HVAC DESIGNS LTD.
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Web: www.hvacdesigns.ca E-mail: info@hvacdesigns.ca

SITE NAME: LAMBERT'S LANE PH.2 — DATE: Jun-19 — WINTER NATURAL AIR CHANGE RATE 0.259 — HEAT LOSS AT °F. 74 — CSA-F280-12
BUILDER: GREENPARK HOMES — TYPE: PRESTON 3 WOB — GFA: 2920 — LOT 52668 — SUMMER NATURAL AIR CHANGE RATE 0.084 — HEAT GAIN AT °F. 11 — ENERGYSTAR

ROOM USE			MBR			ENS			WIC			BED-2			BED-3			BED-4			BATH			WIC-3			WIC-2			ENS-2		
EXP. WALL			32			23			6			14			26			18			7			30			6			11		
CLG. HT.			8			8			8			8			8			8			8			8			8			8		
	FACTORS																															
GRS.WALL AREA	LOSS	GAIN	259			186			48			113			210			145			57			242			48			89		
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	16	297	242	0	0	0	0	0	0	7	130	106	0	0	0	0	0	0	0	0	0
EAST	18.6	40.7	0	0	0	0	0	0	0	0	0	0	0	0	30	557	1222	0	0	0	0	0	0	0	0	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	0	0	16	297	385	0	0	0	0	0	0	0	0	0	7	130	168
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	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	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	227	797	118	171	601	89	46	171	25	97	342	51	180	634	94	129	455	68	50	174	26	242	853	126	48	171	25	82	288	43
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	256	320	142	132	165	74	72	90	40	238	298	133	299	262	117	216	271	120	119	149	66	48	60	27	102	128	57	66	83	37
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	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	209	520	77	0	0	0	119	296	44	24	60	9	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				1710			1045			261			937			1972			1023			750			973			298			0	
SUB TOTAL HT GAIN					1563			773			65			426			1509			573			242			162			82			0
LEVEL FACTOR / MULTIPLIER			0.20	0.27		0.20	0.27		0.20	0.27		0.20	0.27		0.20	0.27		0.20	0.27		0.20	0.27		0.20	0.27		0.20	0.27		0.20	0	
AIR CHANGE HEAT LOSS				457			279			70			251			527			274			200			260			80			1	
AIR CHANGE HEAT GAIN					86			42			4			23			83			31			13			9			5			0
DUCT LOSS				0			0			0			0			250			0			95			123			0			0	
DUCT GAIN					0			0			0			0			232			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	0		0	0		0
HEAT GAIN APPLIANCES/LIGHTS					489			0			0			489			489			489			0			0			0			0
TOTAL HT LOSS BTU/H				2166			1324			331			1187			2750			1296			1045			1358			378			635	
TOTAL HT GAIN x 1.3 BTU/H					3403			1661			90			1531			3319			1733			365			244			113			345

ROOM USE			LIBR			LV/DN			KIT			FAM			LAUN			W/R			FOY			MUD						WOB			BAS		
EXP. WALL			10			18			36			36			0			9			45			24						40			140		
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
NORTH	18.6	15.1	20	371	303	0	0	0	9	167	136	0	0	0	0	0	0	0	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	0	0	0	0	0	58	1076	2362	0	0	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	9	167	217	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	2280	24	445	977	0	0	0	0	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	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	40	986	146	20	493	73				20	493	73	20	493	73
NET EXPOSED WALL	3.5	0.5	80	281	42	140	492	73	285	1002	149	336	1182	175	0	0	0	81	285	42	362	1273	189	220	774	115				267	939	139	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	420	1476	219
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				0	0	0	0	0	0
NO ATTIC EXPOSED CLG	2.7	1.2	0	0	0	0	0	0	0	0	0	10	27	12	0	0	0	0	0	0	48	129	57	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	0	0	0				0	0	0	0	0	0
BASEMENT/CRAWL HEAT LOSS				0			0			0			0			0			0			0			0								2370	
SLAB ON GRADE HEAT LOSS				0			0			0			0			0			0			0			0					522				
SUBTOTAL HT LOSS				652			1234			2454			1654			105			452			3566			1267					2937			4487		
SUB TOTAL HT GAIN					345			1036			2602			1164			47			259			2799			188						1015			449
LEVEL FACTOR / MULTIPLIER			0.30	0.34		0.30	0.34		0.30	0.34		0.30	0.34		0.20	0.27		0.30	0.34		0.30	0.34		0.30	0.34								0.50	0.86	
AIR CHANGE HEAT LOSS				222			420			836			563			28			154			1214			431									6401	
AIR CHANGE HEAT GAIN					19			57			143			54			3			14			154			10										80
DUCT LOSS				0			0			0			0			0			0			0			0									0	
DUCT GAIN					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		0	0		0
HEAT GAIN APPLIANCES/LIGHTS					489			489			489			489			489			0			489			489						0				489
TOTAL HT LOSS BTU/H				874			1655			3290			2217			133			606			4781			1698					2937			10888		
TOTAL HT GAIN x 1.3 BTU/H					1108			2056			4203			2232			700			355			3839			893						1319			1323

