

LAMPONE INVESTMENT INC.

CITY OF MARKHAM

HEAT LOSS/HEAT GAIN CALCULATIONS

MODEL NAME : KIMBERLY 2

LOT 119 - ELEV 3

ALL CONSTRUCTION SHALL COMPLY WITH THE
ONTARIO BUILDING CODE.

Issue Date: 05/28/21

21.117718.000.00.HP

REVIEWED FOR COMPLIANCE WITH THE ONTARIO BUILDING
CODE AND THE APPLICABLE ZONING BY-LAW

BUILDING STANDARDS DIVISION



SITE NAME: LAMPONE INVESTMENTS				LOT 119				DATE: May-21				WINTER NATURAL AIR CHANGE RATE 0.342				HEAT LOSS ΔT °F. 78				CSA-F280-12							
BUILDER: GREENPARK HOMES				TYPE: KIMBERLY 2				GFA: 2866				LO# 87907				SUMMER NATURAL AIR CHANGE RATE 0.107				HEAT GAIN ΔT °F. 13				SB-12 PACKAGE A1			
ROOM USE				MBR		ENS		BED-2		BED-3		BED-4		ENS-2								S-BATH					
EXP. WALL				36		10		31		33		39		6								6					
CLG. HT.				9		9		9		9		9		9								9					
FACTORS																											
GRS.WALL AREA		LOSS GAIN		324		90		279		297		351		54								54					
GLAZING				LOSS GAIN		LOSS GAIN		LOSS GAIN		LOSS GAIN		LOSS GAIN		LOSS GAIN								LOSS GAIN					
NORTH		21.8	16.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
EAST		21.8	41.6	0	0	0	0	0	0	0	46	1002	1911	64	1394	2659	0	0	0	0	0	0	0	0	0		
SOUTH		21.8	24.9	0	0	0	14	305	349	0	0	0	0	0	0	0	7	152	174	0	0	0	0	0	0		
WEST		21.8	41.6	21	457	873	0	0	0	18	392	748	0	0	0	0	0	0	0	0	0	0	0	0	0		
SKYLT.		38.1	101.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
DOORS		25.8	4.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
NET EXPOSED WALL		4.6	0.8	303	1384	228	76	347	57	261	1192	196	251	1147	189	287	1311	216	47	215	35	54	247	41			
NET EXPOSED BSMT WALL ABOVE GR		3.7	0.6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
EXPOSED CLG		1.3	0.6	323	424	190	180	236	106	278	365	163	243	319	143	186	244	109	108	142	63	112	147	66			
NO ATTIC EXPOSED CLG		2.8	1.3	0	0	0	0	0	0	0	0	0	20	56	25	61	172	77	0	0	0	0	0	0			
EXPOSED FLOOR		2.6	0.4	0	0	0	0	0	0	0	0	0	263	687	113	0	0	0	0	0	0	112	292	48			
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				2266		889		1950		3211		3121		509								686					
SUB TOTAL HT GAIN				1290		511		1107		2381		3061		273								155					
LEVEL FACTOR / MULTIPLIER		0.20 0.28		0.20 0.28				0.20 0.28		0.20 0.28		0.20 0.28		0.20 0.28						0.20 0.28							
AIR CHANGE HEAT LOSS				645		253		555		913		888		145								195					
AIR CHANGE HEAT GAIN				97		38		83		179		230		21								12					
DUCT LOSS				0		0		0		412		0		0								88					
DUCT GAIN				0		0		0		362		0		0								17					
HEAT GAIN PEOPLE		240		2	480	0		1	240	1	240	1	240	0	0	0					0	0	0	0			
HEAT GAIN APPLIANCES/LIGHTS				824		0		824		824		824		0								0					
TOTAL HT LOSS BTU/H				2911		1141		2504		4537		4009		654								970					
TOTAL HT GAIN x 1.3 BTU/H				3498		715		2931		5182		5662		382								238					

