

SITE NAME: LAMBERT'S LANE PH.2

BUILDER: GREENPARK HOMES

TYPE: BRENTWOOD 3A

GFA: 2787

DATE: Feb-19

LOG # 81367

WINTER NATURAL AIR CHANGE RATE 0.227

SUMMER NATURAL AIR CHANGE RATE 0.074

HEAT LOSS AT °F. 74

HEAT GAIN AT °F. 11

CSA-F280-12

ENERGYSTAR

ROOM USE	EXP. WALL	CLG. HT.	MBR	ENS	WIC	BED-2	BED-3	BED-4	ENS-4	ENS-3	ENS-2
			32	23	6	15	33	19	9	17	6
			9	9	9	9	10	9	9	9	9
GRS.WALL AREA	FACTORS		288	207	54	135	330	171	81	153	54
GLAZING	LOSS GAIN		LOSS GAIN	LOSS GAIN	LOSS GAIN	LOSS GAIN	LOSS GAIN	LOSS GAIN	LOSS GAIN	LOSS GAIN	LOSS GAIN
NORTH	18.6 15.1	0 0 0	0 0 0	0 0 0	0 0 0	18 334 273	0 0 0	0 0 0	0 0 0	0 0 0	10 186 151
EAST	18.6 40.7	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	30 557 1222	0 0 0	0 0 0	10 186 407	0 0 0
SOUTH	18.6 24.1	0 0 0	11 204 265	0 0 0	0 0 0	0 0 0	0 0 0	34 631 818	11 204 265	0 0 0	0 0 0
WEST	18.6 40.7	36 668 1466	15 278 611	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0
SKYL.T.	31.2 99.9	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
DOORS	24.7 3.7	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
NET EXPOSED WALL	3.5 0.5	252 886 131	181 637 94	54 190 28	117 411 61	300 1055 156	137 482 71	70 246 36	143 603 75	44 155 23	0 0 0
NET EXPOSED BSMT WALL ABOVE GR	3.5 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
EXPOSED CLG	1.3 0.6	255 320 142	132 165 74	102 128 57	240 301 134	338 424 188	209 262 117	99 124 55	70 88 39	102 128 57	0 0 0
NO ATTIC EXPOSED CLG	2.7 1.2	0 0 0	0 0 0	0 0 0	0 0 0	68 182 81	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0
EXPOSED FLOOR	2.5 0.4	0 0 0	0 0 0	0 0 0	0 0 0	153 381 58	0 0 0	0 0 0	70 174 26	0 0 0	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		1974	1284	318	1046	2596	1374	674	950	468	231
SUB TOTAL HT GAIN		1739	1043	85	467	1704	1006	356	547	231	15
LEVEL FACTOR / MULTIPLIER	0.20 0.22		0.20 0.22	0.20 0.22	0.20 0.22	0.20 0.22	0.20 0.22	0.20 0.22	0.20 0.22	0.20 0.22	0.20 0.22
AIR CHANGE HEAT LOSS	404		277	69	228	581	297	124	205	101	15
AIR CHANGE HEAT GAIN		116	69	6	31	113	67	24	36	0	0
DUCT LOSS	0		0	0	0	316	0	0	116	0	0
DUCT GAIN	0		0	0	0	270	0	0	58	0	0
HEAT GAIN PEOPLE	240	2	480	0	0	1	240	1	240	0	0
HEAT GAIN APPLIANCES/LIGHTS		639	0	0	639	639	639	639	639	0	0
TOTAL HT LOSS BTU/H		2278	1581	385	1272	3475	1671	698	1271	569	321
TOTAL HT GAIN x 1.3 BTU/H		3667	1447	118	1791	3856	2538	494	834	321	321

ROOM USE	EXP. WALL	CLG. HT.	LV/DN	KT/FM	LAUN	WR	FOY	BAS
			34	72	18	12	42	184
			10	10	11	10	10	9
GRS.WALL AREA	FACTORS		348	720	198	120	420	1104
GLAZING	LOSS GAIN		LOSS GAIN	LOSS GAIN	LOSS GAIN	LOSS GAIN	LOSS GAIN	LOSS GAIN
NORTH	18.6 15.1	0 0 0	0 0 0	0 0 0	11 204 167	0 0 0	0 0 0	4 74 61
EAST	18.6 40.7	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0
SOUTH	18.6 24.1	28 519 674	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	8 148 193
WEST	18.6 40.7	0 0 0	49 909 1996	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0
SKYL.T.	31.2 99.9	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0
DOORS	24.7 3.7	0 0 0	8 197 29	20 493 73	0 0 0	40 986 146	20 493 73	0 0 0
NET EXPOSED WALL	3.5 0.5	312 1097 163	663 2331 346	157 587 87	120 422 63	380 1336 198	0 0 0	552 1939 288
NET EXPOSED BSMT WALL ABOVE GR	3.5 0.5	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	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0
NO ATTIC EXPOSED CLG	2.7 1.2	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0
EXPOSED FLOOR	2.5 0.4	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	6419
SLAB ON GRADE HEAT LOSS		0	0	0	0	0	0	0
SUBTOTAL HT LOSS		1617	3438	1284	422	2322	344	9074
SUB TOTAL HT GAIN		836	2370	327	63	344	0	614
LEVEL FACTOR / MULTIPLIER	0.30 0.37		0.30 0.37	0.30 0.37	0.30 0.37	0.30 0.37	0.30 0.37	0.50 0.62
AIR CHANGE HEAT LOSS	604		1286	480	158	868	23	5658
AIR CHANGE HEAT GAIN		56	158	22	4	0	0	41
DUCT LOSS	0		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
HEAT GAIN APPLIANCES/LIGHTS		639	639	639	639	639	639	639
TOTAL HT LOSS BTU/H		2221	4723	1764	580	3190	14732	1682
TOTAL HT GAIN x 1.3 BTU/H		1991	4118	1284	87	477	1682	1682

TOTAL HEAT GAIN BTU/H:

25141

TONS: 2.10

LOSS DUE TO VENTILATION LOAD BTU/H: 1693

HEAT LOSS: 40392

TOTAL COMBINED HEAT LOSS BTU/H: 41985

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.

