	0	0	0	0	0	0	0	8	170	130	0	0	0	0	0	0	0	0	0	0	0	0
EAST	21.3	41.8	0	0	0	0	0	0	0	0	0	65	1383	2719	50	1064	2092	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	20	426	837
SOUTH	21.3	25.2	19	404	478	0	0	0	0	0	0	0	0	0	12	255	302	44	936	1108	0	0	0	0	0	0	0	0	0	9	192	227	0	0	0
WEST	21.3	41.8	50	1064	2092	34	724	1422	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
SKYLT.	37.2	102.0	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	0	0	0	0	0	0	0
DOORS	25.2	4.6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
NET EXPOSED WALL	4.5	0.8	437	1950	354	326	1455	264	124	553	100	331	1477	268	334	1491	271	146	652	118	52	232	42	30	134	24	40	179	32	61	272	49	120	536	97
NET EXPOSED BSMT WALL ABOVE GR	3.6	0.7	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	0	0	0	0	0	0
EXPOSED CLG	1.3	0.6	533	684	322	323	415	195	247	317	149	175	225	106	249	320	151	285	366	172	60	77	36	40	51	24	92	118	56	105	135	63	53	68	32
NO ATTIC EXPOSED CLG	2.7	1.3	0	0	0	0	0	0	0	0	0	78	214	101	18	49	23	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	154	393	71	253	645	117	18	46	8	0	0	0	60	153	28	40	102	19	0	0	0	0	0	0	0	0	0
BASEMENT/CRAWL HEAT LOSS				0			0			0			0			0			0			0			0			0			0			0	
SLAB ON GRADE HEAT LOSS				0			0			0			0			0			0			0			0			0			0			0	
SUBTOTAL HT LOSS				4103			2593			1391			3945			3225			1954			632			287			297			598			1029	
SUB TOTAL HT GAIN					3246			1882			419			3311			2847			1398			236			67			88			340			966
LEVEL FACTOR / MULTIPLIER			0.20	0.31		0.20	0.31		0.20	0.31		0.20	0.31		0.20	0.31		0.20	0.31		0.20	0.31		0.20	0.31		0.20	0.31		0.20	0.31		0.20	0.31	
AIR CHANGE HEAT LOSS				1269			802			430			1220			997			604			196			89			92			185			318	
AIR CHANGE HEAT GAIN					252			146			33			257			221			109			18			5			7			26			75
DUCT LOSS				0			0			182			516			422			0			83			38			0			0			0	
DUCT GAIN					0			0			86			421			371			0			66			48			0			0			0
HEAT GAIN PEOPLE	240		2		480	0		0	0		0	1		240	1		240	1		240	0		0	0		0	0		0	0		0	0		0
HEAT GAIN APPLIANCES/LIGHTS					406			406			406			406			406			406			406			406			406			406			406
TOTAL HT LOSS BTU/H				5371			3395			2003			5681			4644			2558			911			414			388			784			1347	
TOTAL HT GAIN x 1.3 BTU/H					5700			3164			1226			6027			5311			2799			945			684			652			1004			1882

ROOM USE			LIB			DIN			KIT/GT			CAB			LAUN			PWD			FOY			MUD									LOD			BAS		
EXP. WALL			31			32			87			45			0			5			35			18									52			238		
CLG. HT.			11			11			11			11			10			11			11			12									10			10		
	FACTORS																																				
GRS.WALL AREA	LOSS	GAIN	341			352			957			495			0			55			385			216									520			1978		
GLAZING			LOSS		GAIN	LOSS		GAIN	LOSS		GAIN	LOSS		GAIN	LOSS		GAIN	LOSS		GAIN	LOSS		GAIN	LOSS		GAIN						LOSS		GAIN	LOSS		GAIN
NORTH	21.3	16.3	0	0	0	0	0	0	46	979	748	0	0	0	0	0	0	9	192	146	0	0	0	0	0	0						0	0	0	6	128	98
EAST	21.3	41.8	56	1192	2343	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
SOUTH	21.3	25.2	0	0	0	34	724	856	21	447	529	63	1341	1586	0	0	0	0	0	0	0	0	0	0	0	0						0	0	0	6	128	151
WEST	21.3	41.8	0	0	0	0	0	0	115	2447	4811	63	1341	2635	0	0	0	0	0	0	0	0	0	0	0	0						22	468	920	0	0	0
SKYLT.	37.2	102.0	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	0	0	0	0
DOORS	25.2	4.6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	56	1414	257	20	505	92						0	0	0	20	505	92
NET EXPOSED WALL	4.5	0.8	285	1272	231	318	1419	258	775	3459	628	369	1647	299	0	0	0	46	205	37	329	1468	267	196	875	159						0	0	0	0	0	0
NET EXPOSED BSMT WALL ABOVE GR	3.6	0.7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0						290	1044	189	402	1447	263
EXPOSED CLG	1.3	0.6	0	0	0	0	0	0	0	0	0	0	0	0	102	131	62	0	0	0	0	0	0	0	0	0						0	0	0	0	0	0
NO ATTIC EXPOSED CLG	2.7	1.3	0	0	0	0	0	0	0	0	0	203	558	263	0	0	0	40	110	52	41	113	53	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	56	143	26	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			0										8373		
SLAB ON GRADE HEAT LOSS				0			0			0			0			0			0			0			0									0				
SUBTOTAL HT LOSS				2464			2143			7332			4886			274			507			2995			1380									1512			10580		
SUB TOTAL HT GAIN					2574			1114			6715			4784			88			235			576			251									1110			603
LEVEL FACTOR / MULTIPLIER			0.30	0.43		0.30	0.43		0.30	0.43		0.30	0.43		0.20	0.31		0.30	0.43		0.30	0.43		0.30	0.43										0.50	1.30		
AIR CHANGE HEAT LOSS				1070			931			3185			2122			85			220			1301			599											15713		
AIR CHANGE HEAT GAIN					200			86			521			371			7			18			45			19												133	
DUCT LOSS				0			0			0			0			36			0			0			0											0		
DUCT GAIN					0			0			0			0			50			0			0			0												0	
HEAT GAIN PEOPLE	240		0		0	0		0	0		0	0		0	0		0	0		0	0		0	0		0						0		0	0		0
HEAT GAIN APPLIANCES/LIGHTS					406			406			406			406			406			406			406			406												406
TOTAL HT LOSS BTU/H				3534			3073			10516			7008			394			727			4296			1979									1512			26293		
TOTAL HT GAIN x 1.3 BTU/H					4134			2089			9936			7230			716			858			1336			879									1443			1485

TOTAL HEAT GAIN BTU/H: 60078 — TONS: 5.01 — LOSS DUE TO VENTILATION LOAD BTU/H: 3181 — STRUCTURAL HEAT LOSS: 86827 — TOTAL COMBINED HEAT LOSS BTU/H: 90008

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: PINE VALLEY & TESTON — ELEV B & B CNR
BUILDER: GOLD PARK HOMES — TYPE: 5005 - KNIGHTSWOOD — DATE: Feb-20 — GFA: 4380 — LO# 77532

HEATING CFM	1955	COOLING CFM	1955	furnace pressure	0.6
TOTAL HEAT LOSS	86,827	TOTAL HEAT GAIN	59,500	furnace filter	0.08
AIR FLOW RATE CFM	22.52	AIR FLOW RATE CFM	32.86	a/c coil pressure	0.2
				available pressure for s/a & r/a	0.32
				plenum pressure s/a	0.17
				max s/a dif press. loss	0.02
				min adjusted pressure s/a	0.15

				r/a pressure	0.15
				r/a grille press. Loss	0.02
				adjusted pressure r/a	0.13

^LENNOX — AFUE = 96 %
EL296UH110XE60C 110 — INPUT (BTU/H) = 110,000
OUTPUT (BTU/H) = **106,000**

FAN SPEED	
LOW	0
MEDLOW	1380
MEDIUM	1505
MEDIUM HIGH	1685
HIGH	1955

DESIGN CFM = **1955** CFM @ .6 " E.S.P.
TEMPERATURE RISE 50 °F

RUN COUNT	4th	3rd	2nd	1st	Bas
S/A	0	0	18	13	7
R/A	0	0	5	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	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	ENS-2	WIC-2	ENS-3	MBR	ENS-4	LIB	DIN	KIT/GT	KIT/GT	KIT/GT	LAUN	PWD	FOY	MUD	BAS	BAS	BAS	BAS
RM LOSS MBH.	2.69	2.73	2.00	1.89	2.32	2.56	0.91	0.41	0.39	2.69	0.78	1.77	3.07	2.63	2.63	2.63	0.39	0.73	4.30	1.98	3.97	3.97	3.97	3.97
CFM PER RUN HEAT	60	62	45	43	52	58	21	9	9	60	18	40	69	59	59	59	9	16	97	45	89	89	89	89
RM GAIN MBH.	2.85	2.45	1.23	2.01	2.66	2.80	0.95	0.68	0.65	2.85	1.00	2.07	2.09	2.48	2.48	2.48	0.72	0.86	1.34	0.88	0.42	0.42	0.42	0.42
CFM PER RUN COOLING	94	81	40	66	87	92	31	22	21	94	33	68	69	82	82	82	24	28	44	29	14	14	14	14
ADJUSTED PRESSURE	0.15	0.15	0.16	0.16	0.15	0.15	0.16	0.16	0.16	0.15	0.16	0.16	0.16	0.15	0.15	0.15	0.16	0.16	0.15	0.16	0.15	0.15	0.15	0.15
ACTUAL DUCT LGH.	70	70	53	49	70	48	47	48	53	64	59	57	29	52	69	54	36	73	40	47	67	60	54	38
EQUIVALENT LENGTH	190	200	170	160	160	160	200	150	170	170	150	140	103	120	140	110	200	170	210	160	150	120	103	90
TOTAL EFFECTIVE LENGTH	260	270	223	209	230	208	247	198	223	234	209	197	132	172	209	164	236	243	250	207	217	180	157	128
ADJUSTED PRESSURE	0.06	0.05	0.07	0.07	0.06	0.07	0.06	0.08	0.07	0.06	0.07	0.08	0.12	0.09	0.07	0.09	0.07	0.06	0.06	0.08	0.07	0.08	0.09	0.11
ROUND DUCT SIZE	**6**	**6**	5	5	**6**	**6**	4	4	4	**6**	4	5	5	5	**6**	5	4	4	**6**	4	**6**	**6**	**6**	5
HEATING VELOCITY (ft/min)	306	316	330	316	265	296	241	103	103	306	207	294	507	433	301	433	103	184	495	516	454	454	454	653
COOLING VELOCITY (ft/min)	479	413	294	485	444	469	356	252	241	479	379	499	507	602	418	602	275	321	224	333	71	71	71	103
OUTLET GRILL SIZE	4X10	4X10	3X10	3X10	4X10	4X10	3X10	3X10	3X10	4X10	3X10	3X10	3X10	3X10	4X10	3X10	3X10	3X10	4X10	3X10	4X10	4X10	4X10	3X10
TRUNK	D	C	E	G	F	E	E	G	G	D	E	F	E	D	B	C	G	A	F	C	A	B	D	E

RUN #	25	26	27	28	29	30	31	32	33	34	35	36	37	38
ROOM NAME	BAS	BAS	BED-2	BED-2	BED-3	WIC-3	LIB	KIT/GT	CAB	CAB	CAB	ENS	ENS	BAS
RM LOSS MBH.	3.97	3.97	1.89	1.89	2.32	1.35	1.77	2.63	2.34	2.34	2.34	0.33	0.33	3.97
CFM PER RUN HEAT	89	89	43	43	52	30	40	59	53	53	53	7	7	89
RM GAIN MBH.	0.42	0.42	2.01	2.01	2.66	1.88	2.07	2.48	2.41	2.41	2.41	0.35	0.35	0.42
CFM PER RUN COOLING	14	14	66	66	87	62	68	82	79	79	79	12	12	14
ADJUSTED PRESSURE	0.15	0.15	0.16	0.16	0.15	0.16	0.16	0.15	0.16	0.16	0.16	0.16	0.16	0.15
ACTUAL DUCT LGH.	34	50	52	55	75	58	51	55	69	71	82	56	58	23
EQUIVALENT LENGTH	110	150	170	160	160	190	160	120	150	130	140	200	190	140
TOTAL EFFECTIVE LENGTH	144	200	222	215	235	248	211	175	219	201	222	256	248	163
ADJUSTED PRESSURE	0.1	0.07	0.07	0.07	0.06	0.06	0.07	0.08	0.07	0.08	0.07	0.06	0.06	0.09
ROUND DUCT SIZE	5	**6**	5	5	**6**	5	5	5	**6**	5	**6**	4	4	**6**
HEATING VELOCITY (ft/min)	653	454	316	316	265	220	294	433	270	389	270	80	80	454
COOLING VELOCITY (ft/min)	103	71	485	485	444	455	499	602	403	580	403	138	138	71
OUTLET GRILL SIZE	3X10	4X10	3X10	3X10	4X10	3X10	3X10	3X10	4X10	3X10	4X10	3X10	3X10	4X10
TRUNK	G	F	G	G	F	F	F	B	A	A	A	C	C	E

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	264	0.06	9.2	10	x	8	475	TRUNK G	645	0.06	12.8	20	x	8	581
TRUNK B	207	0.07	8	8	x	8	466	TRUNK H	1955	0.05	20.3	38	x	10	741
TRUNK C	651	0.05	13.4	20	x	8	586	TRUNK I	0	0.00	0	0	x	8	0
TRUNK D	268	0.06	9.2	10	x	8	482	TRUNK J	0	0.00	0	0	x	8	0
TRUNK E	1308	0.05	17.4	28	x	10	673	TRUNK K	0	0.00	0	0	x	8	0
TRUNK F	400	0.06	10.7	14	x	8	514	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	1500	0.05	18.4	32	x	10	675
TRUNK Y	955	0.05	15.5	28	x	8	614
TRUNK Z	480	0.05	12	16	x	8	540
DROP	1955	0.05	20.3	24	x	18	652

RETURN AIR #	1	2	3	4	5	6	7	8								BR
	0	0	0	0	2@7"	0	0	0	0	0	0	0	0	0	0	
AIR VOLUME	115	130	125	115	240	200	360	365	0	0	0	0	0	0	0	305
PLENUM PRESSURE	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13
ACTUAL DUCT LGH.	84	51	62	59	47	49	30	51	1	1	1	1	1	1	1	14
EQUIVALENT LENGTH	200	135	155	185	135	140	170	195	0	0	0	0	0	0	0	145
TOTAL EFFECTIVE LH	284	186	217	244	182	189	200	246	1	1	1	1	1	1	1	159
ADJUSTED PRESSURE	0.05	0.07	0.06	0.05	0.07	0.07	0.07	0.05	13.36	13.36	13.36	13.36	13.36	13.36	13.36	0.08
ROUND DUCT SIZE	7	6.8	6.9	7	8.5	7.9	9.9	10.8	0	0	0	0	0	0	0	9
INLET GRILL SIZE	8	8	8	8	8	8	8	8	0	0	0	0	0	0	0	8
	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
INLET GRILL SIZE	14	14	14	14	30	14	30	30	0	0	0	0	0	0	0	30

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.

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

375 Finley Ave. Suite 202 Ajax, ON L1S 2E2
Tel: 905.619.2300 Fax: 905.619.2375

SITE NAME: PINE VALLEY & TESTON **ELEV B & B CNR** BCIN# 19669

BUILDER: GOLD PARK HOMES **TYPE: 5005 - KNIGHTSW** **AH - 1** **DATE: Feb-20** **GFA: 4380** **LO# 77532** PAGE 2 of 3

UNIT OUTPUT @ 130 °F	30250	BTU/H	**CFM / OUTLET =**	Water Heater	FLOWMAX		**Air Max**	
MEDIAN OUTLETS for UNIT	14		0	Make & Model #	FLOWMAX-90		MaxAir 50e	OUTPUT 30250 BTUH @ 130 ° F
BTU/H per OUTLET HEATING	2241			Input	85304	Btu/H		CFM @1.5" E.S.P.
				Storage capacity	40	US/gal.		
UNIT OUTPUT COOLING	18000	BTU/H		Efficiency	98.4	%		DESIGN CFM = 580
MEDIAN OUTLETS for UNIT	14							
BTU/H per OUTLET COOLING	1333							A/C SIZE **1.5** TONS
								A/C SIZE 18000 BTU/H

FLOOR	2	2	2	2	2	2	2	2	2	2	1	1	1	1	2	1	1	1	B	2			
ROOM NAME	MBR	ENS	WIC	BED-2	BED-3	BED-4	ENS-2	WIC-2	ENS-3	ENS-4	LIB	DIN	KIT/GT	CAB	LAUN	PWD	FOY	MUD	BAS	WIC-3			
RM LOSS MBH.	5.37	3.39	2.00	5.68	4.64	2.56	0.91	0.41	0.39	0.78	3.53	3.07	10.52	7.01	0.39	0.73	4.30	1.98	27.80	1.35	0.00	0.00	0.00
# of RUNS red'd **HEATING**	2.4	1.5	0.9	2.5	2.1	1.1	0.4	0.2	0.2	0.3	1.6	1.4	4.7	3.1	0.2	0.3	1.9	0.9	12.4	0.6	0.0	0.0	0.0
RM GAIN MBH.	5.70	3.16	1.23	6.03	5.31	2.80	0.95	0.68	0.65	1.00	4.13	2.09	9.94	7.23	0.72	0.86	1.34	0.88	2.93	1.88	0.00	0.00	0.00
# of RUNS red'd **COOLING**	4.3	2.4	0.9	4.5	4.0	2.1	0.7	0.5	0.5	0.8	3.1	1.6	7.5	5.4	0.5	0.6	1.0	0.7	2.2	1.4	0.0	0.0	0.0
# of OUTLETS INSTALLED																							

Total Runs 0

RETURN AIR #	1	2	3	4	5	6	7	8	9	10	11	12	13	14	BR
FLOOR															B
AIR VOLUME	0	0	0	0	0	0	0	0	0	0	0	0	0	0	580
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
ACTUAL DUCT LGH.	1	1	1	1	1	1	1	1	1	1	1	1	1	1	13
EQUILVALENT LENGTH	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL EFFECTIVE LH	1	1	1	1	1	1	1	1	1	1	1	1	1	1	13
ADJUSTED PRESSURE	15	15	15	15	15	15	15	15	15	15	15	15	15	15	1.15
ROUND DUCT SIZE	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5.9
INLET GRILL SIZE	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4
	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
INLET GRILL SIZE	0	0	0	0	0	0	0	0	0	0	0	0	0	0	10

RETURN AIR TRUNK SIZE

	TRUNK CFM	STATIC PRESS.	ROUND DUCT	RECT DUCT		
TRUNK O	0	1.15	0	0	x	8
TRUNK P	0	1.15	0	0	x	8
TRUNK Q	0	1.15	0	0	x	8
TRUNK R	0	1.15	0	0	x	8
TRUNK S	0	1.15	0	0	x	8
TRUNK T	0	1.15	0	0	x	8
TRUNK U	0	1.15	0	0	x	8
TRUNK V	0	1.15	0	0	x	8
TRUNK W	0	1.15	0	0	x	8
TRUNK X	580	1.15	5.9	4	x	8
TRUNK Y	0	1.15	0	0	x	8
TRUNK Z	0	1.15	0	0	x	8
DROP	580	1.15	5.9	4	x	8
				3	x	10
				3	x	12
				2	x	14
				2	x	16
				2	x	18
				4	x	9
				3	x	11

INSTALLATION OF COMBO HEATING SYSTEM TO COMPLY WITH UNIFIED CANADIAN GUIDELINE FOR INTERGRATED (COMBINATION) HEATING SYSTEMS LATEST ADDITION

MAXIMUM TEMPERATURE of HOT WATER SYSTEM SUPPLIED TO PLUMBING FIXTURES SHALL NOT EXCEED 120 ° F or 49° C

EXHAUST & COMBUSTION AIR INTAKES SHALL COMPLY with ALL LOCAL CODES & AUTHORITIES

		+10%
TOTAL COMBINED HEAT LOSS BTU/H	**86827**	**95510**
TOTAL HEAT GAIN BTU/H	**59500**	

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INDIVIDUAL BCIN: 19669
Michael O'Rourke

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TYPE: 5005 - KNIGHTSWOOD LO # 77532
SITE NAME: PINE VALLEY & TESTON ELEV B & B CNR

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	7	@ 10.6 cfm	74.2	cfm
Other Rooms	8	@ 10.6 cfm	84.8	cfm
Table 9.32.3.A.		TOTAL	233.2	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	233.2	cfm
Less Principal Ventil. Capacity	155	cfm
Required Supplemental Capacity	78.2	cfm

PRINCIPAL EXHAUST FAN CAPACITY

Model: VANEE 65H Location: BSMT

155.0 cfm 3.0 sones [✓] HVI Approved

PRINCIPAL EXHAUST HEAT LOSS CALCULATION

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

SUPPLEMENTAL FANS NUTONE

Location	Model	cfm	HVI	Sones
ENS	QTXEN050C	50	✓	0.3
ENS-2	QTXEN050C	50	✓	0.3
ENS-4	QTXEN050C	50	✓	0.3
PWD	QTXEN050C	50	✓	0.3

HEAT RECOVERY VENTILATOR 9.32.3.11.

Model: VANEE 65H

155 cfm high 64 cfm low

75 % Sensible Efficiency [✓] HVI Approved
@ 32 deg F (0 deg C)

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: February-20

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#: 77532 Model: 5005 - KNIGHTSWOOD Builder: GOLD PARK HOMES Date: 2020-02-25

Volume Calculation

House Volume

Level	Floor Area (ft²)	Floor Height (ft)	Volume (ft³)
Bsmt	2020	10	20200
First	2020	11	22220
Second	2360	10	23600
Third	0	9	0
Fourth	0	9	0
		Total:	66,020.0 ft³
		Total:	1869.5 m³

Air Change & Delta T Data

WINTER NATURAL AIR CHANGE RATE	0.350
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	23	31	8	14

5.2.3.1 Heat Loss due to Air Leakage

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

0.350 x 519.30 x 42 °C x 1.2 = 9211 W

= **31427 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 519.30 x 8 °C x 1.2 = 578 W

= **1973 Btu/h**

5.2.3.2 Heat Loss due to Mechanical Ventilation

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

155 CFM x 76 °F x 1.08 x 0.25 = **3181 Btu/h**

6.2.7 Sensible heat Gain due to Ventilation

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

155 CFM x 14 °F x 1.08 x 0.25 = **578 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	31,427	12,091	1.300
2	0.3		21,705	0.434
3	0.2		20,327	0.309
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: 5005 - KNIGHTSWOOD ELEV B & B CNR **BUILDER:** GOLD PARK HOMES
SFQT: 4380 **LO#** 77532 **SITE:** PINE VALLEY & TESTON

DESIGN ASSUMPTIONS

HEATING	°F	COOLING	°F
OUTDOOR DESIGN TEMP.	-4	OUTDOOR DESIGN TEMP.	88
INDOOR DESIGN TEMP.	72	INDOOR DESIGN TEMP. (MAX 75°F)	74

BUILDING DATA

ATTACHMENT:	DETACHED	# 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):	66020.0	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:	7.0 ft
LENGTH: 77.0 ft	WIDTH: 42.0 ft	EXPOSED PERIMETER:	238.0 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	29.80
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

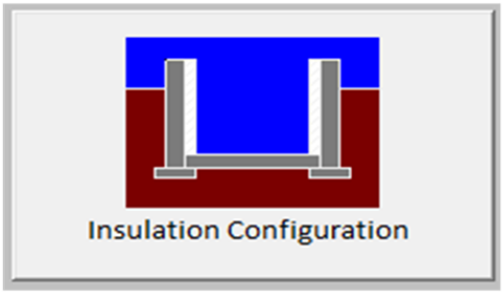
Michael O'Rourke

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 sand, loam, clay
Water Table:	Normal (7-10 m, 23-33 ft)

Foundation Dimensions		
Floor Length (m):	**23.5**	 Insulation Configuration
Floor Width (m):	**12.8**	
Exposed Perimeter (m):	**0.0**	
Wall Height (m):	**3.0**	
Depth Below Grade (m):	**2.13**	
Window Area (m^2):	**3.2**	
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):	**2453**	

TYPE: 5005 - KNIGHTSWOOD ELEV B & B CNR
LO# 77532

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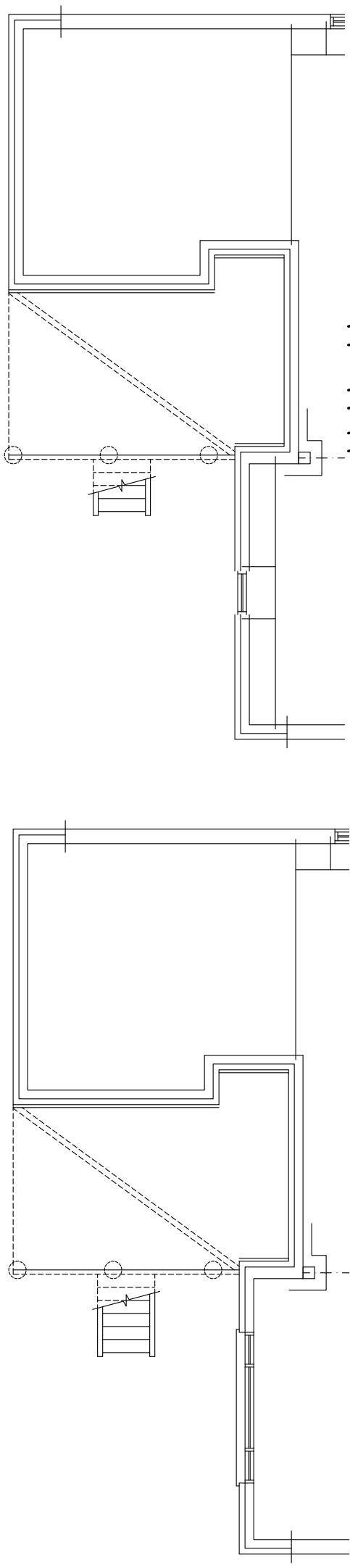
Air Infiltration Residential Load Calculator

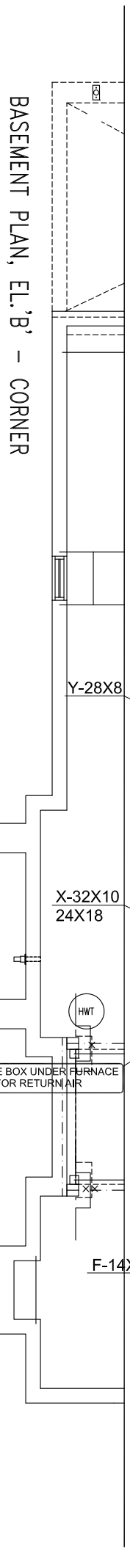
Supplemental tool for CAN/CSA-F280

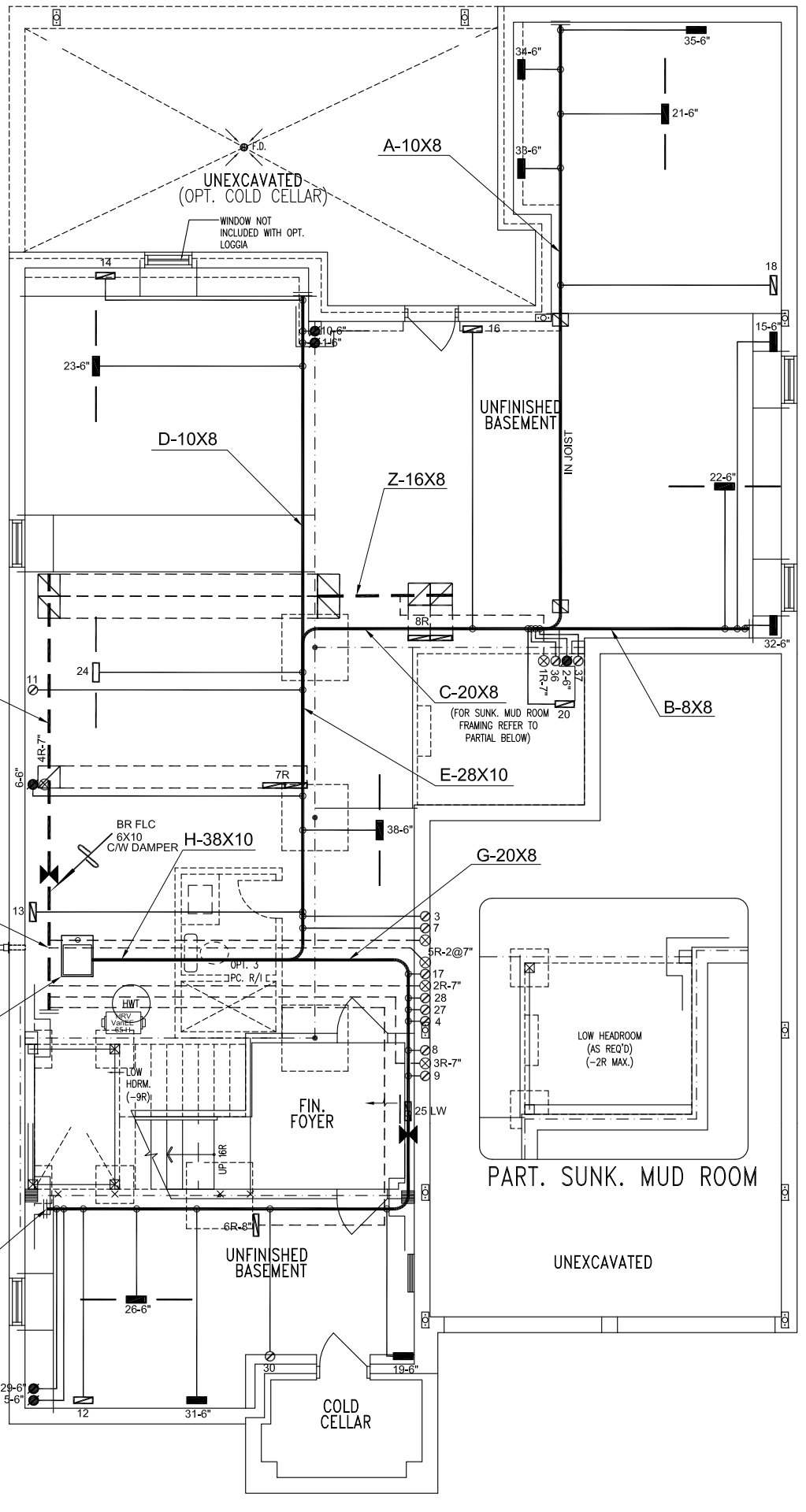
Weather Station Description	
Province:	Ontario
Region:	Vaughan (Woodbridge)
Weather Station Location:	Open flat terrain, grass
Anemometer height (m):	10
Local Shielding	
Building Site:	Suburban, forest
Walls:	Heavy
Flue:	Heavy
Highest Ceiling Height (m):	7.32
Building Configuration	
Type:	Detached
Number of Stories:	Two
Foundation:	Full
House Volume (m^3):	1869.5
Air Leakage/Ventilation	
Air Tightness Type:	Present (1961-) (3.57 ACH)
Custom BDT Data:	ELA @ 10 Pa. 2492.1 cm^2
	3.57 ACH @ 50 Pa
Mechanical Ventilation (L/s):	Total Supply: 73.2 / Total Exhaust: 73.2
Flue Size	
Flue #:	#1 #2 #3 #4
Diameter (mm):	0 0 0 0
Natural Infiltration Rates	
Heating Air Leakage Rate (ACH/H):	**0.350**
Cooling Air Leakage Rate (ACH/H):	**0.121**

TYPE: 5005 - KNIGHTSWOOD ELEV B & B CNR

LO# 77532







PARTIAL BASEMENT PLAN, EL. '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
	REVISIONS	
3.	REVISED AS PER ARCHITECTURALS	FEB/2020
2.	3R RELOCATED	NOV/2018
1.	DECK CONDITIONS ADDED	SEPT/2018

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Client

GOLDPARK HOMES

Project Name

PINE VALLEY & TESTON
VAUGHAN, ONTARIO

KNIGHTSWOOD (& CNR)
5005 ELEV. 'B' 4380 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 90008 BTU/H		
UNIT DATA		
MAKE	LENNOX	
MODEL	EL296UH110XE60C	
INPUT	110	MBTU/H
OUTPUT	106	MBTU/H
COOLING	5.0	TONS
FAN SPEED	1955	cfm @ 0.6" w.c.

# OF RUNS	S/A	R/A	FANS
3RD FLOOR			
2ND FLOOR	18	5	7
1ST FLOOR	13	3	3
BASEMENT	7	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

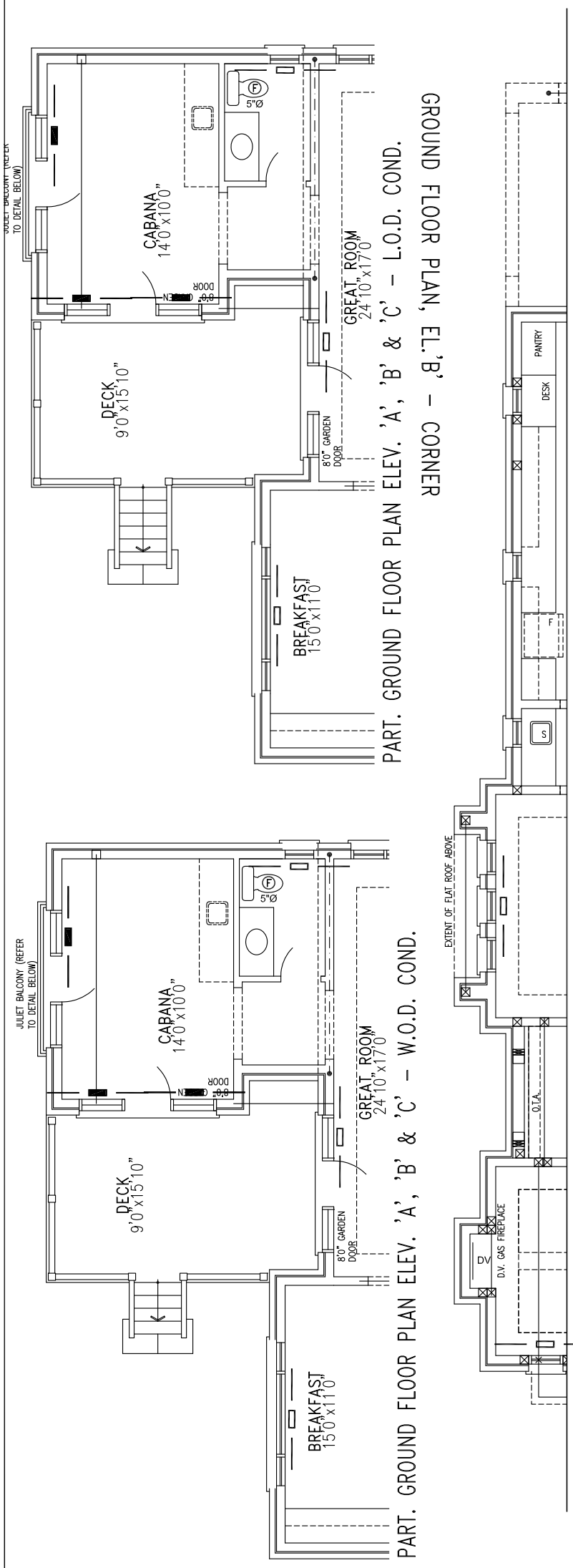
BASEMENT HEATING LAYOUT

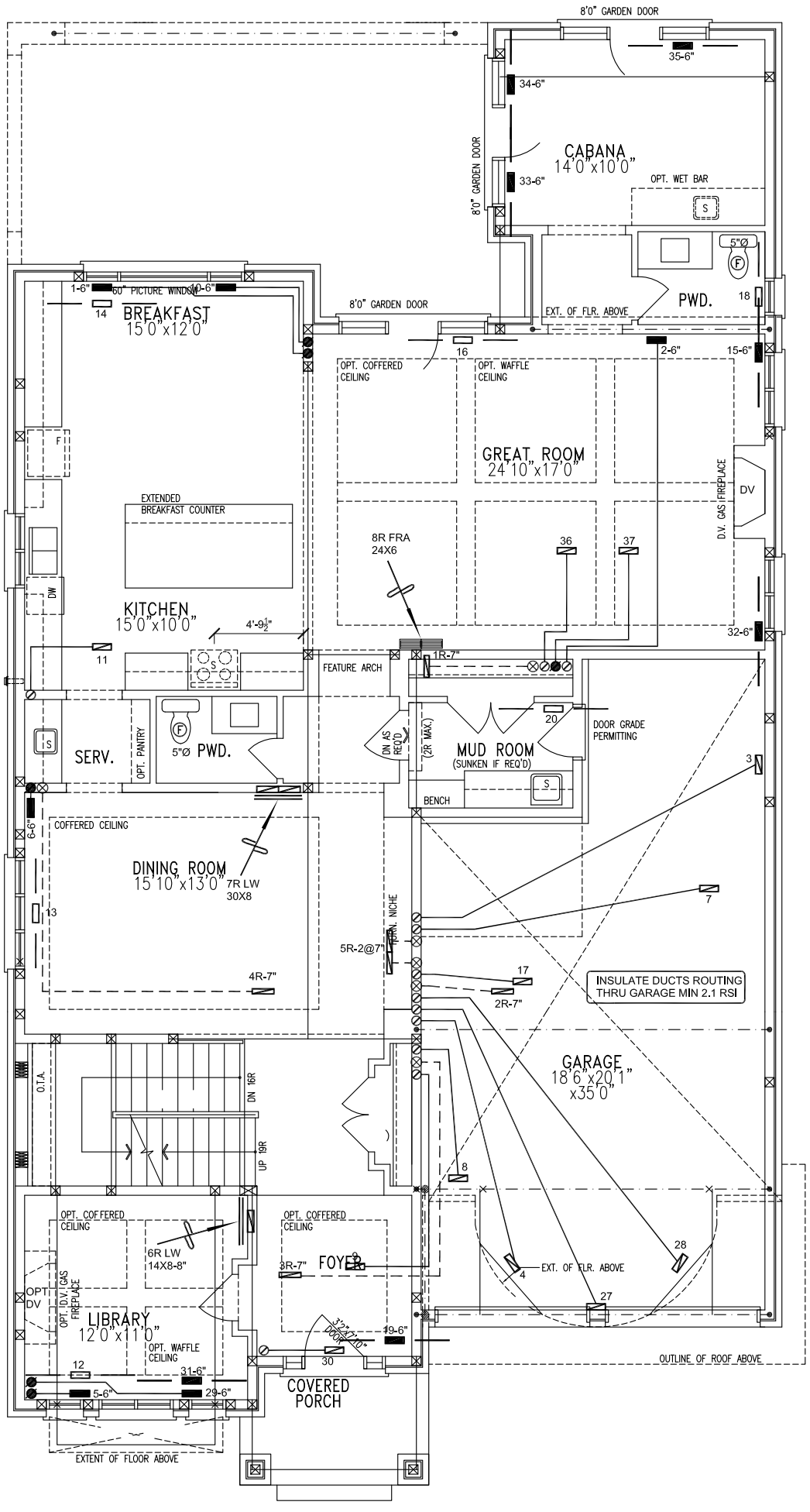
Date JAN/2018

Scale 1/8" = 1'-0"

BCIN# 19669

LO# 77532





PARTIAL GROUND FLOOR PLAN, EL. '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
	REVISIONS	
3.	REVISED AS PER ARCHITECTURALS	FEB/2020
2.	3R RELOCATED	NOV/2018
1.	DECK CONDITIONS ADDED	SEPT/2018

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Client
GOLDPARK HOMES

Project Name
PINE VALLEY & TESTON
VAUGHAN, ONTARIO

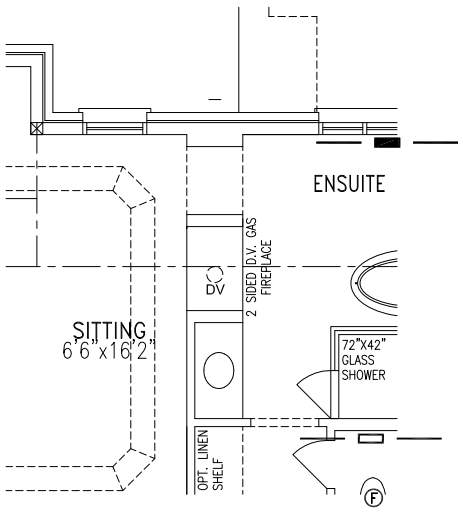
KNIGHTSWOOD (& CNR)
5005 ELEV. 'B' 4380 sqft

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

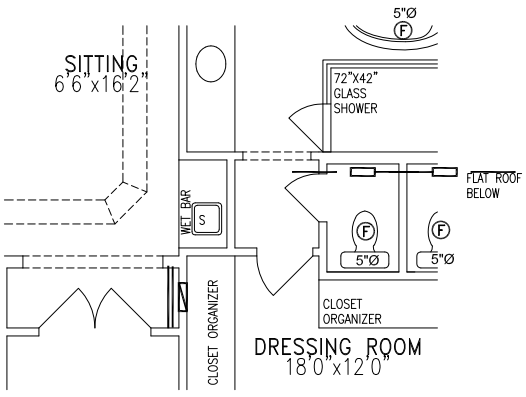
Installation to comply with the latest Ontario Building Code. All supply branch outlets shall be equipped with a manual balancing damper. Ductwork which passes through the garage or unheated spaces shall be adequately insulated and be gas-proofed.

Sheet Title
FIRST FLOOR HEATING LAYOUT

Date JAN/2018
Scale 1/8" = 1'-0"
BCIN# 19669
LO# 77532

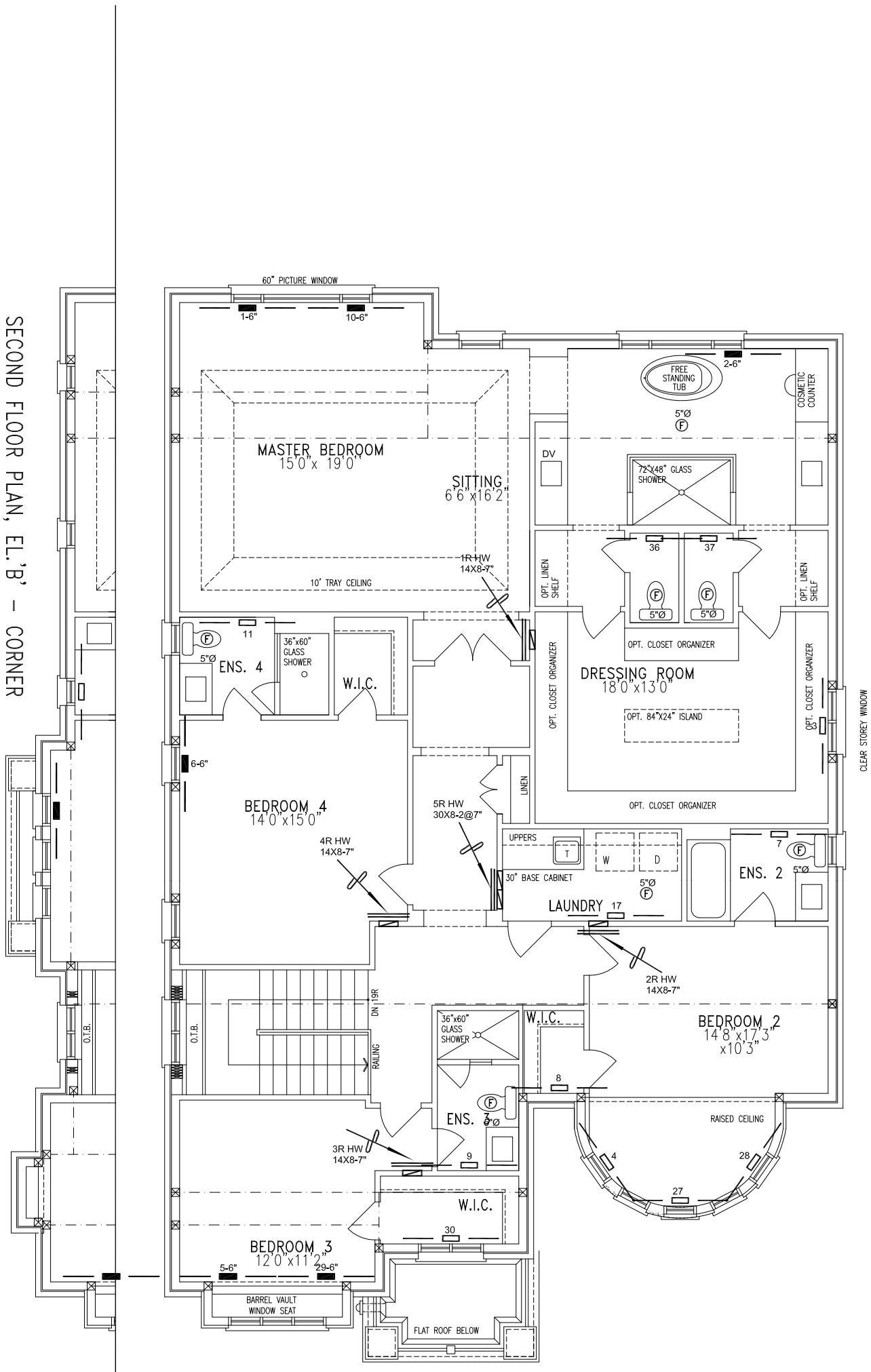


PART. SECOND FLOOR PLAN
OPT. SITTING AREA FIREPLACE



PART. SECOND FLOOR PLAN
OPT. SITTING AREA WET BAR

SECOND FLOOR PLAN, EL. 'B' - CORNER



SECOND FLOOR PLAN, EL. '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.	REVISED AS PER ARCHITECTURALS	FEB/2020
2.	3R RELOCATED	NOV/2018
1.	DECK CONDITIONS ADDED	SEPT/2018

REVISIONS

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Client
GOLDPARK HOMES

Project Name
PINE VALLEY & TESTON
VAUGHAN, ONTARIO

KNIGHTSWOOD (& CNR)
5005 ELEV. 'B' 4380 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
SECOND FLOOR HEATING LAYOUT

Date JAN/2018
Scale 1/8" = 1'-0"
BCIN# 19669
LO# 77532

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**		
VAUGHAN (WOODBRIDGE)				

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:** 5005 - KNIGHTSWOOD ELEV. B & B CNR - OPT. 5 BED **Project:** PINE VALLEY & TESTON

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.

February 25, 2020
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: PINE VALLEY & TESTON | ELEV. B & B CNR - OPT. 5 BED | DATE: Feb-20 | WINTER NATURAL AIR CHANGE RATE 0.350 | HEAT LOSS ΔT °F. 76 | CSA-F280-12
BUILDER: GOLD PARK HOMES | TYPE: 5005 - KNIGHTSWOOD | GFA: 4380 | LO# 77533 | SUMMER NATURAL AIR CHANGE RATE 0.121 | HEAT GAIN ΔT °F. 14 | SB-12 PACKAGE A1

ROOM USE			MBR			ENS			BED-5			BED-2			BED-3			BED-4			ENS-2/5			WIC-2			ENS-3			ENS-4			WIC-3			WIC		
EXP. WALL			46			30			14			36			36			19			6			3			4			7			14			6		
CLG. HT.			11			10			10			11			11			10			10			10			10			10			10			10		
	FACTORS																																				
GRS.WALL AREA	LOSS	GAIN	506			300			140			396			396			190			60			30			40			70			140			60		
GLAZING				LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN
NORTH	21.3	16.3	0	0	0	0	0	0	6	128	98	0	0	0	0	0	0	0	0	0	8	170	130	0	0	0	0	0	0	0	0	0	0	0	0	0	0
EAST	21.3	41.8	0	0	0	0	0	0	0	0	0	65	1383	2719	50	1064	2092	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	20	426	837	0	0	0
SOUTH	21.3	25.2	19	404	478	0	0	0	0	0	0	0	0	0	12	255	302	44	936	1108	0	0	0	0	0	0	0	0	0	9	192	227	0	0	0	0	0	0
WEST	21.3	41.8	50	1064	2092	34	724	1422	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	0	0	0
SKYLT.	37.2	102.0	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	0	0	0	0	0	0	0	0	0	0
DOORS	25.2	4.6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
NET EXPOSED WALL	4.5	0.8	437	1950	354	266	1187	216	134	598	109	331	1477	268	334	1491	271	146	652	118	52	232	42	30	134	24	40	179	32	61	272	49	120	536	97	60	268	49
NET EXPOSED BSMT WALL ABOVE GR	3.6	0.7	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	0	0	0	0	0	0	0	0	0
EXPOSED CLG	1.3	0.6	480	616	290	205	263	124	315	404	190	175	225	106	249	320	151	285	366	172	60	77	36	40	51	24	92	118	56	105	135	63	53	68	32	102	131	62
NO ATTIC EXPOSED CLG	2.7	1.3	0	0	0	0	0	0	0	0	0	78	214	101	18	49	23	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	154	393	71	253	645	117	18	46	8	0	0	0	60	153	28	40	102	19	0	0	0	0	0	0	0	0	0	0	0	0
BASEMENT/CRAWL HEAT LOSS				0			0			0			0			0			0			0			0			0			0			0			0	
SLAB ON GRADE HEAT LOSS				0			0			0			0			0			0			0			0			0			0			0			0	
SUBTOTAL HT LOSS				4035			2174			1523			3945			3225			1954			632			287			297			598			1029			399	
SUB TOTAL HT GAIN					3214			1762			468			3311			2847			1398			236			67			88			340			966			110
LEVEL FACTOR / MULTIPLIER			0.20	0.31		0.20	0.31		0.20	0.31		0.20	0.31		0.20	0.31		0.20	0.31		0.20	0.31		0.20	0.31		0.20	0.31		0.20	0.31		0.20	0.31		0.20	0.31	
AIR CHANGE HEAT LOSS				1245			671			470			1217			995			603			195			89			92			185			318			123	
AIR CHANGE HEAT GAIN					250			137			36			257			221			109			18			5			7			26			75			9
DUCT LOSS				0			0			199			516			422			0			83			38			0			0			0			0	
DUCT GAIN					0			0			117			424			374			0			68			50			0			0			0			0
HEAT GAIN PEOPLE	240		2		480	0		0	1		240	1		240	1		240	1		240	0		0	0		0	0		0	0		0	0		0	0		0
HEAT GAIN APPLIANCES/LIGHTS					428			428			428			428			428			428			428			428			428			428			0			0
TOTAL HT LOSS BTU/H				5279			2844			2192			5678			4642			2556			910			413			388			783			1347			522	
TOTAL HT GAIN x 1.3 BTU/H					5683			3024			1676			6058			5342			2827			976			715			679			1032			1353			154

ROOM USE			LIB			DIN			KIT/GT			CAB			LAUN			PWD			FOY			MUD									LOD			BAS		
EXP. WALL			31			32			87			45			0			5			35			18									52			238		
CLG. HT.			11			11			11			11			10			11			11			12									10			10		
	FACTORS																																					
GRS.WALL AREA	LOSS	GAIN	341			352			957			495			0			55			385			216									520			1978		
GLAZING				LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN								LOSS	GAIN		LOSS	GAIN
NORTH	21.3	16.3	0	0	0	0	0	0	46	979	748	0	0	0	0	0	0	9	192	146	0	0	0	0	0	0							0	0	0	6	128	98
EAST	21.3	41.8	56	1192	2343	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
SOUTH	21.3	25.2	0	0	0	34	724	856	21	447	529	63	1341	1586	0	0	0	0	0	0	0	0	0	0	0	0							0	0	0	6	128	151
WEST	21.3	41.8	0	0	0	0	0	0	115	2447	4811	63	1341	2635	0	0	0	0	0	0	0	0	0	0	0	0							22	468	920	0	0	0
SKYLT.	37.2	102.0	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	0	0	0	0
DOORS	25.2	4.6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	56	1414	257	20	505	92							0	0	0	20	505	92
NET EXPOSED WALL	4.5	0.8	285	1272	231	318	1419	258	775	3459	628	369	1647	299	0	0	0	46	205	37	329	1468	267	196	875	159							0	0	0	0	0	0
NET EXPOSED BSMT WALL ABOVE GR	3.6	0.7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0							290	1044	189	402	1447	263
EXPOSED CLG	1.3	0.6	0	0	0	0	0	0	0	0	0	0	0	0	102	131	62	0	0	0	0	0	0	0	0	0							0	0	0	0	0	0
NO ATTIC EXPOSED CLG	2.7	1.3	0	0	0	0	0	0	0	0	0	203	558	263	0	0	0	40	110	52	41	113	53	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	56	143	26	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			0											8373		
SLAB ON GRADE HEAT LOSS				0			0			0			0			0			0			0			0										0				
SUBTOTAL HT LOSS				2464			2143			7332			4886			274			507			2995			1380										1512			10580	
SUB TOTAL HT GAIN					2574			1114			6715			4784			88			235			576			251										1110			603
LEVEL FACTOR / MULTIPLIER			0.30	0.43		0.30	0.43		0.30	0.43		0.30	0.43		0.20	0.31		0.30	0.43		0.30	0.43		0.30	0.43											0.50	1.30	
AIR CHANGE HEAT LOSS				1070			931			3185			2122			84			220			1301			599												15713	
AIR CHANGE HEAT GAIN					200			86			521			371			7			18			45			19													133
DUCT LOSS				0			0			0			0			36			0			0			0												0		
DUCT GAIN					0			0			0			0			52			0			0			0													0
HEAT GAIN PEOPLE	240		0		0	0		0	0		0	0		0	0		0	0		0	0		0	0		0							0		0	0		0
HEAT GAIN APPLIANCES/LIGHTS					428			428			428			428			428			428			428			428									0			428
TOTAL HT LOSS BTU/H				3534			3073			10516			7008			394			727			4296			1979										1512			26293	
TOTAL HT GAIN x 1.3 BTU/H					4161			2116			9963			7257			747			886			1364			907										1443			1513

TOTAL HEAT GAIN BTU/H: 60454 | TONS: 5.04 | LOSS DUE TO VENTILATION LOAD BTU/H: 3181 | STRUCTURAL HEAT LOSS: 86887 | TOTAL COMBINED HEAT LOSS BTU/H: 90068

I REVIEW AND TAKE RESPONSIBILITY FOR THE DESIGN WORK AND AM QUALIFIED IN THE APPROPRIATE CATEGORY AS AN "OTHER DESIGNER" UNDER DIVISION C, 3.2.5 OF THE BUILDING CODE.

Michael O'Rourke

INDIVIDUAL BCIN: 19669 MICHAEL O'ROURKE

HVAC DESIGNS LTD.

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SITE NAME: PINE VALLEY & TESTON — ELEV. B & B CNR - OPT. 5 BED
BUILDER: GOLD PARK HOMES — TYPE: 5005 - KNIGHTSWOOD — DATE: Feb-20 — GFA: 4380 — LO# 77533

HEATING CFM	1955	COOLING CFM	1955	furnace pressure	0.6
TOTAL HEAT LOSS	86,887	TOTAL HEAT GAIN	59,877	furnace filter	0.08
AIR FLOW RATE CFM	22.5	AIR FLOW RATE CFM	32.65	a/c coil pressure	0.2
				available pressure for s/a & r/a	0.32
				plenum pressure s/a	0.17
				max s/a dif press. loss	0.02
				min adjusted pressure s/a	0.15

				r/a pressure	0.15
				r/a grille press. Loss	0.02
				adjusted pressure r/a	0.13

^LENNOX — AFUE = 96 %
EL296UH110XE60C 110 — INPUT (BTU/H) = 110,000
FAN SPEED — OUTPUT (BTU/H) = **106,000**

FAN SPEED	
LOW	0
MEDLOW	1380
MEDIUM	1505
MEDIUM HIGH	1685
HIGH	1955

DESIGN CFM = **1955** CFM @ .6 " E.S.P.
TEMPERATURE RISE 50 °F

RUN COUNT	4th	3rd	2nd	1st	Bas
S/A	0	0	18	13	7
R/A	0	0	6	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	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
ROOM NAME	MBR	ENS	BED-5	BED-2	BED-3	BED-4	ENS-2/5	WIC-2	ENS-3	MBR	ENS-4	LIB	DIN	KIT/GT	KIT/GT	KIT/GT	LAUN	PWD	FOY	MUD	BAS	BAS	BAS	BAS
RM LOSS MBH.	2.64	2.22	2.19	1.89	2.32	2.56	0.91	0.41	0.39	2.64	0.78	1.77	3.07	2.63	2.63	2.63	0.39	0.73	4.30	1.98	3.97	3.97	3.97	3.97
CFM PER RUN HEAT	59	50	49	43	52	58	20	9	9	59	18	40	69	59	59	59	9	16	97	45	89	89	89	89
RM GAIN MBH.	2.84	2.21	1.68	2.02	2.67	2.83	0.98	0.72	0.68	2.84	1.03	2.08	2.12	2.49	2.49	2.49	0.75	0.89	1.36	0.91	0.42	0.42	0.42	0.42
CFM PER RUN COOLING	93	72	55	66	87	92	32	23	22	93	34	68	69	81	81	81	24	29	45	30	14	14	14	14
ADJUSTED PRESSURE	0.15	0.16	0.16	0.16	0.15	0.15	0.16	0.16	0.16	0.15	0.16	0.16	0.16	0.15	0.15	0.15	0.16	0.16	0.15	0.16	0.15	0.15	0.15	0.15
ACTUAL DUCT LGH.	70	70	53	49	70	48	47	48	53	64	59	57	29	52	69	54	36	73	40	47	67	60	54	38
EQUIVALENT LENGTH	200	200	170	160	160	160	200	150	170	170	150	140	103	120	140	110	200	170	210	160	150	120	103	90
TOTAL EFFECTIVE LENGTH	270	270	223	209	230	208	247	198	223	234	209	197	132	172	209	164	236	243	250	207	217	180	157	128
ADJUSTED PRESSURE	0.05	0.06	0.07	0.07	0.06	0.07	0.06	0.08	0.07	0.06	0.07	0.08	0.12	0.09	0.07	0.09	0.07	0.06	0.06	0.08	0.07	0.08	0.09	0.11
ROUND DUCT SIZE	**6**	**6**	5	5	**6**	**6**	4	4	4	**6**	4	5	5	5	**6**	5	4	4	**6**	4	**6**	**6**	**6**	5
HEATING VELOCITY (ft/min)	301	255	360	316	265	296	229	103	103	301	207	294	507	433	301	433	103	184	495	516	454	454	454	653
COOLING VELOCITY (ft/min)	474	367	404	485	444	469	367	264	252	474	390	499	507	595	413	595	275	333	229	344	71	71	71	103
OUTLET GRILL SIZE	4X10	4X10	3X10	3X10	4X10	4X10	3X10	3X10	3X10	4X10	3X10	3X10	3X10	3X10	4X10	3X10	3X10	3X10	4X10	3X10	4X10	4X10	4X10	3X10
TRUNK	D	C	E	G	F	E	E	G	G	D	E	F	E	D	B	C	G	A	F	C	A	B	D	E

RUN #	25	26	27	28	29	30	31	32	33	34	35	36	37	38
ROOM NAME	BAS	BAS	BED-2	BED-2	BED-3	WIC-3	LIB	KIT/GT	CAB	CAB	CAB	WIC	ENS	BAS
RM LOSS MBH.	3.97	3.97	1.89	1.89	2.32	1.35	1.77	2.63	2.34	2.34	2.34	0.52	0.62	3.97
CFM PER RUN HEAT	89	89	43	43	52	30	40	59	53	53	53	12	14	89
RM GAIN MBH.	0.42	0.42	2.02	2.02	2.67	1.35	2.08	2.49	2.42	2.42	2.42	0.15	0.81	0.42
CFM PER RUN COOLING	14	14	66	66	87	44	68	81	79	79	79	5	27	14
ADJUSTED PRESSURE	0.15	0.15	0.16	0.16	0.15	0.16	0.16	0.15	0.16	0.16	0.16	0.16	0.16	0.15
ACTUAL DUCT LGH.	34	50	52	55	75	58	51	55	69	71	82	56	58	23
EQUIVALENT LENGTH	110	150	170	160	160	190	160	120	150	130	140	200	190	140
TOTAL EFFECTIVE LENGTH	144	200	222	215	235	248	211	175	219	201	222	256	248	163
ADJUSTED PRESSURE	0.1	0.07	0.07	0.07	0.06	0.06	0.07	0.08	0.07	0.08	0.07	0.06	0.06	0.09
ROUND DUCT SIZE	5	**6**	5	5	**6**	5	5	5	**6**	5	**6**	4	4	**6**
HEATING VELOCITY (ft/min)	653	454	316	316	265	220	294	433	270	389	270	138	161	454
COOLING VELOCITY (ft/min)	103	71	485	485	444	323	499	595	403	580	403	57	310	71
OUTLET GRILL SIZE	3X10	4X10	3X10	3X10	4X10	3X10	3X10	3X10	4X10	3X10	4X10	3X10	3X10	4X10
TRUNK	G	F	G	G	F	F	F	B	A	A	A	C	C	E

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	264	0.06	9.2	10	x	8	475	TRUNK G	645	0.06	12.8	20	x	8	581
TRUNK B	207	0.07	8	8	x	8	466	TRUNK H	1955	0.05	20.3	38	x	10	741
TRUNK C	651	0.06	12.8	20	x	8	586	TRUNK I	0	0.00	0	0	x	8	0
TRUNK D	266	0.05	9.6	10	x	8	479	TRUNK J	0	0.00	0	0	x	8	0
TRUNK E	1309	0.05	17.4	28	x	10	673	TRUNK K	0	0.00	0	0	x	8	0
TRUNK F	400	0.06	10.7	14	x	8	514	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	1500	0.05	18.4	32	x	10	675
TRUNK Y	890	0.05	15.1	26	x	8	616
TRUNK Z	435	0.05	11.6	16	x	8	489
DROP	1955	0.05	20.3	24	x	18	652

RETURN AIR #	1	2	3	4	5	6	7	8	9							**BR**
	0	0	0	0	2@7"	0	0	0	0	0	0	0	0	0	0	
AIR VOLUME	115	130	125	115	240	200	340	320	85	0	0	0	0	0	0	285
PLENUM PRESSURE	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13
ACTUAL DUCT LGH.	84	51	62	59	47	49	30	51	51	1	1	1	1	1	1	14
EQUIVALENT LENGTH	200	135	155	185	135	140	170	195	175	0	0	0	0	0	0	145
TOTAL EFFECTIVE LH	284	186	217	244	182	189	200	246	226	1	1	1	1	1	1	159
ADJUSTED PRESSURE	0.05	0.07	0.06	0.05	0.07	0.07	0.07	0.05	0.06	13.36	13.36	13.36	13.36	13.36	13.36	0.08
ROUND DUCT SIZE	7	6.8	6.9	7	8.5	7.9	9.7	10.3	6	0	0	0	0	0	0	8.8
INLET GRILL SIZE	8	8	8	8	8	8	8	8	8	0	0	0	0	0	0	8
	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
INLET GRILL SIZE	14	14	14	14	30	14	30	30	14	0	0	0	0	0	0	30

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Michael O'Rourke — INDIVIDUAL BCIN: 19669 MICHAEL O'ROURKE

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SITE NAME: PINE VALLEY & TESTON **ELEV. B & B CNR - OPT. 5 BED** BCIN# 19669

BUILDER: GOLD PARK HOMES **TYPE: 5005 - KNIGHTSW AH - 1** **DATE: Feb-20** **GFA: 4380** **LO# 77533** PAGE 2 of 3

UNIT OUTPUT @ 130 °F	30250	BTU/H	**CFM / OUTLET =**	Water Heater	FLOWMAX	**Air Max**	
MEDIAN OUTLETS for UNIT	14		0	Make & Model #	FLOWMAX-90	MaxAir 50e	OUTPUT 30250 BTUH @ 130 ° F
BTU/H per OUTLET HEATING	2241			Input	85304 Btu/H		CFM @1.5" E.S.P.
				Storage capacity	40 US/gal.		
UNIT OUTPUT COOLING	18000	BTU/H		Efficiency	98.4 %		DESIGN CFM = 580
MEDIAN OUTLETS for UNIT	14						
BTU/H per OUTLET COOLING	1333						A/C SIZE **1.5** TONS
							A/C SIZE 18000 BTU/H

FLOOR	2	2	2	2	2	2	2	2	2	2	1	1	1	1	2	1	1	1	B	2	2		
ROOM NAME	MBR	ENS	BED-5	BED-2	BED-3	BED-4	ENS-2/5	WIC-2	ENS-3	ENS-4	LIB	DIN	KIT/GT	CAB	LAUN	PWD	FOY	MUD	BAS	WIC-3	WIC		
RM LOSS MBH.	5.28	2.84	2.19	5.68	4.64	2.56	0.91	0.41	0.39	0.78	3.53	3.07	10.52	7.01	0.39	0.73	4.30	1.98	27.80	1.35	0.52	0.00	0.00
# of RUNS red'd **HEATING**	2.4	1.3	1.0	2.5	2.1	1.1	0.4	0.2	0.2	0.3	1.6	1.4	4.7	3.1	0.2	0.3	1.9	0.9	12.4	0.6	0.2	0.0	0.0
RM GAIN MBH.	5.68	3.02	1.68	6.06	5.34	2.83	0.98	0.72	0.68	1.03	4.16	2.12	9.96	7.26	0.75	0.89	1.36	0.91	2.96	1.35	0.15	0.00	0.00
# of RUNS red'd **COOLING**	4.3	2.3	1.3	4.5	4.0	2.1	0.7	0.5	0.5	0.8	3.1	1.6	7.5	5.4	0.6	0.7	1.0	0.7	2.2	1.0	0.1	0.0	0.0
# of OUTLETS INSTALLED																							

Total Runs 0

RETURN AIR #	1	2	3	4	5	6	7	8	9	10	11	12	13	14	BR
FLOOR															B
AIR VOLUME	0	0	0	0	0	0	0	0	0	0	0	0	0	0	580
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
ACTUAL DUCT LGH.	1	1	1	1	1	1	1	1	1	1	1	1	1	1	13
EQUILVALENT LENGTH	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL EFFECTIVE LH	1	1	1	1	1	1	1	1	1	1	1	1	1	1	13
ADJUSTED PRESSURE	15	15	15	15	15	15	15	15	15	15	15	15	15	15	1.15
ROUND DUCT SIZE	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5.9
INLET GRILL SIZE	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4
	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
INLET GRILL SIZE	0	0	0	0	0	0	0	0	0	0	0	0	0	0	10

RETURN AIR TRUNK SIZE

	TRUNK CFM	STATIC PRESS.	ROUND DUCT	RECT DUCT		
TRUNK O	0	1.15	0	0	x	8
TRUNK P	0	1.15	0	0	x	8
TRUNK Q	0	1.15	0	0	x	8
TRUNK R	0	1.15	0	0	x	8
TRUNK S	0	1.15	0	0	x	8
TRUNK T	0	1.15	0	0	x	8
TRUNK U	0	1.15	0	0	x	8
TRUNK V	0	1.15	0	0	x	8
TRUNK W	0	1.15	0	0	x	8
TRUNK X	580	1.15	5.9	4	x	8
TRUNK Y	0	1.15	0	0	x	8
TRUNK Z	0	1.15	0	0	x	8
DROP	580	1.15	5.9	4	x	8
				3	x	10
				3	x	12
				2	x	14
				2	x	16
				2	x	18
				4	x	9
				3	x	11

INSTALLATION OF COMBO HEATING SYSTEM TO COMPLY WITH UNIFIED CANADIAN GUIDELINE FOR INTERGRATED (COMBINATION) HEATING SYSTEMS LATEST ADDITION

MAXIMUM TEMPERATURE of HOT WATER SYSTEM SUPPLIED TO PLUMBING FIXTURES SHALL NOT EXCEED 120 ° F or 49° C

EXHAUST & COMBUSTION AIR INTAKES SHALL COMPLY with ALL LOCAL CODES & AUTHORITIES

		+10%
TOTAL COMBINED HEAT LOSS BTU/H	**86887**	**95576**
TOTAL HEAT GAIN BTU/H	**59877**	

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INDIVIDUAL BCIN: 19669
Michael O'Rourke



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TYPE: 5005 - KNIGHTSWOOD LO # 77533
SITE NAME: PINE VALLEY & TESTON ELEV. B & B CNR - OPT. 5 BED

RESIDENTIAL MECHANICAL VENTILATION DESIGN SUMMARY

COMBUSTION APPLIANCES 9.32.3.1(1)

- a) [✓] Direct vent (sealed combustion) only
- b) [ ] Positive venting induced draft (except fireplaces)
- c) [ ] Natural draft, B-vent or induced draft gas fireplace
- d) [ ] Solid Fuel (including fireplaces)
- e) [ ] No Combustion Appliances

HEATING SYSTEM

[✓] Forced Air [ ] Non Forced Air

[ ] Electric Space Heat

HOUSE TYPE 9.32.1(2)

- [✓] I Type a) or b) appliance only, no solid fuel
- [ ] II Type I except with solid fuel (including fireplaces)
- [ ] III Any Type c) appliance
- [ ] IV Type I, or II with electric space heat
- [ ] Other: Type I, II or IV no forced air

SYSTEM DESIGN OPTIONS O.N.H.W.P.

- [ ] 1 Exhaust only/Forced Air System
- [ ] 2 HRV with Ducting/Forced Air System
- [✓] 3 HRV Simplified/connected to forced air system
- [ ] 4 HRV with Ducting/non forced air system
- [ ] Part 6 Design

TOTAL VENTILATION CAPACITY 9.32.3.3(1)

Basement + Master Bedroom	2	@ 21.2 cfm	42.4	cfm
Other Bedrooms	4	@ 10.6 cfm	42.4	cfm
Kitchen & Bathrooms	7	@ 10.6 cfm	74.2	cfm
Other Rooms	7	@ 10.6 cfm	74.2	cfm
Table 9.32.3.A.		TOTAL	233.2	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	**95.4**	**cfm**

SUPPLEMENTAL VENTILATION CAPACITY 9.32.3.5.

Total Ventilation Capacity	233.2	cfm
Less Principal Ventil. Capacity	155	cfm
Required Supplemental Capacity	78.2	cfm

PRINCIPAL EXHAUST FAN CAPACITY

Model: VANEE 65H Location: BSMT

155.0 cfm 3.0 sones [✓] HVI Approved

PRINCIPAL EXHAUST HEAT LOSS CALCULATION

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

SUPPLEMENTAL FANS NUTONE

Location	Model	cfm	HVI	Sones
ENS	QTXEN050C	50	✓	0.3
ENS-2/5	QTXEN050C	50	✓	0.3
ENS-4	QTXEN050C	50	✓	0.3
PWD	QTXEN050C	50	✓	0.3

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: 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: February-20

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#: 77533 Model: 5005 - KNIGHTSWOOD Builder: GOLD PARK HOMES Date: 2020-02-25

Volume Calculation

House Volume

Level	Floor Area (ft²)	Floor Height (ft)	Volume (ft³)
Bsmt	2020	10	20200
First	2020	11	22220
Second	2360	10	23600
Third	0	9	0
Fourth	0	9	0
		Total:	66,020.0 ft³
		Total:	1869.5 m³

Air Change & Delta T Data

WINTER NATURAL AIR CHANGE RATE	0.350
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	23	31	8	14

5.2.3.1 Heat Loss due to Air Leakage

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

0.350 x 519.30 x 42 °C x 1.2 = 9211 W

= **31427 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 519.30 x 8 °C x 1.2 = 578 W

= **1973 Btu/h**

5.2.3.2 Heat Loss due to Mechanical Ventilation

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

155 CFM x 76 °F x 1.08 x 0.25 = **3181 Btu/h**

6.2.7 Sensible heat Gain due to Ventilation

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

155 CFM x 14 °F x 1.08 x 0.25 = **578 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	31,427	12,091	1.300
2	0.3		21,705	0.434
3	0.2		20,370	0.309
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: 5005 - KNIGHTSWOOD ELEV. B & B CNR - OPT. 5 BED **BUILDER:** GOLD PARK HOMES
SFQT: 4380 **LO#** 77533 **SITE:** PINE VALLEY & TESTON

DESIGN ASSUMPTIONS

HEATING	°F	COOLING	°F
OUTDOOR DESIGN TEMP.	-4	OUTDOOR DESIGN TEMP.	88
INDOOR DESIGN TEMP.	72	INDOOR DESIGN TEMP. (MAX 75°F)	74

BUILDING DATA

ATTACHMENT:	DETACHED	# 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):	66020.0	ASSUMED (Y/N):	Y
INTERNAL SHADING:	BLINDS/CURTAINS	ASSUMED OCCUPANTS:	6
INTERIOR LIGHTING LOAD (Btu/h/ft^2):	1.27	DC BRUSHLESS MOTOR (Y/N):	Y
FOUNDATION CONFIGURATION	BCIN_1	DEPTH BELOW GRADE:	7.0 ft
LENGTH: 77.0 ft	WIDTH: 42.0 ft	EXPOSED PERIMETER:	238.0 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	29.80
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

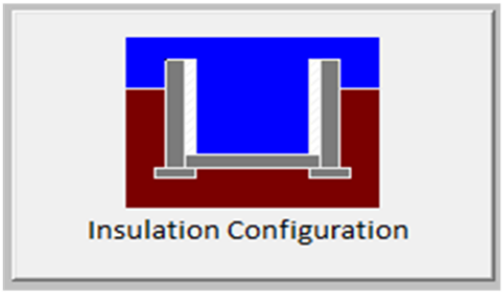


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Residential Foundation Thermal Load Calculator

Supplemental tool for CAN/CSA-F280

Weather Station Description	
Province:	Ontario
Region:	Vaughan (Woodbridge)
Site Description	
Soil Conductivity:	Normal conductivity: dry sand, loam, clay
Water Table:	Normal (7-10 m, 23-33 ft)

Foundation Dimensions		
Floor Length (m):	**23.5**	 Insulation Configuration
Floor Width (m):	**12.8**	
Exposed Perimeter (m):	**0.0**	
Wall Height (m):	**3.0**	
Depth Below Grade (m):	**2.13**	
Window Area (m^2):	**3.2**	
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):	**2453**	

TYPE: 5005 - KNIGHTSWOOD ELEV. B & B CNR - OPT. 5 BED
LO# 77533

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Ajax ON, L1S 2E2
905-619-2300

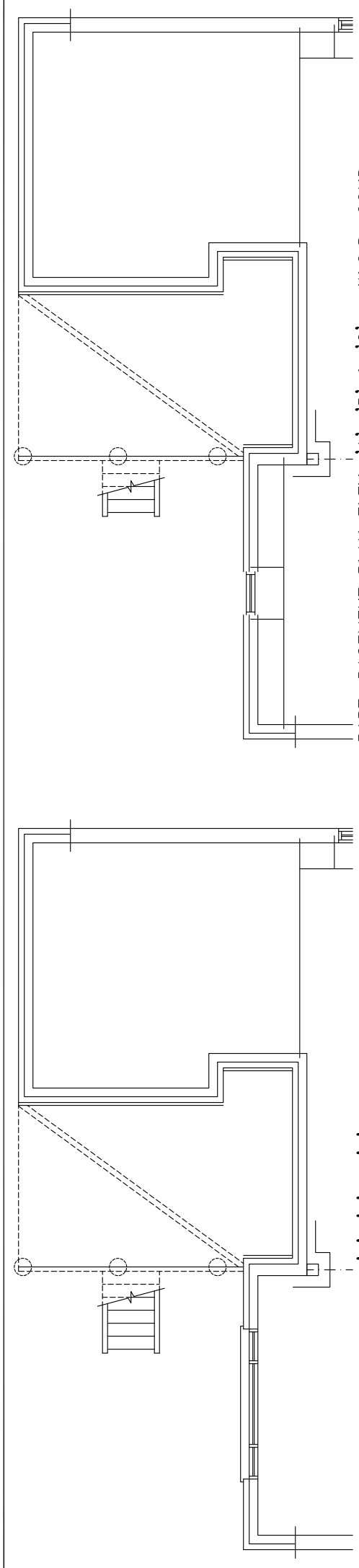
Air Infiltration Residential Load Calculator

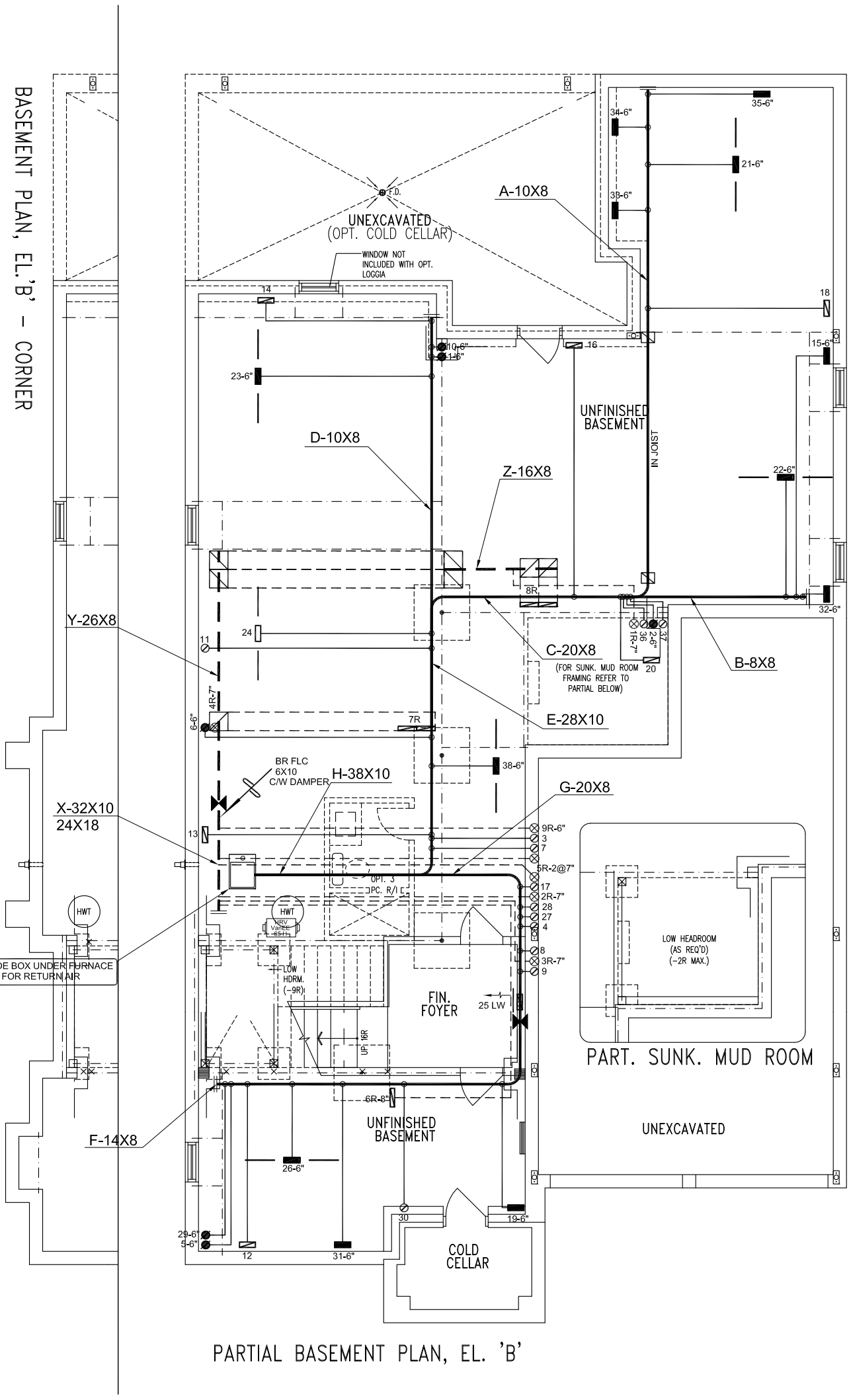
Supplemental tool for CAN/CSA-F280

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):	7.32
Building Configuration	
Type:	Detached
Number of Stories:	Two
Foundation:	Full
House Volume (m^3):	1869.5
Air Leakage/Ventilation	
Air Tightness Type:	Present (1961-) (3.57 ACH)
Custom BDT Data:	ELA @ 10 Pa. 2492.1 cm^2
	3.57 ACH @ 50 Pa
Mechanical Ventilation (L/s):	Total Supply: 73.2 / Total Exhaust: 73.2
Flue Size	
Flue #:	#1 #2 #3 #4
Diameter (mm):	0 0 0 0
Natural Infiltration Rates	
Heating Air Leakage Rate (ACH/H):	**0.350**
Cooling Air Leakage Rate (ACH/H):	**0.121**

TYPE: 5005 - KNIGHTSWOOD ELEV. B & B CNR - OPT. 5 BED

LO# 77533





PARTIAL BASEMENT PLAN, EL. '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.	REVISED AS PER ARCHITECTURALS	FEB/2020
2.	3R RELOCATED	NOV/2018
1.	DECK CONDITIONS ADDED	SEPT/2018

REVISIONS

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Client

GOLDPARK HOMES

Project Name

PINE VALLEY & TESTON
VAUGHAN, ONTARIO
THE KNIGHTSWOOD
OPT. 5 BED
5005 ELEV. 'B' 4380 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 90068 BTU/H		
UNIT DATA		
MAKE	LENNOX	
MODEL	EL296UH110XE60C	
INPUT	110	MBTU/H
OUTPUT	106	MBTU/H
COOLING	5.0	TONS
FAN SPEED	1955	cfm @ 0.6" w.c.