ROOM USE			FAM		KT/BF		LV/DN		LAUN		FOY		MUD		WUB		BAS	
EXP. WALL			32		51		46		9		16		28		22		148	
CLG. HT.			11		11		11		9		12		12		9		9	
FACTORS																		
GRS.WALL AREA			352		561		506		81		192		336		198		1036	
GLAZING			LOSS GAIN		LOSS GAIN		LOSS GAIN		LOSS GAIN		LOSS GAIN		LOSS GAIN		LOSS GAIN		LOSS GAIN	
NORTH	21.8	16.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
EAST	21.8	41.6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
SOUTH	21.8	24.9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
WEST	21.8	41.6	24	523	997	64	1394	2659	0	0	0	7	152	291	0	0	6	131
SKYLT.	38.1	101.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6	131
DOORS	25.8	4.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	249
NET EXPOSED WALL	4.6	0.8	328	1498	247	497	2270	374	467	2133	351	74	338	56	20	517	20	517
NET EXPOSED BSMT WALL ABOVE GR	3.7	0.6	0	0	0	0	0	0	0	0	0	0	0	0	85	238	85	85
EXPOSED CLG	1.3	0.6	0	0	0	0	0	0	0	0	0	0	0	0	178	813	134	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
EXPOSED FLOOR	2.6	0.4	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					
SLAB ON GRADE HEAT LOSS			0		0		0		0		0		0					
SUBTOTAL HT LOSS			2021			3665			2983		625		1728		1961		203	
SUB TOTAL HT GAIN				1244			3033			1572	406		284		323		219	
LEVEL FACTOR / MULTIPLIER			0.30	0.46		0.30	0.46		0.30	0.46	0.20	0.28	0.30	0.46			0.50	1.22
AIR CHANGE HEAT LOSS				925			1677			1365	178		791		897			9427
AIR CHANGE HEAT GAIN					94		228				118	31		21		24		66
DUCT LOSS				0			0			0				0		0		0
DUCT GAIN				0			0			0		0		0		0		0
HEAT GAIN PEOPLE	240			0	0		0	0		0	0	0	0	0		0	0	0
HEAT GAIN APPLIANCES/LIGHTS					824		824			824	824			0		0		824
TOTAL HT LOSS BTU/H				2946			5342			4348	802		2519		2858		1533	
TOTAL HT GAIN x 1.3 BTU/H				2809			5310			3268	1639		397		451		284	

TOTAL HEAT GAIN BTU/H: 35061 TONS: 2.92 LOSS DUE TO VENTILATION LOAD BTU/H: 1670 STRUCTURAL HEAT LOSS: 52726 TOTAL COMBINED HEAT LOSS BTU/H: 54396

SITE NAME: LAMPONE INVESTMENTS
BUILDER: GREENPARK HOMES

LOT 119
TYPE: KIMBERLY 2

DATE: May-21

GFA: 2866 LO# 87907

HEATING CFM 1131 COOLING CFM 1131
TOTAL HEAT LOSS 52,726 TOTAL HEAT GAIN 34,786
AIR FLOW RATE CFM 21.45 AIR FLOW RATE CFM 32.51