THIS STRUCTURE MUST BE
CONSTRUCTED TO MEET OR
EXCEED THE PROVISIONS OF
THE ONTARIO BUILDING CODE

Michael O'Rourke

INDIVIDUAL BCIN: 19669

MICHAEL O'ROURKE

SITE NAME: LAMBERT'S LANE PH.2
BUILDER: GREENPARK HOMES

TYPE: BRENTWOOD 3A

DATE: Feb-19

GFA: 2787 LO# 81367

HEATING CFM 1131 COOLING CFM 1131
TOTAL HEAT LOSS 40,392 TOTAL HEAT GAIN 24,905
AIR FLOW RATE CFM 28 AIR FLOW RATE CFM 45.41

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	11	8	4
R/A	0	0	4	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

FAN SPEED LOW
MEDLOW
MEDIUM
MEDIUM HIGH
HIGH 1131

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

TEMPERATURE RISE 47 °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	21	22	23	24
ROOM NAME	MBR	ENS	WIC	BED-2	BED-3	BED-4	ENS-3	ENS-4	BED-3	MBR	ENS-2	LV/DN	LV/DN	KT/FM	KT/FM	KT/FM	LAUN	W/R	FOY	BAS	BAS	BAS	BAS
RM LOSS MBH.	1.14	1.56	0.39	1.27	1.74	1.67	1.27	0.70	1.74	1.14	0.57	1.11	1.11	1.57	1.57	1.57	1.76	0.58	3.19	3.68	3.68	3.68	3.68
CFM PER RUN HEAT	32	44	11	36	49	47	36	20	49	32	16	31	31	44	44	44	49	16	89	103	103	103	103
RM GAIN MBH.	1.93	1.45	0.12	1.79	1.93	2.54	0.83	0.49	1.93	1.93	0.32	1.00	1.00	1.37	1.37	1.37	1.28	0.09	0.48	0.42	0.42	0.42	0.42
CFM PER RUN COOLING	88	66	5	81	88	115	38	22	88	88	15	45	45	62	62	62	58	4	22	19	19	19	19
ADJUSTED PRESSURE	0.16	0.17	0.17	0.16	0.16	0.15	0.17	0.17	0.16	0.16	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.16	0.16	0.16	0.16	0.16
ACTUAL DUCT LGH.	63	60	37	30	41	32	41	48	55	70	37	29	19	41	36	49	13	9	37	47	40	18	32
EQUIVALENT LENGTH	160	140	190	190	160	170	190	150	130	160	200	160	190	120	130	160	130	190	130	200	200	190	180
TOTAL EFFECTIVE LENGTH	223	200	227	220	201	202	231	198	185	230	237	189	209	161	166	209	143	199	167	247	240	208	212
ADJUSTED PRESSURE	0.07	0.09	0.08	0.07	0.08	0.08	0.07	0.09	0.09	0.07	0.07	0.09	0.08	0.11	0.1	0.08	0.12	0.09	0.1	0.07	0.07	0.08	0.08
ROUND DUCT SIZE	6	5	4	6	6	6	4	4	6	6	4	4	5	5	5	5	5	4	6	6	6	6	6
HEATING VELOCITY (ft/min)	163	323	126	184	250	240	413	229	260	163	184	356	228	323	323	323	360	184	454	525	525	525	525
COOLING VELOCITY (ft/min)	449	485	57	413	449	586	436	252	449	449	172	516	330	455	455	455	426	46	112	97	97	97	97
OUTLET GRILL SIZE	4X10	3X10	3X10	4X10	4X10	4X10	3X10	3X10	4X10	4X10	3X10	3X10	3X10	3X10	3X10	3X10	3X10	3X10	3X10	4X10	4X10	4X10	4X10
TRUNK	A	B	B	B	C	B	C	B	C	A	C	B	B	A	A	A	D	B	C	A	A	B	C

ROOM NAME	ROOM NAME
RM LOSS MBH.	RM LOSS MBH.
CFM PER RUN HEAT	CFM PER RUN HEAT
RM GAIN MBH.	RM GAIN MBH.
CFM PER RUN COOLING	CFM PER RUN COOLING
ADJUSTED PRESSURE	ADJUSTED PRESSURE
ACTUAL DUCT LGH.	ACTUAL DUCT LGH.
EQUIVALENT LENGTH	EQUIVALENT LENGTH
TOTAL EFFECTIVE LENGTH	TOTAL EFFECTIVE LENGTH
ADJUSTED PRESSURE	ADJUSTED PRESSURE
ROUND DUCT SIZE	ROUND DUCT SIZE
HEATING VELOCITY (ft/min)	HEATING VELOCITY (ft/min)
COOLING VELOCITY (ft/min)	COOLING VELOCITY (ft/min)
OUTLET GRILL SIZE	OUTLET GRILL SIZE
TRUNK	TRUNK