TOTAL HEAT GAIN BTU/H: 30462 — TONS: 2.54 — LOSS DUE TO VENTILATION LOAD BTU/H: 1593 — STRUCTURAL HEAT LOSS: 41548 — TOTAL COMBINED HEAT LOSS BTU/H: 43141

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

Michael O'Rourke

INDIVIDUAL BCIN: 19669 MICHAEL O'ROURKE

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

RECEIVED
JUL 16 2019
TOWN OF CALEDON
BUILDING SECTION
FILE NO

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

TYPE: PRESTON 3 WOB DATE: Jun-19 GFA: 2920 LO# 82668

HEATING CFM	1131	COOLING CFM	1131
TOTAL HEAT LOSS	41,548	TOTAL HEAT GAIN	30,226
AIR FLOW RATE CFM	27.22	AIR FLOW RATE CFM	37.42

furnace pressure	0.6
furnace filter	0.05
a/c coil pressure	0.2
available pressure for s/a & r/a	0.35
plenum pressure s/a	0.18
max s/a dif press. loss	0.02
min adjusted pressure s/a	0.16
r/a pressure	0.17
r/a grille press. Loss	0.02
adjusted pressure r/a	0.15

#GOODMAN
GMEC960603BNA 60

FAN SPEED	
LOW	
MEDLOW	
MEDIUM	
MEDIUM HIGH	
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	9	4
R/A	0	0	4	3	1

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

RUN #	1	2	3	4	5	6	7	8	9	10	11	12
ROOM NAME	MBR	ENS	W/C	BED-2	BED-3	BED-4	BATH	WIC-3	WIC-2	MBR	ENS-2	LIBR
RM LOSS MBH.	1.08	1.32	0.33	1.19	1.37	1.30	1.05	1.36	0.38	1.08	0.63	0.87
CFM PER RUN HEAT	30	36	9	32	37	35	28	37	10	30	17	24
RM GAIN MBH.	1.70	1.06	0.09	1.53	1.66	1.73	0.37	0.24	0.11	1.70	0.34	1.11
CFM PER RUN COOLING	64	40	3	57	62	65	14	9	4	64	13	41
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
ACTUAL DUCT LGH.	55	54	42	43	38	36	35	38	52	71	41	38
EQUIVALENT LENGTH	150	180	170	160	190	190	190	150	170	190	170	210
TOTAL EFFECTIVE LENGTH	205	234	212	203	228	226	225	188	222	261	211	248
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
ROUND DUCT SIZE	5	5	4	5	5	5	4	4	4	5	4	5
HEATING VELOCITY (ft/min)	220	264	103	235	272	257	321	424	115	220	195	176
COOLING VELOCITY (ft/min)	470	294	34	419	455	477	161	103	46	470	149	301
OUTLET GRILL SIZE	3X10	3X10	3X10	3X10	3X10	3X10	3X10	3X10	3X10	3X10	3X10	3X10
TRUNK	A	B	B	C	E	E	E	E	B	B	C	B