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
FAN SPEED LOW
MEDLOW
MEDIUM 928
MEDIUM HIGH 1017
HIGH 1131

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

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

TEMPERATURE RISE 47 °F

RUN COUNT	4th	3rd	2nd	1st	Bas
S/A	0	0	13	6	4
R/A	0	0	5	2	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	19	20	21	22	23	24
ROOM NAME	MBR	ENS	BED-3	BED-2	BED-3	BED-4	ENS-2	BED-4	BED-3	MBR	S-BATH	S-BATH	FAM	KT/BF	KT/BF	LV/DN	LAUN	FOY	MUD	BAS	BAS	BAS	BAS
RM LOSS MBH.	1.46	1.14	1.51	2.50	1.51	2.00	0.65	2.00	1.51	1.46	0.48	0.48	2.95	2.67	2.67	4.35	0.80	2.52	2.86	4.30	4.30	4.30	4.30
CFM PER RUN HEAT	31	24	32	54	32	43	14	43	32	31	10	10	63	57	57	93	17	54	61	92	92	92	92
RM GAIN MBH.	1.75	0.71	1.73	2.93	1.73	2.83	0.38	2.83	1.73	1.75	0.12	0.12	2.81	2.66	2.66	3.27	1.64	0.40	0.45	0.58	0.58	0.58	0.58
CFM PER RUN COOLING	57	23	56	95	56	92	12	92	56	57	4	4	91	86	86	106	53	13	15	19	19	19	19
ADJUSTED PRESSURE	0.17	0.17	0.17	0.16	0.17	0.16	0.17	0.16	0.17	0.17	0.17	0.17	0.16	0.16	0.16	0.16	0.17	0.17	0.17	0.16	0.16	0.16	0.16
ACTUAL DUCT LGH.	34	17	60	59	47	48	28	48	48	40	37	54	41	26	16	28	34	41	38	54	18	18	28
EQUIVALENT LENGTH	190	190	140	140	130	170	180	140	120	150	170	160	130	120	140	110	120	150	140	130	130	90	130
TOTAL EFFECTIVE LENGTH	224	207	200	199	177	218	208	188	168	190	207	214	171	146	156	138	154	191	178	184	148	108	158
ADJUSTED PRESSURE	0.08	0.08	0.09	0.08	0.1	0.07	0.08	0.09	0.1	0.09	0.08	0.08	0.09	0.11	0.1	0.12	0.11	0.09	0.1	0.09	0.11	0.15	0.1
ROUND DUCT SIZE	5	4	5	6	5	6	4	6	5	5	4	4	6	6	6	6	5	5	5	6	6	6	6
HEATING VELOCITY (ft/min)	228	275	235	275	235	219	161	219	235	228	115	115	321	291	291	474	125	396	448	469	469	469	469
COOLING VELOCITY (ft/min)	419	264	411	484	411	469	138	469	411	419	46	46	464	438	438	540	389	95	110	97	97	97	97
OUTLET GRILL SIZE	3X10	3X10	3X10	4X10	3X10	4X10	3X10	4X10	3X10	3X10	3X10	3X10	4X10	4X10	4X10	4X10	3X10	3X10	3X10	4X10	4X10	4X10	4X10
TRUNK	B	B	B	C	B	A	A	A	B	D	B	C	C	D	D	A	D	A	C	C	D	B	A

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	MBR	1.46	31	1.75	57	0.17	34	190	224	0.08	5	228	419	3X10	B
2	ENS	1.14	24	0.71	23	0.17	17	190	207	0.08	4	275	264	3X10	B
3	BED-3	1.51	32	1.73	56	0.17	60	140	200	0.09	5	235	411	3X10	B
4	BED-2	2.50	54	2.93	95	0.16	59	140	199	0.08	6	275	484	4X10	C
5	BED-3	1.51	32	1.73	56	0.17	47	130	177	0.1	5	235	411	3X10	B
6	BED-4	2.00	43	2.83	92	0.16	48	170	218	0.07	6	219	469	4X10	A
7	ENS-2	0.65	14	0.38	12	0.17	28	180	208	0.08	4	161	138	3X10	A
8	BED-4	2.00	43	2.83	92	0.16	48	140	188	0.09	6	219	469	4X10	A
9	BED-3	1.51	32	1.73	57	0.17	40	120	168	0.1	5	235	411	3X10	B
10	MBR	1.46	31	1.75	57	0.17	37	150	190	0.09	5	228	419	3X10	D
11	S-BATH	0.48	10	0.12	4	0.17	34	170	207	0.08	4	115	46	3X10	B
12	S-BATH	0.48	10	0.12	4	0.17	54	160	214	0.08	4	115	46	3X10	C
13	FAM	2.95	63	2.81	91	0.16	41	130	171	0.09	6	321	464	4X10	C
14	KT/BF	2.67	57	2.66	86	0.16	26	120	146	0.11	6	291	438	4X10	D
15	KT/BF	2.67	57	2.66	86	0.16	16	140	156	0.1	6	291	438	4X10	D
16	LV/DN	4.35	93	3.27	106	0.16	28	110	138	0.12	6	474	540	4X10	A
17	LAUN	0.80	17	1.64	53	0.17	34	120	154	0.11	5	125	389	3X10	D
19	FOY	2.52	54	0.40	13	0.17	41	150	191	0.09	5	396	95	3X10	A
20	MUD	2.86	61	0.45	15	0.17	38	140	178	0.1	5	448	110	3X10	C
21	BAS	4.30	92	0.58	19	0.16	54	130	184	0.09	6	469	97	4X10	C
22	BAS	4.30	92	0.58	19	0.16	18	130	148	0.11	6	469	97	4X10	D
23	BAS	4.30	92	0.58	19	0.16	18	90	108	0.15	6	469	97	4X10	B
24	BAS	4.30	92	0.58	19	0.16	28	130	158	0.1	6	469	97	4X10	A