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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	402	0.07	10.3	12	x	8	603	TRUNK G	0	0.00	0	0	x	8	0	TRUNK O	0	0.05	0	0	x	8	0				
TRUNK B	741	0.07	13	20	x	8	667	TRUNK H	0	0.00	0	0	x	8	0	TRUNK P	0	0.05	0	0	x	8	0				
TRUNK C	342	0.07	9.7	12	x	8	513	TRUNK I	0	0.00	0	0	x	8	0	TRUNK Q	0	0.05	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	0.05	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									BR		TRUNK U	0	0.05	0	0	x	8	0			
AIR VOLUME	165	135	135	85	285	135	0	0	0	0	0	0	0	0	0	TRUNK V	0	0.05	0	0	x	8	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	TRUNK W	0	0.05	0	0	x	8	0				
ACTUAL DUCT LGH.	49	29	22	45	38	22	1	1	1	1	1	1	1	1	1	TRUNK X	1131	0.05	16.5	32	x	8	636				
EQUIVALENT LENGTH	145	295	255	180	215	150	0	0	0	0	0	0	0	0	0	TRUNK Y	300	0.05	10.1	12	x	8	450				
TOTAL EFFECTIVE LH	194	324	277	225	253	172	1	1	1	1	1	1	1	1	1	TRUNK Z	0	0.05	0	0	x	8	0				
ADJUSTED PRESSURE	0.08	0.05	0.05	0.07	0.06	0.09	14.80	14.80	14.80	14.80	14.80	14.80	14.80	14.80	14.80	DROP	1131	0.05	16.5	24	x	10	679				
ROUND DUCT SIZE	7.1	7.5	7.5	5.8	9.4	6.4	0	0	0	0	0	0	0	0	0												
INLET GRILL SIZE	8	8	8	8	8	8	0	0	0	0	0	0	0	0	0												
	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X												
INLET GRILL SIZE	14	14	14	14	30	14	0	0	0	0	0	0	0	0	0												

RETURN AIR #	1	2	3	4	5	6																			BR
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
AIR VOLUME	165	135	135	85	285	135	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	191
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	0.15
ACTUAL DUCT LGH.	49	29	22	45	38	22	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	14
EQUIVALENT LENGTH	145	295	255	180	215	150	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	135
TOTAL EFFECTIVE LH	194	324	277	225	253	172	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	149
ADJUSTED PRESSURE	0.08	0.05	0.05	0.07	0.06	0.09	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	0.10
ROUND DUCT SIZE	7.1	7.5	7.5	5.8	9.4	6.4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	7.1
INLET GRILL SIZE	8	8	8	8	8	8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	8
	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
INLET GRILL SIZE	14	14	14	14	30	14	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	14

TYPE: BRENTWOOD 3A
 SITE NAME: LAMBERT'S LANE PH.2

LO # 81367

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	6	@ 10.6 cfm	63.6	cfm	
Other Rooms	3	@ 10.6 cfm	31.8	cfm	
Table 9.32.3.A.		TOTAL	169.6	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	169.6	cfm	
Less Principal Ventil. Capacity	79.5	cfm	
Required Supplemental Capacity	90.1	cfm	

PRINCIPAL EXHAUST FAN CAPACITY			
Model:	VANEE 65H	Location:	BSMT
79.5	cfm	3.0	sones
			☒ HVI Approved

PRINCIPAL EXHAUST HEAT LOSS CALCULATION				
CFM	ΔT °F	FACTOR	% LOSS	
79.5 CFM	X	74 F	X	1.08 x 0.25

SUPPLEMENTAL FANS		PANASONIC			
Location	Model	cfm	HVI	Sones	
ENS	FV-05-11VK1	50	☒	0.3	
ENS-4	FV-05-11VK1	50	☒	0.3	
ENS-2	FV-05-11VK1	50	☒	0.3	
W/R	FV-05-11VK1	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:	
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:	February-19

 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: 19689 *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 / Ventilation Calculation)

LO#: 81367

Model: BRENTWOOD 3A

Builder: GREENPARK HOMES

Date: 05/02/2019

Volume Calculation
House Volume

Level	Floor Area (ft²)	Floor Height (ft)	Volume (ft³)
Bsmt	1241	9	11169
First	1241	10	12410
Second	1546	9	13914
Third	0	9	0
Fourth	0	9	0
Total:			37,493.0 ft³
Total:			1051.7 m³

Air Change & Delta T Data

WINTER NATURAL AIR CHANGE RATE	0.227
SUMMER NATURAL AIR CHANGE RATE	0.074

Design Temperature Difference

	Tin °C	Tout °C	ΔT °C	ΔT °F
Winter DTDh	22	-19	41	74
Summer DTDc	24	30	6	11

5.2.3.1 Heat Loss due to Air Leakage

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

$$0.227 \times 294.91 \times 41^\circ\text{C} \times 1.2 = 3317 \text{ W}$$

$$= 11317 \text{ Btu/h}$$

6.2.6 Sensible Gain due to Air Leakage

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

$$= 0.074 \times 294.91 \times 6^\circ\text{C} \times 1.2 = 160 \text{ W}$$

$$= 545 \text{ Btu/h}$$

5.2.3.2 Heat Loss due to Mechanical Ventilation

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

$$80 \text{ CFM} \times 74^\circ\text{F} \times 1.08 \times 0.25 = 1593 \text{ Btu/h}$$

