

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

OPT 2ND FL
TYPE: PRESTON 3 WOB

GFA: 2920

DATE: Jul-19
LO# 82669

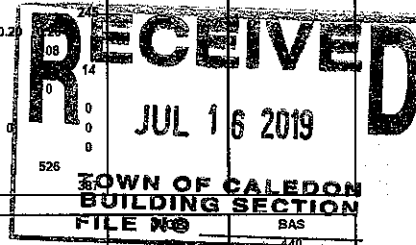
WINTER NATURAL AIR CHANGE RATE 0.259
SUMMER NATURAL AIR CHANGE RATE 0.084

HEAT LOSS AT °F. 74
HEAT GAIN AT °F. 11

CSA-F280-12
ENERGYSTAR

ROOM USE			MBR		ENS		WIC		BED-2		BED-3		BED-4		BATH		WIC-3		BED-5		ENS-2		
EXP. WALL			34		23		10		14		26		12		7		30		11		7		
CLG. HT.			8		8		8		8		8		8		8		8		8		8		
FACTORS																							
GRS.WALL AREA	LOSS	GAIN	275		186		81		113		210		97		57		242		89		57		
GLAZING	LOSS	GAIN	LOSS		GAIN		LOSS		GAIN		LOSS		GAIN		LOSS		GAIN		LOSS		GAIN		
NORTH	18.6	15.1	0	0	0	0	0	0	0	16	297	242	0	0	0	7	130	106	0	0	0	0	
EAST	18.6	40.7	0	0	0	0	0	0	0	0	0	0	30	557	1222	0	0	0	0	0	0	0	
SOUTH	18.6	24.1	0	0	0	0	0	0	0	0	0	0	0	0	0	16	297	385	0	0	0	0	
WEST	18.6	40.7	32	594	1303	15	278	611	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
SKYLT.	31.2	99.9	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	
NET EXPOSED WALL	3.5	0.5	243	854	127	171	601	89	81	284	42	97	342	51	180	634	94	81	285	42	50	174	26
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	
EXPOSED CLG	1.3	0.6	288	361	161	110	138	61	60	75	33	238	298	133	209	262	117	192	241	107	119	149	80
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	
EXPOSED FLOOR	2.5	0.4	0	0	0	0	0	0	0	0	0	0	0	209	520	77	0	0	0	119	296	44	
BASEMENT/CRAWL HEAT LOSS			0	0	0	0	0	0	0	0	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	0	0	0	0	0	0	0	0	
SUBTOTAL HT LOSS			1808		1017		359		937		1972		822		750		973		732		418		
SUB TOTAL HT GAIN			1690		761		76		426		1509		534		242		162		503		245		
LEVEL FACTOR / MULTIPLIER	0.20	0.26			0.20		0.26		0.20		0.26		0.20		0.26		0.20		0.26		0.20		
AIR CHANGE HEAT LOSS			468		263		93		242		510		213		194		252		190		0.20		
AIR CHANGE HEAT GAIN			90		43		4		24		85		30		14		9		28		0.14		
DUCT LOSS			0		0		0		0		248		0		94		122		0		0		
DUCT GAIN			0		0		0		0		228		0		26		17		0		0		
HEAT GAIN PEOPLE	240		2	480	0	0	0	0	1	240	1	240	1	240	0	0	0	0	1	240	0	0	
HEAT GAIN APPLIANCES/LIGHTS				448		0		0		448		448		448		0		0		448		0	
TOTAL HT LOSS BTU/H			2276		1280		452		1179		2731		1035		1038		1347		922		526		
TOTAL HT GAIN x 1.3 BTU/H			3390		1045		104		1479		3264		1628		366		245		1585		387		