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	339	0.07	9.7	12	x	8	509	TRUNK G	0	0.00	0	0	x	8	0	TRUNK O	0	0.05	0	0	x	8	0						
TRUNK B	592	0.07	11.9	16	x	8	666	TRUNK H	0	0.00	0	0	x	8	0	TRUNK P	0	0.05	0	0	x	8	0						
TRUNK C	280	0.08	8.7	10	x	8	504	TRUNK I	0	0.00	0	0	x	8	0	TRUNK Q	0	0.05	0	0	x	8	0						
TRUNK D	534	0.08	11.1	14	x	8	687	TRUNK J	0	0.00	0	0	x	8	0	TRUNK R	0	0.05	0	0	x	8	0						
TRUNK E	0	0.00	0	0	x	8	0	TRUNK K	0	0.00	0	0	x	8	0	TRUNK S	0	0.05	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	0.05	0	0	x	8	0						

RETURN AIR #	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	19	20	21	22	23	24
AIR VOLUME	0	0	0	0	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
ACTUAL DUCT LGH.	37	40	78	54	49	27	36	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
EQUIVALENT LENGTH	155	195	235	175	235	200	200	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL EFFECTIVE LH	192	235	313	229	284	227	236	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
ADJUSTED PRESSURE	0.08	0.06	0.05	0.06	0.05	0.07	0.06	14.80	14.80	14.80	14.80	14.80	14.80	14.80	14.80	14.80	0.06	0.06	0.05	0.06	0.05	0.06	0.05
ROUND DUCT SIZE	6	6	6	6	6	10	7.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
INLET GRILL SIZE	8	8	8	8	8	8	8	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
INLET GRILL SIZE	14	14	14	14	14	30	12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

TYPE: KIMBERLY 2
SITE NAME: LAMPONE INVESTMENTS

LO # 87907
LOT 119

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>3</u> @ 10.6 cfm <u>31.8</u> cfm	
Kitchen & Bathrooms	<u>5</u> @ 10.6 cfm <u>53</u> cfm	
Other Rooms	<u>5</u> @ 10.6 cfm <u>53.0</u> cfm	
Table 9.32.3.A.	TOTAL <u>180.2</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 <u>79.5</u> cfm		

SUPPLEMENTAL VENTILATION CAPACITY		9.32.3.5.
Total Ventilation Capacity	<u>180.2</u> cfm	
Less Principal Ventil. Capacity	<u>79.5</u> cfm	
Required Supplemental Capacity	<u>100.7</u> cfm	

PRINCIPAL EXHAUST FAN CAPACITY	
Model: VANEE 65H	Location: BSMT
<u>79.5</u> cfm	☒ HVI Approved

PRINCIPAL EXHAUST HEAT LOSS CALCULATION				
CFM	ΔT °F	FACTOR	% LOSS	
79.5 CFM	X 78 F	X 1.08	X	0.25

SUPPLEMENTAL FANS		PANASONIC		
Location	Model	cfm	HVI	Sones
ENS	FV-05-11VK1	50	☒	0.3
ENS-2	FV-05-11VK1	50	☒	0.3
S-BATH	FV-05-11VK1	50	☒	0.3
PWD	FV-05-11VK1	50	☒	0.3