# OF RUNS	S/A	R/A	FANS
3RD FLOOR			
2ND FLOOR	18	6	6
1ST FLOOR	13	3	3
BASEMENT	7	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

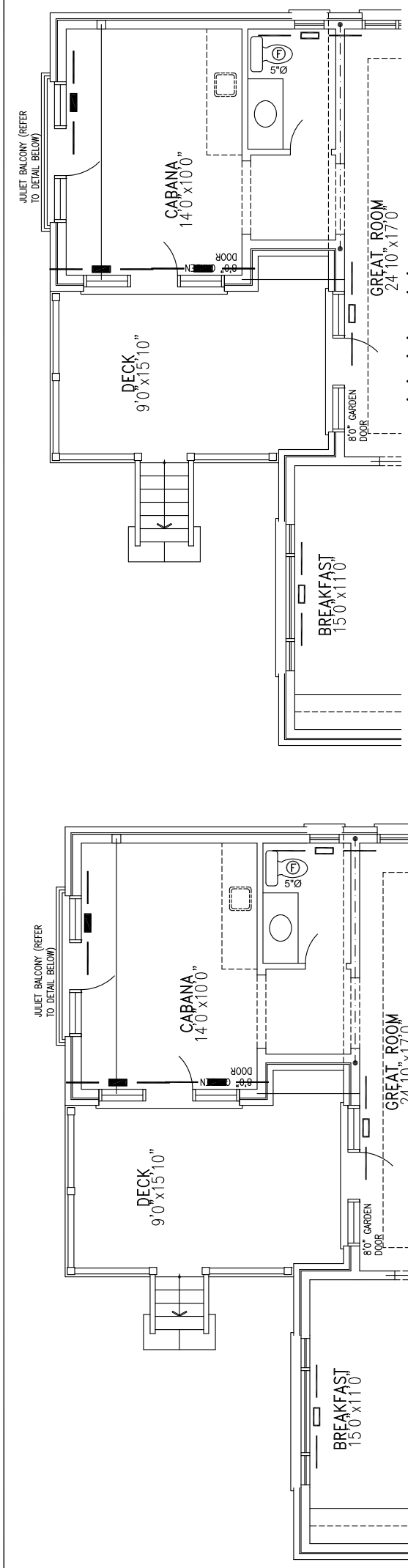
BASEMENT HEATING LAYOUT

Date JAN/2018

Scale 1/8" = 1'-0"

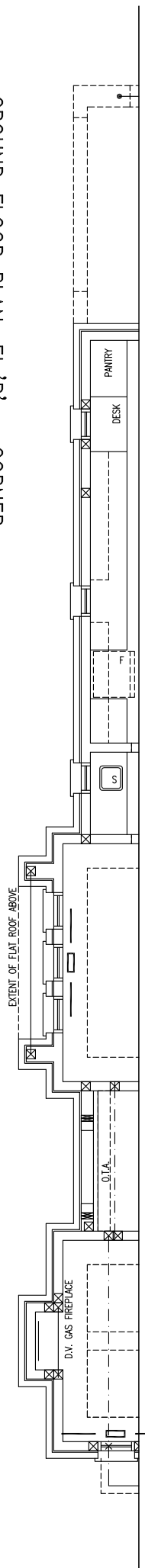
BCIN# 19669

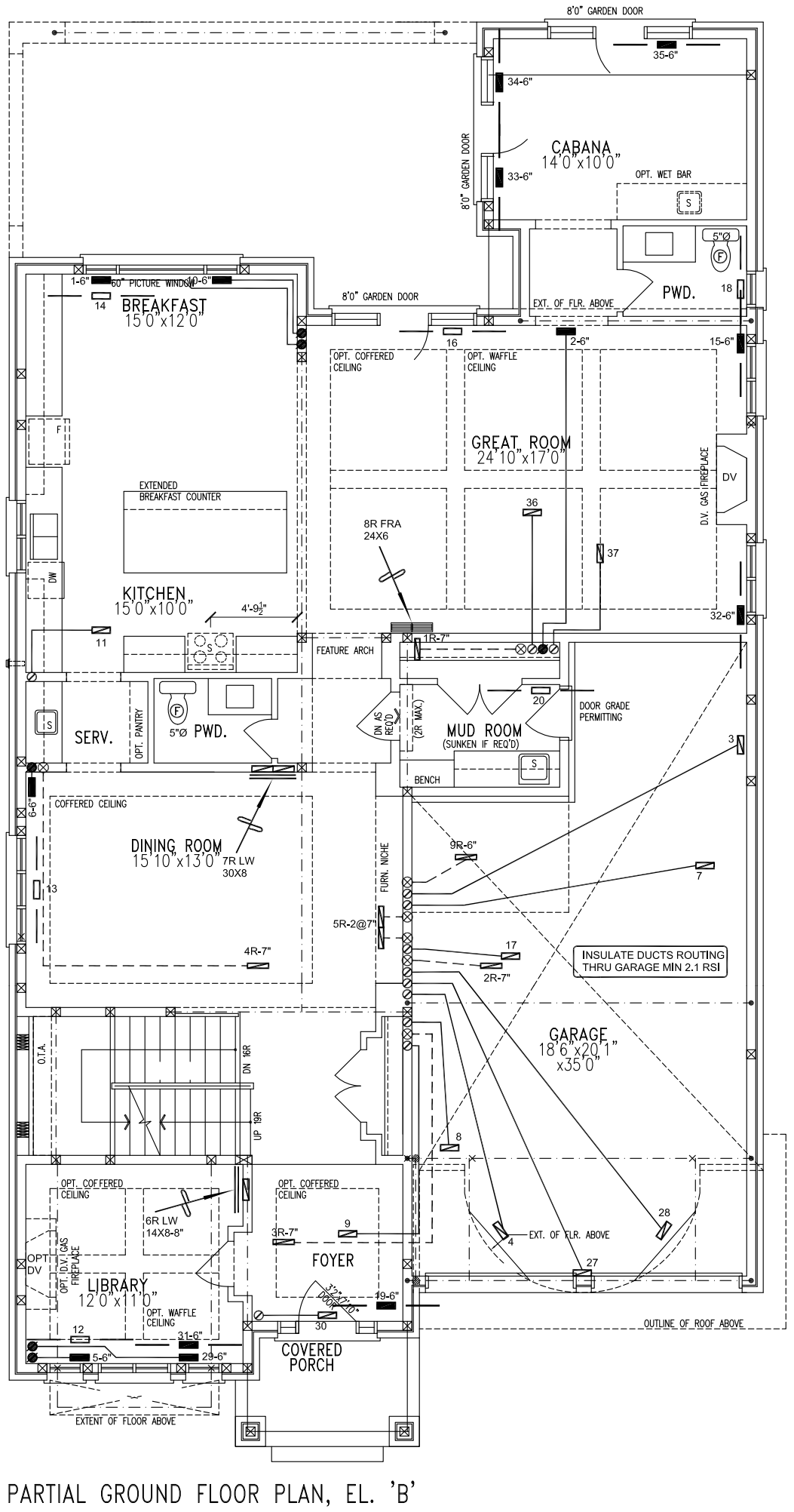
LO# 77533



PART. GROUND FLOOR PLAN ELEV. 'A', 'B' & 'C' - CORNER - L.O.D. COND.

PART. GROUND FLOOR PLAN ELEV. 'A', 'B' & 'C' - W.O.D. COND.





PARTIAL GROUND FLOOR PLAN, EL. '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

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— ▭ —	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.	REVISED AS PER ARCHITECTURALS	FEB/2020
2.	3R RELOCATED	NOV/2018
1.	DECK CONDITIONS ADDED	SEPT/2018

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VAUGHAN, ONTARIO
THE KNIGHTSWOOD
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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

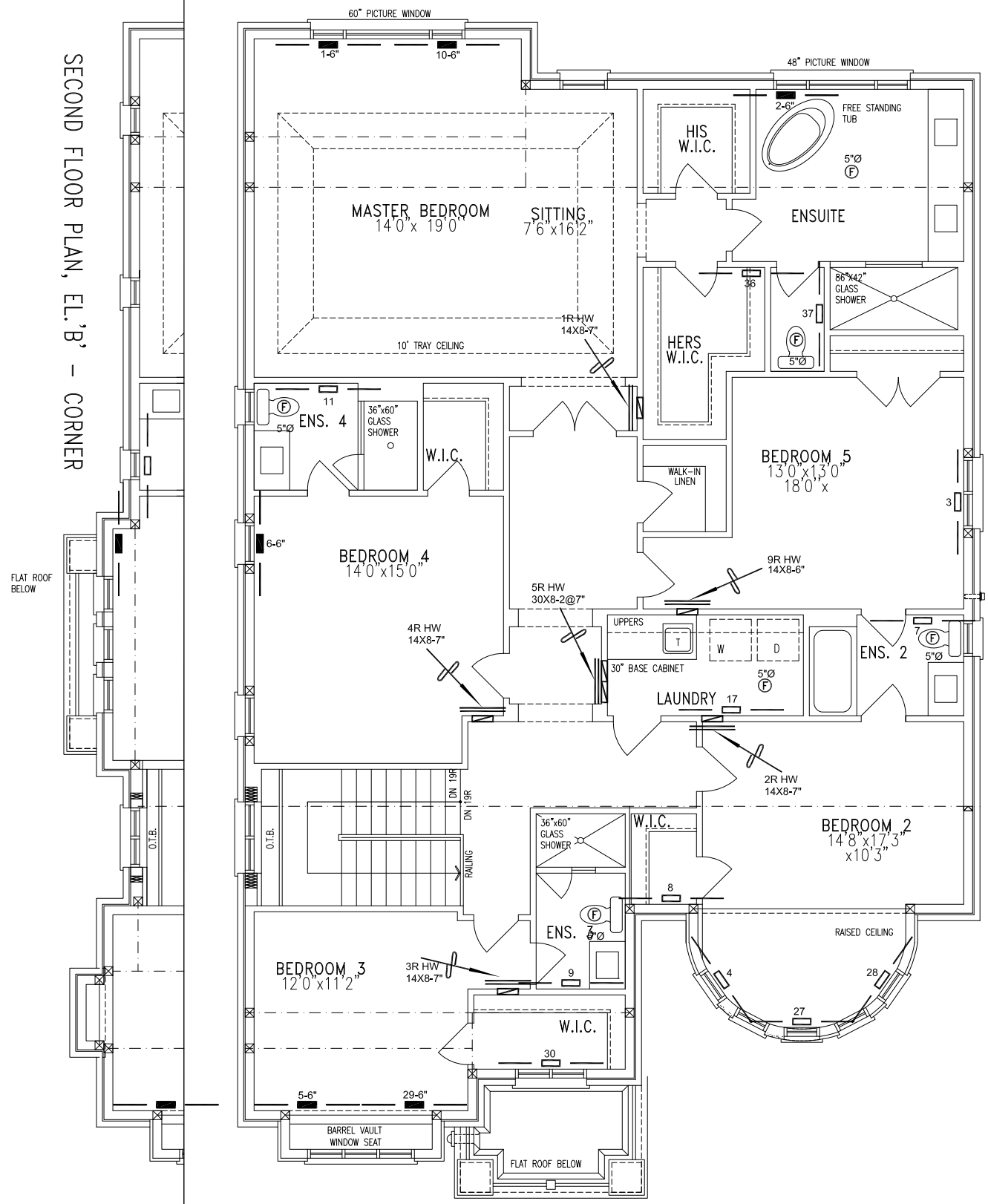
FIRST FLOOR HEATING LAYOUT

Date JAN/2018

Scale 1/8" = 1'-0"

BCIN# 19669

LO# 77533



SECOND FLOOR PLAN, EL. 'B' – CORNER

SECOND FLOOR PLAN, EL. '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

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No.	Description	Date
3.	REVISED AS PER ARCHITECTURALS	FEB/2020
2.	3R RELOCATED	NOV/2018
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Sheet Title
SECOND FLOOR HEATING LAYOUT

Date JAN/2018
Scale 1/8" = 1'-0"
BCIN# 19669
LO# 77533

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**		
VAUGHAN (WOODBRIDGE)				

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:** 5005 - KNIGHTSWOOD ELEV. B & B CNR - OPT. 5 BED OPT SERVICE STAIRS **Project:** PINE VALLEY & TESTON

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.

February 26, 2020
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.

HVAC DESIGNS LTD.
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Tel: 905.619.2300 Fax: 905.619.2375
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SITE NAME: PINE VALLEY & TESTON — ELEV. B & B CNR - OPT. 5 BED OPT SERVICE STAIRS — DATE: Feb-20 — WINTER NATURAL AIR CHANGE RATE 0.350 — HEAT LOSS ΔT °F. 76 — CSA-F280-12
BUILDER: GOLD PARK HOMES — TYPE: 5005 - KNIGHTSWOOD — GFA: 4477 — LO# 85462 — SUMMER NATURAL AIR CHANGE RATE 0.121 — HEAT GAIN ΔT °F. 14 — SB-12 PACKAGE A1

ROOM USE			MBR			ENS			BED-5			BED-2			BED-3			BED-4			ENS-2/5			WIC-2			ENS-3			ENS-4			WIC-3			WIC		
EXP. WALL			46			30			14			36			36			19			6			3			4			7			14			6		
CLG. HT.			11			10			10			11			11			10			10			10			10			10			10			10		
	FACTORS																																				
GRS.WALL AREA	LOSS	GAIN	506			300			140			396			396			190			60			30			40			70			140			60		
GLAZING			LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN
NORTH	21.3	16.3	0	0	0	0	0	0	6	128	98	0	0	0	0	0	0	0	0	0	8	170	130	0	0	0	0	0	0	0	0	0	0	0	0	0	0
EAST	21.3	41.8	0	0	0	0	0	0	0	0	0	65	1383	2719	50	1064	2092	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	20	426	837	0	0	0
SOUTH	21.3	25.2	19	404	478	0	0	0	0	0	0	0	0	0	12	255	302	44	936	1108	0	0	0	0	0	0	0	0	0	9	192	227	0	0	0	0	0	0
WEST	21.3	41.8	50	1064	2092	34	724	1422	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	0	0	0
SKYLT.	37.2	102.0	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	0	0	0	0	0	0	0	0	0	0
DOORS	25.2	4.6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
NET EXPOSED WALL	4.5	0.8	437	1950	354	266	1187	216	134	598	109	331	1477	268	334	1491	271	146	652	118	52	232	42	30	134	24	40	179	32	61	272	49	120	536	97	60	268	49
NET EXPOSED BSMT WALL ABOVE GR	3.6	0.7	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	0	0	0	0	0	0	0	0	0
EXPOSED CLG	1.3	0.6	480	616	290	205	263	124	315	404	190	175	225	106	249	320	151	285	366	172	60	77	36	40	51	24	92	118	56	105	135	63	53	68	32	102	131	62
NO ATTIC EXPOSED CLG	2.7	1.3	0	0	0	0	0	0	0	0	0	78	214	101	18	49	23	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	25	64	12	253	645	117	18	46	8	0	0	0	60	153	28	40	102	19	0	0	0	0	0	0	0	0	0	0	0	0
BASEMENT/CRAWL HEAT LOSS				0			0			0			0			0			0			0			0			0			0			0			0	
SLAB ON GRADE HEAT LOSS				0			0			0			0			0			0			0			0			0			0			0			0	
SUBTOTAL HT LOSS				4035			2174			1194			3945			3225			1954			632			287			297			598			1029			399	
SUB TOTAL HT GAIN					3214			1762			408			3311			2847			1398			236			67			88			340			966			110
LEVEL FACTOR / MULTIPLIER			0.20	0.32		0.20	0.32		0.20	0.32		0.20	0.32		0.20	0.32		0.20	0.32		0.20	0.32		0.20	0.32		0.20	0.32		0.20	0.32		0.20	0.32		0.20	0.32	
AIR CHANGE HEAT LOSS				1304			703			386			1275			1043			632			204			93			96			193			333			129	
AIR CHANGE HEAT GAIN					256			140			32			263			226			111			19			5			7			27			77			9
DUCT LOSS				0			0			158			522			427			0			84			38			0			0			0			0	
DUCT GAIN					0			0			112			426			375			0			70			51			0			0			0			0
HEAT GAIN PEOPLE	240		2		480	0		0	1		240	1		240	1		240	1		240	0		0	0		0	0		0	0		0	0		0	0		0
HEAT GAIN APPLIANCES/LIGHTS					441			441			441			441			441			441			441			441			441			441			0			0
TOTAL HT LOSS BTU/H				5339			2876			1738			5742			4694			2585			920			418			392			792			1362			528	
TOTAL HT GAIN x 1.3 BTU/H					5708			3045			1603			6085			5368			2848			995			734			697			1049			1356			155

ROOM USE			LIB			DIN			KIT/GT			CAB			LAUN			PWD			FOY			MUD									LOD			BAS		
EXP. WALL			31			32			77			45			0			5			35			32									52			238		
CLG. HT.			11			11			11			11			10			11			11			12									10			10		
	FACTORS																																					
GRS.WALL AREA	LOSS	GAIN	341			352			847			495			0			55			385			384									520			1978		
GLAZING			LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN								LOSS	GAIN		LOSS	GAIN	
NORTH	21.3	16.3	0	0	0	0	0	0	46	979	748	0	0	0	0	0	0	9	192	146	0	0	0	0	0	0							0	0	0	6	128	98
EAST	21.3	41.8	56	1192	2343	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
SOUTH	21.3	25.2	0	0	0	34	724	856	21	447	529	63	1341	1586	0	0	0	0	0	0	0	0	0	0	0	0							0	0	0	6	128	151
WEST	21.3	41.8	0	0	0	0	0	0	115	2447	4811	63	1341	2635	0	0	0	0	0	0	0	0	0	0	0	0							22	468	920	0	0	0
SKYLT.	37.2	102.0	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	0	0	0	0
DOORS	25.2	4.6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	56	1414	257	20	505	92							0	0	0	20	505	92
NET EXPOSED WALL	4.5	0.8	285	1272	231	318	1419	258	665	2968	539	369	1647	299	0	0	0	46	205	37	329	1468	267	364	1624	295							0	0	0	0	0	0
NET EXPOSED BSMT WALL ABOVE GR	3.6	0.7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0							290	1044	189	402	1447	263
EXPOSED CLG	1.3	0.6	0	0	0	0	0	0	0	0	0	0	0	0	102	131	62	0	0	0	0	0	0	0	0	0							0	0	0	0	0	0
NO ATTIC EXPOSED CLG	2.7	1.3	0	0	0	0	0	0	0	0	0	203	558	263	0	0	0	40	110	52	41	113	53	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	56	143	26	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			0											8373		
SLAB ON GRADE HEAT LOSS				0			0			0			0			0			0			0			0									0					
SUBTOTAL HT LOSS				2464			2143			6841			4886			274			507			2995			2129									1512			10580		
SUB TOTAL HT GAIN					2574			1114			6626			4784			88			235			576			387										1110			603
LEVEL FACTOR / MULTIPLIER			0.30	0.44		0.30	0.44		0.30	0.44		0.30	0.44		0.20	0.32		0.30	0.44		0.30	0.44		0.30	0.44											0.50	1.34	
AIR CHANGE HEAT LOSS				1090			948			3027			2162			88			224			1325			942												16198		
AIR CHANGE HEAT GAIN					205			89			527			380			7			19			46			31														136
DUCT LOSS				0			0			0			0			36			0			0			0												0		
DUCT GAIN					0			0			0			0			54			0			0			0														0
HEAT GAIN PEOPLE	240		0		0	0		0	0		0	0		0	0		0	0		0	0		0	0		0							0		0	0		0
HEAT GAIN APPLIANCES/LIGHTS					441			441			441			441			441			441			441			441									0					441
TOTAL HT LOSS BTU/H				3554			3091			9868			7048			398			731			4320			3072									1512			26778		
TOTAL HT GAIN x 1.3 BTU/H					4185			2136			9872			7286			766			903			1382			1116										1443			1534

TOTAL HEAT GAIN BTU/H: 60841 — TONS: 5.07 — LOSS DUE TO VENTILATION LOAD BTU/H: 3181 — STRUCTURAL HEAT LOSS: 87758 — TOTAL COMBINED HEAT LOSS BTU/H: 90938

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: PINE VALLEY & TESTON
BUILDER: GOLD PARK HOMES

ELEV. B & B CNR - OPT. 5 BED OPT SERVICE STAIRS
TYPE: 5005 - KNIGHTSWOOD DATE: Feb-20

GFA: 4477 LO# 85462

HEATING CFM	1955	COOLING CFM	1955	furnace pressure	0.6
TOTAL HEAT LOSS	87,758	TOTAL HEAT GAIN	60,263	furnace filter	0.08
AIR FLOW RATE CFM	22.28	AIR FLOW RATE CFM	32.44	a/c coil pressure	0.2
				available pressure for s/a & r/a	0.32
				plenum pressure s/a	0.17
				max s/a dif press. loss	0.02
				min adjusted pressure s/a	0.15

				r/a pressure	0.15
				r/a grille press. Loss	0.02
				adjusted pressure r/a	0.13

^LENNOX
EL296UH110XE60C 110

FAN SPEED	
LOW	0
MEDLOW	1380
MEDIUM	1505
MEDIUM HIGH	1685
HIGH	1955

AFUE = 96 %
INPUT (BTU/H) = 110,000
OUTPUT (BTU/H) = **106,000**

DESIGN CFM = **1955**
CFM @ .6 " E.S.P.

TEMPERATURE RISE 50 °F

RUN COUNT	4th	3rd	2nd	1st	Bas
S/A	0	0	18	13	7
R/A	0	0	6	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	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
ROOM NAME	MBR	ENS	BED-5	BED-2	BED-3	BED-4	ENS-2/5	WIC-2	ENS-3	MBR	ENS-4	LIB	DIN	KIT/GT	KIT/GT	KIT/GT	LAUN	PWD	FOY	MUD	BAS	BAS	BAS	BAS
RM LOSS MBH.	2.67	2.24	1.74	1.91	2.35	2.59	0.92	0.42	0.39	2.67	0.79	1.78	3.09	2.47	2.47	2.47	0.40	0.73	4.32	3.07	4.04	4.04	4.04	4.04
CFM PER RUN HEAT	59	50	39	43	52	58	21	9	9	59	18	40	69	55	55	55	9	16	96	68	90	90	90	90
RM GAIN MBH.	2.85	2.22	1.60	2.03	2.68	2.85	0.99	0.73	0.70	2.85	1.05	2.09	2.14	2.47	2.47	2.47	0.77	0.90	1.38	1.12	0.43	0.43	0.43	0.43
CFM PER RUN COOLING	93	72	52	66	87	92	32	24	23	93	34	68	69	80	80	80	25	29	45	36	14	14	14	14
ADJUSTED PRESSURE	0.15	0.16	0.16	0.16	0.15	0.15	0.16	0.16	0.16	0.15	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.15	0.16	0.15	0.15	0.15	0.15
ACTUAL DUCT LGH.	70	70	53	49	70	48	47	48	53	64	59	57	29	52	69	54	36	73	40	65	67	60	54	38
EQUIVALENT LENGTH	200	200	170	160	160	160	200	150	170	170	150	140	103	120	140	110	200	170	210	190	150	120	103	90
TOTAL EFFECTIVE LENGTH	270	270	223	209	230	208	247	198	223	234	209	197	132	172	209	164	236	243	250	255	217	180	157	128
ADJUSTED PRESSURE	0.05	0.06	0.07	0.07	0.06	0.07	0.06	0.08	0.07	0.06	0.07	0.08	0.12	0.09	0.07	0.1	0.07	0.06	0.06	0.06	0.07	0.08	0.09	0.11
ROUND DUCT SIZE	**6**	**6**	5	5	**6**	**6**	4	4	4	**6**	4	5	5	5	**6**	5	4	4	**6**	**6**	**6**	**6**	**6**	5
HEATING VELOCITY (ft/min)	301	255	286	316	265	296	241	103	103	301	207	294	507	404	280	404	103	184	489	347	459	459	459	661
COOLING VELOCITY (ft/min)	474	367	382	485	444	469	367	275	264	474	390	499	507	587	408	587	287	333	229	184	71	71	71	103
OUTLET GRILL SIZE	4X10	4X10	3X10	3X10	4X10	4X10	3X10	3X10	3X10	4X10	3X10	3X10	3X10	3X10	4X10	3X10	3X10	3X10	4X10	4X10	4X10	4X10	4X10	3X10
TRUNK	D	C	E	G	F	E	E	G	G	D	E	F	E	D	B	C	G	A	F	B	A	B	D	E

RUN #	25	26	27	28	29	30	31	32	33	34	35	36	37	38
ROOM NAME	BAS	BAS	BED-2	BED-2	BED-3	WIC-3	LIB	KIT/GT	CAB	CAB	CAB	WIC	ENS	BAS
RM LOSS MBH.	4.04	4.04	1.91	1.91	2.35	1.36	1.78	2.47	2.35	2.35	2.35	0.53	0.64	4.04
CFM PER RUN HEAT	90	90	43	43	52	30	40	55	52	52	52	12	14	90
RM GAIN MBH.	0.43	0.43	2.03	2.03	2.68	1.36	2.09	2.47	2.43	2.43	2.43	0.15	0.82	0.43
CFM PER RUN COOLING	14	14	66	66	87	44	68	80	79	79	79	5	27	14
ADJUSTED PRESSURE	0.15	0.15	0.16	0.16	0.15	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.15
ACTUAL DUCT LGH.	34	50	52	55	75	58	51	55	69	71	82	56	58	23
EQUIVALENT LENGTH	110	150	170	160	160	190	160	120	150	130	140	200	190	140
TOTAL EFFECTIVE LENGTH	144	200	222	215	235	248	211	175	219	201	222	256	248	163
ADJUSTED PRESSURE	0.1	0.07	0.07	0.07	0.06	0.06	0.07	0.09	0.07	0.08	0.07	0.06	0.06	0.09
ROUND DUCT SIZE	5	**6**	5	5	**6**	5	5	5	**6**	5	**6**	4	4	**6**
HEATING VELOCITY (ft/min)	661	459	316	316	265	220	294	404	265	382	265	138	161	459
COOLING VELOCITY (ft/min)	103	71	485	485	444	323	499	587	403	580	403	57	310	71
OUTLET GRILL SIZE	3X10	4X10	3X10	3X10	4X10	3X10	3X10	3X10	4X10	3X10	4X10	3X10	3X10	4X10
TRUNK	G	F	G	G	F	F	F	B	A	A	A	C	C	E

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	262	0.06	9.1	10	x	8	472	TRUNK G	646	0.06	12.8	20	x	8	581
TRUNK B	268	0.06	9.2	10	x	8	482	TRUNK H	1955	0.05	20.3	38	x	10	741
TRUNK C	661	0.06	12.9	20	x	8	595	TRUNK I	0	0.00	0	0	x	8	0
TRUNK D	263	0.05	9.6	10	x	8	473	TRUNK J	0	0.00	0	0	x	8	0
TRUNK E	1309	0.05	17.4	28	x	10	673	TRUNK K	0	0.00	0	0	x	8	0
TRUNK F	400	0.06	10.7	14	x	8	514	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	1500	0.05	18.4	32	x	10	675
TRUNK Y	890	0.05	15.1	26	x	8	616
TRUNK Z	435	0.05	11.6	16	x	8	489
DROP	1955	0.05	20.3	24	x	18	652

RETURN AIR #	1	2	3	4	5	6	7	8	9							BR
	0	0	0	0	2@7"	0	0	0	0	0	0	0	0	0	0	
AIR VOLUME	115	130	125	115	240	200	340	320	85	0	0	0	0	0	0	285
PLENUM PRESSURE	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13
ACTUAL DUCT LGH.	84	51	62	59	47	49	30	51	51	1	1	1	1	1	1	14
EQUIVALENT LENGTH	200	135	155	185	135	140	170	195	175	0	0	0	0	0	0	145
TOTAL EFFECTIVE LH	284	186	217	244	182	189	200	246	226	1	1	1	1	1	1	159
ADJUSTED PRESSURE	0.05	0.07	0.06	0.05	0.07	0.07	0.07	0.05	0.06	13.36	13.36	13.36	13.36	13.36	13.36	0.08
ROUND DUCT SIZE	7	6.8	6.9	7	8.5	7.9	9.7	10.3	6	0	0	0	0	0	0	8.8
INLET GRILL SIZE	8	8	8	8	8	8	8	8	8	0	0	0	0	0	0	8
	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
INLET GRILL SIZE	14	14	14	14	30	14	30	30	14	0	0	0	0	0	0	30

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Michael O'Rourke - INDIVIDUAL BCIN: 19669 MICHAEL O'ROURKE

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

TYPE: 5005 - KNIGHTSWOOD LO # 85462
SITE NAME: PINE VALLEY & TESTON ELEV. B & B CNR - OPT. 5 BED OPT SERVICE STAIRS

RESIDENTIAL MECHANICAL VENTILATION DESIGN SUMMARY

COMBUSTION APPLIANCES — 9.32.3.1(1)

- a) [✓] Direct vent (sealed combustion) only
- b) [ ] Positive venting induced draft (except fireplaces)
- c) [ ] Natural draft, B-vent or induced draft gas fireplace
- d) [ ] Solid Fuel (including fireplaces)
- e) [ ] No Combustion Appliances

HEATING SYSTEM

[✓] Forced Air [ ] Non Forced Air

[ ] Electric Space Heat

HOUSE TYPE — 9.32.1(2)

- [✓] I Type a) or b) appliance only, no solid fuel
- [ ] II Type I except with solid fuel (including fireplaces)
- [ ] III Any Type c) appliance
- [ ] IV Type I, or II with electric space heat
- [ ] Other: Type I, II or IV no forced air

SYSTEM DESIGN OPTIONS — O.N.H.W.P.

- [ ] 1 Exhaust only/Forced Air System
- [ ] 2 HRV with Ducting/Forced Air System
- [✓] 3 HRV Simplified/connected to forced air system
- [ ] 4 HRV with Ducting/non forced air system
- [ ] Part 6 Design

TOTAL VENTILATION CAPACITY — 9.32.3.3(1)

Basement + Master Bedroom	2	@ 21.2 cfm	42.4	cfm
Other Bedrooms	4	@ 10.6 cfm	42.4	cfm
Kitchen & Bathrooms	7	@ 10.6 cfm	74.2	cfm
Other Rooms	7	@ 10.6 cfm	74.2	cfm
Table 9.32.3.A.		TOTAL	233.2	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	**95.4**	**cfm**

SUPPLEMENTAL VENTILATION CAPACITY — 9.32.3.5.

Total Ventilation Capacity	233.2	cfm
Less Principal Ventil. Capacity	155	cfm
Required Supplemental Capacity	78.2	cfm

PRINCIPAL EXHAUST FAN CAPACITY

Model: VANEE 65H Location: BSMT

155.0 cfm 3.0 sones [✓] HVI Approved

PRINCIPAL EXHAUST HEAT LOSS CALCULATION

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

SUPPLEMENTAL FANS

NUTONE

Location	Model	cfm	HVI	Sones
ENS	QTXEN050C	50	✓	0.3
ENS-2/5	QTXEN050C	50	✓	0.3
ENS-4	QTXEN050C	50	✓	0.3
PWD	QTXEN050C	50	✓	0.3

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: 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: February-20

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#: 85462 Model: 5005 - KNIGHTSWOOD Builder: GOLD PARK HOMES Date: 02/26/2020

Volume Calculation

House Volume

Level	Floor Area (ft²)	Floor Height (ft)	Volume (ft³)
Bsmt	2117	10	21170
First	2117	11	23287
Second	2360	10	23600
Third	0	9	0
Fourth	0	9	0
		Total:	68,057.0 ft³
		Total:	1927.2 m³

Air Change & Delta T Data

WINTER NATURAL AIR CHANGE RATE	0.350
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	23	31	8	14

5.2.3.1 Heat Loss due to Air Leakage

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

0.350 x 535.32 x 42 °C x 1.2 = 9495 W

= **32397 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 535.32 x 8 °C x 1.2 = 596 W

= **2034 Btu/h**

5.2.3.2 Heat Loss due to Mechanical Ventilation

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

155 CFM x 76 °F x 1.08 x 0.25 = **3181 Btu/h**

6.2.7 Sensible heat Gain due to Ventilation

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

155 CFM x 14 °F x 1.08 x 0.25 = **578 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	32,397	12,091	1.340
2	0.3		21,964	0.442
3	0.2		20,041	0.323
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: 5005 - KNIGHTSWOOD ELEV. B & B CNR - OPT. 5 BED OPT **BUILDER:** GOLD PARK HOMES
SFQT: 4477 **LO#** 85462 **SITE:** PINE VALLEY & TESTON

DESIGN ASSUMPTIONS

HEATING	°F	COOLING	°F
OUTDOOR DESIGN TEMP.	-4	OUTDOOR DESIGN TEMP.	88
INDOOR DESIGN TEMP.	72	INDOOR DESIGN TEMP. (MAX 75°F)	74

BUILDING DATA

ATTACHMENT:	DETACHED	# 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):	68057.0	ASSUMED (Y/N):	Y
INTERNAL SHADING:	BLINDS/CURTAINS	ASSUMED OCCUPANTS:	6
INTERIOR LIGHTING LOAD (Btu/h/ft^2):	1.27	DC BRUSHLESS MOTOR (Y/N):	Y
FOUNDATION CONFIGURATION	BCIN_1	DEPTH BELOW GRADE:	7.0 ft
LENGTH: 77.0 ft	WIDTH: 42.0 ft	EXPOSED PERIMETER:	238.0 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	29.80
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

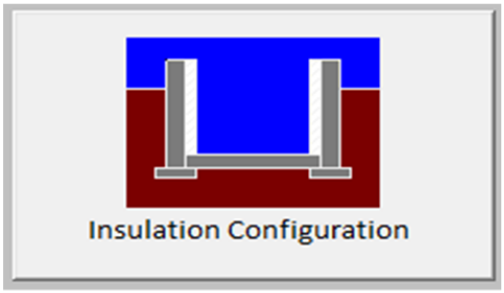
Michael O'Rourke

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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 sand, loam, clay
Water Table:	Normal (7-10 m, 23-33 ft)

Foundation Dimensions		
Floor Length (m):	**23.5**	 Insulation Configuration
Floor Width (m):	**12.8**	
Exposed Perimeter (m):	**0.0**	
Wall Height (m):	**3.0**	
Depth Below Grade (m):	**2.13**	
Window Area (m^2):	**3.2**	
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):	**2453**	

TYPE: 5005 - KNIGHTSWOOD
LO# 85462

ELEV. B & B CNR - OPT. 5 BED OPT SERVICE STAIRS

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

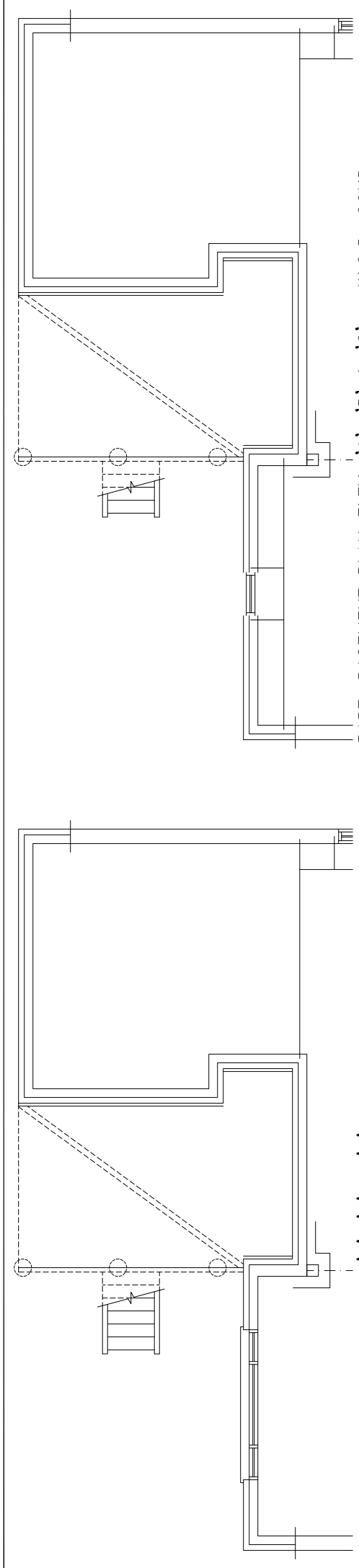
Air Infiltration Residential Load Calculator

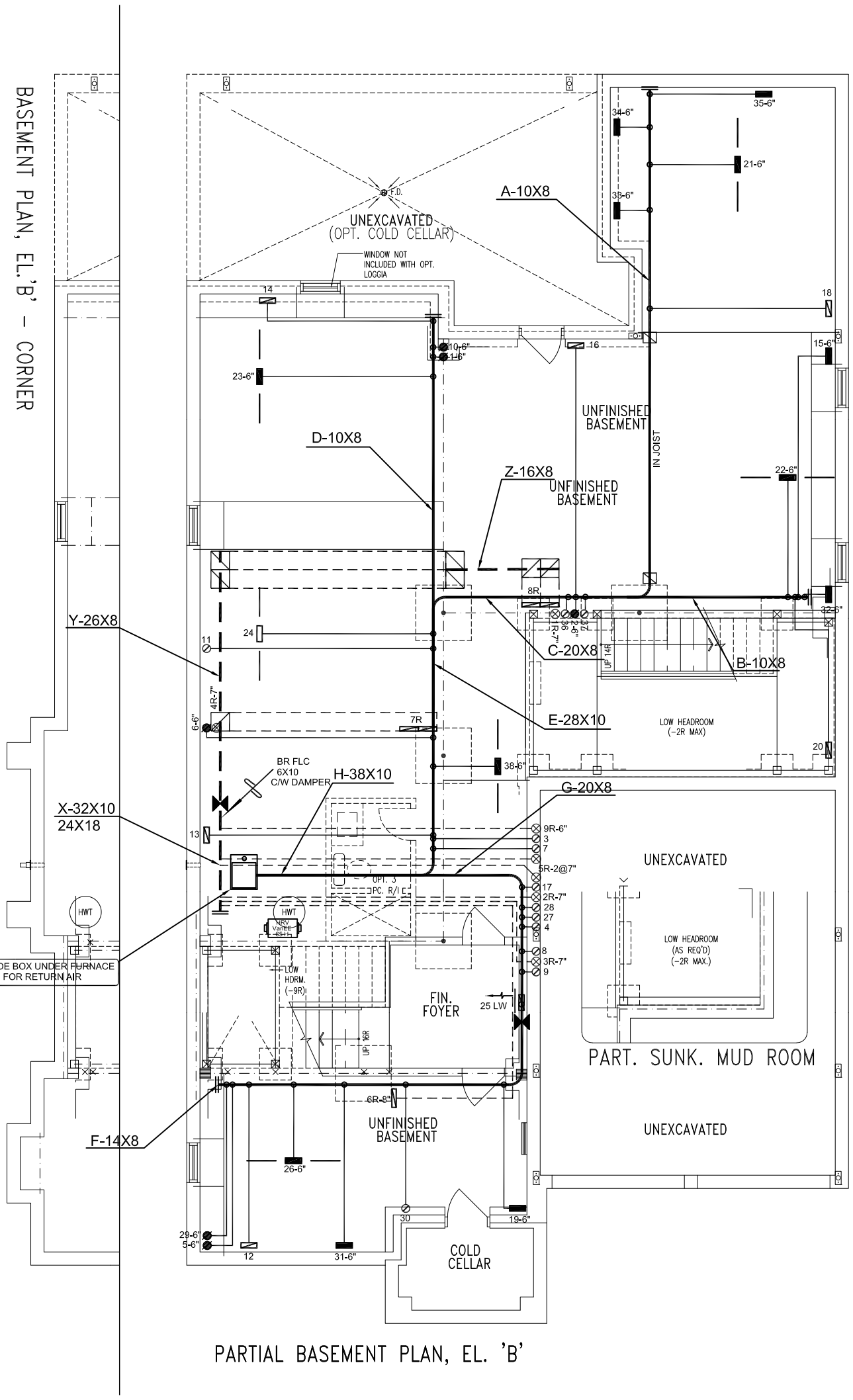
Supplemental tool for CAN/CSA-F280

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):	7.32
Building Configuration	
Type:	Detached
Number of Stories:	Two
Foundation:	Full
House Volume (m^3):	1927.2
Air Leakage/Ventilation	
Air Tightness Type:	Present (1961-) (3.57 ACH)
Custom BDT Data:	ELA @ 10 Pa. 2569.0 cm^2
	3.57 ACH @ 50 Pa
Mechanical Ventilation (L/s):	Total Supply 73.2 / Total Exhaust 73.2
Flue Size	
Flue #:	#1 #2 #3 #4
Diameter (mm):	0 0 0 0
Natural Infiltration Rates	
Heating Air Leakage Rate (ACH/H):	**0.350**
Cooling Air Leakage Rate (ACH/H):	**0.121**

TYPE: 5005 - KNIGHTSWOOD ELEV. B & B CNR - OPT. 5 BED OPT SER\

LO# 85462





PARTIAL BASEMENT PLAN, EL. '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.		

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Client

GOLDPARK HOMES

Project Name

PINE VALLEY & TESTON
VAUGHAN, ONTARIO
THE KNIGHTSWOOD

OPT. 5 BED OPT. SERVICE STAIRS

5005 ELEV. 'B' 4380 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 90938 BTU/H		
UNIT DATA		
MAKE	LENNOX	
MODEL	EL296UH110XE60C	
INPUT	110	MBTU/H
OUTPUT	106	MBTU/H
COOLING	5.0	TONS
FAN SPEED	1955	cfm @ 0.6" w.c.

# OF RUNS	S/A	R/A	FANS
3RD FLOOR			
2ND FLOOR	18	6	6
1ST FLOOR	13	3	3
BASEMENT	7	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

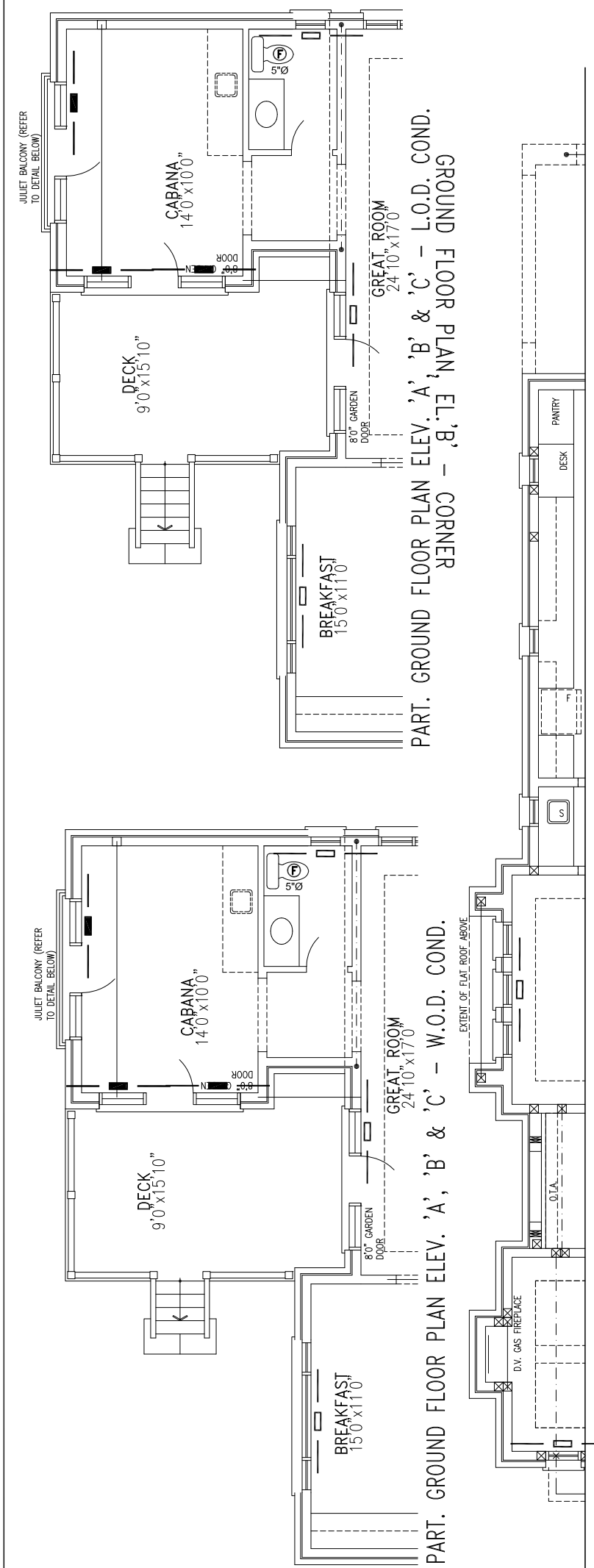
BASEMENT HEATING LAYOUT

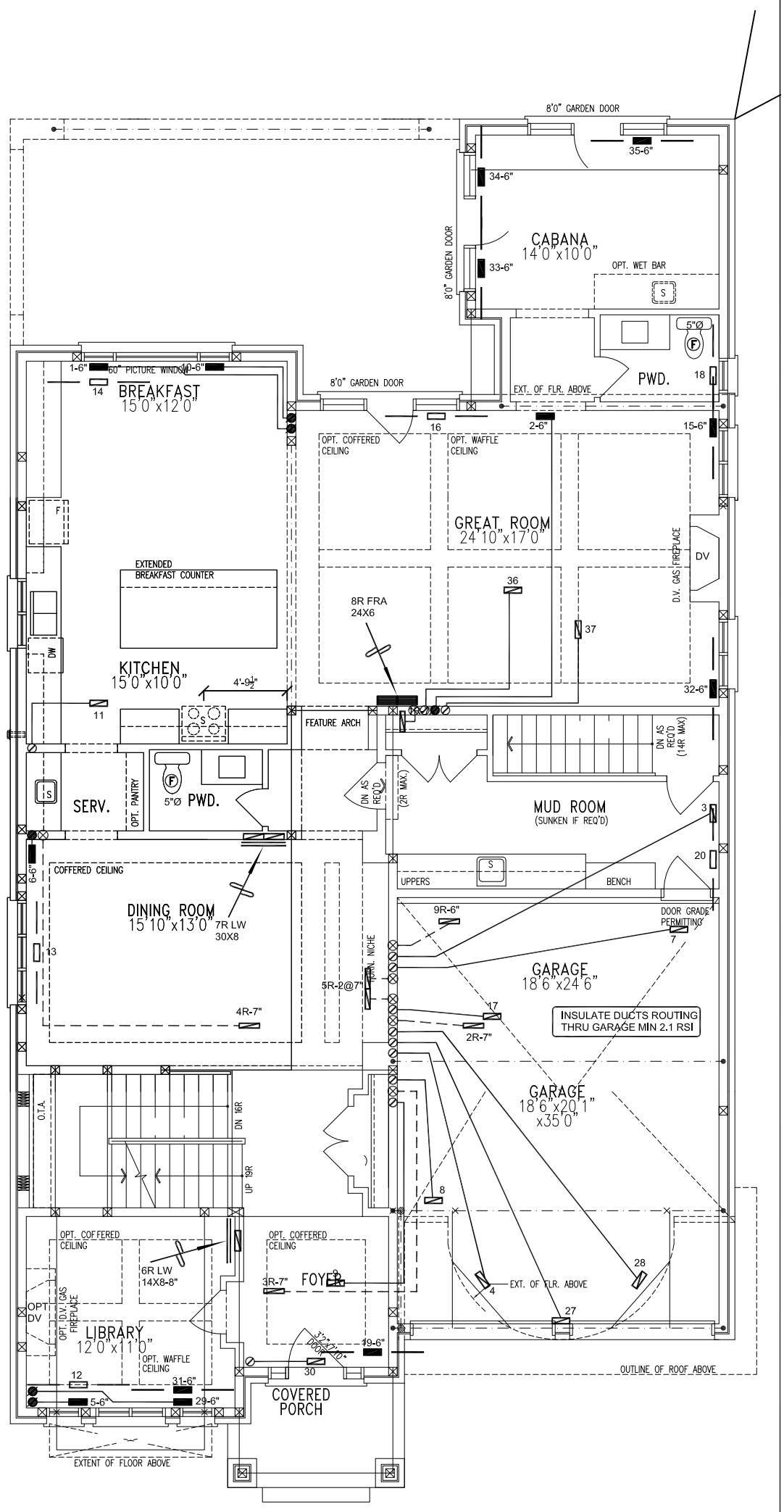
Date FEB/2020

Scale 1/8" = 1'-0"

BCIN# 19669

LO# 85462





PARTIAL GROUND FLOOR PLAN, EL. '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.		

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Client

GOLDPARK HOMES

Project Name

PINE VALLEY & TESTON
VAUGHAN, ONTARIO
THE KNIGHTSWOOD

OPT. 5 BED OPT. SERVICE STAIRS

5005 ELEV. 'B' 4380 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

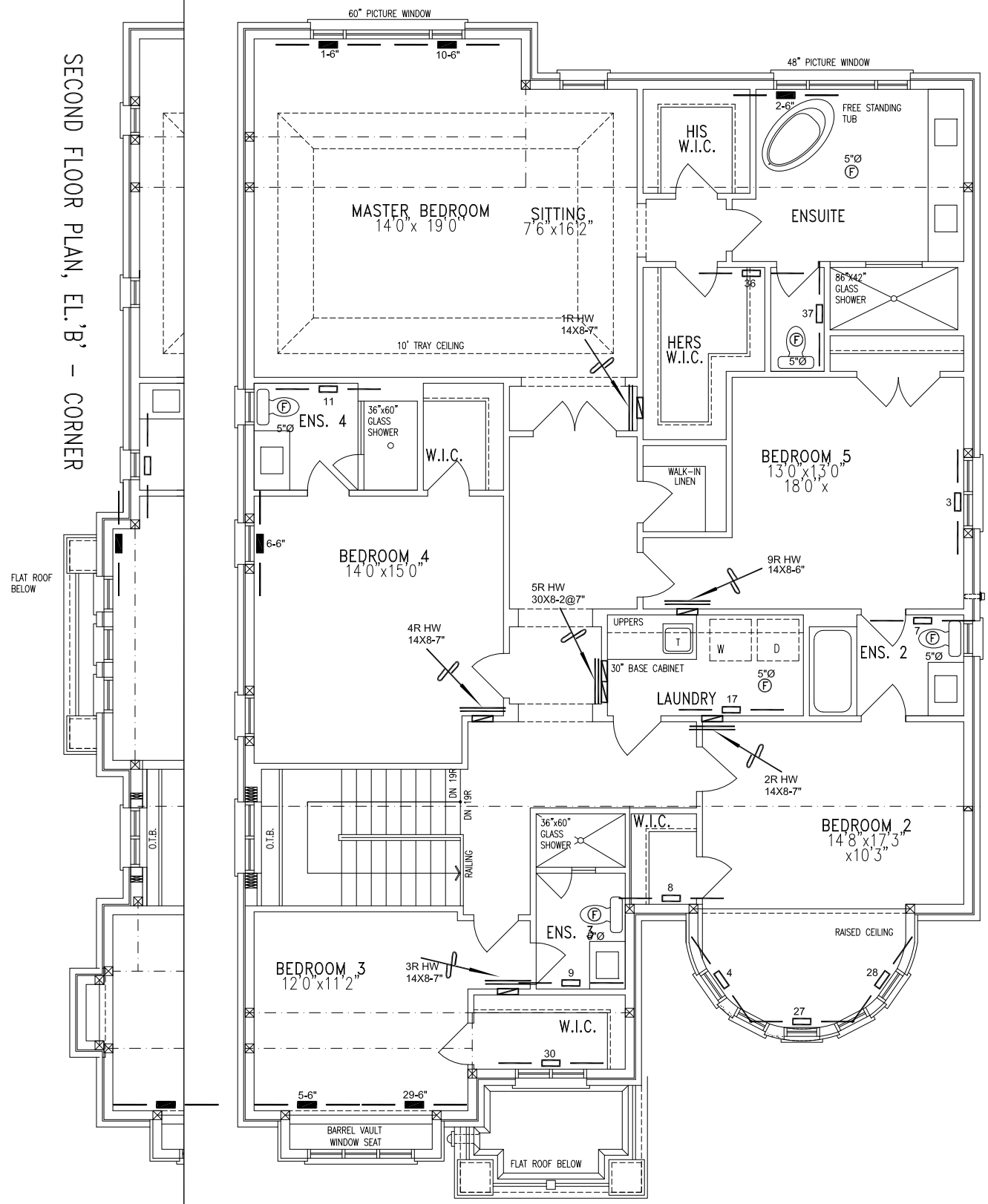
FIRST FLOOR HEATING LAYOUT

Date FEB/2020

Scale 1/8" = 1'-0"

BCIN# 19669

LO# 85462



SECOND FLOOR PLAN, EL. 'B' - CORNER

SECOND FLOOR PLAN, EL. '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.		

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Client
GOLDPARK HOMES

Project Name
PINE VALLEY & TESTON
VAUGHAN, ONTARIO
THE KNIGHTSWOOD
OPT. 5 BED OPT. SERVICE STAIRS
5005 ELEV. 'B' 4380 sqft

HVAC DESIGNS LTD.
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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
SECOND FLOOR HEATING LAYOUT

Date FEB/2020
Scale 1/8" = 1'-0"
BCIN# 19669
LO# 85462

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**		
VAUGHAN (WOODBRIDGE)				

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:** 5005 - KNIGHTSWOOD - WOB ELEV B & B CNR - OPT 5 BED **Project:** PINE VALLEY & TESTON

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.

February 26, 2020
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.

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

SITE NAME: PINE VALLEY & TESTON | ELEV B & B CNR - OPT 5 BED | DATE: Feb-20 | WINTER NATURAL AIR CHANGE RATE 0.416 | HEAT LOSS ΔT °F. 76 | CSA-F280-12

BUILDER: GOLD PARK HOMES | TYPE: 5005 - KNIGHTSWOOD - WOB | GFA: 4380 | LO# 79986 | SUMMER NATURAL AIR CHANGE RATE 0.139 | HEAT GAIN ΔT °F. 13 | SB-12 PACKAGE A1

ROOM USE			MBR			ENS			BED-5			BED-2			BED-3			BED-4			ENS-2/5			WIC-2			ENS-3			ENS-4			WIC-3			WIC		
EXP. WALL			46			30			14			36			36			19			6			3			4			7			14			6		
CLG. HT.			11			10			10			11			11			10			10			10			10			10			10			10		
	FACTORS																																					
GRS.WALL AREA	LOSS	GAIN	506			300			140			396			396			190			60			30			40			70			140			60		
GLAZING				LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN
NORTH	21.3	15.6	0	0	0	0	0	0	6	128	93	0	0	0	0	0	0	0	0	0	8	170	124	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
EAST	21.3	40.3	0	0	0	0	0	0	0	0	0	65	1383	2619	50	1064	2014	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	20	426	806	0	0	0
SOUTH	21.3	24.2	19	404	460	0	0	0	0	0	0	0	0	0	12	255	290	44	936	1064	0	0	0	0	0	0	0	0	0	9	192	218	0	0	0	0	0	0
WEST	21.3	40.3	50	1064	2014	34	724	1370	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	0	0	0
SKYLT.	37.2	101.5	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	0	0	0	0	0	0	0	0	0
DOORS	25.2	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	0	0	0	0	0	0	0	0	0
NET EXPOSED WALL	4.5	0.8	437	1950	328	266	1187	200	134	598	101	331	1477	249	334	1491	251	146	652	110	52	232	39	30	134	23	40	179	30	61	272	46	120	536	90	60	268	45
NET EXPOSED BSMT WALL ABOVE GR	3.6	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	0	0	0	0	0	0	0	0	0	0	0	0
EXPOSED CLG	1.3	0.6	480	616	282	205	263	120	315	404	185	175	225	103	249	320	146	285	366	167	60	77	35	40	51	24	92	118	54	105	135	62	53	68	31	102	131	60
NO ATTIC EXPOSED CLG	2.7	1.3	0	0	0	0	0	0	0	0	0	78	214	98	18	49	23	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	154	393	66	253	645	109	18	46	8	0	0	0	60	153	26	40	102	17	0	0	0	0	0	0	0	0	0	0	0	0
BASEMENT/CRAWL HEAT LOSS				0			0			0			0			0			0			0			0			0			0			0			0	
SLAB ON GRADE HEAT LOSS				0			0			0			0			0			0			0			0			0			0			0			0	
SUBTOTAL HT LOSS				4035			2174			1523			3945			3225			1954			632			287			297			598			1029			399	
SUB TOTAL HT GAIN					3084			1690			445			3177			2732			1342			225			63			84			325			927			105
LEVEL FACTOR / MULTIPLIER			0.20	0.37		0.20	0.37		0.20	0.37		0.20	0.37		0.20	0.37		0.20	0.37		0.20	0.37		0.20	0.37		0.20	0.37		0.20	0.37		0.20	0.37		0.20	0.37	
AIR CHANGE HEAT LOSS				1479			797			558			1446			1182			716			232			105			109			219			377			146	
AIR CHANGE HEAT GAIN					246			135			35			253			218			107			18			5			7			26			74			8
DUCT LOSS				0			0			208			539			441			0			86			39			0			0			0			0	
DUCT GAIN					0			0			115			410			362			0			67			50			0			0			0			0
HEAT GAIN PEOPLE	240		2		480	0		0	1		240	1		240	1		240	1		240	0		0	0		0	0		0	0		0	0		0	0		0
HEAT GAIN APPLIANCES/LIGHTS					428			428			428			428			428			428			428			428			428			428			0			0
TOTAL HT LOSS BTU/H				5513			2970			2289			5930			4848			2670			951			432			405			818			1406			545	
TOTAL HT GAIN x 1.3 BTU/H					5509			2928			1643			5860			5173			2751			959			709			674			1013			1301			147

ROOM USE			LIB			DIN			KIT/GT			CAB			LAUN			PWD			FOY			MUD									WOB			BAS		
EXP. WALL			31			32			87			45			0			5			35			18									52			186		
CLG. HT.			11			11			11			11			10			11			11			12									10			10		
	FACTORS																																					
GRS.WALL AREA	LOSS	GAIN	341			352			957			495			0			55			385			216									520			1302		
GLAZING				LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN								LOSS	GAIN		LOSS	GAIN
NORTH	21.3	15.6	0	0	0	0	0	0	46	979	716	0	0	0	0	0	0	9	192	140	0	0	0	0	0	0							0	0	0	6	128	93
EAST	21.3	40.3	56	1192	2256	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
SOUTH	21.3	24.2	0	0	0	34	724	822	21	447	508	63	1341	1524	0	0	0	0	0	0	0	0	0	0	0	0							46	979	556	6	128	145
WEST	21.3	40.3	0	0	0	0	0	0	105	2234	4230	63	1341	2538	0	0	0	0	0	0	0	0	0	0	0	0							106	2256	2135	0	0	0
SKYLT.	37.2	101.5	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	0	0	0
DOORS	25.2	4.3	0	0	0	0	0	0	10	252	43	0	0	0	0	0	0	0	0	0	56	1414	238	20	505	85							20	505	85	20	505	85
NET EXPOSED WALL	4.5	0.8	285	1272	214	318	1419	239	775	3459	583	369	1647	277	0	0	0	46	205	35	329	1468	247	196	875	147							348	1553	262	0	0	0
NET EXPOSED BSMT WALL ABOVE GR	3.6	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							0	0	0	558	2008	338
EXPOSED CLG	1.3	0.6	0	0	0	0	0	0	0	0	0	0	0	0	102	131	60	0	0	0	0	0	0	0	0	0							0	0	0	0	0	0
NO ATTIC EXPOSED CLG	2.7	1.3	0	0	0	0	0	0	0	0	0	203	558	255	0	0	0	40	110	50	41	113	52	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	56	143	24	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			0												2977	
SLAB ON GRADE HEAT LOSS				0			0			0			0			0			0			0			0									741					
SUBTOTAL HT LOSS				2464			2143			7371			4886			274			507			2995			1380									6034			5746		
SUB TOTAL HT GAIN					2470			1061			6079			4595			84			225			537			232									3038			662	
LEVEL FACTOR / MULTIPLIER			0.30	0.52		0.30	0.52		0.30	0.52		0.30	0.52		0.20	0.37		0.30	0.52		0.30	0.52		0.30	0.52												0.50	1.58	
AIR CHANGE HEAT LOSS				1269			1104			3797			2517			100			261			1543			711												18667		
AIR CHANGE HEAT GAIN					197			85			484			366			7			18			43			19														295
DUCT LOSS				0			0			0			0			37			0			0			0												0		
DUCT GAIN					0			0			0			0			52			0			0			0														0
HEAT GAIN PEOPLE	240		0		0	0		0	0		0	0		0	0		0	0		0	0		0	0		0							0		0	0		0
HEAT GAIN APPLIANCES/LIGHTS					428			428			428			428			428			428			428			428									0					428
TOTAL HT LOSS BTU/H				3732			3246			11168			7403			411			768			4537			2090									6775			24413		
TOTAL HT GAIN x 1.3 BTU/H					4023			2046			9088			7005			741			872			1310			882									3950			1800	

TOTAL HEAT GAIN BTU/H: 60921 | TONS: 5.08 | LOSS DUE TO VENTILATION LOAD BTU/H: 3181 | STRUCTURAL HEAT LOSS: 93321 | TOTAL COMBINED HEAT LOSS BTU/H: 96501

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: PINE VALLEY & TESTON — ELEV B & B CNR - OPT 5 BED
BUILDER: GOLD PARK HOMES — TYPE: 5005 - KNIGHTSWOOD - WOB — DATE: Feb-20 — GFA: 4380 — LO# 79986

HEATING CFM	1955		COOLING CFM	1955			furnace pressure	0.6																
TOTAL HEAT LOSS	93,321		TOTAL HEAT GAIN	60,386			furnace filter	0.08																
AIR FLOW RATE CFM	20.95		AIR FLOW RATE CFM	32.38			a/c coil pressure	0.2																
							available pressure																	
							for s/a & r/a	0.32																
							plenum pressure s/a	0.17			r/a pressure	0.15												
							max s/a dif press. loss	0.02			r/a grille press. Loss	0.02												
							min adjusted pressure s/a	0.15			adjusted pressure r/a	0.13												

^LENNOX — AFUE = 96 %
EL296UH110XE60C 110 — INPUT (BTU/H) = 110,000
FAN SPEED — OUTPUT (BTU/H) = **106,000**
LOW 0
MEDLOW 1380 — DESIGN CFM = **1955**
MEDIUM 1505 — CFM @ .6 " E.S.P.
MEDIUM HIGH 1685
HIGH 1955 — TEMPERATURE RISE 50 °F

RUN COUNT	4th	3rd	2nd	1st	Bas
S/A	0	0	18	13	8
R/A	0	0	6	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	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
ROOM NAME	MBR	ENS	BED-5	BED-2	BED-3	BED-4	ENS-2/5	WIC-2	ENS-3	MBR	ENS-4	LIB	DIN	KIT/GT	KIT/GT	KIT/GT	LAUN	PWD	FOY	MUD	BAS	BAS	BAS	BAS
RM LOSS MBH.	2.76	2.29	2.29	1.98	2.42	2.67	0.95	0.43	0.41	2.76	0.82	1.87	3.25	2.79	2.79	2.79	0.41	0.77	4.54	2.09	3.90	3.90	3.90	3.90
CFM PER RUN HEAT	58	48	48	41	51	56	20	9	8	58	17	39	68	58	58	58	9	16	95	44	82	82	82	82
RM GAIN MBH.	2.75	2.16	1.64	1.95	2.59	2.75	0.96	0.71	0.67	2.75	1.01	2.01	2.05	2.27	2.27	2.27	0.74	0.87	1.31	0.88	0.72	0.72	0.72	0.72
CFM PER RUN COOLING	89	70	53	63	84	89	31	23	22	89	33	65	66	74	74	74	24	28	42	29	23	23	23	23
ADJUSTED PRESSURE	0.15	0.16	0.16	0.16	0.15	0.15	0.16	0.16	0.16	0.15	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.15	0.16	0.15	0.15	0.15	0.15
ACTUAL DUCT LGH.	70	70	53	49	70	48	47	48	53	64	59	57	29	52	69	54	36	73	40	47	77	60	69	38
EQUIVALENT LENGTH	200	200	170	160	160	160	200	150	170	170	150	140	103	120	140	110	200	170	210	160	150	120	150	90
TOTAL EFFECTIVE LENGTH	270	270	223	209	230	208	247	198	223	234	209	197	132	172	209	164	236	243	250	207	227	180	219	128
ADJUSTED PRESSURE	0.05	0.06	0.07	0.07	0.06	0.07	0.06	0.08	0.07	0.06	0.07	0.08	0.12	0.09	0.07	0.1	0.07	0.06	0.06	0.08	0.06	0.08	0.07	0.11
ROUND DUCT SIZE	**6**	**6**	5	5	**6**	**6**	4	4	4	**6**	4	5	5	5	5	5	4	4	**6**	4	**6**	**6**	**6**	**6**
HEATING VELOCITY (ft/min)	296	245	352	301	260	286	229	103	92	296	195	286	499	426	426	426	103	184	484	505	418	418	418	418
COOLING VELOCITY (ft/min)	454	357	389	463	428	454	356	264	252	454	379	477	485	543	543	543	275	321	214	333	117	117	117	117
OUTLET GRILL SIZE	4X10	4X10	3X10	3X10	4X10	4X10	3X10	3X10	3X10	4X10	3X10	3X10	3X10	3X10	3X10	3X10	3X10	3X10	4X10	3X10	4X10	4X10	4X10	4X10
TRUNK	D	C	E	G	F	E	E	G	G	D	E	F	E	D	B	C	G	A	F	C	A	B	D	E

RUN #	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39
ROOM NAME	BAS	BAS	BED-2	BED-2	BED-3	WIC-3	LIB	KIT/GT	CAB	CAB	CAB	WIC	ENS	BAS	BAS
RM LOSS MBH.	3.90	3.90	1.98	1.98	2.42	1.41	1.87	2.79	2.47	2.47	2.47	0.54	0.69	3.90	3.90
CFM PER RUN HEAT	82	82	41	41	51	29	39	58	52	52	52	11	14	82	82
RM GAIN MBH.	0.72	0.72	1.95	1.95	2.59	1.30	2.01	2.27	2.34	2.34	2.34	0.15	0.76	0.72	0.72
CFM PER RUN COOLING	23	23	63	63	84	42	65	74	76	76	76	5	25	23	23
ADJUSTED PRESSURE	0.15	0.15	0.16	0.16	0.15	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.15	0.15
ACTUAL DUCT LGH.	34	50	52	55	75	58	51	55	69	71	82	56	58	23	58
EQUIVALENT LENGTH	110	150	170	160	160	190	160	120	150	130	140	200	190	140	170
TOTAL EFFECTIVE LENGTH	144	200	222	215	235	248	211	175	219	201	222	256	248	163	228
ADJUSTED PRESSURE	0.1	0.07	0.07	0.07	0.06	0.06	0.07	0.09	0.07	0.08	0.07	0.06	0.06	0.09	0.06
ROUND DUCT SIZE	**6**	**6**	5	5	**6**	5	5	5	**6**	5	**6**	4	4	**6**	**6**
HEATING VELOCITY (ft/min)	418	418	301	301	260	213	286	426	265	382	265	126	161	418	418
COOLING VELOCITY (ft/min)	117	117	463	463	428	308	477	543	388	558	388	57	287	117	117
OUTLET GRILL SIZE	4X10	4X10	3X10	3X10	4X10	3X10	3X10	3X10	4X10	3X10	4X10	3X10	3X10	4X10	4X10
TRUNK	G	F	G	G	F	F	F	B	A	A	A	C	C	E	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	254	0.06	9	10	x	8	457	TRUNK G	617	0.06	12.6	18	x	8	617
TRUNK B	198	0.07	7.9	8	x	8	446	TRUNK H	1955	0.05	20.3	38	x	10	741
TRUNK C	709	0.06	13.2	20	x	8	638	TRUNK I	0	0.00	0	0	x	8	0
TRUNK D	256	0.05	9.5	10	x	8	461	TRUNK J	0	0.00	0	0	x	8	0
TRUNK E	1338	0.05	17.6	28	x	10	688	TRUNK K	0	0.00	0	0	x	8	0
TRUNK F	386	0.06	10.6	14	x	8	496	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	1500	0.05	18.4	32	x	10	675
TRUNK Y	890	0.05	15.1	26	x	8	616
TRUNK Z	435	0.05	11.6	16	x	8	489
DROP	1955	0.05	20.3	24	x	18	652

RETURN AIR #	1	2	3	4	5	6	7	8	9							BR
	0	0	0	0	2@7"	0	0	0	0	0	0	0	0	0	0	
AIR VOLUME	115	130	125	115	240	200	340	320	85	0	0	0	0	0	0	285
PLENUM PRESSURE	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13
ACTUAL DUCT LGH.	84	51	62	59	47	49	30	51	51	1	1	1	1	1	1	14
EQUIVALENT LENGTH	200	135	155	185	135	140	170	195	175	0	0	0	0	0	0	145
TOTAL EFFECTIVE LH	284	186	217	244	182	189	200	246	226	1	1	1	1	1	1	159
ADJUSTED PRESSURE	0.05	0.07	0.06	0.05	0.07	0.07	0.07	0.05	0.06	13.36	13.36	13.36	13.36	13.36	13.36	0.08
ROUND DUCT SIZE	7	6.8	6.9	7	8.5	7.9	9.7	10.3	6	0	0	0	0	0	0	8.8
INLET GRILL SIZE	8	8	8	8	8	8	8	8	8	0	0	0	0	0	0	8
	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
INLET GRILL SIZE	14	14	14	14	30	14	30	30	14	0	0	0	0	0	0	30

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: 5005 - KNIGHTSWOOD - WOB LO # 79986
SITE NAME: PINE VALLEY & TESTON ELEV B & B CNR - OPT 5 BED

RESIDENTIAL MECHANICAL VENTILATION DESIGN SUMMARY

COMBUSTION APPLIANCES 9.32.3.1(1)

- a) [✓] Direct vent (sealed combustion) only
- b) [ ] Positive venting induced draft (except fireplaces)
- c) [ ] Natural draft, B-vent or induced draft gas fireplace
- d) [ ] Solid Fuel (including fireplaces)
- e) [ ] No Combustion Appliances

HEATING SYSTEM

[✓] Forced Air [ ] Non Forced Air

[ ] Electric Space Heat

HOUSE TYPE 9.32.1(2)

- [✓] I Type a) or b) appliance only, no solid fuel
- [ ] II Type I except with solid fuel (including fireplaces)
- [ ] III Any Type c) appliance
- [ ] IV Type I, or II with electric space heat
- [ ] Other: Type I, II or IV no forced air

SYSTEM DESIGN OPTIONS O.N.H.W.P.

- [ ] 1 Exhaust only/Forced Air System
- [ ] 2 HRV with Ducting/Forced Air System
- [✓] 3 HRV Simplified/connected to forced air system
- [ ] 4 HRV with Ducting/non forced air system
- [ ] Part 6 Design

TOTAL VENTILATION CAPACITY 9.32.3.3(1)

Basement + Master Bedroom	2	@ 21.2 cfm	42.4	cfm
Other Bedrooms	4	@ 10.6 cfm	42.4	cfm
Kitchen & Bathrooms	7	@ 10.6 cfm	74.2	cfm
Other Rooms	7	@ 10.6 cfm	74.2	cfm
Table 9.32.3.A.		TOTAL	233.2	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	**95.4**	**cfm**

SUPPLEMENTAL VENTILATION CAPACITY 9.32.3.5.

Total Ventilation Capacity	233.2	cfm
Less Principal Ventil. Capacity	155	cfm
Required Supplemental Capacity	78.2	cfm

PRINCIPAL EXHAUST FAN CAPACITY

Model: VANEE 65H Location: BSMT

155.0 cfm 3.0 sones [✓] HVI Approved

PRINCIPAL EXHAUST HEAT LOSS CALCULATION

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

SUPPLEMENTAL FANS NUTONE

Location	Model	cfm	HVI	Sones
ENS	QTXEN050C	50	✓	0.3
ENS-2/5	QTXEN050C	50	✓	0.3
ENS-4	QTXEN050C	50	✓	0.3
PWD	QTXEN050C	50	✓	0.3

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: 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: February-20

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#: 79986 Model: 5005 - KNIGHTSWOOD - WOB Builder: GOLD PARK HOMES Date: 2020-02-26

Volume Calculation

House Volume

Level	Floor Area (ft²)	Floor Height (ft)	Volume (ft³)
Bsmt	2020	10	20200
First	2020	11	22220
Second	2360	10	23600
Third	0	9	0
Fourth	0	9	0
		Total:	66,020.0 ft³
		Total:	1869.5 m³

Air Change & Delta T Data

WINTER NATURAL AIR CHANGE RATE	0.416
SUMMER NATURAL AIR CHANGE RATE	0.139

Design Temperature Difference

	Tin °C	Tout °C	ΔT °C	ΔT °F
Winter DTDh	22	-20	42	76
Summer DTDc	24	31	7	13

5.2.3.1 Heat Loss due to Air Leakage

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

0.416 x 519.30 x 42 °C x 1.2 = 10942 W

= **37334 Btu/h**

6.2.6 Sensible Gain due to Air Leakage

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

= 0.139 x 519.30 x 7 °C x 1.2 = 618 W

= **2108 Btu/h**

5.2.3.2 Heat Loss due to Mechanical Ventilation

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

155 CFM x 76 °F x 1.08 x 0.25 = **3181 Btu/h**

6.2.7 Sensible heat Gain due to Ventilation

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

155 CFM x 13 °F x 1.08 x 0.25 = **536 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	37,334	11,779	1.585
2	0.3		21,745	0.515
3	0.2		20,370	0.367
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: 5005 - KNIGHTSWOOD - WOB ELEV B & B CNR - OPT 5 BED **BUILDER:** GOLD PARK HOMES
SFQT: 4380 **LO#** 79986 **SITE:** PINE VALLEY & TESTON

DESIGN ASSUMPTIONS

HEATING	°F	COOLING	°F
OUTDOOR DESIGN TEMP.	-4	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:	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):	66020.0	ASSUMED (Y/N):	Y
INTERNAL SHADING:	BLINDS/CURTAINS	ASSUMED OCCUPANTS:	6
INTERIOR LIGHTING LOAD ($Btu/h/ft^2$):	1.27	DC BRUSHLESS MOTOR (Y/N):	Y
FOUNDATION CONFIGURATION	BCIN_1	DEPTH BELOW GRADE:	7.0 ft
LENGTH: 77.0 ft	WIDTH: 42.0 ft	EXPOSED PERIMETER:	186.0 ft
WOB INSULATION CONFIGURATION	SCB_9	WOB EXPOSED PERIMETER	52.0 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	29.80
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

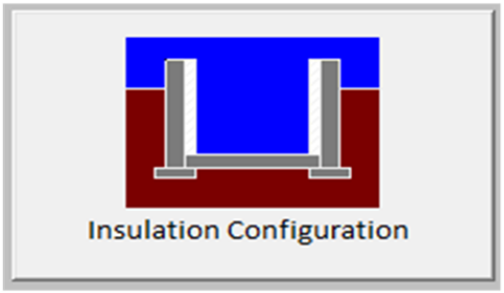
Michael O'Rourke

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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 sand, loam, clay
Water Table:	Normal (7-10 m, 23-33 ft)

Foundation Dimensions		
Floor Length (m):	**4.6**	 Insulation Configuration
Floor Width (m):	**12.8**	
Exposed Perimeter (m):	**56.7**	
Wall Height (m):	**3.0**	
Depth Below Grade (m):	**1.84**	
Window Area (m^2):	**1.1**	
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):	**872**	

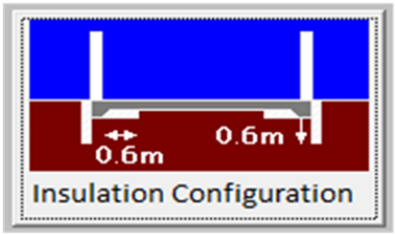
TYPE: 5005 - KNIGHTSWOOD - WOB ELEV B & B CNR - OPT 5 BED
LO# 79986

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 sand, loam, clay
Water Table:	Normal (7-10 m, 23-33 ft)

Foundation Dimensions		
Length (m):	**1.5**	
Width (m):	**12.8**	
Exposed Perimeter (m):	**15.8**	

Radiant Slab		
Heated Fraction of the Slab:	**0**	
Fluid Temperature (°C):	**33**	
Design Months		
Heating Month	**1**	
Results		
Heating Load (Watts):	**217**	

TYPE: 5005 - KNIGHTSWOOD - WOB ELEV B & B CNR - OPT 5 BED
LO# 79986

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

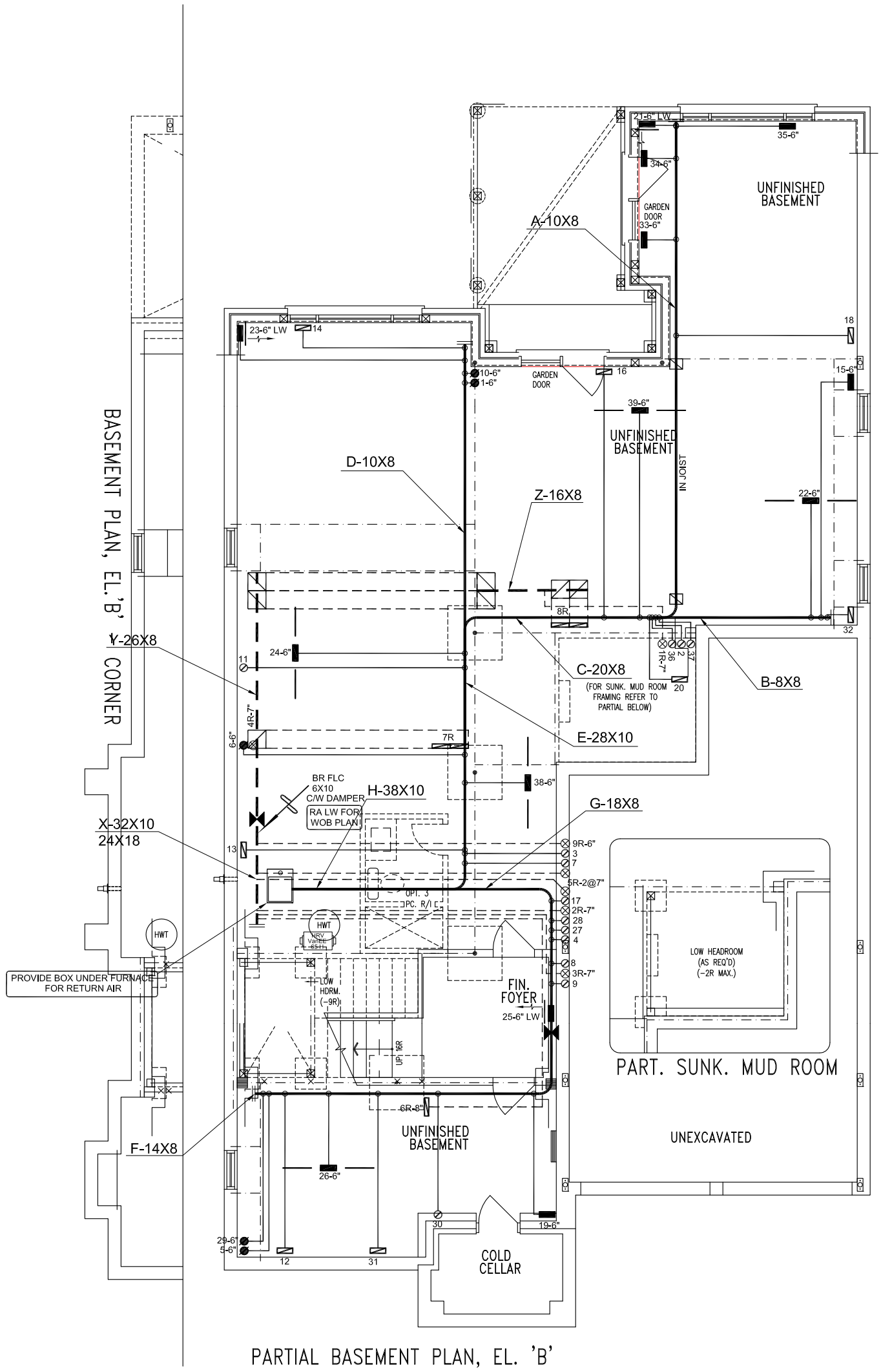
Air Infiltration Residential Load Calculator

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):	9.45
Building Configuration	
Type:	Detached
Number of Stories:	Two
Foundation:	Full
House Volume (m^3):	1869.5
Air Leakage/Ventilation	
Air Tightness Type:	Present (1961-) (3.57 ACH)
Custom BDT Data:	ELA @ 10 Pa. 2492.1 cm^2
	3.57 ACH @ 50 Pa
Mechanical Ventilation (L/s):	Total Supply 73.2 / Total Exhaust 73.2
Flue Size	
Flue #:	#1 #2 #3 #4
Diameter (mm):	0 0 0 0
Natural Infiltration Rates	
Heating Air Leakage Rate (ACH/H):	**0.416**
Cooling Air Leakage Rate (ACH/H):	**0.139**

TYPE: 5005 - KNIGHTSWOOD - WOB ELEV B & B CNR - OPT 5 BED

LO# 79986



PARTIAL BASEMENT PLAN, EL. '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

WOB | 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
	REVISIONS	
3.		
2.	REVISED AS PER ARCHITECTURALS	FEB/2020
1.	3R RELOCATED	NOV/2018

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Client
GOLDPARK HOMES

Project Name
PINE VALLEY & TESTON
VAUGHAN, ONTARIO
THE KNIGHTSWOOD - WOB
OPT. 5 BED
5005 ELEV. 'B' & 'B CNR" 4380sqft

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.