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EXCEED THE PROVISIONS OF
THE ONTARIO BUILDING CODE



ROOM USE			LIBR		LVIDN		KIT		FAM		LAUN		W/R		FOY		MUD				FILE NO		BAS						
EXP. WALL			10		18		36		36		0		9		46		24				46		740						
CLG. HT.			10		10		10		10		8		10		10		10				9		9						
FACTORS																													
GRS.WALL AREA			LOSS GAIN		100		180		360		360		0		90		460		240		340		770						
GLAZING			LOSS GAIN		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	20	371	303	0	0	0	9	167	136	0	0	0	0	0	0	0	0	53	983	802	4	74	61		
EAST			18.6	40.7	0	0	0	0	0	0	0	0	0	0	0	0	0	58	1076	2362	0	0	0	0	0	0	0		
SOUTH			18.6	24.1	0	0	0	40	742	963	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	74	96		
WEST			18.6	40.7	0	0	0	0	0	0	56	1039	2260	24	445	977	0	0	0	0	0	0	0	0	0	0	0	0	
SKYLT.			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		
DOORS			24.7	3.7	0	0	0	0	0	0	10	247	37	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
NET EXPOSED WALL			3.5	0.5	60	281	42	140	492	73	285	1002	149	336	1182	175	0	81	285	42	362	1273	146	20	493	73	20	493	73
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	
EXPOSED CLG			1.3	0.6	0	0	0	0	0	0	0	0	0	0	0	0	84	105	47	0	0	0	82	103	46	0	0	0	
NO ATTIC EXPOSED CLG			2.7	1.2	0	0	0	0	0	0	0	0	10	27	12	0	0	0	0	0	0	0	48	129	57	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	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					652			1234			2454			1654			105			452			3566			1267			
SUB TOTAL HT GAIN						345			1036			2602			1164		47		259			2799			188				
LEVEL FACTOR / MULTIPLIER			0.30	0.34				0.30	0.34		0.30	0.34		0.20	0.26		0.30	0.34		0.30	0.34		0.30	0.34			0.50	0.86	
AIR CHANGE HEAT LOSS					222			420			836			563			27		154			1214			431			6401	
AIR CHANGE HEAT GAIN						.19		58			147			66		3		15			158			11				83	
DUCT LOSS					0			0			0			0			0			0			0					0	
DUCT GAIN					0			0			0			0			0			0			0					0	
HEAT GAIN PEOPLE			240		0			0			0			0			0			0			0					0	
HEAT GAIN APPLIANCES/LIGHTS						448		448			448			448			448			0			0			448		448	
TOTAL HT LOSS BTU/H					874			1655			3290			2217			133		606			4781			1698				
TOTAL HT GAIN x 1.3 BTU/H						1056		2005			4155			2182			647		355			3845			840				

TOTAL HEAT GAIN BTU/H:

31403

TONS: 2.62

LOSS DUE TO VENTILATION LOAD BTU/H: 1911

STRUCTURAL HEAT LOSS: 41866

TOTAL COMBINED HEAT LOSS BTU/H: 43777

Michael O'Rourke

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BUILDER: GREENPARK HOMES

OPT 2ND FL

TYPE: PRESTON 3 WOB

DATE: Jun-19

GFA: 2920

LO#: 82669

HEATING CFM	1131	COOLING CFM	1131
TOTAL HEAT LOSS	41,866	TOTAL HEAT GAIN	30,746
AIR FLOW RATE CFM	27.02	AIR FLOW RATE CFM	36.79

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	13	9	4
R/A	0	0	4	3	1

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

 DESIGN CFM = 1131
CFM @ 5" 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	20	21	22	23	24
ROOM NAME	MBR	ENS	BED-5	BED-2	BED-3	BED-4	BATH	WIC-3	WIC	MBR	ENS-2	LIBR	LV/DN	KIT	KIT	FAM	LAUN	W/R	FOY	MUD	BAS	BAS	BAS	BAS
RM LOSS MBH	1.14	1.28	0.92	1.18	1.37	1.04	1.04	1.35	0.45	1.14	0.53	0.87	1.65	1.65	1.65	2.22	0.13	0.61	2.39	1.70	3.46	3.46	3.46	3.46
CFM PER RUN HEAT	31	35	25	32	37	28	28	36	12	31	14	24	45	44	44	60	4	16	65	46	93	93	93	93
RM GAIN MBH	1.69	1.04	1.27	1.48	1.63	1.63	0.36	0.24	0.10	1.69	0.34	1.05	2.00	2.07	2.07	2.18	0.65	0.35	1.92	0.84	0.65	0.65	0.65	0.65
CFM PER RUN COOLING	62	38	47	54	60	60	13	9	4	62	12	39	74	76	76	80	24	13	71	31	24	24	24	24
ADJUSTED PRESSURE	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.16	0.16	0.16	0.16
ACTUAL DUCT LGH.	55	54	42	43	38	36	35	38	52	71	41	38	33	41	52	44	45	26	31	26	60	50	23	32
EQUIVALENT LENGTH	150	180	170	160	190	190	190	150	170	190	170	210	190	190	200	190	170	160	140	160	200	150	150	160
TOTAL EFFECTIVE LENGTH	205	234	212	203	228	226	225	188	222	261	211	248	223	231	252	234	215	186	171	186	260	200	173	192
ADJUSTED PRESSURE	0.08	0.07	0.08	0.08	0.08	0.08	0.08	0.09	0.08	0.07	0.08	0.07	0.08	0.07	0.07	0.07	0.08	0.09	0.1	0.09	0.06	0.08	0.09	0.08
ROUND DUCT SIZE	5	5	5	5	5	5	4	4	4	5	4	5	5	6	6	6	4	4	5	4	6	6	6	6
HEATING VELOCITY (ft/min)	228	257	184	235	272	206	321	413	138	228	161	176	330	224	224	306	46	184	477	528	474	474	474	474
COOLING VELOCITY (ft/min)	455	279	345	396	441	441	149	103	46	455	138	286	543	388	388	408	275	149	521	356	122	122	122	122
OUTLET GRILL SIZE	3X10	3X10	3X10	3X10	3X10	3X10	3X10	3X10	3X10	3X10	3X10	3X10	3X10	4X10	4X10	4X10	3X10	3X10	3X10	3X10	4X10	4X10	4X10	4X10
TRUNK	A	B	B	C	E	E	E	E	B	B	E	B	C	A	A	A	B	E	D	C	A	B	C	D