6.2.7 Sensible heat Gain due to Ventilation

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

$$80 \text{ CFM} \times 11^\circ\text{F} \times 1.08 \times 0.25 = 236 \text{ Btu/h}$$

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

$$HL_{airr} = \text{Level Factor} \times HL_{airbv} \times \{(HL_{agcr} + HL_{bgcr}) \div (HL_{agcleve} + HL_{bgcleve})\}$$

Level	Level Factor (LF)	HLairbv Air Leakage + Ventilation Heat Loss (Btu/h)	Level Conductive Heat Loss: (HL _{level})	Air Leakage Heat Loss Multiplier (LF x HLairbv / HL _{level})
1	0.5	11,317	9,074	0.624
2	0.3		9,083	0.374
3	0.2		10,487	0.216
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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Specializing in Residential Mechanical Design Services

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BUILDING SECTION
FILE NO _____

HEAT LOSS AND GAIN SUMMARY SHEET

MODEL: BRENTWOOD 3A	BUILDER: GREENPARK HOMES
SFQT: 2787	SITE: LAMBERT'S LANE PH.2
LO# 81367	

DESIGN ASSUMPTIONS

HEATING	°F	COOLING	°F
OUTDOOR DESIGN TEMP.	-2	OUTDOOR DESIGN TEMP.	86
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:	2.50	ASSUMED (Y/N):	Y
AIR TIGHTNESS CATEGORY:	TIGHT	ASSUMED (Y/N):	Y
WIND EXPOSURE:	SHELTERED	ASSUMED (Y/N):	Y
HOUSE VOLUME (ft³):	37493.0	ASSUMED (Y/N):	Y
INTERNAL SHADING:	BLINDS/CURTAINS	ASSUMED OCCUPANTS:	5
INTERIOR LIGHTING LOAD (Btu/h/ft²):	1.27	DC BRUSHLESS MOTOR (Y/N):	Y
FOUNDATION CONFIGURATION	BCIN_1	DEPTH BELOW GRADE:	6.0 ft
LENGTH: 64.0 ft	WIDTH: 28.0 ft	EXPOSED PERIMETER:	184.0 ft

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

Ceiling with Attic Space Minimum RSI (R)-Value	60	59.20
Ceiling Without Attic Space Minimum RSI (R)-Value	31	27.70
Exposed Floor Minimum RSI (R)-Value	31	29.80
Walls Above Grade Minimum RSI (R)-Value	R22+R5	21.10
Basement Walls Minimum RSI (R)-Value	20	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	ZONE 2	-
Skylights Maximum U-Value	ZONE 2	-
Space Heating Equipment Minimum AFUE	0.96	-
HRV Minimum Efficiency	75%	-
Domestic Hot Water Heater Minimum EF	0.9	-

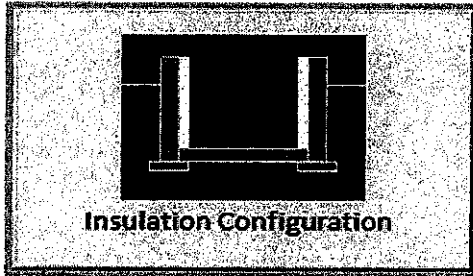
INDIVIDUAL BCIN: 19669

MICHAEL O'ROURKE

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JUN 10 2019*Michael O'Rourke*TOWN OF CALEDON
BUILDING SECTION
FILE NO. _____THIS STRUCTURE MUST BE
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Residential Foundation Thermal Load Calculator

Supplemental tool for CAN/CSA-F280

Weather Station Description		
Province:	Ontario	
Region:	Brampton	
Site Description		
Soil Conductivity:	Normal conductivity: dry sand, loam, clay	
Water Table:	Normal (7-10 m, 23-33 ft)	
Foundation Dimensions		
Floor Length (m):	19.5	 Insulation Configuration
Floor Width (m):	8.5	
Exposed Perimeter (m):	0.0	
Wall Height (m):	2.7	
Depth Below Grade (m):	1.83	
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):	1881	

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LO# 81367**RECEIVED**
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Air Infiltration Residential Load Calculator