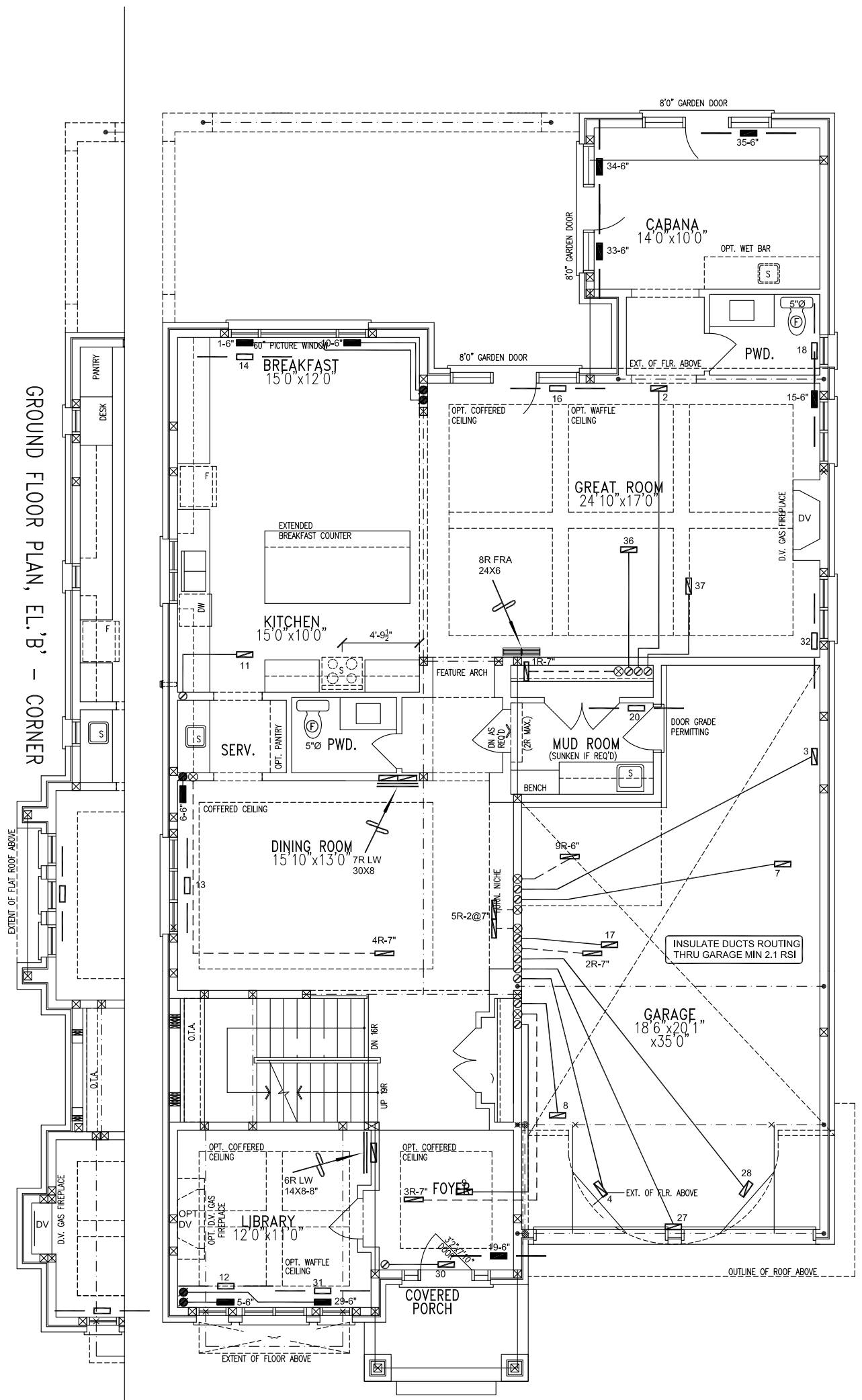
UNIT DATA		
HEAT LOSS	96501	BTU/H
MAKE	LENNOX	
MODEL	EL296UH110XE60C	
INPUT	110	MBTU/H
OUTPUT	106	MBTU/H
COOLING	5.0	TONS
FAN SPEED	1955	cfm @ 0.6" w.c.

# OF RUNS	S/A	R/A	FANS
3RD FLOOR			
2ND FLOOR	18	6	6
1ST FLOOR	13	3	3
BASEMENT	8	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/2018
Scale 1/8" = 1'-0"
BCIN# 19669
LO# 79986



PARTIAL GROUND FLOOR PLAN, EL. '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

WOB | 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.	REVISED AS PER ARCHITECTURALS	FEB/2020
1.	3R RELOCATED	NOV/2018

REVISIONS

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Client
GOLDPARK HOMES

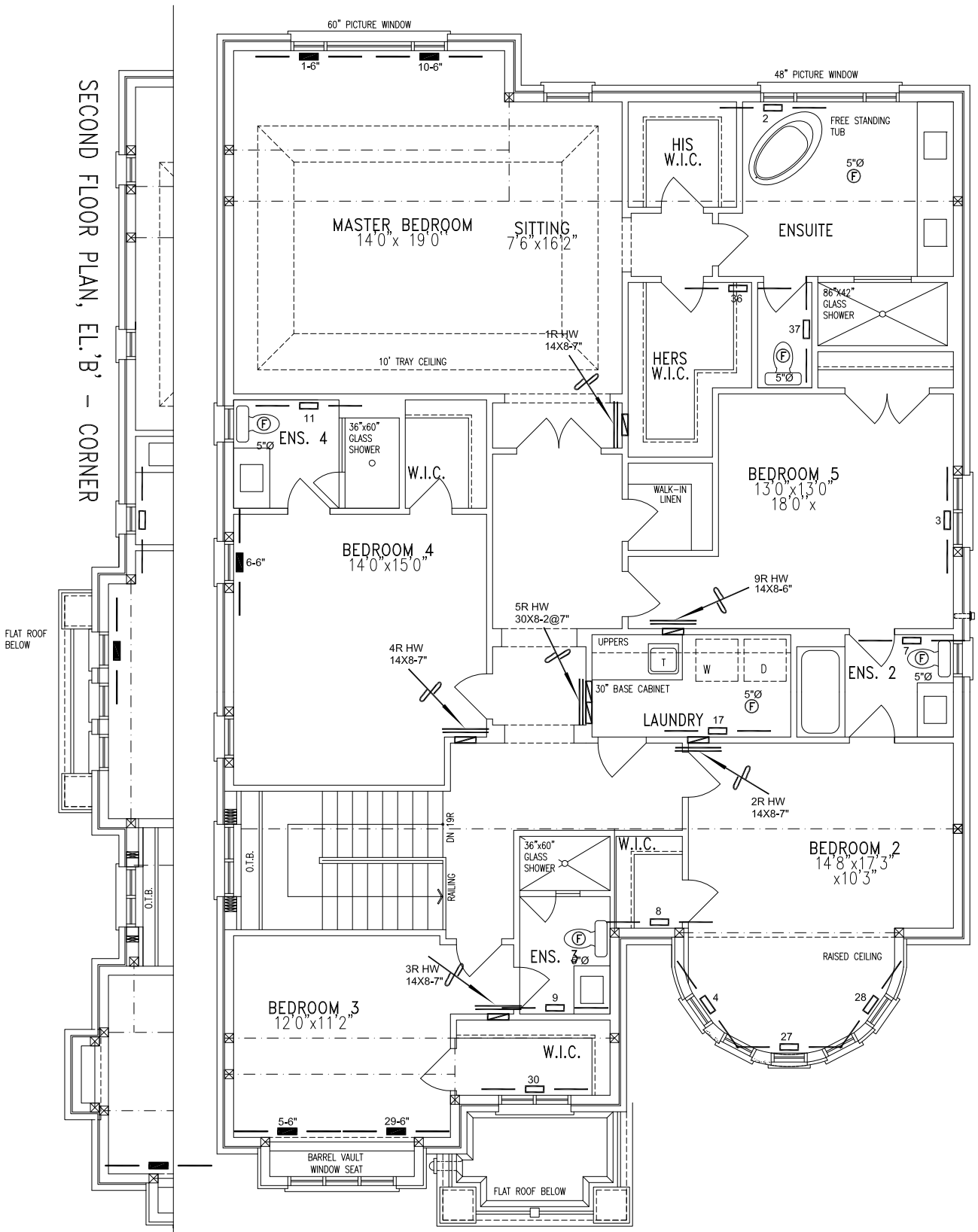
Project Name
PINE VALLEY & TESTON
VAUGHAN, ONTARIO
THE KNIGHTSWOOD - WOB
OPT. 5 BED
5005 ELEV. 'B' & 'B CNR" 4380sqft

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

Sheet Title
FIRST FLOOR HEATING LAYOUT

Date SEPT/2018
Scale 1/8" = 1'-0"
BCIN# 19669
LO# 79986



OPT. 5 BEDROOM SECOND FLOOR PLAN, EL.'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

WOB | 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.	REVISED AS PER ARCHITECTURALS	FEB/2020
1.	3R RELOCATED	NOV/2018

REVISIONS

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Client
GOLDPARK HOMES

Project Name
PINE VALLEY & TESTON
VAUGHAN, ONTARIO
THE KNIGHTSWOOD - WOB
OPT. 5 BED
5005 ELEV. 'B' & 'B CNR" 4380sqft

HVAC DESIGNS LTD.
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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
SECOND FLOOR HEATING LAYOUT

Date SEPT/2018
Scale 1/8" = 1'-0"
BCIN# 19669
LO# 79986

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**		
VAUGHAN (WOODBRIDGE)				

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:** 5005 - KNIGHTSWOOD - WOB ELEV B & B CNR - OPT 5 BED - OPT SERVICE STAIR **Project:** PINE VALLEY & TESTON

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.

February 26, 2020
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.

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

SITE NAME: PINE VALLEY & TESTON — ELEV B & B CNR - OPT 5 BED - OPT SERVICE STAIR — DATE: Feb-20 — WINTER NATURAL AIR CHANGE RATE 0.416 — HEAT LOSS ΔT °F. 76 — CSA-F280-12
BUILDER: GOLD PARK HOMES — TYPE: 5005 - KNIGHTSWOOD - WOB — GFA: 4477 — LO# 85464 — SUMMER NATURAL AIR CHANGE RATE 0.139 — HEAT GAIN ΔT °F. 13 — SB-12 PACKAGE A1

ROOM USE			MBR			ENS			BED-5			BED-2			BED-3			BED-4			ENS-2/5			WIC-2			ENS-3			ENS-4			WIC-3			WIC		
EXP. WALL			46			30			14			36			36			19			6			3			4			7			14			6		
CLG. HT.			11			10			10			11			11			10			10			10			10			10			10			10		
	FACTORS																																				
GRS.WALL AREA	LOSS	GAIN	506			300			140			396			396			190			60			30			40			70			140			60		
GLAZING			LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN
NORTH	21.3	15.6	0	0	0	0	0	0	6	128	93	0	0	0	0	0	0	0	0	0	8	170	124	0	0	0	0	0	0	0	0	0	0	0	0	0	0
EAST	21.3	40.3	0	0	0	0	0	0	0	0	0	65	1383	2619	50	1064	2014	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	20	426	806	0	0	0
SOUTH	21.3	24.2	19	404	460	0	0	0	0	0	0	0	0	0	12	255	290	44	936	1064	0	0	0	0	0	0	0	0	0	9	192	218	0	0	0	0	0	0
WEST	21.3	40.3	50	1064	2014	34	724	1370	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	0	0	0
SKYLT.	37.2	101.5	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	0	0	0	0	0	0	0	0	0
DOORS	25.2	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	0	0	0	0	0	0	0	0	0
NET EXPOSED WALL	4.5	0.8	437	1950	328	266	1187	200	134	598	101	331	1477	249	334	1491	251	146	652	110	52	232	39	30	134	23	40	179	30	61	272	46	120	536	90	60	268	45
NET EXPOSED BSMT WALL ABOVE GR	3.6	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	0	0	0	0	0	0	0	0	0	0	0	0
EXPOSED CLG	1.3	0.6	480	616	282	205	263	120	315	404	185	175	225	103	249	320	146	285	366	167	60	77	35	40	51	24	92	118	54	105	135	62	53	68	31	102	131	60
NO ATTIC EXPOSED CLG	2.7	1.3	0	0	0	0	0	0	0	0	0	78	214	98	18	49	23	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	25	64	11	253	645	109	18	46	8	0	0	0	60	153	26	40	102	17	0	0	0	0	0	0	0	0	0	0	0	0
BASEMENT/CRAWL HEAT LOSS				0			0			0			0			0			0			0			0			0			0			0			0	
SLAB ON GRADE HEAT LOSS				0			0			0			0			0			0			0			0			0			0			0			0	
SUBTOTAL HT LOSS				4035			2174			1194			3945			3225			1954			632			287			297			598			1029			399	
SUB TOTAL HT GAIN					3084			1690			390			3177			2732			1342			225			63			84			325			927			105
LEVEL FACTOR / MULTIPLIER			0.20	0.38		0.20	0.38		0.20	0.38		0.20	0.38		0.20	0.38		0.20	0.38		0.20	0.38		0.20	0.38		0.20	0.38		0.20	0.38		0.20	0.38		0.20	0.38	
AIR CHANGE HEAT LOSS				1550			835			458			1515			1239			750			243			110			114			230			395			153	
AIR CHANGE HEAT GAIN					252			138			32			259			223			110			18			5			7			27			76			9
DUCT LOSS				0			0			165			546			446			0			88			40			0			0			0			0	
DUCT GAIN					0			0			110			412			364			0			68			51			0			0			0			0
HEAT GAIN PEOPLE	240		2		480	0		0	1		240	1		240	1		240	1		240	0		0	0		0	0		0	0		0	0		0	0		0
HEAT GAIN APPLIANCES/LIGHTS					441			441			441			441			441			441			441			441			441			441			0			0
TOTAL HT LOSS BTU/H				5584			3009			1817			6006			4910			2704			963			437			410			828			1424			552	
TOTAL HT GAIN x 1.3 BTU/H					5534			2950			1577			5888			5200			2771			978			728			691			1030			1304			148

ROOM USE			LIB			DIN			KIT/GT			CAB			LAUN			PWD			FOY			MUD									WOB			BAS		
EXP. WALL			31			32			77			45			0			5			35			32									52			186		
CLG. HT.			11			11			11			11			10			11			11			12									10			10		
	FACTORS																																					
GRS.WALL AREA	LOSS	GAIN	341			352			847			495			0			55			385			384									520			1302		
GLAZING			LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN								LOSS	GAIN		LOSS	GAIN	
NORTH	21.3	15.6	0	0	0	0	0	0	46	979	716	0	0	0	0	0	0	9	192	140	0	0	0	0	0	0							0	0	0	6	128	93
EAST	21.3	40.3	56	1192	2256	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
SOUTH	21.3	24.2	0	0	0	34	724	822	21	447	508	63	1341	1524	0	0	0	0	0	0	0	0	0	0	0	0							46	979	556	6	128	145
WEST	21.3	40.3	0	0	0	0	0	0	105	2234	4230	63	1341	2538	0	0	0	0	0	0	0	0	0	0	0	0							106	2256	2135	0	0	0
SKYLT.	37.2	101.5	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	0	0	0
DOORS	25.2	4.3	0	0	0	0	0	0	10	252	43	0	0	0	0	0	0	0	0	0	56	1414	238	20	505	85							20	505	85	20	505	85
NET EXPOSED WALL	4.5	0.8	285	1272	214	318	1419	239	665	2968	500	369	1647	277	0	0	0	46	205	35	329	1468	247	364	1624	274							348	1553	262	0	0	0
NET EXPOSED BSMT WALL ABOVE GR	3.6	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							0	0	0	558	2008	338
EXPOSED CLG	1.3	0.6	0	0	0	0	0	0	0	0	0	0	0	0	102	131	60	0	0	0	0	0	0	0	0	0							0	0	0	0	0	0
NO ATTIC EXPOSED CLG	2.7	1.3	0	0	0	0	0	0	0	0	0	203	558	255	0	0	0	40	110	50	41	113	52	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	56	143	24	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			0											2977		
SLAB ON GRADE HEAT LOSS				0			0			0			0			0			0			0			0									741					
SUBTOTAL HT LOSS				2464			2143			6880			4886			274			507			2995			2129									6034			5746		
SUB TOTAL HT GAIN					2470			1061			5996			4595			84			225			537			359									3038			662	
LEVEL FACTOR / MULTIPLIER			0.30	0.52		0.30	0.52		0.30	0.52		0.30	0.52		0.20	0.38		0.30	0.52		0.30	0.52		0.30	0.52											0.50	1.63	
AIR CHANGE HEAT LOSS				1293			1124			3610			2564			105			266			1571			1117												19243		
AIR CHANGE HEAT GAIN					202			87			490			375			7			18			44			29													302
DUCT LOSS				0			0			0			0			38			0			0			0												0		
DUCT GAIN					0			0			0			0			53			0			0			0													0
HEAT GAIN PEOPLE	240		0		0	0		0	0		0	0		0	0		0	0		0	0		0	0		0							0		0	0		0
HEAT GAIN APPLIANCES/LIGHTS					441			441			441			441			441			441			441			441									0			441
TOTAL HT LOSS BTU/H				3756			3267			10491			7450			417			773			4566			3247									6775			24989		
TOTAL HT GAIN x 1.3 BTU/H					4047			2066			9005			7034			760			889			1328			1077									3950			1826

TOTAL HEAT GAIN BTU/H: 61315 — TONS: 5.11 — LOSS DUE TO VENTILATION LOAD BTU/H: 3181 — STRUCTURAL HEAT LOSS: 94374 — TOTAL COMBINED HEAT LOSS BTU/H: 97555

I REVIEW AND TAKE RESPONSIBILITY FOR THE DESIGN WORK AND AM QUALIFIED IN THE APPROPRIATE CATEGORY AS AN "OTHER DESIGNER" UNDER DIVISION C, 3.2.5 OF THE BUILDING CODE.

Michael O'Rourke

INDIVIDUAL BCIN: 19669 MICHAEL O'ROURKE

HVAC DESIGNS LTD.

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SITE NAME: PINE VALLEY & TESTON — ELEV B & B CNR - OPT 5 BED - OPT SERVICE STAIR
BUILDER: GOLD PARK HOMES — TYPE: 5005 - KNIGHTSWOOD - WOB — DATE: Feb-20 — GFA: 4477 — LO# 85464

HEATING CFM	1955		COOLING CFM	1955			furnace pressure	0.6																
TOTAL HEAT LOSS	94,374		TOTAL HEAT GAIN	60,779			furnace filter	0.08									^LENNOX			AFUE = 96 %				
AIR FLOW RATE CFM	20.72		AIR FLOW RATE CFM	32.17			a/c coil pressure	0.2									EL296UH110XE60C	110		INPUT (BTU/H) = 110,000				
							available pressure										FAN SPEED			OUTPUT (BTU/H) = **106,000**				
							for s/a & r/a	0.32									LOW	0						
RUN COUNT	4th	3rd	2nd	1st	Bas												MEDLOW	1380		DESIGN CFM = **1955**				
S/A	0	0	18	13	8												MEDIUM	1505		CFM @ .6 " E.S.P.				
R/A	0	0	6	3	1		plenum pressure s/a	0.17			r/a pressure	0.15					MEDIUM HIGH	1685						
All S/A diffusers 4"x10" unless noted otherwise on layout.							max s/a dif press. loss	0.02			r/a grille press. Loss	0.02					HIGH	1955		TEMPERATURE RISE 50 °F				
All S/A runs 5"Ø unless noted otherwise on layout.							min adjusted pressure s/a	0.15			adjusted pressure r/a	0.13												

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	BED-5	BED-2	BED-3	BED-4	ENS-2/5	WIC-2	ENS-3	MBR	ENS-4	LIB	DIN	KIT/GT	KIT/GT	KIT/GT	LAUN	PWD	FOY	MUD	BAS	BAS	BAS	BAS
RM LOSS MBH.	2.79	2.30	1.82	2.00	2.45	2.70	0.96	0.44	0.41	2.79	0.83	1.88	3.27	2.62	2.62	2.62	0.42	0.77	4.57	3.25	3.97	3.97	3.97	3.97
CFM PER RUN HEAT	58	48	38	41	51	56	20	9	9	58	17	39	68	54	54	54	9	16	95	67	82	82	82	82
RM GAIN MBH.	2.77	2.17	1.58	1.96	2.60	2.77	0.98	0.73	0.69	2.77	1.03	2.02	2.07	2.25	2.25	2.25	0.76	0.89	1.33	1.08	0.72	0.72	0.72	0.72
CFM PER RUN COOLING	89	70	51	63	84	89	31	23	22	89	33	65	66	72	72	72	24	29	43	35	23	23	23	23
ADJUSTED PRESSURE	0.15	0.16	0.16	0.16	0.15	0.15	0.16	0.16	0.16	0.15	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.15	0.16	0.15	0.15	0.15	0.15
ACTUAL DUCT LGH.	70	70	53	49	70	48	47	48	53	64	59	57	29	52	69	54	36	73	40	65	77	60	69	38
EQUIVALENT LENGTH	200	200	170	160	160	160	200	150	170	170	150	140	103	120	140	110	200	170	210	190	150	120	150	90
TOTAL EFFECTIVE LENGTH	270	270	223	209	230	208	247	198	223	234	209	197	132	172	209	164	236	243	250	255	227	180	219	128
ADJUSTED PRESSURE	0.05	0.06	0.07	0.07	0.06	0.07	0.06	0.08	0.07	0.06	0.07	0.08	0.12	0.09	0.07	0.1	0.07	0.06	0.06	0.06	0.06	0.08	0.07	0.11
ROUND DUCT SIZE	**6**	**6**	5	5	**6**	**6**	4	4	4	**6**	4	5	5	5	5	5	4	4	**6**	5	**6**	**6**	**6**	**6**
HEATING VELOCITY (ft/min)	296	245	279	301	260	286	229	103	103	296	195	286	499	396	396	396	103	184	484	492	418	418	418	418
COOLING VELOCITY (ft/min)	454	357	374	463	428	454	356	264	252	454	379	477	485	529	529	529	275	333	219	257	117	117	117	117
OUTLET GRILL SIZE	4X10	4X10	3X10	3X10	4X10	4X10	3X10	3X10	3X10	4X10	3X10	3X10	3X10	3X10	3X10	3X10	3X10	3X10	4X10	3X10	4X10	4X10	4X10	4X10
TRUNK	D	C	E	G	F	E	E	G	G	D	E	F	E	D	B	C	G	A	F	B	A	B	D	E

RUN #	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39
ROOM NAME	BAS	BAS	BED-2	BED-2	BED-3	WIC-3	LIB	KIT/GT	CAB	CAB	CAB	WIC	ENS	BAS	BAS
RM LOSS MBH.	3.97	3.97	2.00	2.00	2.45	1.42	1.88	2.62	2.48	2.48	2.48	0.55	0.70	3.97	3.97
CFM PER RUN HEAT	82	82	41	41	51	30	39	54	51	51	51	11	15	82	82
RM GAIN MBH.	0.72	0.72	1.96	1.96	2.60	1.30	2.02	2.25	2.34	2.34	2.34	0.15	0.77	0.72	0.72
CFM PER RUN COOLING	23	23	63	63	84	42	65	72	75	75	75	5	25	23	23
ADJUSTED PRESSURE	0.15	0.15	0.16	0.16	0.15	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.15	0.15
ACTUAL DUCT LGH.	34	50	52	55	75	58	51	55	69	71	82	56	58	23	58
EQUIVALENT LENGTH	110	150	170	160	160	190	160	120	150	130	140	200	190	140	170
TOTAL EFFECTIVE LENGTH	144	200	222	215	235	248	211	175	219	201	222	256	248	163	228
ADJUSTED PRESSURE	0.1	0.07	0.07	0.07	0.06	0.06	0.07	0.09	0.07	0.08	0.07	0.06	0.06	0.09	0.06
ROUND DUCT SIZE	**6**	**6**	5	5	**6**	5	5	5	5	5	5	4	4	**6**	**6**
HEATING VELOCITY (ft/min)	418	418	301	301	260	220	286	396	374	374	374	126	172	418	418
COOLING VELOCITY (ft/min)	117	117	463	463	428	308	477	529	551	551	551	57	287	117	117
OUTLET GRILL SIZE	4X10	4X10	3X10	3X10	4X10	3X10	3X10	3X10	3X10	3X10	3X10	3X10	3X10	4X10	4X10
TRUNK	G	F	G	G	F	F	F	B	A	A	A	C	C	E	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	251	0.06	9	10	x	8	452	TRUNK G	619	0.06	12.6	18	x	8	619
TRUNK B	257	0.06	9.1	10	x	8	463	TRUNK H	1955	0.05	20.3	38	x	10	741
TRUNK C	718	0.06	13.3	20	x	8	646	TRUNK I	0	0.00	0	0	x	8	0
TRUNK D	252	0.05	9.4	10	x	8	454	TRUNK J	0	0.00	0	0	x	8	0
TRUNK E	1333	0.05	17.6	28	x	10	686	TRUNK K	0	0.00	0	0	x	8	0
TRUNK F	387	0.06	10.6	14	x	8	498	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	1500	0.05	18.4	32	x	10	675
TRUNK Y	890	0.05	15.1	26	x	8	616
TRUNK Z	435	0.05	11.6	16	x	8	489
DROP	1955	0.05	20.3	24	x	18	652

RETURN AIR #	1	2	3	4	5	6	7	8	9							BR
	0	0	0	0	2@7"	0	0	0	0	0	0	0	0	0	0	
AIR VOLUME	115	130	125	115	240	200	340	320	85	0	0	0	0	0	0	285
PLENUM PRESSURE	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13
ACTUAL DUCT LGH.	84	51	62	59	47	49	30	51	51	1	1	1	1	1	1	14
EQUIVALENT LENGTH	200	135	155	185	135	140	170	195	175	0	0	0	0	0	0	145
TOTAL EFFECTIVE LH	284	186	217	244	182	189	200	246	226	1	1	1	1	1	1	159
ADJUSTED PRESSURE	0.05	0.07	0.06	0.05	0.07	0.07	0.07	0.05	0.06	13.36	13.36	13.36	13.36	13.36	13.36	0.08
ROUND DUCT SIZE	7	6.8	6.9	7	8.5	7.9	9.7	10.3	6	0	0	0	0	0	0	8.8
INLET GRILL SIZE	8	8	8	8	8	8	8	8	8	0	0	0	0	0	0	8
	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
INLET GRILL SIZE	14	14	14	14	30	14	30	30	14	0	0	0	0	0	0	30

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: 5005 - KNIGHTSWOOD - WOB LO # 85464
SITE NAME: PINE VALLEY & TESTON ELEV B & B CNR - OPT 5 BED - OPT SERVICE STAIR

RESIDENTIAL MECHANICAL VENTILATION DESIGN SUMMARY

COMBUSTION APPLIANCES 9.32.3.1(1)

- a) [✓] Direct vent (sealed combustion) only
- b) [ ] Positive venting induced draft (except fireplaces)
- c) [ ] Natural draft, B-vent or induced draft gas fireplace
- d) [ ] Solid Fuel (including fireplaces)
- e) [ ] No Combustion Appliances

HEATING SYSTEM

[✓] Forced Air [ ] Non Forced Air

[ ] Electric Space Heat

HOUSE TYPE 9.32.1(2)

- [✓] I Type a) or b) appliance only, no solid fuel
- [ ] II Type I except with solid fuel (including fireplaces)
- [ ] III Any Type c) appliance
- [ ] IV Type I, or II with electric space heat
- [ ] Other: Type I, II or IV no forced air

SYSTEM DESIGN OPTIONS O.N.H.W.P.

- [ ] 1 Exhaust only/Forced Air System
- [ ] 2 HRV with Ducting/Forced Air System
- [✓] 3 HRV Simplified/connected to forced air system
- [ ] 4 HRV with Ducting/non forced air system
- [ ] Part 6 Design

TOTAL VENTILATION CAPACITY 9.32.3.3(1)

Basement + Master Bedroom	2	@ 21.2 cfm	42.4	cfm
Other Bedrooms	4	@ 10.6 cfm	42.4	cfm
Kitchen & Bathrooms	7	@ 10.6 cfm	74.2	cfm
Other Rooms	7	@ 10.6 cfm	74.2	cfm
Table 9.32.3.A.		TOTAL	233.2	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	**95.4**	**cfm**

SUPPLEMENTAL VENTILATION CAPACITY 9.32.3.5.

Total Ventilation Capacity	233.2	cfm
Less Principal Ventil. Capacity	155	cfm
Required Supplemental Capacity	78.2	cfm

PRINCIPAL EXHAUST FAN CAPACITY

Model: VANEE 65H Location: BSMT

155.0 cfm 3.0 sones [✓] HVI Approved

PRINCIPAL EXHAUST HEAT LOSS CALCULATION

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

SUPPLEMENTAL FANS NUTONE

Location	Model	cfm	HVI	Sones
ENS	QTXEN050C	50	✓	0.3
ENS-2/5	QTXEN050C	50	✓	0.3
ENS-4	QTXEN050C	50	✓	0.3
PWD	QTXEN050C	50	✓	0.3

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: 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: February-20

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#: 85464 Model: 5005 - KNIGHTSWOOD - WOB Builder: GOLD PARK HOMES Date: 2020-02-26

Volume Calculation

House Volume

Level	Floor Area (ft²)	Floor Height (ft)	Volume (ft³)
Bsmt	2117	10	21170
First	2117	11	23287
Second	2360	10	23600
Third	0	9	0
Fourth	0	9	0
		Total:	68,057.0 ft³
		Total:	1927.2 m³

Air Change & Delta T Data

WINTER NATURAL AIR CHANGE RATE	0.416
SUMMER NATURAL AIR CHANGE RATE	0.139

Design Temperature Difference

	Tin °C	Tout °C	ΔT °C	ΔT °F
Winter DTDh	22	-20	42	76
Summer DTDc	24	31	7	13

5.2.3.1 Heat Loss due to Air Leakage

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

0.416 x 535.32 x 42 °C x 1.2 = 11280 W

= **38486 Btu/h**

6.2.6 Sensible Gain due to Air Leakage

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

= 0.139 x 535.32 x 7 °C x 1.2 = 637 W

= **2173 Btu/h**

5.2.3.2 Heat Loss due to Mechanical Ventilation

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

155 CFM x 76 °F x 1.08 x 0.25 = **3181 Btu/h**

6.2.7 Sensible heat Gain due to Ventilation

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

155 CFM x 13 °F x 1.08 x 0.25 = **536 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	38,486	11,779	1.634
2	0.3		22,004	0.525
3	0.2		20,041	0.384
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: 5005 - KNIGHTSWOOD - WOB ELEV B & B CNR - OPT 5 BED - OPT **BUILDER:** GOLD PARK HOMES
SFQT: 4477 **LO#** 85464 **SITE:** PINE VALLEY & TESTON

DESIGN ASSUMPTIONS

HEATING	°F	COOLING	°F
OUTDOOR DESIGN TEMP.	-4	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:	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):	68057.0	ASSUMED (Y/N):	Y
INTERNAL SHADING:	BLINDS/CURTAINS	ASSUMED OCCUPANTS:	6
INTERIOR LIGHTING LOAD (Btu/h/ft^2):	1.27	DC BRUSHLESS MOTOR (Y/N):	Y
FOUNDATION CONFIGURATION	BCIN_1	DEPTH BELOW GRADE:	7.0 ft
LENGTH: 77.0 ft	WIDTH: 42.0 ft	EXPOSED PERIMETER:	186.0 ft
WOB INSULATION CONFIGURATION	SCB_9	WOB EXPOSED PERIMETER	52.0 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	29.80
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

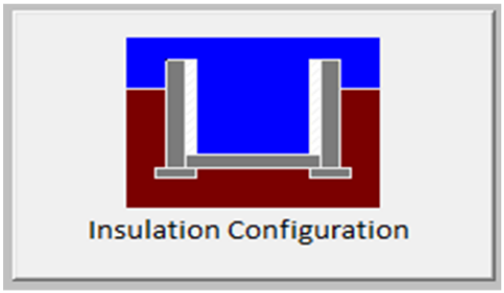
Michael O'Rourke

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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 sand, loam, clay
Water Table:	Normal (7-10 m, 23-33 ft)

Foundation Dimensions		
Floor Length (m):	**4.6**	 Insulation Configuration
Floor Width (m):	**12.8**	
Exposed Perimeter (m):	**56.7**	
Wall Height (m):	**3.0**	
Depth Below Grade (m):	**1.84**	
Window Area (m^2):	**1.1**	
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):	**872**	

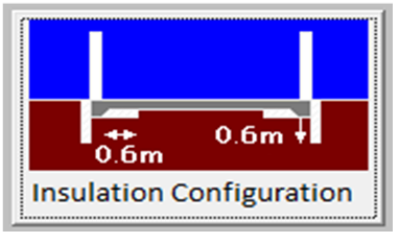
TYPE: 5005 - KNIGHTSWOOD - WOB ELEV B & B CNR - OPT 5 BED - OPT SERVICE STAIR
LO# 85464

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 sand, loam, clay
Water Table:	Normal (7-10 m, 23-33 ft)

Foundation Dimensions		
Length (m):	**1.5**	
Width (m):	**12.8**	
Exposed Perimeter (m):	**15.8**	

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

Results	
Heating Load (Watts):	**217**

TYPE: 5005 - KNIGHTSWOOD - WOB ELEV B & B CNR - OPT 5 BED - OPT SERVICE STAIR
LO# 85464

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

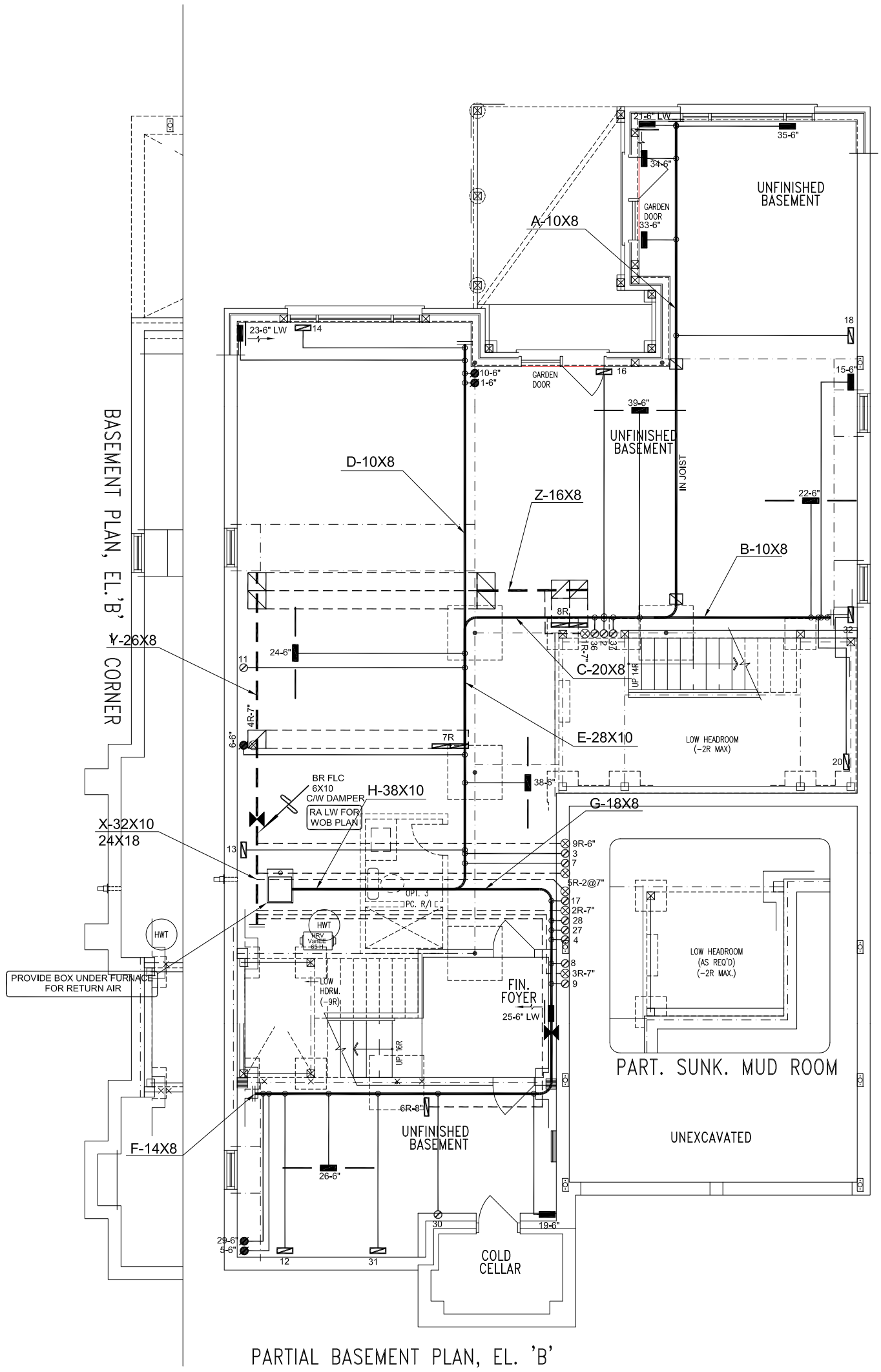
Air Infiltration Residential Load Calculator

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):	9.45
Building Configuration	
Type:	Detached
Number of Stories:	Two
Foundation:	Full
House Volume (m^3):	1927.2
Air Leakage/Ventilation	
Air Tightness Type:	Present (1961-) (3.57 ACH)
Custom BDT Data:	ELA @ 10 Pa. 2569.0 cm^2
	3.57 ACH @ 50 Pa
Mechanical Ventilation (L/s):	Total Supply 73.2 / Total Exhaust 73.2
Flue Size	
Flue #:	#1 #2 #3 #4
Diameter (mm):	0 0 0 0
Natural Infiltration Rates	
Heating Air Leakage Rate (ACH/H):	**0.416**
Cooling Air Leakage Rate (ACH/H):	**0.139**

TYPE: 5005 - KNIGHTSWOOD - WOB ELEV B & B CNR - OPT 5 BED - OPT SER\

LO# 85464



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

WOB | 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.		

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Client

GOLDPARK HOMES

Project Name

PINE VALLEY & TESTON
VAUGHAN, ONTARIO
THE HIGHBOURNE - WOB
OPT. 5 BED - SERVICE STAIR
5005 ELEV. 'B' & 'B CNR" 4477sqft

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 97555 BTU/H		
UNIT DATA		
MAKE	LENNOX	
MODEL	EL296UH110XE60C	
INPUT	110	MBTU/H
OUTPUT	106	MBTU/H
COOLING	5.0	TONS
FAN SPEED	1955	cfm @ 0.6" w.c.

# OF RUNS	S/A	R/A	FANS
3RD FLOOR			
2ND FLOOR	18	6	6
1ST FLOOR	13	3	3
BASEMENT	8	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

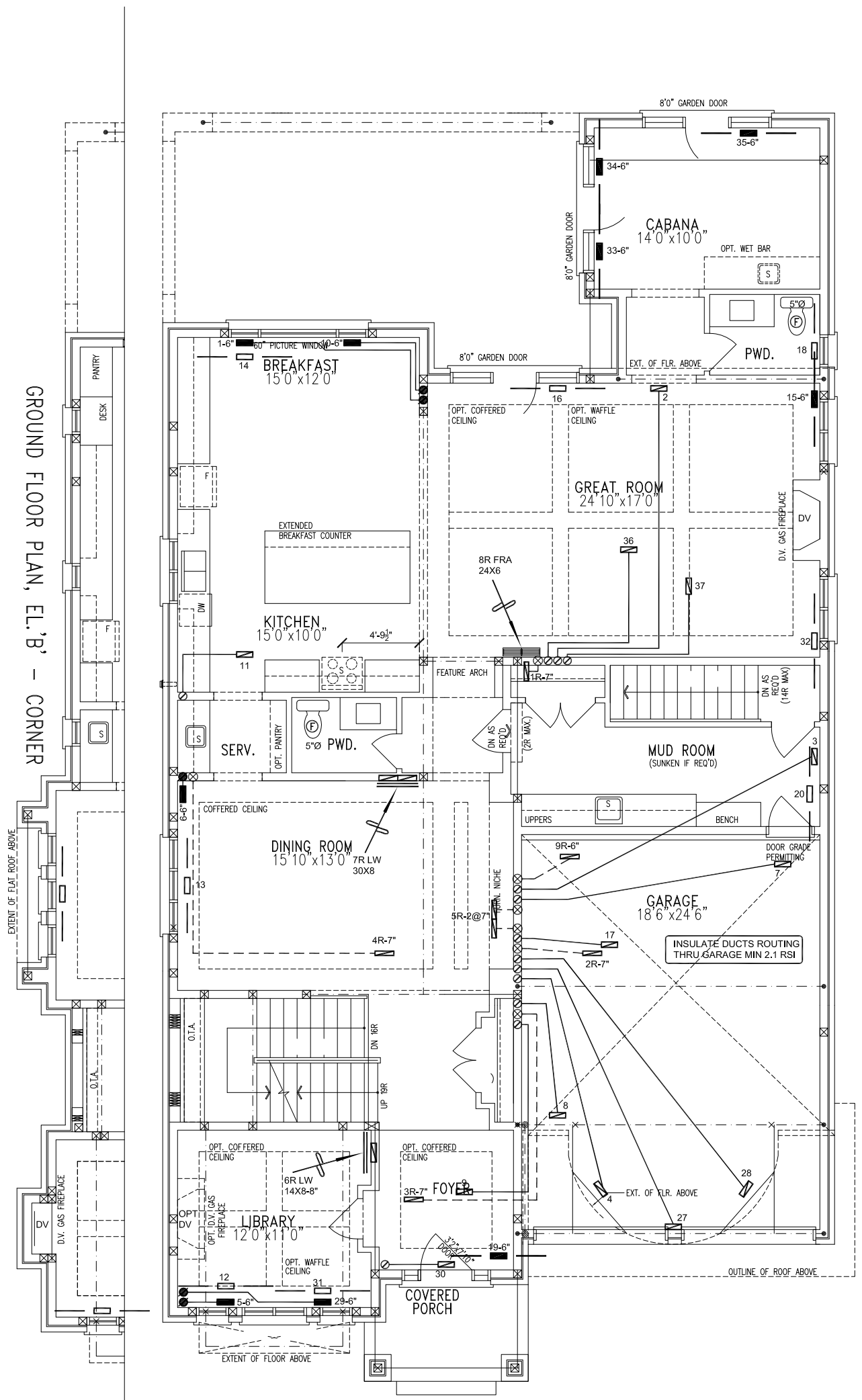
BASEMENT HEATING LAYOUT

Date FEB/2020

Scale 1/8" = 1'-0"

BCIN# 19669

LO# 85464



PARTIAL GROUND FLOOR PLAN, EL. '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

WOB | 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

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Client
GOLDPARK HOMES

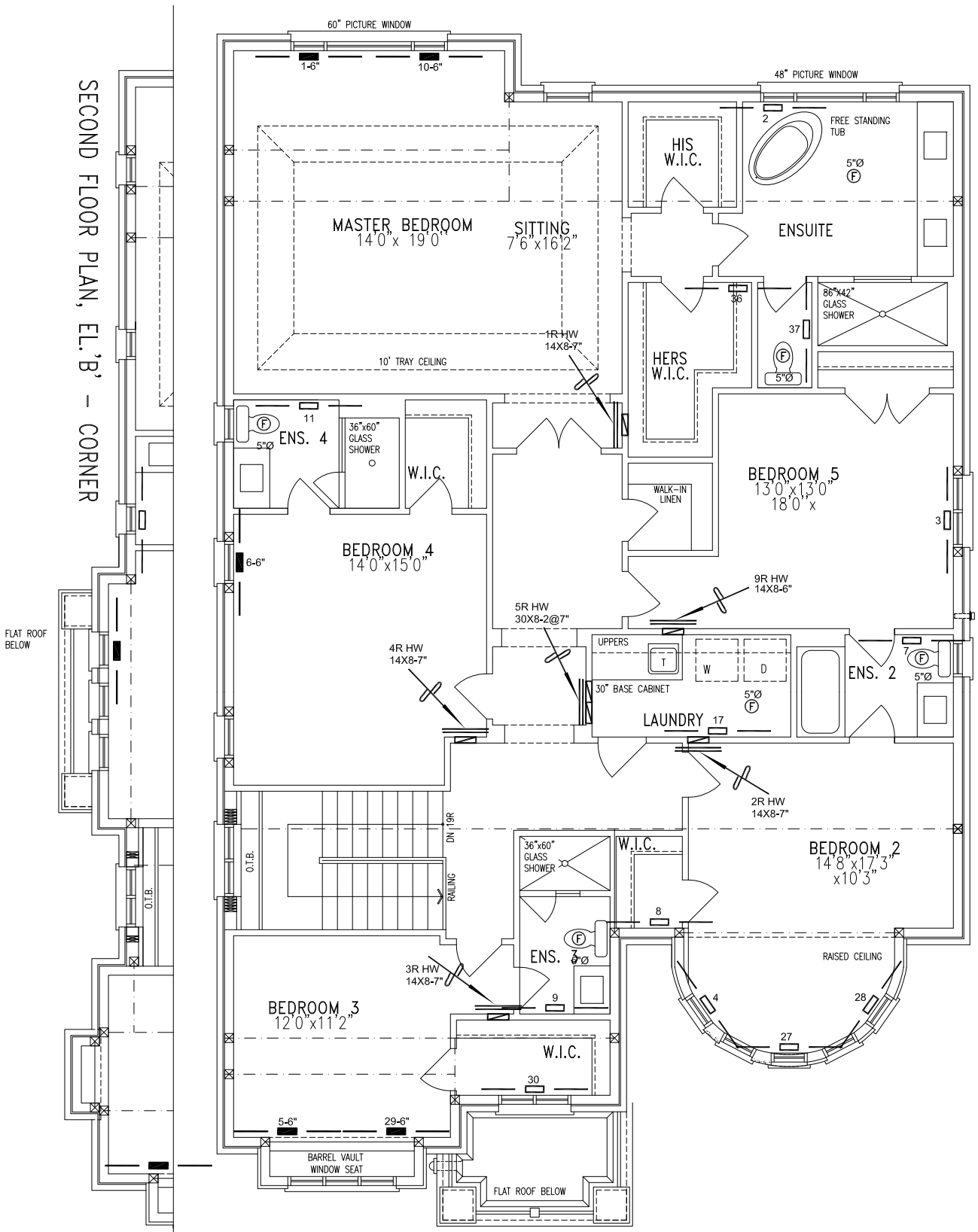
Project Name
PINE VALLEY & TESTON
VAUGHAN, ONTARIO
THE HIGHBOURNE - WOB
OPT. 5 BED - SERVICE STAIR
5005 ELEV. 'B' & 'B CNR" 4477sqft

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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 FEB/2020
Scale 1/8" = 1'-0"
BCIN# 19669
LO# 85464



OPT. 5 BEDROOM SECOND FLOOR PLAN, EL.'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

WOB | 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.		

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Client
GOLDPARK HOMES

Project Name
PINE VALLEY & TESTON
VAUGHAN, ONTARIO
THE HIGHBOURNE - WOB
OPT. 5 BED - SERVICE STAIR
5005 ELEV. 'B' & 'B CNR" 4477sqft

HVAC DESIGNS LTD.
375 Finley Ave. Suite 202 - Ajax, Ontario
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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.

Sheet Title
SECOND FLOOR HEATING LAYOUT

Date FEB/2020
Scale 1/8" = 1'-0"
BCIN# 19669
LO# 85464

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**		
VAUGHAN (WOODBRIDGE)				

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:** 5005 ELEV. 'B' - KNIGHTSWOOD OPT. 5 BED + ELEVATOR **Project:** PINE VALLEY & TESTON

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.

September 10, 2018
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.

HVA 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

SITE NAME: PINE VALLEY & TESTON — OPT. 5 BED + ELEVATOR — DATE: Sep-18 — WINTER NATURAL AIR CHANGE RATE 0.350 — HEAT LOSS ΔT °F. 76 — CSA-F280-12
BUILDER: GOLD PARK HOMES — TYPE: 5005 ELEV. 'B' - KNIGHTSWOOD — GFA: 4412 — LO# 77535 — SUMMER NATURAL AIR CHANGE RATE 0.124 — HEAT GAIN ΔT °F. 15 — SB-12 PACKAGE A1

ROOM USE			MBR			ENS			BED-5			BED-2			BED-3			BED-4			ENS-2/5			WIC-2			ENS-3			ENS-4			WIC-3			WIC		
EXP. WALL			46			30			14			34			36			19			9			3			4			7			14			6		
CLG. HT.			11			10			10			11			11			10			10			10			10			10			10			10		
	FACTORS																																				
GRS.WALL AREA	LOSS	GAIN	506			300			140			374			396			190			90			30			40			70			140			60		
GLAZING			LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN
NORTH	21.3	16.5	0	0	0	0	0	0	6	128	99	0	0	0	0	0	0	0	0	0	8	170	132	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
EAST	21.3	42.1	0	0	0	0	0	0	0	0	0	65	1383	2737	50	1064	2106	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	20	426	842	0	0	0
SOUTH	21.3	25.5	0	0	0	0	0	0	0	0	0	0	0	0	10	213	255	32	681	815	0	0	0	0	0	0	0	0	0	8	170	204	0	0	0	0	0	0
WEST	21.3	42.1	50	1064	2106	34	724	1432	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	0	0	0
SKYLT.	37.2	102.5	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	0	0	0	0	0	0	0	0	0
DOORS	25.2	4.9	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	0	0	0	0	0	0	0	0	0
NET EXPOSED WALL	4.5	0.9	456	2036	396	266	1187	231	134	598	116	309	1379	269	336	1499	292	168	705	137	82	366	71	30	134	26	40	179	35	62	277	54	120	536	104	60	268	52
NET EXPOSED BSMT WALL ABOVE GR	3.6	0.7	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	0	0	0	0	0	0	0	0	0
EXPOSED CLG	1.3	0.6	480	616	298	205	263	127	255	327	158	175	225	109	249	320	155	285	366	177	81	104	50	40	51	25	92	118	57	105	135	65	53	68	33	102	131	63
NO ATTIC EXPOSED CLG	2.7	1.3	0	0	0	0	0	0	0	0	0	78	214	104	18	49	24	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	154	393	76	253	645	126	18	46	9	0	0	0	81	207	40	40	102	20	0	0	0	0	0	0	0	0	0	0	0	0
BASEMENT/CRAWL HEAT LOSS			0			0			0			0			0			0			0			0			0			0			0			0		
SLAB ON GRADE HEAT LOSS			0			0			0			0			0			0			0			0			0			0			0			0		
SUBTOTAL HT LOSS			3715			2174			1446			3846			3191			1752			847			287			297			582			1029			399		
SUB TOTAL HT GAIN				2800			1790			451			3344			2840			1129			294			71			92			323			979			116	
LEVEL FACTOR / MULTIPLIER			0.20	0.32		0.20	0.32		0.20	0.32		0.20	0.32		0.20	0.32		0.20	0.32		0.20	0.32		0.20	0.32		0.20	0.32		0.20	0.32		0.20	0.32		0.20	0.32	
AIR CHANGE HEAT LOSS				1173			686			456			1215			1008			553			267			91			94			184			325			126		
AIR CHANGE HEAT GAIN					241			154			39			288			245			97			25			6			8			28			84			10
DUCT LOSS				0			0			190			506			420			0			111			38			0			0			0			0		
DUCT GAIN					0			0			141			456			401			0			32			8			0			0			0			0
HEAT GAIN PEOPLE	240		2		480	0		0	1		240	1		240	1		240	1		240	0		0	0		0	0		0	0		0	0		0	0		0	
HEAT GAIN APPLIANCES/LIGHTS					684			0			684			684			684			684			0			0			0			0			0			0
TOTAL HT LOSS BTU/H			4888			2860			2092			5567			4619			2305			1225			416			390			765			1354			525		
TOTAL HT GAIN x 1.3 BTU/H				5467			2628			2021			6516			5733			2796			457			110			130			456			1383			163	

ROOM USE			LIB			DIN			KIT/GT			CAB			LAUN			PWD			FOY			MUD									LOD			BAS		
EXP. WALL			31			32			87			45			0			5			35			18									52			238		
CLG. HT.			11			11			11			11			10			11			11			12									10			10		
	FACTORS																																					
GRS.WALL AREA	LOSS	GAIN	341			352			957			495			0			55			385			216									520			1978		
GLAZING			LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN								LOSS	GAIN		LOSS	GAIN		
NORTH	21.3	16.5	0	0	0	0	0	0	46	979	761	0	0	0	0	0	0	9	192	149	0	0	0	0	0	0							0	0	0	6	128	99
EAST	21.3	42.1	56	1192	2358	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
SOUTH	21.3	25.5	0	0	0	34	724	866	20	426	509	63	1341	1604	0	0	0	0	0	0	0	0	0	0	0	0							0	0	0	6	128	153
WEST	21.3	42.1	0	0	0	0	0	0	115	2447	4843	63	1341	2653	0	0	0	0	0	0	0	0	0	0	0	0							22	468	926	0	0	0
SKYLT.	37.2	102.5	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	0	0	0
DOORS	25.2	4.9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	55	1414	275	20	505	98							0	0	0	20	505	98
NET EXPOSED WALL	4.5	0.9	285	1272	248	318	1419	276	776	3463	674	369	1647	321	0	0	0	46	205	40	329	1468	286	196	875	170							0	0	0	0	0	0
NET EXPOSED BSMT WALL ABOVE GR	3.6	0.7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0							290	1044	203	402	1447	282
EXPOSED CLG	1.3	0.6	0	0	0	0	0	0	0	0	0	0	0	0	142	182	88	0	0	0	0	0	0	0	0	0							0	0	0	0	0	0
NO ATTIC EXPOSED CLG	2.7	1.3	0	0	0	0	0	0	0	0	0	203	558	270	0	0	0	40	110	53	41	113	55	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	142	362	71	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			0												8373		
SLAB ON GRADE HEAT LOSS			0			0			0			0			0			0			0			0									0					
SUBTOTAL HT LOSS			2464			2143			7316			4886			544			507			2995			1380									1512			10580		
SUB TOTAL HT GAIN				2606			1142			6787			4848			159			242			616			269									1130			632	
LEVEL FACTOR / MULTIPLIER			0.30	0.44		0.30	0.44		0.30	0.44		0.30	0.44		0.20	0.32		0.30	0.44		0.30	0.44		0.30	0.44										0.60	1.31	
AIR CHANGE HEAT LOSS				1082			941			3212			2146			172			223			1315			606												15873		
AIR CHANGE HEAT GAIN					225			98			585			418			14			21			53			23													152	
DUCT LOSS				0			0			0			0			72			0			0			0												0		
DUCT GAIN					0			0			0			0			86			0			0			0													0	
HEAT GAIN PEOPLE	240		0		0	0		0	0		0	0		0	0		0	0		0	0		0	0		0							0		0	0		0	
HEAT GAIN APPLIANCES/LIGHTS					684			684			684			684			684			0			0			684									0			684	
TOTAL HT LOSS BTU/H			3545			3084			10527			7032			788			729			4310			1986									1512			26453		
TOTAL HT GAIN x 1.3 BTU/H				4569			2602			10473			7735			1225			342			870			1269									1469			1908	

TOTAL HEAT GAIN BTU/H: 60740 — TONS: 5.06 — LOSS DUE TO VENTILATION LOAD BTU/H: 3181 — STRUCTURAL HEAT LOSS: 86972 — TOTAL COMBINED HEAT LOSS BTU/H: 90152

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INDIVIDUAL BCIN: 19669 MICHAEL O'ROURKE

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SITE NAME: PINE VALLEY & TESTON
BUILDER: GOLD PARK HOMES

OPT. 5 BED + ELEVATOR
TYPE: 5005 ELEV. 'B' - KNIGHTSWOOD DATE: Sep-18

GFA: 4412 LO# 77535

HEATING CFM	1955		COOLING CFM	1955		furnace pressure	0.6																	
TOTAL HEAT LOSS	86,972		TOTAL HEAT GAIN	60,121		furnace filter	0.08																	
AIR FLOW RATE CFM	22.48		AIR FLOW RATE CFM	32.52		a/c coil pressure	0.2																	
						available pressure for s/a & r/a	0.32																	
						plenum pressure s/a	0.17			r/a pressure	0.15													
						max s/a dif press. loss	0.02			r/a grille press. Loss	0.02													
						min adjusted pressure s/a	0.15			adjusted pressure r/a	0.13													

^LENNOX
EL296UH110XE60C 110
FAN SPEED
LOW 0
MEDLOW 1380
MEDIUM 1505
MEDIUM HIGH 1685
HIGH 1955

AFUE = 96 %
INPUT (BTU/H) = 110,000
OUTPUT (BTU/H) = 106,000
DESIGN CFM = 1955
CFM @ .6 " E.S.P.
TEMPERATURE RISE 50 °F

RUN COUNT	4th	3rd	2nd	1st	Bas
S/A	0	0	18	13	7
R/A	0	0	6	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	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
ROOM NAME	MBR	ENS	BED-5	BED-2	BED-3	BED-4	ENS-2/5	WIC-2	ENS-3	MBR	ENS-4	LIB	DIN	KIT/GT	KIT/GT	KIT/GT	LAUN	PWD	FOY	MUD	BAS	BAS	BAS	BAS
RM LOSS MBH.	2.44	2.23	2.09	1.86	2.31	2.30	1.23	0.42	0.39	2.44	0.77	1.77	3.08	2.63	2.63	2.63	0.79	0.73	4.31	1.99	3.99	3.99	3.99	3.99
CFM PER RUN HEAT	55	50	47	42	52	52	28	9	9	55	17	40	69	59	59	59	18	16	97	45	90	90	90	90
RM GAIN MBH.	2.73	1.96	2.02	2.17	2.87	2.80	0.46	0.11	0.13	2.73	0.46	2.28	2.50	2.62	2.62	2.62	1.22	0.34	0.87	1.27	0.48	0.48	0.48	0.48
CFM PER RUN COOLING	89	64	66	71	93	91	15	4	4	89	15	74	81	85	85	85	40	11	28	41	16	16	16	16
ADJUSTED PRESSURE	0.15	0.16	0.16	0.16	0.15	0.15	0.16	0.16	0.16	0.15	0.16	0.16	0.15	0.15	0.15	0.15	0.16	0.16	0.15	0.16	0.15	0.15	0.15	0.15
ACTUAL DUCT LGH.	70	70	71	49	70	48	74	48	53	64	59	57	29	52	69	54	36	73	40	47	67	60	54	38
EQUIVALENT LENGTH	200	200	170	160	160	160	200	150	170	170	150	140	103	120	140	110	200	170	210	160	150	120	103	90
TOTAL EFFECTIVE LENGTH	270	270	241	209	230	208	274	198	223	234	209	197	132	172	209	164	236	243	250	207	217	180	157	128
ADJUSTED PRESSURE	0.05	0.06	0.06	0.07	0.06	0.07	0.06	0.08	0.07	0.06	0.07	0.08	0.11	0.09	0.07	0.09	0.07	0.06	0.06	0.08	0.07	0.08	0.09	0.11
ROUND DUCT SIZE	6	5	5	5	6	6	4	4	4	6	4	5	5	5	6	5	4	4	6	4	6	6	6	5
HEATING VELOCITY (ft/min)	280	367	345	308	265	265	321	103	103	280	195	294	507	433	301	433	207	184	495	516	459	459	459	661
COOLING VELOCITY (ft/min)	454	470	485	521	474	464	172	46	46	454	172	543	595	624	433	624	459	126	143	470	82	82	82	117
OUTLET GRILL SIZE	4X10	3X10	3X10	3X10	4X10	4X10	3X10	3X10	3X10	4X10	3X10	3X10	3X10	3X10	4X10	3X10	3X10	3X10	4X10	3X10	4X10	4X10	4X10	3X10
TRUNK	D	C	C	G	F	E	C	G	G	D	E	F	E	D	B	C	G	A	F	C	A	B	D	E

RUN #	25	26	27	28	29	30	31	32	33	34	35	36	37	38
ROOM NAME	BAS	BAS	BED-2	BED-2	BED-3	WIC-3	LIB	KIT/GT	CAB	CAB	CAB	WIC	ENS	BAS
RM LOSS MBH.	3.99	3.99	1.86	1.86	2.31	1.35	1.77	2.63	2.34	2.34	2.34	0.52	0.63	3.99
CFM PER RUN HEAT	90	90	42	42	52	30	40	59	53	53	53	12	14	90
RM GAIN MBH.	0.48	0.48	2.17	2.17	2.87	1.38	2.28	2.62	2.58	2.58	2.58	0.16	0.56	0.48
CFM PER RUN COOLING	16	16	71	71	93	45	74	85	84	84	84	5	18	16
ADJUSTED PRESSURE	0.15	0.15	0.16	0.16	0.15	0.16	0.16	0.15	0.15	0.15	0.15	0.16	0.16	0.15
ACTUAL DUCT LGH.	34	50	52	55	75	58	51	55	69	71	82	54	58	23
EQUIVALENT LENGTH	110	150	170	160	160	190	160	120	150	130	140	180	190	140
TOTAL EFFECTIVE LENGTH	144	200	222	215	235	248	211	175	219	201	222	234	248	163
ADJUSTED PRESSURE	0.1	0.07	0.07	0.07	0.06	0.06	0.07	0.08	0.07	0.07	0.07	0.07	0.06	0.09
ROUND DUCT SIZE	5	6	5	5	6	5	5	6	6	6	6	4	4	6
HEATING VELOCITY (ft/min)	661	459	308	308	265	220	294	301	270	270	270	138	161	459
COOLING VELOCITY (ft/min)	117	82	521	521	474	330	543	433	428	428	428	57	207	82
OUTLET GRILL SIZE	3X10	4X10	3X10	3X10	4X10	3X10	3X10	4X10	4X10	4X10	4X10	3X10	3X10	4X10
TRUNK	G	F	G	G	F	F	F	B	A	A	A	C	C	E

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	265	0.06	9.2	10	x	8	477	TRUNK G	653	0.06	12.8	20	x	8	588
TRUNK B	208	0.07	8.1	8	x	8	468	TRUNK H	1955	0.05	20.3	38	x	10	741
TRUNK C	728	0.06	13.4	20	x	8	655	TRUNK I	0	0.00	0	0	x	8	0
TRUNK D	259	0.05	9.5	10	x	8	466	TRUNK J	0	0.00	0	0	x	8	0
TRUNK E	1305	0.05	17.4	28	x	10	671	TRUNK K	0	0.00	0	0	x	8	0
TRUNK F	401	0.06	10.7	14	x	8	516	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	1490	0.05	18.3	32	x	10	671
TRUNK Y	985	0.05	15.7	28	x	8	633
TRUNK Z	435	0.05	11.6	16	x	8	489
DROP	1955	0.05	20.3	24	x	18	652

RETURN AIR #	1	2	3	4	5	6	7	8	9							BR
	0	0	0	0	2@7"	0	0	0	0	0	0	0	0	0	0	
AIR VOLUME	115	135	130	115	240	200	350	320	85	0	0	0	0	0	0	265
PLENUM PRESSURE	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13
ACTUAL DUCT LGH.	84	51	62	59	47	49	30	51	61	1	1	1	1	1	1	14
EQUIVALENT LENGTH	200	135	155	185	135	140	170	195	165	0	0	0	0	0	0	145
TOTAL EFFECTIVE LH	284	186	217	244	182	189	200	246	226	1	1	1	1	1	1	159
ADJUSTED PRESSURE	0.05	0.07	0.06	0.05	0.07	0.07	0.07	0.05	0.06	13.36	13.36	13.36	13.36	13.36	13.36	0.08
ROUND DUCT SIZE	7	6.8	7	7	8.5	7.9	9.8	10.3	6	0	0	0	0	0	0	8.5
INLET GRILL SIZE	8	8	8	8	8	8	8	8	8	0	0	0	0	0	0	8
	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
INLET GRILL SIZE	14	14	14	14	30	14	30	30	14	0	0	0	0	0	0	24

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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

TYPE: 5005 ELEV. 'B' - KNIGHTSWOOD LO # 77535
SITE NAME: PINE VALLEY & TESTON OPT. 5 BED + ELEVATOR

RESIDENTIAL MECHANICAL VENTILATION DESIGN SUMMARY

COMBUSTION APPLIANCES 9.32.3.1(1)

- a) [✓] Direct vent (sealed combustion) only
- b) [ ] Positive venting induced draft (except fireplaces)
- c) [ ] Natural draft, B-vent or induced draft gas fireplace
- d) [ ] Solid Fuel (including fireplaces)
- e) [ ] No Combustion Appliances

HEATING SYSTEM

[✓] Forced Air [ ] Non Forced Air

[ ] Electric Space Heat

HOUSE TYPE 9.32.1(2)

- [✓] I Type a) or b) appliance only, no solid fuel
- [ ] II Type I except with solid fuel (including fireplaces)
- [ ] III Any Type c) appliance
- [ ] IV Type I, or II with electric space heat
- [ ] Other: Type I, II or IV no forced air

SYSTEM DESIGN OPTIONS O.N.H.W.P.

- [ ] 1 Exhaust only/Forced Air System
- [ ] 2 HRV with Ducting/Forced Air System
- [✓] 3 HRV Simplified/connected to forced air system
- [ ] 4 HRV with Ducting/non forced air system
- [ ] Part 6 Design

TOTAL VENTILATION CAPACITY 9.32.3.3(1)

Basement + Master Bedroom	2	@ 21.2 cfm	42.4	cfm
Other Bedrooms	4	@ 10.6 cfm	42.4	cfm
Kitchen & Bathrooms	7	@ 10.6 cfm	74.2	cfm
Other Rooms	7	@ 10.6 cfm	74.2	cfm
Table 9.32.3.A.		TOTAL	233.2	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	95.4	cfm

SUPPLEMENTAL VENTILATION CAPACITY 9.32.3.5.

Total Ventilation Capacity	233.2	cfm
Less Principal Ventil. Capacity	155	cfm
Required Supplemental Capacity	78.2	cfm

PRINCIPAL EXHAUST FAN CAPACITY

Model: VANEE 65H Location: BSMT

155.0 cfm 3.0 sones [✓] HVI Approved

PRINCIPAL EXHAUST HEAT LOSS CALCULATION

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

SUPPLEMENTAL FANS NUTONE

Location	Model	cfm	HVI	Sones
ENS	QTXEN050C	50	✓	0.3
ENS-2/5	QTXEN050C	50	✓	0.3
ENS-4	QTXEN050C	50	✓	0.3
PWD	QTXEN050C	50	✓	0.3

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: 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: September-18

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#: 77535 Model: 5005 ELEV. 'B' - KNIGHTSWOOD Builder: GOLD PARK HOMES Date: 9/10/2018

Volume Calculation

House Volume

Level	Floor Area (ft²)	Floor Height (ft)	Volume (ft³)
Bsmt	2052	10	20520
First	2052	11	22572
Second	2360	10	23600
Third	0	9	0
Fourth	0	9	0
		Total:	66,692.0 ft³
		Total:	1888.5 m³

Air Change & Delta T Data

WINTER NATURAL AIR CHANGE RATE	0.350
SUMMER NATURAL AIR CHANGE RATE	0.124

Design Temperature Difference

	Tin °C	Tout °C	ΔT °C	ΔT °F
Winter DTDh	22	-20	42	76
Summer DTDc	23	31	8	15

5.2.3.1 Heat Loss due to Air Leakage

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

0.350 x 524.59 x 42 °C x 1.2 = **9304 W**

= **31747 Btu/h**

6.2.6 Sensible Gain due to Air Leakage

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

= 0.124 x 524.59 x 8 °C x 1.2 = **644 W**

= **2196 Btu/h**

5.2.3.2 Heat Loss due to Mechanical Ventilation

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

155 CFM x 76 °F x 1.08 x 0.25 = **3181 Btu/h**

6.2.7 Sensible heat Gain due to Ventilation

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

155 CFM x 15 °F x 1.08 x 0.25 = **619 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	31,747	12,091	1.313
2	0.3		21,688	0.439
3	0.2		20,108	0.316
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: 5005 ELEV. 'B' - KNIGHTSWOOD OPT. 5 BED + ELEVATOR **BUILDER:** GOLD PARK HOMES
SFQT: 4412 **LO#** 77535 **SITE:** PINE VALLEY & TESTON

DESIGN ASSUMPTIONS

HEATING	°F	COOLING	°F
OUTDOOR DESIGN TEMP.	-4	OUTDOOR DESIGN TEMP.	88
INDOOR DESIGN TEMP.	72	INDOOR DESIGN TEMP. (MAX 75°F)	73

BUILDING DATA

ATTACHMENT:	DETACHED	# 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):	66692.0	ASSUMED (Y/N):	Y
INTERNAL SHADING:	BLINDS/CURTAINS	ASSUMED OCCUPANTS:	6
INTERIOR LIGHTING LOAD ($Btu/h/ft^2$):	1.27	DC BRUSHLESS MOTOR (Y/N):	Y
FOUNDATION CONFIGURATION	BCIN_1	DEPTH BELOW GRADE:	7.0 ft
LENGTH: 77.0 ft	WIDTH: 42.0 ft	EXPOSED PERIMETER:	238.0 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	29.80
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	-

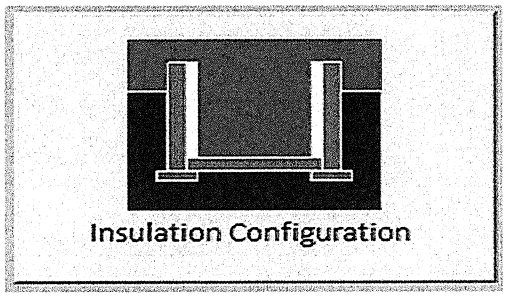
INDIVIDUAL BCIN: 19669
MICHAEL O'ROURKE

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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 sand, loam, clay	
Water Table:	Normal (7-10 m, 23-33 ft)	
Foundation Dimensions		
Floor Length (m):	**23.5**	 Insulation Configuration
Floor Width (m):	**12.8**	
Exposed Perimeter (m):	**0.0**	
Wall Height (m):	**3.0**	
Depth Below Grade (m):	**2.13**	
Window Area (m^2):	**3.2**	
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):	**2453**	

TYPE: 5005 ELEV. 'B' - KNIGHTSWOOD OPT. 5 BED + ELEVATOR
LO# 77535

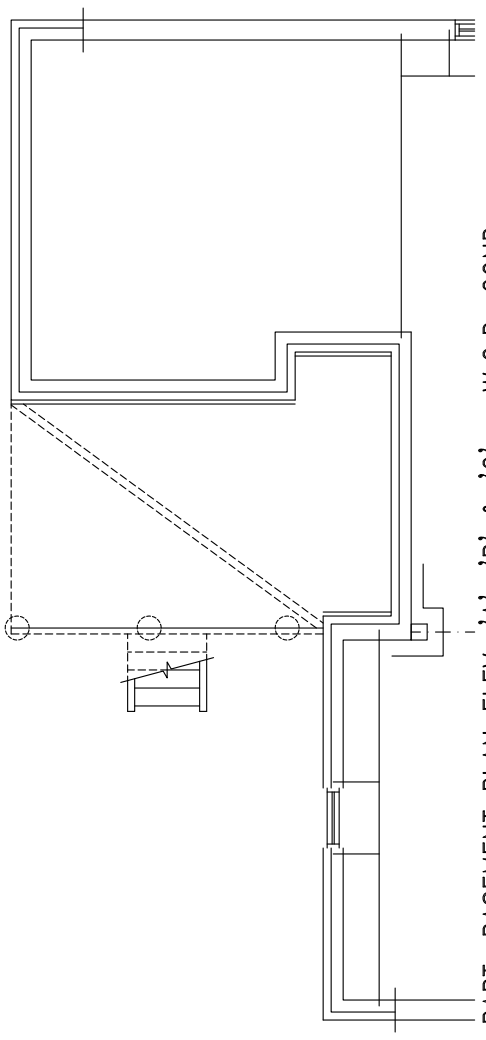
HVAC Designs Ltd.
375 Finley Ave, Suite 202
Ajax ON, L1S 2E2
905-619-2300

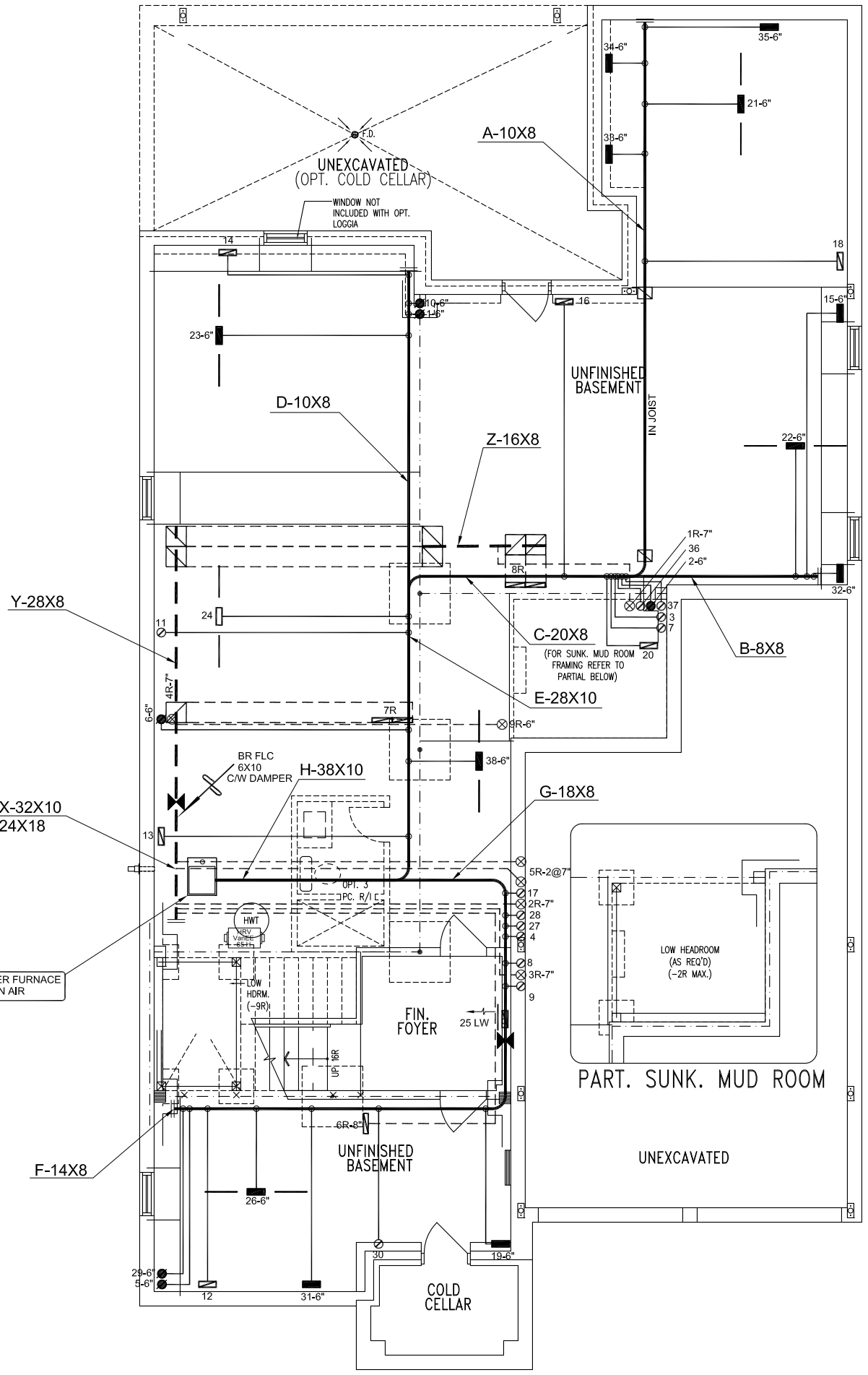
Air Infiltration Residential Load Calculator

Supplemental tool for CAN/CSA-F280

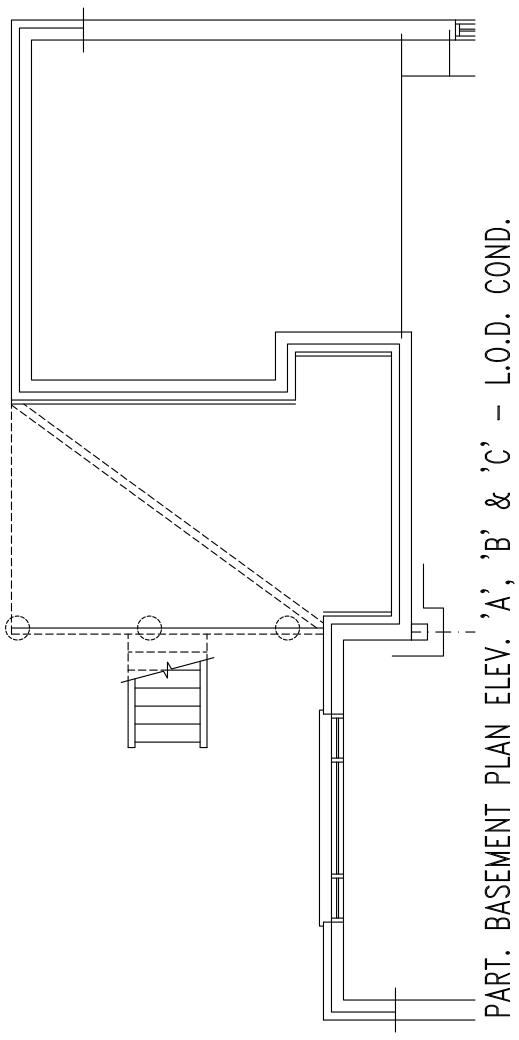
Weather Station Description	
Province:	Ontario
Region:	Vaughan (Woodbridge)
Weather Station Location:	Open flat terrain, grass
Anemometer height (m):	10
Local Shielding	
Building Site:	Suburban, forest
Walls:	Heavy
Flue:	Heavy
Highest Ceiling Height (m):	7.32
Building Configuration	
Type:	Detached
Number of Stories:	Two
Foundation:	Full
House Volume (m^3):	1888.5
Air Leakage/Ventilation	
Air Tightness Type:	Present (1961-) (3.57 ACH)
Custom BDT Data:	ELA @ 10 Pa. 2517.4 cm^2
	3.57 ACH @ 50 Pa
Mechanical Ventilation (L/s):	Total Supply 73.2 / Total Exhaust 73.2
Flue Size	
Flue #:	#1 #2 #3 #4
Diameter (mm):	0 0 0 0
Natural Infiltration Rates	
Heating Air Leakage Rate (ACH/H):	**0.350**
Cooling Air Leakage Rate (ACH/H):	**0.124**

TYPE: 5005 ELEV. 'B' - KNIGHTSWOOD OPT. 5 BED + ELEVATOR
LO# 77535





PARTIAL BASEMENT PLAN, EL. '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

REVISIONS

No.	Description	Date
3.	REVISED AS PER ARCHITECTURALS	FEB/2020
2.	3R RELOCATED	NOV/2018
1.	DECK CONDITIONS ADDED	SEPT/2018

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Client
GOLDPARK HOMES

Project Name
PINE VALLEY & TESTON
VAUGHAN, ONTARIO
KNIGHTSWOOD
OPT. 5 BED + ELEVATOR
5005 ELEV. 'B' 4412 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 90152 BTU/H

UNIT DATA

MAKE	LENNOX	
MODEL	EL296UH110XE60C	
INPUT	110	MBTU/H
OUTPUT	106	MBTU/H
COOLING	5.0	TONS
FAN SPEED	1955	cfm @ 0.6" w.c.