RUN #	28	27
ROOM NAME	BED-3	FOY
RM LOSS MBH	1.37	2.39
CFM PER RUN HEAT	37	65
RM GAIN MBH	1.63	1.92
CFM PER RUN COOLING	60	71
ADJUSTED PRESSURE	0.17	0.17
ACTUAL DUCT LGH.	44	21
EQUIVALENT LENGTH	170	160
TOTAL EFFECTIVE LENGTH	214	181
ADJUSTED PRESSURE	0.08	0.1
ROUND DUCT SIZE	5	5
HEATING VELOCITY (ft/min)	272	477
COOLING VELOCITY (ft/min)	441	521
OUTLET GRILL SIZE	3X10	3X10
TRUNK	E	D

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SUPPLY AIR TRUNK SIZE													RETURN AIR TRUNK SIZE												
TRUNK	STATIC	ROUND	RECT	VELOCITY				TRUNK	STATIC	ROUND	RECT	VELOCITY	TRUNK	STATIC	ROUND	RECT	VELOCITY				TRUNK	STATIC	ROUND	RECT	VELOCITY
CFM	PRESS.	DUCT	DUCT	(ft/min)				CFM	PRESS.	DUCT	DUCT	(ft/min)	CFM	PRESS.	DUCT	DUCT	(ft/min)				CFM	PRESS.	DUCT	DUCT	(ft/min)
TRUNK A	272	0.06	9.3	12	x	8	408	TRUNK G	0	0.00	0	0	x	8	0	0	TRUNK O	0	0.05	0	0	x	8	0	0
TRUNK B	496	0.06	11.6	18	x	8	496	TRUNK H	0	0.00	0	0	x	8	0	0	TRUNK P	0	0.05	0	0	x	8	0	0
TRUNK C	712	0.06	13.3	22	x	8	583	TRUNK I	0	0.00	0	0	x	8	0	0	TRUNK Q	0	0.05	0	0	x	8	0	0
TRUNK D	223	0.08	8	8	x	8	502	TRUNK J	0	0.00	0	0	x	8	0	0	TRUNK R	0	0.05	0	0	x	8	0	0
TRUNK E	419	0.08	10.1	12	x	8	629	TRUNK K	0	0.00	0	0	x	8	0	0	TRUNK S	0	0.05	0	0	x	8	0	0
TRUNK F	1131	0.06	15.8	28	x	8	727	TRUNK L	0	0.00	0	0	x	8	0	0	TRUNK T	0	0.05	0	0	x	8	0	0
																	TRUNK U	0	0.05	0	0	x	8	0	0
																	TRUNK V	0	0.05	0	0	x	8	0	0
																	TRUNK W	0	0.05	0	0	x	8	0	0
RETURN AIR #	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	TRUNK X	1131	0.05	16.5	32	x	8	636	636
AIR VOLUME	115	155	95	125	135	155	170	0	0	0	0	0	0	0	0	0	TRUNK Y	560	0.05	12.7	18	x	8	560	560
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	TRUNK Z	0	0.05	0	0	x	8	0	0
ACTUAL DUCT LGH.	76	45	44	52	40	43	18	1	1	1	1	1	1	1	1	1	DROP	1131	0.05	16.5	24	x	10	679	679
EQUIVALENT LENGTH	245	185	135	175	250	225	180	0	0	0	0	0	0	0	0	0									
TOTAL EFFECTIVE LH	321	230	179	227	290	268	198	1	1	1	1	1	1	1	1	1									
ADJUSTED PRESSURE	0.05	0.06	0.08	0.07	0.05	0.06	0.07	14.80	14.80	14.80	14.80	14.80	14.80	14.80	14.80	14.80									
ROUND DUCT SIZE	7	7.5	5.8	6.7	7.5	7.5	7.5	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									
	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X									
INLET GRILL SIZE	14	14	14	14	14	14	14	0	0	0	0	0	0	0	0	0									

TYPE: PRESTON 3 WOB
SITE NAME: LAMBERT'S LANE PH.2

LO # 82669
OPT 2ND FL

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>5</u> @ 10.6 cfm	<u>53</u> cfm
Other Rooms	<u>7</u> @ 10.6 cfm	<u>74.2</u> cfm
Table 9.32.3.A.	TOTAL	<u>212.0</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>95.4</u> cfm

SUPPLEMENTAL VENTILATION CAPACITY		9.32.3.5.
Total Ventilation Capacity	<u>212</u>	cfm
Less Principal Ventil. Capacity	<u>95.4</u>	cfm
Required Supplemental Capacity	<u>116.6</u>	cfm