RUN #	13	14	15	16	17	18	19	20	21	22	23	24
ROOM NAME	LV/DN	KIT	KIT	FAM	LAUN	W/R	FOY	MUD	BAS	BAS	BAS	BAS
RM LOSS MBH.	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	45	45	45	60	4	16	65	46	94	94	94	94
RM GAIN MBH.	2.06	2.10	2.10	2.23	0.70	0.35	1.92	0.89	0.66	0.66	0.66	0.66
CFM PER RUN COOLING	77	79	79	84	26	13	72	33	25	25	25	25
ADJUSTED PRESSURE	0.17	0.17	0.17	0.16	0.17	0.17	0.17	0.17	0.16	0.16	0.16	0.16
ACTUAL DUCT LGH.	33	41	52	44	45	26	31	26	60	50	23	32
EQUIVALENT LENGTH	190	190	200	190	170	160	140	160	200	150	150	160
TOTAL EFFECTIVE LENGTH	223	231	252	234	215	186	171	186	260	200	173	192
ADJUSTED PRESSURE	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	6	6	6	6	4	4	5	4	6	6	6	6
HEATING VELOCITY (ft/min)	229	229	229	306	46	184	477	528	479	479	479	479
COOLING VELOCITY (ft/min)	393	403	403	428	298	149	529	379	127	127	127	127
OUTLET GRILL SIZE	4X10	4X10	4X10	4X10	3X10	3X10	3X10	3X10	4X10	4X10	4X10	4X10
TRUNK	C	A	A	A	B	E	D	C	A	B	C	D

RUN #		26	27
ROOM NAME		BED-3	FOY
RM LOSS MBH.		1.37	2.39
CFM PER RUN HEAT		37	65
RM GAIN MBH.		1.66	1.92
CFM PER RUN COOLING		62	72
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)		455	529
OUTLET GRILL SIZE		3X10	3X10
TRUNK		E	D

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

SUPPLY AIR TRUNK SIZE

	TRUNK CFM	STATIC PRESS.	ROUND DUCT	RECT DUCT			VELOCITY (ft/min)
TRUNK A	274	0.06	9.3	12	x	8	411
TRUNK B	481	0.06	11.5	18	x	8	481
TRUNK C	715	0.06	13.3	22	x	8	585
TRUNK D	224	0.08	8	8	x	8	504
TRUNK E	414	0.08	10.1	12	x	8	621
TRUNK F	1129	0.06	15.8	28	x	8	726
TRUNK G	0	0.00	0	0	x	8	0
TRUNK H	0	0.00	0	0	x	8	0
TRUNK I	0	0.00	0	0	x	8	0
TRUNK J	0	0.00	0	0	x	8	0
TRUNK K	0	0.00	0	0	x	8	0
TRUNK L	0	0.00	0	0	x	8	0

RETURN AIR TRUNK SIZE

	TRUNK CFM	STATIC PRESS.	ROUND DUCT	RECT DUCT			VELOCITY (ft/min)
TRUNK O	0	0.05	0	0	x	8	0
TRUNK P	0	0.05	0	0	x	8	0
TRUNK Q	0	0.05	0	0	x	8	0
TRUNK R	0	0.05	0	0	x	8	0
TRUNK S	0	0.05	0	0	x	8	0
TRUNK T	0	0.05	0	0	x	8	0
TRUNK U	0	0.05	0	0	x	8	0
TRUNK V	0	0.05	0	0	x	8	0
TRUNK W	0	0.05	0	0	x	8	0
TRUNK X	1131	0.05	16.5	32	x	8	636
TRUNK Y	560	0.05	12.7	18	x	8	560
TRUNK Z	0	0.05	0	0	x	8	0
DROP	1131	0.05	16.5	24	x	10	679

RETURN AIR #	1	2	3	4	5	6	7									BR
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
AIR VOLUME	115	155	95	125	135	155	170	0	0	0	0	0	0	0	0	181
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
ACTUAL DUCT LGH.	76	45	44	52	40	43	18	1	1	1	1	1	1	1	1	14
EQUIVALENT LENGTH	245	185	135	175	250	225	180	0	0	0	0	0	0	0	0	135
TOTAL EFFECTIVE LH	321	230	179	227	290	268	198	1	1	1	1	1	1	1	1	149
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	0.10
ROUND DUCT SIZE	7	7.5	5.8	6.7	7.5	7.5	7.5	0	0	0	0	0	0	0	0	7
INLET GRILL SIZE	8	8	8	8	8	8	8	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
INLET GRILL SIZE	14	14	14	14	14	14	14	0	0	0	0	0	0	0	0	14

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

INDIVIDUAL BCIN: 19669 MICHAEL O'ROURKE

HVAC DESIGNS LTD.

