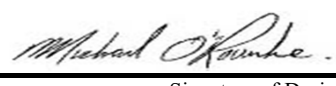


Schedule 1: Designer Information

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 RICHMOND HILL	Postal code	Plan number/ other description	
B. Individual who reviews and takes responsibility for design activities			
Name MICHAEL O'ROURKE		Firm HVAC DESIGNS LTD.	
Street address 375 FINLEY AVE		Unit no. 202	Lot/con. N/A
Municipality AJAX	Postal code L1S 2E2	Province ONTARIO	E-mail info@hvacdesigns.ca
Telephone number (905) 619-2300	Fax number (905) 619-2375	Cell number ()	
C. Design activities undertaken by individual identified in Section B. [Building Code Table 3.5.2.1 OF Division C]			
☐ House ☐ Small Buildings ☐ Large Buildings ☐ Complex Buildings ☒ HVAC – House ☐ Building Services ☐ Detection, Lighting and Power ☐ Fire Protection ☐ Building Structural ☐ Plumbing – House ☐ Plumbing – All Buildings ☐ 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: AVIGNON 3 18 DENHAM DRIVE Project: BALTRIO	
D. Declaration of Designer			
I, <u>MICHAEL O'ROURKE</u> declare that (choose one as appropriate): (print name)			
☐ I review and take responsibility for the design work on behalf of a firm registered under subsection 3.2.4. of Division C, of the Building Code. I am qualified, and the firm is registered, in the appropriate classes/categories. Individual BCIN: _____ Firm BCIN: _____			
☒ I review and take responsibility for the design and am qualified in the appropriate category as an "other designer" under subsection 3.2.5. of Division C, of the Building Code. Individual BCIN: <u>19669</u> Basis for exemption from registration and qualification: <u>O.B.C SENTENCE 3.2.4.1 (4)</u>			
☐ 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 19, 2019			
Date		Signature of Designer	

NOTE:

- 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.
- 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.

Application for a Permit Construct or Demolish – Effective January 1, 2015

SITE NAME: BALTRIO				18 DENHAM DRIVE								DATE Sep-19				WINTER NATURAL AIR CHANGE RATE 0.332								HEAT LOSS ΔT °F. 78				CSA-F280-12																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																							
BUILDER: GREENPARK HOMES				TYPE: AVIGNON 3								GFA: 6495				LO# 83730				SUMMER NATURAL AIR CHANGE RATE 0.107								HEAT GAIN ΔT °F. 14				SB-12 PACKAGE A1																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																			
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EXP. WALL				25				37				0				22				75				38				17				21				0				0				25				30																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																			
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GRS.WALL AREA				LOSS				GAIN				250				333				0				198				675				342				153				210				0				0				350				330																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																											
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NORTH				21.8	16.3	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	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