# OF RUNS	S/A	R/A	FANS
3RD FLOOR			
2ND FLOOR	18	6	6
1ST FLOOR	13	3	3
BASEMENT	7	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

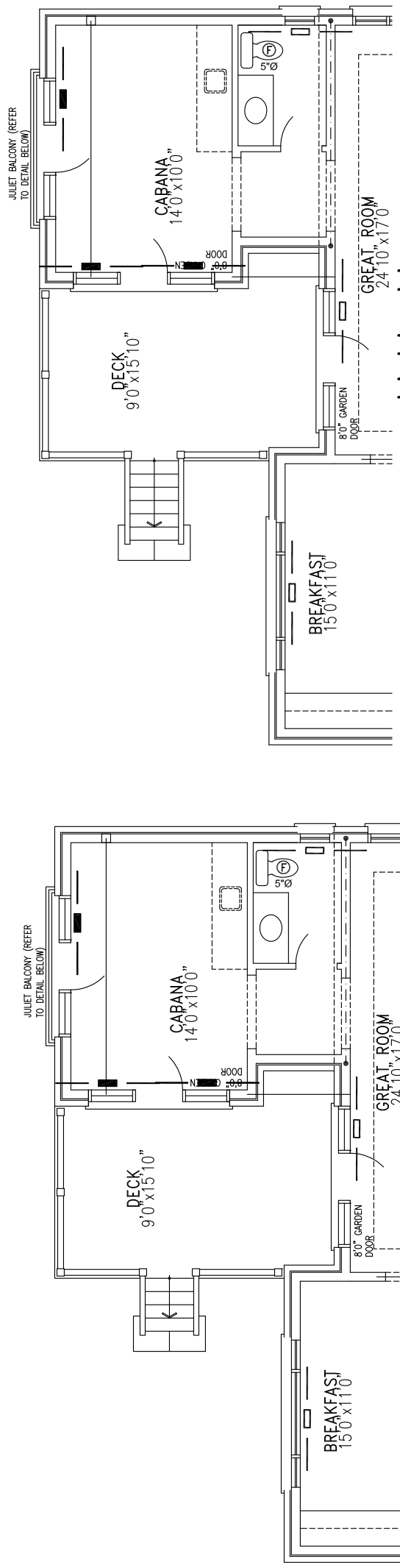
Sheet Title
BASEMENT HEATING LAYOUT

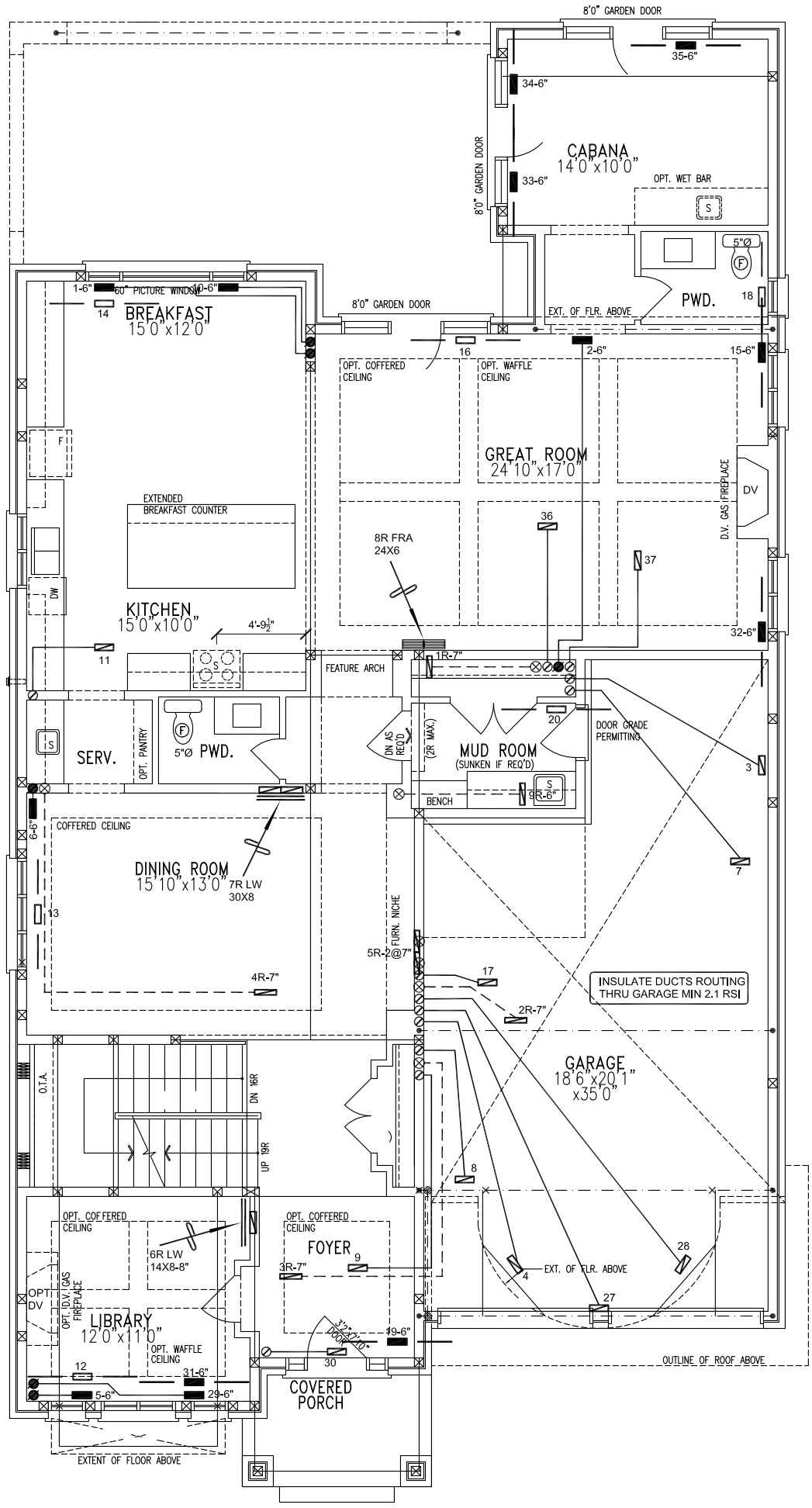
Date JAN/2018

Scale 1/8" = 1'-0"

BCIN# 19669

LO# 77535





PARTIAL GROUND FLOOR PLAN, EL. '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.	REVISED AS PER ARCHITECTURALS	FEB/2020
2.	3R RELOCATED	NOV/2018
1.	DECK CONDITIONS ADDED	SEPT/2018

REVISIONS

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Client

GOLDPARK HOMES

Project Name

PINE VALLEY & TESTON
VAUGHAN, ONTARIO
KNIGHTSWOOD
OPT. 5 BED + ELEVATOR
5005 ELEV. 'B' 4412 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

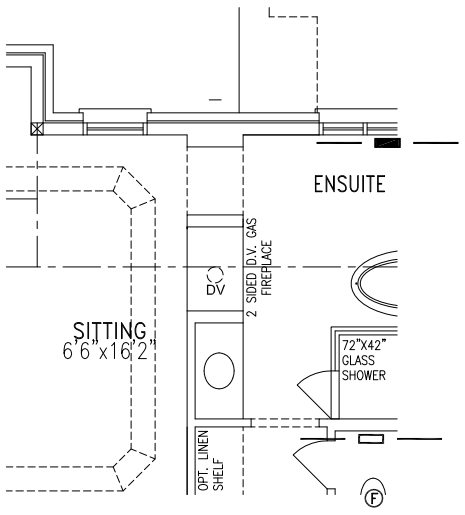
FIRST FLOOR HEATING LAYOUT

Date JAN/2018

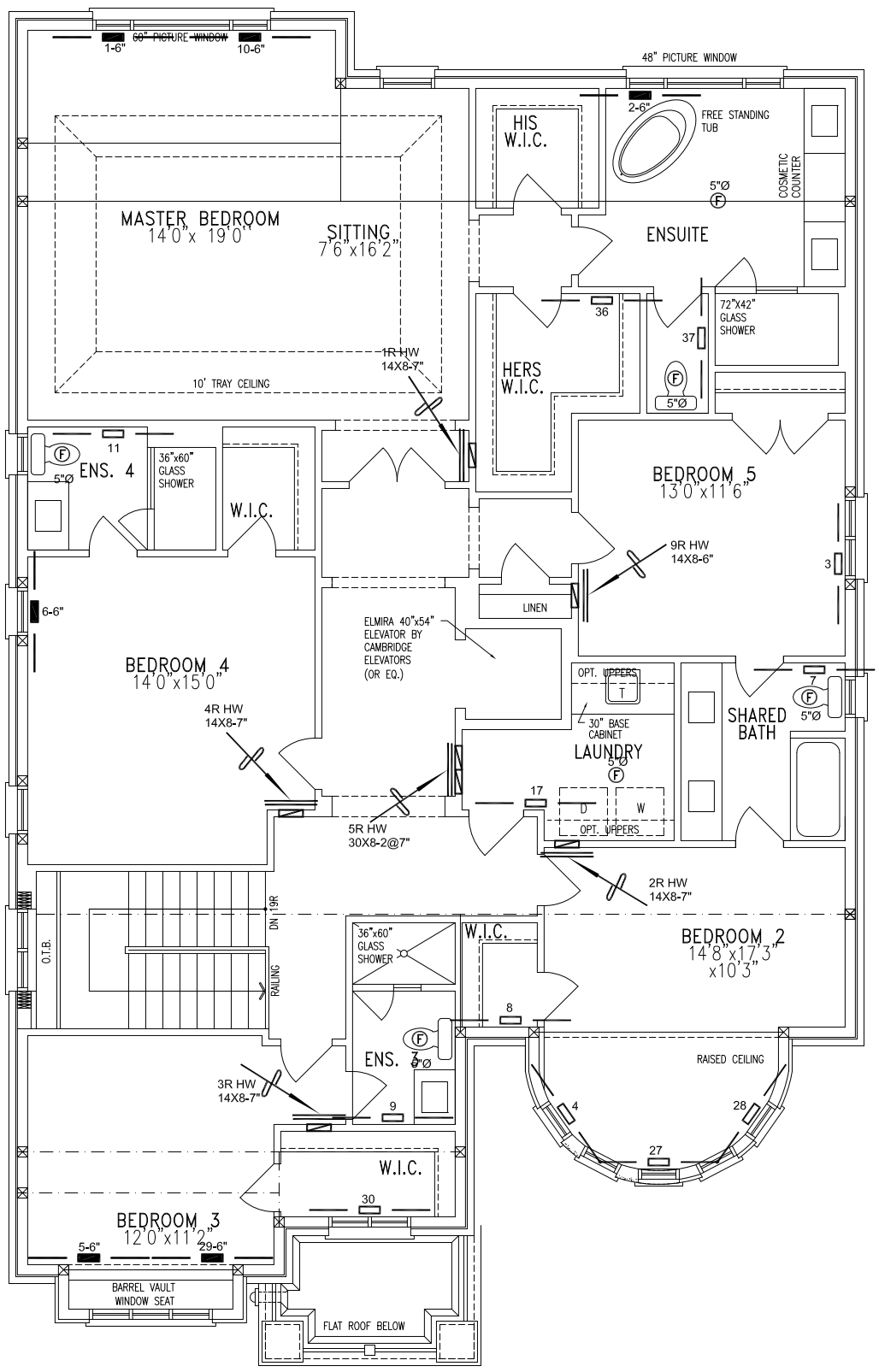
Scale 1/8" = 1'-0"

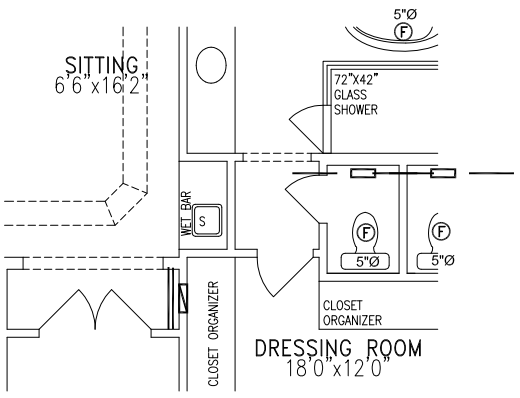
BCIN# 19669

LO# 77535



PART. SECOND FLOOR PLAN
OPT. SITTING AREA FIREPLACE





PART. SECOND FLOOR PLAN
OPT. SITTING AREA WET BAR

SECOND FLOOR PLAN, EL. '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.	REVISED AS PER ARCHITECTURALS	FEB/2020
2.	3R RELOCATED	NOV/2018
1.	DECK CONDITIONS ADDED	SEPT/2018

REVISIONS

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Client
GOLDPARK HOMES

Project Name
PINE VALLEY & TESTON
VAUGHAN, ONTARIO
KNIGHTSWOOD
OPT. 5 BED + ELEVATOR
5005 ELEV. 'B' 4412 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
SECOND FLOOR HEATING LAYOUT

Date JAN/2018
Scale 1/8" = 1'-0"
BCIN# 19669
LO# 77535

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**		
VAUGHAN (WOODBRIDGE)				

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:** 5005 ELEV. 'B' - KNIGHTSWOOD OPT. 5 BED + ELEVATOR WOB **Project:** PINE VALLEY & TESTON

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.

September 11, 2018
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.

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

SITE NAME: PINE VALLEY & TESTON | OPT. 5 BED + ELEVATOR WOB | DATE: Sep-18 | WINTER NATURAL AIR CHANGE RATE 0.416 | HEAT LOSS ΔT °F. 76 | CSA-F280-12
BUILDER: GOLD PARK HOMES | TYPE: 5005 ELEV. 'B' - KNIGHTSWOOD | GFA: 4412 | LO# 79988 | SUMMER NATURAL AIR CHANGE RATE 0.139 | HEAT GAIN ΔT °F. 13 | SB-12 PACKAGE A1

ROOM USE			MBR			ENS			BED-5			BED-2			BED-3			BED-4			ENS-2/5			WIC-2			ENS-3			ENS-4			WIC-3			WIC		
EXP. WALL			46			30			14			34			36			19			9			3			4			7			14			6		
CLG. HT.			11			10			10			11			11			10			10			10			10			10			10			10		
	FACTORS																																				
GRS.WALL AREA	LOSS	GAIN	506			300			140			374			396			190			90			30			40			70			140			60		
GLAZING			LOSS		GAIN	LOSS		GAIN	LOSS		GAIN	LOSS		GAIN	LOSS		GAIN	LOSS		GAIN	LOSS		GAIN	LOSS		GAIN	LOSS		GAIN	LOSS		GAIN	LOSS		GAIN	LOSS		GAIN
NORTH	21.3	16.0	0	0	0	0	0	0	6	128	96	0	0	0	0	0	0	0	0	0	8	170	128	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
EAST	21.3	41.6	0	0	0	0	0	0	0	0	0	65	1383	2701	50	1064	2078	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	20	426	831	0	0	0
SOUTH	21.3	24.9	0	0	0	0	0	0	0	0	0	0	0	0	10	213	249	32	681	797	0	0	0	0	0	0	0	0	0	8	170	199	0	0	0	0	0	0
WEST	21.3	41.6	50	1064	2078	34	724	1413	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	0	0	0
SKYLT.	37.2	101.5	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	0	0	0	0	0	0	0	0	0
DOORS	25.2	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	0	0	0	0	0	0	0	0	0
NET EXPOSED WALL	4.5	0.8	456	2035	343	266	1187	200	134	598	101	309	1379	232	336	1499	253	168	705	119	82	366	62	30	134	23	40	179	30	62	277	47	120	536	90	60	268	45
NET EXPOSED BSMT WALL ABOVE GR	3.6	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	0	0	0	0	0	0	0	0	0	0	0	0
EXPOSED CLG	1.3	0.6	480	616	282	205	263	120	255	327	150	175	225	103	249	320	146	285	366	167	81	104	48	40	51	24	92	118	54	105	135	62	53	68	31	102	131	60
NO ATTIC EXPOSED CLG	2.7	1.3	0	0	0	0	0	0	0	0	0	78	214	98	18	49	23	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	154	393	66	253	645	109	18	46	8	0	0	0	81	207	35	40	102	17	0	0	0	0	0	0	0	0	0	0	0	0
BASEMENT/CRAWL HEAT LOSS				0			0			0			0			0			0			0			0			0			0			0			0	
SLAB ON GRADE HEAT LOSS				0			0			0			0			0			0			0			0			0			0			0			0	
SUBTOTAL HT LOSS				3715			2174			1446			3846			3191			1752			847			287			297			582			1029			399	
SUB TOTAL HT GAIN					2702			1733			413			3243			2756			1083			272			63			84			307			952			105
LEVEL FACTOR / MULTIPLIER			0.20	0.38		0.20	0.38		0.20	0.38		0.20	0.38		0.20	0.38		0.20	0.38		0.20	0.38		0.20	0.38		0.20	0.38		0.20	0.38		0.20	0.38		0.20	0.38	
AIR CHANGE HEAT LOSS				1394			815			542			1443			1197			657			318			108			111			218			386			150	
AIR CHANGE HEAT GAIN					217			139			33			260			221			87			22			5			7			25			76			8
DUCT LOSS				0			0			199			529			439			0			116			39			0			0			0			0	
DUCT GAIN					0			0			137			443			390			0			29			7			0			0			0			0
HEAT GAIN PEOPLE	240		2		480	0		0	1		240	1		240	1		240	1		240	0		0	0		0	0		0	0		0	0		0	0		0
HEAT GAIN APPLIANCES/LIGHTS					684			0			684			684			684			684			0			0			0			0			0			0
TOTAL HT LOSS BTU/H				5109			2989			2187			5818			4827			2409			1281			434			408			800			1415			548	
TOTAL HT GAIN x 1.3 BTU/H					5308			2434			1959			6331			5579			2722			420			98			118			432			1337			148

ROOM USE			LIB			DIN			KIT/GT			CAB			LAUN			PWD			FOY			MUD									WOB			BAS		
EXP. WALL			31			32			87			45			0			5			35			18									52			186		
CLG. HT.			11			11			11			11			10			11			11			12									10			10		
	FACTORS																																					
GRS.WALL AREA	LOSS	GAIN	341			352			957			495			0			55			385			216									520			1302		
GLAZING			LOSS		GAIN	LOSS		GAIN	LOSS		GAIN	LOSS		GAIN	LOSS		GAIN	LOSS		GAIN	LOSS		GAIN	LOSS		GAIN							LOSS		GAIN	LOSS		GAIN
NORTH	21.3	16.0	0	0	0	0	0	0	46	979	735	0	0	0	0	0	0	9	192	144	0	0	0	0	0	0							0	0	0	6	128	96
EAST	21.3	41.6	56	1192	2327	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
SOUTH	21.3	24.9	0	0	0	34	724	847	20	426	498	63	1341	1569	0	0	0	0	0	0	0	0	0	0	0	0							46	979	573	6	128	149
WEST	21.3	41.6	0	0	0	0	0	0	105	2234	4363	63	1341	2618	0	0	0	0	0	0	0	0	0	0	0	0							106	2256	2202	0	0	0
SKYLT.	37.2	101.5	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	0	0	0
DOORS	25.2	4.3	0	0	0	0	0	0	10	252	43	0	0	0	0	0	0	0	0	0	56	1414	238	20	505	85							20	505	85	20	505	85
NET EXPOSED WALL	4.5	0.8	285	1272	214	318	1419	239	776	3463	583	369	1647	277	0	0	0	46	205	35	329	1468	247	196	875	147							348	1553	262	0	0	0
NET EXPOSED BSMT WALL ABOVE GR	3.6	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							0	0	0	556	2008	338
EXPOSED CLG	1.3	0.6	0	0	0	0	0	0	0	0	0	0	0	0	142	182	83	0	0	0	0	0	0	0	0	0							0	0	0	0	0	0
NO ATTIC EXPOSED CLG	2.7	1.3	0	0	0	0	0	0	0	0	0	203	558	256	0	0	0	40	110	50	41	113	52	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	142	362	61	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			0											2977		
SLAB ON GRADE HEAT LOSS				0			0			0			0			0			0			0			0									741					
SUBTOTAL HT LOSS				2464			2143			7354			4886			544			507			2995			1380									6034			5746		
SUB TOTAL HT GAIN					2541			1086			6222			4719			144			229			537			232									3122			668	
LEVEL FACTOR / MULTIPLIER			0.30	0.52		0.30	0.52		0.30	0.52		0.30	0.52		0.20	0.38		0.30	0.52		0.30	0.52		0.30	0.52											0.50	1.60	
AIR CHANGE HEAT LOSS				1283			1116			3830			2544			204			264			1560			718											18857		
AIR CHANGE HEAT GAIN					204			87			499			379			12			18			43			19													304
DUCT LOSS				0			0			0			0			75			0			0			0											0		
DUCT GAIN					0			0			0			0			84			0			0			0													0
HEAT GAIN PEOPLE	240		0		0	0		0	0		0	0		0	0		0	0		0	0		0	0		0							0		0	0		0
HEAT GAIN APPLIANCES/LIGHTS					684			684			684			684			684			0			0			684									0			684
TOTAL HT LOSS BTU/H				3746			3258			11184			7430			823			771			4554			2098									6775			24603		
TOTAL HT GAIN x 1.3 BTU/H					4458			2414			9626			7517			1201			321			754			1216									4058			2154

TOTAL HEAT GAIN BTU/H: 61140 TONS: 5.09 LOSS DUE TO VENTILATION LOAD BTU/H: 3181 STRUCTURAL HEAT LOSS: 93468 TOTAL COMBINED HEAT LOSS BTU/H: 96649

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: PINE VALLEY & TESTON
BUILDER: GOLD PARK HOMES

OPT. 5 BED + ELEVATOR WOB
TYPE: 5005 ELEV. 'B' - KNIGHTSWOOD DATE: Sep-18

GFA: 4412 LO# 79988

HEATING CFM	1955	COOLING CFM	1955
TOTAL HEAT LOSS	93,468	TOTAL HEAT GAIN	60,604
AIR FLOW RATE CFM	20.92	AIR FLOW RATE CFM	32.26

furnace pressure	0.6
furnace filter	0.08
a/c coil pressure	0.2
available pressure for s/a & r/a	0.32
plenum pressure s/a	0.17
max s/a dif press. loss	0.02
min adjusted pressure s/a	0.15
r/a pressure	0.15
r/a grille press. Loss	0.02
adjusted pressure r/a	0.13

^LENNOX
EL296UH110XE60C 110
FAN SPEED
LOW 0
MEDLOW 1380
MEDIUM 1505
MEDIUM HIGH 1685
HIGH 1955

AFUE = 96 %
INPUT (BTU/H) = 110,000
OUTPUT (BTU/H) = 106,000
DESIGN CFM = 1955
CFM @ .6 " E.S.P.
TEMPERATURE RISE 50 °F

RUN COUNT	4th	3rd	2nd	1st	Bas
S/A	0	0	18	13	8
R/A	0	0	6	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	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
ROOM NAME	MBR	ENS	BED-5	BED-2	BED-3	BED-4	ENS-2/5	WIC-2	ENS-3	MBR	ENS-4	LIB	DIN	KIT/GT	KIT/GT	KIT/GT	LAUN	PWD	FOY	MUD	BAS	BAS	BAS	BAS
RM LOSS MBH.	2.55	2.29	2.19	1.94	2.41	2.41	1.28	0.43	0.41	2.55	0.80	1.87	3.26	2.80	2.80	2.80	0.82	0.77	4.55	2.10	3.92	3.92	3.92	3.92
CFM PER RUN HEAT	53	48	46	41	50	50	27	9	9	53	17	39	68	58	58	58	17	16	95	44	82	82	82	82
RM GAIN MBH.	2.65	1.92	1.96	2.11	2.79	2.72	0.42	0.10	0.12	2.65	0.43	2.23	2.41	2.41	2.41	2.41	1.20	0.32	0.75	1.22	0.78	0.78	0.78	0.78
CFM PER RUN COOLING	86	62	63	68	90	88	14	3	4	86	14	72	78	78	78	78	39	10	24	39	25	25	25	25
ADJUSTED PRESSURE	0.15	0.16	0.16	0.16	0.15	0.15	0.16	0.16	0.16	0.15	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.15	0.16	0.15	0.15	0.15	0.15
ACTUAL DUCT LGH.	70	70	71	49	70	48	74	48	53	64	59	57	29	52	69	54	36	73	40	47	77	60	69	38
EQUIVALENT LENGTH	200	200	170	160	160	160	200	150	170	170	150	140	103	120	140	110	200	170	210	160	150	120	150	90
TOTAL EFFECTIVE LENGTH	270	270	241	209	230	208	274	198	223	234	209	197	132	172	209	164	236	243	250	207	227	180	219	128
ADJUSTED PRESSURE	0.05	0.06	0.06	0.07	0.06	0.07	0.06	0.08	0.07	0.06	0.07	0.08	0.12	0.09	0.07	0.1	0.07	0.06	0.06	0.08	0.06	0.08	0.07	0.11
ROUND DUCT SIZE	6	5	5	5	6	6	4	4	4	6	4	5	5	5	6	5	4	4	6	4	6	6	6	5
HEATING VELOCITY (ft/min)	270	352	338	301	255	255	310	103	103	270	195	286	499	426	296	426	195	184	484	505	418	418	418	602
COOLING VELOCITY (ft/min)	438	455	463	499	459	449	161	34	46	438	161	529	573	573	398	573	447	115	122	447	127	127	127	184
OUTLET GRILL SIZE	4X10	3X10	3X10	3X10	4X10	4X10	3X10	3X10	3X10	4X10	3X10	3X10	3X10	3X10	4X10	3X10	3X10	3X10	4X10	3X10	4X10	4X10	4X10	3X10
TRUNK	D	C	C	G	F	E	C	G	G	D	E	F	E	D	B	C	G	A	F	C	A	B	D	E

RUN #	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39
ROOM NAME	BAS	BAS	BED-2	BED-2	BED-3	WIC-3	LIB	KIT/GT	CAB	CAB	CAB	WIC	ENS	BAS	BAS
RM LOSS MBH.	3.92	3.92	1.94	1.94	2.41	1.42	1.87	2.80	2.48	2.48	2.48	0.55	0.69	3.92	3.92
CFM PER RUN HEAT	82	82	41	41	50	30	39	58	52	52	52	11	15	82	82
RM GAIN MBH.	0.78	0.78	2.11	2.11	2.79	1.34	2.23	2.41	2.51	2.51	2.51	0.15	0.52	0.78	0.78
CFM PER RUN COOLING	25	25	68	68	90	43	72	78	81	81	81	5	17	25	25
ADJUSTED PRESSURE	0.15	0.15	0.16	0.16	0.15	0.16	0.16	0.16	0.15	0.15	0.15	0.16	0.16	0.15	0.15
ACTUAL DUCT LGH.	34	50	52	55	75	58	51	55	69	71	82	54	58	23	58
EQUIVALENT LENGTH	110	150	170	160	160	190	160	120	150	130	140	180	190	140	170
TOTAL EFFECTIVE LENGTH	144	200	222	215	235	248	211	175	219	201	222	234	248	163	228
ADJUSTED PRESSURE	0.1	0.07	0.07	0.07	0.06	0.06	0.07	0.09	0.07	0.07	0.07	0.07	0.06	0.09	0.06
ROUND DUCT SIZE	5	6	5	5	6	5	5	5	6	6	6	4	4	5	6
HEATING VELOCITY (ft/min)	602	418	301	301	255	220	286	426	265	265	265	126	172	602	418
COOLING VELOCITY (ft/min)	184	127	499	499	459	316	529	573	413	413	413	57	195	184	127
OUTLET GRILL SIZE	3X10	4X10	3X10	3X10	4X10	3X10	3X10	3X10	4X10	4X10	4X10	3X10	3X10	3X10	4X10
TRUNK	G	F	G	G	F	F	F	B	A	A	A	C	C	E	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	254	0.06	9	10	x	8	457		TRUNK G	625	0.06	12.6	18	x	8	625
TRUNK B	198	0.07	7.9	8	x	8	446		TRUNK H	1955	0.05	20.3	38	x	10	741
TRUNK C	783	0.06	13.8	22	x	8	641		TRUNK I	0	0.00	0	0	x	8	0
TRUNK D	246	0.05	9.3	10	x	8	443		TRUNK J	0	0.00	0	0	x	8	0
TRUNK E	1328	0.05	17.5	28	x	10	683		TRUNK K	0	0.00	0	0	x	8	0
TRUNK F	385	0.06	10.5	14	x	8	495		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	1490	0.05	18.3	32	x	10	671
TRUNK Y	985	0.05	15.7	28	x	8	633
TRUNK Z	435	0.05	11.6	16	x	8	489
DROP	1955	0.05	20.3	24	x	18	652

RETURN AIR #	1	2	3	4	5	6	7	8	9							BR
	0	0	0	0	2@7"	0	0	0	0	0	0	0	0	0	0	
AIR VOLUME	115	135	130	115	240	200	350	320	85	0	0	0	0	0	0	265
PLENUM PRESSURE	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13
ACTUAL DUCT LGH.	84	51	62	59	47	49	30	51	61	1	1	1	1	1	1	14
EQUIVALENT LENGTH	200	135	155	185	135	140	170	195	165	0	0	0	0	0	0	145
TOTAL EFFECTIVE LH	284	186	217	244	182	189	200	246	226	1	1	1	1	1	1	159
ADJUSTED PRESSURE	0.05	0.07	0.06	0.05	0.07	0.07	0.07	0.05	0.06	13.36	13.36	13.36	13.36	13.36	13.36	0.08
ROUND DUCT SIZE	7	6.8	7	7	8.5	7.9	9.8	10.3	6	0	0	0	0	0	0	8.5
INLET GRILL SIZE	8	8	8	8	8	8	8	8	8	0	0	0	0	0	0	8
	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
INLET GRILL SIZE	14	14	14	14	30	14	30	30	14	0	0	0	0	0	0	24

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: 5005 ELEV. 'B' - KNIGHTSWOOD LO # 79988
SITE NAME: PINE VALLEY & TESTON OPT. 5 BED + ELEVATOR WOB

RESIDENTIAL MECHANICAL VENTILATION DESIGN SUMMARY

COMBUSTION APPLIANCES 9.32.3.1(1)

- a) [✓] Direct vent (sealed combustion) only
- b) [ ] Positive venting induced draft (except fireplaces)
- c) [ ] Natural draft, B-vent or induced draft gas fireplace
- d) [ ] Solid Fuel (including fireplaces)
- e) [ ] No Combustion Appliances

HEATING SYSTEM

[✓] Forced Air [ ] Non Forced Air

[ ] Electric Space Heat

HOUSE TYPE 9.32.1(2)

- [✓] I Type a) or b) appliance only, no solid fuel
- [ ] II Type I except with solid fuel (including fireplaces)
- [ ] III Any Type c) appliance
- [ ] IV Type I, or II with electric space heat
- [ ] Other: Type I, II or IV no forced air

SYSTEM DESIGN OPTIONS O.N.H.W.P.

- [ ] 1 Exhaust only/Forced Air System
- [ ] 2 HRV with Ducting/Forced Air System
- [✓] 3 HRV Simplified/connected to forced air system
- [ ] 4 HRV with Ducting/non forced air system
- [ ] Part 6 Design

TOTAL VENTILATION CAPACITY 9.32.3.3(1)

Basement + Master Bedroom	2	@ 21.2 cfm	42.4	cfm
Other Bedrooms	4	@ 10.6 cfm	42.4	cfm
Kitchen & Bathrooms	7	@ 10.6 cfm	74.2	cfm
Other Rooms	7	@ 10.6 cfm	74.2	cfm
Table 9.32.3.A.		TOTAL	233.2	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	95.4	cfm

SUPPLEMENTAL VENTILATION CAPACITY 9.32.3.5.

Total Ventilation Capacity	233.2	cfm
Less Principal Ventil. Capacity	155	cfm
Required Supplemental Capacity	78.2	cfm

PRINCIPAL EXHAUST FAN CAPACITY

Model: VANEE 65H Location: BSMT

155.0 cfm 3.0 sones [✓] HVI Approved

PRINCIPAL EXHAUST HEAT LOSS CALCULATION

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

SUPPLEMENTAL FANS NUTONE

Location	Model	cfm	HVI	Sones
ENS	QTXEN050C	50	✓	0.3
ENS-2/5	QTXEN050C	50	✓	0.3
ENS-4	QTXEN050C	50	✓	0.3
PWD	QTXEN050C	50	✓	0.3

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: 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: September-18

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#: 79988 Model: 5005 ELEV. 'B' - KNIGHTSWOOD Builder: GOLD PARK HOMES Date: 9/11/2018

Volume Calculation

House Volume

Level	Floor Area (ft²)	Floor Height (ft)	Volume (ft³)
Bsmt	2052	10	20520
First	2052	11	22572
Second	2360	10	23600
Third	0	9	0
Fourth	0	9	0
		Total:	66,692.0 ft³
		Total:	1888.5 m³

Air Change & Delta T Data

WINTER NATURAL AIR CHANGE RATE	0.416
SUMMER NATURAL AIR CHANGE RATE	0.139

Design Temperature Difference

	Tin °C	Tout °C	ΔT °C	ΔT °F
Winter DTDh	22	-20	42	76
Summer DTDc	24	31	7	13

5.2.3.1 Heat Loss due to Air Leakage

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

0.416 x 524.59 x 42 °C x 1.2 = 11053 W

= **37714 Btu/h**

6.2.6 Sensible Gain due to Air Leakage

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

= 0.139 x 524.59 x 7 °C x 1.2 = 624 W

= **2130 Btu/h**

5.2.3.2 Heat Loss due to Mechanical Ventilation

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

155 CFM x 76 °F x 1.08 x 0.25 = **3181 Btu/h**

6.2.7 Sensible heat Gain due to Ventilation

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

155 CFM x 13 °F x 1.08 x 0.25 = **536 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	37,714	11,779	1.601
2	0.3		21,728	0.521
3	0.2		20,108	0.375
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: 5005 ELEV. 'B' - KNIGHTSWOOD OPT. 5 BED + ELEVATOR WOB **BUILDER:** GOLD PARK HOMES
SFQT: 4412 **LO#** 79988 **SITE:** PINE VALLEY & TESTON

DESIGN ASSUMPTIONS

HEATING	°F	COOLING	°F
OUTDOOR DESIGN TEMP.	-4	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:	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):	66692.0	ASSUMED (Y/N):	Y
INTERNAL SHADING:	BLINDS/CURTAINS	ASSUMED OCCUPANTS:	6
INTERIOR LIGHTING LOAD ($Btu/h/ft^2$):	1.27	DC BRUSHLESS MOTOR (Y/N):	Y
FOUNDATION CONFIGURATION	BCIN_1	DEPTH BELOW GRADE:	7.0 ft
LENGTH: 77.0 ft	WIDTH: 42.0 ft	EXPOSED PERIMETER:	186.0 ft
WOB INSULATION CONFIGURATION	SCB_9	WOB EXPOSED PERIMETER	52.0 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	29.80
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

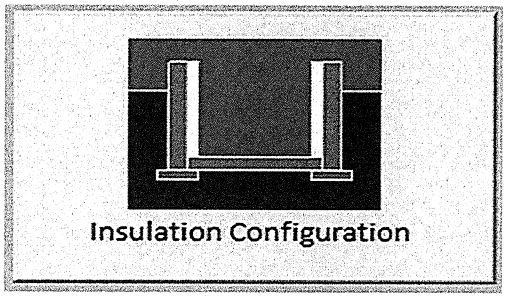
Michael O'Rourke.

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 sand, loam, clay
Water Table:	Normal (7-10 m, 23-33 ft)

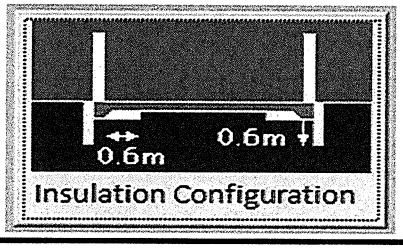
Foundation Dimensions		
Floor Length (m):	**4.6**	 Insulation Configuration
Floor Width (m):	**12.8**	
Exposed Perimeter (m):	**56.7**	
Wall Height (m):	**3.0**	
Depth Below Grade (m):	**1.84**	
Window Area (m^2):	**1.1**	
Door Area (m^2):	**1.9**	
Radiant Slab		
Heated Fraction of the Slab:	**0**	
Fluid Temperature (°C):	**33**	
Design Months		
Heating Month	**1**	
Foundation Loads		
Heating Load (Watts):	**872**	

TYPE: 5005 ELEV. 'B' - KNIGHTSWOOD OPT. 5 BED + ELEVATOR WOB
LO# 79988

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 sand, loam, clay	
Water Table:	Normal (7-10 m, 23-33 ft)	
Foundation Dimensions		
Length (m):	1.5	
Width (m):	12.8	
Exposed Perimeter (m):	15.8	
Radiant Slab		
Heated Fraction of the Slab:	0	
Fluid Temperature (°C):	33	
Design Months		
Heating Month	1	
Results		
Heating Load (Watts):	**217**	

TYPE: 5005 ELEV. 'B' - KNIGHTSWOOD OPT. 5 BED + ELEVATOR WOB
LO# 79988

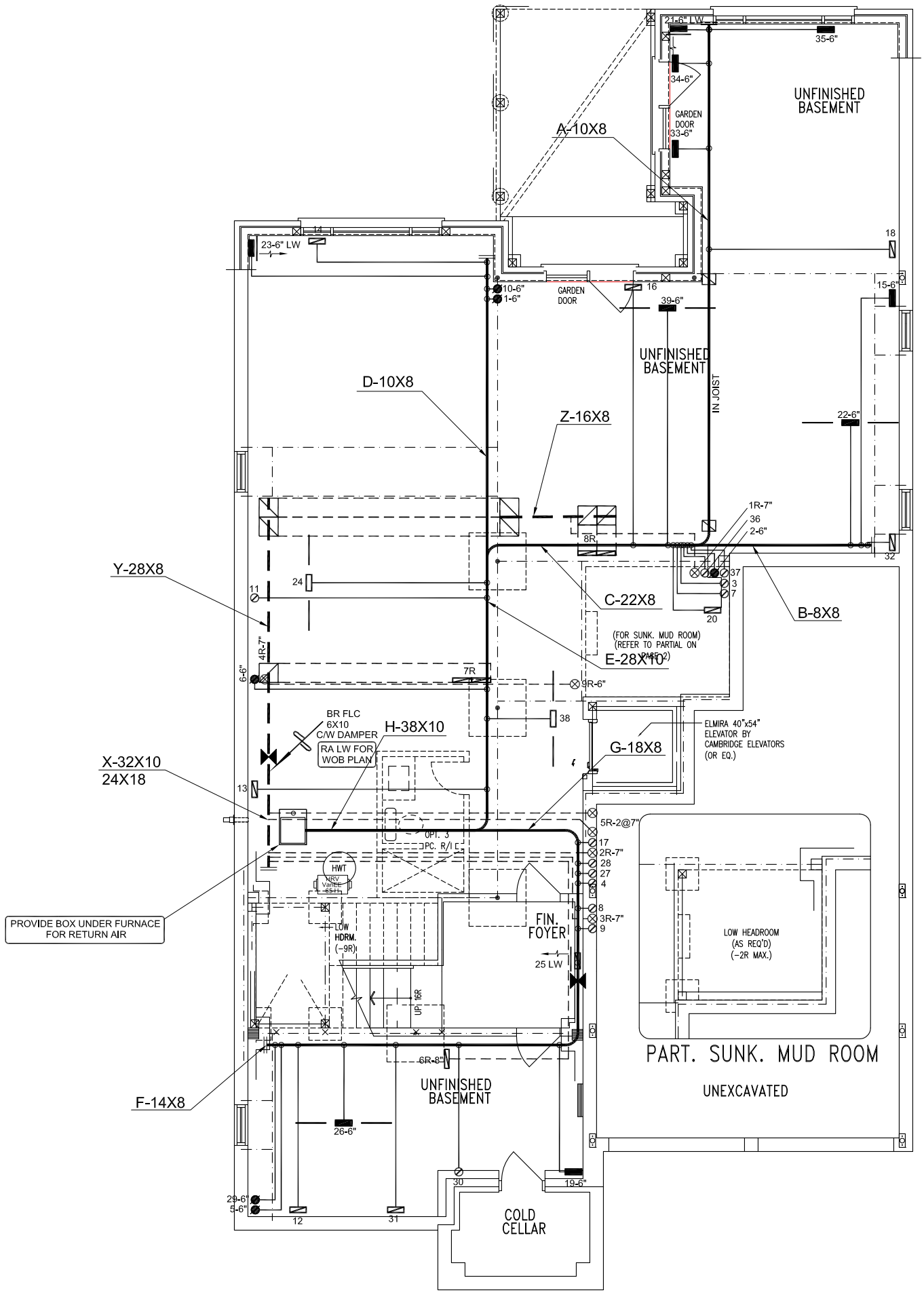
HVAC Designs Ltd.
375 Finley Ave, Suite 202
Ajax ON, L1S 2E2
905-619-2300

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):	9.45
Building Configuration	
Type:	Detached
Number of Stories:	Two
Foundation:	Full
House Volume (m^3):	1888.5
Air Leakage/Ventilation	
Air Tightness Type:	Present (1961-) (3.57 ACH)
Custom BDT Data:	ELA @ 10 Pa. 2517.4 cm^2
	3.57 ACH @ 50 Pa
Mechanical Ventilation (L/s):	Total Supply 73.2 / Total Exhaust 73.2
Flue Size	
Flue #:	#1 #2 #3 #4
Diameter (mm):	0 0 0 0
Natural Infiltration Rates	
Heating Air Leakage Rate (ACH/H):	**0.416**
Cooling Air Leakage Rate (ACH/H):	**0.139**

TYPE: 5005 ELEV. 'B' - KNIGHTSWOOD OPT. 5 BED + ELEVATOR WOB
LO# 79988



PARTIAL BASEMENT PLAN, EL. '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

WOB | 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.	REVISED AS PER ARCHITECTURALS	FEB/2020
1.	3R RELOCATED	NOV/2018

REVISIONS

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Client
GOLDPARK HOMES

Project Name
PINE VALLEY & TESTON
VAUGHAN, ONTARIO
KNIGHTSWOOD - WOB
OPT. 5 BED + ELEVATOR
5005 ELEV. 'B' 4412 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.

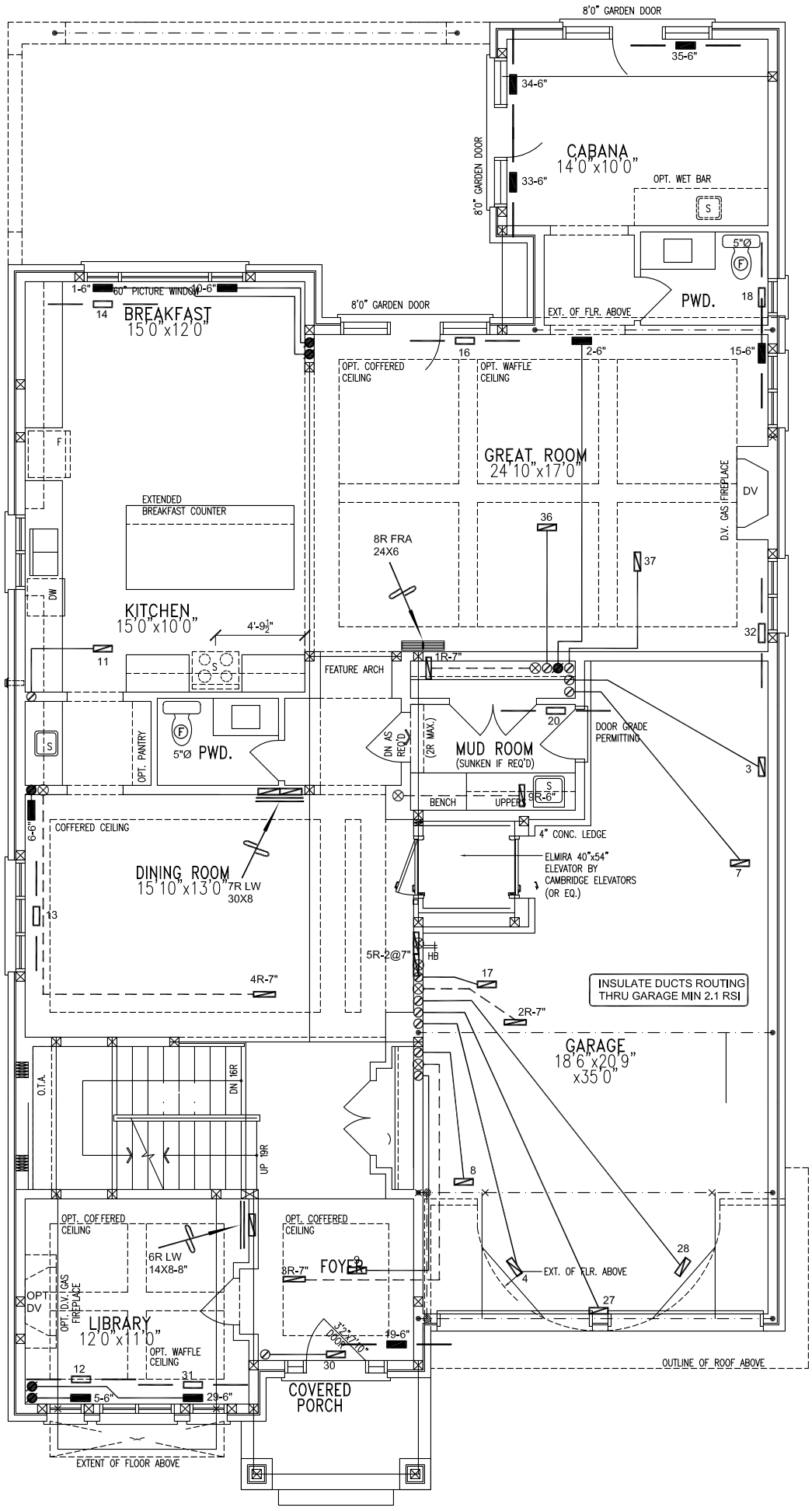
HEAT LOSS 96694 BTU/H		
UNIT DATA		
MAKE	LENNOX	
MODEL	EL296UH110XE60C	
INPUT	110	MBTU/H
OUTPUT	106	MBTU/H
COOLING	5.0	TONS
FAN SPEED	1955	cfm @ 0.6" w.c.

# OF RUNS	S/A	R/A	FANS
3RD FLOOR			
2ND FLOOR	18	6	6
1ST FLOOR	13	3	3
BASEMENT	8	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/2018
Scale 1/8" = 1'-0"
BCIN# 19669
LO# 79988



PARTIAL GROUND FLOOR PLAN, EL. '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

WOB | 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.	REVISED AS PER ARCHITECTURALS	FEB/2020
1.	3R RELOCATED	NOV/2018

REVISIONS

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Client

GOLDPARK HOMES

Project Name

PINE VALLEY & TESTON
VAUGHAN, ONTARIO
KNIGHTSWOOD - WOB
OPT. 5 BED + ELEVATOR
5005 ELEV. 'B' 4412 sqft

HVAC DESIGNS LTD.
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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.

Sheet Title

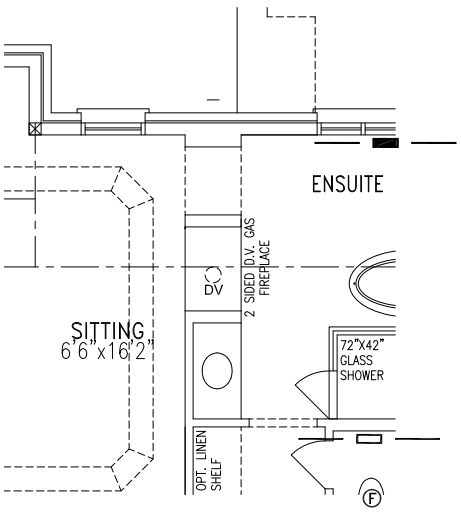
FIRST FLOOR HEATING LAYOUT

Date SEPT/2018

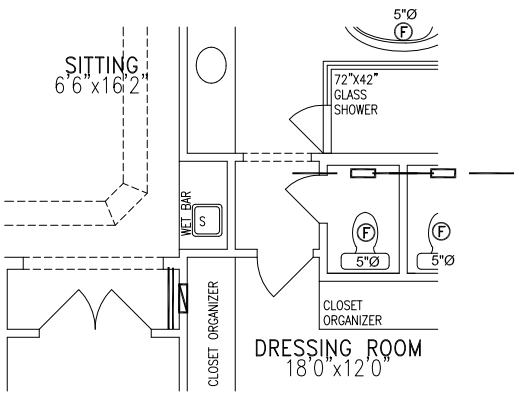
Scale 1/8" = 1'-0"

BCIN# 19669

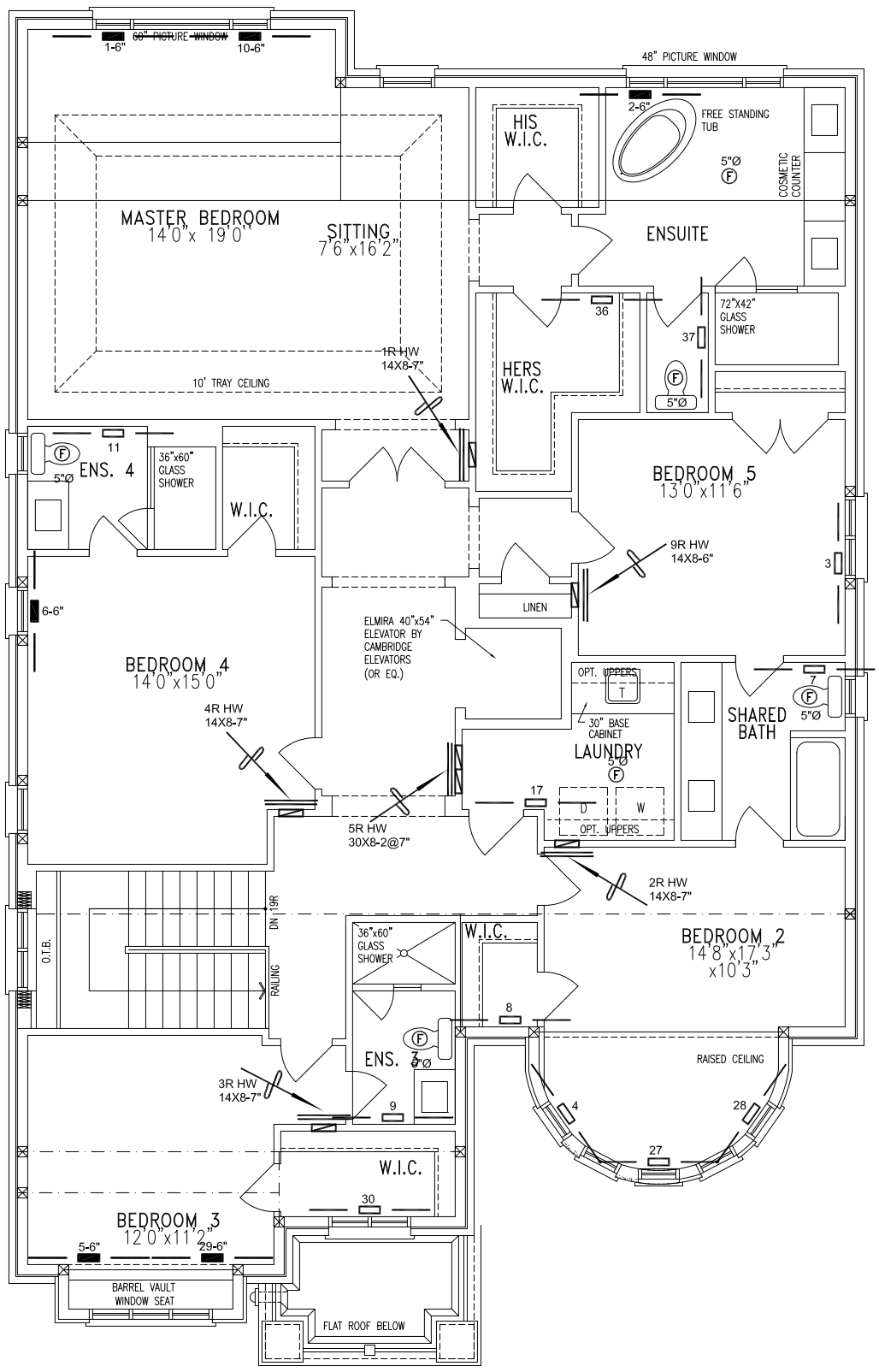
LO# 79988



PART. SECOND FLOOR PLAN
OPT. SITTING AREA FIREPLACE



PART. SECOND FLOOR PLAN
OPT. SITTING AREA WET BAR



SECOND FLOOR PLAN, EL. '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

WOB | 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.	REVISED AS PER ARCHITECTURALS	FEB/2020
1.	3R RELOCATED	NOV/2018

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Client

GOLDPARK HOMES

Project Name

PINE VALLEY & TESTON
VAUGHAN, ONTARIO
KNIGHTSWOOD - WOB
OPT. 5 BED + ELEVATOR
5005 ELEV. 'B' 4412 sqft

HVAC DESIGNS LTD.
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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

SECOND FLOOR HEATING LAYOUT

Date SEPT/2018

Scale 1/8" = 1'-0"

BCIN# 19669

LO# 79988

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**		
VAUGHAN (WOODBRIDGE)				

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:** 5005 ELEV. 'B' & 'B CNR' KNIGHTSWOOD - OPT. ELEVATOR **Project:** PINE VALLEY & TESTON

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.

February 25, 2020
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.

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

SITE NAME: PINE VALLEY & TESTON | KNIGHTSWOOD - OPT. ELEVATOR | DATE: Feb-20 | WINTER NATURAL AIR CHANGE RATE 0.350 | HEAT LOSS ΔT °F. 76 | CSA-F280-12

BUILDER: GOLD PARK HOMES | TYPE: 5005 ELEV. 'B' & 'B CNR' | GFA: 4412 | LO# 77534 | SUMMER NATURAL AIR CHANGE RATE 0.121 | HEAT GAIN ΔT °F. 14 | SB-12 PACKAGE A1

ROOM USE			MBR			ENS			WIC			BED-2			BED-3			BED-4			ENS-2			WIC-2			ENS-3			ENS-4			WIC-3		
EXP. WALL			46			36			13			34			36			19			8			3			4			7			14		
CLG. HT.			11			10			10			11			11			10			10			10			10			10			10		
	FACTORS																																		
GRS.WALL AREA	LOSS	GAIN	506			360			130			374			396			190			80			30			40			70			140		
GLAZING			LOSS		GAIN	LOSS		GAIN	LOSS		GAIN	LOSS		GAIN	LOSS		GAIN	LOSS		GAIN	LOSS		GAIN	LOSS		GAIN	LOSS		GAIN	LOSS		GAIN	LOSS		GAIN
NORTH	21.3	16.3	0	0	0	0	0	0	6	128	98	0	0	0	0	0	0	0	0	0	8	170	130	0	0	0	0	0	0	0	0	0	0	0	0
EAST	21.3	41.8	0	0	0	0	0	0	0	0	0	65	1383	2719	50	1064	2092	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	20	426	837
SOUTH	21.3	25.2	19	404	478	0	0	0	0	0	0	0	0	0	12	255	302	44	936	1108	0	0	0	0	0	0	0	0	0	9	192	227	0	0	0
WEST	21.3	41.8	50	1064	2092	34	724	1422	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
SKYLT.	37.2	102.0	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	0	0	0	0	0	0	0
DOORS	25.2	4.6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
NET EXPOSED WALL	4.5	0.8	437	1950	354	326	1455	264	124	553	100	309	1379	250	334	1491	271	146	652	118	72	321	58	30	134	24	40	179	32	61	272	49	120	536	97
NET EXPOSED BSMT WALL ABOVE GR	3.6	0.7	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	0	0	0	0	0	0
EXPOSED CLG	1.3	0.6	533	684	322	323	415	195	207	266	125	175	225	106	249	320	151	285	366	172	60	77	36	40	51	24	92	118	56	105	135	63	53	68	32
NO ATTIC EXPOSED CLG	2.7	1.3	0	0	0	0	0	0	0	0	0	78	214	101	18	49	23	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	154	393	71	253	645	117	18	46	8	0	0	0	60	153	28	40	102	19	0	0	0	0	0	0	0	0	0
BASEMENT/CRAWL HEAT LOSS				0			0			0			0			0			0			0			0			0			0			0	
SLAB ON GRADE HEAT LOSS				0			0			0			0			0			0			0			0			0			0			0	
SUBTOTAL HT LOSS				4103			2593			1339			3846			3225			1954			722			287			297			598			1029	
SUB TOTAL HT GAIN					3246			1882			394			3293			2847			1398			252			67			88			340			966
LEVEL FACTOR / MULTIPLIER			0.20	0.31		0.20	0.31		0.20	0.31		0.20	0.31		0.20	0.31		0.20	0.31		0.20	0.31		0.20	0.31		0.20	0.31		0.20	0.31		0.20	0.31	
AIR CHANGE HEAT LOSS				1282			810			419			1202			1008			611			225			90			93			187			322	
AIR CHANGE HEAT GAIN					254			147			31			258			223			109			20			5			7			27			76
DUCT LOSS				0			0			176			505			423			0			95			38			0			0			0	
DUCT GAIN					0			0			84			420			372			0			68			48			0			0			0
HEAT GAIN PEOPLE	240		2		480	0		0	0		0	1		240	1		240	1		240	0		0	0		0	0		0	0		0	0		0
HEAT GAIN APPLIANCES/LIGHTS					410			410			410			410			410			410			410			410			410			410			410
TOTAL HT LOSS BTU/H				5385			3403			1934			5553			4656			2564			1042			415			389			786			1351	
TOTAL HT GAIN x 1.3 BTU/H					5708			3171			1195			6008			5319			2806			976			690			657			1010			1888

ROOM USE			LIB			DIN			KIT/GT			CAB			LAUN			PWD			FOY			MUD									LOD			BAS		
EXP. WALL			31			32			87			45			0			5			35			18									52			238		
CLG. HT.			11			11			11			11			10			11			11			12									10			10		
	FACTORS																																				
GRS.WALL AREA	LOSS	GAIN	341			352			957			495			0			55			385			216									520			1978		
GLAZING			LOSS		GAIN	LOSS		GAIN	LOSS		GAIN	LOSS		GAIN	LOSS		GAIN	LOSS		GAIN	LOSS		GAIN	LOSS		GAIN						LOSS		GAIN	LOSS		GAIN
NORTH	21.3	16.3	0	0	0	0	0	0	46	979	748	0	0	0	0	0	0	9	192	146	0	0	0	0	0	0						0	0	0	6	128	98
EAST	21.3	41.8	56	1192	2343	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
SOUTH	21.3	25.2	0	0	0	34	724	856	21	447	529	63	1341	1586	0	0	0	0	0	0	0	0	0	0	0	0						0	0	0	6	128	151
WEST	21.3	41.8	0	0	0	0	0	0	115	2447	4811	63	1341	2635	0	0	0	0	0	0	0	0	0	0	0	0						22	468	920	0	0	0
SKYLT.	37.2	102.0	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	0	0	0	0
DOORS	25.2	4.6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	56	1414	257	20	505	92						0	0	0	20	505	92
NET EXPOSED WALL	4.5	0.8	285	1272	231	318	1419	258	775	3459	628	369	1647	299	0	0	0	46	205	37	329	1468	267	196	875	159						0	0	0	0	0	0
NET EXPOSED BSMT WALL ABOVE GR	3.6	0.7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0						290	1044	189	402	1447	263
EXPOSED CLG	1.3	0.6	0	0	0	0	0	0	0	0	0	0	0	0	142	182	86	0	0	0	0	0	0	0	0	0						0	0	0	0	0	0
NO ATTIC EXPOSED CLG	2.7	1.3	0	0	0	0	0	0	0	0	0	203	558	263	0	0	0	40	110	52	41	113	53	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	56	143	26	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			0										8373		
SLAB ON GRADE HEAT LOSS				0			0			0			0			0			0			0			0									0				
SUBTOTAL HT LOSS				2464			2143			7332			4886			325			507			2995			1380									1512			10580		
SUB TOTAL HT GAIN					2574			1114			6715			4784			112			235			576			251									1110			603
LEVEL FACTOR / MULTIPLIER			0.30	0.44		0.30	0.44		0.30	0.44		0.30	0.44		0.20	0.31		0.30	0.44		0.30	0.44		0.30	0.44										0.50	1.31		
AIR CHANGE HEAT LOSS				1081			940			3217			2144			102			222			1314			605											15873		
AIR CHANGE HEAT GAIN					201			87			526			374			9			18			45			20												134	
DUCT LOSS				0			0			0			0			43			0			0			0											0		
DUCT GAIN					0			0			0			0			53			0			0			0												0	
HEAT GAIN PEOPLE	240		0		0	0		0	0		0	0		0	0		0	0		0	0		0	0		0						0		0	0		0
HEAT GAIN APPLIANCES/LIGHTS					410			410			410			410			410			410			410			410												410
TOTAL HT LOSS BTU/H				3545			3083			10549			7030			469			729			4309			1985									1512			26453		
TOTAL HT GAIN x 1.3 BTU/H					4141			2095			9946			7239			759			864			1342			885									1443			1492

TOTAL HEAT GAIN BTU/H: 60211 TONS: 5.02 LOSS DUE TO VENTILATION LOAD BTU/H: 3181 STRUCTURAL HEAT LOSS: 87140 TOTAL COMBINED HEAT LOSS BTU/H: 90321

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: PINE VALLEY & TESTON — KNIGHTSWOOD - OPT. ELEVATOR
BUILDER: GOLD PARK HOMES — TYPE: 5005 ELEV. 'B' & 'B CNR' — DATE: Feb-20 — GFA: 4412 — LO# 77534

HEATING CFM	1955	COOLING CFM	1955	furnace pressure	0.6
TOTAL HEAT LOSS	87,140	TOTAL HEAT GAIN	59,633	furnace filter	0.08
AIR FLOW RATE CFM	22.44	AIR FLOW RATE CFM	32.78	a/c coil pressure	0.2
				available pressure for s/a & r/a	0.32
				plenum pressure s/a	0.17
				max s/a dif press. loss	0.02
				min adjusted pressure s/a	0.15

				r/a pressure	0.15
				r/a grille press. Loss	0.02
				adjusted pressure r/a	0.13

^LENNOX — AFUE = 96 %
EL296UH110XE60C 110 — INPUT (BTU/H) = 110,000
OUTPUT (BTU/H) = **106,000**

FAN SPEED	
LOW	0
MEDLOW	1380
MEDIUM	1505
MEDIUM HIGH	1685
HIGH	1955

DESIGN CFM = **1955** CFM @ .6 " E.S.P.
TEMPERATURE RISE 50 °F

RUN COUNT	4th	3rd	2nd	1st	Bas
S/A	0	0	18	13	7
R/A	0	0	5	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	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	ENS-2	WIC-2	ENS-3	MBR	ENS-4	LIB	DIN	KIT/GT	KIT/GT	KIT/GT	LAUN	PWD	FOY	MUD	BAS	BAS	BAS	BAS
RM LOSS MBH.	2.69	2.73	1.93	1.85	2.33	2.56	1.04	0.41	0.39	2.69	0.79	1.77	3.08	2.64	2.64	2.64	0.47	0.73	4.31	1.99	3.99	3.99	3.99	3.99
CFM PER RUN HEAT	60	61	43	42	52	58	23	9	9	60	18	40	69	59	59	59	11	16	97	45	90	90	90	90
RM GAIN MBH.	2.85	2.46	1.20	2.00	2.66	2.81	0.98	0.69	0.66	2.85	1.01	2.07	2.09	2.49	2.49	2.49	0.76	0.86	1.34	0.88	0.42	0.42	0.42	0.42
CFM PER RUN COOLING	94	81	39	66	87	92	32	23	22	94	33	68	69	82	82	82	25	28	44	29	14	14	14	14
ADJUSTED PRESSURE	0.15	0.15	0.16	0.16	0.15	0.15	0.16	0.16	0.16	0.15	0.16	0.16	0.16	0.15	0.15	0.15	0.16	0.16	0.15	0.16	0.15	0.15	0.15	0.15
ACTUAL DUCT LGH.	70	70	71	49	70	48	74	48	53	64	59	57	29	52	69	54	36	73	40	47	67	60	54	38
EQUIVALENT LENGTH	200	200	170	160	160	160	200	150	170	170	150	140	103	120	140	110	200	170	210	160	150	120	103	90
TOTAL EFFECTIVE LENGTH	270	270	241	209	230	208	274	198	223	234	209	197	132	172	209	164	236	243	250	207	217	180	157	128
ADJUSTED PRESSURE	0.05	0.05	0.06	0.07	0.06	0.07	0.06	0.08	0.07	0.06	0.07	0.08	0.12	0.09	0.07	0.09	0.07	0.06	0.06	0.08	0.07	0.08	0.09	0.11
ROUND DUCT SIZE	**7**	**6**	5	5	**6**	**6**	4	4	4	**6**	4	5	5	5	**6**	5	4	4	**6**	4	**6**	**6**	**6**	5
HEATING VELOCITY (ft/min)	225	311	316	308	265	296	264	103	103	306	207	294	507	433	301	433	126	184	495	516	459	459	459	661
COOLING VELOCITY (ft/min)	352	413	286	485	444	469	367	264	252	479	379	499	507	602	418	602	287	321	224	333	71	71	71	103
OUTLET GRILL SIZE	4X10	4X10	3X10	3X10	4X10	4X10	3X10	3X10	3X10	4X10	3X10	3X10	3X10	3X10	4X10	3X10	3X10	3X10	4X10	3X10	4X10	4X10	4X10	3X10
TRUNK	D	C	C	G	F	E	C	G	G	D	E	F	E	D	B	C	E	A	F	C	A	B	D	E

RUN #	25	26	27	28	29	30	31	32	33	34	35	36	37	38
ROOM NAME	BAS	BAS	BED-2	BED-2	BED-3	WIC-3	LIB	KIT/GT	CAB	CAB	CAB	ENS	ENS	BAS
RM LOSS MBH.	3.99	3.99	1.85	1.85	2.33	1.35	1.77	2.64	2.34	2.34	2.34	0.33	0.33	3.99
CFM PER RUN HEAT	90	90	42	42	52	30	40	59	53	53	53	8	8	90
RM GAIN MBH.	0.42	0.42	2.00	2.00	2.66	1.89	2.07	2.49	2.41	2.41	2.41	0.36	0.36	0.42
CFM PER RUN COOLING	14	14	66	66	87	62	68	82	79	79	79	12	12	14
ADJUSTED PRESSURE	0.15	0.15	0.16	0.16	0.15	0.16	0.16	0.15	0.16	0.16	0.16	0.16	0.16	0.15
ACTUAL DUCT LGH.	34	50	52	55	75	58	51	55	69	71	82	56	58	23
EQUIVALENT LENGTH	110	150	170	160	160	190	160	120	150	130	140	200	190	140
TOTAL EFFECTIVE LENGTH	144	200	222	215	235	248	211	175	219	201	222	256	248	163
ADJUSTED PRESSURE	0.1	0.07	0.07	0.07	0.06	0.06	0.07	0.08	0.07	0.08	0.07	0.06	0.06	0.09
ROUND DUCT SIZE	5	**6**	5	5	**6**	5	5	5	**6**	5	**6**	4	4	**6**
HEATING VELOCITY (ft/min)	661	459	308	308	265	220	294	433	270	389	270	92	92	459
COOLING VELOCITY (ft/min)	103	71	485	485	444	455	499	602	403	580	403	138	138	71
OUTLET GRILL SIZE	3X10	4X10	3X10	3X10	4X10	3X10	3X10	3X10	4X10	3X10	4X10	3X10	3X10	4X10
TRUNK	G	F	G	G	F	F	F	B	A	A	A	C	C	E

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	265	0.06	9.2	10	x	8	477	TRUNK G	635	0.06	12.7	18	x	8	635
TRUNK B	208	0.07	8.1	8	x	8	468	TRUNK H	1955	0.05	20.3	38	x	10	741
TRUNK C	720	0.05	13.9	22	x	8	589	TRUNK I	0	0.00	0	0	x	8	0
TRUNK D	269	0.05	9.6	10	x	8	484	TRUNK J	0	0.00	0	0	x	8	0
TRUNK E	1325	0.05	17.5	28	x	10	681	TRUNK K	0	0.00	0	0	x	8	0
TRUNK F	401	0.06	10.7	14	x	8	516	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	1490	0.05	18.3	32	x	10	671
TRUNK Y	940	0.05	15.4	28	x	8	604
TRUNK Z	455	0.05	11.7	16	x	8	512
DROP	1955	0.05	20.3	24	x	18	652

RETURN AIR #	1	2	3	4	5	6	7	8								BR
	0	0	0	0	2@7"	0	0	0	0	0	0	0	0	0	0	
AIR VOLUME	115	135	130	115	240	200	370	340	0	0	0	0	0	0	0	310
PLENUM PRESSURE	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13
ACTUAL DUCT LGH.	84	51	62	59	47	49	30	51	1	1	1	1	1	1	1	14
EQUIVALENT LENGTH	200	135	155	185	135	140	170	195	0	0	0	0	0	0	0	145
TOTAL EFFECTIVE LH	284	186	217	244	182	189	200	246	1	1	1	1	1	1	1	159
ADJUSTED PRESSURE	0.05	0.07	0.06	0.05	0.07	0.07	0.07	0.05	13.36	13.36	13.36	13.36	13.36	13.36	13.36	0.08
ROUND DUCT SIZE	7	6.8	7	7	8.5	7.9	10	10.5	0	0	0	0	0	0	0	9
INLET GRILL SIZE	8	8	8	8	8	8	8	8	0	0	0	0	0	0	0	8
	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
INLET GRILL SIZE	14	14	14	14	30	14	30	30	0	0	0	0	0	0	0	30

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: 5005 ELEV. 'B' & 'B CNR' LO # 77534
SITE NAME: PINE VALLEY & TESTON KNIGHTSWOOD - OPT. ELEVATOR

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	7	@ 10.6 cfm	74.2	cfm
Other Rooms	8	@ 10.6 cfm	84.8	cfm
Table 9.32.3.A.		TOTAL	233.2	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	233.2	cfm
Less Principal Ventil. Capacity	155	cfm
Required Supplemental Capacity	78.2	cfm

PRINCIPAL EXHAUST FAN CAPACITY

Model: VANEE 65H Location: BSMT

155.0 cfm 3.0 sones [✓] HVI Approved

PRINCIPAL EXHAUST HEAT LOSS CALCULATION

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

SUPPLEMENTAL FANS NUTONE

Location	Model	cfm	HVI	Sones
ENS	QTXEN050C	50	✓	0.3
ENS-2	QTXEN050C	50	✓	0.3
ENS-4	QTXEN050C	50	✓	0.3
PWD	QTXEN050C	50	✓	0.3

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: 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: February-20

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#: 77534 Model: 5005 ELEV. 'B' & 'B CNR' Builder: GOLD PARK HOMES Date: 2020-02-25

Volume Calculation

House Volume

Level	Floor Area (ft²)	Floor Height (ft)	Volume (ft³)
Bsmt	2052	10	20520
First	2052	11	22572
Second	2360	10	23600
Third	0	9	0
Fourth	0	9	0
		Total:	66,692.0 ft³
		Total:	1888.5 m³

Air Change & Delta T Data

WINTER NATURAL AIR CHANGE RATE	0.350
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	23	31	8	14

5.2.3.1 Heat Loss due to Air Leakage

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

0.350 x 524.59 x 42 °C x 1.2 = 9304 W

= **31747 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 524.59 x 8 °C x 1.2 = 584 W

= **1993 Btu/h**

5.2.3.2 Heat Loss due to Mechanical Ventilation

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

155 CFM x 76 °F x 1.08 x 0.25 = **3181 Btu/h**

6.2.7 Sensible heat Gain due to Ventilation

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

155 CFM x 14 °F x 1.08 x 0.25 = **578 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	31,747	12,091	1.313
2	0.3		21,705	0.439
3	0.2		20,318	0.313
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: 5005 ELEV. 'B' & 'B CNR' KNIGHTSWOOD - OPT. ELEVATOR **BUILDER:** GOLD PARK HOMES
SFQT: 4412 **LO#** 77534 **SITE:** PINE VALLEY & TESTON

DESIGN ASSUMPTIONS

HEATING	°F	COOLING	°F
OUTDOOR DESIGN TEMP.	-4	OUTDOOR DESIGN TEMP.	88
INDOOR DESIGN TEMP.	72	INDOOR DESIGN TEMP. (MAX 75°F)	74

BUILDING DATA

ATTACHMENT:	DETACHED	# 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):	66692.0	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:	7.0 ft
LENGTH: 77.0 ft	WIDTH: 42.0 ft	EXPOSED PERIMETER:	238.0 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	29.80
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

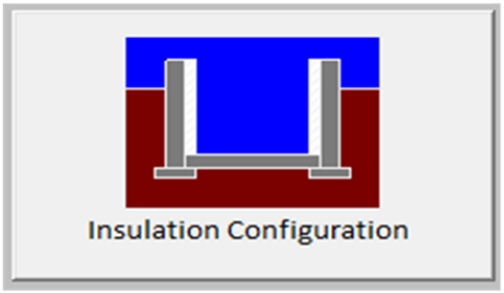


HVAC Designs Ltd.
375 Finley Ave, Suite 202
Ajax ON, L1S 2E2
905-619-2300

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 sand, loam, clay
Water Table:	Normal (7-10 m, 23-33 ft)

Foundation Dimensions		
Floor Length (m):	**23.5**	 Insulation Configuration
Floor Width (m):	**12.8**	
Exposed Perimeter (m):	**0.0**	
Wall Height (m):	**3.0**	
Depth Below Grade (m):	**2.13**	
Window Area (m^2):	**3.2**	
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):	**2453**	

TYPE: 5005 ELEV. 'B' & 'B CNR' KNIGHTSWOOD - OPT. ELEVATOR
LO# 77534

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

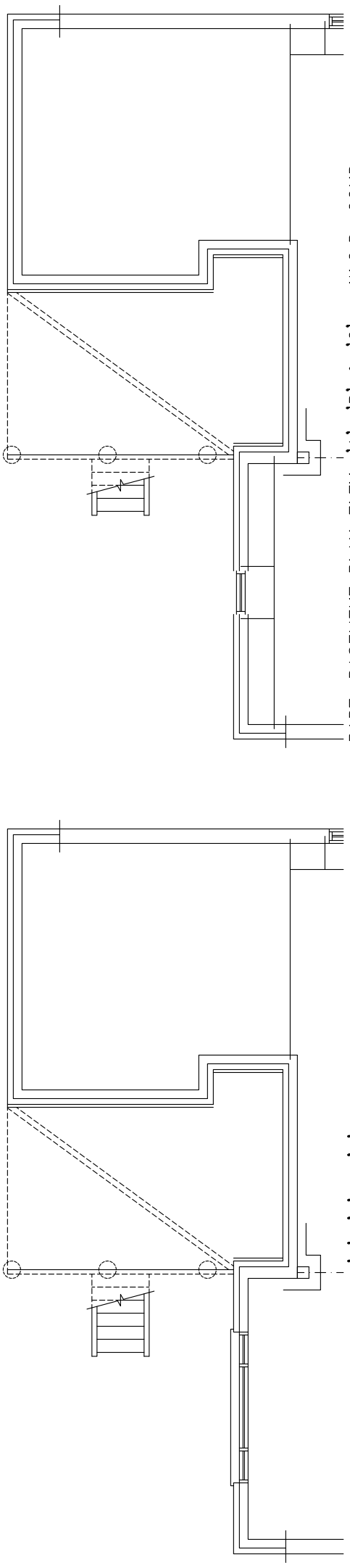
Air Infiltration Residential Load Calculator

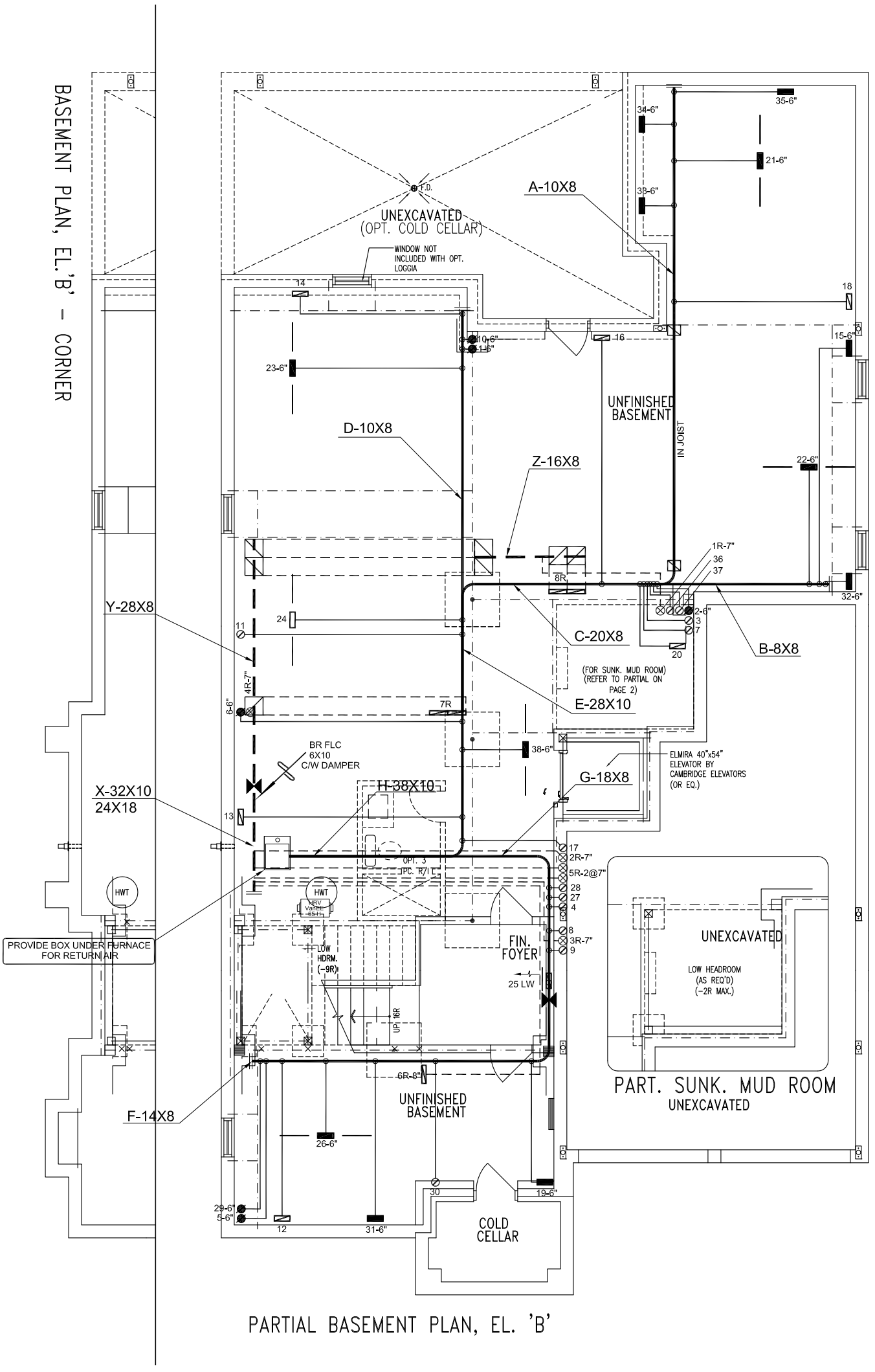
Supplemental tool for CAN/CSA-F280

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):	7.32
Building Configuration	
Type:	Detached
Number of Stories:	Two
Foundation:	Full
House Volume (m^3):	1888.5
Air Leakage/Ventilation	
Air Tightness Type:	Present (1961-) (3.57 ACH)
Custom BDT Data:	ELA @ 10 Pa. 2517.4 cm^2
	3.57 ACH @ 50 Pa
Mechanical Ventilation (L/s):	Total Supply 73.2 / Total Exhaust 73.2
Flue Size	
Flue #:	#1 #2 #3 #4
Diameter (mm):	0 0 0 0
Natural Infiltration Rates	
Heating Air Leakage Rate (ACH/H):	**0.350**
Cooling Air Leakage Rate (ACH/H):	**0.121**

TYPE: 5005 ELEV. 'B' & 'B CNR' KNIGHTSWOOD - OPT. ELEVATOR

LO# 77534





PARTIAL BASEMENT PLAN, EL. '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.	REVISED AS PER ARCHITECTURALS	FEB/2020
2.	3R RELOCATED	NOV/2018
1.	DECK CONDITIONS ADDED	SEPT/2018

REVISIONS

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Client

GOLDPARK HOMES

Project Name

PINE VALLEY & TESTON
VAUGHAN, ONTARIO
KNIGHTSWOOD
OPT. ELEVATOR
5005 ELEV. 'B' & CNR 4412 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 90321 BTU/H	
UNIT DATA	
MAKE	LENNOX
MODEL	EL296UH110XE60C
INPUT	110 MBTU/H
OUTPUT	106 MBTU/H
COOLING	5.0 TONS
FAN SPEED	1955 cfm @ 0.6" w.c.