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TYPE: PRESTON 3 WOB LO # 82668
SITE NAME: LAMBERT'S LANE PH.2

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	5	@ 10.6 cfm	53	cfm
Other Rooms	7	@ 10.6 cfm	74.2	cfm
Table 9.32.3.A.		TOTAL	201.4	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	201.4	cfm
Less Principal Ventil. Capacity	79.5	cfm
Required Supplemental Capacity	121.9	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
BATH	FV-05-11VK1	50	✓	0.3
ENS-2	FV-05-11VK1	50	✓	0.3
WR	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 @ 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: Michael O'Rourke.
HRAI # 001820
Date: June-19

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

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

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

HVAC DESIGNS LTD.

375 Finley Ave. Suite 202 Ajax, ON L1S 2E2
Tel: 905.619.2300 Fax: 905.619.2375
Web: www.hvacdesigns.ca E-mail: info@hvacdesigns.ca

CSA F280-12 Residential Heat Loss and Heat Gain Calculations

Formula Sheet (For Air Leakage / Ventiliation Calculation)

LO#: 82668 Model: PRESTON 3 WOB Builder: GREENPARK HOMES Date: 07/06/2019

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

	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

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

0.259 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

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

80 CFM x 74 °F x 1.08 x 0.25 = 1593 Btu/h

6.2.7 Sensible heat Gain due to Ventilation

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

80 CFM x 11 °F x 1.08 x 0.25 = 236 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	12,802	7,424	0.862
2	0.3		11,279	0.340
3	0.2		9,574	0.267
4	0		0	0.000
5	0		0	0.000

*HLairbv = Air leakage heat loss + ventilation heat loss
*For a balanced or supply only ventilation system HLairve = 0

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HEAT LOSS AND GAIN SUMMARY SHEET

MODEL: PRESTON 3 WOB **BUILDER:** GREENPARK HOMES
SFQT: 2920 **LO#** 82668 **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 (ft^3):	37290.3	ASSUMED (Y/N):	Y
INTERNAL SHADING:	BLINDS/CURTAINS	ASSUMED OCCUPANTS:	5
INTERIOR LIGHTING LOAD ($Btu/h/ft^2$):	1.27	DC BRUSHLESS MOTOR (Y/N):	Y
FOUNDATION CONFIGURATION	BCIN_1	DEPTH BELOW GRADE:	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

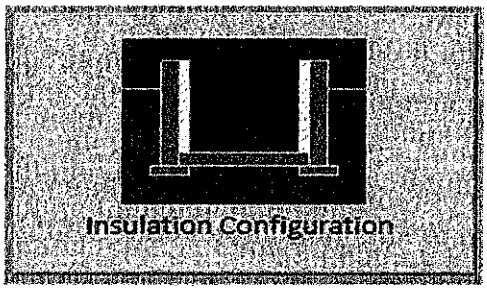
Michael O'Rourke

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

Residential Foundation Thermal Load Calculator

Supplemental tool for CAN/CSA-F280

Weather Station Description	
Province:	Ontario
Region:	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	 Insulation Configuration
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# 82668

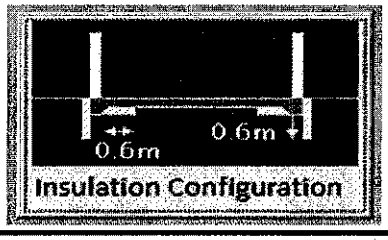
THIS STRUCTURE MUST BE CONSTRUCTED TO MEET OR EXCEED THE PROVISIONS O THE ONTARIO BUILDING COD

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

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	
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# 82668

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

Air Infiltration Residential Load Calculator

Supplemental tool for CAN/CSA-F280

Weather Station Description	
Province:	Ontario
Region:	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 37.5 / Total Exhaust 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# 82668