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:	May-21

CSA F280-12 Residential Heat Loss and Heat Gain Calculations																																																												
Formula Sheet (For Air Leakage / Ventilation Calculation)																																																												
LO#: 87907	Model: KIMBERLY 2	Builder: GREENPARK HOMES	Date: 5/5/2021																																																									
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>1253</td> <td>9</td> <td>11277</td> </tr> <tr> <td>First</td> <td>1253</td> <td>11</td> <td>13783</td> </tr> <tr> <td>Second</td> <td>1613</td> <td>9</td> <td>14517</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="3" style="text-align: right;">Total:</td> <td>39,577.0 ft³</td> </tr> <tr> <td colspan="3" style="text-align: right;">Total:</td> <td>1120.7 m³</td> </tr> </tbody> </table>			Level	Floor Area (ft²)	Floor Height (ft)	Volume (ft³)	Bsmt	1253	9	11277	First	1253	11	13783	Second	1613	9	14517	Third	0	9	0	Fourth	0	9	0	Total:			39,577.0 ft³	Total:			1120.7 m³	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 80%;">WINTER NATURAL AIR CHANGE RATE</td> <td style="width: 20%; text-align: center;">0.342</td> </tr> <tr> <td>SUMMER NATURAL AIR CHANGE RATE</td> <td style="text-align: center;">0.107</td> </tr> </table> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <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> </thead> <tbody> <tr> <td>Winter DTDh</td> <td style="text-align: center;">22</td> <td style="text-align: center;">-21</td> <td style="text-align: center;">43</td> <td style="text-align: center;">78</td> </tr> <tr> <td>Summer DTDc</td> <td style="text-align: center;">24</td> <td style="text-align: center;">31</td> <td style="text-align: center;">7</td> <td style="text-align: center;">13</td> </tr> </tbody> </table>		WINTER NATURAL AIR CHANGE RATE	0.342	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	24	31	7	13
Level	Floor Area (ft²)	Floor Height (ft)	Volume (ft³)																																																									
Bsmt	1253	9	11277																																																									
First	1253	11	13783																																																									
Second	1613	9	14517																																																									
Third	0	9	0																																																									
Fourth	0	9	0																																																									
Total:			39,577.0 ft³																																																									
Total:			1120.7 m³																																																									
WINTER NATURAL AIR CHANGE RATE	0.342																																																											
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	24	31	7	13																																																								
5.2.3.1 Heat Loss due to Air Leakage			6.2.6 Sensible Gain due to Air Leakage																																																									
$HL_{airb} = LR_{airh} \times \frac{V_b}{3.6} \times DTD_h \times 1.2$ 0.342 x 311.30 x 43 °C x 1.2 = 5526 W = 18854 Btu/h			$HG_{salb} = LR_{airc} \times \frac{V_b}{3.6} \times DTD_c \times 1.2$ = 0.107 x 311.30 x 7 °C x 1.2 = 284 W = 968 Btu/h																																																									
5.2.3.2 Heat Loss due to Mechanical Ventilation			6.2.7 Sensible heat Gain due to Ventilation																																																									
$HL_{vairb} = PVC \times DTD_h \times 1.08 \times (1 - E)$ 80 CFM x 78 °F x 1.08 x 0.25 = 1670 Btu/h			$HL_{vairb} = PVC \times DTD_h \times 1.08 \times (1 - E)$ 80 CFM x 13 °F x 1.08 x 0.25 = 275 Btu/h																																																									
5.2.3.3 Calculation of Air Change Heat Loss for Each Room (Floor Multiplier Section)																																																												
$HL_{airr} = Level\ Factor \times HL_{airbv} \times \{(HL_{agcr} + HL_{bgcr}) \div (HL_{agclevel} + HL_{bgclevel})\}$																																																												
Level	Level Factor (LF)	HLairve Air Leakage + Ventilation Heat Loss (Btu/h)	Level Conductive Heat Loss: (HL _{clevel})	Air Leakage Heat Loss Multiplier (LF x HLairbv / HLlevel)																																																								
1	0.5	18,854	7,758	1.215																																																								
2	0.3		12,358	0.458																																																								
3	0.2		13,256	0.284																																																								
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																																																												

HEAT LOSS AND GAIN SUMMARY SHEET

MODEL: KIMBERLY 2	LOT 119	BUILDER: GREENPARK HOMES
SFQT: 2866	LO# 87907	SITE: LAMPONE INVESTMENTS

DESIGN ASSUMPTIONS

HEATING	°F	COOLING	°F
OUTDOOR DESIGN TEMP.	-6	OUTDOOR DESIGN TEMP.	88
INDOOR DESIGN TEMP.	72	INDOOR DESIGN TEMP. (MAX 75°F)	75