# OF RUNS	S/A	R/A	FANS
3RD FLOOR			
2ND FLOOR	18	5	7
1ST FLOOR	13	3	3
BASEMENT	7	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

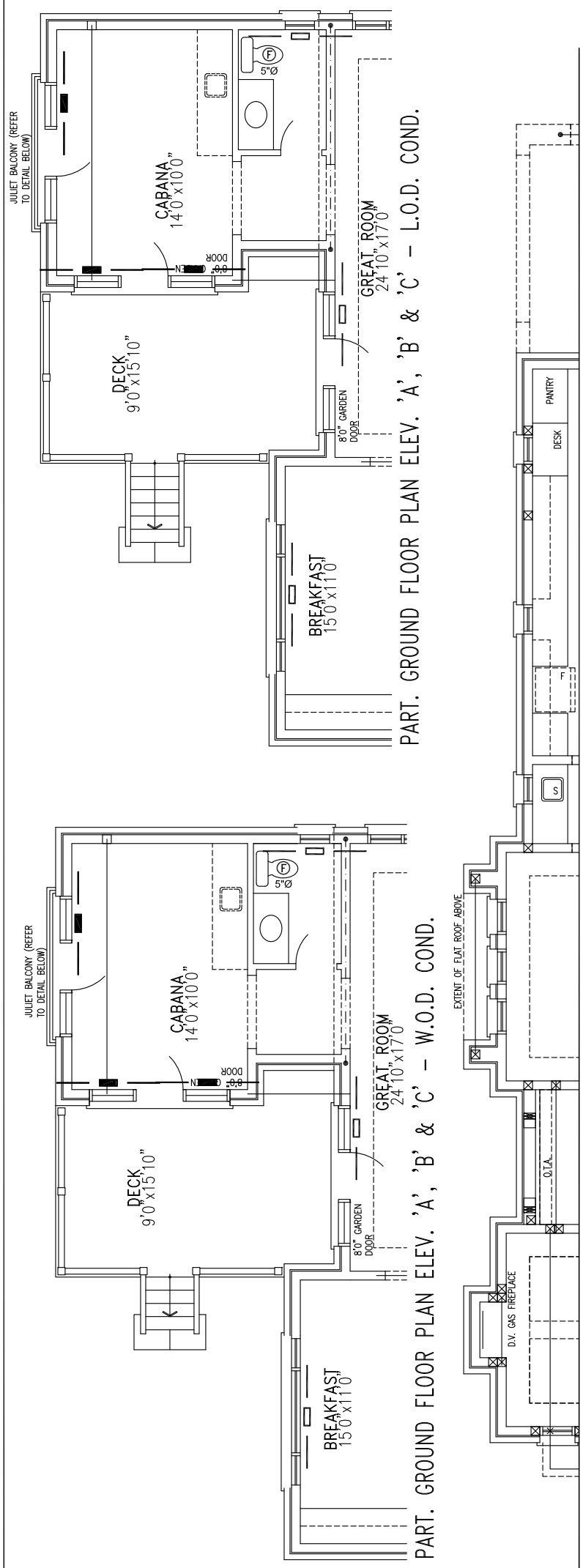
BASEMENT HEATING LAYOUT

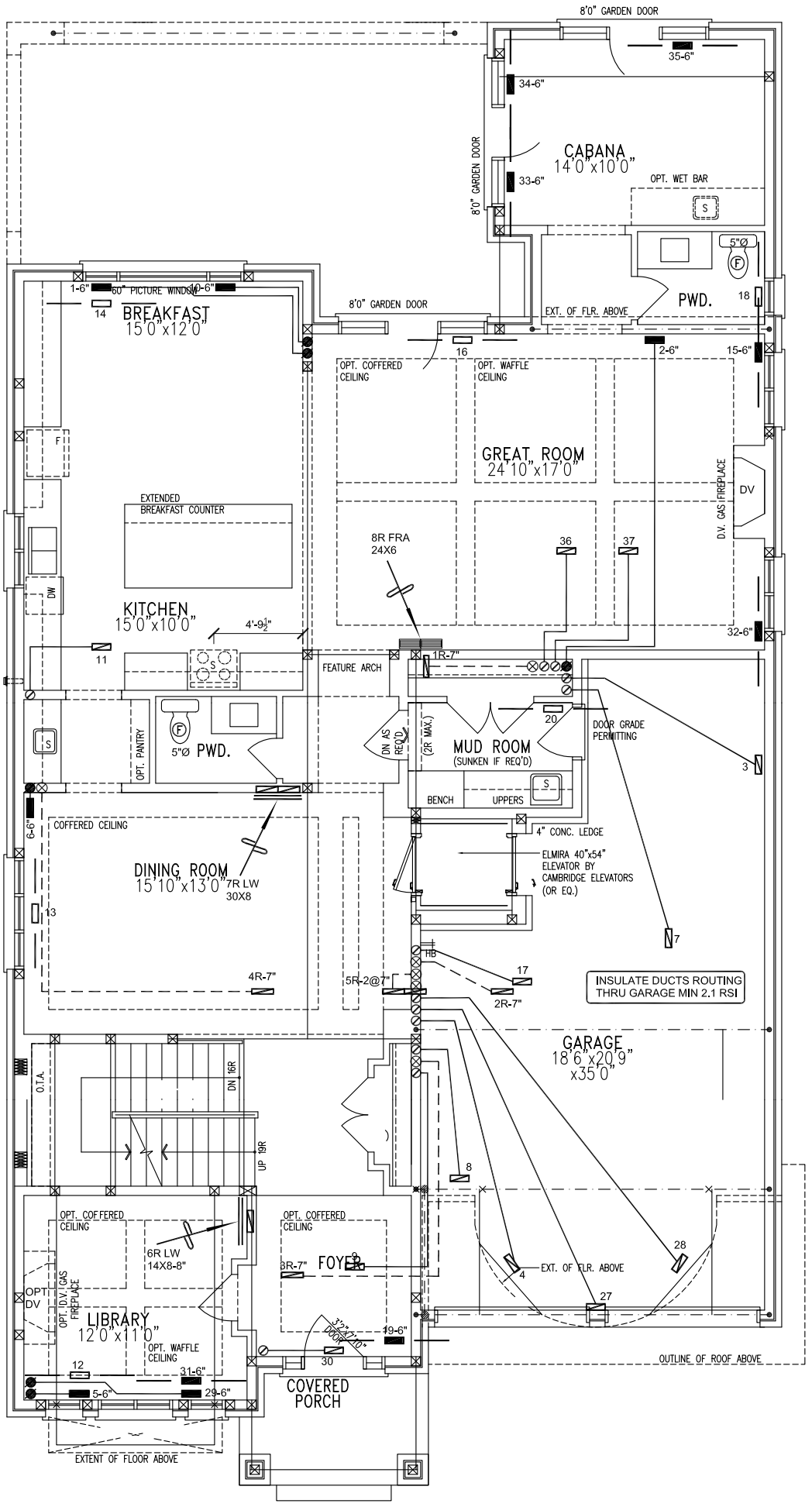
Date JAN/2018

Scale 1/8" = 1'-0"

BCIN# 19669

LO# 77534





PARTIAL GROUND FLOOR PLAN, EL. '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

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	SUPPLY AIR BOOT ABOVE		6" SUPPLY AIR STACK 2nd FLOOR		FRA- FLOOR RETURN AIR GRILLE		REDUCER

No.	Description	Date
	REVISIONS	
3.	REVISED AS PER ARCHITECTURALS	FEB/2020
2.	3R RELOCATED	NOV/2018
1.	DECK CONDITIONS ADDED	SEPT/2018

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Client

GOLDPARK HOMES

Project Name

PINE VALLEY & TESTON
VAUGHAN, ONTARIO
KNIGHTSWOOD
OPT. ELEVATOR
5005 ELEV. 'B' & CNR 4412 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

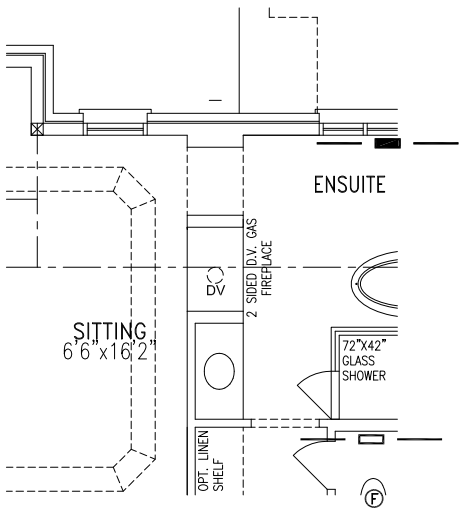
FIRST FLOOR HEATING LAYOUT

Date JAN/2018

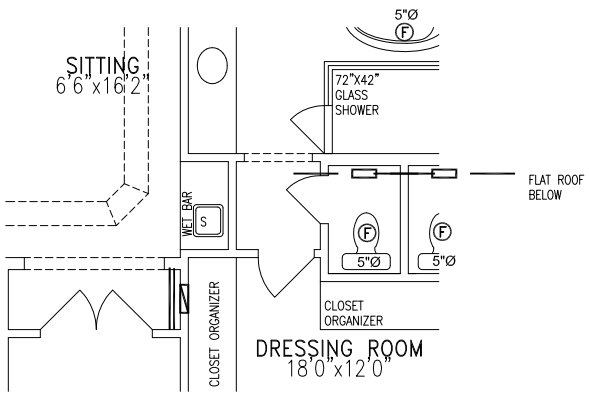
Scale 1/8" = 1'-0"

BCIN# 19669

LO# 77534

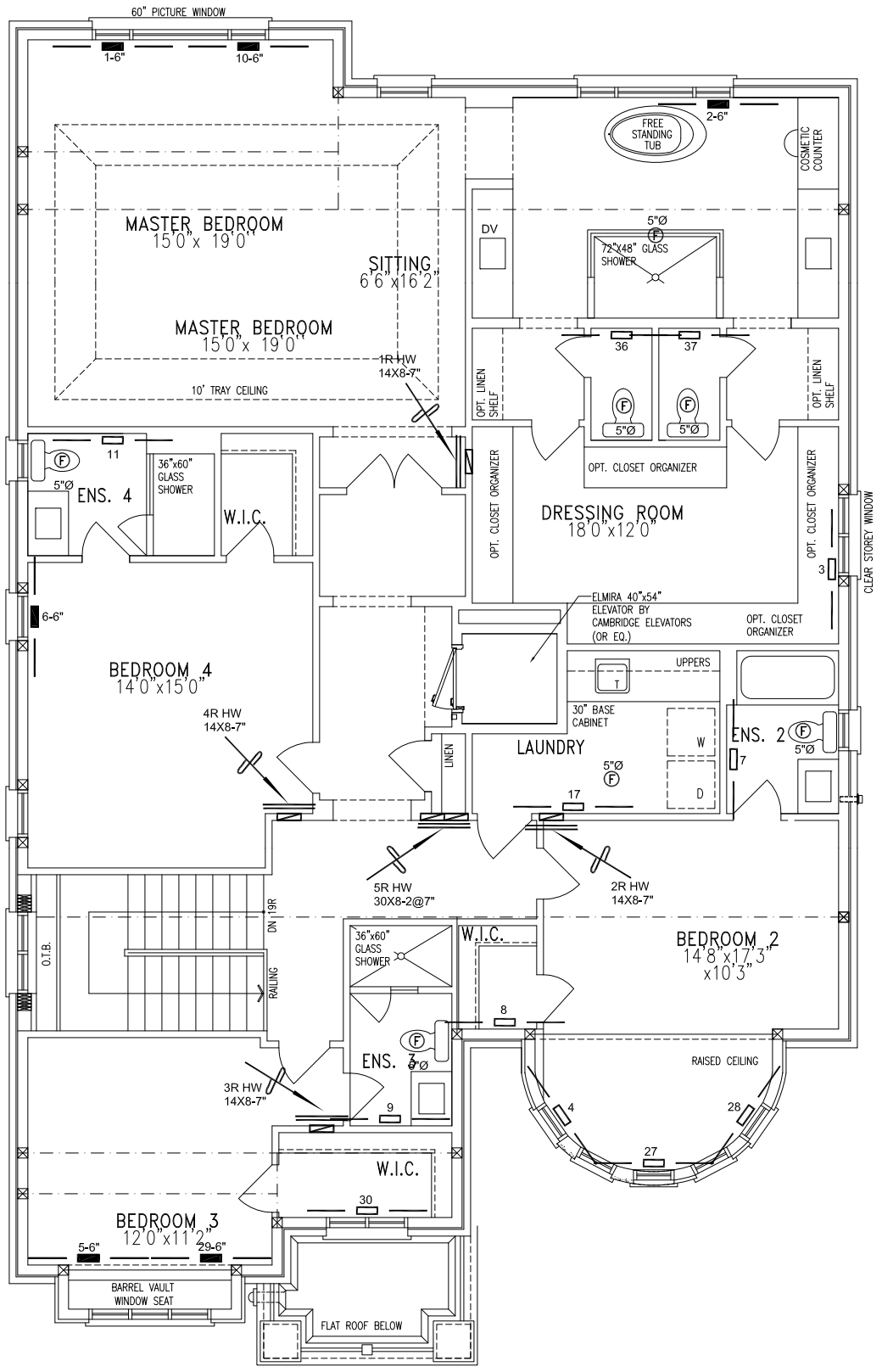


PART. SECOND FLOOR PLAN
OPT. SITTING AREA FIREPLACE



PART. SECOND FLOOR PLAN
OPT. SITTING AREA WET BAR

SECOND FLOOR PLAN, EL. 'B' - CORNER



SECOND FLOOR PLAN, EL. '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

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	SUPPLY AIR BOOT ABOVE		6" SUPPLY AIR STACK 2nd FLOOR		FRA- FLOOR RETURN AIR GRILLE		REDUCER

No.	Description	Date
3.	REVISED AS PER ARCHITECTURALS	FEB/2020
2.	3R RELOCATED	NOV/2018
1.	DECK CONDITIONS ADDED	SEPT/2018

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Client

GOLDPARK HOMES

Project Name

PINE VALLEY & TESTON
VAUGHAN, ONTARIO
KNIGHTSWOOD
OPT. ELEVATOR
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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

SECOND FLOOR
HEATING
LAYOUT

Date JAN/2018

Scale 1/8" = 1'-0"

BCIN# 19669

LO# 77534

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
VAUGHAN (WOODBRIDGE)		

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:** 5005 ELEV. 'B' - KNIGHTSWOOD OPT. 5 BED + ELEVATOR + SERV STAIR **Project:** PINE VALLEY & TESTON

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.

February 26, 2020
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.

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

SITE NAME: PINE VALLEY & TESTON | OPT. 5 BED + ELEVATOR + SERV STAIR | DATE: Feb-20 | WINTER NATURAL AIR CHANGE RATE 0.350 | HEAT LOSS ΔT °F. 76 | CSA-F280-12
BUILDER: GOLD PARK HOMES | TYPE: 5005 ELEV. 'B' - KNIGHTSWOOD GFA: 4412 | LO# 85466 | SUMMER NATURAL AIR CHANGE RATE 0.124 | HEAT GAIN ΔT °F. 15 | SB-12 PACKAGE A1

ROOM USE			MBR			ENS			BED-5			BED-2			BED-3			BED-4			ENS-2/5			WIC-2			ENS-3			ENS-4			WIC-3			WIC		
EXP. WALL			46			30			14			34			36			19			9			3			4			7			14			6		
CLG. HT.			11			10			10			11			11			10			10			10			10			10			10			10		
	FACTORS																																				
GRS.WALL AREA	LOSS	GAIN	506			300			140			374			396			190			90			30			40			70			140			60		
GLAZING				LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN
NORTH	21.3	16.5	0	0	0	0	0	0	6	128	99	0	0	0	0	0	0	0	0	0	8	170	132	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
EAST	21.3	42.1	0	0	0	0	0	0	0	0	0	65	1383	2737	50	1064	2106	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	20	426	842	0	0	0
SOUTH	21.3	25.5	0	0	0	0	0	0	0	0	0	0	0	0	10	213	255	32	681	815	0	0	0	0	0	0	0	0	0	8	170	204	0	0	0	0	0	0
WEST	21.3	42.1	50	1064	2106	34	724	1432	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	0	0	0
SKYLT.	37.2	102.5	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	0	0	0	0	0	0	0	0	0
DOORS	25.2	4.9	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	0	0	0	0	0	0	0	0	0
NET EXPOSED WALL	4.5	0.9	456	2035	396	266	1187	231	134	598	116	309	1379	269	336	1499	292	158	705	137	82	366	71	30	134	26	40	179	35	62	277	54	120	536	104	60	268	52
NET EXPOSED BSMT WALL ABOVE GR	3.6	0.7	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	0	0	0	0	0	0	0	0	0
EXPOSED CLG	1.3	0.6	480	616	298	205	263	127	255	327	158	175	225	109	249	320	155	285	366	177	81	104	50	40	51	25	92	118	57	105	135	65	53	68	33	102	131	63
NO ATTIC EXPOSED CLG	2.7	1.3	0	0	0	0	0	0	0	0	0	78	214	104	18	49	24	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	25	64	12	253	645	126	18	46	9	0	0	0	81	207	40	40	102	20	0	0	0	0	0	0	0	0	0	0	0	0
BASEMENT/CRAWL HEAT LOSS				0			0			0			0			0			0			0			0			0			0			0			0	
SLAB ON GRADE HEAT LOSS				0			0			0			0			0			0			0			0			0			0			0			0	
SUBTOTAL HT LOSS				3715			2174			1117			3846			3191			1752			847			287			297			582			1029			399	
SUB TOTAL HT GAIN					2800			1790			387			3344			2840			1129			294			71			92			323			979			116
LEVEL FACTOR / MULTIPLIER			0.20	0.32		0.20	0.32		0.20	0.32		0.20	0.32		0.20	0.32		0.20	0.32		0.20	0.32		0.20	0.32		0.20	0.32		0.20	0.32		0.20	0.32		0.20	0.32	
AIR CHANGE HEAT LOSS				1193			698			358			1235			1024			562			272			92			95			187			330			128	
AIR CHANGE HEAT GAIN					242			154			33			288			245			97			25			6			8			28			84			10
DUCT LOSS				0			0			148			508			422			0			112			38			0			0			0			0	
DUCT GAIN					0			0			134			456			401			0			32			8			0			0			0			0
HEAT GAIN PEOPLE	240		2		480	0		0	1		240	1		240	1		240	1		240	0		0	0		0	0		0	0		0	0		0	0		0
HEAT GAIN APPLIANCES/LIGHTS					684			0			684			684			684			684			0			0			0			0			0			0
TOTAL HT LOSS BTU/H				4908			2871			1623			5589			4637			2314			1230			417			392			768			1360			527	
TOTAL HT GAIN x 1.3 BTU/H					5468			2528			1922			6516			5733			2796			457			110			130			456			1383			163

ROOM USE			LIB			DIN			KIT/GT			CAB			LAUN			PWD			FOY			MUD									LOD			BAS		
EXP. WALL			31			32			77			45			0			5			35			32									52			238		
CLG. HT.			11			11			11			11			10			11			11			12									10			10		
	FACTORS																																					
GRS.WALL AREA	LOSS	GAIN	341			352			847			495			0			55			385			384									520			1978		
GLAZING				LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN								LOSS	GAIN		LOSS	GAIN
NORTH	21.3	16.5	0	0	0	0	0	0	46	979	761	0	0	0	0	0	0	9	192	149	0	0	0	0	0	0							0	0	0	6	128	99
EAST	21.3	42.1	56	1192	2358	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
SOUTH	21.3	25.5	0	0	0	34	724	866	20	426	509	63	1341	1604	0	0	0	0	0	0	0	0	0	0	0	0							0	0	0	6	128	153
WEST	21.3	42.1	0	0	0	0	0	0	115	2447	4843	63	1341	2653	0	0	0	0	0	0	0	0	0	0	0	0							22	468	926	0	0	0
SKYLT.	37.2	102.5	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	0	0	0
DOORS	25.2	4.9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	56	1414	275	20	505	98							0	0	0	20	505	98
NET EXPOSED WALL	4.5	0.9	285	1272	248	318	1419	276	666	2972	579	369	1647	321	0	0	0	46	205	40	329	1468	286	364	1624	316							0	0	0	0	0	0
NET EXPOSED BSMT WALL ABOVE GR	3.6	0.7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0							290	1044	203	402	1447	282
EXPOSED CLG	1.3	0.6	0	0	0	0	0	0	0	0	0	0	0	0	142	182	88	0	0	0	0	0	0	0	0	0							0	0	0	0	0	0
NO ATTIC EXPOSED CLG	2.7	1.3	0	0	0	0	0	0	0	0	0	203	558	270	0	0	0	40	110	53	41	113	55	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	142	362	71	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			0											8373		
SLAB ON GRADE HEAT LOSS				0			0			0			0			0			0			0			0									0					
SUBTOTAL HT LOSS				2464			2143			6824			4886			544			507			2995			2129									1512			10580		
SUB TOTAL HT GAIN					2606			1142			6691			4848			159			242			616			415									1130			632	
LEVEL FACTOR / MULTIPLIER			0.30	0.43		0.30	0.43		0.30	0.43		0.30	0.43		0.20	0.32		0.30	0.43		0.30	0.43		0.30	0.43										0.50	1.31		
AIR CHANGE HEAT LOSS				1069			930			2961			2120			175			220			1300			924											15873		
AIR CHANGE HEAT GAIN					225			98			577			418			14			21			53			36													152
DUCT LOSS				0			0			0			0			72			0			0			0											0		
DUCT GAIN					0			0			0			0			86			0			0			0													0
HEAT GAIN PEOPLE	240		0		0	0		0	0		0	0		0	0		0	0		0	0		0	0		0							0		0	0		0
HEAT GAIN APPLIANCES/LIGHTS					684			684			684			684			684			0			0			684									0				684
TOTAL HT LOSS BTU/H				3533			3072			9785			7006			791			727			4295			3053									1512			26453		
TOTAL HT GAIN x 1.3 BTU/H					4569			2502			10338			7735			1225			342			870			1475									1469			1908	

TOTAL HEAT GAIN BTU/H: 60713 | TONS: 5.06 | LOSS DUE TO VENTILATION LOAD BTU/H: 3181 | STRUCTURAL HEAT LOSS: 86863 | TOTAL COMBINED HEAT LOSS BTU/H: 90044

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: PINE VALLEY & TESTON — OPT. 5 BED + ELEVATOR + SERV STAIR
BUILDER: GOLD PARK HOMES — TYPE: 5005 ELEV. 'B' - KNIGHTSWOOD DATE: Feb-20 — GFA: 4412 LO# 85466

HEATING CFM	1955		COOLING CFM	1955			furnace pressure	0.6																
TOTAL HEAT LOSS	86,863		TOTAL HEAT GAIN	60,094			furnace filter	0.08																
AIR FLOW RATE CFM	22.51		AIR FLOW RATE CFM	32.53			a/c coil pressure	0.2																
							available pressure																	
							for s/a & r/a	0.32																
							plenum pressure s/a	0.17		r/a pressure	0.15													
							max s/a dif press. loss	0.02		r/a grille press. Loss	0.02													
							min adjusted pressure s/a	0.15		adjusted pressure r/a	0.13													

^LENNOX — AFUE = 96 %
EL296UH110XE60C 110 — INPUT (BTU/H) = 110,000
OUTPUT (BTU/H) = **106,000**

FAN SPEED	
LOW	0
MEDLOW	1380
MEDIUM	1505
MEDIUM HIGH	1685
HIGH	1955

DESIGN CFM = **1955** CFM @ .6 " E.S.P.
TEMPERATURE RISE 50 °F

RUN COUNT	4th	3rd	2nd	1st	Bas
S/A	0	0	18	13	7
R/A	0	0	6	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	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
ROOM NAME	MBR	ENS	BED-5	BED-2	BED-3	BED-4	ENS-2/5	WIC-2	ENS-3	MBR	ENS-4	LIB	DIN	KIT/GT	KIT/GT	KIT/GT	LAUN	PWD	FOY	MUD	BAS	BAS	BAS	BAS
RM LOSS MBH.	2.45	2.24	1.62	1.86	2.32	2.31	1.23	0.42	0.39	2.45	0.77	1.77	3.07	2.45	2.45	2.45	0.79	0.73	4.29	3.05	3.99	3.99	3.99	3.99
CFM PER RUN HEAT	55	50	37	42	52	52	28	9	9	55	17	40	69	55	55	55	18	16	97	69	90	90	90	90
RM GAIN MBH.	2.73	1.96	1.92	2.17	2.87	2.80	0.46	0.11	0.13	2.73	0.46	2.28	2.50	2.58	2.58	2.58	1.22	0.34	0.87	1.47	0.48	0.48	0.48	0.48
CFM PER RUN COOLING	89	64	63	71	93	91	15	4	4	89	15	74	81	84	84	84	40	11	28	48	16	16	16	16
ADJUSTED PRESSURE	0.15	0.16	0.16	0.16	0.15	0.15	0.16	0.16	0.16	0.15	0.16	0.16	0.15	0.15	0.15	0.15	0.16	0.16	0.15	0.16	0.15	0.15	0.15	0.15
ACTUAL DUCT LGH.	70	70	68	49	70	48	79	48	53	64	59	57	29	52	69	54	36	73	40	65	67	60	54	38
EQUIVALENT LENGTH	200	200	150	160	160	160	150	150	170	170	150	140	103	120	160	110	200	170	210	190	150	120	103	90
TOTAL EFFECTIVE LENGTH	270	270	218	209	230	208	229	198	223	234	209	197	132	172	229	164	236	243	250	255	217	180	157	128
ADJUSTED PRESSURE	0.05	0.06	0.07	0.07	0.06	0.07	0.07	0.08	0.07	0.06	0.07	0.08	0.11	0.09	0.06	0.09	0.07	0.06	0.06	0.06	0.07	0.08	0.09	0.11
ROUND DUCT SIZE	**6**	5	5	5	**6**	**6**	4	4	4	**6**	4	5	5	5	**6**	5	4	4	**6**	**6**	**6**	**6**	**6**	**6**
HEATING VELOCITY (ft/min)	280	367	272	308	265	265	321	103	103	280	195	294	507	404	280	404	207	184	495	352	459	459	459	459
COOLING VELOCITY (ft/min)	454	470	463	521	474	464	172	46	46	454	172	543	595	617	428	617	459	126	143	245	82	82	82	82
OUTLET GRILL SIZE	4X10	3X10	3X10	3X10	4X10	4X10	3X10	3X10	3X10	4X10	3X10	3X10	3X10	3X10	4X10	3X10	3X10	3X10	4X10	4X10	4X10	4X10	4X10	4X10
TRUNK	D	C	B	G	F	E	B	G	G	D	E	F	E	D	B	C	G	A	F	B	A	B	D	E

RUN #	25	26	27	28	29	30	31	32	33	34	35	36	37	38
ROOM NAME	BAS	BAS	BED-2	BED-2	BED-3	WIC-3	LIB	KIT/GT	CAB	CAB	CAB	WIC	ENS	BAS
RM LOSS MBH.	3.99	3.99	1.86	1.86	2.32	1.36	1.77	2.45	2.34	2.34	2.34	0.53	0.64	3.99
CFM PER RUN HEAT	90	90	42	42	52	31	40	55	53	53	53	12	14	90
RM GAIN MBH.	0.48	0.48	2.17	2.17	2.87	1.38	2.28	2.58	2.58	2.58	2.58	0.16	0.56	0.48
CFM PER RUN COOLING	16	16	71	71	93	45	74	84	84	84	84	5	18	16
ADJUSTED PRESSURE	0.15	0.15	0.16	0.16	0.15	0.16	0.16	0.15	0.15	0.15	0.15	0.16	0.16	0.15
ACTUAL DUCT LGH.	34	50	52	55	75	58	51	55	69	71	82	54	58	23
EQUIVALENT LENGTH	110	150	170	160	160	190	160	120	150	130	140	180	190	140
TOTAL EFFECTIVE LENGTH	144	200	222	215	235	248	211	175	219	201	222	234	248	163
ADJUSTED PRESSURE	0.1	0.07	0.07	0.07	0.06	0.06	0.07	0.08	0.07	0.07	0.07	0.07	0.06	0.09
ROUND DUCT SIZE	**6**	**6**	5	5	**6**	5	5	**6**	**6**	**6**	**6**	4	4	**6**
HEATING VELOCITY (ft/min)	459	459	308	308	265	228	294	280	270	270	270	138	161	459
COOLING VELOCITY (ft/min)	82	82	521	521	474	330	543	428	428	428	428	57	207	82
OUTLET GRILL SIZE	4X10	4X10	3X10	3X10	4X10	3X10	3X10	4X10	4X10	4X10	4X10	3X10	3X10	4X10
TRUNK	G	F	G	G	F	F	F	B	A	A	A	C	C	E

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	265	0.06	9.2	10	x	8	477		TRUNK G	654	0.06	12.9	20	x	8	589
TRUNK B	334	0.06	10	12	x	8	501		TRUNK H	1955	0.05	20.3	38	x	10	741
TRUNK C	730	0.06	13.4	20	x	8	657		TRUNK I	0	0.00	0	0	x	8	0
TRUNK D	255	0.05	9.5	10	x	8	459		TRUNK J	0	0.00	0	0	x	8	0
TRUNK E	1303	0.05	17.4	28	x	10	670		TRUNK K	0	0.00	0	0	x	8	0
TRUNK F	402	0.06	10.7	14	x	8	517		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	1490	0.05	18.3	32	x	10	671
TRUNK Y	985	0.05	15.7	28	x	8	633
TRUNK Z	435	0.05	11.6	16	x	8	489
DROP	1955	0.05	20.3	24	x	18	652

RETURN AIR #	1	2	3	4	5	6	7	8	9							BR
	0	0	0	0	2@7"	0	0	0	0	0	0	0	0	0	0	
AIR VOLUME	115	135	130	115	240	200	350	320	85	0	0	0	0	0	0	265
PLENUM PRESSURE	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13
ACTUAL DUCT LGH.	84	51	62	59	47	49	30	51	61	1	1	1	1	1	1	14
EQUIVALENT LENGTH	200	135	155	185	135	140	170	195	165	0	0	0	0	0	0	145
TOTAL EFFECTIVE LH	284	186	217	244	182	189	200	246	226	1	1	1	1	1	1	159
ADJUSTED PRESSURE	0.05	0.07	0.06	0.05	0.07	0.07	0.07	0.05	0.06	13.36	13.36	13.36	13.36	13.36	13.36	0.08
ROUND DUCT SIZE	7	6.8	7	7	8.5	7.9	9.8	10.3	6	0	0	0	0	0	0	8.5
INLET GRILL SIZE	8	8	8	8	8	8	8	8	8	0	0	0	0	0	0	8
	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
INLET GRILL SIZE	14	14	14	14	30	14	30	30	14	0	0	0	0	0	0	24

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: 5005 ELEV. 'B' - KNIGHTSWOOD LO # 85466
SITE NAME: PINE VALLEY & TESTON OPT. 5 BED + ELEVATOR + SERV STAIR

RESIDENTIAL MECHANICAL VENTILATION DESIGN SUMMARY

COMBUSTION APPLIANCES 9.32.3.1(1)

- a) [✓] Direct vent (sealed combustion) only
- b) [ ] Positive venting induced draft (except fireplaces)
- c) [ ] Natural draft, B-vent or induced draft gas fireplace
- d) [ ] Solid Fuel (including fireplaces)
- e) [ ] No Combustion Appliances

HEATING SYSTEM

[✓] Forced Air [ ] Non Forced Air

[ ] Electric Space Heat

HOUSE TYPE 9.32.1(2)

- [✓] I Type a) or b) appliance only, no solid fuel
- [ ] II Type I except with solid fuel (including fireplaces)
- [ ] III Any Type c) appliance
- [ ] IV Type I, or II with electric space heat
- [ ] Other: Type I, II or IV no forced air

SYSTEM DESIGN OPTIONS O.N.H.W.P.

- [ ] 1 Exhaust only/Forced Air System
- [ ] 2 HRV with Ducting/Forced Air System
- [✓] 3 HRV Simplified/connected to forced air system
- [ ] 4 HRV with Ducting/non forced air system
- [ ] Part 6 Design

TOTAL VENTILATION CAPACITY 9.32.3.3(1)

Basement + Master Bedroom	2	@ 21.2 cfm	42.4	cfm
Other Bedrooms	4	@ 10.6 cfm	42.4	cfm
Kitchen & Bathrooms	7	@ 10.6 cfm	74.2	cfm
Other Rooms	7	@ 10.6 cfm	74.2	cfm
Table 9.32.3.A.		TOTAL	233.2	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	**95.4**	**cfm**

SUPPLEMENTAL VENTILATION CAPACITY 9.32.3.5.

Total Ventilation Capacity	233.2	cfm
Less Principal Ventil. Capacity	155	cfm
Required Supplemental Capacity	78.2	cfm

PRINCIPAL EXHAUST FAN CAPACITY

Model: VANEE 65H Location: BSMT

155.0 cfm 3.0 sones [✓] HVI Approved

PRINCIPAL EXHAUST HEAT LOSS CALCULATION

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

SUPPLEMENTAL FANS NUTONE

Location	Model	cfm	HVI	Sones
ENS	QTXEN050C	50	✓	0.3
ENS-2/5	QTXEN050C	50	✓	0.3
ENS-4	QTXEN050C	50	✓	0.3
PWD	QTXEN050C	50	✓	0.3

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: 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: February-20

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#: 85466 Model: 5005 ELEV. 'B' - KNIGHTSWOOD Builder: GOLD PARK HOMES Date: 2020-02-26

Volume Calculation

House Volume

Level	Floor Area (ft²)	Floor Height (ft)	Volume (ft³)
Bsmt	2052	10	20520
First	2052	11	22572
Second	2360	10	23600
Third	0	9	0
Fourth	0	9	0
		Total:	66,692.0 ft³
		Total:	1888.5 m³

Air Change & Delta T Data

WINTER NATURAL AIR CHANGE RATE	0.350
SUMMER NATURAL AIR CHANGE RATE	0.124

Design Temperature Difference

	Tin °C	Tout °C	ΔT °C	ΔT °F
Winter DTDh	22	-20	42	76
Summer DTDc	23	31	8	15

5.2.3.1 Heat Loss due to Air Leakage

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

0.350 x 524.59 x 42 °C x 1.2 = 9304 W

= **31747 Btu/h**

6.2.6 Sensible Gain due to Air Leakage

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

= 0.124 x 524.59 x 8 °C x 1.2 = 644 W

= **2196 Btu/h**

5.2.3.2 Heat Loss due to Mechanical Ventilation

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

155 CFM x 76 °F x 1.08 x 0.25 = **3181 Btu/h**

6.2.7 Sensible heat Gain due to Ventilation

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

155 CFM x 15 °F x 1.08 x 0.25 = **619 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	31,747	12,091	1.313
2	0.3		21,947	0.434
3	0.2		19,779	0.321
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: 5005 ELEV. 'B' - KNIGHTSWOOD OPT. 5 BED + ELEVATOR + SERV ST **BUILDER:** GOLD PARK HOMES
SFQT: 4412 **LO#** 85466 **SITE:** PINE VALLEY & TESTON

DESIGN ASSUMPTIONS

HEATING	°F	COOLING	°F
OUTDOOR DESIGN TEMP.	-4	OUTDOOR DESIGN TEMP.	88
INDOOR DESIGN TEMP.	72	INDOOR DESIGN TEMP. (MAX 75°F)	73

BUILDING DATA

ATTACHMENT:	DETACHED	# 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):	66692.0	ASSUMED (Y/N):	Y
INTERNAL SHADING:	BLINDS/CURTAINS	ASSUMED OCCUPANTS:	6
INTERIOR LIGHTING LOAD (Btu/h/ft^2):	1.27	DC BRUSHLESS MOTOR (Y/N):	Y
FOUNDATION CONFIGURATION	BCIN_1	DEPTH BELOW GRADE:	7.0 ft
LENGTH: 77.0 ft	WIDTH: 42.0 ft	EXPOSED PERIMETER:	238.0 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	29.80
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

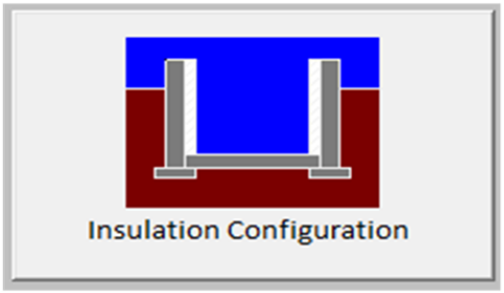


HVAC Designs Ltd.
375 Finley Ave, Suite 202
Ajax ON, L1S 2E2
905-619-2300

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 sand, loam, clay
Water Table:	Normal (7-10 m, 23-33 ft)

Foundation Dimensions		
Floor Length (m):	**23.5**	 Insulation Configuration
Floor Width (m):	**12.8**	
Exposed Perimeter (m):	**0.0**	
Wall Height (m):	**3.0**	
Depth Below Grade (m):	**2.13**	
Window Area (m^2):	**3.2**	
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):	**2453**	

TYPE: 5005 ELEV. 'B' - KNIGHTSWOOD OPT. 5 BED + ELEVATOR + SERV STAIR
LO# 85466

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

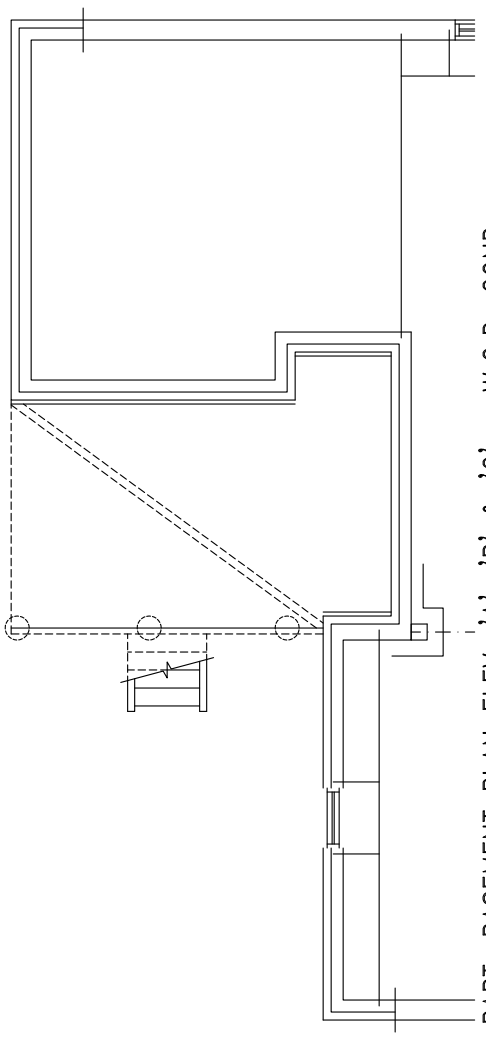
Air Infiltration Residential Load Calculator

Supplemental tool for CAN/CSA-F280

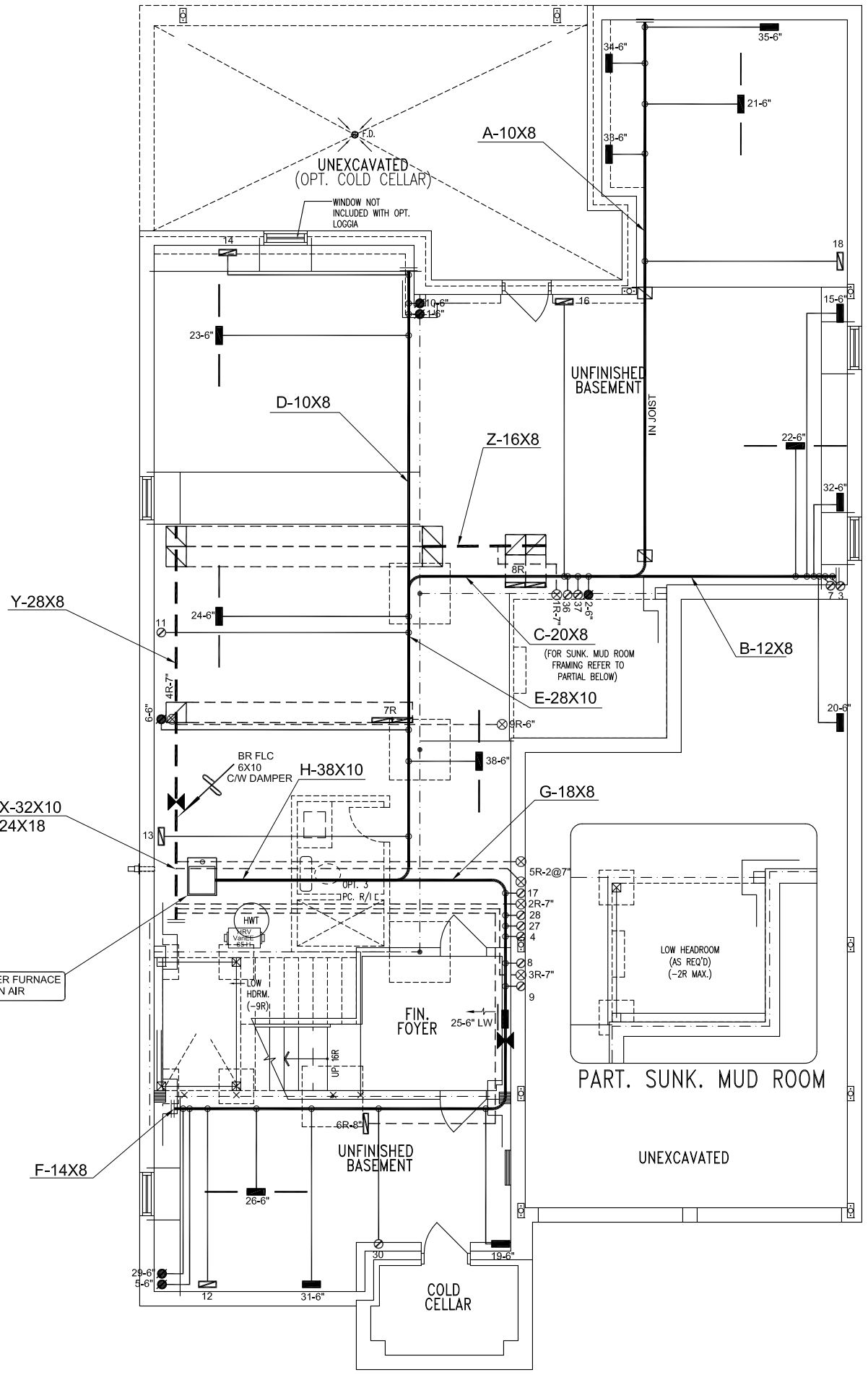
Weather Station Description	
Province:	Ontario
Region:	Vaughan (Woodbridge)
Weather Station Location:	Open flat terrain, grass
Anemometer height (m):	10
Local Shielding	
Building Site:	Suburban, forest
Walls:	Heavy
Flue:	Heavy
Highest Ceiling Height (m):	7.32
Building Configuration	
Type:	Detached
Number of Stories:	Two
Foundation:	Full
House Volume (m^3):	1888.5
Air Leakage/Ventilation	
Air Tightness Type:	Present (1961-) (3.57 ACH)
Custom BDT Data:	ELA @ 10 Pa. 2517.4 cm^2
	3.57 ACH @ 50 Pa
Mechanical Ventilation (L/s):	Total Supply 73.2 / Total Exhaust 73.2
Flue Size	
Flue #:	#1 #2 #3 #4
Diameter (mm):	0 0 0 0
Natural Infiltration Rates	
Heating Air Leakage Rate (ACH/H):	**0.350**
Cooling Air Leakage Rate (ACH/H):	**0.124**

TYPE: 5005 ELEV. 'B' - KNIGHTSWOOD OPT. 5 BED + ELEVATOR + SERV STAIR

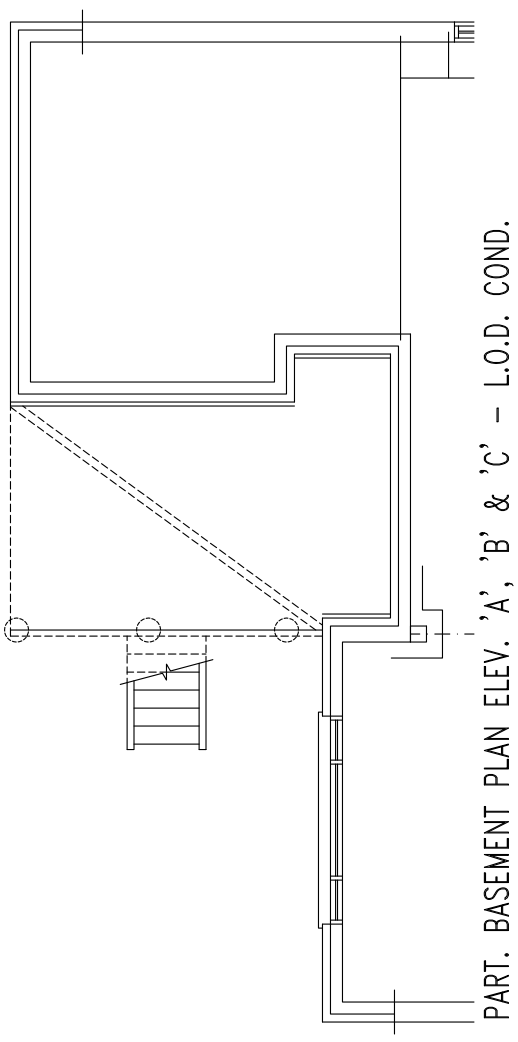
LO# 85466



PART. BASEMENT PLAN ELEV. 'A', 'B' & 'C' – W.O.D. COND.



PARTIAL BASEMENT PLAN, EL. 'B'



PART. BASEMENT PLAN ELEV. 'A', 'B' & 'C' – L.O.D. COND.

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

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Client

GOLDPARK HOMES

Project Name

PINE VALLEY & TESTON
VAUGHAN, ONTARIO
KNIGHTSWOOD
OPT. 5 BED/ELEV/STAIR
5005 ELEV. 'B' 4412 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 90044 BTU/H

UNIT DATA

MAKE	LENNOX	
MODEL	EL296UH110XE60C	
INPUT	110	MBTU/H
OUTPUT	106	MBTU/H
COOLING	5.0	TONS
FAN SPEED	1955	cfm @ 0.6" w.c.

# OF RUNS	S/A	R/A	FANS
3RD FLOOR			
2ND FLOOR	18	6	6
1ST FLOOR	13	3	3
BASEMENT	7	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

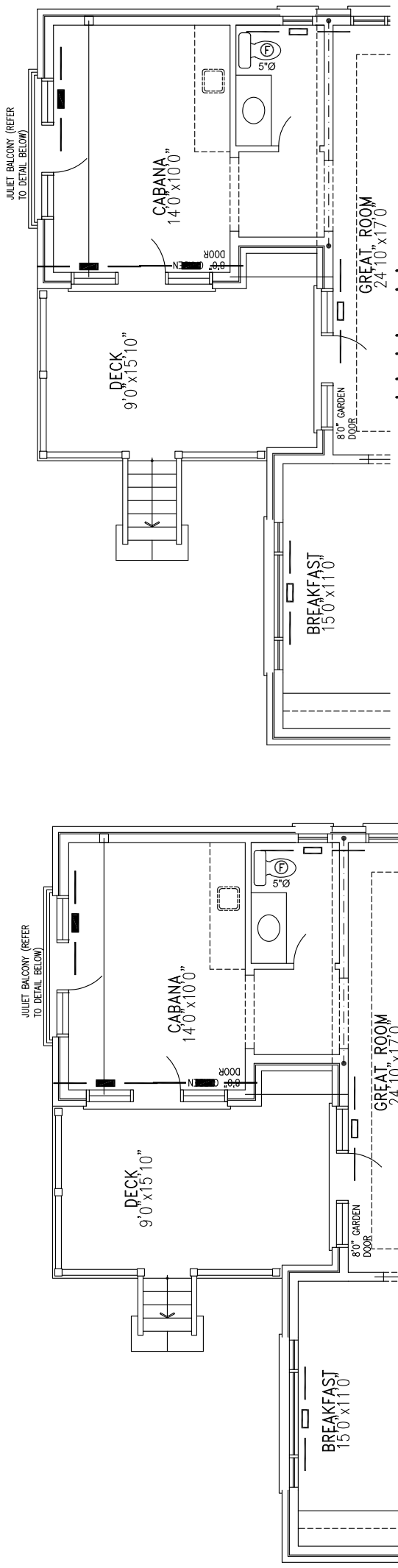
BASEMENT HEATING LAYOUT

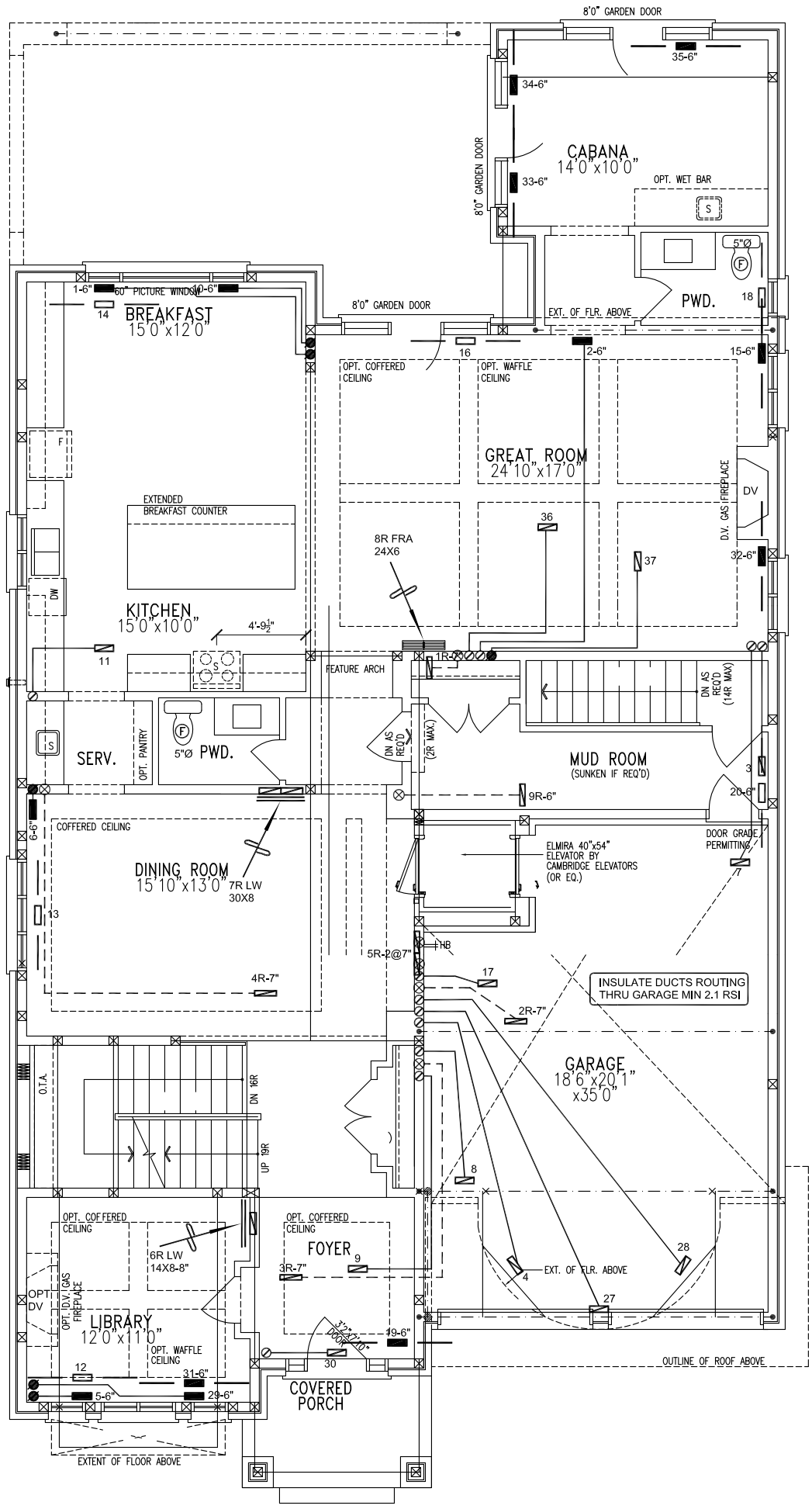
Date JAN/2018

Scale 1/8" = 1'-0"

BCIN# 19669

LO# 85466





PARTIAL GROUND FLOOR PLAN, EL. '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

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	SUPPLY AIR BOOT ABOVE		6" SUPPLY AIR STACK 2nd FLOOR		FRA- FLOOR RETURN AIR GRILLE		REDUCER

No.	Description	Date
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Client

GOLDPARK HOMES

Project Name

PINE VALLEY & TESTON
VAUGHAN, ONTARIO
KNIGHTSWOOD
OPT. 5 BED/ELEV/STAIR
5005 ELEV. 'B' 4412 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

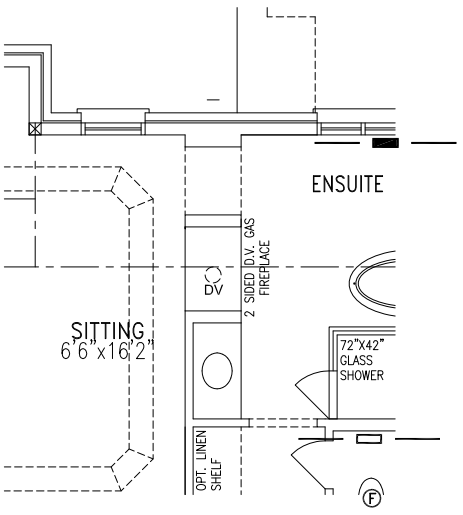
FIRST FLOOR HEATING LAYOUT

Date JAN/2018

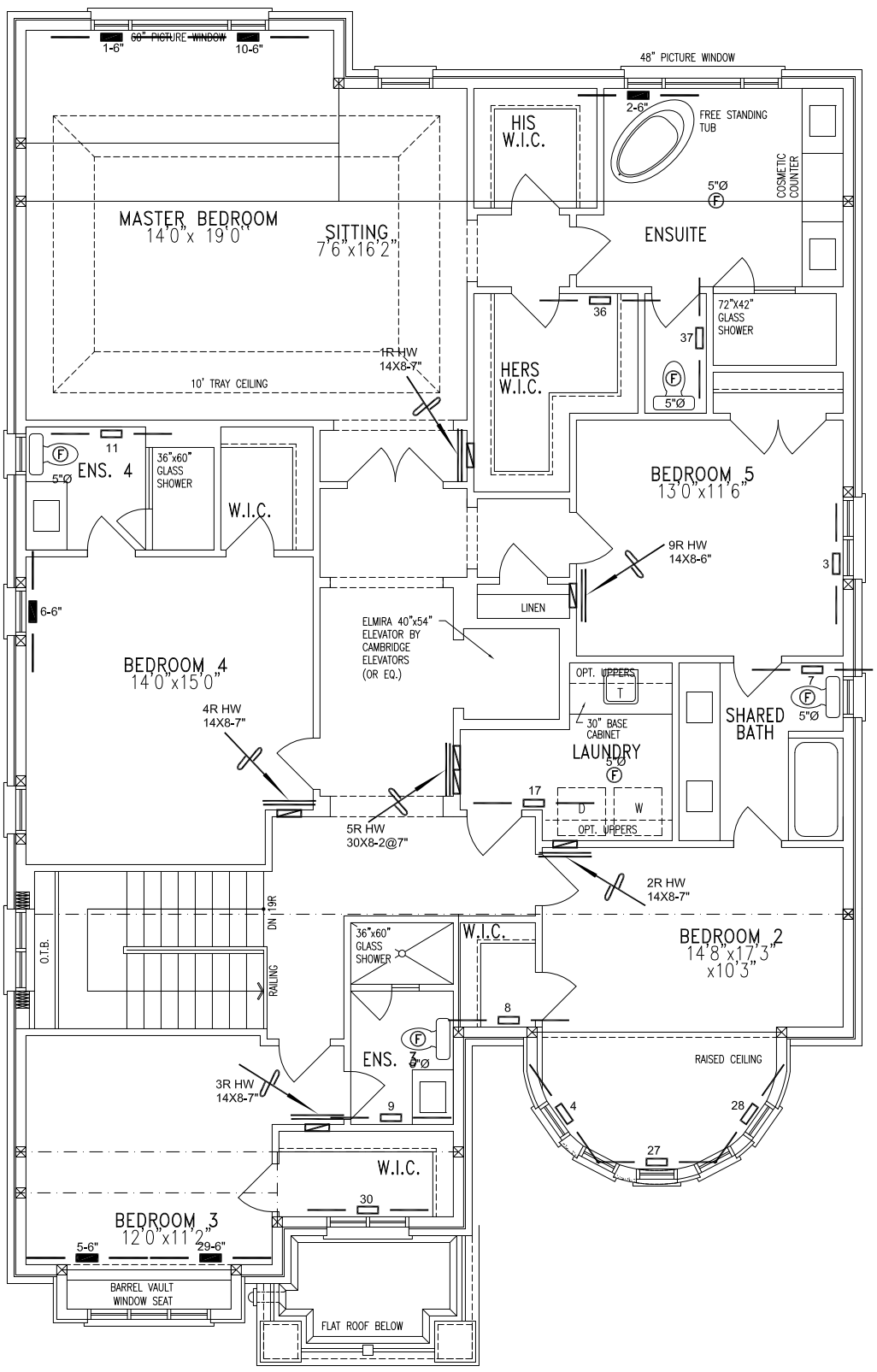
Scale 1/8" = 1'-0"

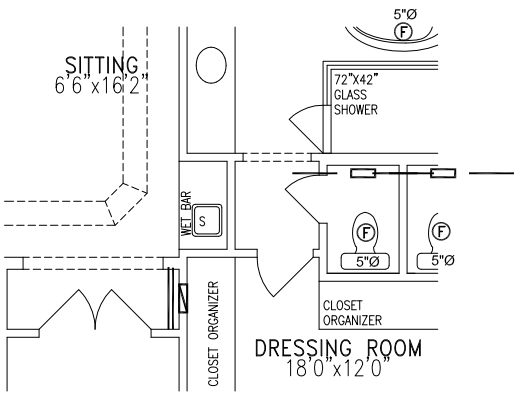
BCIN# 19669

LO# 85466



PART. SECOND FLOOR PLAN
OPT. SITTING AREA FIREPLACE





PART. SECOND FLOOR PLAN
OPT. SITTING AREA WET BAR

SECOND FLOOR PLAN, EL. '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
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	FLOOR SUPPLY AIR GRILLE 6" BOOT		SUPPLY AIR STACK FROM 2nd FLOOR		30"x8" RETURN AIR GRILLE		RETURN AIR STACK 2nd FLOOR
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Client
GOLDPARK HOMES

Project Name
PINE VALLEY & TESTON
VAUGHAN, ONTARIO
KNIGHTSWOOD
OPT. 5 BED/ELEV/STAIR
5005 ELEV. 'B' 4412 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
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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
SECOND FLOOR HEATING LAYOUT

Date JAN/2018
Scale 1/8" = 1'-0"
BCIN# 19669
LO# 85466

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
VAUGHAN (WOODBRIDGE)		

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:** 5005 ELEV. 'B' & 'B CNR' - KNIGHTSWOOD OPT. 5 BED + ELEVATOR + STAIR + WOB **Project:** PINE VALLEY & TESTON

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.

February 26, 2020
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.

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

SITE NAME: PINE VALLEY & TESTON | OPT. 5 BED + ELEVATOR + STAIR + WOB | DATE: Feb-20 | WINTER NATURAL AIR CHANGE RATE 0.416 | HEAT LOSS ΔT °F. 76 | CSA-F280-12
BUILDER: GOLD PARK HOMES | TYPE: 5005 ELEV. 'B' & 'B CNR' - KNIGHT GFA: 4412 | LO# 85468 | SUMMER NATURAL AIR CHANGE RATE 0.139 | HEAT GAIN ΔT °F. 13 | SB-12 PACKAGE A1

ROOM USE			MBR			ENS			BED-5			BED-2			BED-3			BED-4			ENS-2/5			WIC-2			ENS-3			ENS-4			WIC-3			WIC		
EXP. WALL			46			30			14			34			36			19			9			3			4			7			14			6		
CLG. HT.			11			10			10			11			11			10			10			10			10			10			10			10		
	FACTORS																																				
GRS.WALL AREA	LOSS	GAIN	506			300			140			374			396			190			90			30			40			70			140			60		
GLAZING				LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN
NORTH	21.3	15.6	0	0	0	0	0	0	6	128	93	0	0	0	0	0	0	0	0	0	8	170	124	0	0	0	0	0	0	0	0	0	0	0	0	0	0
EAST	21.3	40.3	0	0	0	0	0	0	0	0	0	65	1383	2619	50	1064	2014	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	20	426	806	0	0	0
SOUTH	21.3	24.2	19	404	460	0	0	0	0	0	0	0	0	0	12	255	290	44	936	1064	0	0	0	0	0	0	0	0	0	9	192	218	0	0	0	0	0	0
WEST	21.3	40.3	50	1064	2014	34	724	1370	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	0	0	0
SKYLT.	37.2	101.5	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	0	0	0	0	0	0	0	0	0
DOORS	25.2	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	0	0	0	0	0	0	0	0	0
NET EXPOSED WALL	4.5	0.8	437	1950	328	266	1187	200	134	598	101	309	1379	232	334	1491	251	146	652	110	82	366	62	30	134	23	40	179	30	61	272	46	120	536	90	60	268	45
NET EXPOSED BSMT WALL ABOVE GR	3.6	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	0	0	0	0	0	0	0	0	0	0	0	0
EXPOSED CLG	1.3	0.6	480	616	282	205	263	120	255	327	150	175	225	103	249	320	146	285	366	167	81	104	48	40	51	24	92	118	54	105	135	62	53	68	31	102	131	60
NO ATTIC EXPOSED CLG	2.7	1.3	0	0	0	0	0	0	0	0	0	78	214	98	18	49	23	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	25	64	11	253	645	109	18	46	8	0	0	0	81	207	35	40	102	17	0	0	0	0	0	0	0	0	0	0	0	0
BASEMENT/CRAWL HEAT LOSS				0			0			0			0			0			0			0			0			0			0			0			0	
SLAB ON GRADE HEAT LOSS				0			0			0			0			0			0			0			0			0			0			0			0	
SUBTOTAL HT LOSS				4035			2174			1117			3846			3225			1954			847			287			297			598			1029			399	
SUB TOTAL HT GAIN					3084			1690			355			3161			2732			1342			269			63			84			325			927			105
LEVEL FACTOR / MULTIPLIER			0.20	0.37		0.20	0.37		0.20	0.37		0.20	0.37		0.20	0.37		0.20	0.37		0.20	0.37		0.20	0.37		0.20	0.37		0.20	0.37		0.20	0.37		0.20	0.37	
AIR CHANGE HEAT LOSS				1495			806			414			1426			1195			724			314			106			110			222			381			148	
AIR CHANGE HEAT GAIN					247			136			28			254			219			108			22			5			7			26			74			8
DUCT LOSS				0			0			153			527			442			0			116			39			0			0			0			0	
DUCT GAIN					0			0			106			409			362			0			72			50			0			0			0			0
HEAT GAIN PEOPLE	240		2		480	0		0	1		240	1		240	1		240	1		240	0		0	0		0	0		0	0		0	0		0	0		0
HEAT GAIN APPLIANCES/LIGHTS					432			432			432			432			432			432			432			432			432			432			0			0
TOTAL HT LOSS BTU/H				5530			2979			1684			5799			4862			2678			1277			433			406			820			1411			546	
TOTAL HT GAIN x 1.3 BTU/H					5517			2935			1509			5843			5182			2758			1033			716			680			1018			1302			148

ROOM USE			LIB			DIN			KIT/GT			CAB			LAUN			PWD			FOY			MUD									WOB			BAS		
EXP. WALL			31			32			77			45			0			5			35			32									52			186		
CLG. HT.			11			11			11			11			10			11			11			12									10			10		
	FACTORS																																					
GRS.WALL AREA	LOSS	GAIN	341			352			847			495			0			55			385			384									520			1302		
GLAZING				LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN								LOSS	GAIN		LOSS	GAIN
NORTH	21.3	15.6	0	0	0	0	0	0	46	979	716	0	0	0	0	0	0	9	192	140	0	0	0	0	0	0							0	0	0	6	128	93
EAST	21.3	40.3	56	1192	2256	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
SOUTH	21.3	24.2	0	0	0	34	724	822	21	447	508	63	1341	1524	0	0	0	0	0	0	0	0	0	0	0	0							46	979	556	6	128	145
WEST	21.3	40.3	0	0	0	0	0	0	105	2234	4230	63	1341	2538	0	0	0	0	0	0	0	0	0	0	0	0							106	2256	2135	0	0	0
SKYLT.	37.2	101.5	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	0	0	0
DOORS	25.2	4.3	0	0	0	0	0	0	10	252	43	0	0	0	0	0	0	0	0	0	56	1414	238	20	505	85							20	505	85	20	505	85
NET EXPOSED WALL	4.5	0.8	285	1272	214	318	1419	239	665	2968	500	369	1647	277	0	0	0	46	205	35	329	1468	247	364	1624	274							348	1553	262	0	0	0
NET EXPOSED BSMT WALL ABOVE GR	3.6	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							0	0	0	558	2008	338
EXPOSED CLG	1.3	0.6	0	0	0	0	0	0	0	0	0	0	0	0	142	182	83	0	0	0	0	0	0	0	0	0							0	0	0	0	0	0
NO ATTIC EXPOSED CLG	2.7	1.3	0	0	0	0	0	0	0	0	0	203	558	255	0	0	0	40	110	50	41	113	52	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	142	362	61	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			0												2977	
SLAB ON GRADE HEAT LOSS				0			0			0			0			0			0			0			0									741					
SUBTOTAL HT LOSS				2464			2143			6880			4886			544			507			2995			2129									6034			5746		
SUB TOTAL HT GAIN					2470			1061			5996			4595			144			225			537			359									3038			662	
LEVEL FACTOR / MULTIPLIER			0.30	0.51		0.30	0.51		0.30	0.51		0.30	0.51		0.20	0.37		0.30	0.51		0.30	0.51		0.30	0.51											0.50	1.60	
AIR CHANGE HEAT LOSS				1267			1102			3538			2512			202			261			1540			1095												18857		
AIR CHANGE HEAT GAIN					198			85			481			369			12			18			43			29														297
DUCT LOSS				0			0			0			0			75			0			0			0												0		
DUCT GAIN					0			0			0			0			59			0			0			0														0
HEAT GAIN PEOPLE	240		0		0	0		0	0		0	0		0	0		0	0		0	0		0	0		0							0		0	0		0
HEAT GAIN APPLIANCES/LIGHTS					432			432			432			432			432			432			432			432									0			432	
TOTAL HT LOSS BTU/H				3730			3244			10418			7398			821			767			4535			3224									6775			24603		
TOTAL HT GAIN x 1.3 BTU/H					4031			2052			8982			7014			841			878			1316			1065									3950			1808

TOTAL HEAT GAIN BTU/H: 61111 TONS: 5.09 LOSS DUE TO VENTILATION LOAD BTU/H: 3181 STRUCTURAL HEAT LOSS: 93942 TOTAL COMBINED HEAT LOSS BTU/H: 97122

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

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SITE NAME: PINE VALLEY & TESTON — OPT. 5 BED + ELEVATOR + STAIR + WOB
BUILDER: GOLD PARK HOMES — TYPE: 5005 ELEV. 'B' & 'B CNR' - KNIGHT DATE: Feb-20 — GFA: 4412 LO# 85468

HEATING CFM	1955	COOLING CFM	1955	furnace pressure	0.6
TOTAL HEAT LOSS	93,942	TOTAL HEAT GAIN	60,576	furnace filter	0.08
AIR FLOW RATE CFM	20.81	AIR FLOW RATE CFM	32.27	a/c coil pressure	0.2
				available pressure for s/a & r/a	0.32

^LENNOX — AFUE = 96 %
EL296UH110XE60C 110 — INPUT (BTU/H) = 110,000
FAN SPEED — OUTPUT (BTU/H) = **106,000**
LOW 0
MEDLOW 1380 — DESIGN CFM = **1955**
MEDIUM 1505 — CFM @ .6 " E.S.P.
MEDIUM HIGH 1685
HIGH 1955 — TEMPERATURE RISE 50 °F

RUN COUNT	4th	3rd	2nd	1st	Bas
S/A	0	0	18	13	8
R/A	0	0	6	3	1

plenum pressure s/a 0.17 — r/a pressure 0.15
max s/a dif press. loss 0.02 — r/a grille press. Loss 0.02
min adjusted pressure s/a 0.15 — adjusted pressure r/a 0.13

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	BED-5	BED-2	BED-3	BED-4	ENS-2/5	WIC-2	ENS-3	MBR	ENS-4	LIB	DIN	KIT/GT	KIT/GT	KIT/GT	LAUN	PWD	FOY	MUD	BAS	BAS	BAS	BAS
RM LOSS MBH.	2.76	2.29	1.68	1.93	2.43	2.68	1.28	0.43	0.41	2.76	0.82	1.87	3.24	2.60	2.60	2.60	0.82	0.77	4.53	3.22	3.92	3.92	3.92	3.92
CFM PER RUN HEAT	58	48	35	40	51	56	27	9	8	58	17	39	68	54	54	54	17	16	94	67	82	82	82	82
RM GAIN MBH.	2.76	2.17	1.51	1.95	2.59	2.76	1.03	0.72	0.68	2.76	1.02	2.02	2.05	2.25	2.25	2.25	0.84	0.88	1.32	1.07	0.72	0.72	0.72	0.72
CFM PER RUN COOLING	89	70	49	63	84	89	33	23	22	89	33	65	66	72	72	72	27	28	42	34	23	23	23	23
ADJUSTED PRESSURE	0.15	0.16	0.16	0.16	0.15	0.15	0.16	0.16	0.16	0.15	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.15	0.16	0.15	0.15	0.15	0.15
ACTUAL DUCT LGH.	70	70	68	49	70	48	79	48	53	64	59	57	29	52	69	54	36	73	40	65	77	60	69	38
EQUIVALENT LENGTH	200	200	150	160	160	160	150	150	170	170	150	140	103	120	140	110	200	170	210	190	150	120	150	90
TOTAL EFFECTIVE LENGTH	270	270	218	209	230	208	229	198	223	234	209	197	132	172	209	164	236	243	250	255	227	180	219	128
ADJUSTED PRESSURE	0.05	0.06	0.07	0.07	0.06	0.07	0.07	0.08	0.07	0.06	0.07	0.08	0.12	0.09	0.07	0.1	0.07	0.06	0.06	0.06	0.06	0.08	0.07	0.11
ROUND DUCT SIZE	**6**	**6**	5	5	**6**	**6**	4	4	4	**6**	4	5	5	5	5	5	4	4	**6**	5	**6**	**6**	**6**	**6**
HEATING VELOCITY (ft/min)	296	245	257	294	260	286	310	103	92	296	195	286	499	396	396	396	195	184	479	492	418	418	418	418
COOLING VELOCITY (ft/min)	454	357	360	463	428	454	379	264	252	454	379	477	485	529	529	529	310	321	214	250	117	117	117	117
OUTLET GRILL SIZE	4X10	4X10	3X10	3X10	4X10	4X10	3X10	3X10	3X10	4X10	3X10	3X10	3X10	3X10	3X10	3X10	3X10	3X10	4X10	3X10	4X10	4X10	4X10	4X10
TRUNK	D	C	B	G	F	E	B	G	G	D	E	F	E	D	B	C	G	A	F	B	A	B	D	E

RUN #	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39
ROOM NAME	BAS	BAS	BED-2	BED-2	BED-3	WIC-3	LIB	KIT/GT	CAB	CAB	CAB	WIC	ENS	BAS	BAS
RM LOSS MBH.	3.92	3.92	1.93	1.93	2.43	1.41	1.87	2.60	2.47	2.47	2.47	0.55	0.69	3.92	3.92
CFM PER RUN HEAT	82	82	40	40	51	29	39	54	51	51	51	11	14	82	82
RM GAIN MBH.	0.72	0.72	1.95	1.95	2.59	1.30	2.02	2.25	2.34	2.34	2.34	0.15	0.77	0.72	0.72
CFM PER RUN COOLING	23	23	63	63	84	42	65	72	75	75	75	5	25	23	23
ADJUSTED PRESSURE	0.15	0.15	0.16	0.16	0.15	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.15	0.15
ACTUAL DUCT LGH.	34	50	52	55	75	58	51	55	69	71	82	54	58	23	58
EQUIVALENT LENGTH	110	150	170	160	160	190	160	120	150	130	140	180	190	140	170
TOTAL EFFECTIVE LENGTH	144	200	222	215	235	248	211	175	219	201	222	234	248	163	228
ADJUSTED PRESSURE	0.1	0.07	0.07	0.07	0.06	0.06	0.07	0.09	0.07	0.08	0.07	0.07	0.06	0.09	0.06
ROUND DUCT SIZE	**6**	**6**	5	5	**6**	5	5	5	5	5	5	4	4	**6**	**6**
HEATING VELOCITY (ft/min)	418	418	294	294	260	213	286	396	374	374	374	126	161	418	418
COOLING VELOCITY (ft/min)	117	117	463	463	428	308	477	529	551	551	551	57	287	117	117
OUTLET GRILL SIZE	4X10	4X10	3X10	3X10	4X10	3X10	3X10	3X10	3X10	3X10	3X10	3X10	3X10	4X10	4X10
TRUNK	G	F	G	G	F	F	F	B	A	A	A	C	C	E	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	251	0.06	9	10	x	8	452	TRUNK G	621	0.06	12.6	18	x	8	621
TRUNK B	319	0.06	9.8	12	x	8	479	TRUNK H	1955	0.05	20.3	38	x	10	741
TRUNK C	779	0.06	13.7	22	x	8	637	TRUNK I	0	0.00	0	0	x	8	0
TRUNK D	252	0.05	9.4	10	x	8	454	TRUNK J	0	0.00	0	0	x	8	0
TRUNK E	1336	0.05	17.6	28	x	10	687	TRUNK K	0	0.00	0	0	x	8	0
TRUNK F	385	0.06	10.5	14	x	8	495	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	1490	0.05	18.3	32	x	10	671
TRUNK Y	985	0.05	15.7	28	x	8	633
TRUNK Z	435	0.05	11.6	16	x	8	489
DROP	1955	0.05	20.3	24	x	18	652

RETURN AIR #	1	2	3	4	5	6	7	8	9							BR
	0	0	0	0	2@7"	0	0	0	0	0	0	0	0	0	0	
AIR VOLUME	115	135	130	115	240	200	350	320	85	0	0	0	0	0	0	265
PLENUM PRESSURE	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13
ACTUAL DUCT LGH.	84	51	62	59	47	49	30	51	61	1	1	1	1	1	1	14
EQUIVALENT LENGTH	200	135	155	185	135	140	170	195	165	0	0	0	0	0	0	145
TOTAL EFFECTIVE LH	284	186	217	244	182	189	200	246	226	1	1	1	1	1	1	159
ADJUSTED PRESSURE	0.05	0.07	0.06	0.05	0.07	0.07	0.07	0.05	0.06	13.36	13.36	13.36	13.36	13.36	13.36	0.08
ROUND DUCT SIZE	7	6.8	7	7	8.5	7.9	9.8	10.3	6	0	0	0	0	0	0	8.5
INLET GRILL SIZE	8	8	8	8	8	8	8	8	8	0	0	0	0	0	0	8
	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
INLET GRILL SIZE	14	14	14	14	30	14	30	30	14	0	0	0	0	0	0	24

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Michael O'Rourke — INDIVIDUAL BCIN: 19669 MICHAEL O'ROURKE

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TYPE: 5005 ELEV. 'B' & 'B CNR' - KNIGHTSWOOD LO # 85468
SITE NAME: PINE VALLEY & TESTON OPT. 5 BED + ELEVATOR + STAIR + WOB

RESIDENTIAL MECHANICAL VENTILATION DESIGN SUMMARY

COMBUSTION APPLIANCES 9.32.3.1(1)

- a) [✓] Direct vent (sealed combustion) only
- b) [ ] Positive venting induced draft (except fireplaces)
- c) [ ] Natural draft, B-vent or induced draft gas fireplace
- d) [ ] Solid Fuel (including fireplaces)
- e) [ ] No Combustion Appliances

HEATING SYSTEM

[✓] Forced Air [ ] Non Forced Air

[ ] Electric Space Heat

HOUSE TYPE 9.32.1(2)

- [✓] I Type a) or b) appliance only, no solid fuel
- [ ] II Type I except with solid fuel (including fireplaces)
- [ ] III Any Type c) appliance
- [ ] IV Type I, or II with electric space heat
- [ ] Other: Type I, II or IV no forced air

SYSTEM DESIGN OPTIONS O.N.H.W.P.

- [ ] 1 Exhaust only/Forced Air System
- [ ] 2 HRV with Ducting/Forced Air System
- [✓] 3 HRV Simplified/connected to forced air system
- [ ] 4 HRV with Ducting/non forced air system
- [ ] Part 6 Design

TOTAL VENTILATION CAPACITY 9.32.3.3(1)

Basement + Master Bedroom	2	@ 21.2 cfm	42.4	cfm
Other Bedrooms	4	@ 10.6 cfm	42.4	cfm
Kitchen & Bathrooms	7	@ 10.6 cfm	74.2	cfm
Other Rooms	7	@ 10.6 cfm	74.2	cfm
Table 9.32.3.A.		TOTAL	233.2	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	**95.4**	**cfm**

SUPPLEMENTAL VENTILATION CAPACITY 9.32.3.5.

Total Ventilation Capacity	233.2	cfm
Less Principal Ventil. Capacity	155	cfm
Required Supplemental Capacity	78.2	cfm

PRINCIPAL EXHAUST FAN CAPACITY

Model: VANEE 65H Location: BSMT

155.0 cfm 3.0 sones [✓] HVI Approved

PRINCIPAL EXHAUST HEAT LOSS CALCULATION

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

SUPPLEMENTAL FANS NUTONE

Location	Model	cfm	HVI	Sones
ENS	QTXEN050C	50	✓	0.3
ENS-2/5	QTXEN050C	50	✓	0.3
ENS-4	QTXEN050C	50	✓	0.3
PWD	QTXEN050C	50	✓	0.3

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: 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: February-20

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#: 85468 Model: 5005 ELEV. 'B' & 'B CNR' - KNIGHTSWOO Builder: GOLD PARK HOMES Date: 2020-02-26

Volume Calculation

House Volume

Level	Floor Area (ft²)	Floor Height (ft)	Volume (ft³)
Bsmt	2052	10	20520
First	2052	11	22572
Second	2360	10	23600
Third	0	9	0
Fourth	0	9	0
		Total:	66,692.0 ft³
		Total:	1888.5 m³

Air Change & Delta T Data

WINTER NATURAL AIR CHANGE RATE	0.416
SUMMER NATURAL AIR CHANGE RATE	0.139

Design Temperature Difference

	Tin °C	Tout °C	ΔT °C	ΔT °F
Winter DTDh	22	-20	42	76
Summer DTDc	24	31	7	13

5.2.3.1 Heat Loss due to Air Leakage

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

0.416 x 524.59 x 42 °C x 1.2 = 11053 W

= **37714 Btu/h**

6.2.6 Sensible Gain due to Air Leakage

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

= 0.139 x 524.59 x 7 °C x 1.2 = 624 W

= **2130 Btu/h**

5.2.3.2 Heat Loss due to Mechanical Ventilation

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

155 CFM x 76 °F x 1.08 x 0.25 = **3181 Btu/h**

6.2.7 Sensible heat Gain due to Ventilation

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

155 CFM x 13 °F x 1.08 x 0.25 = **536 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	37,714	11,779	1.601
2	0.3		22,004	0.514
3	0.2		20,351	0.371
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

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

HEAT LOSS AND GAIN SUMMARY SHEET

MODEL: 5005 ELEV. 'B' & 'B CNR' - KNIGHT OPT. 5 BED + ELEVATOR + STAIR + **BUILDER:** GOLD PARK HOMES
SFQT: 4412 **LO#** 85468 **SITE:** PINE VALLEY & TESTON

DESIGN ASSUMPTIONS

HEATING	°F	COOLING	°F
OUTDOOR DESIGN TEMP.	-4	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:	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):	66692.0	ASSUMED (Y/N):	Y
INTERNAL SHADING:	BLINDS/CURTAINS	ASSUMED OCCUPANTS:	6
INTERIOR LIGHTING LOAD (Btu/h/ft^2):	1.27	DC BRUSHLESS MOTOR (Y/N):	Y
FOUNDATION CONFIGURATION	BCIN_1	DEPTH BELOW GRADE:	7.0 ft
LENGTH: 77.0 ft	WIDTH: 42.0 ft	EXPOSED PERIMETER:	186.0 ft
WOB INSULATION CONFIGURATION	SCB_9	WOB EXPOSED PERIMETER	52.0 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	29.80
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

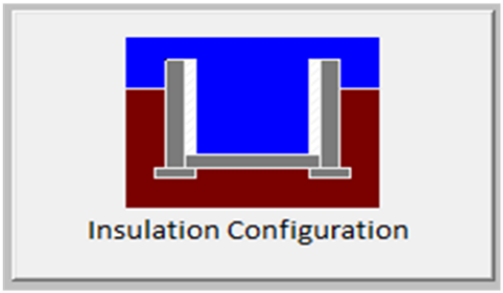
Michael O'Rourke

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 sand, loam, clay
Water Table:	Normal (7-10 m, 23-33 ft)

Foundation Dimensions		
Floor Length (m):	**4.6**	 Insulation Configuration
Floor Width (m):	**12.8**	
Exposed Perimeter (m):	**56.7**	
Wall Height (m):	**3.0**	
Depth Below Grade (m):	**1.84**	
Window Area (m^2):	**1.1**	
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):	**872**	

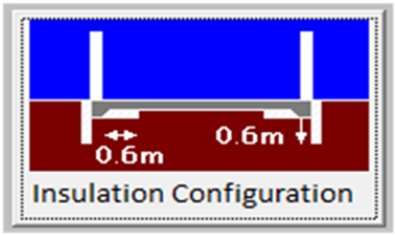
TYPE: 5005 ELEV. 'B' & 'B CNR' - KNIGHTSV OPT. 5 BED + ELEVATOR + STAIR + WOB
LO# 85468

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 sand, loam, clay
Water Table:	Normal (7-10 m, 23-33 ft)

Foundation Dimensions		
Length (m):	**1.5**	
Width (m):	**12.8**	
Exposed Perimeter (m):	**15.8**	

Radiant Slab		
Heated Fraction of the Slab:	**0**	
Fluid Temperature (°C):	**33**	
Design Months		
Heating Month	**1**	
Results		
Heating Load (Watts):	**217**	

TYPE: 5005 ELEV. 'B' & 'B CNR' - KNIGHTSW OPT. 5 BED + ELEVATOR + STAIR + WOB
LO# 85468

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

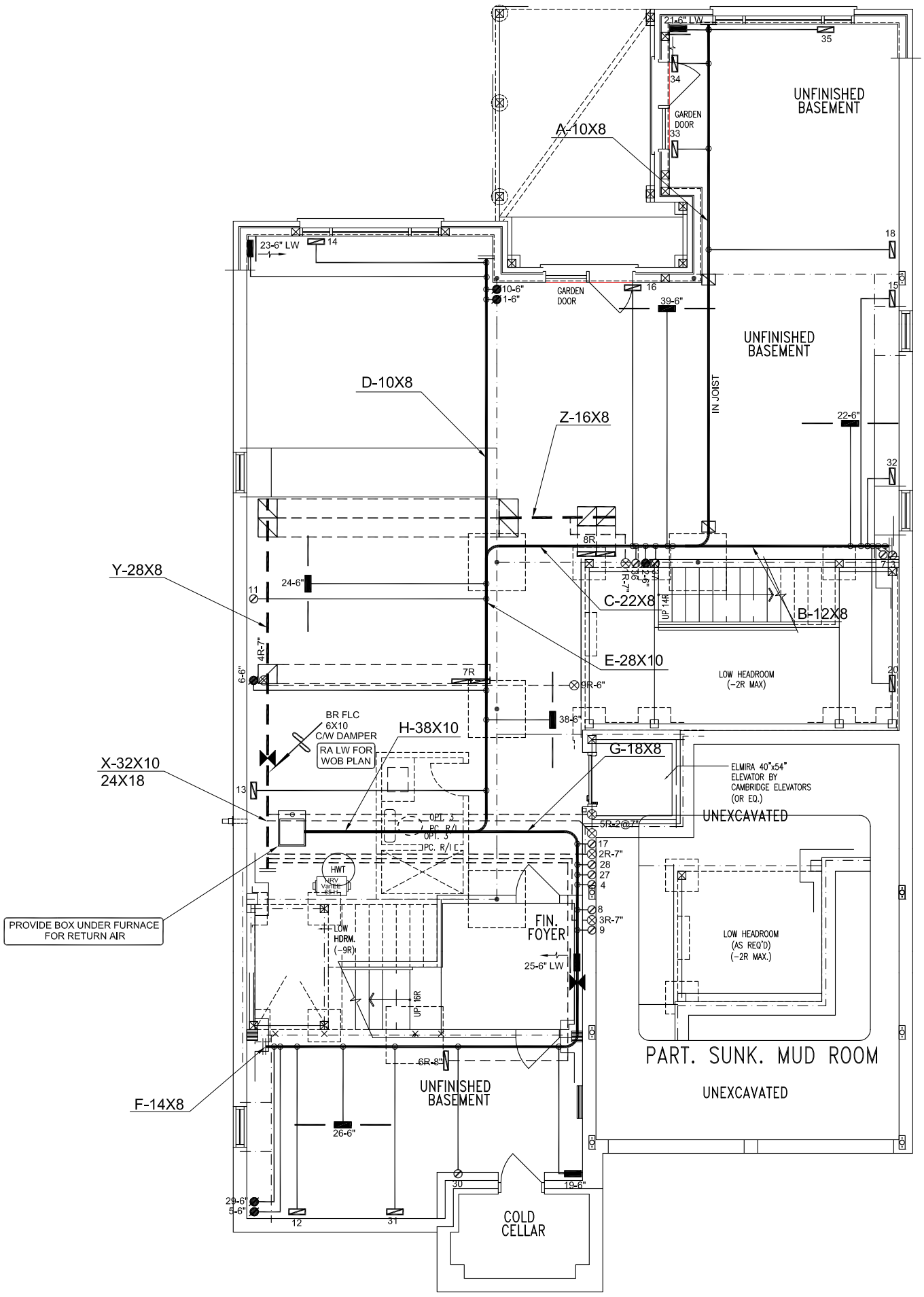
Air Infiltration Residential Load Calculator

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):	9.45
Building Configuration	
Type:	Detached
Number of Stories:	Two
Foundation:	Full
House Volume (m^3):	1888.5
Air Leakage/Ventilation	
Air Tightness Type:	Present (1961-) (3.57 ACH)
Custom BDT Data:	ELA @ 10 Pa. 2517.4 cm^2
	3.57 ACH @ 50 Pa
Mechanical Ventilation (L/s):	Total Supply 73.2 / Total Exhaust 73.2
Flue Size	
Flue #:	#1 #2 #3 #4
Diameter (mm):	0 0 0 0
Natural Infiltration Rates	
Heating Air Leakage Rate (ACH/H):	**0.416**
Cooling Air Leakage Rate (ACH/H):	**0.139**

TYPE: 5005 ELEV. 'B' & 'B CNR' - KNIGHTS OPT. 5 BED + ELEVATOR + STAIR + WOE

LO# 85468



PARTIAL BASEMENT PLAN, EL. '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

WOB | 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.		