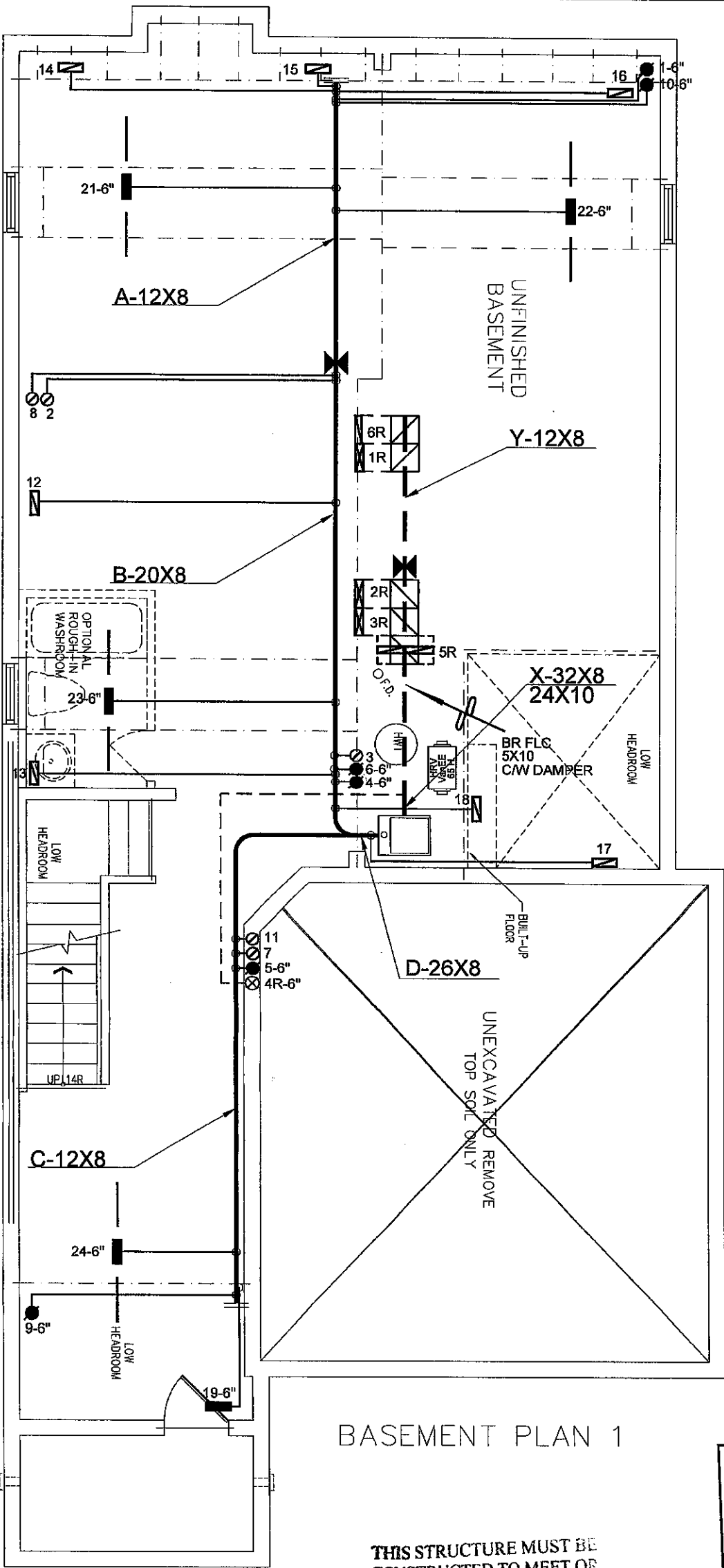
Supplemental tool for CAN/CSA-F280

Weather Station Description			
Province:	Ontario		
Region:	Brampton		
Weather Station Location:	Open flat terrain, grass		
Anemometer height (m):	10		
Local Shielding			
Building Site:	Suburban, forest		
Walls:	Heavy		
Flue:	Heavy		
Highest Ceiling Height (m):	6.71		
Building Configuration			
Type:	Detached		
Number of Stories:	Two		
Foundation:	Full		
House Volume (m ³):	1061.7		
Air Leakage/Ventilation			
Air Tightness Type:	Energy Star Detached (2.5 ACH)		
Custom BDT Data:	ELA @ 10 Pa.	991.1 cm ²	
	2.50	ACH @ 50 Pa	
Mechanical Ventilation (L/s):	Total Supply	Total Exhaust	
	37.5	37.5	
Flue Size			
Flue #:	#1	#2	#3
Diameter (mm):	0	0	0
Natural Infiltration Rates			
Heating Air Leakage Rate (ACH/H):	0.227		
Cooling Air Leakage Rate (ACH/H):	0.074		

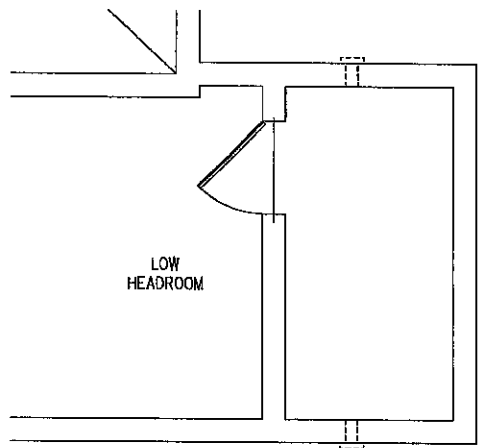
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LO# 81367**RECEIVED**
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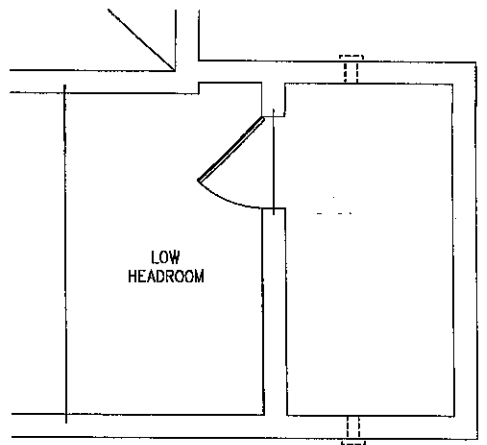
TOWN OF CALEDON
BUILDING SECTION
FILE NO.