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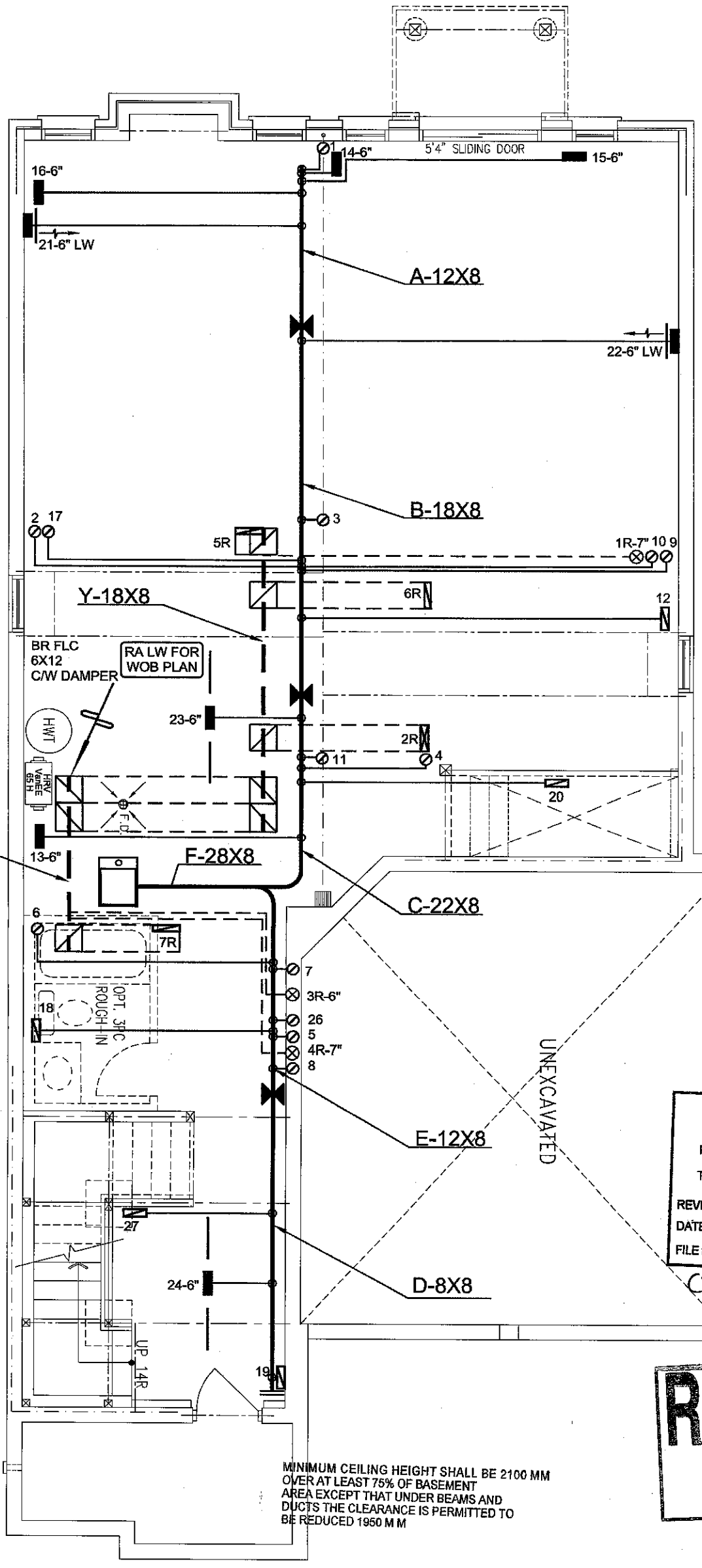
BASEMENT PLAN – ELEV. '1'



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CERTIFIED MODEL
PRE-APPROVED
FOR PERMIT APPLICATION AS PER THE ONTARIO BUILDING CODE
TOWN OF CALEDON BUILDING DIVISION
REVIEWED BY SA
DATE July 25, 2019
FILE # CMOD-PRESTON3-WOB
(ELEVATION 1&2)

RECEIVED
JUL 16 2019
TOWN OF CALEDON
BUILDING SECTION
FILE NO

MINIMUM CEILING HEIGHT SHALL BE 2100 MM OVER AT LEAST 75% OF BASEMENT AREA EXCEPT THAT UNDER BEAMS AND DUCTS THE CLEARANCE IS PERMITTED TO BE REDUCED 1950 M M