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Client
GOLDPARK HOMES

Project Name
PINE VALLEY & TESTON
VAUGHAN, ONTARIO
KNIGHTSWOOD - WOB
OPT. 5 BED/ELEV/SERV STAIR
5005 ELEV. 'B' 4412 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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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.

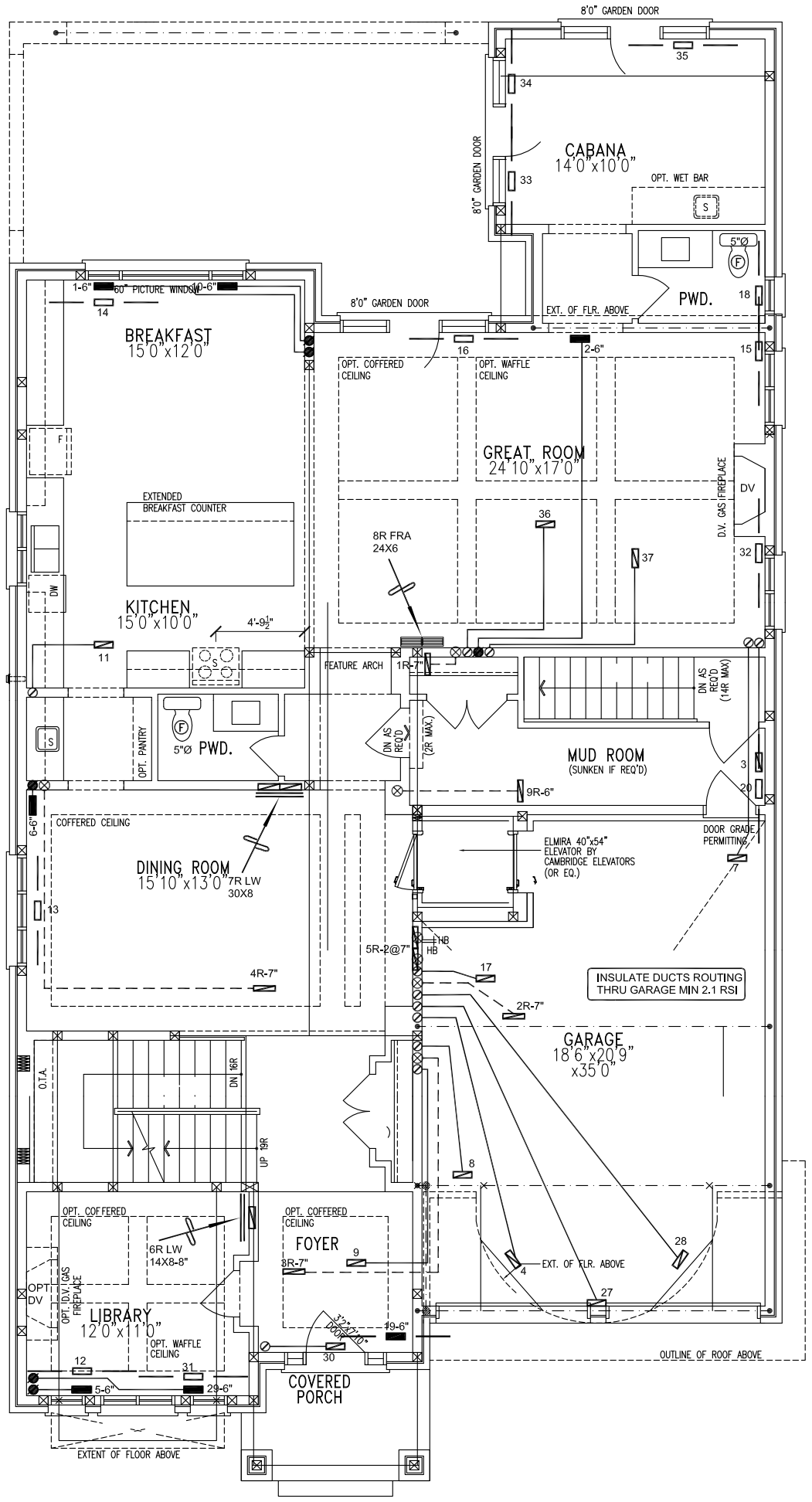
HEAT LOSS 97122 BTU/H	
UNIT DATA	
MAKE	LENNOX
MODEL	EL296UH110XE60C
INPUT	110 MBTU/H
OUTPUT	106 MBTU/H
COOLING	5.0 TONS
FAN SPEED	1955 cfm @ 0.6" w.c.

# OF RUNS	S/A	R/A	FANS
3RD FLOOR			
2ND FLOOR	18	6	6
1ST FLOOR	13	3	3
BASEMENT	8	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 FEB/2020
Scale 1/8" = 1'-0"
BCIN# 19669
LO# 85468



PARTIAL GROUND FLOOR PLAN, EL. '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

WOB | 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.		

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Client

GOLDPARK HOMES

Project Name

PINE VALLEY & TESTON
VAUGHAN, ONTARIO
KNIGHTSWOOD - WOB
OPT. 5 BED/ELEV/SERV STAIR
5005 ELEV. 'B' 4412 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

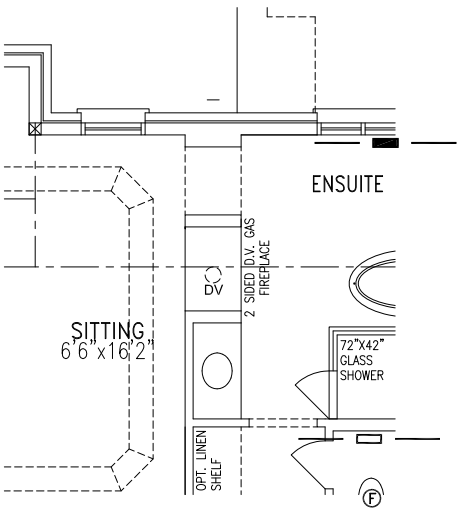
FIRST FLOOR HEATING LAYOUT

Date FEB/2020

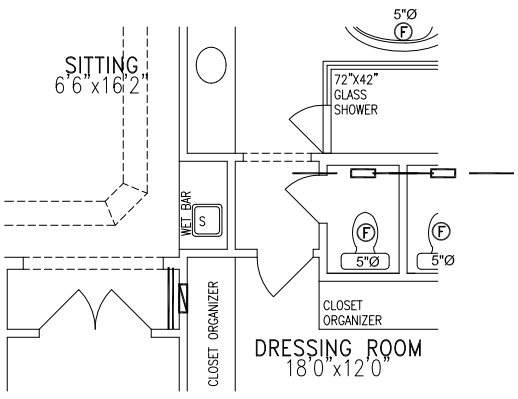
Scale 1/8" = 1'-0"

BCIN# 19669

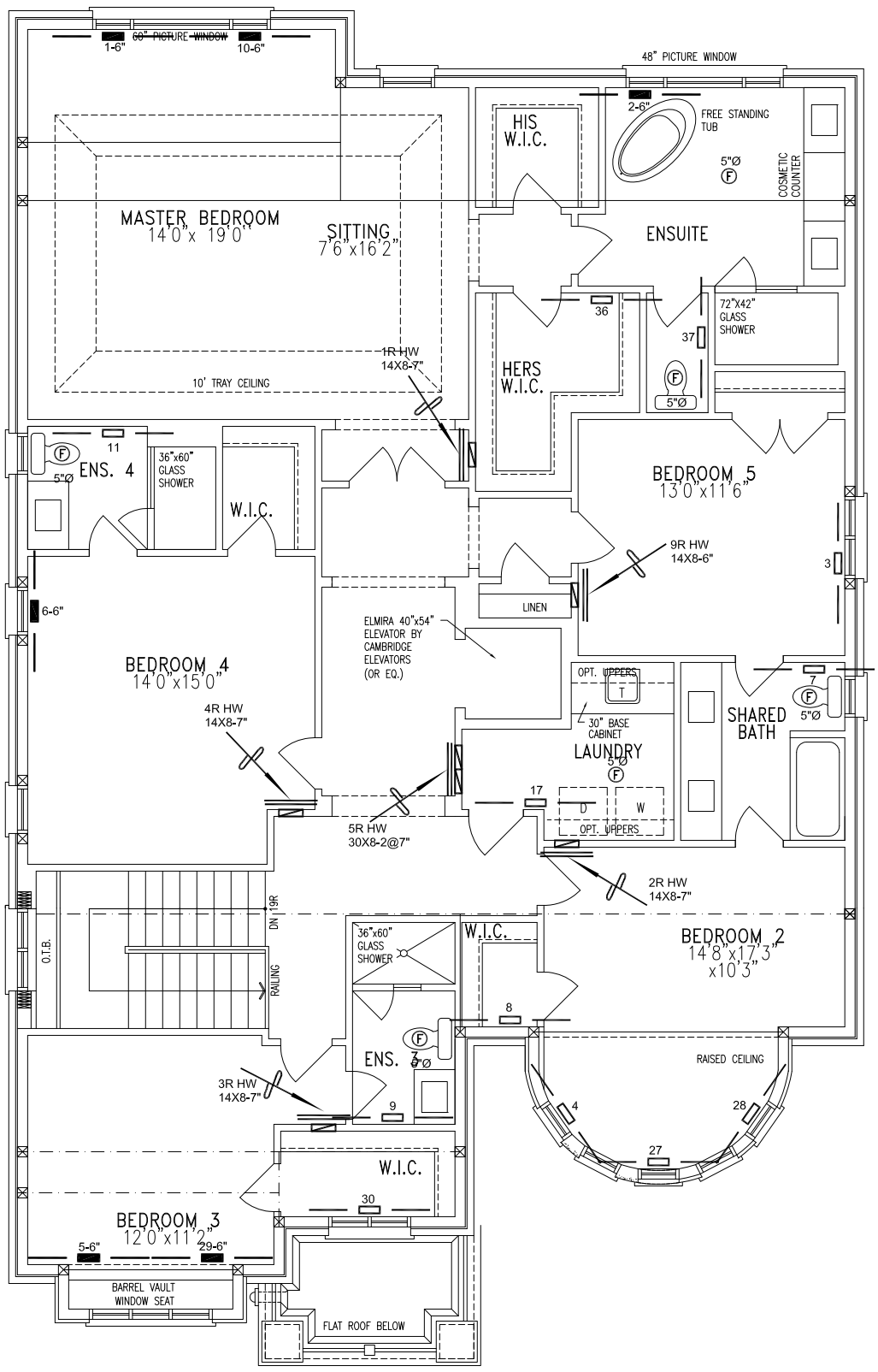
LO# 85468



PART. SECOND FLOOR PLAN
OPT. SITTING AREA FIREPLACE



PART. SECOND FLOOR PLAN
OPT. SITTING AREA WET BAR



SECOND FLOOR PLAN, EL. '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

WOB | 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.		

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Client
GOLDPARK HOMES

Project Name
PINE VALLEY & TESTON
VAUGHAN, ONTARIO
KNIGHTSWOOD - WOB
OPT. 5 BED/ELEV/SERV STAIR
5005 ELEV. 'B' 4412 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
SECOND FLOOR HEATING LAYOUT

Date FEB/2020
Scale 1/8" = 1'-0"
BCIN# 19669
LO# 85468

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**		
VAUGHAN (WOODBRIDGE)				

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:** 5005 ELEV. 'B' & 'B CNR' KNIGHTSWOOD - OPT. ELEVATOR / STAIR **Project:** PINE VALLEY & TESTON

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.

February 26, 2020
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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Tel: 905.619.2300 Fax: 905.619.2375
Web: www.hvacdesigns.ca E-mail: info@hvacdesigns.ca

SITE NAME: PINE VALLEY & TESTON | KNIGHTSWOOD - OPT. ELEVATOR / STAIR | DATE: Feb-20 | WINTER NATURAL AIR CHANGE RATE 0.350 | HEAT LOSS ΔT °F. 76 | CSA-F280-12

BUILDER: GOLD PARK HOMES | TYPE: 5005 ELEV. 'B' & 'B CNR' | GFA: 4412 | LO# 85465 | SUMMER NATURAL AIR CHANGE RATE 0.121 | HEAT GAIN ΔT °F. 14 | SB-12 PACKAGE A1

ROOM USE			MBR			ENS			WIC			BED-2			BED-3			BED-4			ENS-2			WIC-2			ENS-3			ENS-4			WIC-3		
EXP. WALL			46			36			13			34			36			19			8			3			4			7			14		
CLG. HT.			11			10			10			11			11			10			10			10			10			10			10		
	FACTORS																																		
GRS.WALL AREA	LOSS	GAIN	506			360			130			374			396			190			80			30			40			70			140		
GLAZING				LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN
NORTH	21.3	16.3	0	0	0	0	0	0	6	128	98	0	0	0	0	0	0	0	0	0	8	170	130	0	0	0	0	0	0	0	0	0	0	0	0
EAST	21.3	41.8	0	0	0	0	0	0	0	0	0	65	1383	2719	50	1064	2092	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	20	426	837
SOUTH	21.3	25.2	19	404	478	0	0	0	0	0	0	0	0	0	12	255	302	44	936	1108	0	0	0	0	0	0	0	0	0	9	192	227	0	0	0
WEST	21.3	41.8	50	1064	2092	34	724	1422	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
SKYLT.	37.2	102.0	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	0	0	0	0	0	0	0
DOORS	25.2	4.6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
NET EXPOSED WALL	4.5	0.8	437	1950	354	326	1455	264	124	553	100	309	1379	250	334	1491	271	146	652	118	72	321	58	30	134	24	40	179	32	61	272	49	120	536	97
NET EXPOSED BSMT WALL ABOVE GR	3.6	0.7	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	0	0	0	0	0	0
EXPOSED CLG	1.3	0.6	533	684	322	323	415	195	207	266	125	175	225	106	249	320	151	285	366	172	60	77	36	40	51	24	92	118	56	105	135	63	53	68	32
NO ATTIC EXPOSED CLG	2.7	1.3	0	0	0	0	0	0	0	0	0	78	214	101	18	49	23	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	25	64	12	253	645	117	18	46	8	0	0	0	60	153	28	40	102	19	0	0	0	0	0	0	0	0	0
BASEMENT/CRAWL HEAT LOSS				0			0			0			0			0			0			0			0			0			0			0	
SLAB ON GRADE HEAT LOSS				0			0			0			0			0			0			0			0			0			0			0	
SUBTOTAL HT LOSS				4103			2593			1010			3846			3225			1954			722			287			297			598			1029	
SUB TOTAL HT GAIN					3246			1882			335			3293			2847			1398			252			67			88			340			966
LEVEL FACTOR / MULTIPLIER			0.20	0.33		0.20	0.33		0.20	0.33		0.20	0.33		0.20	0.33		0.20	0.33		0.20	0.33		0.20	0.33		0.20	0.33		0.20	0.33		0.20	0.33	
AIR CHANGE HEAT LOSS				1343			849			331			1259			1056			640			236			94			97			196			337	
AIR CHANGE HEAT GAIN					260			151			27			264			228			112			20			5			7			27			77
DUCT LOSS				0			0			134			511			428			0			96			38			0			0			0	
DUCT GAIN					0			0			78			422			374			0			70			50			0			0			0
HEAT GAIN PEOPLE	240		2		480	0		0	0		0	1		240	1		240	1		240	0		0	0		0	0		0	0		0	0		0
HEAT GAIN APPLIANCES/LIGHTS					423			423			423			423			423			423			423			423			423			423			423
TOTAL HT LOSS BTU/H				5446			3442			1475			5616			4709			2593			1054			419			394			794			1366	
TOTAL HT GAIN x 1.3 BTU/H					5732			3192			1122			6035			5345			2825			994			708			673			1026			1906

ROOM USE			LIB			DIN			KIT/GT			CAB			LAUN			PWD			FOY			MUD									LOD			BAS		
EXP. WALL			31			32			77			45			0			5			35			32									52			238		
CLG. HT.			11			11			11			11			10			11			11			12									10			10		
	FACTORS																																				
GRS.WALL AREA	LOSS	GAIN	341			352			847			495			0			55			385			384									520			1978		
GLAZING				LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN								LOSS	GAIN		LOSS	GAIN
NORTH	21.3	16.3	0	0	0	0	0	0	46	979	748	0	0	0	0	0	0	9	192	146	0	0	0	0	0	0							0	0	0	6	128	98
EAST	21.3	41.8	56	1192	2343	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
SOUTH	21.3	25.2	0	0	0	34	724	856	21	447	529	63	1341	1586	0	0	0	0	0	0	0	0	0	0	0	0							0	0	0	6	128	151
WEST	21.3	41.8	0	0	0	0	0	0	115	2447	4811	63	1341	2635	0	0	0	0	0	0	0	0	0	0	0	0							22	468	920	0	0	0
SKYLT.	37.2	102.0	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	0	0	0	0
DOORS	25.2	4.6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	56	1414	257	20	505	92							0	0	0	20	505	92
NET EXPOSED WALL	4.5	0.8	285	1272	231	318	1419	258	665	2968	539	369	1647	299	0	0	0	46	205	37	329	1468	267	364	1624	295							0	0	0	0	0	0
NET EXPOSED BSMT WALL ABOVE GR	3.6	0.7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0							290	1044	189	402	1447	263
EXPOSED CLG	1.3	0.6	0	0	0	0	0	0	0	0	0	0	0	0	142	182	86	0	0	0	0	0	0	0	0	0							0	0	0	0	0	0
NO ATTIC EXPOSED CLG	2.7	1.3	0	0	0	0	0	0	0	0	0	203	558	263	0	0	0	40	110	52	41	113	53	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	56	143	26	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			0											8373		
SLAB ON GRADE HEAT LOSS				0			0			0			0			0			0			0			0										0			
SUBTOTAL HT LOSS				2464			2143			6841			4886			325			507			2995			2129										1512			10580		
SUB TOTAL HT GAIN					2574			1114			6626			4784			112			235			576			387										1110			603
LEVEL FACTOR / MULTIPLIER			0.30	0.45		0.30	0.45		0.30	0.45		0.30	0.45		0.20	0.33		0.30	0.45		0.30	0.45		0.30	0.45											0.50	1.35	
AIR CHANGE HEAT LOSS				1101			957			3057			2183			106			226			1338			952												16358		
AIR CHANGE HEAT GAIN					206			89			531			383			9			19			46			31													137
DUCT LOSS				0			0			0			0			43			0			0			0												0		
DUCT GAIN					0			0			0			0			54			0			0			0													0
HEAT GAIN PEOPLE	240		0		0	0		0	0		0	0		0	0		0	0		0	0		0	0		0							0		0	0		0
HEAT GAIN APPLIANCES/LIGHTS					423			423			423			423			423			423			423			423									0			423
TOTAL HT LOSS BTU/H				3564			3100			9898			7069			475			733			4333			3081										1512			26938		
TOTAL HT GAIN x 1.3 BTU/H					4163			2114			9854			7267			777			880			1359			1093										1443			1512

TOTAL HEAT GAIN BTU/H: 60597 | TONS: 5.05 | LOSS DUE TO VENTILATION LOAD BTU/H: 3181 | STRUCTURAL HEAT LOSS: 88010 | TOTAL COMBINED HEAT LOSS BTU/H: 91191

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: PINE VALLEY & TESTON — KNIGHTSWOOD - OPT. ELEVATOR / STAIR
BUILDER: GOLD PARK HOMES — TYPE: 5005 ELEV. 'B' & 'B CNR' — DATE: Feb-20 — GFA: 4412 — LO# 85465

HEATING CFM	1955		COOLING CFM	1955			furnace pressure	0.6																
TOTAL HEAT LOSS	88,010		TOTAL HEAT GAIN	60,019			furnace filter	0.08									^LENNOX		AFUE = 96 %					
AIR FLOW RATE CFM	22.21		AIR FLOW RATE CFM	32.57			a/c coil pressure	0.2									EL296UH110XE60C	110	INPUT (BTU/H) = 110,000					
							available pressure										FAN SPEED		OUTPUT (BTU/H) = **106,000**					
							for s/a & r/a	0.32									LOW	0						
RUN COUNT	4th	3rd	2nd	1st	Bas												MEDLOW	1380	DESIGN CFM = **1955**					
S/A	0	0	18	13	7		plenum pressure s/a	0.17		r/a pressure	0.15						MEDIUM	1505	CFM @ .6 " E.S.P.					
R/A	0	0	5	3	1		max s/a dif press. loss	0.02		r/a grille press. Loss	0.02						MEDIUM HIGH	1685						
All S/A diffusers 4"x10" unless noted otherwise on layout.							min adjusted pressure s/a	0.15		adjusted pressure r/a	0.13						HIGH	1955	TEMPERATURE RISE 50 °F					
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	ENS-2	WIC-2	ENS-3	MBR	ENS-4	LIB	DIN	KIT/GT	KIT/GT	KIT/GT	LAUN	PWD	FOY	MUD	BAS	BAS	BAS	BAS
RM LOSS MBH.	2.72	2.75	1.48	1.87	2.35	2.59	1.05	0.42	0.39	2.72	0.79	1.78	3.10	2.47	2.47	2.47	0.47	0.73	4.33	3.08	4.06	4.06	4.06	4.06
CFM PER RUN HEAT	60	61	33	42	52	58	23	9	9	60	18	40	69	55	55	55	11	16	96	68	90	90	90	90
RM GAIN MBH.	2.87	2.46	1.12	2.01	2.67	2.83	0.99	0.71	0.67	2.87	1.03	2.08	2.11	2.46	2.46	2.46	0.78	0.88	1.36	1.09	0.42	0.42	0.42	0.42
CFM PER RUN COOLING	93	80	37	66	87	92	32	23	22	93	33	68	69	80	80	80	25	29	44	36	14	14	14	14
ADJUSTED PRESSURE	0.15	0.16	0.16	0.16	0.15	0.15	0.16	0.16	0.16	0.15	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.15	0.16	0.15	0.15	0.15	0.15
ACTUAL DUCT LGH.	70	70	68	49	70	48	79	48	53	64	59	57	29	52	69	54	36	73	40	65	67	60	54	38
EQUIVALENT LENGTH	200	200	150	160	160	160	150	150	170	170	150	140	103	120	130	110	200	170	210	190	150	120	103	90
TOTAL EFFECTIVE LENGTH	270	270	218	209	230	208	229	198	223	234	209	197	132	172	199	164	236	243	250	255	217	180	157	128
ADJUSTED PRESSURE	0.05	0.06	0.07	0.07	0.06	0.07	0.07	0.08	0.07	0.06	0.07	0.08	0.12	0.09	0.08	0.1	0.07	0.06	0.06	0.06	0.07	0.08	0.09	0.11
ROUND DUCT SIZE	**6**	**6**	4	5	**6**	**6**	4	4	4	**6**	4	5	5	5	5	5	4	4	**6**	**6**	**6**	**6**	**6**	**6**
HEATING VELOCITY (ft/min)	306	311	379	308	265	296	264	103	103	306	207	294	507	404	404	404	126	184	489	347	459	459	459	459
COOLING VELOCITY (ft/min)	474	408	424	485	444	469	367	264	252	474	379	499	507	587	587	587	287	333	224	184	71	71	71	71
OUTLET GRILL SIZE	4X10	4X10	3X10	3X10	4X10	4X10	3X10	3X10	3X10	4X10	3X10	3X10	3X10	3X10	3X10	3X10	3X10	3X10	4X10	4X10	4X10	4X10	4X10	4X10
TRUNK	D	C	B	G	F	E	B	G	G	D	E	F	E	D	B	C	E	A	F	B	A	B	D	E

RUN #	25	26	27	28	29	30	31	32	33	34	35	36	37	38
ROOM NAME	BAS	BAS	BED-2	BED-2	BED-3	WIC-3	LIB	KIT/GT	CAB	CAB	CAB	ENS	ENS	BAS
RM LOSS MBH.	4.06	4.06	1.87	1.87	2.35	1.37	1.78	2.47	2.36	2.36	2.36	0.35	0.35	4.06
CFM PER RUN HEAT	90	90	42	42	52	30	40	55	52	52	52	8	8	90
RM GAIN MBH.	0.42	0.42	2.01	2.01	2.67	1.91	2.08	2.46	2.42	2.42	2.42	0.36	0.36	0.42
CFM PER RUN COOLING	14	14	66	66	87	62	68	80	79	79	79	12	12	14
ADJUSTED PRESSURE	0.15	0.15	0.16	0.16	0.15	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.15
ACTUAL DUCT LGH.	34	50	52	55	75	58	51	55	69	71	82	56	58	23
EQUIVALENT LENGTH	110	150	170	160	160	190	160	120	150	130	140	200	190	140
TOTAL EFFECTIVE LENGTH	144	200	222	215	235	248	211	175	219	201	222	256	248	163
ADJUSTED PRESSURE	0.1	0.07	0.07	0.07	0.06	0.06	0.07	0.09	0.07	0.08	0.07	0.06	0.06	0.09
ROUND DUCT SIZE	**6**	**6**	5	5	**6**	5	5	5	**6**	**6**	**6**	4	4	**6**
HEATING VELOCITY (ft/min)	459	459	308	308	265	220	294	404	265	265	265	92	92	459
COOLING VELOCITY (ft/min)	71	71	485	485	444	455	499	587	403	403	403	138	138	71
OUTLET GRILL SIZE	4X10	4X10	3X10	3X10	4X10	3X10	3X10	3X10	4X10	4X10	4X10	3X10	3X10	4X10
TRUNK	G	F	G	G	F	F	F	B	A	A	A	C	C	E

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	262	0.06	9.1	10	x	8	472		TRUNK G	634	0.06	12.7	18	x	8	634
TRUNK B	324	0.06	9.9	12	x	8	486		TRUNK H	1955	0.05	20.3	38	x	10	741
TRUNK C	718	0.06	13.3	20	x	8	646		TRUNK I	0	0.00	0	0	x	8	0
TRUNK D	265	0.05	9.6	10	x	8	477		TRUNK J	0	0.00	0	0	x	8	0
TRUNK E	1319	0.05	17.5	28	x	10	678		TRUNK K	0	0.00	0	0	x	8	0
TRUNK F	400	0.06	10.7	14	x	8	514		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	1490	0.05	18.3	32	x	10	671
TRUNK Y	940	0.05	15.4	28	x	8	604
TRUNK Z	455	0.05	11.7	16	x	8	512
DROP	1955	0.05	20.3	24	x	18	652

RETURN AIR #	1	2	3	4	5	6	7	8								**BR**
	0	0	0	0	2@7"	0	0	0	0	0	0	0	0	0	0	
AIR VOLUME	115	135	130	115	240	200	370	340	0	0	0	0	0	0	0	310
PLENUM PRESSURE	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13
ACTUAL DUCT LGH.	84	51	62	59	47	49	30	51	1	1	1	1	1	1	1	14
EQUIVALENT LENGTH	200	135	155	185	135	140	170	195	0	0	0	0	0	0	0	145
TOTAL EFFECTIVE LH	284	186	217	244	182	189	200	246	1	1	1	1	1	1	1	159
ADJUSTED PRESSURE	0.05	0.07	0.06	0.05	0.07	0.07	0.07	0.05	13.36	13.36	13.36	13.36	13.36	13.36	13.36	0.08
ROUND DUCT SIZE	7	6.8	7	7	8.5	7.9	10	10.5	0	0	0	0	0	0	0	9
INLET GRILL SIZE	8	8	8	8	8	8	8	8	0	0	0	0	0	0	0	8
	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
INLET GRILL SIZE	14	14	14	14	30	14	30	30	0	0	0	0	0	0	0	30

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: 5005 ELEV. 'B' & 'B CNR' LO # 85465
SITE NAME: PINE VALLEY & TESTON KNIGHTSWOOD - OPT. ELEVATOR / STAIR

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	7	@ 10.6 cfm	74.2	cfm
Other Rooms	8	@ 10.6 cfm	84.8	cfm
Table 9.32.3.A.		TOTAL	233.2	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	233.2	cfm
Less Principal Ventil. Capacity	155	cfm
Required Supplemental Capacity	78.2	cfm

PRINCIPAL EXHAUST FAN CAPACITY

Model: VANEE 65H Location: BSMT

155.0 cfm 3.0 sones [✓] HVI Approved

PRINCIPAL EXHAUST HEAT LOSS CALCULATION

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

SUPPLEMENTAL FANS NUTONE

Location	Model	cfm	HVI	Sones
ENS	QTXEN050C	50	✓	0.3
ENS-2	QTXEN050C	50	✓	0.3
ENS-4	QTXEN050C	50	✓	0.3
PWD	QTXEN050C	50	✓	0.3

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: 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: February-20

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#: 85465 Model: 5005 ELEV. 'B' & 'B CNR' Builder: GOLD PARK HOMES Date: 2020-02-26

Volume Calculation

House Volume

Level	Floor Area (ft²)	Floor Height (ft)	Volume (ft³)
Bsmt	2149	10	21490
First	2149	11	23639
Second	2360	10	23600
Third	0	9	0
Fourth	0	9	0
		Total:	68,729.0 ft³
		Total:	1946.2 m³

Air Change & Delta T Data

WINTER NATURAL AIR CHANGE RATE	0.350
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	23	31	8	14

5.2.3.1 Heat Loss due to Air Leakage

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

0.350 x 540.61 x 42 °C x 1.2 = 9589 W

= **32716 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 540.61 x 8 °C x 1.2 = 602 W

= **2054 Btu/h**

5.2.3.2 Heat Loss due to Mechanical Ventilation

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

155 CFM x 76 °F x 1.08 x 0.25 = **3181 Btu/h**

6.2.7 Sensible heat Gain due to Ventilation

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

155 CFM x 14 °F x 1.08 x 0.25 = **578 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	32,716	12,091	1.353
2	0.3		21,964	0.447
3	0.2		19,989	0.327
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

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

HEAT LOSS AND GAIN SUMMARY SHEET

MODEL: 5005 ELEV. 'B' & 'B CNR' KNIGHTSWOOD - OPT. ELEVATOR **BUILDER:** GOLD PARK HOMES
SFQT: 4412 **LO#** 85465 **SITE:** PINE VALLEY & TESTON

DESIGN ASSUMPTIONS

HEATING	°F	COOLING	°F
OUTDOOR DESIGN TEMP.	-4	OUTDOOR DESIGN TEMP.	88
INDOOR DESIGN TEMP.	72	INDOOR DESIGN TEMP. (MAX 75°F)	74

BUILDING DATA

ATTACHMENT:	DETACHED	# 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):	68729.0	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:	7.0 ft
LENGTH: 77.0 ft	WIDTH: 42.0 ft	EXPOSED PERIMETER:	238.0 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	29.80
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

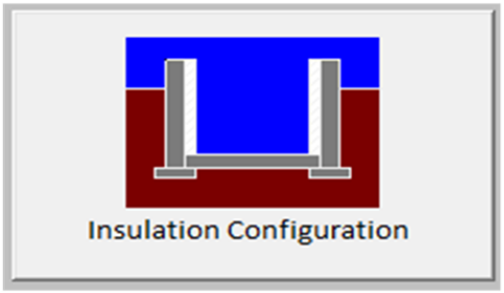


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905-619-2300

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 sand, loam, clay
Water Table:	Normal (7-10 m, 23-33 ft)

Foundation Dimensions		
Floor Length (m):	**23.5**	 Insulation Configuration
Floor Width (m):	**12.8**	
Exposed Perimeter (m):	**0.0**	
Wall Height (m):	**3.0**	
Depth Below Grade (m):	**2.13**	
Window Area (m^2):	**3.2**	
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):	**2453**	

TYPE: 5005 ELEV. 'B' & 'B CNR' KNIGHTSWOOD - OPT. ELEVATOR / STAIR
LO# 85465

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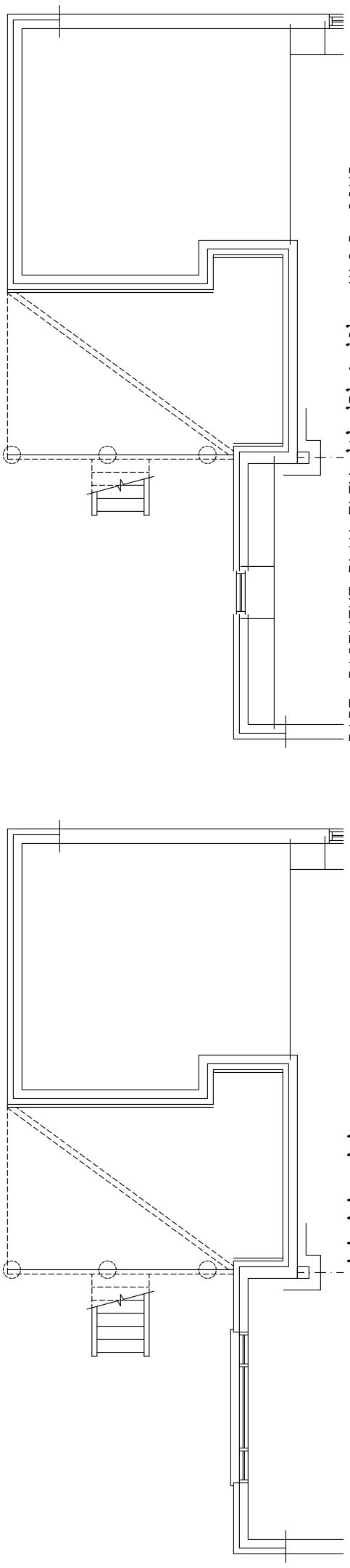
Air Infiltration Residential Load Calculator

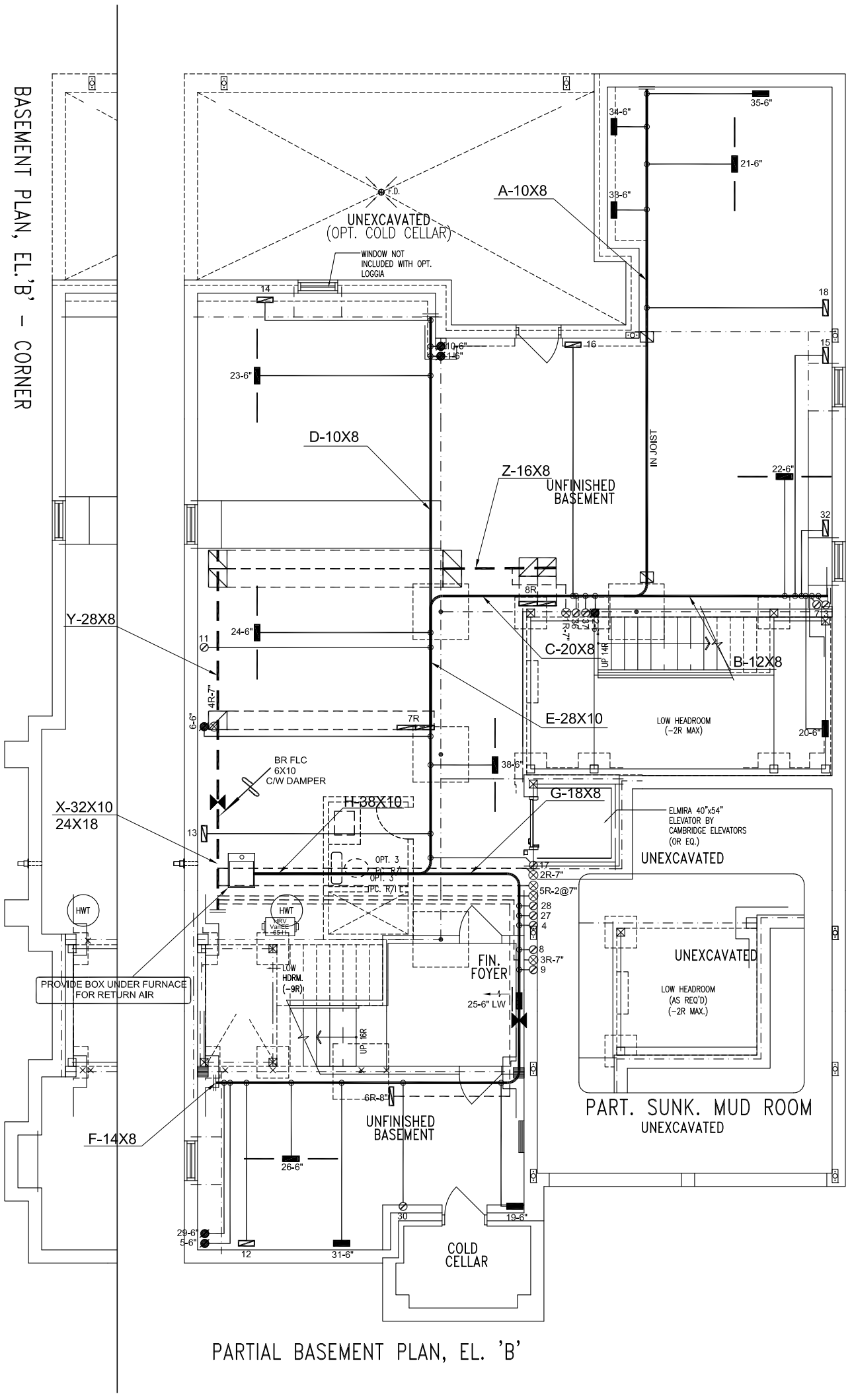
Supplemental tool for CAN/CSA-F280

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):	7.32
Building Configuration	
Type:	Detached
Number of Stories:	Two
Foundation:	Full
House Volume (m^3):	1946.2
Air Leakage/Ventilation	
Air Tightness Type:	Present (1961-) (3.57 ACH)
Custom BDT Data:	ELA @ 10 Pa. 2594.3 cm^2
	3.57 ACH @ 50 Pa
Mechanical Ventilation (L/s):	Total Supply 73.2 / Total Exhaust 73.2
Flue Size	
Flue #:	#1 #2 #3 #4
Diameter (mm):	0 0 0 0
Natural Infiltration Rates	
Heating Air Leakage Rate (ACH/H):	**0.350**
Cooling Air Leakage Rate (ACH/H):	**0.121**

TYPE: 5005 ELEV. 'B' & 'B CNR' KNIGHTSWOOD - OPT. ELEVATOR / STA

LO# 85465





PARTIAL BASEMENT PLAN, EL. '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.		

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Client

GOLDPARK HOMES

Project Name

PINE VALLEY & TESTON
VAUGHAN, ONTARIO
KNIGHTSWOOD
OPT. ELEVATOR - SERV STAIR
5005 ELEV. 'B' & CNR 4509 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 91191 BTU/H		
UNIT DATA		
MAKE	LENNOX	
MODEL	EL296UH110XE60C	
INPUT	110	MBTU/H
OUTPUT	106	MBTU/H
COOLING	5.0	TONS
FAN SPEED	1955	cfm @ 0.6" w.c.

# OF RUNS	S/A	R/A	FANS
3RD FLOOR			
2ND FLOOR	18	5	7
1ST FLOOR	13	3	3
BASEMENT	7	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

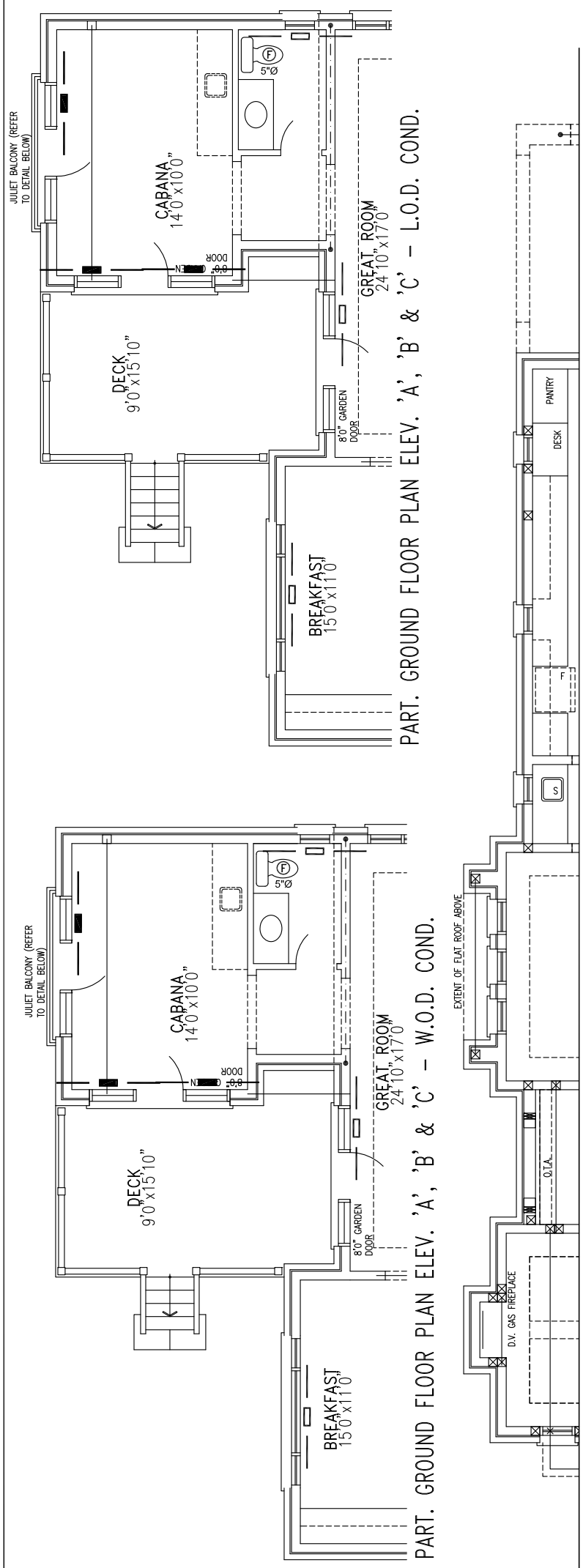
BASEMENT HEATING LAYOUT

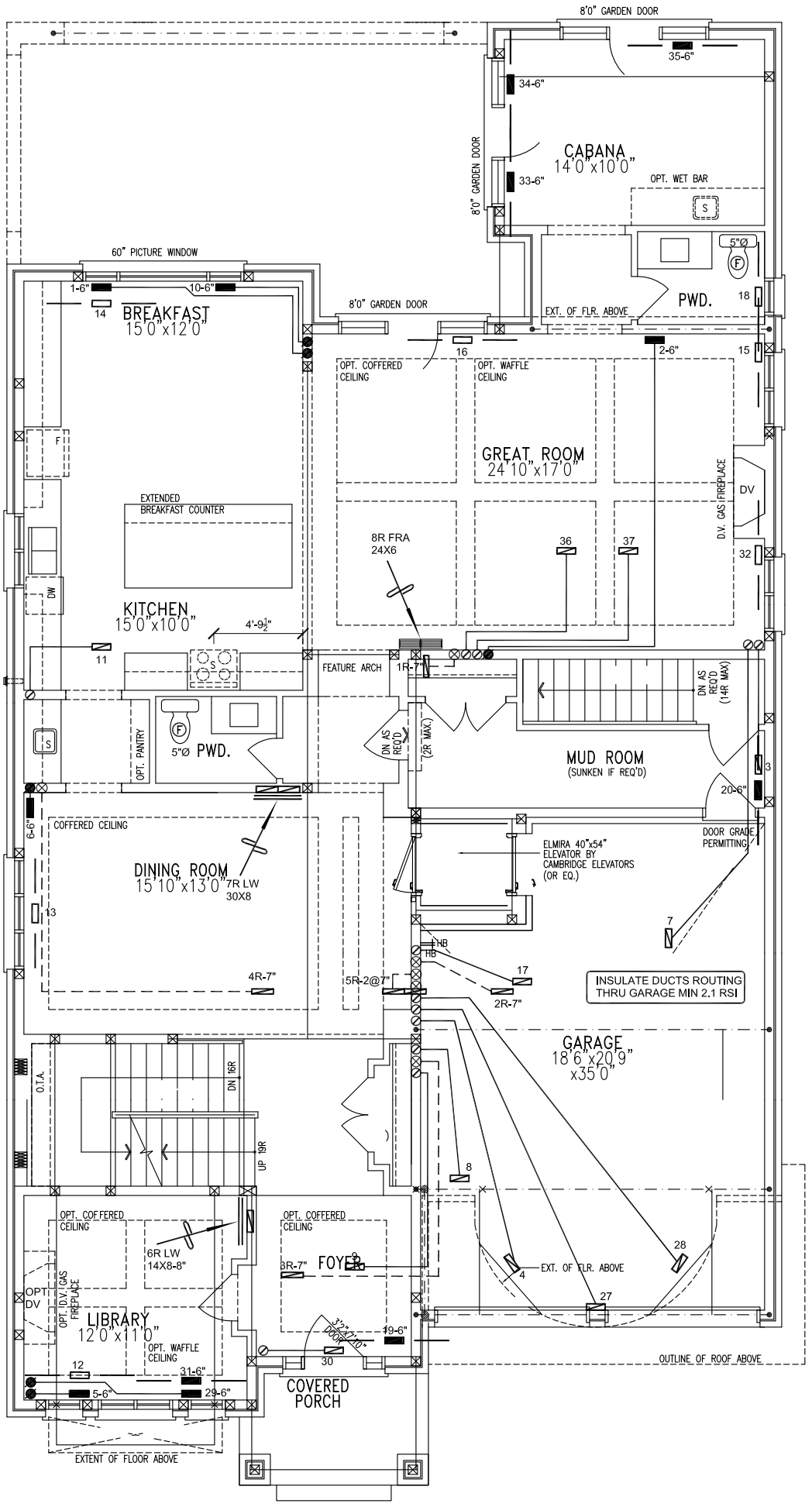
Date FEB/2020

Scale 1/8" = 1'-0"

BCIN# 19669

LO# 85465





PARTIAL GROUND FLOOR PLAN, EL. '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
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Client

GOLDPARK HOMES

Project Name

PINE VALLEY & TESTON
VAUGHAN, ONTARIO
KNIGHTSWOOD
OPT. ELEVATOR - SERV STAIR
5005 ELEV. 'B' & CNR 4509 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

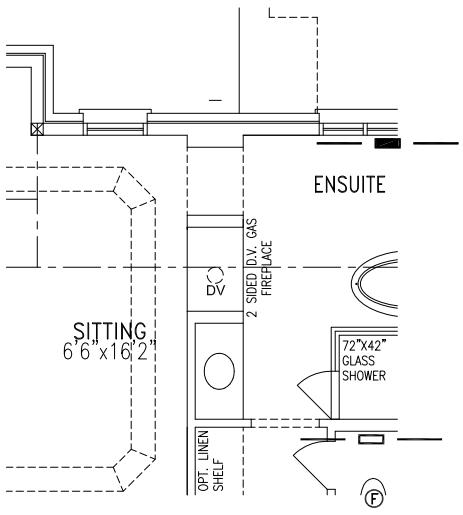
FIRST FLOOR HEATING LAYOUT

Date FEB/2020

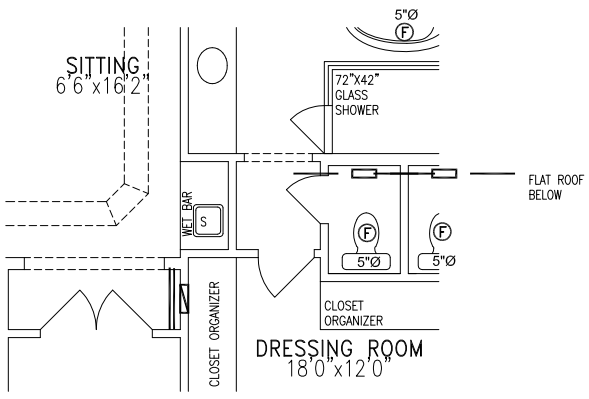
Scale 1/8" = 1'-0"

BCIN# 19669

LO# 85465

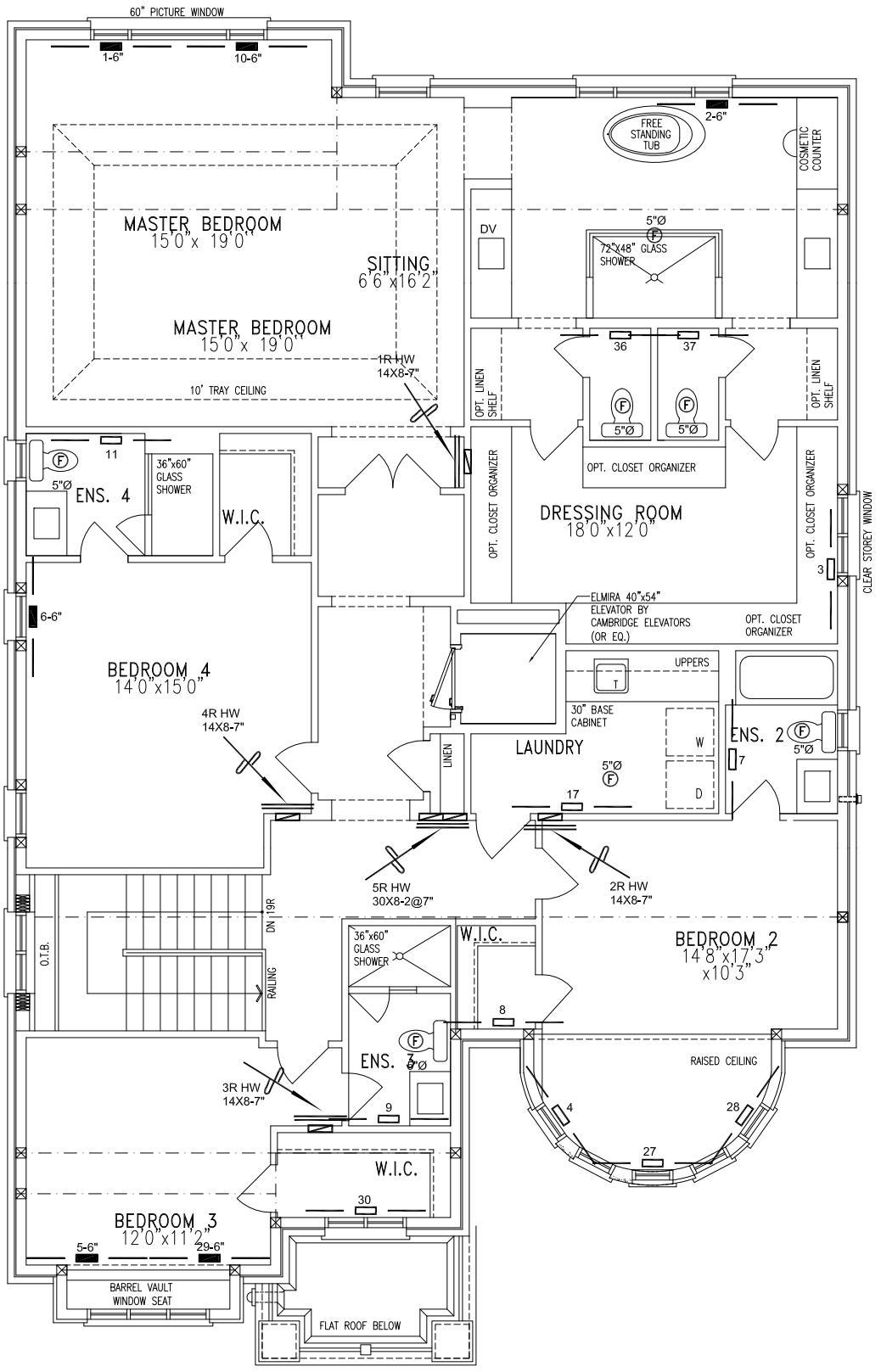


PART. SECOND FLOOR PLAN
OPT. SITTING AREA FIREPLACE



PART. SECOND FLOOR PLAN
OPT. SITTING AREA WET BAR

SECOND FLOOR PLAN, EL.'B' - CORNER



SECOND FLOOR PLAN, EL. '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
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Client

GOLDPARK HOMES

Project Name

PINE VALLEY & TESTON
VAUGHAN, ONTARIO
KNIGHTSWOOD
OPT. ELEVATOR - SERV STAIR
5005 ELEV. 'B' & CNR 4509 sqft

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Sheet Title

SECOND FLOOR HEATING LAYOUT

Date FEB/2020

Scale 1/8" = 1'-0"

BCIN# 19669

LO# 85465

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**		
VAUGHAN (WOODBRIDGE)				

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:** 5005 'B' & 'B CNR' KNIGHTSWOOD - OPT. ELEV - WOB **Project:** PINE VALLEY & TESTON

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.

February 26, 2020
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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Tel: 905.619.2300 Fax: 905.619.2375
Web: www.hvacdesigns.ca E-mail: info@hvacdesigns.ca

SITE NAME: PINE VALLEY & TESTON | KNIGHTSWOOD - OPT. ELEV - WOB | DATE: Feb-20 | WINTER NATURAL AIR CHANGE RATE 0.416 | HEAT LOSS ΔT °F. 76 | CSA-F280-12

BUILDER: GOLD PARK HOMES | TYPE: 5005 'B' & 'B CNR' | GFA: 4412 | LO# 79987 | SUMMER NATURAL AIR CHANGE RATE 0.139 | HEAT GAIN ΔT °F. 13 | SB-12 PACKAGE A1

ROOM USE			MBR			ENS			WIC			BED-2			BED-3			BED-4			ENS-2			WIC-2			ENS-3			ENS-4			WIC-3		
EXP. WALL			46			36			13			34			36			19			8			3			4			7			14		
CLG. HT.			11			10			10			11			11			10			10			10			10			10			10		
	FACTORS																																		
GRS.WALL AREA	LOSS	GAIN	506			360			130			374			396			190			80			30			40			70			140		
GLAZING			LOSS		GAIN	LOSS		GAIN	LOSS		GAIN	LOSS		GAIN	LOSS		GAIN	LOSS		GAIN	LOSS		GAIN	LOSS		GAIN	LOSS		GAIN	LOSS		GAIN	LOSS		GAIN
NORTH	21.3	15.6	0	0	0	0	0	0	6	128	93	0	0	0	0	0	0	0	0	0	8	170	124	0	0	0	0	0	0	0	0	0	0	0	0
EAST	21.3	40.3	0	0	0	0	0	0	0	0	0	65	1383	2619	50	1064	2014	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	20	426	806
SOUTH	21.3	24.2	19	404	460	0	0	0	0	0	0	0	0	0	12	255	290	44	936	1064	0	0	0	0	0	0	0	0	0	9	192	218	0	0	0
WEST	21.3	40.3	50	1064	2014	34	724	1370	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
SKYLT.	37.2	101.5	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	0	0	0	0	0	0
DOORS	25.2	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	0	0	0	0	0	0
NET EXPOSED WALL	4.5	0.8	437	1950	328	326	1455	245	124	553	93	309	1379	232	334	1491	251	146	652	110	72	321	54	30	134	23	40	179	30	61	272	46	120	536	90
NET EXPOSED BSMT WALL ABOVE GR	3.6	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	0	0	0	0	0	0	0	0	0
EXPOSED CLG	1.3	0.6	533	684	313	323	415	190	207	266	122	175	225	103	249	320	146	285	366	167	60	77	35	40	51	24	92	118	54	105	135	62	53	68	31
NO ATTIC EXPOSED CLG	2.7	1.3	0	0	0	0	0	0	0	0	0	78	214	98	18	49	23	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	154	393	66	253	645	109	18	46	8	0	0	0	60	153	26	40	102	17	0	0	0	0	0	0	0	0	0
BASEMENT/CRAWL HEAT LOSS				0			0			0			0			0			0			0			0			0			0			0	
SLAB ON GRADE HEAT LOSS				0			0			0			0			0			0			0			0			0			0			0	
SUBTOTAL HT LOSS				4103			2593			1339			3846			3225			1954			722			287			297			598			1029	
SUB TOTAL HT GAIN					3116			1805			374			3161			2732			1342			240			63			84			325			927
LEVEL FACTOR / MULTIPLIER			0.20	0.37		0.20	0.37		0.20	0.37		0.20	0.37		0.20	0.37		0.20	0.37		0.20	0.37		0.20	0.37		0.20	0.37		0.20	0.37		0.20	0.37	
AIR CHANGE HEAT LOSS				1523			963			497			1428			1197			725			268			107			110			222			382	
AIR CHANGE HEAT GAIN					250			145			30			254			220			108			19			5			7			26			74
DUCT LOSS				0			0			184			527			442			0			99			39			0			0			0	
DUCT GAIN					0			0			84			409			362			0			69			50			0			0			0
HEAT GAIN PEOPLE	240		2		480	0		0	0		0	1		240	1		240	1		240	0		0	0		0	0		0	0		0	0		0
HEAT GAIN APPLIANCES/LIGHTS					432			432			432			432			432			432			432			432			432			432			0
TOTAL HT LOSS BTU/H				5626			3555			2020			5802			4864			2679			1088			433			407			821			1411	
TOTAL HT GAIN x 1.3 BTU/H					5561			3096			1196			5844			5182			2758			988			716			680			1018			1302

ROOM USE			LIB			DIN			KIT/GT			CAB			LAUN			PWD			FOY			MUD									WOB			BAS		
EXP. WALL			31			32			87			45			0			5			35			18									52			186		
CLG. HT.			11			11			11			11			10			11			11			12									10			10		
	FACTORS																																				
GRS.WALL AREA	LOSS	GAIN	341			352			957			495			0			55			385			216									520			1302		
GLAZING			LOSS		GAIN	LOSS		GAIN	LOSS		GAIN	LOSS		GAIN	LOSS		GAIN	LOSS		GAIN	LOSS		GAIN	LOSS		GAIN						LOSS		GAIN	LOSS		GAIN
NORTH	21.3	15.6	0	0	0	0	0	0	46	979	716	0	0	0	0	0	0	9	192	140	0	0	0	0	0	0						0	0	0	6	128	93
EAST	21.3	40.3	56	1192	2256	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
SOUTH	21.3	24.2	0	0	0	34	724	822	21	447	508	63	1341	1524	0	0	0	0	0	0	0	0	0	0	0	0						46	979	556	6	128	145
WEST	21.3	40.3	0	0	0	0	0	0	105	2234	4230	63	1341	2538	0	0	0	0	0	0	0	0	0	0	0	0						106	2256	2135	0	0	0
SKYLT.	37.2	101.5	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	0	0	0
DOORS	25.2	4.3	0	0	0	0	0	0	10	252	43	0	0	0	0	0	0	0	0	0	56	1414	238	20	505	85						20	505	85	20	505	85
NET EXPOSED WALL	4.5	0.8	285	1272	214	318	1419	239	775	3459	583	369	1647	277	0	0	0	46	205	35	329	1468	247	196	875	147						348	1553	262	0	0	0
NET EXPOSED BSMT WALL ABOVE GR	3.6	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						0	0	0	558	2008	338
EXPOSED CLG	1.3	0.6	0	0	0	0	0	0	0	0	0	0	0	0	142	182	83	0	0	0	0	0	0	0	0	0						0	0	0	0	0	0
NO ATTIC EXPOSED CLG	2.7	1.3	0	0	0	0	0	0	0	0	0	203	558	255	0	0	0	40	110	50	41	113	52	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	56	143	24	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			0										2977	
SLAB ON GRADE HEAT LOSS				0			0			0			0			0			0			0			0									741		
SUBTOTAL HT LOSS				2464			2143			7371			4886			325			507			2995			1380									6034			5746	
SUB TOTAL HT GAIN					2470			1061			6079			4595			107			225			537			232									3038			662
LEVEL FACTOR / MULTIPLIER			0.30	0.52		0.30	0.52		0.30	0.52		0.30	0.52		0.20	0.37		0.30	0.52		0.30	0.52		0.30	0.52										0.50	1.60	
AIR CHANGE HEAT LOSS				1282			1115			3835			2542			121			264			1558			718											18857	
AIR CHANGE HEAT GAIN					198			85			488			369			9			18			43			19												297
DUCT LOSS				0			0			0			0			45			0			0			0											0		
DUCT GAIN					0			0			0			0			55			0			0			0												0
HEAT GAIN PEOPLE	240		0		0	0		0	0		0	0		0	0		0	0		0	0		0	0		0						0		0	0		0
HEAT GAIN APPLIANCES/LIGHTS					432			432			432			432			432			432			432			432									0			432
TOTAL HT LOSS BTU/H				3745			3258			11207			7428			490			770			4553			2098									6775			24603	
TOTAL HT GAIN x 1.3 BTU/H					4031			2052			9099			7015			784			878			1316			888									3950			1808

TOTAL HEAT GAIN BTU/H: 60698 TONS: 5.06 LOSS DUE TO VENTILATION LOAD BTU/H: 3181 STRUCTURAL HEAT LOSS: 93634 TOTAL COMBINED HEAT LOSS BTU/H: 96814

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: PINE VALLEY & TESTON — KNIGHTSWOOD - OPT. ELEV - WOB
BUILDER: GOLD PARK HOMES — TYPE: 5005 'B' & 'B CNR' — DATE: Feb-20 — GFA: 4412 — LO# 79987

HEATING CFM	1955	COOLING CFM	1955	furnace pressure	0.6
TOTAL HEAT LOSS	93,634	TOTAL HEAT GAIN	60,162	furnace filter	0.08
AIR FLOW RATE CFM	20.88	AIR FLOW RATE CFM	32.5	a/c coil pressure	0.2
				available pressure for s/a & r/a	0.32
				plenum pressure s/a	0.17
				max s/a dif press. loss	0.02
				min adjusted pressure s/a	0.15

r/a pressure	0.15			
r/a grille press. Loss	0.02			
adjusted pressure r/a	0.13			

^LENNOX — AFUE = 96 %
EL296UH110XE60C 110 — INPUT (BTU/H) = 110,000
OUTPUT (BTU/H) = **106,000**

FAN SPEED	
LOW	0
MEDLOW	1380
MEDIUM	1505
MEDIUM HIGH	1685
HIGH	1955

DESIGN CFM = **1955** CFM @ .6 " E.S.P.
TEMPERATURE RISE 50 °F

RUN COUNT	4th	3rd	2nd	1st	Bas
S/A	0	0	18	13	8
R/A	0	0	5	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	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	ENS-2	WIC-2	ENS-3	MBR	ENS-4	LIB	DIN	KIT/GT	KIT/GT	KIT/GT	LAUN	PWD	FOY	MUD	BAS	BAS	BAS	BAS
RM LOSS MBH.	2.81	2.79	2.02	1.93	2.43	2.68	1.09	0.43	0.41	2.81	0.82	1.87	3.26	2.80	2.80	2.80	0.49	0.77	4.55	2.10	3.92	3.92	3.92	3.92
CFM PER RUN HEAT	59	58	42	40	51	56	23	9	8	59	17	39	68	58	58	58	10	16	95	44	82	82	82	82
RM GAIN MBH.	2.78	2.43	1.20	1.95	2.59	2.76	0.99	0.72	0.68	2.78	1.02	2.02	2.05	2.27	2.27	2.27	0.78	0.88	1.32	0.89	0.72	0.72	0.72	0.72
CFM PER RUN COOLING	90	79	39	63	84	90	32	23	22	90	33	66	67	74	74	74	25	29	43	29	23	23	23	23
ADJUSTED PRESSURE	0.15	0.16	0.16	0.16	0.15	0.15	0.16	0.16	0.16	0.15	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.15	0.16	0.15	0.15	0.15	0.15
ACTUAL DUCT LGH.	70	70	71	49	70	48	74	48	53	64	59	57	29	52	69	54	36	73	40	47	77	60	69	38
EQUIVALENT LENGTH	200	200	170	160	160	160	200	150	170	170	150	140	103	120	140	110	200	170	210	160	150	120	150	90
TOTAL EFFECTIVE LENGTH	270	270	241	209	230	208	274	198	223	234	209	197	132	172	209	164	236	243	250	207	227	180	219	128
ADJUSTED PRESSURE	0.05	0.06	0.06	0.07	0.06	0.07	0.06	0.08	0.07	0.06	0.07	0.08	0.12	0.09	0.07	0.1	0.07	0.06	0.06	0.08	0.06	0.08	0.07	0.11
ROUND DUCT SIZE	**6**	**6**	5	5	**6**	**6**	4	4	4	**6**	4	5	5	5	5	5	4	4	**6**	4	**6**	**6**	**6**	**6**
HEATING VELOCITY (ft/min)	301	296	308	294	260	286	264	103	92	301	195	286	499	426	426	426	115	184	484	505	418	418	418	418
COOLING VELOCITY (ft/min)	459	403	286	463	428	459	367	264	252	459	379	485	492	543	543	543	287	333	219	333	117	117	117	117
OUTLET GRILL SIZE	4X10	4X10	3X10	3X10	4X10	4X10	3X10	3X10	3X10	4X10	3X10	3X10	3X10	3X10	3X10	3X10	3X10	3X10	4X10	3X10	4X10	4X10	4X10	4X10
TRUNK	D	C	C	G	F	E	C	G	G	D	E	F	E	D	B	C	E	A	F	C	A	B	D	E

RUN #	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39
ROOM NAME	BAS	BAS	BED-2	BED-2	BED-3	WIC-3	LIB	KIT/GT	CAB	CAB	CAB	ENS	ENS	BAS	BAS
RM LOSS MBH.	3.92	3.92	1.93	1.93	2.43	1.41	1.87	2.80	2.48	2.48	2.48	0.39	0.39	3.92	3.92
CFM PER RUN HEAT	82	82	40	40	51	29	39	58	52	52	52	8	8	82	82
RM GAIN MBH.	0.72	0.72	1.95	1.95	2.59	1.30	2.02	2.27	2.34	2.34	2.34	0.33	0.33	0.72	0.72
CFM PER RUN COOLING	23	23	63	63	84	42	66	74	76	76	76	11	11	23	23
ADJUSTED PRESSURE	0.15	0.15	0.16	0.16	0.15	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.15	0.15
ACTUAL DUCT LGH.	34	50	52	55	75	58	51	55	69	71	82	56	58	23	58
EQUIVALENT LENGTH	110	150	170	160	160	190	160	120	150	130	140	200	190	140	170
TOTAL EFFECTIVE LENGTH	144	200	222	215	235	248	211	175	219	201	222	256	248	163	228
ADJUSTED PRESSURE	0.1	0.07	0.07	0.07	0.06	0.06	0.07	0.09	0.07	0.08	0.07	0.06	0.06	0.09	0.06
ROUND DUCT SIZE	**6**	**6**	5	5	**6**	5	5	5	**6**	5	**6**	4	4	**6**	**6**
HEATING VELOCITY (ft/min)	418	418	294	294	260	213	286	426	265	382	265	92	92	418	418
COOLING VELOCITY (ft/min)	117	117	463	463	428	308	485	543	388	558	388	126	126	117	117
OUTLET GRILL SIZE	4X10	4X10	3X10	3X10	4X10	3X10	3X10	3X10	4X10	3X10	4X10	3X10	3X10	4X10	4X10
TRUNK	G	F	G	G	F	F	F	B	A	A	A	C	C	E	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	254	0.06	9	10	x	8	457	TRUNK G	605	0.06	12.5	18	x	8	605
TRUNK B	198	0.07	7.9	8	x	8	446	TRUNK H	1955	0.05	20.3	38	x	10	741
TRUNK C	775	0.06	13.7	22	x	8	634	TRUNK I	0	0.00	0	0	x	8	0
TRUNK D	258	0.05	9.5	10	x	8	464	TRUNK J	0	0.00	0	0	x	8	0
TRUNK E	1348	0.05	17.6	28	x	10	693	TRUNK K	0	0.00	0	0	x	8	0
TRUNK F	386	0.06	10.6	14	x	8	496	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	1490	0.05	18.3	32	x	10	671
TRUNK Y	940	0.05	15.4	28	x	8	604
TRUNK Z	455	0.05	11.7	16	x	8	512
DROP	1955	0.05	20.3	24	x	18	652

RETURN AIR #	1	2	3	4	5	6	7	8								BR
	0	0	0	0	2@7"	0	0	0	0	0	0	0	0	0	0	
AIR VOLUME	115	135	130	115	240	200	370	340	0	0	0	0	0	0	0	310
PLENUM PRESSURE	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13
ACTUAL DUCT LGH.	84	51	62	59	47	49	30	51	1	1	1	1	1	1	1	14
EQUIVALENT LENGTH	200	135	155	185	135	140	170	195	0	0	0	0	0	0	0	145
TOTAL EFFECTIVE LH	284	186	217	244	182	189	200	246	1	1	1	1	1	1	1	159
ADJUSTED PRESSURE	0.05	0.07	0.06	0.05	0.07	0.07	0.07	0.05	13.36	13.36	13.36	13.36	13.36	13.36	13.36	0.08
ROUND DUCT SIZE	7	6.8	7	7	8.5	7.9	10	10.5	0	0	0	0	0	0	0	9
INLET GRILL SIZE	8	8	8	8	8	8	8	8	0	0	0	0	0	0	0	8
	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
INLET GRILL SIZE	14	14	14	14	30	14	30	30	0	0	0	0	0	0	0	30

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: 5005 'B' & 'B CNR' LO # 79987
SITE NAME: PINE VALLEY & TESTON KNIGHTSWOOD - OPT. ELEV - WOB

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	7	@ 10.6 cfm	74.2	cfm
Other Rooms	8	@ 10.6 cfm	84.8	cfm
Table 9.32.3.A.		TOTAL	233.2	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	233.2	cfm
Less Principal Ventil. Capacity	155	cfm
Required Supplemental Capacity	78.2	cfm

PRINCIPAL EXHAUST FAN CAPACITY

Model: VANEE 65H Location: BSMT

155.0 cfm 3.0 sones [✓] HVI Approved

PRINCIPAL EXHAUST HEAT LOSS CALCULATION

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

SUPPLEMENTAL FANS NUTONE

Location	Model	cfm	HVI	Sones
ENS	QTXEN050C	50	✓	0.3
ENS-2	QTXEN050C	50	✓	0.3
ENS-4	QTXEN050C	50	✓	0.3
PWD	QTXEN050C	50	✓	0.3

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: 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: February-20

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#: 79987 Model: 5005 'B' & 'B CNR' Builder: GOLD PARK HOMES Date: 2020-02-26

Volume Calculation

House Volume

Level	Floor Area (ft²)	Floor Height (ft)	Volume (ft³)
Bsmt	2052	10	20520
First	2052	11	22572
Second	2360	10	23600
Third	0	9	0
Fourth	0	9	0
		Total:	66,692.0 ft³
		Total:	1888.5 m³

Air Change & Delta T Data

WINTER NATURAL AIR CHANGE RATE	0.416
SUMMER NATURAL AIR CHANGE RATE	0.139

Design Temperature Difference

	Tin °C	Tout °C	ΔT °C	ΔT °F
Winter DTDh	22	-20	42	76
Summer DTDc	24	31	7	13

5.2.3.1 Heat Loss due to Air Leakage

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

0.416 x 524.59 x 42 °C x 1.2 = 11053 W

= **37714 Btu/h**

6.2.6 Sensible Gain due to Air Leakage

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

= 0.139 x 524.59 x 7 °C x 1.2 = 624 W

= **2130 Btu/h**

5.2.3.2 Heat Loss due to Mechanical Ventilation

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

155 CFM x 76 °F x 1.08 x 0.25 = **3181 Btu/h**

6.2.7 Sensible heat Gain due to Ventilation

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

155 CFM x 13 °F x 1.08 x 0.25 = **536 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	37,714	11,779	1.601
2	0.3		21,745	0.520
3	0.2		20,318	0.371
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: 5005 'B' & 'B CNR' KNIGHTSWOOD - OPT. ELEV - WO **BUILDER:** GOLD PARK HOMES
SFQT: 4412 **LO#** 79987 **SITE:** PINE VALLEY & TESTON

DESIGN ASSUMPTIONS

HEATING	°F	COOLING	°F
OUTDOOR DESIGN TEMP.	-4	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:	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):	66692.0	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:	7.0 ft
LENGTH: 77.0 ft	WIDTH: 42.0 ft	EXPOSED PERIMETER:	186.0 ft
WOB INSULATION CONFIGURATION	SCB_9	WOB EXPOSED PERIMETER	52.0 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	29.80
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

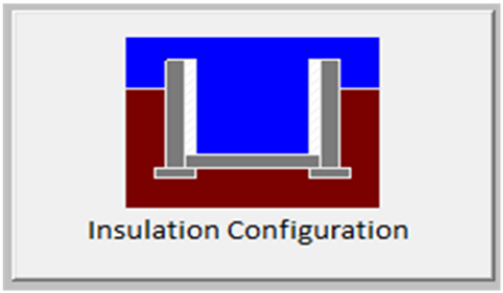


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905-619-2300

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 sand, loam, clay
Water Table:	Normal (7-10 m, 23-33 ft)

Foundation Dimensions		
Floor Length (m):	**4.6**	 Insulation Configuration
Floor Width (m):	**12.8**	
Exposed Perimeter (m):	**56.7**	
Wall Height (m):	**3.0**	
Depth Below Grade (m):	**1.84**	
Window Area (m^2):	**1.1**	
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):	**872**	

TYPE: 5005 'B' & 'B CNR'
LO# 79987

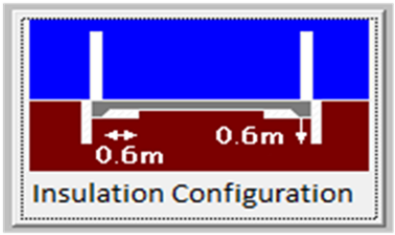
KNIGHTSWOOD - OPT. ELEV - WOB

HVAC Designs Ltd.
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Ajax ON, L1S 2E2
905-619-2300

Residential Foundation Thermal Load Calculator

Supplemental tool for CAN/CSA-F280

Weather Station Description	
Province:	Ontario
Region:	Vaughan (Woodbridge)
Site Description	
Soil Conductivity:	Normal conductivity: dry sand, loam, clay
Water Table:	Normal (7-10 m, 23-33 ft)

Foundation Dimensions		
Length (m):	**1.5**	
Width (m):	**12.8**	
Exposed Perimeter (m):	**15.8**	

Radiant Slab		
Heated Fraction of the Slab:	**0**	
Fluid Temperature (°C):	**33**	

Design Months		
Heating Month	**1**	

Results	
Heating Load (Watts):	**217**

TYPE: 5005 'B' & 'B CNR'
LO# 79987

KNIGHTSWOOD - OPT. ELEV - WOB

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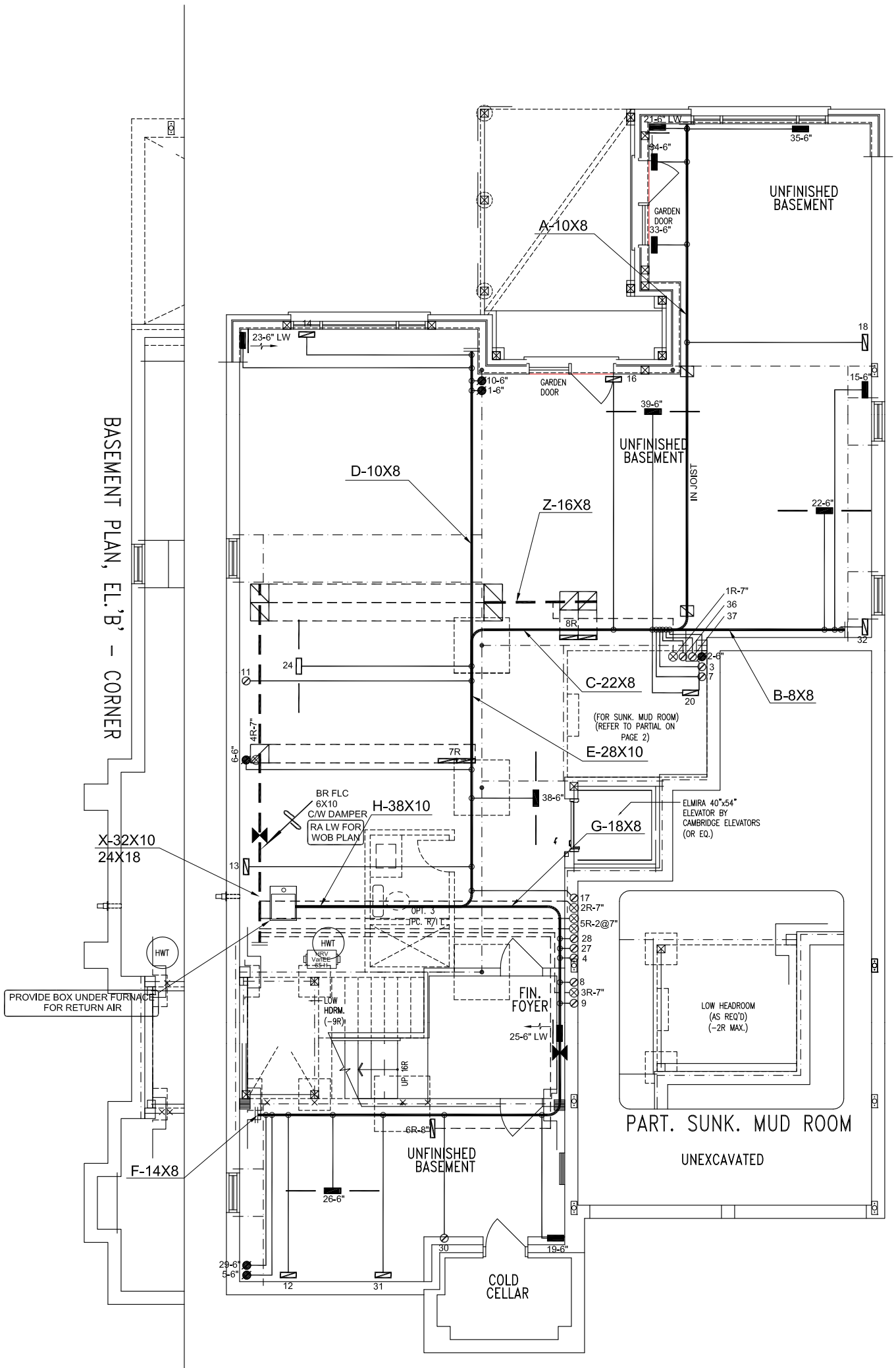
Air Infiltration Residential Load Calculator

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):	9.45
Building Configuration	
Type:	Detached
Number of Stories:	Two
Foundation:	Full
House Volume (m^3):	1888.5
Air Leakage/Ventilation	
Air Tightness Type:	Present (1961-) (3.57 ACH)
Custom BDT Data:	ELA @ 10 Pa. 2517.4 cm^2
	3.57 ACH @ 50 Pa
Mechanical Ventilation (L/s):	Total Supply: 73.2 / Total Exhaust: 73.2
Flue Size	
Flue #:	#1 #2 #3 #4
Diameter (mm):	0 0 0 0
Natural Infiltration Rates	
Heating Air Leakage Rate (ACH/H):	**0.416**
Cooling Air Leakage Rate (ACH/H):	**0.139**

TYPE: 5005 'B' & 'B CNR' KNIGHTSWOOD - OPT. ELEV - WOB

LO# 79987



PARTIAL BASEMENT PLAN, EL. '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

WOB 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.	REVISED AS PER ARCHITECTURALS	FEB/2020
1.	3R RELOCATED	NOV/2018

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Client
GOLDPARK HOMES

Project Name
PINE VALLEY & TESTON
VAUGHAN, ONTARIO
KNIGHTSWOOD - WOB
OPT. ELEVATOR
5005 ELEV. 'B' & 'B CNR' 4412sqft

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
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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.