ROOM USE				ENS-5			DIN			KIT			LIV			LAUN			PWD			FOY			MUD			BAS-2			HALL			WUB			BAS					
EXP. WALL				0			42			56			44			23			11			7			36			131			37			25			123					
CLG. HT.				9			11			11			14			9			11			11			13			10			9			10			10					
FACTORS				0			462			616			616			207			121			77			468			917			333			250			861					
GRS.WALL AREA		LOSS GAIN		LOSS GAIN			LOSS GAIN			LOSS GAIN			LOSS GAIN			LOSS GAIN			LOSS GAIN			LOSS GAIN			LOSS GAIN			LOSS GAIN			LOSS GAIN			LOSS GAIN			LOSS GAIN					
GLAZING				0			0			0			0			0			0			0			0			0			0			0			0			0		
NORTH		21.8	16.3	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	12	261	195	0	0	0	0	0	0					
EAST		21.8	41.8	0	0	0	0	0	0	86	1873	3598	0	0	0	0	0	0	0	0	0	0	0	0	0	5	109	209	0	0	0	0	0	0	0	0	0					
SOUTH		21.8	25.2	0	0	0	0	0	0	25	545	629	52	1133	1309	0	0	0	8	174	201	0	0	0	0	0	0	0	27	588	680	0	0	0	0	0	0					
WEST		21.8	41.8	0	0	0	57	1242	2384	0	0	0	77	1677	3221	11	240	460	0	0	0	16	349	669	0	0	0	0	0	0	0	0	0	0	10	218	418					
SKYLT.		38.1	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		25.8	4.6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	48	1241	220	60	1551	275	20	517	92	0	0	0	40	1034	183	20	517	92				
NET EXPOSED WALL		4.6	0.8	0	0	0	405	1850	328	505	2307	409	487	2225	395	196	895	159	113	516	92	13	59	11	408	1864	331	0	0	0	294	1343	238	210	959	170	0	0	0			
NET EXPOSED BSMT WALL ABOVE GR		3.7	0.7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	393	1448	257	0	0	0	0	0	0	369	1359	241					
EXPOSED CLG		1.3	0.6	80	105	48	0	0	0	0	0	0	0	0	0	126	166	76	0	0	0	0	0	0	0	0	0	0	662	870	400	0	0	0	0	0	0					
NO ATTIC EXPOSED CLG		2.8	1.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0						
EXPOSED FLOOR		2.6	0.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0						
BASEMENT/CRAWL HEAT LOSS				0			0			0			0			0			0			0			0			4029			0			0			4551					
SLAB ON GRADE HEAT LOSS				0			0			0			0			0			0			0			0			0			0			248			0					
SUBTOTAL HT LOSS				105			3092			4725			5035			1301			691			1649			3415			6102			3062			2241			6646					
SUB TOTAL HT GAIN				48			2713			4636			4925			695			293			900			606			558			1513			354			751					
LEVEL FACTOR / MULTIPLIER		0.20		0.34		0.30		0.55		0.30		0.55		0.30		0.55		0.30		0.55		0.30		0.55		0.30		0.55		0.50		1.45		0.20		0.34						
AIR CHANGE HEAT LOSS				36		1686		2576		2745		440		377		899		1862		8874		1037		116		43		0		0		0		0		0						
AIR CHANGE HEAT GAIN				4		207		354		376		53		22		69		46		0		43		116		0		0		0		0		0		84						
DUCT LOSS				0		0		0		0		0		0		0		0		0		0		0		0		0		0		0		0		0						
DUCT GAIN				0		0		0		0		0		0		0		0		0		0		0		0		0		0		0		0		0						
HEAT GAIN PEOPLE		240		0		0		0		0		0		0		0		0		0		0		0		0		0		0		0		0		0						
HEAT GAIN APPLIANCES/LIGHTS				0		926		926		926		926		926		926		926		926		926		926		926		926		926		926		926		926						
TOTAL HT LOSS BTU/H				141		4778		7302		7780		1741		1067		2548		5277		14976		4099		2118		2489		19569		228		228		228								
TOTAL HT GAIN x 1.3 BTU/H				68		4999		7691		8095		2176		410		1259		848		1984		2118		460		19569		228		228		228		228								

SITE NAME: BALTRIO
BUILDER: GREENPARK HOMES

18 DENHAM DRIVE
TYPE: AVIGNON 3

DATE: Sep-19

GFA: 6495 LO# 83730

FURNACE 1

HEATING CFM 1131 COOLING CFM 1131
TOTAL HEAT LOSS 52,461 TOTAL HEAT GAIN 32,633
AIR FLOW RATE CFM 21.56 AIR FLOW RATE CFM 34.66

furnace pressure 0.6
furnace filter 0.05
a/c coil pressure 0.2
available pressure
for s/a & r/a 0.35

#GOODMAN
GMEC960603BNA 60

AFUE = 96 %
INPUT (BTU/H) = 60,000
OUTPUT (BTU/H) = 57,600

RUN COUNT	4th	3rd	2nd	1st	Bas
S/A	0	0	8	6	5
R/A	0	0	3	3	1

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

plenium pressure s/a 0.18 r/a pressure 0.17
max s/a dif press. loss 0.02 r/a grille press. Loss 0.02
min adjusted pressure s/a 0.16 adjusted pressure r/a 0.15

FAN SPEED
LOW
MEDLOW
MEDIUM
MEDIUM HIGH
HIGH 1131

DESIGN CFM = 1131
CFM @ .6" E.S.P.