PRINCIPAL EXHAUST FAN CAPACITY	
Model: VANEE 65H	Location: BSMT
<u>95.4</u> cfm	<u>3.0</u> sones
☒ HVI Approved	

PRINCIPAL EXHAUST HEAT LOSS CALCULATION			
CFM	ΔT °F	FACTOR	% LOSS
95.4 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
BATH	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		
<u>155</u> cfm high	<u>64</u> cfm low	
<u>75</u> % 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:	July-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: 19889 *Michael O'Rourke* MICHAEL O'ROURKE

THIS STRUCTURE MUST BE
SUBMITTED TO THE
MUNICIPALITY FOR REVIEW
AND APPROVAL
DATE: 07/19/2019

HEAT LOSS AND GAIN SUMMARY SHEET

MODEL: PRESTON 3 WOB	OPT 2ND FL	BUILDER: GREENPARK HOMES
SFQT: 2920	LO# 82669	SITE: LAMBERT'S LANE PH.2

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):	37290.3	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:	5.5 ft
LENGTH: 60.0 ft	WIDTH: 30.0 ft	EXPOSED PERIMETER:	140.0 ft
WOB INSULATION CONFIGURATION	SCB_9	WOB EXPOSED PERIMETER	40.0 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	-

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INDIVIDUAL BCIN: 19669
MICHAEL O'ROURKE

Michael O'Rourke

CSA F280-12 Residential Heat Loss and Heat Gain Calculations
Formula Sheet (For Air Leakage / Ventilation Calculation)

LO#: 82669

Model: PRESTON 3 WOB

Builder: GREENPARK HOMES

Date: 7/12/2019

Volume Calculation
House Volume

Level	Floor Area (ft²)	Floor Height (ft)	Volume (ft³)
Bsmt	1314	9	11169
First	1314	10	13140
Second	1606	8	12981.298
Third	0	9	0
Fourth	0	9	0
Total:			37,290.3 ft³
Total:			1055.9 m³

Air Change & Delta T Data

WINTER NATURAL AIR CHANGE RATE	0.259
SUMMER NATURAL AIR CHANGE RATE	0.084

Design Temperature Difference

	T _{in} °C	T _{out} °C	ΔT °C	ΔT °F
Winter DTD _h	22	-19	41	74
Summer DTD _c	24	30	6	11

5.2.3.1 Heat Loss due to Air Leakage

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

0.259 x 293.32 x 41 °C x 1.2 = 3752 W

= 12802 Btu/h

6.2.6 Sensible Gain due to Air Leakage

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

= 0.084 x 293.32 x 6 °C x 1.2 = 181 W

= 617 Btu/h

5.2.3.2 Heat Loss due to Mechanical Ventilation

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

95 CFM x 74 °F x 1.08 x 0.25 = 1911 Btu/h

6.2.7 Sensible heat Gain due to Ventilation

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

95 CFM x 11 °F x 1.08 x 0.25 = 283 Btu/h

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

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

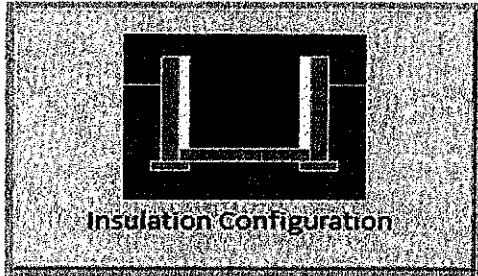
Level	Level Factor (LF)	HL _{airve} Air Leakage + Ventilation Heat Loss (Btu/h)	Level Conductive Heat Loss: (HL _{cleve})	Air Leakage Heat Loss Multiplier (LF x HL _{airbv} / HL _{level})
1	0.5	12,802	7,424	0.862
2	0.3		11,279	0.340
3	0.2		9,895	0.259
4	0		0	0.000
5	0		0	0.000

*HL_{airbv} = Air leakage heat loss + ventilation heat loss

*For a balanced or supply only ventilation system HL_{airve} = 0

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):	4.6	
Floor Width (m):	9.1	
Exposed Perimeter (m):	42.7	
Wall Height (m):	2.6	
Depth Below Grade (m):	1.40	
Window Area (m ²):	0.7	
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):		694

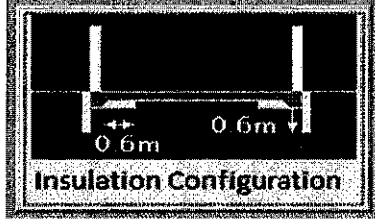
TYPE: PRESTON 3 WOB
LO# 82669

OPT 2ND FL

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Residential Slab on Grade 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		
Length (m):	1.5	 Insulation Configuration
Width (m):	9.1	
Exposed Perimeter (m):	12.2	
Radiant Slab		
Heated Fraction of the Slab:	0	
Fluid Temperature (°C):	33	
Design Months		
Heating Month	1	
Results		
Heating Load (Watts):		153