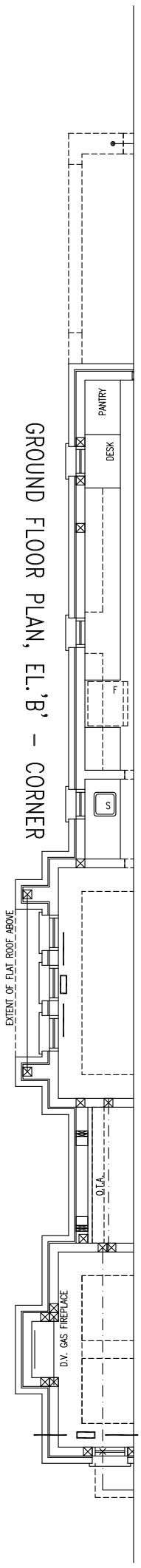
HEAT LOSS 96814 BTU/H		
UNIT DATA		
MAKE	LENNOX	
MODEL	EL296UH110XE60C	
INPUT	110	MBTU/H
OUTPUT	106	MBTU/H
COOLING	5.0	TONS
FAN SPEED	1955	cfm @ 0.6" w.c.

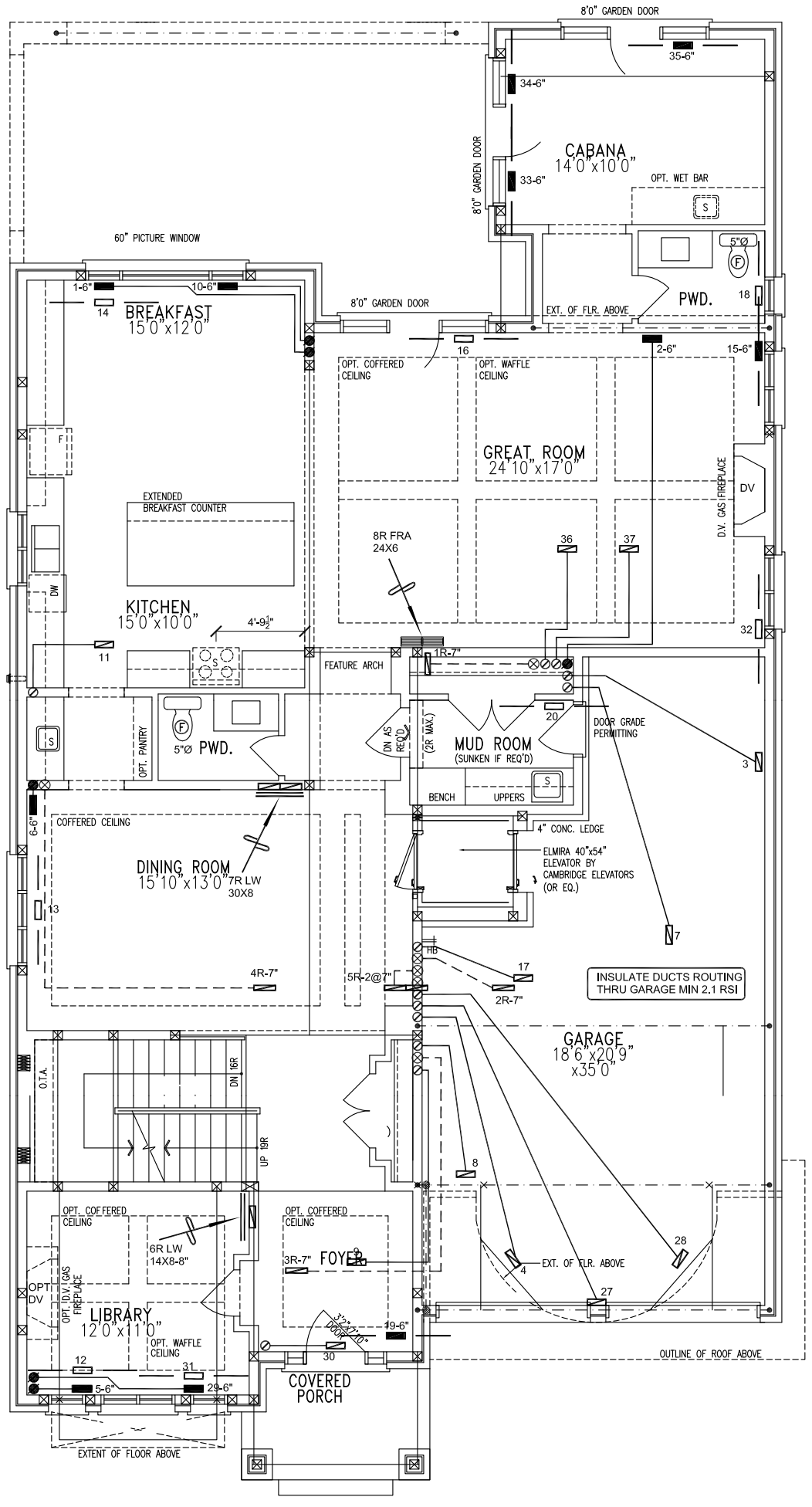
# OF RUNS	S/A	R/A	FANS
3RD FLOOR			
2ND FLOOR	18	5	7
1ST FLOOR	13	3	3
BASEMENT	8	1	0

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/2018
Scale 1/8" = 1'-0"
BCIN# 19669
LO# 79987





PARTIAL GROUND FLOOR PLAN, EL. '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

WOB | 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.	REVISED AS PER ARCHITECTURALS	FEB/2020
1.	3R RELOCATED	NOV/2018

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Client
GOLDPARK HOMES

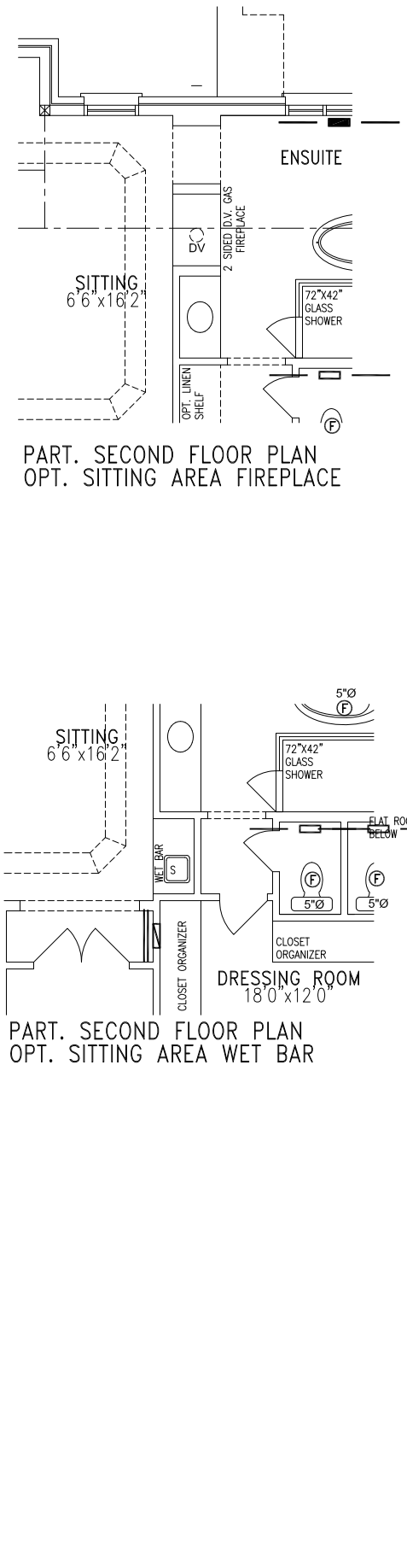
Project Name
PINE VALLEY & TESTON
VAUGHAN, ONTARIO
KNIGHTSWOOD - WOB
OPT. ELEVATOR
5005 ELEV. 'B' & 'B CNR' 4412sqft

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

Sheet Title
FIRST FLOOR HEATING LAYOUT

Date SEPT/2018
Scale 1/8" = 1'-0"
BCIN# 19669
LO# 79987



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

WOB | 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.	REVISED AS PER ARCHITECTURALS	FEB/2020
1.	3R RELOCATED	NOV/2018

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Client
GOLDPARK HOMES

Project Name
PINE VALLEY & TESTON
VAUGHAN, ONTARIO
KNIGHTSWOOD - WOB
OPT. ELEVATOR
5005 ELEV. 'B' & 'B CNR' 4412sqft

HVAC DESIGNS LTD.
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Email: info@hvacdesigns.ca
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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.

Sheet Title
SECOND FLOOR HEATING LAYOUT

Date SEPT/2018
Scale 1/8" = 1'-0"
BCIN# 19669
LO# 79987

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**		
VAUGHAN (WOODBRIDGE)				

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:** 5005 'B' & 'B CNR' KNIGHTSWOOD - OPT. ELEV - SERV STAIR - WOB **Project:** PINE VALLEY & TESTON

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.

February 26, 2020
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: PINE VALLEY & TESTON | KNIGHTSWOOD - OPT. ELEV - SERV STAIR - WOB | DATE: Feb-20 | WINTER NATURAL AIR CHANGE RATE 0.416 | HEAT LOSS ΔT °F. 76 | CSA-F280-12

BUILDER: GOLD PARK HOMES | TYPE: 5005 'B' & 'B CNR' | GFA: 4412 | LO# 85467 | SUMMER NATURAL AIR CHANGE RATE 0.139 | HEAT GAIN ΔT °F. 13 | SB-12 PACKAGE A1

ROOM USE			MBR			ENS			WIC			BED-2			BED-3			BED-4			ENS-2			WIC-2			ENS-3			ENS-4			WIC-3		
EXP. WALL			46			36			13			34			36			19			8			3			4			7			14		
CLG. HT.			11			10			10			11			11			10			10			10			10			10			10		
	FACTORS																																	
GRS.WALL AREA	LOSS	GAIN	506			360			130			374			396			190			80			30			40			70			140		
GLAZING			LOSS		GAIN	LOSS		GAIN	LOSS		GAIN	LOSS		GAIN	LOSS		GAIN	LOSS		GAIN	LOSS		GAIN	LOSS		GAIN	LOSS		GAIN	LOSS		GAIN	LOSS		GAIN
NORTH	21.3	15.6	0	0	0	0	0	0	6	128	93	0	0	0	0	0	0	0	0	0	8	170	124	0	0	0	0	0	0	0	0	0	0	0	0
EAST	21.3	40.3	0	0	0	0	0	0	0	0	0	65	1383	2619	50	1064	2014	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	20	426	806
SOUTH	21.3	24.2	19	404	460	0	0	0	0	0	0	0	0	0	12	255	290	44	936	1064	0	0	0	0	0	0	0	0	0	9	192	218	0	0	0
WEST	21.3	40.3	50	1064	2014	34	724	1370	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
SKYLT.	37.2	101.5	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	0	0	0	0	0	0
DOORS	25.2	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	0	0	0	0	0	0
NET EXPOSED WALL	4.5	0.8	437	1950	328	326	1455	245	124	553	93	309	1379	232	334	1491	251	146	652	110	72	321	54	30	134	23	40	179	30	61	272	46	120	536	90
NET EXPOSED BSMT WALL ABOVE GR	3.6	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	0	0	0	0	0	0	0	0	0
EXPOSED CLG	1.3	0.6	533	684	313	323	415	190	207	266	122	175	225	103	249	320	146	285	366	167	60	77	35	40	51	24	92	118	54	105	135	62	53	68	31
NO ATTIC EXPOSED CLG	2.7	1.3	0	0	0	0	0	0	0	0	0	78	214	98	18	49	23	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	25	64	11	253	645	109	18	46	8	0	0	0	60	153	26	40	102	17	0	0	0	0	0	0	0	0	0
BASEMENT/CRAWL HEAT LOSS				0			0			0			0			0			0			0			0			0			0			0	
SLAB ON GRADE HEAT LOSS				0			0			0			0			0			0			0			0			0			0			0	
SUBTOTAL HT LOSS				4103			2593			1010			3846			3225			1954			722			287			297			598			1029	
SUB TOTAL HT GAIN					3116			1805			319			3161			2732			1342			240			63			84			325			927
LEVEL FACTOR / MULTIPLIER			0.20	0.38		0.20	0.38		0.20	0.38		0.20	0.38		0.20	0.38		0.20	0.38		0.20	0.38		0.20	0.38		0.20	0.38		0.20	0.38		0.20	0.38	
AIR CHANGE HEAT LOSS				1548			978			381			1451			1217			737			272			108			112			226			388	
AIR CHANGE HEAT GAIN					250			145			26			254			220			108			19			5			7			26			75
DUCT LOSS				0			0			139			530			444			0			99			40			0			0			0	
DUCT GAIN					0			0			78			409			362			0			69			50			0			0			0
HEAT GAIN PEOPLE	240		2		480	0		0	0		0	1		240	1		240	1		240	0		0	0		0	0		0	0		0	0		0
HEAT GAIN APPLIANCES/LIGHTS					432			432			432			432			432			432			432			432			432			432			0
TOTAL HT LOSS BTU/H				5651			3571			1531			5828			4886			2691			1093			435			408			824			1417	
TOTAL HT GAIN x 1.3 BTU/H					5561			3096			1111			5844			5182			2758			988			716			680			1018			1302

ROOM USE			LIB			DIN			KIT/GT			CAB			LAUN			PWD			FOY			MUD									WOB			BAS		
EXP. WALL			31			32			77			45			0			5			35			32									52			186		
CLG. HT.			11			11			11			11			10			11			11			12									10			10		
	FACTORS																																				
GRS.WALL AREA	LOSS	GAIN	341			352			847			495			0			55			385			384									520			1302		
GLAZING			LOSS		GAIN	LOSS		GAIN	LOSS		GAIN	LOSS		GAIN	LOSS		GAIN	LOSS		GAIN	LOSS		GAIN	LOSS		GAIN						LOSS		GAIN	LOSS		GAIN
NORTH	21.3	15.6	0	0	0	0	0	0	46	979	716	0	0	0	0	0	0	9	192	140	0	0	0	0	0	0						0	0	0	6	128	93
EAST	21.3	40.3	56	1192	2256	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
SOUTH	21.3	24.2	0	0	0	34	724	822	21	447	508	63	1341	1524	0	0	0	0	0	0	0	0	0	0	0	0						46	979	556	6	128	145
WEST	21.3	40.3	0	0	0	0	0	0	105	2234	4230	63	1341	2538	0	0	0	0	0	0	0	0	0	0	0	0						106	2256	2135	0	0	0
SKYLT.	37.2	101.5	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	0	0	0
DOORS	25.2	4.3	0	0	0	0	0	0	10	252	43	0	0	0	0	0	0	0	0	0	56	1414	238	20	505	85						20	505	85	20	505	85
NET EXPOSED WALL	4.5	0.8	285	1272	214	318	1419	239	665	2968	500	369	1647	277	0	0	0	46	205	35	329	1468	247	364	1624	274						348	1553	262	0	0	0
NET EXPOSED BSMT WALL ABOVE GR	3.6	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						0	0	0	558	2008	338
EXPOSED CLG	1.3	0.6	0	0	0	0	0	0	0	0	0	0	0	0	142	182	83	0	0	0	0	0	0	0	0	0						0	0	0	0	0	0
NO ATTIC EXPOSED CLG	2.7	1.3	0	0	0	0	0	0	0	0	0	203	558	255	0	0	0	40	110	50	41	113	52	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	56	143	24	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			0										2977	
SLAB ON GRADE HEAT LOSS				0			0			0			0			0			0			0			0									741		
SUBTOTAL HT LOSS				2464			2143			6880			4886			325			507			2995			2129									6034			5746	
SUB TOTAL HT GAIN					2470			1061			5996			4595			107			225			537			359									3038			662
LEVEL FACTOR / MULTIPLIER			0.30	0.51		0.30	0.51		0.30	0.51		0.30	0.51		0.20	0.38		0.30	0.51		0.30	0.51		0.30	0.51										0.50	1.60	
AIR CHANGE HEAT LOSS				1267			1102			3538			2512			123			261			1540			1095											18857	
AIR CHANGE HEAT GAIN					199			85			482			369			9			18			43			29												297
DUCT LOSS				0			0			0			0			45			0			0			0											0	
DUCT GAIN					0			0			0			0			55			0			0			0												0
HEAT GAIN PEOPLE	240		0		0	0		0	0		0	0		0	0		0	0		0	0		0	0		0						0		0	0		0
HEAT GAIN APPLIANCES/LIGHTS					432			432			432			432			432			432			432			432										0			432
TOTAL HT LOSS BTU/H				3730			3244			10418			7398			492			767			4535			3224									6775			24603	
TOTAL HT GAIN x 1.3 BTU/H					4031			2052			8983			7015			784			878			1316			1065									3950			1809

TOTAL HEAT GAIN BTU/H: 60675 TONS: 5.06 LOSS DUE TO VENTILATION LOAD BTU/H: 3181 STRUCTURAL HEAT LOSS: 93524 TOTAL COMBINED HEAT LOSS BTU/H: 96705

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: PINE VALLEY & TESTON — KNIGHTSWOOD - OPT. ELEV - SERV STAIR - WOB
BUILDER: GOLD PARK HOMES — TYPE: 5005 'B' & 'B CNR' — DATE: Feb-20 — GFA: 4412 — LO# 85467

HEATING CFM	1955	COOLING CFM	1955	furnace pressure	0.6
TOTAL HEAT LOSS	93,524	TOTAL HEAT GAIN	60,139	furnace filter	0.08
AIR FLOW RATE CFM	20.9	AIR FLOW RATE CFM	32.51	a/c coil pressure	0.2
				available pressure for s/a & r/a	0.32

^LENNOX — AFUE = 96 %
EL296UH110XE60C 110 — INPUT (BTU/H) = 110,000
OUTPUT (BTU/H) = **106,000**

FAN SPEED	
LOW	0
MEDLOW	1380
MEDIUM	1505
MEDIUM HIGH	1685
HIGH	1955

DESIGN CFM = **1955** CFM @ .6 " E.S.P.

RUN COUNT	4th	3rd	2nd	1st	Bas
S/A	0	0	18	13	8
R/A	0	0	5	3	1

plenum pressure s/a 0.17 — r/a pressure 0.15
max s/a dif press. loss 0.02 — r/a grille press. Loss 0.02
min adjusted pressure s/a 0.15 — adjusted pressure r/a 0.13

TEMPERATURE RISE 50 °F

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	ENS-2	WIC-2	ENS-3	MBR	ENS-4	LIB	DIN	KIT/GT	KIT/GT	KIT/GT	LAUN	PWD	FOY	MUD	BAS	BAS	BAS	BAS
RM LOSS MBH.	2.83	2.79	1.53	1.94	2.44	2.69	1.09	0.44	0.41	2.83	0.82	1.87	3.24	2.60	2.60	2.60	0.49	0.77	4.53	3.22	3.92	3.92	3.92	3.92
CFM PER RUN HEAT	59	58	32	41	51	56	23	9	9	59	17	39	68	54	54	54	10	16	95	67	82	82	82	82
RM GAIN MBH.	2.78	2.43	1.11	1.95	2.59	2.76	0.99	0.72	0.68	2.78	1.02	2.02	2.05	2.25	2.25	2.25	0.78	0.88	1.32	1.07	0.72	0.72	0.72	0.72
CFM PER RUN COOLING	90	79	36	63	84	90	32	23	22	90	33	66	67	73	73	73	25	29	43	35	23	23	23	23
ADJUSTED PRESSURE	0.15	0.16	0.16	0.16	0.15	0.15	0.16	0.16	0.16	0.15	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.15	0.16	0.15	0.15	0.15	0.15
ACTUAL DUCT LGH.	70	70	68	49	70	48	79	48	53	64	59	57	29	52	69	54	36	73	40	65	77	60	69	38
EQUIVALENT LENGTH	200	200	150	160	160	160	150	150	170	170	150	140	103	120	140	110	200	170	210	190	150	120	150	90
TOTAL EFFECTIVE LENGTH	270	270	218	209	230	208	229	198	223	234	209	197	132	172	209	164	236	243	250	255	227	180	219	128
ADJUSTED PRESSURE	0.05	0.06	0.07	0.07	0.06	0.07	0.07	0.08	0.07	0.06	0.07	0.08	0.12	0.09	0.07	0.1	0.07	0.06	0.06	0.06	0.06	0.08	0.07	0.11
ROUND DUCT SIZE	**6**	**6**	4	5	**6**	**6**	4	4	4	**6**	4	5	5	5	5	5	4	4	**6**	5	**6**	**6**	**6**	**6**
HEATING VELOCITY (ft/min)	301	296	367	301	260	286	264	103	103	301	195	286	499	396	396	396	115	184	484	492	418	418	418	418
COOLING VELOCITY (ft/min)	459	403	413	463	428	459	367	264	252	459	379	485	492	536	536	536	287	333	219	257	117	117	117	117
OUTLET GRILL SIZE	4X10	4X10	3X10	3X10	4X10	4X10	3X10	3X10	3X10	4X10	3X10	3X10	3X10	3X10	3X10	3X10	3X10	3X10	4X10	3X10	4X10	4X10	4X10	4X10
TRUNK	D	C	B	G	F	E	B	G	G	D	E	F	E	D	B	C	E	A	F	B	A	B	D	E

RUN #	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39
ROOM NAME	BAS	BAS	BED-2	BED-2	BED-3	WIC-3	LIB	KIT/GT	CAB	CAB	CAB	ENS	ENS	BAS	BAS
RM LOSS MBH.	3.92	3.92	1.94	1.94	2.44	1.42	1.87	2.60	2.47	2.47	2.47	0.39	0.39	3.92	3.92
CFM PER RUN HEAT	82	82	41	41	51	30	39	54	52	52	52	8	8	82	82
RM GAIN MBH.	0.72	0.72	1.95	1.95	2.59	1.30	2.02	2.25	2.34	2.34	2.34	0.33	0.33	0.72	0.72
CFM PER RUN COOLING	23	23	63	63	84	42	66	73	76	76	76	11	11	23	23
ADJUSTED PRESSURE	0.15	0.15	0.16	0.16	0.15	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.15	0.15
ACTUAL DUCT LGH.	34	50	52	55	75	58	51	55	69	71	82	56	58	23	58
EQUIVALENT LENGTH	110	150	170	160	160	190	160	120	150	130	140	200	190	140	170
TOTAL EFFECTIVE LENGTH	144	200	222	215	235	248	211	175	219	201	222	256	248	163	228
ADJUSTED PRESSURE	0.1	0.07	0.07	0.07	0.06	0.06	0.07	0.09	0.07	0.08	0.07	0.06	0.06	0.09	0.06
ROUND DUCT SIZE	**6**	**6**	5	5	**6**	5	5	5	**6**	5	**6**	4	4	**6**	**6**
HEATING VELOCITY (ft/min)	418	418	301	301	260	220	286	396	265	382	265	92	92	418	418
COOLING VELOCITY (ft/min)	117	117	463	463	428	308	485	536	388	558	388	126	126	117	117
OUTLET GRILL SIZE	4X10	4X10	3X10	3X10	4X10	3X10	3X10	3X10	4X10	3X10	4X10	3X10	3X10	4X10	4X10
TRUNK	G	F	G	G	F	F	F	B	A	A	A	C	C	E	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	254	0.06	9	10	x	8	457	TRUNK G	610	0.06	12.5	18	x	8	610
TRUNK B	312	0.06	9.7	12	x	8	468	TRUNK H	1955	0.05	20.3	38	x	10	741
TRUNK C	776	0.06	13.7	22	x	8	635	TRUNK I	0	0.00	0	0	x	8	0
TRUNK D	254	0.05	9.4	10	x	8	457	TRUNK J	0	0.00	0	0	x	8	0
TRUNK E	1345	0.05	17.6	28	x	10	692	TRUNK K	0	0.00	0	0	x	8	0
TRUNK F	387	0.06	10.6	14	x	8	498	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	1490	0.05	18.3	32	x	10	671
TRUNK Y	940	0.05	15.4	28	x	8	604
TRUNK Z	455	0.05	11.7	16	x	8	512
DROP	1955	0.05	20.3	24	x	18	652

RETURN AIR #	1	2	3	4	5	6	7	8								**BR**
	0	0	0	0	2@7"	0	0	0	0	0	0	0	0	0	0	
AIR VOLUME	115	135	130	115	240	200	370	340	0	0	0	0	0	0	0	310
PLENUM PRESSURE	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13
ACTUAL DUCT LGH.	84	51	62	59	47	49	30	51	1	1	1	1	1	1	1	14
EQUIVALENT LENGTH	200	135	155	185	135	140	170	195	0	0	0	0	0	0	0	145
TOTAL EFFECTIVE LH	284	186	217	244	182	189	200	246	1	1	1	1	1	1	1	159
ADJUSTED PRESSURE	0.05	0.07	0.06	0.05	0.07	0.07	0.07	0.05	13.36	13.36	13.36	13.36	13.36	13.36	13.36	0.08
ROUND DUCT SIZE	7	6.8	7	7	8.5	7.9	10	10.5	0	0	0	0	0	0	0	9
INLET GRILL SIZE	8	8	8	8	8	8	8	8	0	0	0	0	0	0	0	8
	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
INLET GRILL SIZE	14	14	14	14	30	14	30	30	0	0	0	0	0	0	0	30

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: 5005 'B' & 'B CNR' LO # 85467
SITE NAME: PINE VALLEY & TESTON KNIGHTSWOOD - OPT. ELEV - SERV STAIR - WOB

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	7	@ 10.6 cfm	74.2	cfm
Other Rooms	8	@ 10.6 cfm	84.8	cfm
Table 9.32.3.A.		TOTAL	233.2	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	233.2	cfm
Less Principal Ventil. Capacity	155	cfm
Required Supplemental Capacity	78.2	cfm

PRINCIPAL EXHAUST FAN CAPACITY

Model: VANEE 65H Location: BSMT

155.0 cfm 3.0 sones [✓] HVI Approved

PRINCIPAL EXHAUST HEAT LOSS CALCULATION

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

SUPPLEMENTAL FANS NUTONE

Location	Model	cfm	HVI	Sones
ENS	QTXEN050C	50	✓	0.3
ENS-2	QTXEN050C	50	✓	0.3
ENS-4	QTXEN050C	50	✓	0.3
PWD	QTXEN050C	50	✓	0.3

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: 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: February-20

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#: 85467 Model: 5005 'B' & 'B CNR' Builder: GOLD PARK HOMES Date: 2020-02-26

Volume Calculation

House Volume

Level	Floor Area (ft²)	Floor Height (ft)	Volume (ft³)
Bsmt	2052	10	20520
First	2052	11	22572
Second	2360	10	23600
Third	0	9	0
Fourth	0	9	0
		Total:	66,692.0 ft³
		Total:	1888.5 m³

Air Change & Delta T Data

WINTER NATURAL AIR CHANGE RATE	0.416
SUMMER NATURAL AIR CHANGE RATE	0.139

Design Temperature Difference

	Tin °C	Tout °C	ΔT °C	ΔT °F
Winter DTDh	22	-20	42	76
Summer DTDc	24	31	7	13

5.2.3.1 Heat Loss due to Air Leakage

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

0.416 x 524.59 x 42 °C x 1.2 = 11053 W

= **37714 Btu/h**

6.2.6 Sensible Gain due to Air Leakage

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

= 0.139 x 524.59 x 7 °C x 1.2 = 624 W

= **2130 Btu/h**

5.2.3.2 Heat Loss due to Mechanical Ventilation

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

155 CFM x 76 °F x 1.08 x 0.25 = **3181 Btu/h**

6.2.7 Sensible heat Gain due to Ventilation

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

155 CFM x 13 °F x 1.08 x 0.25 = **536 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	37,714	11,779	1.601
2	0.3		22,004	0.514
3	0.2		19,989	0.377
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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Tel: 905.619.2300 Fax: 905.619.2375
Web: www.hvacdesigns.ca E-mail: info@hvacdesigns.ca

HEAT LOSS AND GAIN SUMMARY SHEET

MODEL: 5005 'B' & 'B CNR' KNIGHTSWOOD - OPT. ELEV - SER' **BUILDER:** GOLD PARK HOMES
SFQT: 4412 **LO#** 85467 **SITE:** PINE VALLEY & TESTON

DESIGN ASSUMPTIONS

HEATING	°F	COOLING	°F
OUTDOOR DESIGN TEMP.	-4	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:	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):	66692.0	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:	7.0 ft
LENGTH: 77.0 ft	WIDTH: 42.0 ft	EXPOSED PERIMETER:	186.0 ft
WOB INSULATION CONFIGURATION	SCB_9	WOB EXPOSED PERIMETER	52.0 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	29.80
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

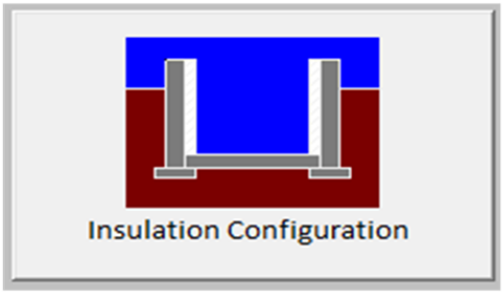


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375 Finley Ave, Suite 202
Ajax ON, L1S 2E2
905-619-2300

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 sand, loam, clay
Water Table:	Normal (7-10 m, 23-33 ft)

Foundation Dimensions		
Floor Length (m):	**4.6**	 Insulation Configuration
Floor Width (m):	**12.8**	
Exposed Perimeter (m):	**56.7**	
Wall Height (m):	**3.0**	
Depth Below Grade (m):	**1.84**	
Window Area (m^2):	**1.1**	
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):	**872**	

TYPE: 5005 'B' & 'B CNR'
LO# 85467

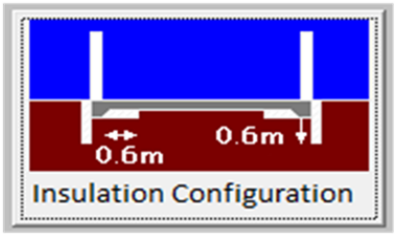
KNIGHTSWOOD - OPT. ELEV - SERV STAIR - WOB

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 sand, loam, clay
Water Table:	Normal (7-10 m, 23-33 ft)

Foundation Dimensions		
Length (m):	**1.5**	
Width (m):	**12.8**	
Exposed Perimeter (m):	**15.8**	

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

Results	
Heating Load (Watts):	**217**

TYPE: 5005 'B' & 'B CNR'
LO# 85467

KNIGHTSWOOD - OPT. ELEV - SERV STAIR - WOB

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

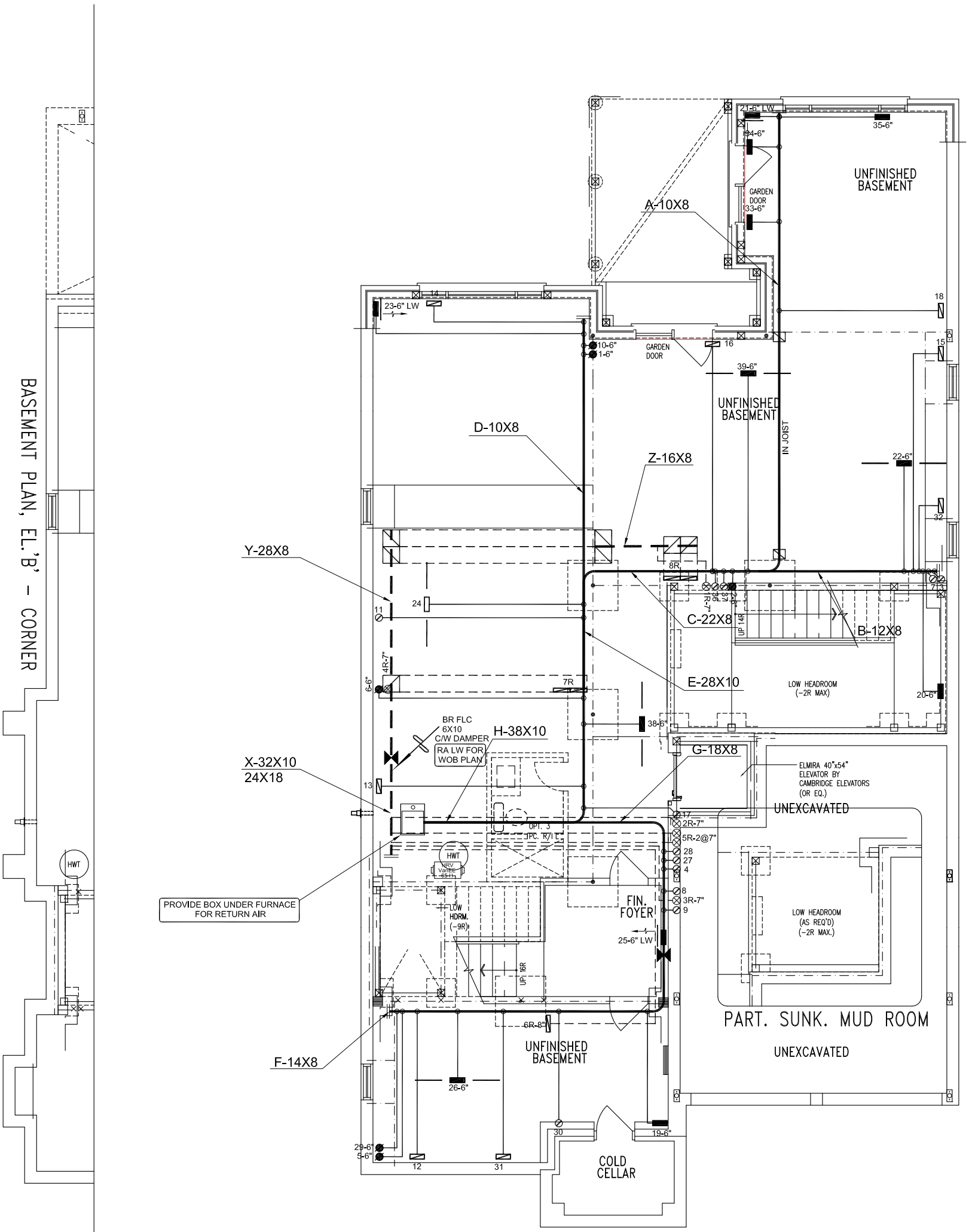
Air Infiltration Residential Load Calculator

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):	9.45
Building Configuration	
Type:	Detached
Number of Stories:	Two
Foundation:	Full
House Volume (m^3):	1888.5
Air Leakage/Ventilation	
Air Tightness Type:	Present (1961-) (3.57 ACH)
Custom BDT Data:	ELA @ 10 Pa. 2517.4 cm^2
	3.57 ACH @ 50 Pa
Mechanical Ventilation (L/s):	Total Supply 73.2 / Total Exhaust 73.2
Flue Size	
Flue #:	#1 #2 #3 #4
Diameter (mm):	0 0 0 0
Natural Infiltration Rates	
Heating Air Leakage Rate (ACH/H):	**0.416**
Cooling Air Leakage Rate (ACH/H):	**0.139**

TYPE: 5005 'B' & 'B CNR' KNIGHTSWOOD - OPT. ELEV - SERV STA

LO# 85467



PARTIAL BASEMENT PLAN, EL. '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

WOB 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.		

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Client

GOLDPARK HOMES

Project Name

PINE VALLEY & TESTON
VAUGHAN, ONTARIO
KNIGHTSWOOD - WOB
OPT. ELEVATOR - SERV STAIR
5005 ELEV. 'B' & 'B CNR' 4412sqft

HVAC DESIGNS LTD.
375 Finley Ave. Suite 202 - Ajax, Ontario
L1S 2E2 Tel. 905.619.2300 - 905.420.5300 Fax 905.619.2375
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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 96705 BTU/H	
UNIT DATA	
MAKE	LENNOX
MODEL	EL296UH110XE60C
INPUT	110 MBTU/H
OUTPUT	106 MBTU/H
COOLING	5.0 TONS
FAN SPEED	1955 cfm @ 0.6" w.c.

# OF RUNS	S/A	R/A	FANS
3RD FLOOR			
2ND FLOOR	18	5	7
1ST FLOOR	13	3	3
BASEMENT	8	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

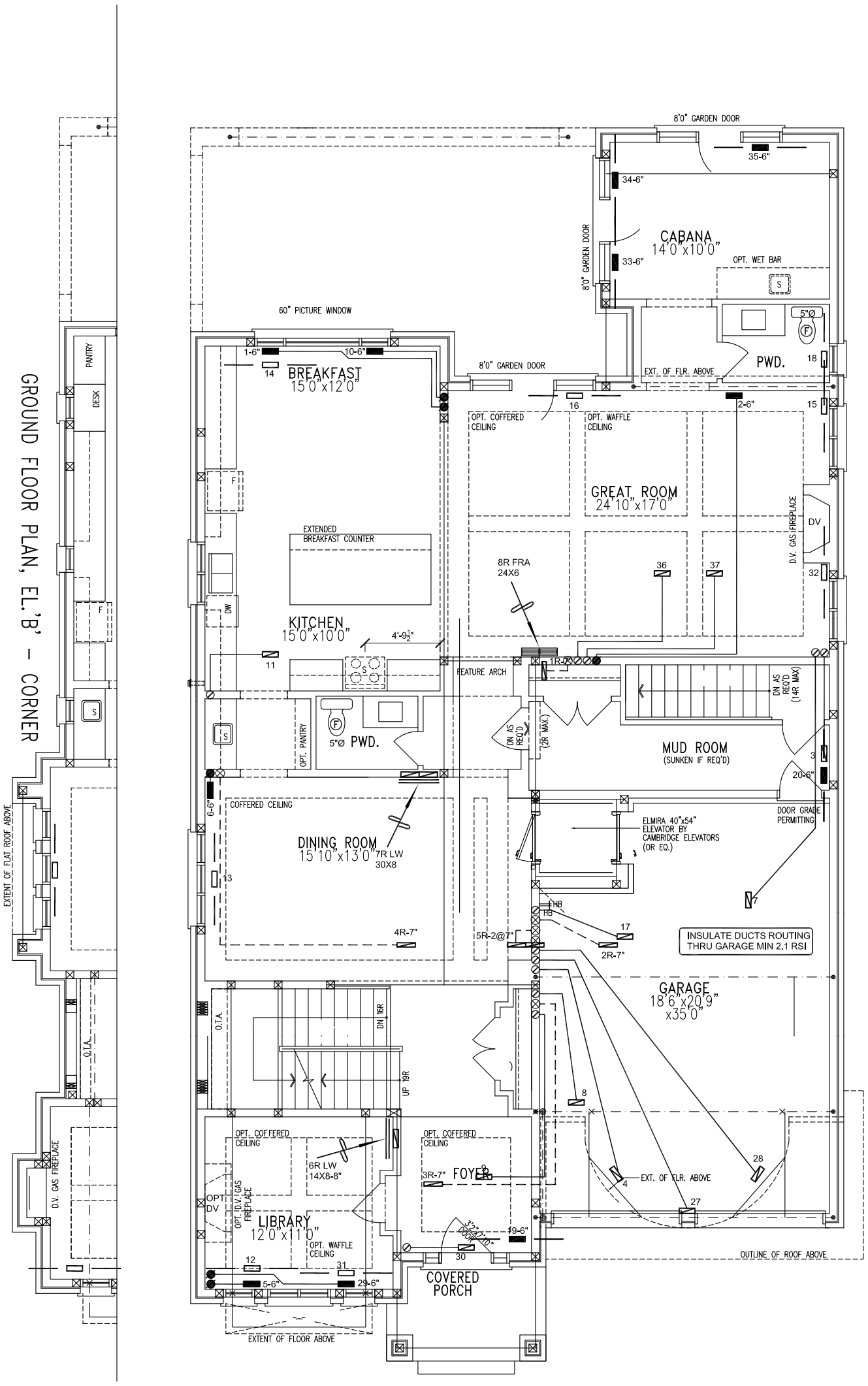
BASEMENT HEATING LAYOUT

Date FEB/2020

Scale 1/8" = 1'-0"

BCIN# 19669

LO# 85467



PARTIAL GROUND FLOOR PLAN, EL. 'B' - CORNER

PARTIAL GROUND FLOOR PLAN, EL. '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

WOB | 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.		
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Client

GOLDPARK HOMES

Project Name

PINE VALLEY & TESTON
VAUGHAN, ONTARIO
KNIGHTSWOOD - WOB
OPT. ELEVATOR - SERV STAIR
5005 ELEV. 'B' & 'B CNR' 4412sqft

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Email: info@hvacdesigns.ca
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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

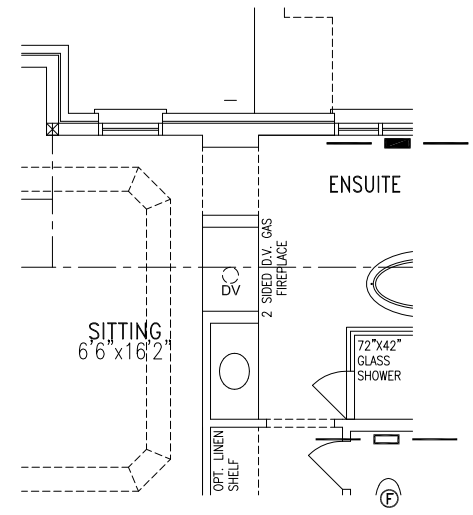
FIRST FLOOR HEATING LAYOUT

Date FEB/2020

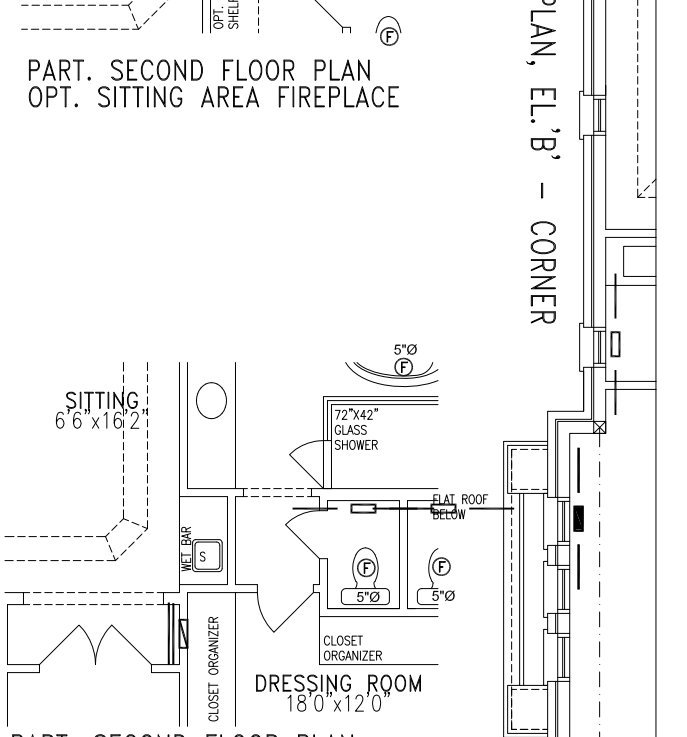
Scale 1/8" = 1'-0"

BCIN# 19669

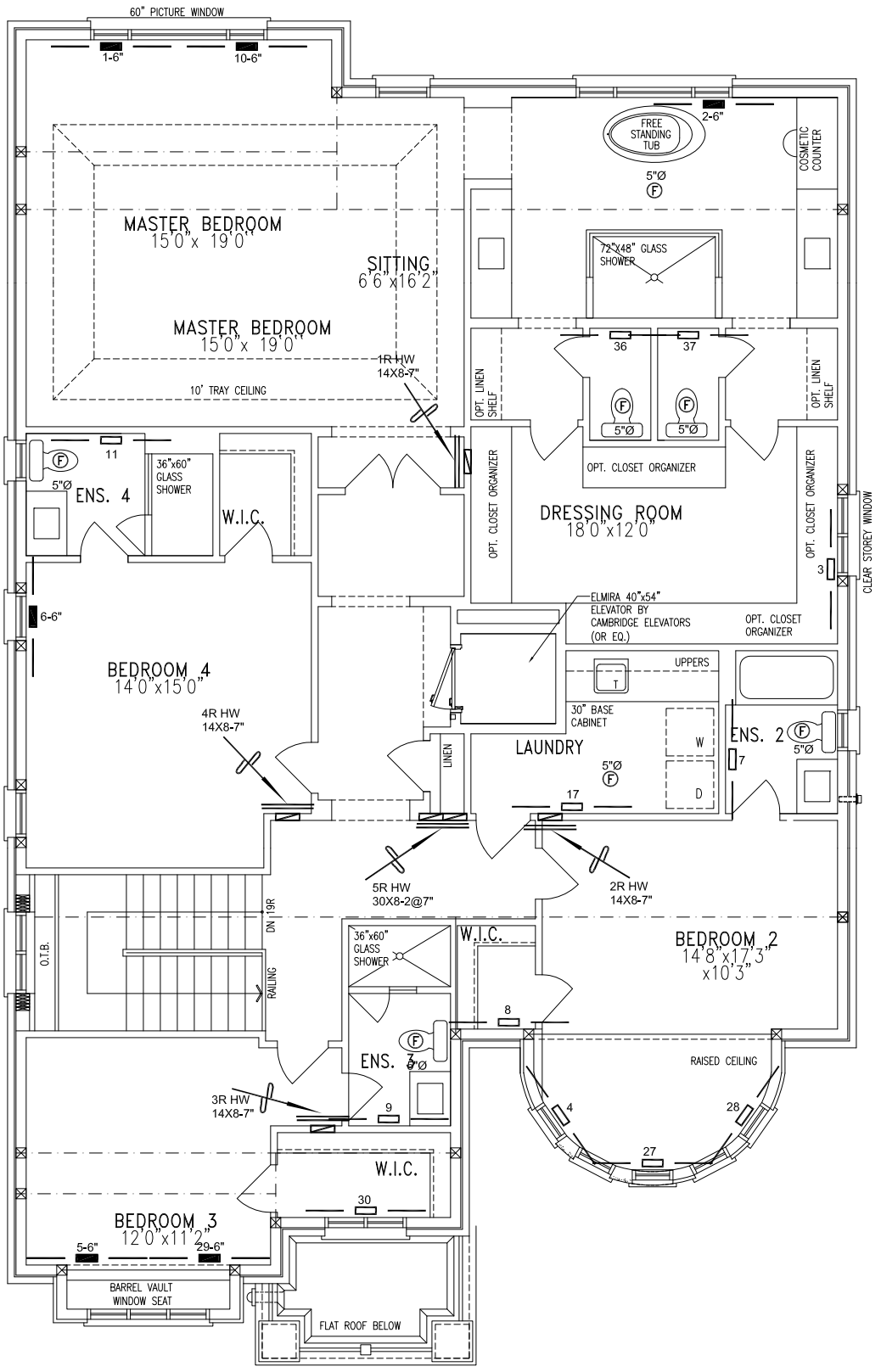
LO# 85467



PART. SECOND FLOOR PLAN
OPT. SITTING AREA FIREPLACE



PART. SECOND FLOOR PLAN
OPT. SITTING AREA WET BAR



SECOND FLOOR PLAN, EL. '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

WOB | 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
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Client
GOLDPARK HOMES

Project Name
PINE VALLEY & TESTON
VAUGHAN, ONTARIO
KNIGHTSWOOD - WOB
OPT. ELEVATOR - SERV STAIR
5005 ELEV. 'B' & 'B CNR' 4412sqft

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.

Sheet Title
SECOND FLOOR HEATING LAYOUT

Date FEB/2020
Scale 1/8" = 1'-0"
BCIN# 19669
LO# 85467

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**		
VAUGHAN (WOODBRIDGE)				

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:** 5005 - KNIGHTSWOOD ELEV B & B CNR OPT SERVICE STAIRS **Project:** PINE VALLEY & TESTON

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.

February 26, 2020
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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Tel: 905.619.2300 Fax: 905.619.2375
Web: www.hvacdesigns.ca E-mail: info@hvacdesigns.ca

SITE NAME: PINE VALLEY & TESTON — ELEV B & B CNR OPT SERVICE STAIRS — DATE: Feb-20 — WINTER NATURAL AIR CHANGE RATE 0.350 — HEAT LOSS ΔT °F. 76 — CSA-F280-12
BUILDER: GOLD PARK HOMES — TYPE: 5005 - KNIGHTSWOOD — GFA: 4477 — LO# 85461 — SUMMER NATURAL AIR CHANGE RATE 0.121 — HEAT GAIN ΔT °F. 14 — SB-12 PACKAGE A1

ROOM USE			MBR			ENS			WIC			BED-2			BED-3			BED-4			ENS-2			WIC-2			ENS-3			ENS-4			WIC-3		
EXP. WALL			46			36			13			36			36			19			6			3			4			7			14		
CLG. HT.			11			10			10			11			11			10			10			10			10			10			10		
FACTORS																																			
GRS.WALL AREA	LOSS	GAIN	506			360			130			396			396			190			60			30			40			70			140		
GLAZING			LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN	
NORTH	21.3	16.3	0	0	0	0	0	0	6	128	98	0	0	0	0	0	0	0	0	0	8	170	130	0	0	0	0	0	0	0	0	0	0	0	0
EAST	21.3	41.8	0	0	0	0	0	0	0	0	0	65	1383	2719	50	1064	2092	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	20	426	837
SOUTH	21.3	25.2	19	404	478	0	0	0	0	0	0	0	0	0	12	255	302	44	936	1108	0	0	0	0	0	0	0	0	0	9	192	227	0	0	0
WEST	21.3	41.8	50	1064	2092	34	724	1422	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
SKYLT.	37.2	102.0	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	0	0	0	0	0	0	0
DOORS	25.2	4.6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
NET EXPOSED WALL	4.5	0.8	437	1950	354	326	1455	264	124	553	100	331	1477	268	334	1491	271	146	652	118	52	232	42	30	134	24	40	179	32	61	272	49	120	536	97
NET EXPOSED BSMT WALL ABOVE GR	3.6	0.7	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	0	0	0	0	0	0
EXPOSED CLG	1.3	0.6	533	684	322	323	415	195	247	317	149	175	225	106	249	320	151	285	366	172	60	77	36	40	51	24	92	118	56	105	135	63	53	68	32
NO ATTIC EXPOSED CLG	2.7	1.3	0	0	0	0	0	0	0	0	0	78	214	101	18	49	23	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	25	64	12	253	645	117	18	46	8	0	0	0	60	153	28	40	102	19	0	0	0	0	0	0	0	0	0
BASEMENT/CRAWL HEAT LOSS			0			0			0			0			0			0			0			0			0			0			0		
SLAB ON GRADE HEAT LOSS			0			0			0			0			0			0			0			0			0			0			0		
SUBTOTAL HT LOSS			4103			2593			1062			3945			3225			1954			632			287			297			598			1029		
SUB TOTAL HT GAIN					3246			1882			359			3311			2847			1398			236			67			88			340			966
LEVEL FACTOR / MULTIPLIER			0.20	0.32		0.20	0.32		0.20	0.32		0.20	0.32		0.20	0.32		0.20	0.32		0.20	0.32		0.20	0.32		0.20	0.32		0.20	0.32		0.20	0.32	
AIR CHANGE HEAT LOSS				1329			840			344			1278			1045			633			205			93			96			194			333		
AIR CHANGE HEAT GAIN					258			150			29			263			226			111			19			5			7			27			77
DUCT LOSS				0			0			141			522			427			0			84			38			0			0			0		
DUCT GAIN					0			0			81			423			373			0			67			49			0			0			0
HEAT GAIN PEOPLE	240		2		480	0		0	0		0	1		240	1		240	1		240	0		0	0		0	0		0	0		0	0		0
HEAT GAIN APPLIANCES/LIGHTS					419			419			419			419			419			419			419			419			419			419			419
TOTAL HT LOSS BTU/H				5432			3433			1546			5745			4697			2587			921			418			393			792			1363	
TOTAL HT GAIN x 1.3 BTU/H					5724			3185			1153			6054			5336			2819			963			702			668			1021			1900

ROOM USE			LIB			DIN			KIT/GT			CAB			LAUN			PWD			FOY			MUD									LOD			BAS		
EXP. WALL			31			32			77			45			0			5			35			32									52			238		
CLG. HT.			11			11			11			11			10			11			11			12									10			10		
FACTORS																																						
GRS.WALL AREA	LOSS	GAIN	341			352			847			495			0			55			385			384									520			1978		
GLAZING			LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN								LOSS	GAIN		LOSS	GAIN	
NORTH	21.3	16.3	0	0	0	0	0	0	46	979	748	0	0	0	0	0	0	9	192	146	0	0	0	0	0	0							0	0	0	6	128	98
EAST	21.3	41.8	56	1192	2343	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
SOUTH	21.3	25.2	0	0	0	34	724	856	21	447	529	63	1341	1586	0	0	0	0	0	0	0	0	0	0	0	0							0	0	0	6	128	151
WEST	21.3	41.8	0	0	0	0	0	0	115	2447	4811	63	1341	2635	0	0	0	0	0	0	0	0	0	0	0	0							22	468	920	0	0	0
SKYLT.	37.2	102.0	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	0	0	0	0
DOORS	25.2	4.6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	56	1414	257	20	505	92							0	0	0	20	505	92
NET EXPOSED WALL	4.5	0.8	285	1272	231	318	1419	258	665	2968	539	369	1647	299	0	0	0	46	205	37	329	1468	267	364	1624	295							0	0	0	0	0	0
NET EXPOSED BSMT WALL ABOVE GR	3.6	0.7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0							290	1044	189	402	1447	263
EXPOSED CLG	1.3	0.6	0	0	0	0	0	0	0	0	0	0	0	0	102	131	62	0	0	0	0	0	0	0	0	0							0	0	0	0	0	0
NO ATTIC EXPOSED CLG	2.7	1.3	0	0	0	0	0	0	0	0	0	203	558	263	0	0	0	40	110	52	41	113	53	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	56	143	26	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			0												8373		
SLAB ON GRADE HEAT LOSS			0			0			0			0			0			0			0			0									0					
SUBTOTAL HT LOSS			2464			2143			6841			4886			274			507			2995			2129									1512			10580		
SUB TOTAL HT GAIN					2574			1114			6626			4784			88			235			576			387								1110			603
LEVEL FACTOR / MULTIPLIER			0.30	0.44		0.30	0.44		0.30	0.44		0.30	0.44		0.20	0.32		0.30	0.44		0.30	0.44		0.30	0.44										0.50	1.34	
AIR CHANGE HEAT LOSS				1090			948			3027			2162			89			224			1325			942												16198		
AIR CHANGE HEAT GAIN					205			89			527			380			7			19			46			31													136
DUCT LOSS				0			0			0			0			36			0			0			0												0		
DUCT GAIN					0			0			0			0			51			0			0			0													0
HEAT GAIN PEOPLE	240		0		0	0		0	0		0	0		0	0		0	0		0	0		0	0		0							0		0	0		0
HEAT GAIN APPLIANCES/LIGHTS					419			419			419			419			419			419			419			419								0				419
TOTAL HT LOSS BTU/H				3554			3091			9868			7048			399			731			4320			3072									1512			26778		
TOTAL HT GAIN x 1.3 BTU/H					4156			2107			9843			7257			734			875			1353			1087									1443			1505

TOTAL HEAT GAIN BTU/H: 60464 — TONS: 5.04 — LOSS DUE TO VENTILATION LOAD BTU/H: 3181 — STRUCTURAL HEAT LOSS: 87697 — TOTAL COMBINED HEAT LOSS BTU/H: 90878

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: PINE VALLEY & TESTON
BUILDER: GOLD PARK HOMES

ELEV B & B CNR OPT SERVICE STAIRS
TYPE: 5005 - KNIGHTSWOOD DATE: Feb-20

GFA: 4477 LO# 85461

HEATING CFM	1955	COOLING CFM	1955	furnace pressure	0.6
TOTAL HEAT LOSS	87,697	TOTAL HEAT GAIN	59,886	furnace filter	0.08
AIR FLOW RATE CFM	22.29	AIR FLOW RATE CFM	32.65	a/c coil pressure	0.2
				available pressure for s/a & r/a	0.32
				plenum pressure s/a	0.17
				max s/a dif press. loss	0.02
				min adjusted pressure s/a	0.15

				r/a pressure	0.15
				r/a grille press. Loss	0.02
				adjusted pressure r/a	0.13

^LENNOX
EL296UH110XE60C 110

AFUE = 96 %
INPUT (BTU/H) = 110,000
OUTPUT (BTU/H) = **106,000**

FAN SPEED	
LOW	0
MEDLOW	1380
MEDIUM	1505
MEDIUM HIGH	1685
HIGH	1955

DESIGN CFM = **1955**
CFM @ .6 " E.S.P.

TEMPERATURE RISE 50 °F

RUN COUNT	4th	3rd	2nd	1st	Bas
S/A	0	0	18	13	7
R/A	0	0	5	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	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	ENS-2	WIC-2	ENS-3	MBR	ENS-4	LIB	DIN	KIT/GT	KIT/GT	KIT/GT	LAUN	PWD	FOY	MUD	BAS	BAS	BAS	BAS
RM LOSS MBH.	2.72	2.74	1.55	1.91	2.35	2.59	0.92	0.42	0.39	2.72	0.79	1.78	3.09	2.47	2.47	2.47	0.40	0.73	4.32	3.07	4.04	4.04	4.04	4.04
CFM PER RUN HEAT	61	61	34	43	52	58	21	9	9	61	18	40	69	55	55	55	9	16	96	68	90	90	90	90
RM GAIN MBH.	2.86	2.46	1.15	2.02	2.67	2.82	0.96	0.70	0.67	2.86	1.02	2.08	2.11	2.46	2.46	2.46	0.73	0.87	1.35	1.09	0.42	0.42	0.42	0.42
CFM PER RUN COOLING	93	80	38	66	87	92	31	23	22	93	33	68	69	80	80	80	24	29	44	35	14	14	14	14
ADJUSTED PRESSURE	0.15	0.16	0.16	0.16	0.15	0.15	0.16	0.16	0.16	0.15	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.15	0.16	0.15	0.15	0.15	0.15
ACTUAL DUCT LGH.	70	70	53	49	70	48	47	48	53	64	59	57	29	52	69	54	36	73	40	65	67	60	54	38
EQUIVALENT LENGTH	190	200	170	160	160	160	200	150	170	170	150	140	103	120	140	110	200	170	210	190	150	120	103	90
TOTAL EFFECTIVE LENGTH	260	270	223	209	230	208	247	198	223	234	209	197	132	172	209	164	236	243	250	255	217	180	157	128
ADJUSTED PRESSURE	0.06	0.06	0.07	0.07	0.06	0.07	0.06	0.08	0.07	0.06	0.07	0.08	0.12	0.09	0.07	0.1	0.07	0.06	0.06	0.06	0.07	0.08	0.09	0.11
ROUND DUCT SIZE	**6**	**6**	4	5	**6**	**6**	4	4	4	**6**	4	5	5	5	**6**	5	4	4	**6**	**6**	**6**	**6**	**6**	5
HEATING VELOCITY (ft/min)	311	311	390	316	265	296	241	103	103	311	207	294	507	404	280	404	103	184	489	347	459	459	459	661
COOLING VELOCITY (ft/min)	474	408	436	485	444	469	356	264	252	474	379	499	507	587	408	587	275	333	224	178	71	71	71	103
OUTLET GRILL SIZE	4X10	4X10	3X10	3X10	4X10	4X10	3X10	3X10	3X10	4X10	3X10	3X10	3X10	3X10	4X10	3X10	3X10	3X10	4X10	4X10	4X10	4X10	4X10	3X10
TRUNK	D	C	E	G	F	E	E	G	G	D	E	F	E	D	B	C	G	A	F	B	A	B	D	E

RUN #	25	26	27	28	29	30	31	32	33	34	35	36	37	38
ROOM NAME	BAS	BAS	BED-2	BED-2	BED-3	WIC-3	LIB	KIT/GT	CAB	CAB	CAB	ENS	ENS	BAS
RM LOSS MBH.	4.04	4.04	1.91	1.91	2.35	1.36	1.78	2.47	2.35	2.35	2.35	0.34	0.34	4.04
CFM PER RUN HEAT	90	90	43	43	52	30	40	55	52	52	52	8	8	90
RM GAIN MBH.	0.42	0.42	2.02	2.02	2.67	1.90	2.08	2.46	2.42	2.42	2.42	0.36	0.36	0.42
CFM PER RUN COOLING	14	14	66	66	87	62	68	80	79	79	79	12	12	14
ADJUSTED PRESSURE	0.15	0.15	0.16	0.16	0.15	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.15
ACTUAL DUCT LGH.	34	50	52	55	75	58	51	55	69	71	82	56	58	23
EQUIVALENT LENGTH	110	150	170	160	160	190	160	120	150	130	140	200	190	140
TOTAL EFFECTIVE LENGTH	144	200	222	215	235	248	211	175	219	201	222	256	248	163
ADJUSTED PRESSURE	0.1	0.07	0.07	0.07	0.06	0.06	0.07	0.09	0.07	0.08	0.07	0.06	0.06	0.09
ROUND DUCT SIZE	5	**6**	5	5	**6**	5	5	5	**6**	5	**6**	4	4	**6**
HEATING VELOCITY (ft/min)	661	459	316	316	265	220	294	404	265	382	265	92	92	459
COOLING VELOCITY (ft/min)	103	71	485	485	444	455	499	587	403	580	403	138	138	71
OUTLET GRILL SIZE	3X10	4X10	3X10	3X10	4X10	3X10	3X10	3X10	4X10	3X10	4X10	3X10	3X10	4X10
TRUNK	G	F	G	G	F	F	F	B	A	A	A	C	C	E

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	262	0.06	9.1	10	x	8	472	TRUNK G	646	0.06	12.8	20	x	8	581
TRUNK B	268	0.06	9.2	10	x	8	482	TRUNK H	1955	0.06	19.4	34	x	10	828
TRUNK C	662	0.06	12.9	20	x	8	596	TRUNK I	0	0.00	0	0	x	8	0
TRUNK D	267	0.06	9.2	10	x	8	481	TRUNK J	0	0.00	0	0	x	8	0
TRUNK E	1309	0.06	16.7	26	x	10	725	TRUNK K	0	0.00	0	0	x	8	0
TRUNK F	400	0.06	10.7	14	x	8	514	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	1500	0.05	18.4	32	x	10	675
TRUNK Y	955	0.05	15.5	28	x	8	614
TRUNK Z	480	0.05	12	16	x	8	540
DROP	1955	0.05	20.3	24	x	18	652

RETURN AIR #	1	2	3	4	5	6	7	8								BR
	0	0	0	0	2@7"	0	0	0	0	0	0	0	0	0	0	
AIR VOLUME	115	130	125	115	240	200	360	365	0	0	0	0	0	0	0	305
PLENUM PRESSURE	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13
ACTUAL DUCT LGH.	84	51	62	59	47	49	30	51	1	1	1	1	1	1	1	14
EQUIVALENT LENGTH	200	135	155	185	135	140	170	195	0	0	0	0	0	0	0	145
TOTAL EFFECTIVE LH	284	186	217	244	182	189	200	246	1	1	1	1	1	1	1	159
ADJUSTED PRESSURE	0.05	0.07	0.06	0.05	0.07	0.07	0.07	0.05	13.36	13.36	13.36	13.36	13.36	13.36	13.36	0.08
ROUND DUCT SIZE	7	6.8	6.9	7	8.5	7.9	9.9	10.8	0	0	0	0	0	0	0	9
INLET GRILL SIZE	8	8	8	8	8	8	8	8	0	0	0	0	0	0	0	8
	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
INLET GRILL SIZE	14	14	14	14	30	14	30	30	0	0	0	0	0	0	0	30

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: 5005 - KNIGHTSWOOD LO # 85461
SITE NAME: PINE VALLEY & TESTON ELEV B & B CNR OPT SERVICE STAIRS

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	7	@ 10.6 cfm	74.2	cfm
Other Rooms	8	@ 10.6 cfm	84.8	cfm
Table 9.32.3.A.		TOTAL	233.2	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	233.2	cfm
Less Principal Ventil. Capacity	155	cfm
Required Supplemental Capacity	78.2	cfm

PRINCIPAL EXHAUST FAN CAPACITY

Model: VANEE 65H Location: BSMT

155.0 cfm 3.0 sones [✓] HVI Approved

PRINCIPAL EXHAUST HEAT LOSS CALCULATION

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

SUPPLEMENTAL FANS

NUTONE

Location	Model	cfm	HVI	Sones
ENS	QTXEN050C	50	✓	0.3
ENS-2	QTXEN050C	50	✓	0.3
ENS-4	QTXEN050C	50	✓	0.3
PWD	QTXEN050C	50	✓	0.3

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: 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: February-20

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#: 85461 Model: 5005 - KNIGHTSWOOD Builder: GOLD PARK HOMES Date: 02/26/2020

Volume Calculation

House Volume

Level	Floor Area (ft²)	Floor Height (ft)	Volume (ft³)
Bsmt	2117	10	21170
First	2117	11	23287
Second	2360	10	23600
Third	0	9	0
Fourth	0	9	0
		Total:	68,057.0 ft³
		Total:	1927.2 m³

Air Change & Delta T Data

WINTER NATURAL AIR CHANGE RATE	0.350
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	23	31	8	14

5.2.3.1 Heat Loss due to Air Leakage

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

0.350 x 535.32 x 42 °C x 1.2 = 9495 W

= **32397 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 535.32 x 8 °C x 1.2 = 596 W

= **2034 Btu/h**

5.2.3.2 Heat Loss due to Mechanical Ventilation

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

155 CFM x 76 °F x 1.08 x 0.25 = **3181 Btu/h**

6.2.7 Sensible heat Gain due to Ventilation

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

155 CFM x 14 °F x 1.08 x 0.25 = **578 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	32,397	12,091	1.340
2	0.3		21,964	0.442
3	0.2		19,998	0.324
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: 5005 - KNIGHTSWOOD ELEV B & B CNR OPT SERVICE STA **BUILDER:** GOLD PARK HOMES
SFQT: 4477 **LO#** 85461 **SITE:** PINE VALLEY & TESTON

DESIGN ASSUMPTIONS

HEATING	°F	COOLING	°F
OUTDOOR DESIGN TEMP.	-4	OUTDOOR DESIGN TEMP.	88
INDOOR DESIGN TEMP.	72	INDOOR DESIGN TEMP. (MAX 75°F)	74

BUILDING DATA

ATTACHMENT:	DETACHED	# 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):	68057.0	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:	7.0 ft
LENGTH: 77.0 ft	WIDTH: 42.0 ft	EXPOSED PERIMETER:	238.0 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	29.80
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

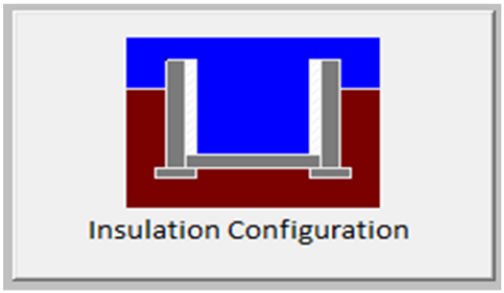
Michael O'Rourke

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 sand, loam, clay
Water Table:	Normal (7-10 m, 23-33 ft)

Foundation Dimensions		
Floor Length (m):	**23.5**	 Insulation Configuration
Floor Width (m):	**12.8**	
Exposed Perimeter (m):	**0.0**	
Wall Height (m):	**3.0**	
Depth Below Grade (m):	**2.13**	
Window Area (m^2):	**3.2**	
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):	**2453**	

TYPE: 5005 - KNIGHTSWOOD ELEV B & B CNR OPT SERVICE STAIRS
LO# 85461

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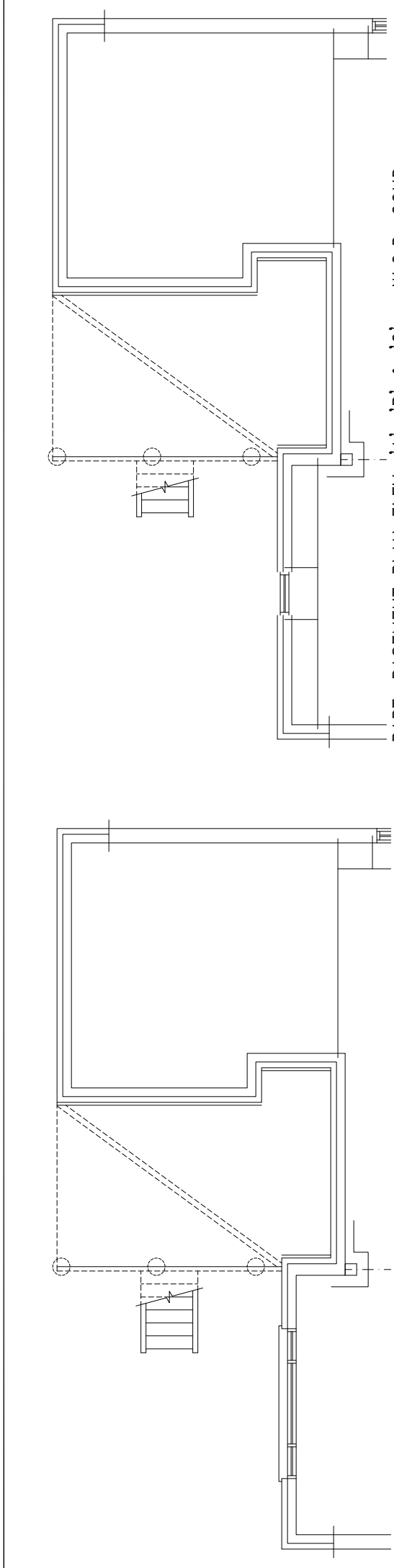
Air Infiltration Residential Load Calculator

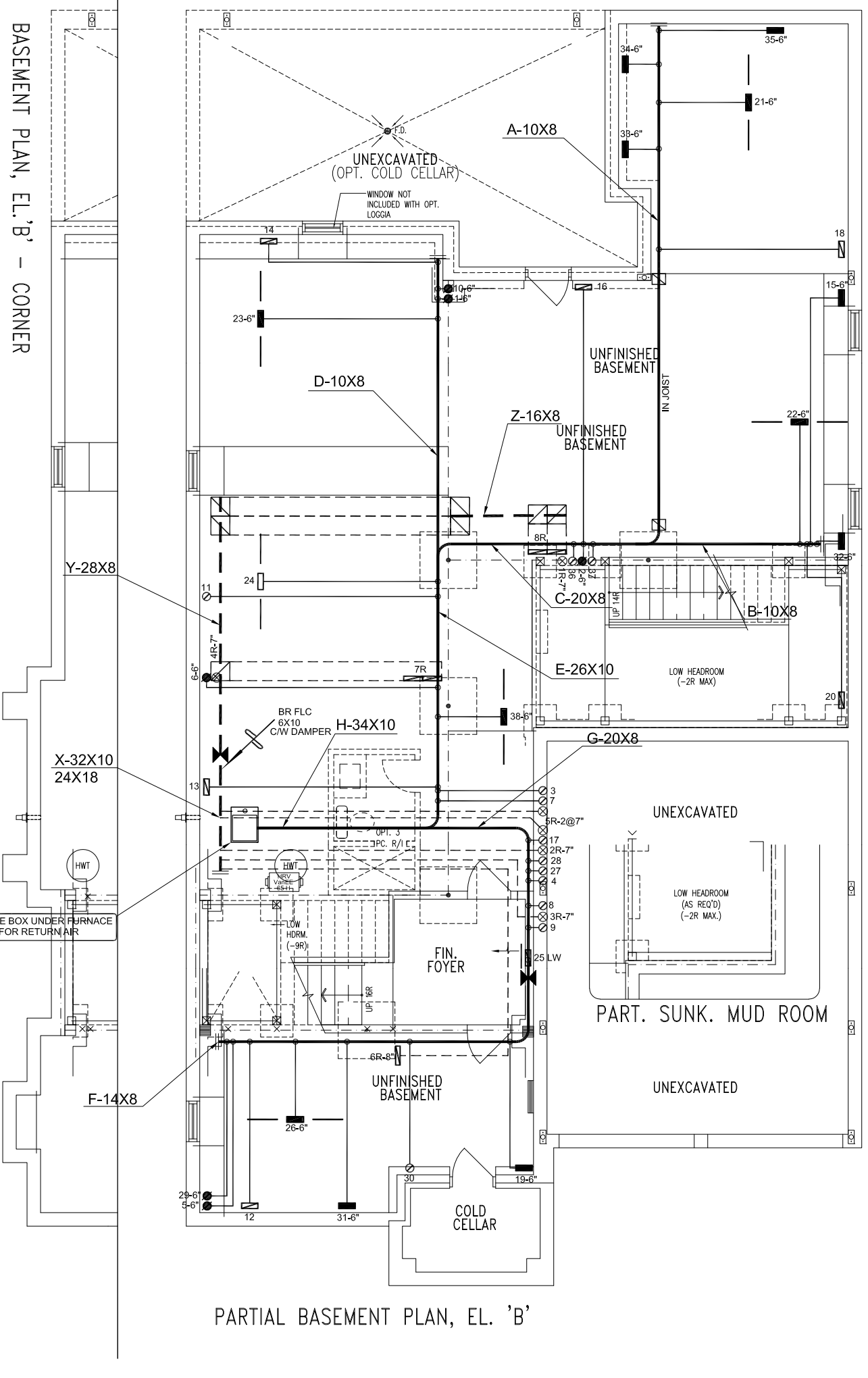
Supplemental tool for CAN/CSA-F280

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):	7.32
Building Configuration	
Type:	Detached
Number of Stories:	Two
Foundation:	Full
House Volume (m^3):	1927.2
Air Leakage/Ventilation	
Air Tightness Type:	Present (1961-) (3.57 ACH)
Custom BDT Data:	ELA @ 10 Pa. 2569.0 cm^2
	3.57 ACH @ 50 Pa
Mechanical Ventilation (L/s):	Total Supply 73.2 / Total Exhaust 73.2
Flue Size	
Flue #:	#1 #2 #3 #4
Diameter (mm):	0 0 0 0
Natural Infiltration Rates	
Heating Air Leakage Rate (ACH/H):	**0.350**
Cooling Air Leakage Rate (ACH/H):	**0.121**

TYPE: 5005 - KNIGHTSWOOD ELEV B & B CNR OPT SERVICE STAIRS

LO# 85461





PARTIAL BASEMENT PLAN, EL. '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.		

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Client

GOLDPARK HOMES

Project Name

PINE VALLEY & TESTON
VAUGHAN, ONTARIO
OPT SERVICE STAIRS
KNIGHTSWOOD (& CNR)
5005 ELEV. 'B' 4477 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 90878 BTU/H

UNIT DATA

MAKE	LENNOX	
MODEL	EL296UH110XE60C	
INPUT	110	MBTU/H
OUTPUT	106	MBTU/H
COOLING	5.0	TONS
FAN SPEED	1955	cfm @ 0.6" w.c.

# OF RUNS	S/A	R/A	FANS
3RD FLOOR			
2ND FLOOR	18	5	7
1ST FLOOR	13	3	3
BASEMENT	7	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

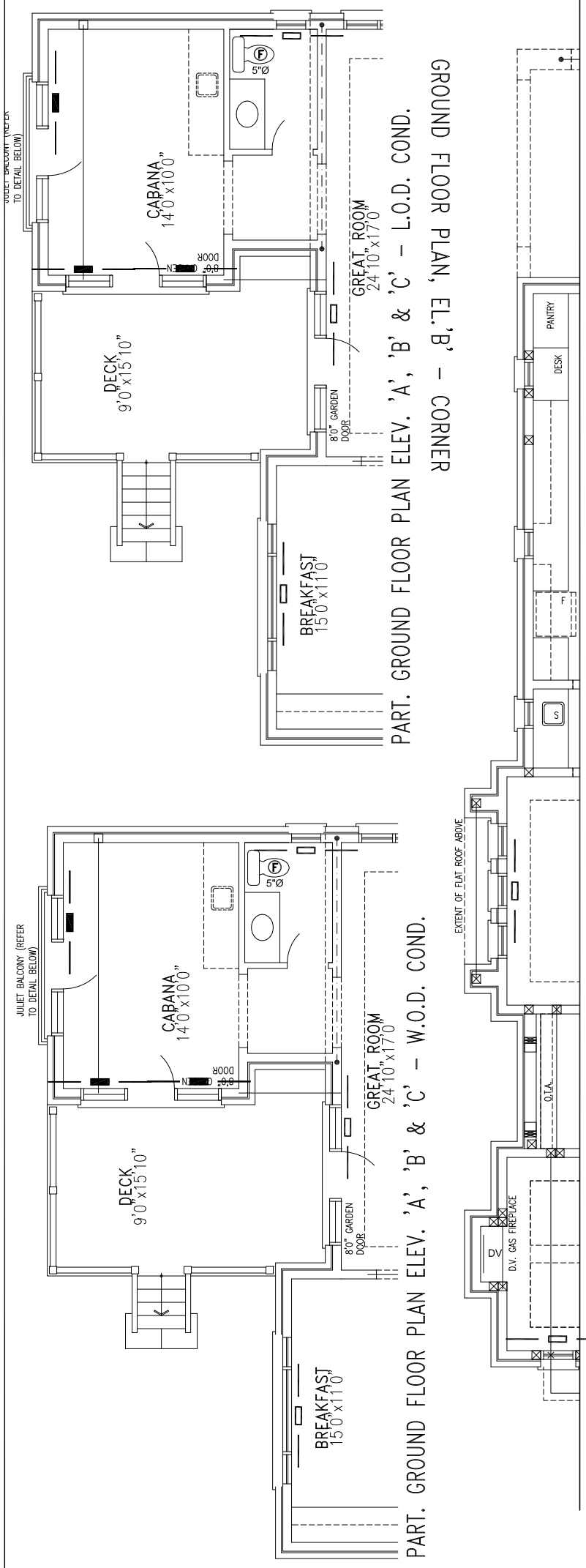
BASEMENT HEATING LAYOUT

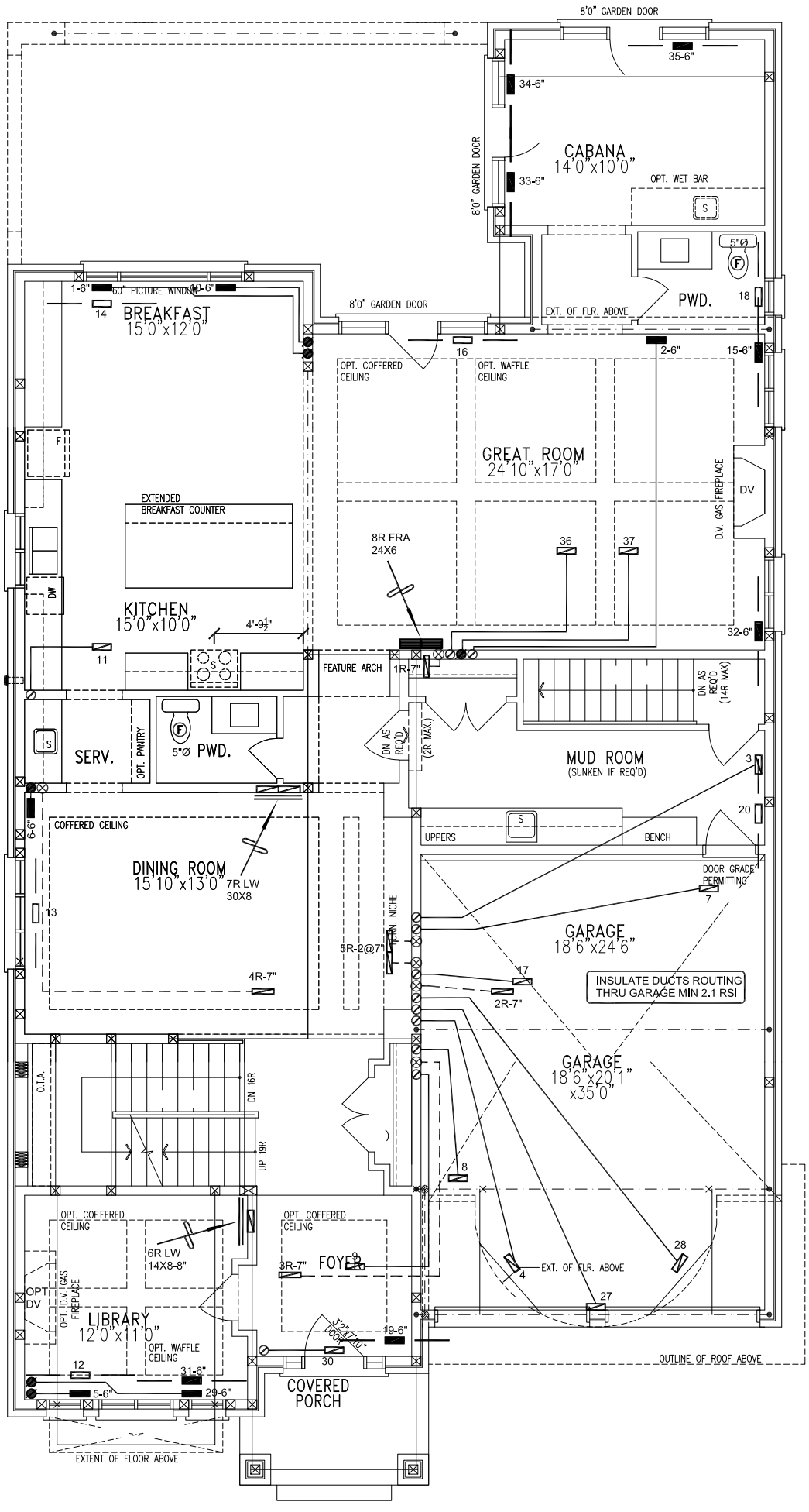
Date FEB/2020

Scale 1/8" = 1'-0"

BCIN# 19669

LO# 85461





PARTIAL GROUND FLOOR PLAN, EL. '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
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Client
GOLDPARK HOMES

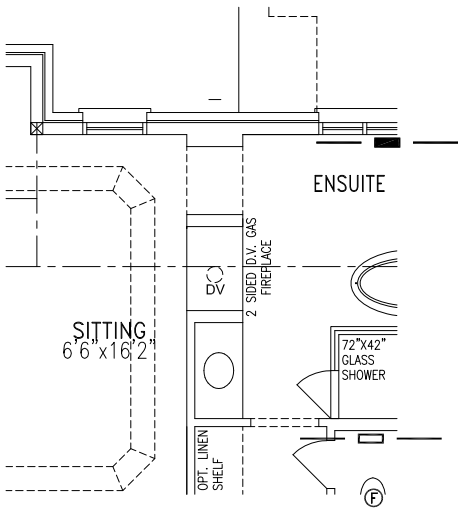
Project Name
PINE VALLEY & TESTON
VAUGHAN, ONTARIO
OPT SERVICE STAIRS
KNIGHTSWOOD (& CNR)
5005 ELEV. 'B' 4477 sqft

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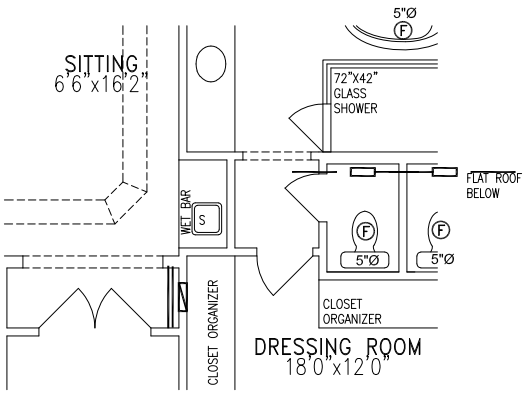
Installation to comply with the latest Ontario Building Code. All supply branch outlets shall be equipped with a manual balancing damper. Ductwork which passes through the garage or unheated spaces shall be adequately insulated and be gas-proofed.