TEMPERATURE RISE 47 °F

RUN #	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
ROOM NAME	LAUN	BED-5	BED-5	BED-4	BED-4	ENS-4	ENS-5	LIV	LIV	FOY	DIN	DIN	HALL	BAS	BAS	BAS	BAS	LIV	BAS
RM LOSS MBH	1.74	1.53	1.53	2.96	2.96	0.32	0.14	2.59	2.59	2.55	2.39	2.39	4.10	4.41	4.41	4.41	4.41	2.59	4.41
CFM PER RUN HEAT	38	33	33	64	64	7	3	56	56	55	52	52	88	95	95	95	95	56	95
RM GAIN MBH	2.18	2.49	2.49	3.05	3.05	0.09	0.07	2.70	2.70	1.26	2.50	2.50	2.12	0.55	0.55	0.55	0.55	2.70	0.55
CFM PER RUN COOLING	75	86	86	106	106	3	2	94	94	44	87	87	73	19	19	19	19	94	19
ADJUSTED PRESSURE	0.17	0.16	0.16	0.16	0.16	0.17	0.17	0.16	0.16	0.17	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16
ACTUAL DUCT LGH	45	39	50	53	51	63	23	45	30	25	36	31	30	35	23	24	36	37	28
EQUIVALENT LENGTH	150	180	160	170	180	120	120	140	150	150	130	110	190	120	110	150	160	150	140
TOTAL EFFECTIVE LENGTH	195	219	210	223	231	183	143	185	180	175	166	141	220	155	133	174	196	187	168
ADJUSTED PRESSURE	0.09	0.07	0.08	0.07	0.07	0.09	0.12	0.09	0.09	0.1	0.1	0.11	0.07	0.1	0.12	0.09	0.08	0.09	0.1
ROUND DUCT SIZE	5	6	6	6	6	4	4	6	6	4	5	5	6	5	5	6	6	6	5
HEATING VELOCITY (ft/min)	279	168	168	326	326	80	34	286	286	631	382	382	449	698	698	484	484	286	698
COOLING VELOCITY (ft/min)	551	438	438	540	540	34	23	479	479	505	639	639	372	140	140	97	97	479	140
OUTLET GRILL SIZE	3X10	4X10	4X10	4X10	4X10	3X10	3X10	4X10	4X10	3X10	3X10	3X10	4X10	3X10	3X10	4X10	4X10	4X10	3X10
TRUNK	B	A	A	E	E	D	D	B	B	A	A	A	E	C	C	B	B	E	C

RUN #	ROOM NAME	RM LOSS MBH	CFM PER RUN HEAT	RM GAIN MBH	CFM PER RUN COOLING	ADJUSTED PRESSURE	ACTUAL DUCT LGH	EQUIVALENT LENGTH	TOTAL EFFECTIVE LENGTH	ADJUSTED PRESSURE	ROUND DUCT SIZE	HEATING VELOCITY (ft/min)	COOLING VELOCITY (ft/min)	OUTLET GRILL SIZE	TRUNK
1	LAUN	1.74	38	2.18	75	0.17	45	150	195	0.09	5	279	551	3X10	B
2	BED-5	1.53	33	2.49	86	0.16	39	180	219	0.07	6	168	438	4X10	A
3	BED-5	1.53	33	2.49	86	0.16	50	160	210	0.08	6	168	438	4X10	A
4	BED-4	2.96	64	3.05	106	0.16	53	170	223	0.07	6	326	540	4X10	E
5	BED-4	2.96	64	3.05	106	0.16	51	180	231	0.07	6	326	540	4X10	E
6	ENS-4	0.32	7	0.09	3	0.17	63	120	183	0.09	4	80	34	3X10	D
7	ENS-5	0.14	3	0.07	2	0.17	23	120	143	0.12	4	34	23	3X10	D
8	LIV	2.59	56	2.70	94	0.16	45	140	185	0.09	6	286	479	4X10	B
9	LIV	2.59	56	2.70	94	0.16	30	150	180	0.09	6	286	479	4X10	B
10	FOY	2.55	55	1.26	44	0.17	25	150	175	0.1	4	631	505	3X10	A
11	DIN	2.39	52	2.50	87	0.16	36	130	166	0.1	5	382	639	3X10	A
12	DIN	2.39	52	2.50	87	0.16	31	110	141	0.11	5	382	639	3X10	A
13	HALL	4.10	88	2.12	73	0.16	30	190	220	0.07	6	449	372	4X10	E
14	BAS	4.41	95	0.55	19	0.16	35	120	155	0.1	5	698	140	3X10	C
15	BAS	4.41	95	0.55	19	0.16	23	110	133	0.12	5	698	140	3X10	C
16	BAS	4.41	95	0.55	19	0.16	24	150	174	0.09	6	484	97	4X10	B
17	BAS	4.41	95	0.55	19	0.16	36	160	196	0.08	6	484	97	4X10	B
18	LIV	2.59	56	2.70	94	0.16	37	150	187	0.09	6	286	479	4X10	E
19	BAS	4.41	95	0.55	19	0.16	28	140	168	0.1	5	698	140	3X10	C