TYPE: PRESTON 3 WOB
LO# 82669

OPT 2ND FL

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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):	8.10			
Building Configuration				
Type:	Detached			
Number of Stories:	Two			
Foundation:	Full			
House Volume (m ³):	1055.9			
Air Leakage/Ventilation				
Air Tightness Type:	Energy Star Detached (2.5 ACH)			
Custom BDT Data:	ELA @ 10 Pa.	985.7 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	#4
Diameter (mm):	0	0	0	0
Natural Infiltration Rates				
Heating Air Leakage Rate (ACH/H):	0.259			
Cooling Air Leakage Rate (ACH/H):	0.084			

TYPE: PRESTON 3 WOB
LO# 82669

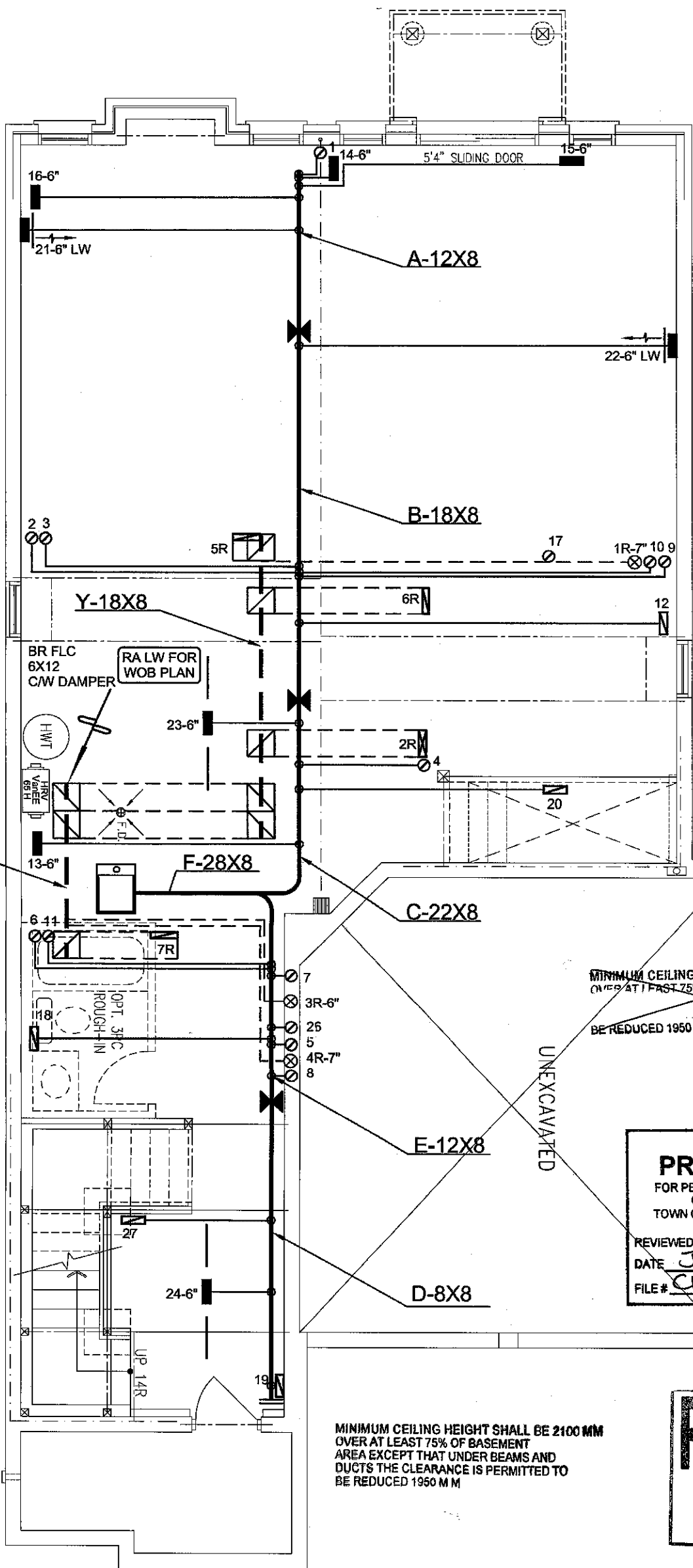
OPT 2ND FL

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BASEMENT PLAN - ELEV. '1'

BASEMENT PLAN - ELEV. '2'



CERTIFIED MODEL
PRE-APPROVED
FOR PERMIT APPLICATION AS PER THE
ONTARIO BUILDING CODE
TOWN OF CALEDON BUILDING DIVISION
REVIEWED BY *[Signature]* SA
DATE *July 15 2019*
FILE # *CMOD- PRESTON 3 WOB (5th OPT)*
(ELEVATION 1 & 2)

RECEIVED
JUL 16 2019
TOWN OF CALEDON
BUILDING SECTION
FILE NO

WOB
CSA-F280-12

ENERGY STAR

I MICHAEL O'Rourke HAVE REVIEWED
AND TAKE RESPONSIBILITY FOR THE
DESIGN WORK AND AM QUALIFIED
UNDER DIVISION C, 3.2.3 OF THE
BUILDING CODE.
Michael O'Rourke
Michael O'Rourke, BCIN# 19669
HVAC DESIGNS LTD.