BASEMENT PLAN 1



BASEMENT PLAN 2



BASEMENT PLAN 3

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CERTIFIED MODEL
PRE-APPROVED
FOR PERMIT APPLICATION AS PER THE
ONTARIO BUILDING CODE
TOWN OF CALEDON BUILDING DIVISION
REVIEWED BY [Signature] (SA)
DATE JUNE 21, 2019
FILE # C-MOD-BRENTWOOD 3A

(ELEVATION 1, 2, & 3)

CSA-F280-12



ENERGY STAR

I, MICHAEL O'Rourke HAVE REVIEWED
AND TAKE RESPONSIBILITY FOR THE
DESIGN WORK AND AM QUALIFIED
UNDER DIVISION C, 3.2.5 OF THE
BUILDING CODE.
Michael O'Rourke
Michael O'Rourke, BCIN# 19669
HVAC DESIGNS LTD.

HVAC LEGEND								3.	
SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	2.	
	SUPPLY AIR GRILLE		6" SUPPLY AIR BOOT ABOVE		14"x8" RETURN AIR GRILLE		RETURN AIR STACK ABOVE	1.	
	SUPPLY AIR GRILLE 6" BOOT		SUPPLY AIR STACK FROM 2nd FLOOR		30"x8" RETURN AIR GRILLE		RETURN AIR STACK 2nd FLOOR	No.	Description
	SUPPLY AIR BOOT ABOVE		6" SUPPLY AIR STACK 2nd FLOOR		FRA- FLOOR RETURN AIR GRILLE		REDUCER	Date	

REVISIONS

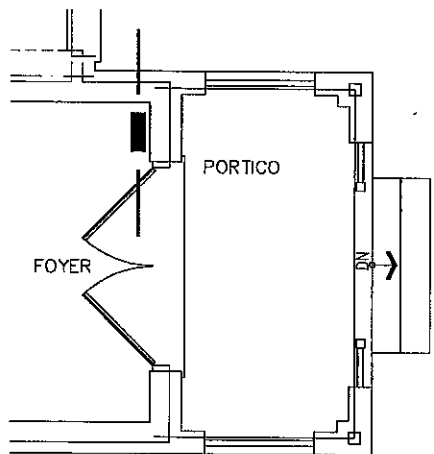
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Client GREENPARK HOMES		HVAC DESIGNS LTD. 375 Finley Ave. Suite 202 - Ajax, Ontario L1S 2E2 Tel. 905.619.2300 - 905.420.5300 Fax 905.619.2375 Email: info@hvacdesigns.ca Web: www.hvacdesigns.ca Specializing in Residential Mechanical Design Services 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 41985 BTU/H UNIT DATA		# OF RUNS S/A R/A FANS				Sheet Title BASEMENT HEATING LAYOUT	
Project Name LAMBERT'S LANE HOME CORP PH 2 CALEDON, ONTARIO			MAKE GOODMAN		3RD FLOOR					Date FEB/2019 Scale 3/16" = 1'-0" BCIN# 19669
BRENTWOOD 3A 2787 sqft			MODEL GMEC960603BNA		2ND FLOOR		11	4	4	
			INPUT 60 MBTU/H		1ST FLOOR		8	2	2	
			OUTPUT 57.6 MBTU/H		BASEMENT		4	1	0	LO# 81367
			COOLING 2.0 TONS		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					
			FAN SPEED 1131 cfm @ 0.6" w.c.							

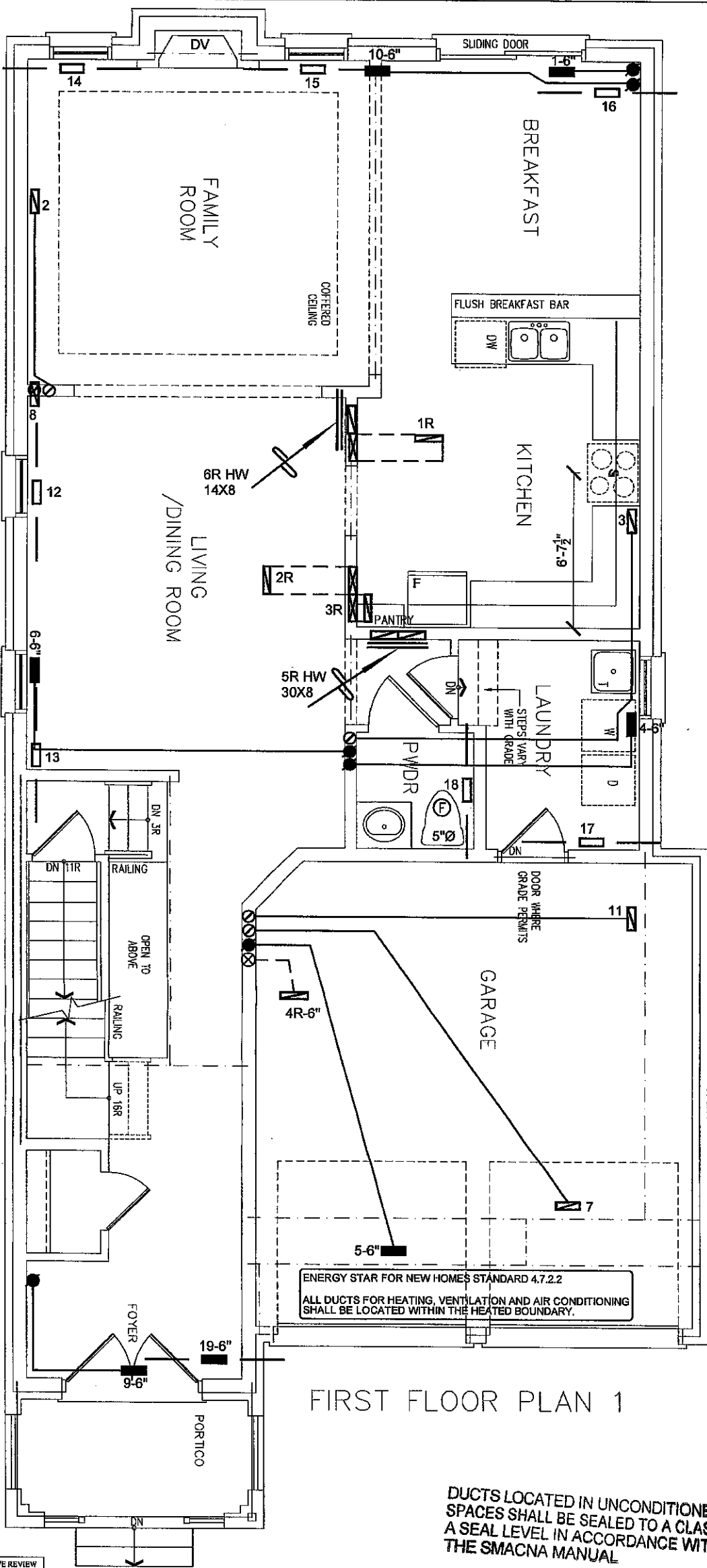
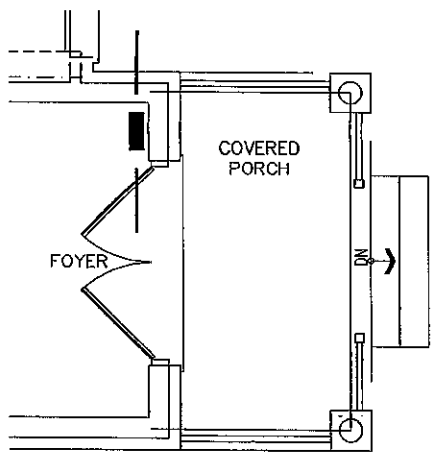
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TOWN OF CALEDON
BUILDING DEPARTMENT