SUPPLY AIR TRUNK SIZE												RETURN 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 CFM	STATIC PRESS.	ROUND DUCT	RECT DUCT			VELOCITY (ft/min)	
TRUNK A	225	0.07	8.3	8	x	8	506			TRUNK G	0	0.00	0	0	x	8	0		TRUNK O	0	0.06	0	0	x	8	0
TRUNK B	565	0.07	11.7	16	x	8	636			TRUNK H	0	0.00	0	0	x	8	0		TRUNK P	0	0.06	0	0	x	8	0
TRUNK C	285	0.10	8.3	8	x	8	641			TRUNK I	0	0.00	0	0	x	8	0		TRUNK Q	0	0.06	0	0	x	8	0
TRUNK D	1132	0.07	15.2	26	x	8	784			TRUNK J	0	0.00	0	0	x	8	0		TRUNK R	0	0.06	0	0	x	8	0
TRUNK E	837	0.07	13.6	22	x	8	685			TRUNK K	0	0.00	0	0	x	8	0		TRUNK S	0	0.06	0	0	x	8	0
TRUNK F	0	0.00	0	0	x	8	0			TRUNK L	0	0.00	0	0	x	8	0		TRUNK T	0	0.06	0	0	x	8	0

RETURN AIR #	1	2	3	4	5	6	BR
AIR VOLUME	130	130	130	165	145	235	0
PLENUM PRESSURE	0.15	0.15	0.15	0.15	0.15	0.15	0.15
ACTUAL DUCT LGH	64	43	43	38	17	26	1
EQUIVALENT LENGTH	155	155	185	175	220	215	0
TOTAL EFFECTIVE LH	219	198	228	213	237	241	1
ADJUSTED PRESSURE	0.07	0.07	0.06	0.07	0.06	0.06	14.80
ROUND DUCT SIZE	6.8	6.8	7	7.4	7.3	8.8	0
INLET GRILL SIZE	8	8	8	8	8	8	0
INLET GRILL SIZE	X	X	X	X	X	X	X
INLET GRILL SIZE	14	14	14	14	14	30	0

TRUNK CFM	STATIC PRESS.	ROUND DUCT	RECT DUCT	VELOCITY (ft/min)
TRUNK O	0	0.06	0	0
TRUNK P	0	0.06	0	0
TRUNK Q	0	0.06	0	0
TRUNK R	0	0.06	0	0
TRUNK S	0	0.06	0	0
TRUNK T	0	0.06	0	0
TRUNK U	0	0.06	0	0
TRUNK V	0	0.06	0	0
TRUNK W	0	0.06	0	0
TRUNK X	1131	0.06	15.8	30
TRUNK Y	361	0.06	10.3	12
TRUNK Z	0	0.06	0	0
DROP	1131	0.06	15.8	24

SITE NAME: BALTRIO
BUILDER: GREENPARK HOMES

18 DENHAM DRIVE
TYPE: AVIGNON 3

DATE: Sep-19

GFA: 6495 LO# 83730

FURNACE 2

HEATING CFM 1504 COOLING CFM 1504
TOTAL HEAT LOSS 56,449 TOTAL HEAT GAIN 41,441
AIR FLOW RATE CFM 26.64 AIR FLOW RATE CFM 36.29

furnace pressure 0.6
furnace filter 0.05
a/c coil pressure 0.2
available pressure
for s/a & r/a 0.35

#*GOODMAN
GMEC960804CNA
FAN SPEED 80

AFUE = 96 %
INPUT (BTU/H) = 80,000
OUTPUT (BTU/H) = 76,800

RUN COUNT	4th	3rd	2nd	1st	Bas
S/A	0	0	14	10	4
R/A	0	0	3	2	1

plenum pressure s/a 0.18
max s/a dif press. loss 0.03
min adjusted pressure s/a 0.15

r/a pressure 0.17
r/a grille press. Loss 0.02
adjusted pressure r/a 0.15

LOW
MEDLOW
MEDIUM
MEDIUM HIGH 1504
HIGH 1615

DESIGN CFM = 1504
CFM @ 6" E.S.P.