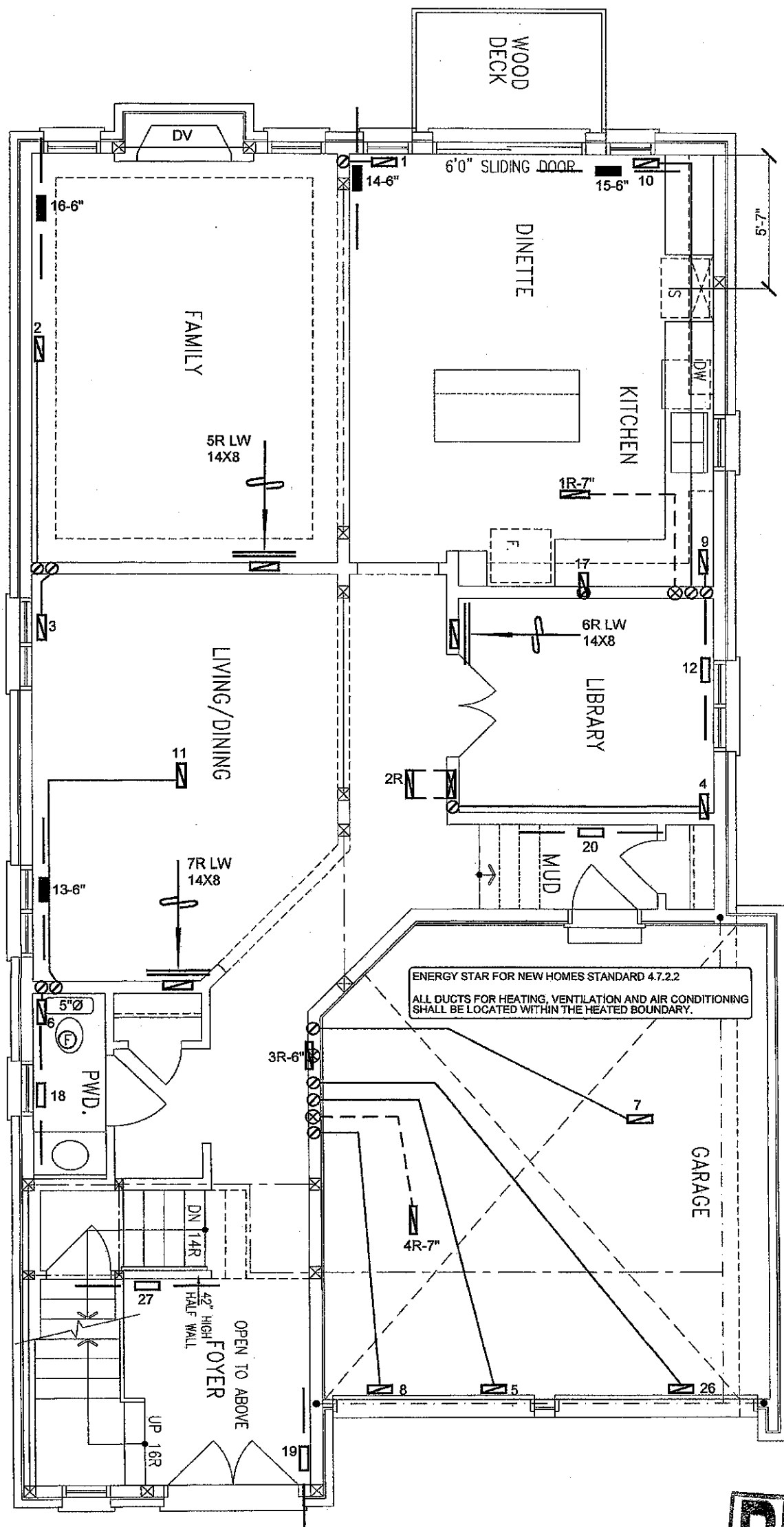
HVAC LEGEND						REVISIONS	
SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	No.	Description
	SUPPLY AIR GRILLE		6" SUPPLY AIR BOOT ABOVE		14"x8" RETURN AIR GRILLE	1.	
	SUPPLY AIR GRILLE 6" BOOT		SUPPLY AIR STACK FROM 2nd FLOOR		30"x8" RETURN AIR GRILLE	2.	
	SUPPLY AIR BOOT ABOVE		6" SUPPLY AIR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