FIRST FLOOR PLAN 2



FIRST FLOOR PLAN 3



FIRST FLOOR PLAN 1

DUCTS LOCATED IN UNCONDITIONED SPACES SHALL BE SEALED TO A CLASS A SEAL LEVEL IN ACCORDANCE WITH THE SMACNA MANUAL

I MICHAEL O'BROUKE HAVE REVIEWED AND TAKE RESPONSIBILITY FOR THE DESIGN WORK AND AM QUALIFIED UNDER DIVISION C.32.5 OF THE BUILDING CODE.
Michael O'Brien, BCIN# 19669
HVAC DESIGNS LTD.

CSA-F280-12

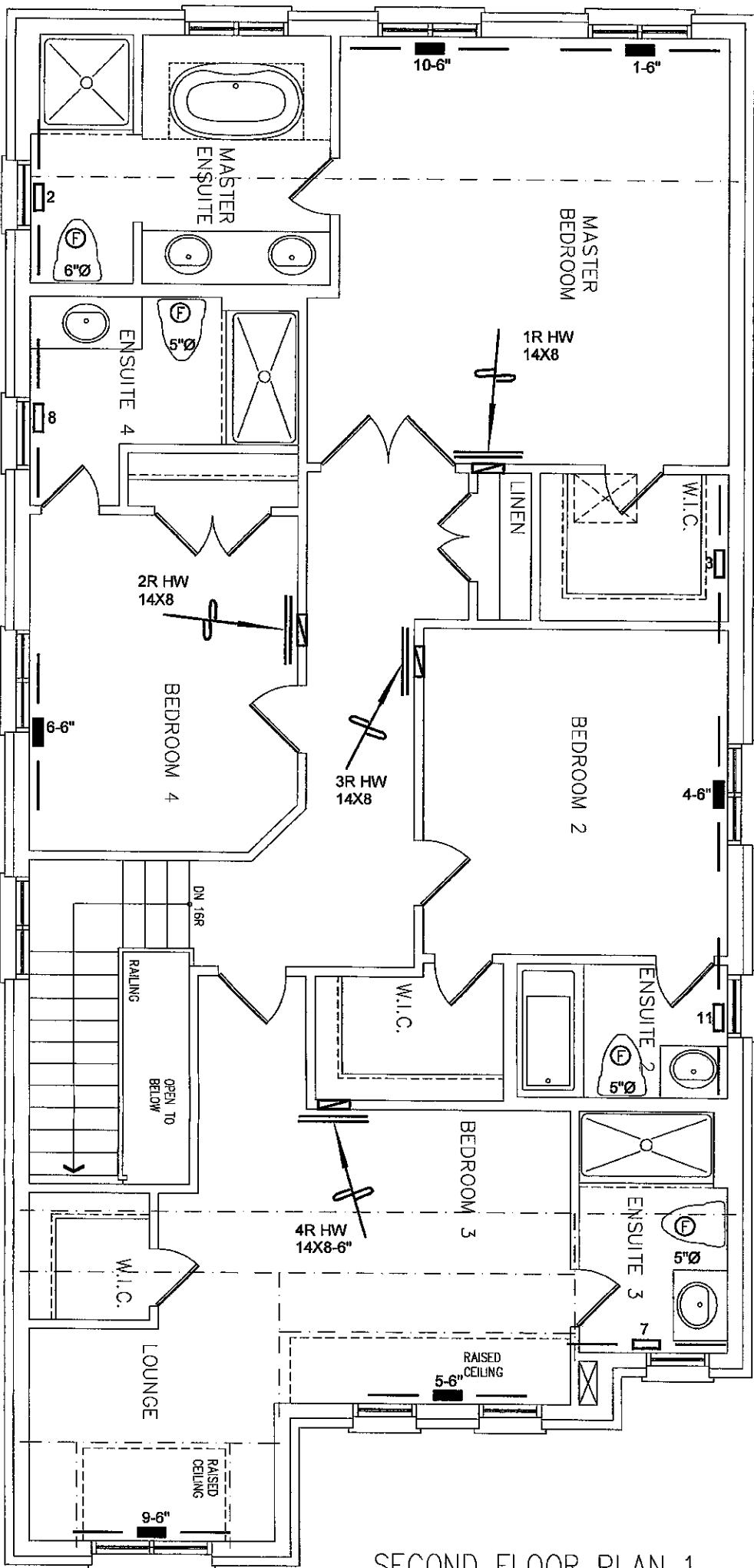


ENERGY STAR

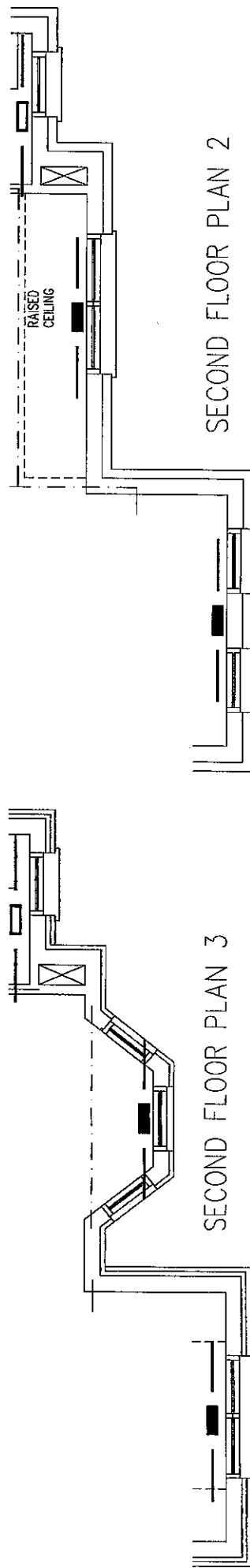
HVAC LEGEND								3.	
SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	2.	
	SUPPLY AIR GRILLE		6" SUPPLY AIR BOOT ABOVE		14"x8" RETURN AIR GRILLE		RETURN AIR STACK ABOVE	1.	
	SUPPLY AIR GRILLE 6" BOOT		SUPPLY AIR STACK FROM 2nd FLOOR		30"x8" RETURN AIR GRILLE		RETURN AIR STACK 2nd FLOOR	No.	Description
	SUPPLY AIR BOOT ABOVE		6" SUPPLY AIR STACK 2nd FLOOR		FRA- FLOOR RETURN AIR GRILLE		REDUCER	Date	
								REVISIONS	

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Client: GREENPARK HOMES		HVACDESIGNS 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.	THIS STRUCTURE MUST BE CONSTRUCTED TO MEET OR EXCEED THE PROVISIONS OF THE ONTARIO BUILDING CODE	Sheet Title: FIRST FLOOR HEATING LAYOUT
Project Name: LAMBERT'S LANE HOME CORP PH 2 CALEDON, ONTARIO	BRENTWOOD 3A 2787 sqft			Date: FEB/2019 Scale: 3/16" = 1'-0" BCIN# 19669 LO# 81367