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	BED-3	BED-3	ENS-3	ENS-4	BED-2	BED-2	MBR	MBR	WICS	ENS	ENS	KIT	KIT	FAM	FAM	H-OFF	PWD	BAS-2	BAS-2	BAS-2	BAS-2	MUD	BED-3	MBR
RM LOSS MBH	2.90	2.90	0.10	0.32	1.21	1.21	1.32	1.32	0.19	1.82	1.82	2.43	2.43	2.41	2.41	1.75	1.07	3.74	3.74	3.74	3.74	2.64	2.90	1.32
CFM PER RUN HEAT	77	77	3	9	32	32	35	35	5	49	49	65	65	64	64	47	28	100	100	100	100	70	77	35
RM GAIN MBH	2.21	2.21	0.05	0.09	1.72	1.72	2.22	2.22	0.09	1.36	1.36	2.56	2.56	3.33	3.33	2.05	0.41	0.50	0.50	0.50	0.50	0.42	2.21	2.22
CFM PER RUN COOLING	80	80	2	3	62	62	81	81	3	49	49	93	93	121	121	74	15	18	18	18	18	15	80	81
ADJUSTED PRESSURE	0.17	0.17	0.17	0.17	0.17	0.17	0.16	0.16	0.17	0.17	0.17	0.16	0.16	0.15	0.15	0.17	0.17	0.16	0.16	0.16	0.16	0.17	0.17	0.16
ACTUAL DUCT LGH	74	73	46	72	69	54	50	73	33	80	71	52	46	43	57	66	54	68	41	44	68	14	64	77
EQUIVALENT LENGTH	170	160	140	180	210	150	150	120	190	140	140	150	130	130	110	150	100	130	140	120	120	100	180	130
TOTAL EFFECTIVE LENGTH	244	233	186	252	279	204	200	193	223	220	211	202	176	173	167	216	154	198	181	164	188	114	244	207
ADJUSTED PRESSURE	0.07	0.07	0.09	0.07	0.06	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.09	0.09	0.09	0.08	0.11	0.08	0.09	0.1	0.09	0.15	0.07	0.08
ROUND DUCT SIZE	6	6	4	4	6	5	6	6	4	5	5	6	6	6	6	5	4	6	6	6	6	5	6	6
HEATING VELOCITY (ft/min)	393	393	34	103	163	235	178	178	57	360	360	331	331	326	326	345	321	510	510	510	510	514	393	178
COOLING VELOCITY (ft/min)	408	408	23	34	316	455	413	413	34	360	360	474	474	617	617	543	172	92	92	92	92	110	408	413
OUTLET GRILL SIZE	4X10	4X10	3X10	3X10	4X10	3X10	4X10	4X10	3X10	3X10	3X10	4X10	4X10	4X10	4X10	3X10	3X10	4X10	4X10	4X10	4X10	3X10	4X10	4X10
TRUNK	D	D	D	C	C	D	D	B	B	A	A	C	C	B	B	A	A	C	D	B	A	E	D	B

RUN #	25	26	27	28
ROOM NAME	WICS	KIT	H-OFF	MUD
RM LOSS MBH	0.19	2.43	1.75	2.64
CFM PER RUN HEAT	5	65	47	70
RM GAIN MBH	0.09	2.56	2.05	0.42
CFM PER RUN COOLING	3	93	74	15
ADJUSTED PRESSURE	0.17	0.16	0.17	0.17
ACTUAL DUCT LGH	65	37	70	10
EQUIVALENT LENGTH	150	120	140	130
TOTAL EFFECTIVE LENGTH	215	157	210	140
ADJUSTED PRESSURE	0.08	0.1	0.08	0.12
ROUND DUCT SIZE	4	5	5	5
HEATING VELOCITY (ft/min)	57	477	345	514
COOLING VELOCITY (ft/min)	34	683	543	110
OUTLET GRILL SIZE	3X10	3X10	3X10	3X10
TRUNK	B	D	A	E