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

WOB
CSA-F280-12
energy
ENERGY STAR

HVAC LEGEND

SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION
— ▭ —	SUPPLY AIR GRILLE	▬	6" SUPPLY AIR BOOT ABOVE	▭	14"x8" RETURN AIR GRILLE	▭	RETURN AIR STACK ABOVE
— ▬ —	SUPPLY AIR GRILLE 6" BOOT	⊘	SUPPLY AIR STACK FROM 2nd FLOOR	▭	30"x8" RETURN AIR GRILLE	▭	RETURN AIR STACK 2nd FLOOR
▭	SUPPLY AIR BOOT ABOVE	●	6" SUPPLY AIR STACK 2nd FLOOR	▬	FRA- FLOOR RETURN AIR GRILLE	⧗	REDUCER

No.	Description	Date
3.		
2.		
1.		

REVISIONS

Client
GREENPARK HOMES

Project Name
LAMBERTS LANE HOME CORP PH 2
CALEDON, ONTARIO

PRESTON 3 WOB 2920 sqft

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

HEAT LOSS 43141 BTU/H	
UNIT DATA	
MAKE	GOODMAN
MODEL	GMEC960603BNA-60
INPUT	60 MBTU/H
OUTPUT	57.6 MBTU/H
COOLING	2.5 TONS
FAN SPEED	1131 cfm @ 0.6" w.c.

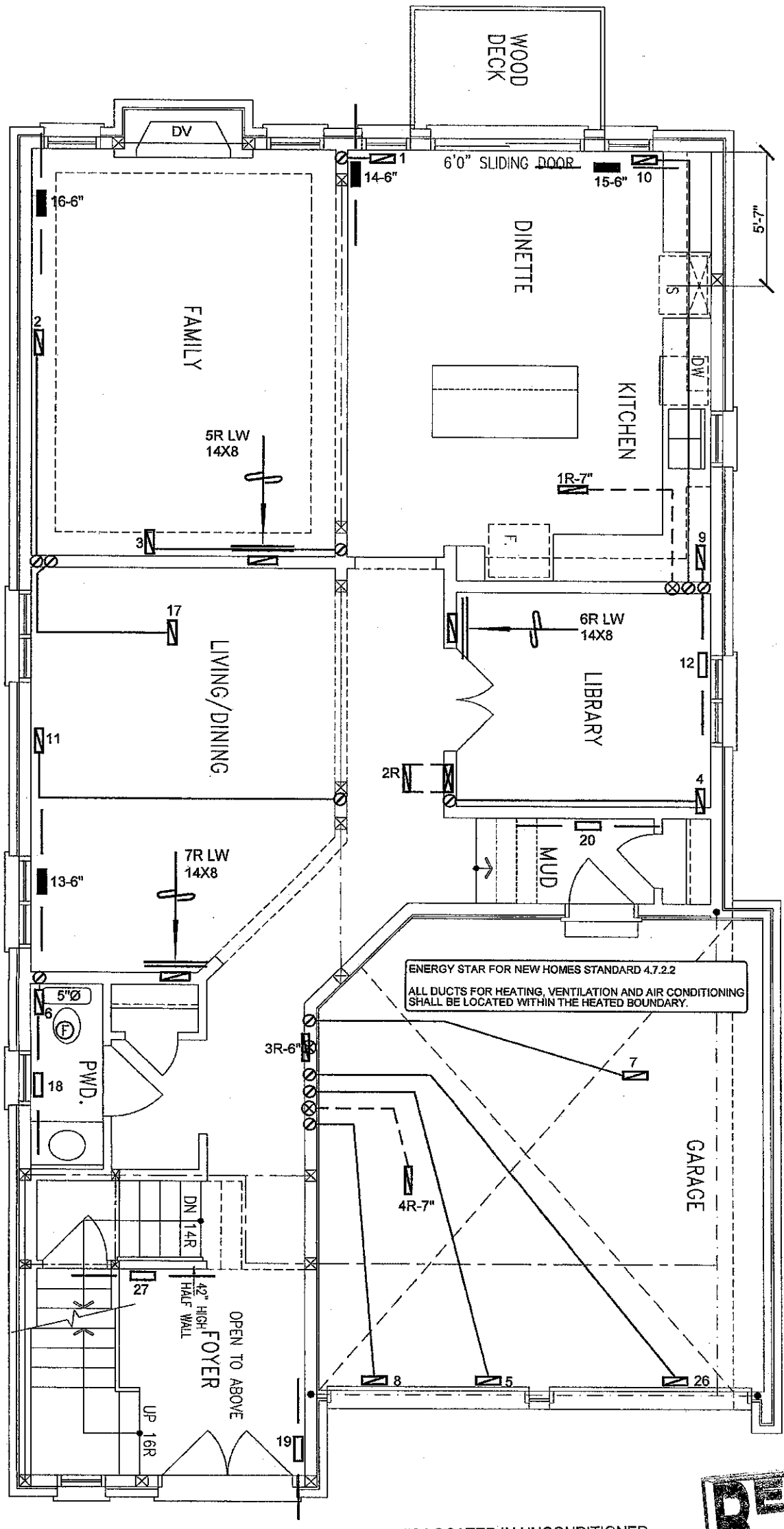
# OF RUNS	S/A	R/A	FANS
3RD FLOOR			
2ND FLOOR	13	4	4
1ST FLOOR	9	3	2
BASEMENT	4	1	0