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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
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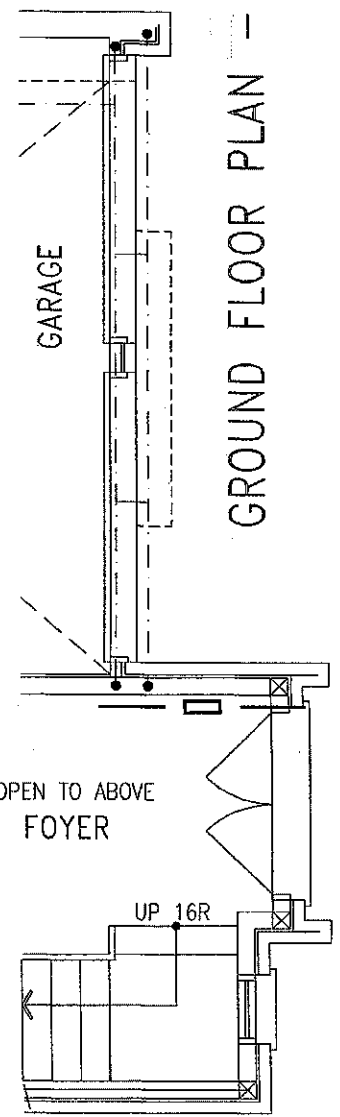
Client	 375 Finley Ave. Suite 202 - Ajax, Ontario L1S 2E2 Tel. 905.619.2300 - 905.420.5300 Fax 905.619.2375 Email: info@hvacdesigns.ca Web: www.hvacdesigns.ca Specializing in Residential Mechanical Design Services Installation to comply with the latest Ontario Building Code. All supply branch outlets 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 43777 BTU/H UNIT DATA		# OF RUNS S/A R/A FANS			Sheet Title		
GREENPARK HOMES		MAKE GOODMAN	3RD FLOOR					BASEMENT HEATING LAYOUT	
Project Name LAMBERTS LANE HOME CORP PH 2 CALEDON, ONTARIO		MODEL GMCE960603BNA-60	2ND FLOOR		13	4	4		
		INPUT 60 MBTU/H	1ST FLOOR		9	3	2		
		OUTPUT 57.6 MBTU/H	BASEMENT		4	1	0	Date JUNE/2019	
OPT 2ND FL PRESTON 3 WOB 2920 sqft	COOLING 2.5 TONS	FAN SPEED 1131 cfm @ 0.6" w.g.		ALL S/A DIFFUSERS 4 "x10" UNLESS NOTED OTHERWISE ON LAYOUT. ALL S/A RUNS 5" UNLESS NOTED OTHERWISE ON LAYOUT. UNDERCUT DOORS 1" min. FOR R/A			Scale 3/16" = 1'-0"		
							BCIN# 19669		
							LO#	82669	

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GROUND FLOOR PLAN - ELEV. '1'



GROUND FLOOR PLAN - ELEV. '2'



Michael O'Rourke, BSCM 10660
HVAC DESIGNS LTD.