SUPPLY AIR TRUNK SIZE

	TRUNK CFM	STATIC PRESS.	ROUND DUCT	RECT DUCT	VELOCITY (ft/min)
TRUNK A	320	0.08	9.2	10	x 8 576
TRUNK B	628	0.08	11.8	16	x 8 707
TRUNK C	271	0.06	9.2	10	x 8 488
TRUNK D	737	0.06	13.4	20	x 8 663
TRUNK E	1505	0.06	17.6	28	x 10 774
TRUNK F	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	1504	0.05	18.4	32	x 10 677
TRUNK Y	790	0.05	14.4	24	x 8 593
TRUNK Z	379	0.05	11	14	x 8 487
DROP	1504	0.05	18.4	24	x 14 645

RETURN AIR #

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
AIR VOLUME	185	205	130	405	385	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
PLENUM PRESSURE	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15
ACTUAL DUCT LGH	40	51	61	62	68	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
EQUIVALENT LENGTH	220	175	175	150	190	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL EFFECTIVE LH	260	226	236	212	258	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
ADJUSTED PRESSURE	0.06	0.07	0.06	0.07	0.06	14.80	14.80	14.80	14.80	14.80	14.80	14.80	14.80	14.80	14.80	14.80	14.80	14.80	14.80	14.80	14.80	14.80	14.80	14.80
ROUND DUCT SIZE	8	8	7	10.3	10.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
INLET GRILL SIZE	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
INLET GRILL SIZE	30	14	14	30	30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

TYPE: AVIGNON 3
SITE NAME: BALTRIO

LO # 83730
18 DENHAM DRIVE

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	<u>2</u> @ 21.2 cfm <u>42.4</u> cfm	
Other Bedrooms	<u>4</u> @ 10.6 cfm <u>42.4</u> cfm	
Kitchen & Bathrooms	<u>7</u> @ 10.6 cfm <u>74.2</u> cfm	
Other Rooms	<u>6</u> @ 10.6 cfm <u>63.6</u> cfm	
Table 9.32.3.A.	TOTAL <u>222.6</u> 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	<u>222.6</u> cfm	
Less Principal Ventil. Capacity	<u>155</u> cfm	
Required Supplemental Capacity	<u>67.6</u> cfm	

PRINCIPAL EXHAUST FAN CAPACITY			
Model: VANEE 65H	Location: BSMT		
<u>155.0</u> cfm	<u>3.0</u> sones ☒ HVI Approved		
PRINCIPAL EXHAUST HEAT LOSS CALCULATION			
CFM	ΔT °F	FACTOR	% LOSS
155.0 CFM	X 78 F	X 1.08	X 0.25

SUPPLEMENTAL FANS		NUTONE	
Location	Model	cfm	HVI
ENS	QTXEN050C	50	☒
ENS-2	QTXEN050C	50	☒
ENS-4	QTXEN050C	50	☒
PWD	QTXEN050C	50	☒

HEAT RECOVERY VENTILATOR		9.32.3.11.
Model: VANEE 65H		
<u>155</u> cfm high	<u>64</u> cfm low	
<u>75</u> % Sensible Efficiency @ 32 deg F (0 deg C)	☒ HVI Approved	

LOCATION OF INSTALLATION	
Lot:	Concession
Township	Plan:
Address	
Roll #	Building Permit #

BUILDER: GREENPARK 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:	<i>Michael O'Rourke</i>
HRAI #	001820
Date:	September-19