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

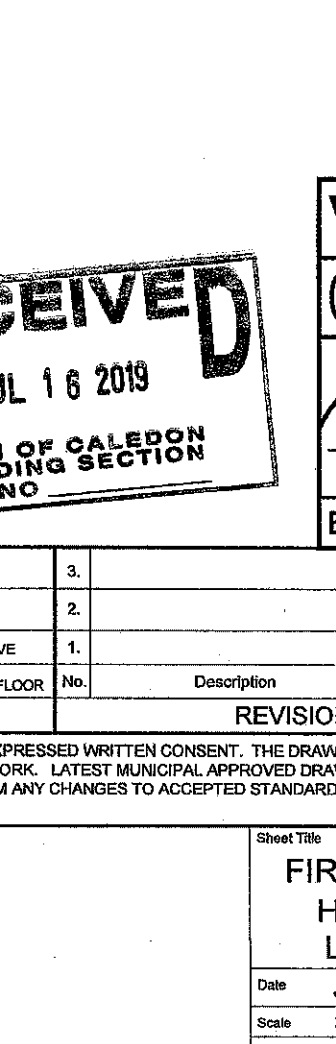
Sheet Title
BASEMENT HEATING LAYOUT

Date JUNE/2019
Scale 3/16" = 1'-0"
BCIN# 19669
LO# 82668

GROUND FLOOR PLAN – ELEV. '1'



GROUND FLOOR PLAN – ELEV. '1'



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

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JUL 16 2019
TOWN OF CALEDON
BUILDING SECTION
FILE NO

WOB
CSA-F280-12
ENERGY STAR

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

HVAC LEGEND

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

No.	Description	Date
3.		
2.		
1.		