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

RECEIVED
JUL 16 2019
TOWN OF CALEDON
BUILDING SECTION
FILE NO

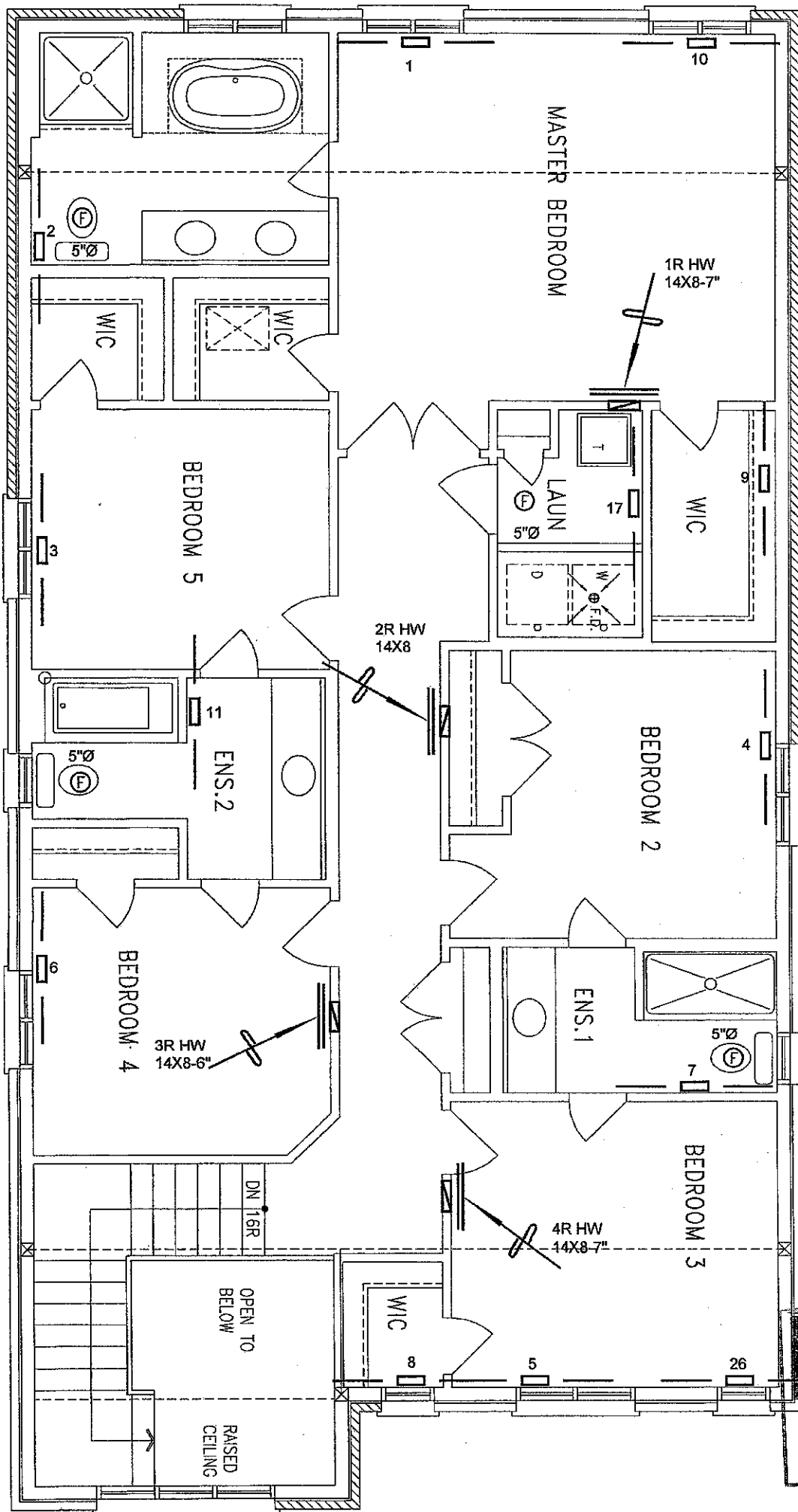
WOB
CSA-F280-12

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	

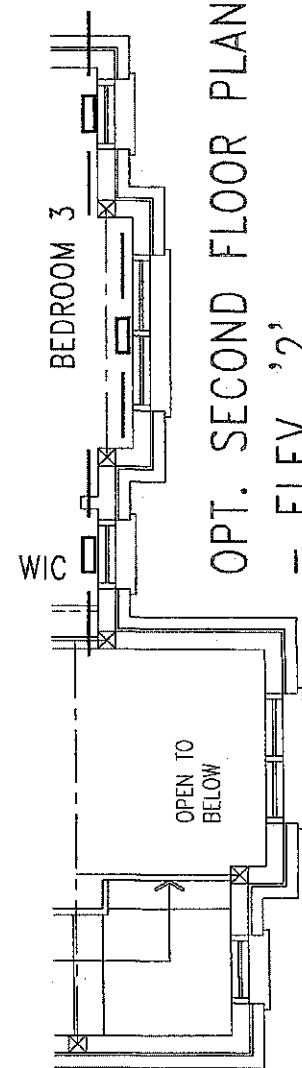
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Client GREENPARK HOMES Project Name LAMBERTS LANE HOME CORP PH 2 CALEDON, ONTARIO OPT 2ND FL PRESTON 3 WOB 2920 sqft	 375 Finley Ave. Suite 202 - Ajax, Ontario L1S 2E2 Tel. 905.619.2300 - 905.420.5300 Fax 905.619.2375 Email: info@hvacdesigns.ca Web: 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 JUNE/2019 Scale 3/16" = 1'-0" BCIN# 19669 LO# 82669
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OPT. SECOND FLOOR PLAN (5 BED)
- ELEV. '2'



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TOWN OF CALEDON
BUILDING SECTION
FILE NO

OPT. SECOND FLOOR PLAN (5 BED)
- ELEV. '1'

WOB
CSA-F280-12

ENERGY STAR

I MICHAEL O'ROURKE HAVE REVIEWED
AND TAKE RESPONSIBILITY FOR THE
DESIGN WORK AND AM QUALIFIED
UNDER DIVISION 6, 9.2.5 OF THE
BUILDING CODE.

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	Date
— ■ —	SUPPLY AIR BOOT ABOVE	⊙	6" SUPPLY AIR STACK 2nd FLOOR	— ▤ —	FRA- FLOOR RETURN AIR GRILLE	— ▤ —	REDUCER	REVISIONS		

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Client GREENPARK HOMES		 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	
Project Name LAMBERTS LANE HOME CORP PH 2 CALEDON, ONTARIO			Date JUNE/2019	Scale 3/16" = 1'-0"
OPT 2ND FL PRESTON 3 WOB 2920 sqft			BCIN# 19669	
			LO#	82669