Sheet Title
FIRST FLOOR HEATING LAYOUT

Date FEB/2020
Scale 1/8" = 1'-0"
BCIN# 19669
LO# 85461

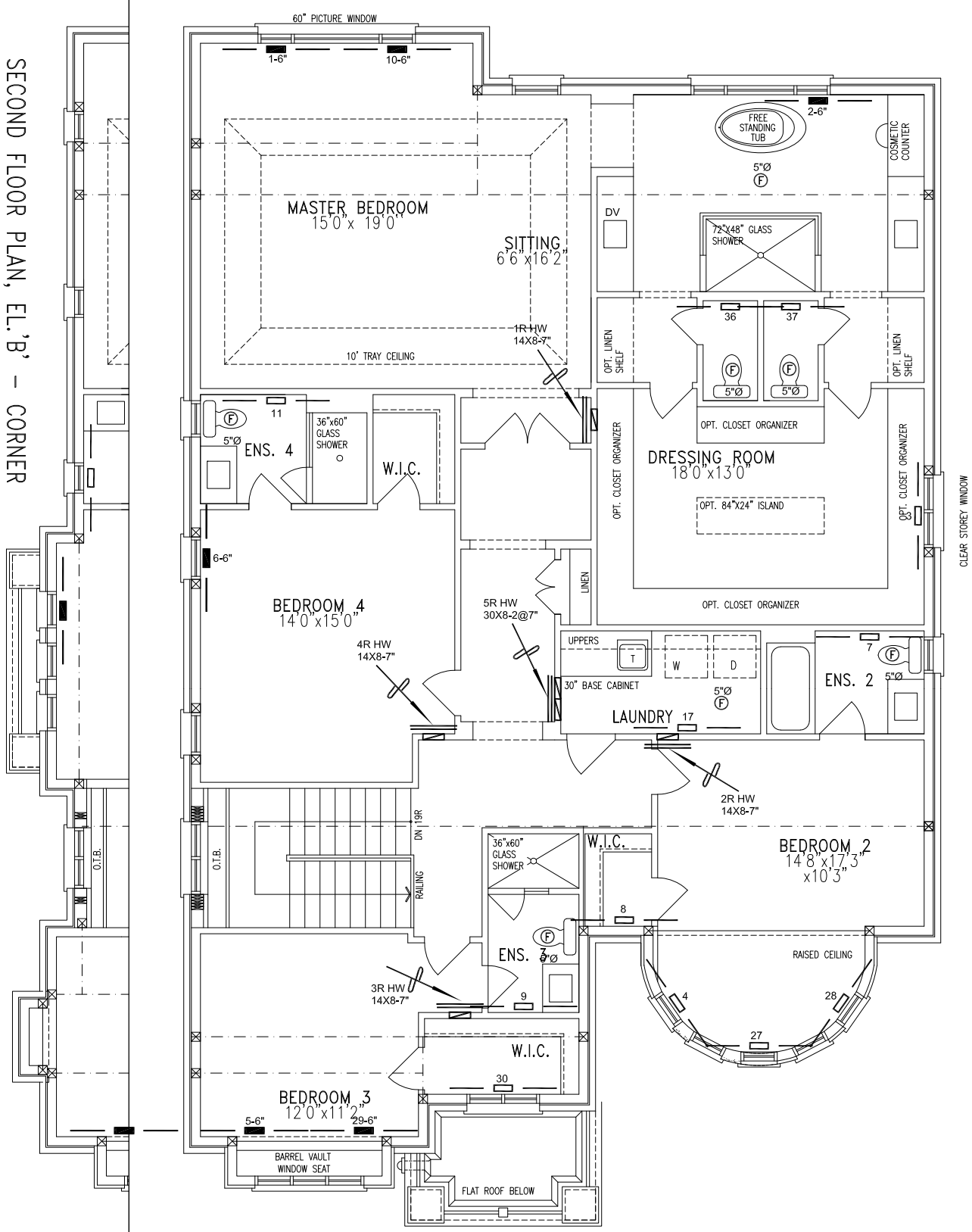


PART. SECOND FLOOR PLAN
OPT. SITTING AREA FIREPLACE



PART. SECOND FLOOR PLAN
OPT. SITTING AREA WET BAR

SECOND FLOOR PLAN, EL. 'B' - CORNER



SECOND FLOOR PLAN, EL. '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
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Client
GOLDPARK HOMES

Project Name
PINE VALLEY & TESTON
VAUGHAN, ONTARIO
OPT SERVICE STAIRS
KNIGHTSWOOD (& CNR)
5005 ELEV. 'B' 4477 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
SECOND FLOOR HEATING LAYOUT

Date FEB/2020
Scale 1/8" = 1'-0"
BCIN# 19669
LO# 85461

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**		
VAUGHAN (WOODBRIDGE)				

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:** 5005 - KNIGHTSWOOD ELEV B & B CNR - WOB **Project:** PINE VALLEY & TESTON

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.

February 26, 2020
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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Tel: 905.619.2300 Fax: 905.619.2375
Web: www.hvacdesigns.ca E-mail: info@hvacdesigns.ca

SITE NAME: PINE VALLEY & TESTON | ELEV B & B CNR - WOB | DATE: Feb-20 | WINTER NATURAL AIR CHANGE RATE 0.416 | HEAT LOSS ΔT °F. 76 | CSA-F280-12

BUILDER: GOLD PARK HOMES | TYPE: 5005 - KNIGHTSWOOD | GFA: 4380 | LO# 79985 | SUMMER NATURAL AIR CHANGE RATE 0.139 | HEAT GAIN ΔT °F. 13 | SB-12 PACKAGE A1

ROOM USE			MBR			ENS			WIC			BED-2			BED-3			BED-4			ENS-2			WIC-2			ENS-3			ENS-4			WIC-3		
EXP. WALL			46			36			13			36			36			19			6			3			4			7			14		
CLG. HT.			11			10			10			11			11			10			10			10			10			10			10		
	FACTORS																																		
GRS.WALL AREA	LOSS	GAIN	506			360			130			396			396			190			60			30			40			70			140		
GLAZING			LOSS		GAIN	LOSS		GAIN	LOSS		GAIN	LOSS		GAIN	LOSS		GAIN	LOSS		GAIN	LOSS		GAIN	LOSS		GAIN	LOSS		GAIN	LOSS		GAIN	LOSS		GAIN
NORTH	21.3	15.6	0	0	0	0	0	0	6	128	93	0	0	0	0	0	0	0	0	0	8	170	124	0	0	0	0	0	0	0	0	0	0	0	0
EAST	21.3	40.3	0	0	0	0	0	0	0	0	0	65	1383	2619	50	1064	2014	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	20	426	806
SOUTH	21.3	24.2	19	404	460	0	0	0	0	0	0	0	0	0	12	255	290	44	936	1064	0	0	0	0	0	0	0	0	0	9	192	218	0	0	0
WEST	21.3	40.3	50	1064	2014	34	724	1370	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
SKYLT.	37.2	101.5	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	0	0	0	0	0	0
DOORS	25.2	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	0	0	0	0	0	0
NET EXPOSED WALL	4.5	0.8	437	1950	328	326	1455	245	124	553	93	331	1477	249	334	1491	251	146	652	110	52	232	39	30	134	23	40	179	30	61	272	46	120	536	90
NET EXPOSED BSMT WALL ABOVE GR	3.6	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	0	0	0	0	0	0	0	0	0
EXPOSED CLG	1.3	0.6	533	684	313	323	415	190	247	317	145	175	225	103	249	320	146	285	366	167	60	77	35	40	51	24	92	118	54	105	135	62	53	68	31
NO ATTIC EXPOSED CLG	2.7	1.3	0	0	0	0	0	0	0	0	0	78	214	98	18	49	23	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	154	393	66	253	645	109	18	46	8	0	0	0	60	153	26	40	102	17	0	0	0	0	0	0	0	0	0
BASEMENT/CRAWL HEAT LOSS				0			0			0			0			0			0			0			0			0			0			0	
SLAB ON GRADE HEAT LOSS				0			0			0			0			0			0			0			0			0			0			0	
SUBTOTAL HT LOSS				4103			2593			1391			3945			3225			1954			632			287			297			598			1029	
SUB TOTAL HT GAIN					3116			1805			398			3177			2732			1342			225			63			84			325			927
LEVEL FACTOR / MULTIPLIER			0.20	0.37		0.20	0.37		0.20	0.37		0.20	0.37		0.20	0.37		0.20	0.37		0.20	0.37		0.20	0.37		0.20	0.37		0.20	0.37		0.20	0.37	
AIR CHANGE HEAT LOSS				1507			952			511			1449			1185			718			232			106			109			220			378	
AIR CHANGE HEAT GAIN					248			144			32			253			218			107			18			5			7			26			74
DUCT LOSS				0			0			190			539			441			0			86			39			0			0			0	
DUCT GAIN					0			0			88			412			364			0			69			52			0			0			0
HEAT GAIN PEOPLE	240		2		480	0		0	0		0	1		240	1		240	1		240	0		0	0		0	0		0	0		0	0		0
HEAT GAIN APPLIANCES/LIGHTS					452			452			452			452			452			452			452			452			0			452			0
TOTAL HT LOSS BTU/H				5610			3545			2092			5933			4850			2671			951			432			406			818			1407	
TOTAL HT GAIN x 1.3 BTU/H					5584			3120			1260			5894			5208			2782			993			743			118			1044			1301

ROOM USE			LIB			DIN			KIT/GT			CAB			LAUN			PWD			FOY			MUD									WOB			BAS		
EXP. WALL			31			32			87			45			0			5			35			18									52			186		
CLG. HT.			11			11			11			11			10			11			11			12									10			10		
	FACTORS																																				
GRS.WALL AREA	LOSS	GAIN	341			352			957			495			0			55			385			216									520			1302		
GLAZING			LOSS		GAIN	LOSS		GAIN	LOSS		GAIN	LOSS		GAIN	LOSS		GAIN	LOSS		GAIN	LOSS		GAIN	LOSS		GAIN						LOSS		GAIN	LOSS		GAIN
NORTH	21.3	15.6	0	0	0	0	0	0	46	979	716	0	0	0	0	0	0	9	192	140	0	0	0	0	0	0						0	0	0	6	128	93
EAST	21.3	40.3	56	1192	2256	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
SOUTH	21.3	24.2	0	0	0	34	724	822	21	447	508	63	1341	1524	0	0	0	0	0	0	0	0	0	0	0	0						46	979	556	6	128	145
WEST	21.3	40.3	0	0	0	0	0	0	105	2234	4230	63	1341	2538	0	0	0	0	0	0	0	0	0	0	0	0						106	2256	2135	0	0	0
SKYLT.	37.2	101.5	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	0	0	0
DOORS	25.2	4.3	0	0	0	0	0	0	10	252	43	0	0	0	0	0	0	0	0	0	56	1414	238	20	505	85						20	505	85	20	505	85
NET EXPOSED WALL	4.5	0.8	285	1272	214	318	1419	239	775	3459	583	369	1647	277	0	0	0	46	205	35	329	1468	247	196	875	147						348	1553	262	0	0	0
NET EXPOSED BSMT WALL ABOVE GR	3.6	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						0	0	0	558	2008	338
EXPOSED CLG	1.3	0.6	0	0	0	0	0	0	0	0	0	0	0	0	102	131	60	0	0	0	0	0	0	0	0	0						0	0	0	0	0	0
NO ATTIC EXPOSED CLG	2.7	1.3	0	0	0	0	0	0	0	0	0	203	558	255	0	0	0	40	110	50	41	113	52	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	56	143	24	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			0										2977		
SLAB ON GRADE HEAT LOSS				0			0			0			0			0			0			0			0									741				
SUBTOTAL HT LOSS				2464			2143			7371			4886			274			507			2995			1380									6034			5746		
SUB TOTAL HT GAIN					2470			1061			6079			4595			84			225			537			232									3038			662
LEVEL FACTOR / MULTIPLIER			0.30	0.52		0.30	0.52		0.30	0.52		0.30	0.52		0.20	0.37		0.30	0.52		0.30	0.52		0.30	0.52											0.50	1.58	
AIR CHANGE HEAT LOSS				1269			1104			3797			2517			101			261			1543			711												18667	
AIR CHANGE HEAT GAIN					197			85			484			366			7			18			43			19													295
DUCT LOSS				0			0			0			0			37			0			0			0												0	
DUCT GAIN					0			0			0			0			54			0			0			0													0
HEAT GAIN PEOPLE	240		0		0	0		0	0		0	0		0	0		0	0		0	0		0	0		0						0		0	0		0
HEAT GAIN APPLIANCES/LIGHTS					452			452			452			452			452			452			452			452												452
TOTAL HT LOSS BTU/H				3732			3246			11168			7403			412			768			4537			2090									6775			24413	
TOTAL HT GAIN x 1.3 BTU/H					4054			2077			9119			7036			775			903			1341			913									3950			1831

TOTAL HEAT GAIN BTU/H: 60581 TONS: 5.05 LOSS DUE TO VENTILATION LOAD BTU/H: 3181 STRUCTURAL HEAT LOSS: 93260 TOTAL COMBINED HEAT LOSS BTU/H: 96441

I REVIEW AND TAKE RESPONSIBILITY FOR THE DESIGN WORK AND AM QUALIFIED IN THE APPROPRIATE CATEGORY AS AN "OTHER DESIGNER" UNDER DIVISION C, 3.2.5 OF THE BUILDING CODE.

Michael O'Rourke

INDIVIDUAL BCIN: 19669 MICHAEL O'ROURKE

HVAC DESIGNS LTD.

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SITE NAME: PINE VALLEY & TESTON — ELEV B & B CNR - WOB
BUILDER: GOLD PARK HOMES — TYPE: 5005 - KNIGHTSWOOD — DATE: Feb-20 — GFA: 4380 — LO# 79985

HEATING CFM	1955		COOLING CFM	1955		furnace pressure	0.6																	
TOTAL HEAT LOSS	93,260		TOTAL HEAT GAIN	60,045		furnace filter	0.08																	
AIR FLOW RATE CFM	20.96		AIR FLOW RATE CFM	32.56		a/c coil pressure	0.2																	
						available pressure																		
						for s/a & r/a	0.32																	
						plenum pressure s/a	0.17			r/a pressure	0.15													
						max s/a dif press. loss	0.02			r/a grille press. Loss	0.02													
						min adjusted pressure s/a	0.15			adjusted pressure r/a	0.13													

^LENNOX
EL296UH110XE60C **110**

AFUE = 96 %
INPUT (BTU/H) = 110,000
OUTPUT (BTU/H) = **106,000**

FAN SPEED	
LOW	0
MEDLOW	1380
MEDIUM	1505
MEDIUM HIGH	1685
HIGH	1955

DESIGN CFM = **1955** CFM @ .6 " E.S.P.

TEMPERATURE RISE 50 °F

RUN COUNT	4th	3rd	2nd	1st	Bas
S/A	0	0	18	13	8
R/A	0	0	5	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	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	ENS-2	WIC-2	ENS-3	MBR	ENS-4	LIB	DIN	KIT/GT	KIT/GT	KIT/GT	LAUN	PWD	FOY	MUD	BAS	BAS	BAS	BAS
RM LOSS MBH.	2.80	2.78	2.09	1.98	2.43	2.67	0.95	0.43	0.41	2.80	0.82	1.87	3.25	2.79	2.79	2.79	0.41	0.77	4.54	2.09	3.90	3.90	3.90	3.90
CFM PER RUN HEAT	59	58	44	41	51	56	20	9	8	59	17	39	68	59	59	59	9	16	95	44	82	82	82	82
RM GAIN MBH.	2.79	2.44	1.26	1.96	2.60	2.78	0.99	0.74	0.12	2.79	1.04	2.03	2.08	2.28	2.28	2.28	0.78	0.90	1.34	0.91	0.72	0.72	0.72	0.72
CFM PER RUN COOLING	91	79	41	64	85	91	32	24	4	91	34	66	68	74	74	74	25	29	44	30	24	24	24	24
ADJUSTED PRESSURE	0.15	0.16	0.16	0.16	0.15	0.15	0.16	0.16	0.16	0.15	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.15	0.16	0.15	0.15	0.15	0.15
ACTUAL DUCT LGH.	70	70	53	49	70	48	47	48	53	64	59	57	29	52	69	54	36	73	40	47	77	60	69	38
EQUIVALENT LENGTH	200	200	170	160	160	160	200	150	170	170	150	140	103	120	140	110	200	170	210	160	150	120	150	90
TOTAL EFFECTIVE LENGTH	270	270	223	209	230	208	247	198	223	234	209	197	132	172	209	164	236	243	250	207	227	180	219	128
ADJUSTED PRESSURE	0.05	0.06	0.07	0.07	0.06	0.07	0.06	0.08	0.07	0.06	0.07	0.08	0.12	0.09	0.07	0.1	0.07	0.06	0.06	0.08	0.06	0.08	0.07	0.11
ROUND DUCT SIZE	**6**	**6**	5	5	**6**	**6**	4	4	4	**6**	4	5	5	5	5	5	4	4	**6**	4	**6**	**6**	**6**	5
HEATING VELOCITY (ft/min)	301	296	323	301	260	286	229	103	92	301	195	286	499	433	433	433	103	184	484	505	418	418	418	602
COOLING VELOCITY (ft/min)	464	403	301	470	433	464	367	275	46	464	390	485	499	543	543	543	287	333	224	344	122	122	122	176
OUTLET GRILL SIZE	4X10	4X10	3X10	3X10	4X10	4X10	3X10	3X10	3X10	4X10	3X10	3X10	3X10	3X10	3X10	3X10	3X10	3X10	4X10	3X10	4X10	4X10	4X10	3X10
TRUNK	D	C	E	G	F	E	E	G	G	D	E	F	E	D	B	C	G	A	F	C	A	B	D	E

RUN #	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39
ROOM NAME	BAS	BAS	BED-2	BED-2	BED-3	WIC-3	LIB	KIT/GT	CAB	CAB	CAB	ENS	ENS	BAS	BAS
RM LOSS MBH.	3.90	3.90	1.98	1.98	2.43	1.41	1.87	2.79	2.47	2.47	2.47	0.38	0.38	3.90	3.90
CFM PER RUN HEAT	82	82	41	41	51	29	39	59	52	52	52	8	8	82	82
RM GAIN MBH.	0.72	0.72	1.96	1.96	2.60	1.30	2.03	2.28	2.35	2.35	2.35	0.34	0.34	0.72	0.72
CFM PER RUN COOLING	24	24	64	64	85	42	66	74	76	76	76	11	11	24	24
ADJUSTED PRESSURE	0.15	0.15	0.16	0.16	0.15	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.15	0.15
ACTUAL DUCT LGH.	34	50	52	55	75	58	51	55	69	71	82	56	58	23	58
EQUIVALENT LENGTH	110	150	170	160	160	190	160	120	150	130	140	200	190	140	170
TOTAL EFFECTIVE LENGTH	144	200	222	215	235	248	211	175	219	201	222	256	248	163	228
ADJUSTED PRESSURE	0.1	0.07	0.07	0.07	0.06	0.06	0.07	0.09	0.07	0.08	0.07	0.06	0.06	0.09	0.06
ROUND DUCT SIZE	5	**6**	5	5	**6**	5	5	5	**6**	5	**6**	4	4	5	**6**
HEATING VELOCITY (ft/min)	602	418	301	301	260	213	286	433	265	382	265	92	92	602	418
COOLING VELOCITY (ft/min)	176	122	470	470	433	308	485	543	388	558	388	126	126	176	122
OUTLET GRILL SIZE	3X10	4X10	3X10	3X10	4X10	3X10	3X10	3X10	4X10	3X10	4X10	3X10	3X10	3X10	4X10
TRUNK	G	F	G	G	F	F	F	B	A	A	A	C	C	E	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	254	0.06	9	10	x	8	457		TRUNK G	617	0.06	12.6	18	x	8	617
TRUNK B	200	0.07	7.9	8	x	8	450		TRUNK H	1955	0.05	20.3	38	x	10	741
TRUNK C	713	0.06	13.3	20	x	8	642		TRUNK I	0	0.00	0	0	x	8	0
TRUNK D	259	0.05	9.5	10	x	8	466		TRUNK J	0	0.00	0	0	x	8	0
TRUNK E	1341	0.05	17.6	28	x	10	690		TRUNK K	0	0.00	0	0	x	8	0
TRUNK F	386	0.06	10.6	14	x	8	496		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	1500	0.05	18.4	32	x	10	675
TRUNK Y	955	0.05	15.5	28	x	8	614
TRUNK Z	480	0.05	12	16	x	8	540
DROP	1955	0.05	20.3	24	x	18	652

RETURN AIR #	1	2	3	4	5	6	7	8								BR
	0	0	0	0	2@7"	0	0	0	0	0	0	0	0	0	0	
AIR VOLUME	115	130	125	115	240	200	360	365	0	0	0	0	0	0	0	305
PLENUM PRESSURE	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13
ACTUAL DUCT LGH.	84	51	62	59	47	49	30	51	1	1	1	1	1	1	1	14
EQUIVALENT LENGTH	200	135	155	185	135	140	170	195	0	0	0	0	0	0	0	145
TOTAL EFFECTIVE LH	284	186	217	244	182	189	200	246	1	1	1	1	1	1	1	159
ADJUSTED PRESSURE	0.05	0.07	0.06	0.05	0.07	0.07	0.07	0.05	13.36	13.36	13.36	13.36	13.36	13.36	13.36	0.08
ROUND DUCT SIZE	7	6.8	6.9	7	8.5	7.9	9.9	10.8	0	0	0	0	0	0	0	9
INLET GRILL SIZE	8	8	8	8	8	8	8	8	0	0	0	0	0	0	0	8
	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
INLET GRILL SIZE	14	14	14	14	30	14	30	30	0	0	0	0	0	0	0	30

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: 5005 - KNIGHTSWOOD LO # 79985
SITE NAME: PINE VALLEY & TESTON ELEV B & B CNR - WOB

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	7	@ 10.6 cfm	74.2	cfm
Other Rooms	8	@ 10.6 cfm	84.8	cfm
Table 9.32.3.A.		TOTAL	233.2	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	233.2	cfm
Less Principal Ventil. Capacity	155	cfm
Required Supplemental Capacity	78.2	cfm

PRINCIPAL EXHAUST FAN CAPACITY

Model: VANEE 65H Location: BSMT

155.0 cfm 3.0 sones [✓] HVI Approved

PRINCIPAL EXHAUST HEAT LOSS CALCULATION

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

SUPPLEMENTAL FANS NUTONE

Location	Model	cfm	HVI	Sones
ENS	QTXEN050C	50	✓	0.3
ENS-2	QTXEN050C	50	✓	0.3
ENS-4	QTXEN050C	50	✓	0.3
PWD	QTXEN050C	50	✓	0.3

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: 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: February-20

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#: 79985 Model: 5005 - KNIGHTSWOOD Builder: GOLD PARK HOMES Date: 2020-02-26

Volume Calculation

House Volume

Level	Floor Area (ft²)	Floor Height (ft)	Volume (ft³)
Bsmt	2020	10	20200
First	2020	11	22220
Second	2360	10	23600
Third	0	9	0
Fourth	0	9	0
		Total:	66,020.0 ft³
		Total:	1869.5 m³

Air Change & Delta T Data

WINTER NATURAL AIR CHANGE RATE	0.416
SUMMER NATURAL AIR CHANGE RATE	0.139

Design Temperature Difference

	Tin °C	Tout °C	ΔT °C	ΔT °F
Winter DTDh	22	-20	42	76
Summer DTDc	24	31	7	13

5.2.3.1 Heat Loss due to Air Leakage

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

0.416 x 519.30 x 42 °C x 1.2 = 10942 W

= **37334 Btu/h**

6.2.6 Sensible Gain due to Air Leakage

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

= 0.139 x 519.30 x 7 °C x 1.2 = 618 W

= **2108 Btu/h**

5.2.3.2 Heat Loss due to Mechanical Ventilation

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

155 CFM x 76 °F x 1.08 x 0.25 = **3181 Btu/h**

6.2.7 Sensible heat Gain due to Ventilation

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

155 CFM x 13 °F x 1.08 x 0.25 = **536 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	37,334	11,779	1.585
2	0.3		21,745	0.515
3	0.2		20,327	0.367
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.
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

HEAT LOSS AND GAIN SUMMARY SHEET

MODEL: 5005 - KNIGHTSWOOD ELEV B & B CNR - WOB **BUILDER:** GOLD PARK HOMES
SFQT: 4380 **LO#** 79985 **SITE:** PINE VALLEY & TESTON

DESIGN ASSUMPTIONS

HEATING	°F	COOLING	°F
OUTDOOR DESIGN TEMP.	-4	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:	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):	66020.0	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:	7.0 ft
LENGTH: 77.0 ft	WIDTH: 42.0 ft	EXPOSED PERIMETER:	186.0 ft
WOB INSULATION CONFIGURATION	SCB_9	WOB EXPOSED PERIMETER	52.0 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	29.80
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

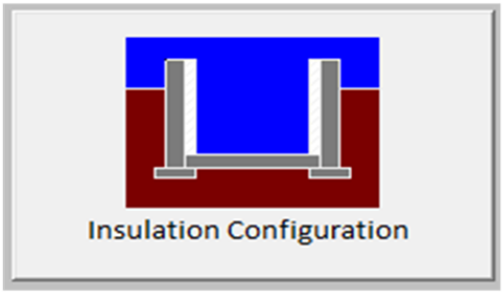
Michael O'Rourke

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 sand, loam, clay
Water Table:	Normal (7-10 m, 23-33 ft)

Foundation Dimensions		
Floor Length (m):	**4.6**	 Insulation Configuration
Floor Width (m):	**12.8**	
Exposed Perimeter (m):	**56.7**	
Wall Height (m):	**3.0**	
Depth Below Grade (m):	**1.84**	
Window Area (m^2):	**1.1**	
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):	**872**	

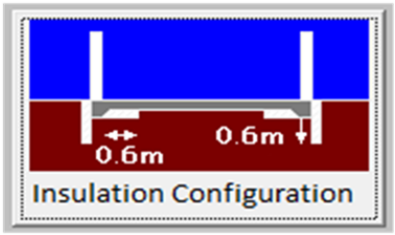
TYPE: 5005 - KNIGHTSWOOD ELEV B & B CNR - WOB
LO# 79985

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 sand, loam, clay
Water Table:	Normal (7-10 m, 23-33 ft)

Foundation Dimensions		
Length (m):	**1.5**	
Width (m):	**12.8**	
Exposed Perimeter (m):	**15.8**	

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

Results	
Heating Load (Watts):	**217**

TYPE: 5005 - KNIGHTSWOOD ELEV B & B CNR - WOB
LO# 79985

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905-619-2300

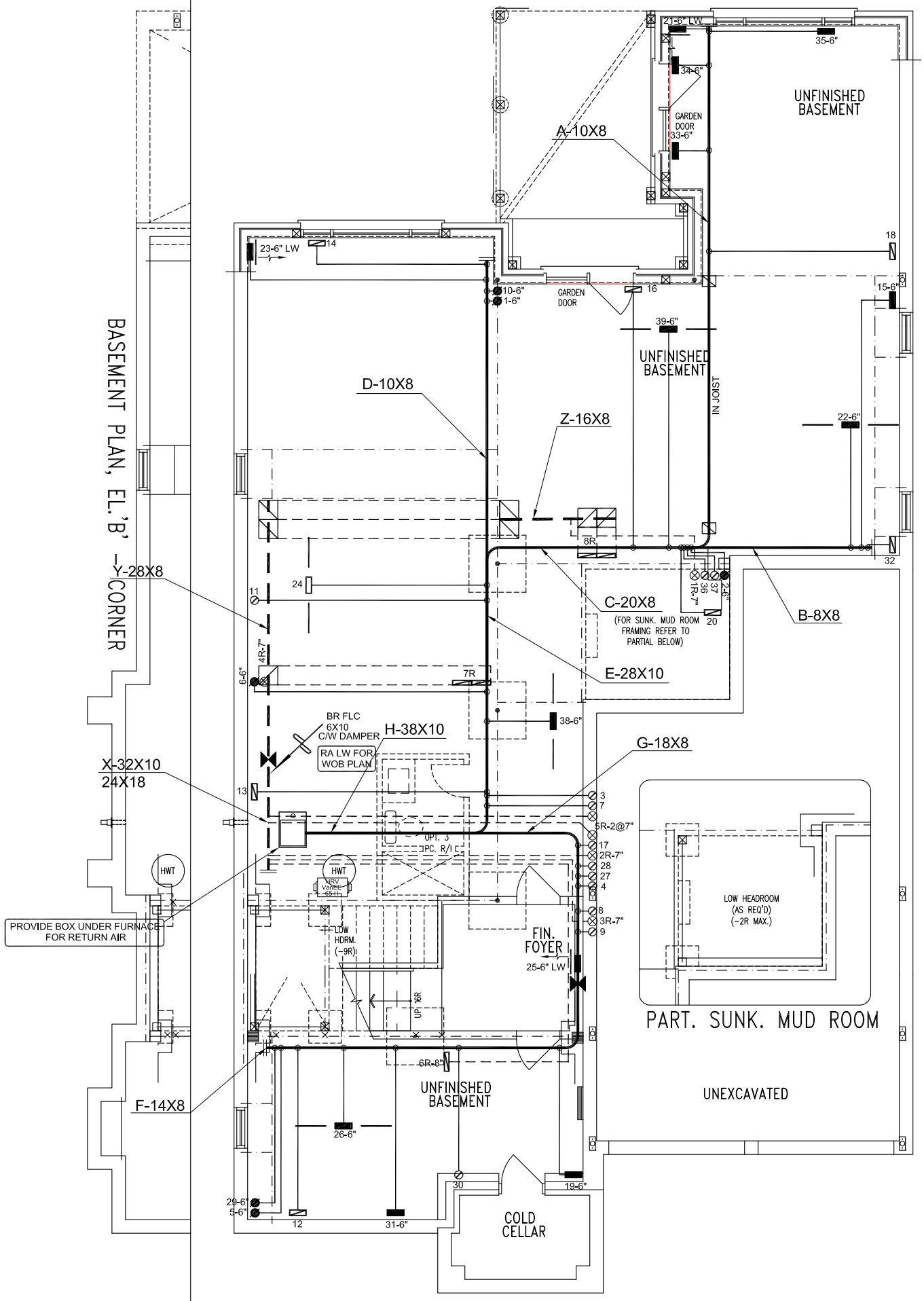
Air Infiltration Residential Load Calculator

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):	9.45
Building Configuration	
Type:	Detached
Number of Stories:	Two
Foundation:	Full
House Volume (m^3):	1869.5
Air Leakage/Ventilation	
Air Tightness Type:	Present (1961-) (3.57 ACH)
Custom BDT Data:	ELA @ 10 Pa. 2492.1 cm^2
	3.57 ACH @ 50 Pa
Mechanical Ventilation (L/s):	Total Supply: 73.2 / Total Exhaust: 73.2
Flue Size	
Flue #:	#1 #2 #3 #4
Diameter (mm):	0 0 0 0
Natural Infiltration Rates	
Heating Air Leakage Rate (ACH/H):	**0.416**
Cooling Air Leakage Rate (ACH/H):	**0.139**

TYPE: 5005 - KNIGHTSWOOD ELEV B & B CNR - WOB

LO# 79985



PARTIAL BASEMENT PLAN, EL. '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

WOB | 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.	REVISED AS PER ARCHITECTURALS	FEB/2020
1.	3R RELOCATED	NOV/2018

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Client
GOLDPARK HOMES

Project Name
PINE VALLEY & TESTON
VAUGHAN, ONTARIO

KNIGHTSWOOD - WOB
5005 ELEV. 'B' & 'B CNR' 4380 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.

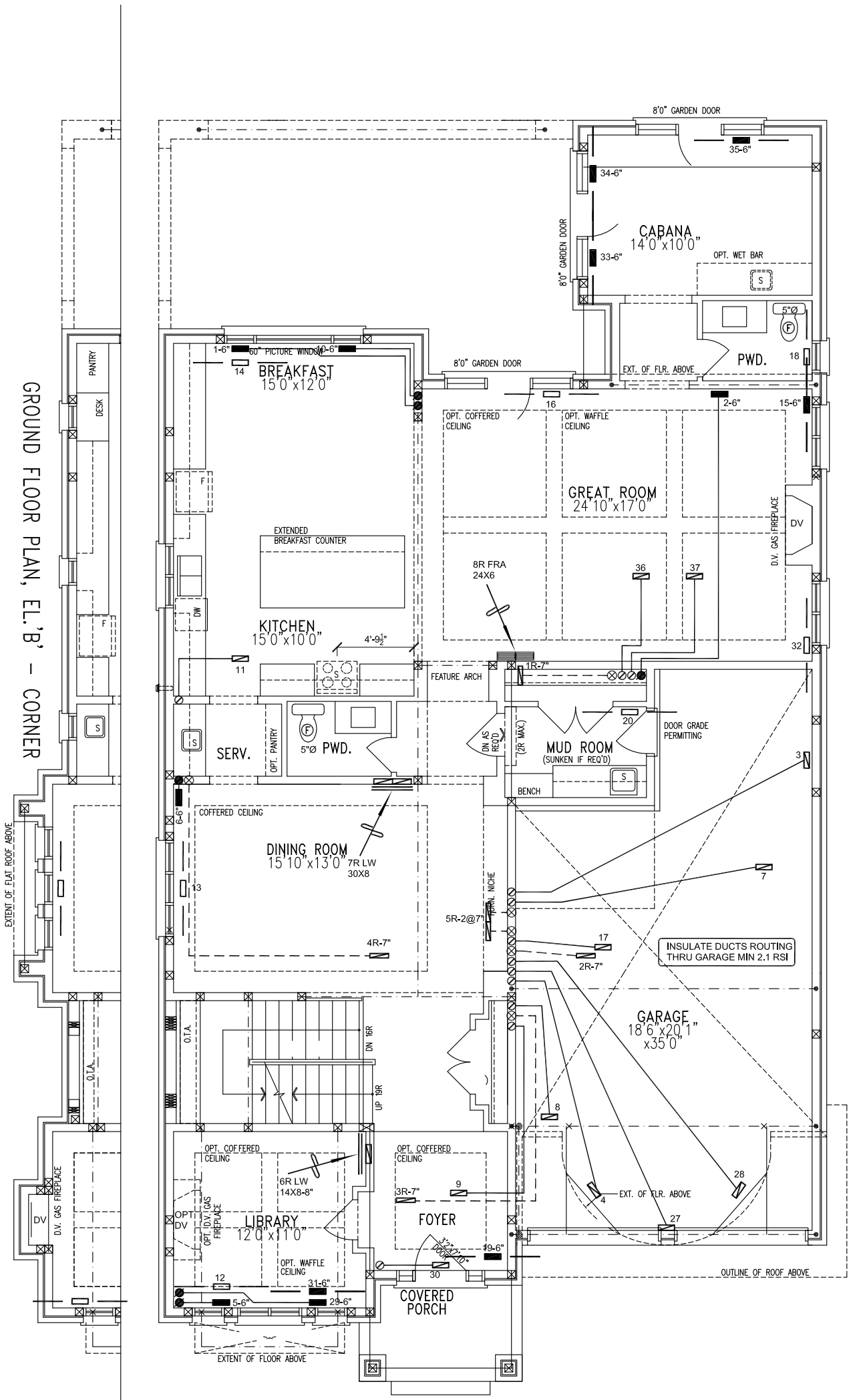
HEAT LOSS 96441 BTU/H		
UNIT DATA		
MAKE	LENNOX	
MODEL	EL296UH110XE60C	
INPUT	110	MBTU/H
OUTPUT	106	MBTU/H
COOLING	5.0	TONS
FAN SPEED	1955	cfm @ 0.6" w.c.

# OF RUNS	S/A	R/A	FANS
3RD FLOOR			
2ND FLOOR	18	5	7
1ST FLOOR	13	3	3
BASEMENT	8	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/2018
Scale 1/8" = 1'-0"
BCIN# 19669
LO# 79985



PARTIAL GROUND FLOOR PLAN, EL. '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

WOB | 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.	REVISED AS PER ARCHITECTURALS	FEB/2020
1.	3R RELOCATED	NOV/2018

REVISIONS

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Client
GOLDPARK HOMES

Project Name
PINE VALLEY & TESTON
VAUGHAN, ONTARIO

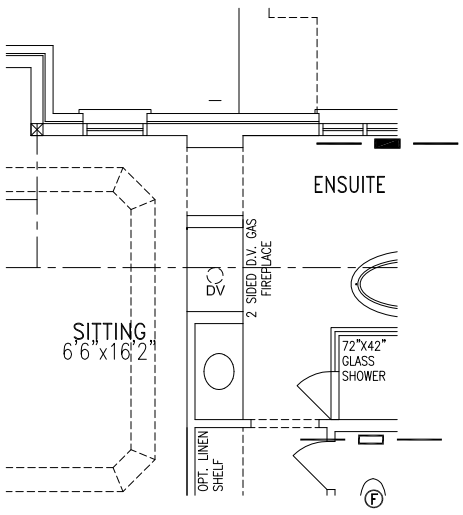
KNIGHTSWOOD - WOB
5005 ELEV. 'B' & 'B CNR' 4380 sqft

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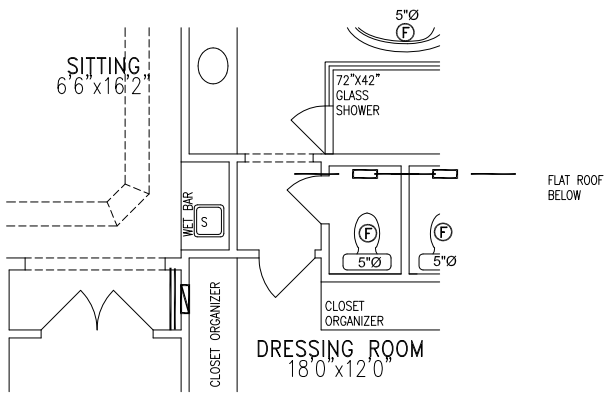
Installation to comply with the latest Ontario Building Code. All supply branch outlets shall be equipped with a manual balancing damper. Ductwork which passes through the garage or unheated spaces shall be adequately insulated and be gas-proofed.

Sheet Title
FIRST FLOOR HEATING LAYOUT

Date SEPT/2018
Scale 1/8" = 1'-0"
BCIN# 19669
LO# 79985

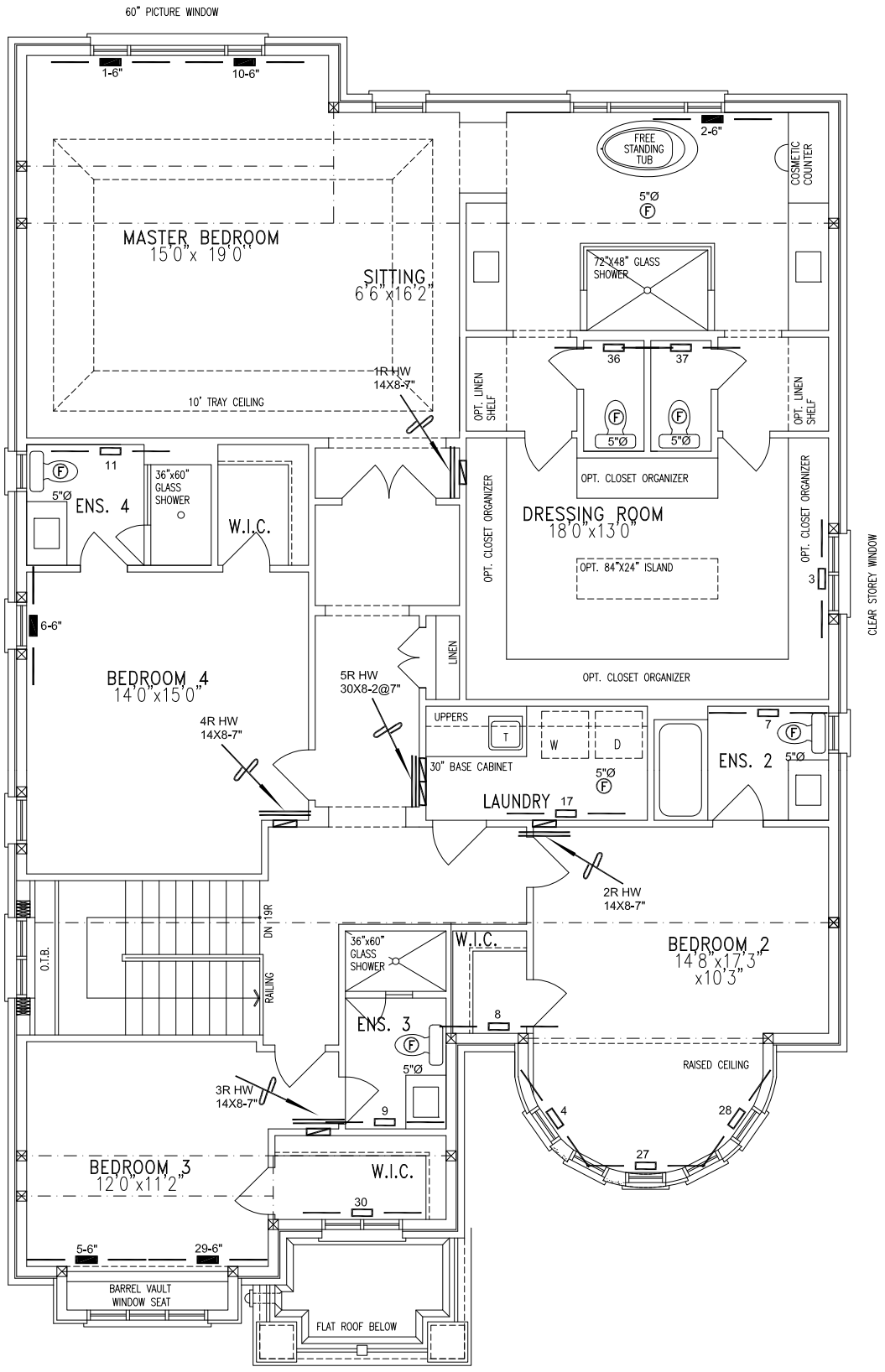


PART. SECOND FLOOR PLAN
OPT. SITTING AREA FIREPLACE



PART. SECOND FLOOR PLAN
OPT. SITTING AREA WET BAR

SECOND FLOOR PLAN, EL. 'B' - CORNER



SECOND FLOOR PLAN, EL. '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

WOB | 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
	REVISIONS	
3.		
2.	REVISED AS PER ARCHITECTURALS	FEB/2020
1.	3R RELOCATED	NOV/2018

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Client
GOLDPARK HOMES

Project Name
PINE VALLEY & TESTON
VAUGHAN, ONTARIO

KNIGHTSWOOD - WOB
5005 ELEV. 'B' & 'B CNR' 4380 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
SECOND FLOOR HEATING LAYOUT

Date SEPT/2018
Scale 1/8" = 1'-0"
BCIN# 19669
LO# 79985

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**		
VAUGHAN (WOODBRIDGE)				

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:** 5005 - KNIGHTSWOOD ELEV B & B CNR - WOB - OPT. SERVICE STAIR **Project:** PINE VALLEY & TESTON

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.

February 26, 2020
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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Tel: 905.619.2300 Fax: 905.619.2375
Web: www.hvacdesigns.ca E-mail: info@hvacdesigns.ca

SITE NAME: PINE VALLEY & TESTON — ELEV B & B CNR - WOB - OPT. SERVICE STAIR — DATE: Feb-20 — WINTER NATURAL AIR CHANGE RATE 0.416 — HEAT LOSS ΔT °F. 76 — CSA-F280-12
BUILDER: GOLD PARK HOMES — TYPE: 5005 - KNIGHTSWOOD — GFA: 4477 — LO# 85463 — SUMMER NATURAL AIR CHANGE RATE 0.139 — HEAT GAIN ΔT °F. 13 — SB-12 PACKAGE A1

ROOM USE			MBR			ENS			WIC			BED-2			BED-3			BED-4			ENS-2			WIC-2			ENS-3			ENS-4			WIC-3		
EXP. WALL			46			36			13			36			36			19			6			3			4			7			14		
CLG. HT.			11			10			10			11			11			10			10			10			10			10			10		
	FACTORS																																		
GRS.WALL AREA	LOSS	GAIN	506			360			130			396			396			190			60			30			40			70			140		
GLAZING			LOSS		GAIN	LOSS		GAIN	LOSS		GAIN	LOSS		GAIN	LOSS		GAIN	LOSS		GAIN	LOSS		GAIN	LOSS		GAIN	LOSS		GAIN	LOSS		GAIN	LOSS		GAIN
NORTH	21.3	15.6	0	0	0	0	0	0	6	128	93	0	0	0	0	0	0	0	0	0	8	170	124	0	0	0	0	0	0	0	0	0	0	0	0
EAST	21.3	40.3	0	0	0	0	0	0	0	0	0	65	1383	2619	50	1064	2014	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	20	426	806
SOUTH	21.3	24.2	19	404	460	0	0	0	0	0	0	0	0	0	12	255	290	44	936	1064	0	0	0	0	0	0	0	0	0	9	192	218	0	0	0
WEST	21.3	40.3	50	1064	2014	34	724	1370	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
SKYLT.	37.2	101.5	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	0	0	0	0	0	0
DOORS	25.2	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	0	0	0	0	0	0
NET EXPOSED WALL	4.5	0.8	437	1950	328	326	1455	245	124	553	93	331	1477	249	334	1491	251	146	652	110	52	232	39	30	134	23	40	179	30	61	272	46	120	536	90
NET EXPOSED BSMT WALL ABOVE GR	3.6	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	0	0	0	0	0	0	0	0	0
EXPOSED CLG	1.3	0.6	533	684	313	323	415	190	247	317	145	175	225	103	249	320	146	285	366	167	60	77	35	40	51	24	92	118	54	105	135	62	53	68	31
NO ATTIC EXPOSED CLG	2.7	1.3	0	0	0	0	0	0	0	0	0	78	214	98	18	49	23	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	25	64	11	253	645	109	18	46	8	0	0	0	60	153	26	40	102	17	0	0	0	0	0	0	0	0	0
BASEMENT/CRAWL HEAT LOSS			0			0			0			0			0			0			0			0			0			0			0		
SLAB ON GRADE HEAT LOSS			0			0			0			0			0			0			0			0			0			0			0		
SUBTOTAL HT LOSS			4103			2593			1062			3945			3225			1954			632			287			297			598			1029		
SUB TOTAL HT GAIN					3116			1805			342			3177			2732			1342			225			63			84			325			927
LEVEL FACTOR / MULTIPLIER			0.20	0.38		0.20	0.38		0.20	0.38		0.20	0.38		0.20	0.38		0.20	0.38		0.20	0.38		0.20	0.38		0.20	0.38		0.20	0.38		0.20	0.38	
AIR CHANGE HEAT LOSS				1579			998			409			1518			1241			752			243			111			114			230			396		
AIR CHANGE HEAT GAIN					254			147			28			260			223			110			18			5			7			27			76
DUCT LOSS				0			0			147			546			447			0			88			40			0			0			0		
DUCT GAIN					0			0			84			414			366			0			71			53			0			0			0
HEAT GAIN PEOPLE	240		2		480	0		0	0		0	1		240	1		240	1		240	0		0	0		0	0		0	0		0	0		0
HEAT GAIN APPLIANCES/LIGHTS					465			465			465			465			465			465			465			465			0			465			0
TOTAL HT LOSS BTU/H				5682			3591			1618			6009			4913			2706			963			438			411			829			1425	
TOTAL HT GAIN x 1.3 BTU/H					5610			3142			1195			5923			5235			2803			1013			763			118			1062			1304

ROOM USE			LIB			DIN			KIT/GT			CAB			LAUN			PWD			FOY			MUD									WOB			BAS		
EXP. WALL			31			32			77			45			0			5			35			32									52			186		
CLG. HT.			11			11			11			11			10			11			11			12									10			10		
	FACTORS																																					
GRS.WALL AREA	LOSS	GAIN	341			352			847			495			0			55			385			384									520			1302		
GLAZING			LOSS		GAIN	LOSS		GAIN	LOSS		GAIN	LOSS		GAIN	LOSS		GAIN	LOSS		GAIN	LOSS		GAIN	LOSS		GAIN							LOSS		GAIN	LOSS		GAIN
NORTH	21.3	15.6	0	0	0	0	0	0	46	979	716	0	0	0	0	0	0	9	192	140	0	0	0	0	0	0							0	0	0	6	128	93
EAST	21.3	40.3	56	1192	2256	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
SOUTH	21.3	24.2	0	0	0	34	724	822	21	447	508	63	1341	1524	0	0	0	0	0	0	0	0	0	0	0	0							46	979	556	6	128	145
WEST	21.3	40.3	0	0	0	0	0	0	105	2234	4230	63	1341	2538	0	0	0	0	0	0	0	0	0	0	0	0							106	2256	2135	0	0	0
SKYLT.	37.2	101.5	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	0	0	0
DOORS	25.2	4.3	0	0	0	0	0	0	10	252	43	0	0	0	0	0	0	0	0	0	56	1414	238	20	505	85							20	505	85	20	505	85
NET EXPOSED WALL	4.5	0.8	285	1272	214	318	1419	239	665	2968	500	369	1647	277	0	0	0	46	205	35	329	1468	247	364	1624	274							348	1553	262	0	0	0
NET EXPOSED BSMT WALL ABOVE GR	3.6	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							0	0	0	558	2008	338
EXPOSED CLG	1.3	0.6	0	0	0	0	0	0	0	0	0	0	0	0	102	131	60	0	0	0	0	0	0	0	0	0							0	0	0	0	0	0
NO ATTIC EXPOSED CLG	2.7	1.3	0	0	0	0	0	0	0	0	0	203	558	255	0	0	0	40	110	50	41	113	52	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	56	143	24	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			0												2977		
SLAB ON GRADE HEAT LOSS			0			0			0			0			0			0			0			0									741					
SUBTOTAL HT LOSS			2464			2143			6880			4886			274			507			2995			2129									6034			5746		
SUB TOTAL HT GAIN					2470			1061			5996			4595			84			225			537			359									3038			662
LEVEL FACTOR / MULTIPLIER			0.30	0.52		0.30	0.52		0.30	0.52		0.30	0.52		0.20	0.38		0.30	0.52		0.30	0.52		0.30	0.52											0.50	1.63	
AIR CHANGE HEAT LOSS				1293			1124			3610			2564			105			266			1571			1117												19243		
AIR CHANGE HEAT GAIN					202			87			490			375			7			18			44			29													302
DUCT LOSS				0			0			0			0			38			0			0			0												0		
DUCT GAIN					0			0			0			0			56			0			0			0													0
HEAT GAIN PEOPLE	240		0		0	0		0	0		0	0		0	0		0	0		0	0		0	0		0							0		0	0		0
HEAT GAIN APPLIANCES/LIGHTS					465			465			465			465			465			465			465			465									0			465
TOTAL HT LOSS BTU/H				3756			3267			10491			7450			417			773			4566			3247									6775			24989		
TOTAL HT GAIN x 1.3 BTU/H					4078			2097			9037			7066			795			921			1360			1109									3950			1858

TOTAL HEAT GAIN BTU/H: 60975 — TONS: 5.08 — LOSS DUE TO VENTILATION LOAD BTU/H: 3181 — STRUCTURAL HEAT LOSS: 94313 — TOTAL COMBINED HEAT LOSS BTU/H: 97494

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: PINE VALLEY & TESTON
BUILDER: GOLD PARK HOMES

ELEV B & B CNR - WOB - OPT. SERVICE STAIR
TYPE: 5005 - KNIGHTSWOOD DATE: Feb-20

GFA: 4477 LO# 85463

HEATING CFM	1955	COOLING CFM	1955
TOTAL HEAT LOSS	94,313	TOTAL HEAT GAIN	60,439
AIR FLOW RATE CFM	20.73	AIR FLOW RATE CFM	32.35

furnace pressure	0.6
furnace filter	0.08
a/c coil pressure	0.2
available pressure for s/a & r/a	0.32
plenum pressure s/a	0.17
max s/a dif press. loss	0.02
min adjusted pressure s/a	0.15
r/a pressure	0.15
r/a grille press. Loss	0.02
adjusted pressure r/a	0.13

^LENNOX
EL296UH110XE60C 110

FAN SPEED	
LOW	0
MEDLOW	1380
MEDIUM	1505
MEDIUM HIGH	1685
HIGH	1955

AFUE = 96 %
INPUT (BTU/H) = 110,000
OUTPUT (BTU/H) = **106,000**

DESIGN CFM = **1955**
CFM @ .6 " E.S.P.

TEMPERATURE RISE 50 °F

RUN COUNT	4th	3rd	2nd	1st	Bas
S/A	0	0	18	13	8
R/A	0	0	5	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	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	ENS-2	WIC-2	ENS-3	MBR	ENS-4	LIB	DIN	KIT/GT	KIT/GT	KIT/GT	LAUN	PWD	FOY	MUD	BAS	BAS	BAS	BAS
RM LOSS MBH.	2.84	2.80	1.62	2.00	2.46	2.71	0.96	0.44	0.41	2.84	0.83	1.88	3.27	2.62	2.62	2.62	0.42	0.77	4.57	3.25	3.97	3.97	3.97	3.97
CFM PER RUN HEAT	59	58	34	42	51	56	20	9	9	59	17	39	68	54	54	54	9	16	95	67	82	82	82	82
RM GAIN MBH.	2.80	2.45	1.20	1.97	2.62	2.80	1.01	0.76	0.12	2.80	1.06	2.04	2.10	2.26	2.26	2.26	0.80	0.92	1.36	1.11	0.73	0.73	0.73	0.73
CFM PER RUN COOLING	91	79	39	64	85	91	33	25	4	91	34	66	68	73	73	73	26	30	44	36	23	23	23	23
ADJUSTED PRESSURE	0.15	0.16	0.16	0.16	0.15	0.15	0.16	0.16	0.16	0.15	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.15	0.16	0.15	0.15	0.15	0.15
ACTUAL DUCT LGH.	70	70	53	49	70	48	47	48	53	64	59	57	29	52	69	54	36	73	40	65	77	60	69	38
EQUIVALENT LENGTH	200	200	170	160	160	160	200	150	170	170	150	140	103	120	140	110	200	170	210	190	150	120	150	90
TOTAL EFFECTIVE LENGTH	270	270	223	209	230	208	247	198	223	234	209	197	132	172	209	164	236	243	250	255	227	180	219	128
ADJUSTED PRESSURE	0.05	0.06	0.07	0.07	0.06	0.07	0.06	0.08	0.07	0.06	0.07	0.08	0.12	0.09	0.07	0.1	0.07	0.06	0.06	0.06	0.06	0.08	0.07	0.11
ROUND DUCT SIZE	**6**	**6**	4	5	**6**	**6**	4	4	4	**6**	4	5	5	5	5	5	4	4	**6**	5	**6**	**6**	**6**	5
HEATING VELOCITY (ft/min)	301	296	390	308	260	286	229	103	103	301	195	286	499	396	396	396	103	184	484	492	418	418	418	602
COOLING VELOCITY (ft/min)	464	403	447	470	433	464	379	287	46	464	390	485	499	536	536	536	298	344	224	264	117	117	117	169
OUTLET GRILL SIZE	4X10	4X10	3X10	3X10	4X10	4X10	3X10	3X10	3X10	4X10	3X10	3X10	3X10	3X10	3X10	3X10	3X10	3X10	4X10	3X10	4X10	4X10	4X10	3X10
TRUNK	D	C	E	G	F	E	E	G	G	D	E	F	E	D	B	C	G	A	F	B	A	B	D	E

RUN #	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39
ROOM NAME	BAS	BAS	BED-2	BED-2	BED-3	WIC-3	LIB	KIT/GT	CAB	CAB	CAB	ENS	ENS	BAS	BAS
RM LOSS MBH.	3.97	3.97	2.00	2.00	2.46	1.43	1.88	2.62	2.48	2.48	2.48	0.40	0.40	3.97	3.97
CFM PER RUN HEAT	82	82	42	42	51	30	39	54	51	51	51	8	8	82	82
RM GAIN MBH.	0.73	0.73	1.97	1.97	2.62	1.30	2.04	2.26	2.36	2.36	2.36	0.35	0.35	0.73	0.73
CFM PER RUN COOLING	23	23	64	64	85	42	66	73	76	76	76	11	11	23	23
ADJUSTED PRESSURE	0.15	0.15	0.16	0.16	0.15	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.15	0.15
ACTUAL DUCT LGH.	34	50	52	55	75	58	51	55	69	71	82	56	58	23	58
EQUIVALENT LENGTH	110	150	170	160	160	190	160	120	150	130	140	200	190	140	170
TOTAL EFFECTIVE LENGTH	144	200	222	215	235	248	211	175	219	201	222	256	248	163	228
ADJUSTED PRESSURE	0.1	0.07	0.07	0.07	0.06	0.06	0.07	0.09	0.07	0.08	0.07	0.06	0.06	0.09	0.06
ROUND DUCT SIZE	5	**6**	5	5	**6**	5	5	5	**6**	5	**6**	4	4	5	**6**
HEATING VELOCITY (ft/min)	602	418	308	308	260	220	286	396	260	374	260	92	92	602	418
COOLING VELOCITY (ft/min)	169	117	470	470	433	308	485	536	388	558	388	126	126	169	117
OUTLET GRILL SIZE	3X10	4X10	3X10	3X10	4X10	3X10	3X10	3X10	4X10	3X10	4X10	3X10	3X10	3X10	4X10
TRUNK	G	F	G	G	F	F	F	B	A	A	A	C	C	E	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	251	0.06	9	10	x	8	452	TRUNK G	622	0.06	12.6	18	x	8	622
TRUNK B	257	0.06	9.1	10	x	8	463	TRUNK H	1955	0.05	20.3	38	x	10	741
TRUNK C	718	0.06	13.3	20	x	8	646	TRUNK I	0	0.00	0	0	x	8	0
TRUNK D	254	0.05	9.4	10	x	8	457	TRUNK J	0	0.00	0	0	x	8	0
TRUNK E	1331	0.05	17.6	28	x	10	685	TRUNK K	0	0.00	0	0	x	8	0
TRUNK F	387	0.06	10.6	14	x	8	498	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	1500	0.05	18.4	32	x	10	675
TRUNK Y	955	0.05	15.5	28	x	8	614
TRUNK Z	480	0.05	12	16	x	8	540
DROP	1955	0.05	20.3	24	x	18	652

RETURN AIR #	1	2	3	4	5	6	7	8								BR
	0	0	0	0	2@7"	0	0	0	0	0	0	0	0	0	0	
AIR VOLUME	115	130	125	115	240	200	360	365	0	0	0	0	0	0	0	305
PLENUM PRESSURE	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13
ACTUAL DUCT LGH.	84	51	62	59	47	49	30	51	1	1	1	1	1	1	1	14
EQUIVALENT LENGTH	200	135	155	185	135	140	170	195	0	0	0	0	0	0	0	145
TOTAL EFFECTIVE LH	284	186	217	244	182	189	200	246	1	1	1	1	1	1	1	159
ADJUSTED PRESSURE	0.05	0.07	0.06	0.05	0.07	0.07	0.07	0.05	13.36	13.36	13.36	13.36	13.36	13.36	13.36	0.08
ROUND DUCT SIZE	7	6.8	6.9	7	8.5	7.9	9.9	10.8	0	0	0	0	0	0	0	9
INLET GRILL SIZE	8	8	8	8	8	8	8	8	0	0	0	0	0	0	0	8
	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
INLET GRILL SIZE	14	14	14	14	30	14	30	30	0	0	0	0	0	0	0	30

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: 5005 - KNIGHTSWOOD LO # 85463
SITE NAME: PINE VALLEY & TESTON ELEV B & B CNR - WOB - OPT. SERVICE STAIR

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	7	@ 10.6 cfm	74.2	cfm
Other Rooms	8	@ 10.6 cfm	84.8	cfm
Table 9.32.3.A.		TOTAL	233.2	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	233.2	cfm
Less Principal Ventil. Capacity	155	cfm
Required Supplemental Capacity	78.2	cfm

PRINCIPAL EXHAUST FAN CAPACITY

Model: VANEE 65H Location: BSMT

155.0 cfm 3.0 sones [✓] HVI Approved

PRINCIPAL EXHAUST HEAT LOSS CALCULATION

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

SUPPLEMENTAL FANS

NUTONE

Location	Model	cfm	HVI	Sones
ENS	QTXEN050C	50	✓	0.3
ENS-2	QTXEN050C	50	✓	0.3
ENS-4	QTXEN050C	50	✓	0.3
PWD	QTXEN050C	50	✓	0.3

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: 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: February-20

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#: 85463 Model: 5005 - KNIGHTSWOOD Builder: GOLD PARK HOMES Date: 2020-02-26

Volume Calculation

House Volume

Level	Floor Area (ft²)	Floor Height (ft)	Volume (ft³)
Bsmt	2117	10	21170
First	2117	11	23287
Second	2360	10	23600
Third	0	9	0
Fourth	0	9	0
		Total:	68,057.0 ft³
		Total:	1927.2 m³

Air Change & Delta T Data

WINTER NATURAL AIR CHANGE RATE	0.416
SUMMER NATURAL AIR CHANGE RATE	0.139

Design Temperature Difference

	Tin °C	Tout °C	ΔT °C	ΔT °F
Winter DTDh	22	-20	42	76
Summer DTDc	24	31	7	13

5.2.3.1 Heat Loss due to Air Leakage

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

0.416 x 535.32 x 42 °C x 1.2 = 11280 W

= **38486 Btu/h**

6.2.6 Sensible Gain due to Air Leakage

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

= 0.139 x 535.32 x 7 °C x 1.2 = 637 W

= **2173 Btu/h**

5.2.3.2 Heat Loss due to Mechanical Ventilation

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

155 CFM x 76 °F x 1.08 x 0.25 = **3181 Btu/h**

6.2.7 Sensible heat Gain due to Ventilation

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

155 CFM x 13 °F x 1.08 x 0.25 = **536 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	38,486	11,779	1.634
2	0.3		22,004	0.525
3	0.2		19,998	0.385
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: 5005 - KNIGHTSWOOD ELEV B & B CNR - WOB - OPT. SER **BUILDER:** GOLD PARK HOMES
SFQT: 4477 **LO#** 85463 **SITE:** PINE VALLEY & TESTON

DESIGN ASSUMPTIONS

HEATING	°F	COOLING	°F
OUTDOOR DESIGN TEMP.	-4	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:	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):	68057.0	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:	7.0 ft
LENGTH: 77.0 ft	WIDTH: 42.0 ft	EXPOSED PERIMETER:	186.0 ft
WOB INSULATION CONFIGURATION	SCB_9	WOB EXPOSED PERIMETER	52.0 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	29.80
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

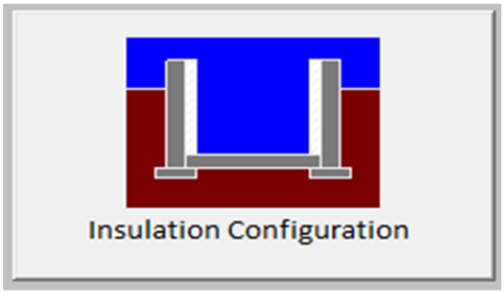
Michael O'Rourke

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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 sand, loam, clay
Water Table:	Normal (7-10 m, 23-33 ft)

Foundation Dimensions		
Floor Length (m):	**4.6**	 Insulation Configuration
Floor Width (m):	**12.8**	
Exposed Perimeter (m):	**56.7**	
Wall Height (m):	**3.0**	
Depth Below Grade (m):	**1.84**	
Window Area (m^2):	**1.1**	
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):	**872**	

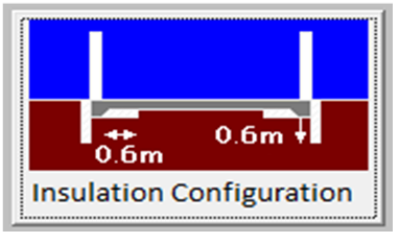
TYPE: 5005 - KNIGHTSWOOD ELEV B & B CNR - WOB - OPT. SERVICE STAIR
LO# 85463

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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 sand, loam, clay
Water Table:	Normal (7-10 m, 23-33 ft)

Foundation Dimensions		
Length (m):	**1.5**	
Width (m):	**12.8**	
Exposed Perimeter (m):	**15.8**	

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

Results	
Heating Load (Watts):	**217**

TYPE: 5005 - KNIGHTSWOOD ELEV B & B CNR - WOB - OPT. SERVICE STAIR
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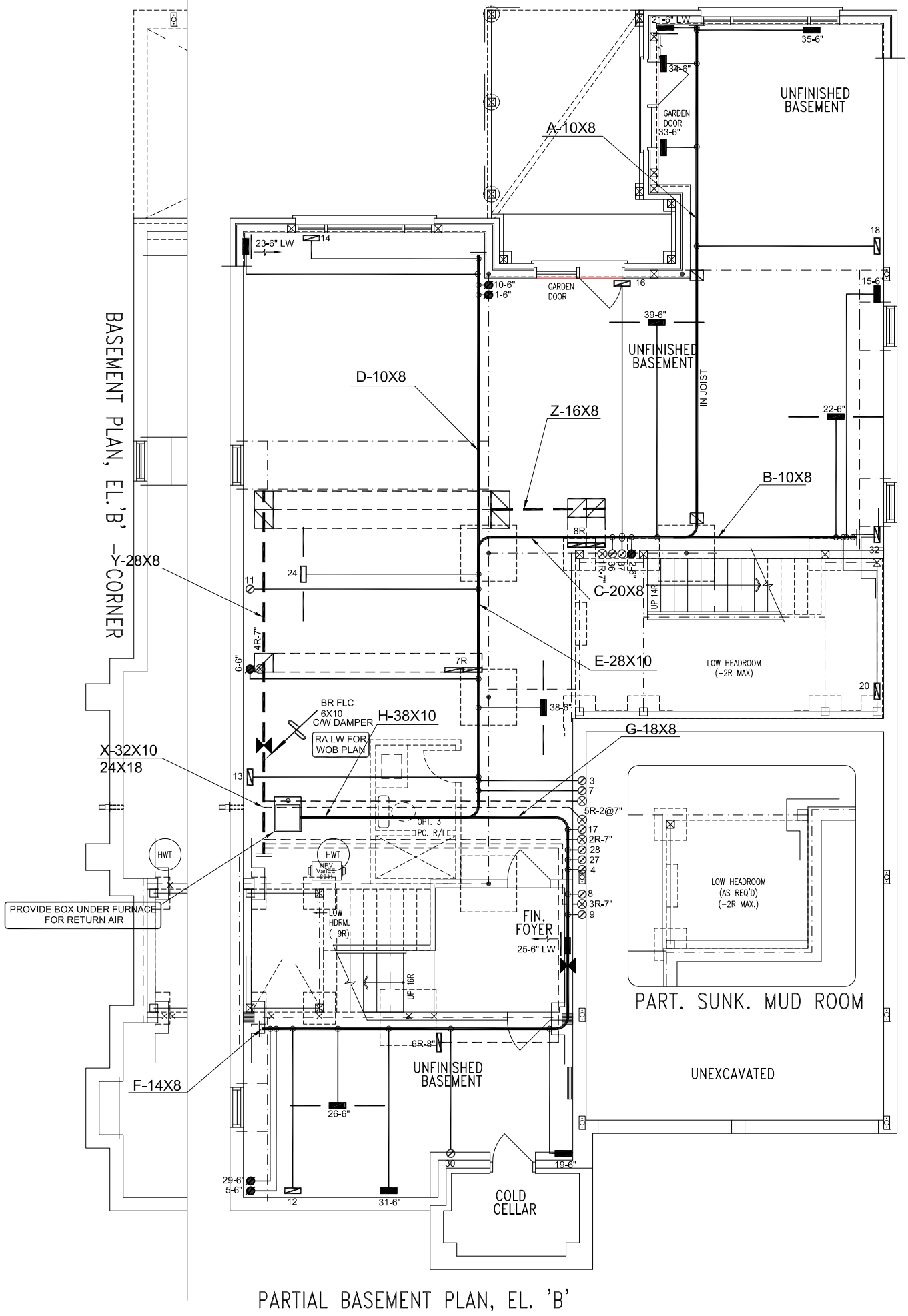
Air Infiltration Residential Load Calculator

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):	9.45
Building Configuration	
Type:	Detached
Number of Stories:	Two
Foundation:	Full
House Volume (m^3):	1927.2
Air Leakage/Ventilation	
Air Tightness Type:	Present (1961-) (3.57 ACH)
Custom BDT Data:	ELA @ 10 Pa. 2569.0 cm^2
	3.57 ACH @ 50 Pa
Mechanical Ventilation (L/s):	Total Supply 73.2 / Total Exhaust 73.2
Flue Size	
Flue #:	#1 #2 #3 #4
Diameter (mm):	0 0 0 0
Natural Infiltration Rates	
Heating Air Leakage Rate (ACH/H):	**0.416**
Cooling Air Leakage Rate (ACH/H):	**0.139**

TYPE: 5005 - KNIGHTSWOOD ELEV B & B CNR - WOB - OPT. SERVICE S

LO# 85463



PARTIAL BASEMENT PLAN, EL. '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

WOB | 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.		

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Client
GOLDPARK HOMES

Project Name
PINE VALLEY & TESTON
VAUGHAN, ONTARIO
OPT. SERVICE STAIR
KNIGHTSWOOD - WOB
5005 ELEV. 'B' & 'B CNR' 4477 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.

HEAT LOSS 97484 BTU/H

UNIT DATA

MAKE	LENNOX	
MODEL	EL296UH110XE60C	
INPUT	110	MBTU/H
OUTPUT	106	MBTU/H
COOLING	5.0	TONS
FAN SPEED	1955	cfm @ 0.6" w.c.

# OF RUNS	S/A	R/A	FANS
3RD FLOOR			
2ND FLOOR	18	5	7
1ST FLOOR	13	3	3
BASEMENT	8	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

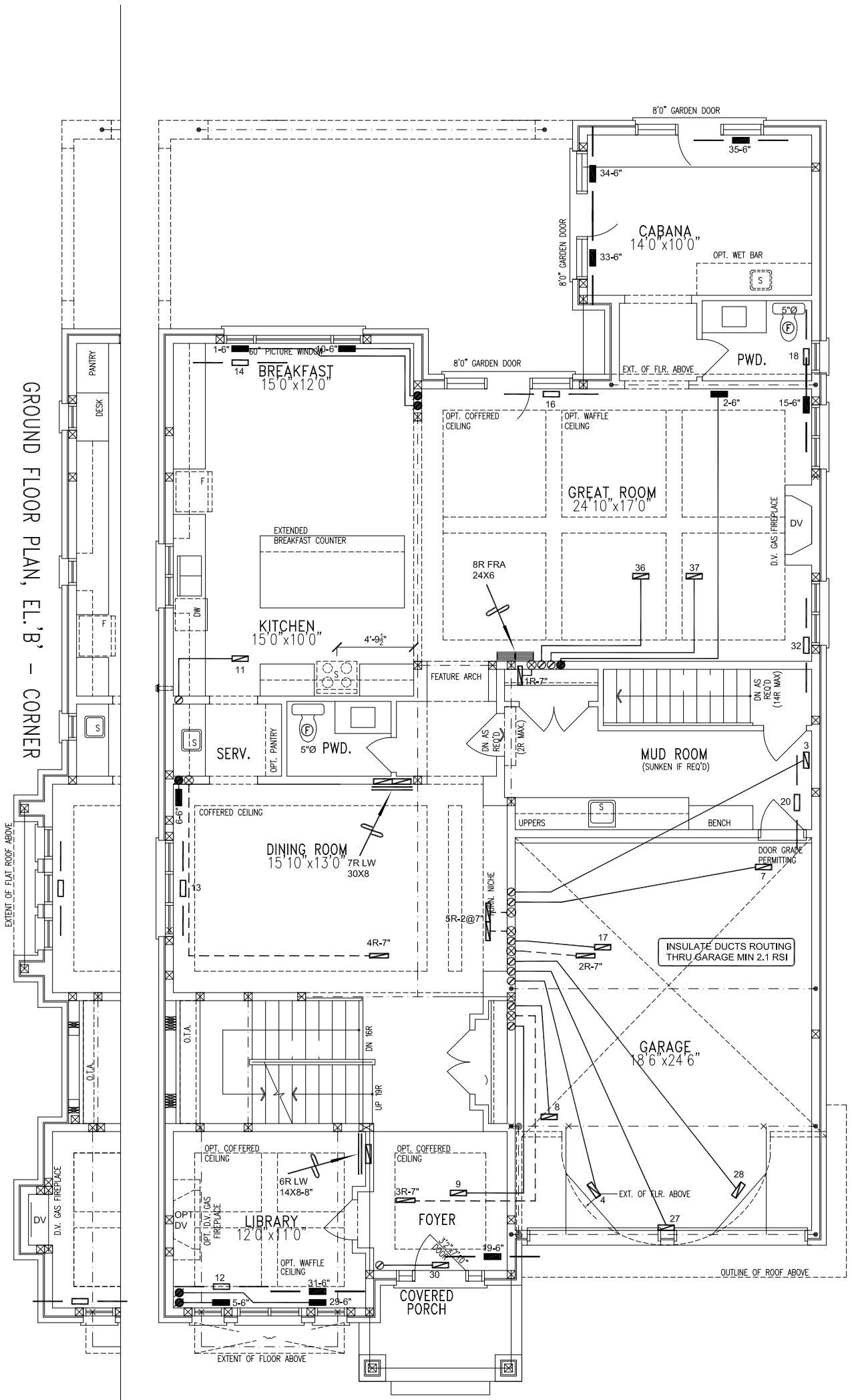
Sheet Title
BASEMENT HEATING LAYOUT

Date FEB/2020

Scale 1/8" = 1'-0"

BCIN# 19669

LO# 85463



PARTIAL GROUND FLOOR PLAN, EL. 'B' - CORNER

PARTIAL GROUND FLOOR PLAN, EL. 'B'

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CSA-F280-12

WOB | PACKAGE A1

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GOLDPARK HOMES

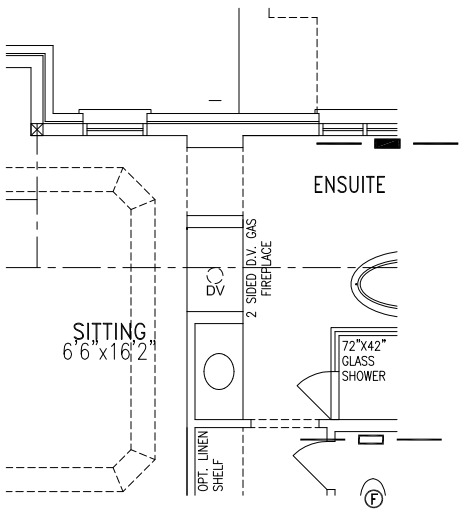
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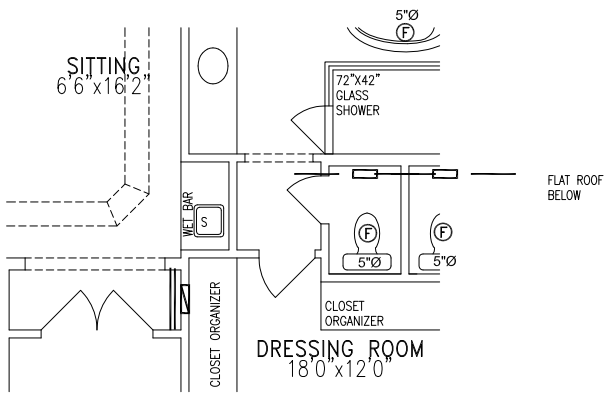
Installation to comply with the latest Ontario Building Code. All supply branch outlets shall be equipped with a manual balancing damper. Ductwork which passes through the garage or unheated spaces shall be adequately insulated and be gas-proofed.

Sheet Title
FIRST FLOOR HEATING LAYOUT

Date FEB/2020
Scale 1/8" = 1'-0"
BCIN# 19669
LO# 85463

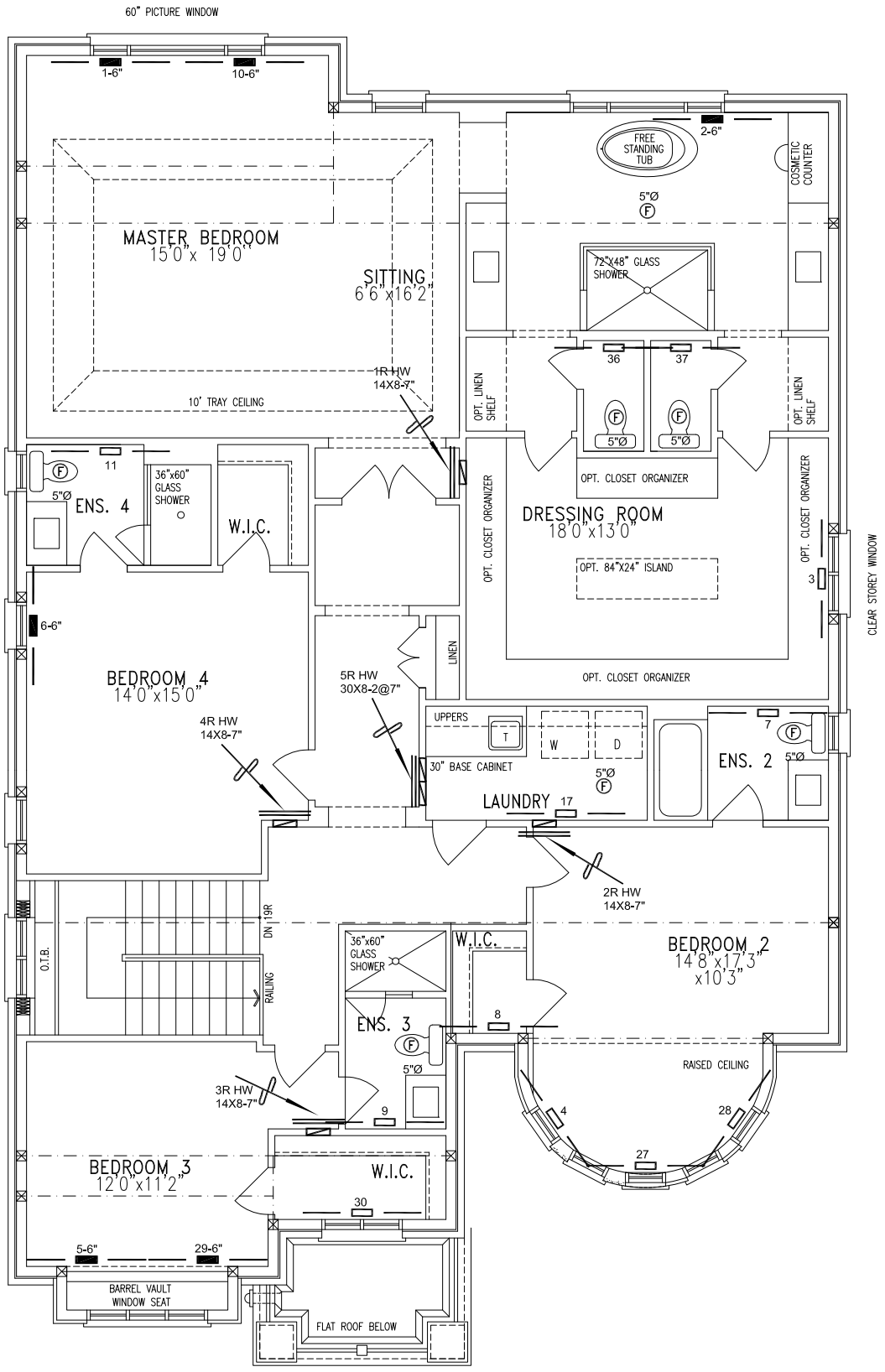


PART. SECOND FLOOR PLAN
OPT. SITTING AREA FIREPLACE



PART. SECOND FLOOR PLAN
OPT. SITTING AREA WET BAR

SECOND FLOOR PLAN, EL. 'B' - CORNER



SECOND FLOOR PLAN, EL. 'B'

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CSA-F280-12

WOB | PACKAGE A1

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Sheet Title
SECOND FLOOR HEATING LAYOUT

Date FEB/2020
Scale 1/8" = 1'-0"
BCIN# 19669
LO# 85463