CSA F280-12 Residential Heat Loss and Heat Gain Calculations																																																												
Formula Sheet (For Air Leakage / Ventilation Calculation)																																																												
LO#: 83730	Model: AVIGNON 3	Builder: GREENPARK HOMES	Date: 09/19/2019																																																									
Volume Calculation			Air Change & Delta T Data																																																									
House Volume <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>Level</th> <th>Floor Area (ft²)</th> <th>Floor Height (ft)</th> <th>Volume (ft³)</th> </tr> </thead> <tbody> <tr> <td>Bsmt</td> <td>2979</td> <td>10</td> <td>29790</td> </tr> <tr> <td>First</td> <td>2979</td> <td>11</td> <td>32769</td> </tr> <tr> <td>Second</td> <td>3516</td> <td>9</td> <td>31644</td> </tr> <tr> <td>Third</td> <td>0</td> <td>9</td> <td>0</td> </tr> <tr> <td>Fourth</td> <td>0</td> <td>9</td> <td>0</td> </tr> <tr> <td colspan="2" style="text-align: right;">Total:</td> <td></td> <td>94,203.0 ft³</td> </tr> <tr> <td colspan="2" style="text-align: right;">Total:</td> <td></td> <td>2667.5 m³</td> </tr> </tbody> </table>			Level	Floor Area (ft²)	Floor Height (ft)	Volume (ft³)	Bsmt	2979	10	29790	First	2979	11	32769	Second	3516	9	31644	Third	0	9	0	Fourth	0	9	0	Total:			94,203.0 ft³	Total:			2667.5 m³	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 70%;">WINTER NATURAL AIR CHANGE RATE</td> <td style="width: 30%;">0.332</td> </tr> <tr> <td>SUMMER NATURAL AIR CHANGE RATE</td> <td>0.107</td> </tr> </table> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th colspan="5" style="text-align: center;">Design Temperature Difference</th> </tr> <tr> <th></th> <th>Tin °C</th> <th>Tout °C</th> <th>ΔT °C</th> <th>ΔT °F</th> </tr> <tr> <td>Winter DTDh</td> <td>22</td> <td>-21</td> <td>43</td> <td>78</td> </tr> <tr> <td>Summer DTDc</td> <td>23</td> <td>31</td> <td>8</td> <td>14</td> </tr> </table>		WINTER NATURAL AIR CHANGE RATE	0.332	SUMMER NATURAL AIR CHANGE RATE	0.107	Design Temperature Difference						Tin °C	Tout °C	ΔT °C	ΔT °F	Winter DTDh	22	-21	43	78	Summer DTDc	23	31	8	14
Level	Floor Area (ft²)	Floor Height (ft)	Volume (ft³)																																																									
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5.2.3.1 Heat Loss due to Air Leakage			6.2.6 Sensible Gain due to Air Leakage																																																									
$HL_{airb} = LR_{airh} \times \frac{V_b}{3.6} \times DTD_h \times 1.2$ 0.332 x 740.98 x 43 °C x 1.2 = 12777 W = 43594 Btu/h			$HG_{salb} = LR_{airc} \times \frac{V_b}{3.6} \times DTD_c \times 1.2$ = 0.107 x 740.98 x 8 °C x 1.2 = 731 W = 2493 Btu/h																																																									
5.2.3.2 Heat Loss due to Mechanical Ventilation			6.2.7 Sensible heat Gain due to Ventilation																																																									
$HL_{vaib} = PVC \times DTD_h \times 1.08 \times (1 - E)$ 155 CFM x 78 °F x 1.08 x 0.25 = 3256 Btu/h			$HL_{vaib} = PVC \times DTD_h \times 1.08 \times (1 - E)$ 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)																																																												
$HL_{airr} = Level\ Factor \times HL_{airbv} \times \{(HL_{agcr} + HL_{bgcr}) \div (HL_{agclevel} + HL_{bgclevel})\}$ <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>Level</th> <th>Level Factor (LF)</th> <th>HLairve Air Leakage + Ventilation Heat Loss (Btu/h)</th> <th>Level Conductive Heat Loss: (HL_{clevel})</th> <th>Air Leakage Heat Loss Multiplier (LF x HLairbv / HLlevel)</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>0.5</td> <td rowspan="5" style="text-align: center;">43,594</td> <td>14,989</td> <td>1.454</td> </tr> <tr> <td>2</td> <td>0.3</td> <td>23,985</td> <td>0.545</td> </tr> <tr> <td>3</td> <td>0.2</td> <td>25,748</td> <td>0.339</td> </tr> <tr> <td>4</td> <td>0</td> <td>0</td> <td>0.000</td> </tr> <tr> <td>5</td> <td>0</td> <td>0</td> <td>0.000</td> </tr> </tbody> </table> *HLairbv = Air leakage heat loss + ventilation heat loss *For a balanced or supply only ventilation system HLairve = 0					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	43,594	14,989	1.454	2	0.3	23,985	0.545	3	0.2	25,748	0.339	4	0	0	0.000	5	0	0	0.000																														
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HEAT LOSS AND GAIN SUMMARY SHEET