REVISIONS

Client
GREENPARK HOMES

Project Name
LAMBERTS LANE HOME CORP PH 2
CALEDON, ONTARIO

PRESTON 3 WOB 2920 sqft

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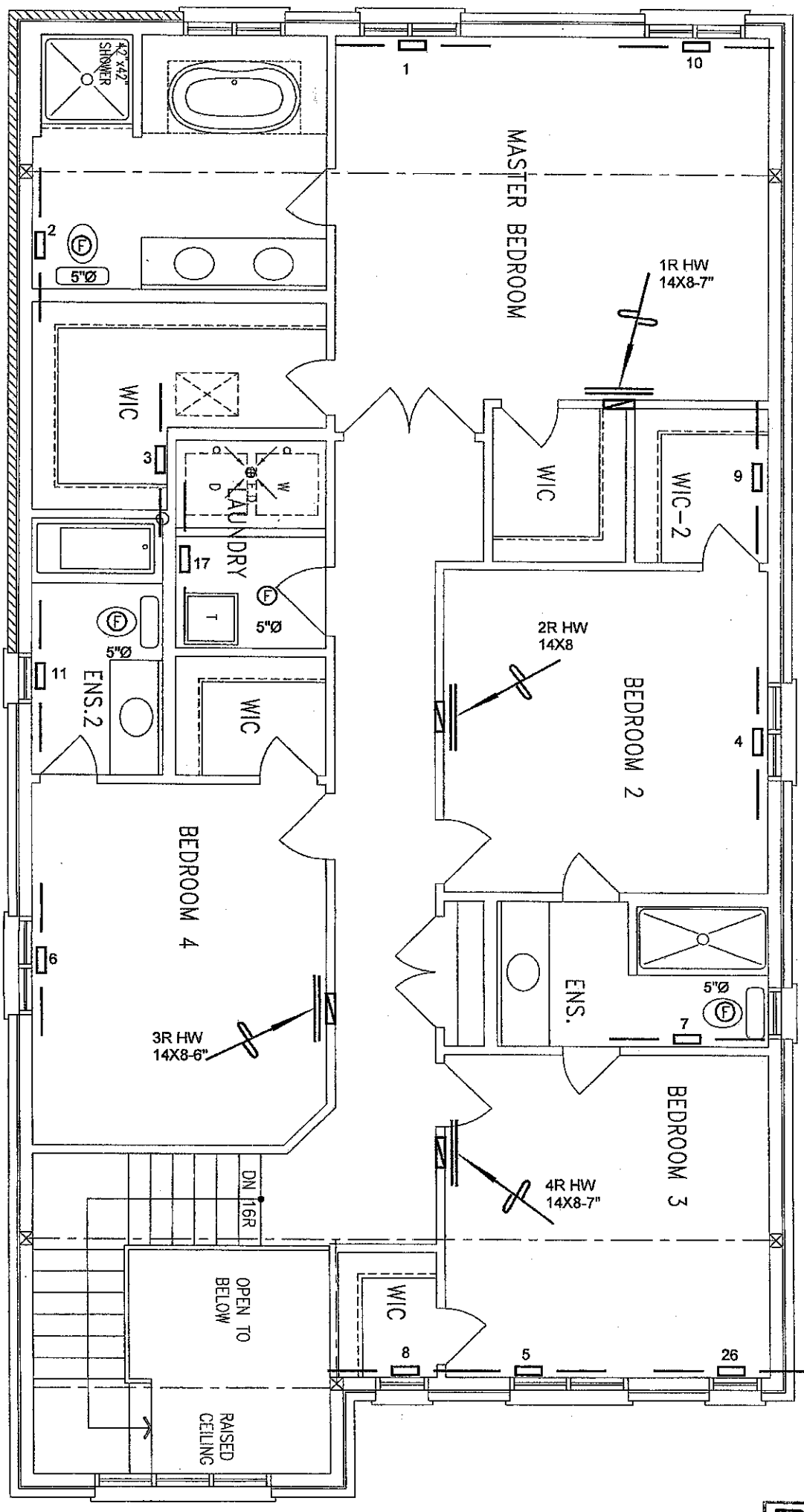
Installation to comply with the latest Ontario Building Code. All supply branch outlets shall be equipped with a manual balancing damper. Ductwork which passes through the garage or unheated spaces shall be adequately insulated and be gas-proofed.

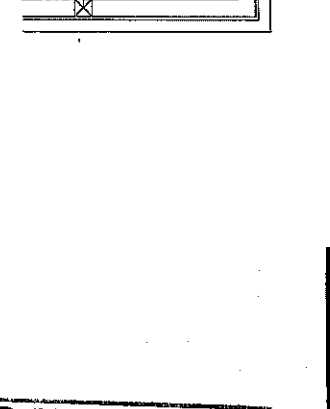
Sheet Title
FIRST FLOOR HEATING LAYOUT

Date JUNE/2019
Scale 3/16" = 1'-0"
BCIN# 19669
LO# 82668

SECOND FLOOR PLAN (4 BED) - ELEV. '1'



SECOND FLOOR PLAN (4 BED) - ELEV. '2'



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WOB

CSA-F280-12

ENERGY STAR

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BUILDING SECTION
FILE NO

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No.	Description	Date
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1.		

REVISIONS

Client
GREENPARK HOMES

Project Name
LAMBERTS LANE HOME CORP PH 2
CALEDON, ONTARIO

PRESTON 3 WOB 2920 sqft

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SECOND FLOOR HEATING LAYOUT

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BCIN# 19669
LO# 82668