BUILDING DATA

ATTACHMENT:	DETACHED	# OF STORIES (+BASEMENT):	3
FRONT FACES:	EAST	ASSUMED (Y/N):	Y
AIR CHANGES PER HOUR:	3.57	ASSUMED (Y/N):	Y
AIR TIGHTNESS CATEGORY:	AVERAGE	ASSUMED (Y/N):	Y
WIND EXPOSURE:	SHELTERED	ASSUMED (Y/N):	Y
HOUSE VOLUME (ft³):	39577.0	ASSUMED (Y/N):	Y
INTERNAL SHADING:	BLINDS/CURTAINS	ASSUMED OCCUPANTS:	5
INTERIOR LIGHTING LOAD (Btu/h/ft²):	1.80	DC BRUSHLESS MOTOR (Y/N):	Y
FOUNDATION CONFIGURATION	BCIN_1	DEPTH BELOW GRADE:	7.0 ft
LENGTH: 48.0 ft	WIDTH: 37.0 ft	EXPOSED PERIMETER:	148.0 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	-

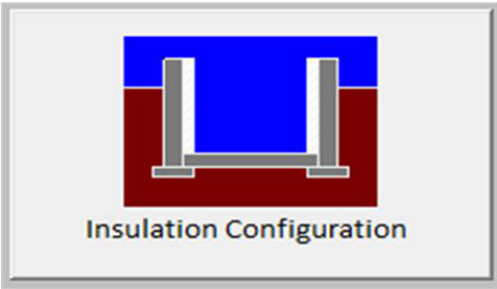
INDIVIDUAL BCIN: 19669

MICHAEL O'ROURKE



Residential Foundation Thermal Load Calculator

Supplemental tool for CAN/CSA-F280

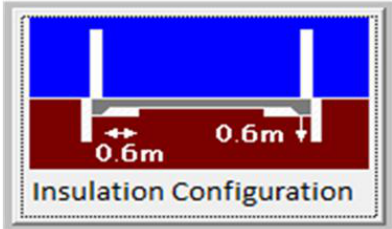
Weather Station Description		
Province:	Ontario	
Region:	Markham	
Site Description		
Soil Conductivity:	Normal conductivity: dry sand, loam, clay	
Water Table:	Normal (7-10 m, 23-33 ft)	
Foundation Dimensions		
Floor Length (m):	14.6	 Insulation Configuration
Floor Width (m):	11.3	
Exposed Perimeter (m):	45.1	
Wall Height (m):	2.7	
Depth Below Grade (m):	2.13	
Window Area (m ²):	1.1	
Door Area (m ²):	3.7	
Radiant Slab		
Heated Fraction of the Slab:	0	
Fluid Temperature (°C):	33	
Design Months		
Heating Month	1	
Foundation Loads		
Heating Load (Watts):		1276

TYPE: KIMBERLY 2
LO# 87907

LOT 119

Residential Slab on Grade Thermal Load Calculator

Supplemental tool for CAN/CSA-F280

Weather Station Description		
Province:	Ontario	
Region:	Markham	
Site Description		
Soil Conductivity:	Normal conductivity: dry sand, loam, clay	
Water Table:	Normal (7-10 m, 23-33 ft)	
Foundation Dimensions		
Length (m):	1.8	
Width (m):	4.9	
Exposed Perimeter (m):	6.7	
Radiant Slab		
Heated Fraction of the Slab:	0	
Fluid Temperature (°C):	33	
Design Months		
Heating Month	1	
Results		
Heating Load (Watts):		60

TYPE: KIMBERLY 2
LO# 87907

LOT 119

Air Infiltration Residential Load Calculator

Supplemental tool for CAN/CSA-F280

Weather Station Description				
Province:	Ontario			
Region:	Markham			
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):	1120.7			
Air Leakage/Ventilation				
Air Tightness Type:	Present (1961-) (3.57 ACH)			
Custom BDT Data:	ELA @ 10 Pa.	1493.9 cm ²		
	3.57	ACH @ 50 Pa		
Mechanical Ventilation (L/s):	Total Supply	Total Exhaust		
	37.5	37.5		
Flue Size				
Flue #:	#1	#2	#3	#4
Diameter (mm):	0	0	0	0
Natural Infiltration Rates				
Heating Air Leakage Rate (ACH/H):	0.342			
Cooling Air Leakage Rate (ACH/H):	0.107			

TYPE: KIMBERLY 2
LO# 87907

LOT 119