MODEL: AVIGNON 3	18 DENHAM DRIVE	BUILDER: GREENPARK HOMES
SFQT: 6495	LO# 83730	SITE: BALTRIO

DESIGN ASSUMPTIONS

HEATING	°F	COOLING	°F
OUTDOOR DESIGN TEMP.	-6	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:	WEST	ASSUMED (Y/N):	Y
AIR CHANGES PER HOUR:	3.57	ASSUMED (Y/N):	Y
AIR TIGHTNESS CATEGORY:	AVERAGE	ASSUMED (Y/N):	Y
WIND EXPOSURE:	SHELTERED	ASSUMED (Y/N):	Y
HOUSE VOLUME (ft³):	94203.0	ASSUMED (Y/N):	Y
INTERNAL SHADING:	BLINDS/CURTAINS	ASSUMED OCCUPANTS:	6
INTERIOR LIGHTING LOAD (Btu/h/ft²):	1.27	DC BRUSHLESS MOTOR (Y/N):	Y
FOUNDATION CONFIGURATION	BCIN_1	DEPTH BELOW GRADE:	7.0 ft
LENGTH: 62.0 ft	WIDTH: 65.0 ft	EXPOSED PERIMETER:	254.0 ft

2012 OBC - COMPLIANCE PACKAGE**Component****Compliance Package
A1****Nominal Min. Eff.**

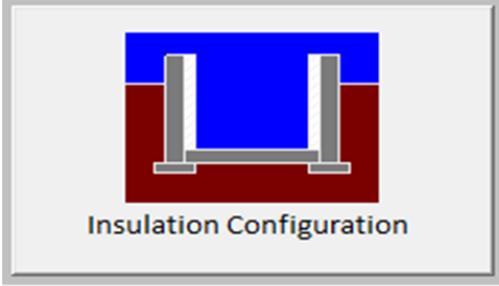
Ceiling with Attic Space Minimum RSI (R)-Value	60	59.22
Ceiling Without Attic Space Minimum RSI (R)-Value	31	27.65
Exposed Floor Minimum RSI (R)-Value	31	29.80
Walls Above Grade Minimum RSI (R)-Value	22	17.03
Basement Walls Minimum RSI (R)-Value	20 ci	21.12
Below Grade Slab Entire surface > 600 mm below 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



Residential Foundation Thermal Load Calculator

Supplemental tool for CAN/CSA-F280

Weather Station Description		
Province:	Ontario	
Region:	Richmond Hill	
Site Description		
Soil Conductivity:	Normal conductivity: dry sand, loam, clay	
Water Table:	Normal (7-10 m, 23-33 ft)	
Foundation Dimensions		
Floor Length (m):	18.9	 Insulation Configuration
Floor Width (m):	19.8	
Exposed Perimeter (m):	0.0	
Wall Height (m):	3.0	
Depth Below Grade (m):	2.13	
Window Area (m ²):	1.4	
Door Area (m ²):	7.4	
Radiant Slab		
Heated Fraction of the Slab:	0	
Fluid Temperature (°C):	33	
Design Months		
Heating Month	1	
Foundation Loads		
Heating Load (Watts):		2514

TYPE: AVIGNON 3
LO# 83730

18 DENHAM DRIVE

Air Infiltration Residential Load Calculator

Supplemental tool for CAN/CSA-F280

Weather Station Description				
Province:	Ontario			
Region:	Richmond Hill			
Weather Station Location:	Open flat terrain, grass			
Anemometer height (m):	10			
Local Shielding				
Building Site:	Suburban, forest			
Walls:	Heavy			
Flue:	Heavy			
Highest Ceiling Height (m):	7.01			
Building Configuration				
Type:	Detached			
Number of Stories:	Two			
Foundation:	Full			
House Volume (m ³):	2667.5			
Air Leakage/Ventilation				
Air Tightness Type:	Present (1961-) (3.57 ACH)			
Custom BDT Data:	ELA @ 10 Pa.	3555.9 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):	0.332			
Cooling Air Leakage Rate (ACH/H):	0.107			

TYPE: AVIGNON 3
LO# 83730

18 DENHAM DRIVE