SECOND FLOOR PLAN 1



SECOND FLOOR PLAN 2

SECOND FLOOR PLAN 3

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BUILDING SECTION
FILE NO.

I MICHAEL O'Rourke HAVE REVIEWED AND TAKE RESPONSIBILITY FOR THE DESIGN WORK AND AM QUALIFIED UNDER DIVISION C.32.5 OF THE BUILDING CODE.
Michael O'Rourke
Michael O'Rourke, BCIN# 19669
HVAC DESIGNS LTD.

CSA-F280-12

ENERGY STAR

HVAC LEGEND								REVISIONS	
SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	No.	Description
	SUPPLY AIR GRILLE		6" SUPPLY AIR BOOT ABOVE		14"x8" RETURN AIR GRILLE		RETURN AIR STACK ABOVE	3.	
	SUPPLY AIR GRILLE 6" BOOT		SUPPLY AIR STACK FROM 2nd FLOOR		30"x8" RETURN AIR GRILLE		RETURN AIR STACK 2nd FLOOR	2.	
	SUPPLY AIR BOOT ABOVE		6" SUPPLY AIR STACK 2nd FLOOR		FRA- FLOOR RETURN AIR GRILLE		REDUCER	1.	
								No.	Description
									Date

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Client
GREENPARK HOMES

Project Name
**LAMBERT'S LANE HOME CORP PH 2
CALEDON, ONTARIO**

BRENTWOOD 3A 2787 sqft

375 Finley Ave. Suite 202 - Ajax, Ontario
L1S 2E2 Tel. 905.619.2300 - 905.420.5300 Fax 905.619.2375
Email: info@hvacdsgns.ca
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Sheet Title
**SECOND FLOOR
HEATING
LAYOUT**

Date
FEB/2019

Scale
3/16" = 1'-0"

BCIN# 19669

LO# 81367