HVAC DESIGNS LTD.
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SITE NAME: LAMBERT'S LANE PH.2 | LOT 56 | DATE: Aug-13 | WINTER NATURAL AIR CHANGE RATE 0.268 | HEAT LOSS ΔT °F. 74 | CSA-F280-12
BUILDER: GREENPARK HOMES | TYPE: WOODCROFT 4 | GFA: 3559 | LOT# 83531 | SUMMER NATURAL AIR CHANGE RATE 0.087 | HEAT GAIN ΔT °F. 11 | ENERGYSTAR

ROOM USE			MBR			ENS			WIC			BED-4			BED-3			BED-2			ENS-2			ENS-3			LIB			ENS-4			WIC-2		
EXP. WALL			37			24			9			35			12			13			6			9			12			10			12		
CLG. HT.			8			8			8			8			8			8			8			8			8			8			8		
FACTORS																																		
GRS.WALL AREA	LOSS	GAIN	296			192			72			280			96			104			48			72			96			80			96		
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	0	0	0	9	167	136	0	0	0	0	0	0	0	0	0	16	297	242	7	130	106	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	44	816	1792	35	649	1425	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	10	186	407
SOUTH	18.6	24.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	16	297	385	15	278	361	0	0	0
WEST	18.6	40.7	32	594	1303	14	260	570	0	0	0	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	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	0	0	0
NET EXPOSED WALL	3.5	0.5	264	928	138	169	594	88	72	253	38	235	830	123	61	215	32	88	309	46	41	144	21	65	229	34	80	281	42	65	229	34	86	302	45
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	0	0	0
EXPOSED CLG	1.3	0.6	336	421	187	143	179	80	142	178	79	147	184	82	150	188	84	234	293	130	108	135	60	54	68	30	204	256	114	170	213	95	36	45	20
NO ATTIC EXPOSED CLG	2.7	1.2	0	0	0	0	0	0	0	0	0	40	107	48	30	80	36	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	160	448	66	0	0	0	108	269	40	54	134	20	0	0	0	0	0	0	36	90	13
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				1943			1200			431			1938			1580			900			678			561			834			720			623	
SUB TOTAL HT GAIN					1628			874			117			2044			1643			419			227			190			540			490			485
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		0.20	0.28		0.20	0.28		0.20	0.28		0.20	0.28	
AIR CHANGE HEAT LOSS				541			334			120			539			440			250			189			156			232			200			173	
AIR CHANGE HEAT GAIN					91			49			7			114			92			23			13			11			30			27			27
DUCT LOSS				0			0			0			0			202			0			87			72			0			0			80	
DUCT GAIN					0			0			0			0			270			0			24			20			0			0			51
HEAT GAIN PEOPLE	240		2		480	0		0	0		0	1		240	1		240	1		240	0		0	0		0	0		0	0		0	0		0
HEAT GAIN APPLIANCES/LIGHTS					728			0			0			728			728			728			0			0			728			0			0
TOTAL HT LOSS BTU/H				2484			1534			551			2477			2222			1150			954			788			1065			920			876	
TOTAL HT GAIN x 1.3 BTU/H					3805			1200			160			4064			3864			1833			343			287			1688			672			733

ROOM USE			DIN			OFF			KT/FM				LAUN			W/R			FOY			MUD				WOR			BAS		
EXP. WALL			29			20			79				11			7			25			31				46			144		
CLG. HT.			11			11			11				8			11			11			11				9			9		
FACTORS																																
GRS.WALL AREA	LOSS	GAIN	319			220			889				88			77			275			341				276			864		
GLAZING			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	0	0	0	0	0	0	8	148	121		0	0	0	0	0	0
EAST	18.6	40.7	0	0	0	24	445	977	0	0	0		0	0	0	0	0	0	0	0	0	0	0	0		58	1076	2362	0	0	0
SOUTH	18.6	24.1	32	594	770	0	0	0	0	0	0		15	278	361	8	148	193	0	0	0	0	0	0		0	0	0	4	74	96
WEST	18.6	40.7	0	0	0	0	0	0	84	1558	3420		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
DOORS	24.7	3.7	0	0	0	0	0	0	20	493	73		0	0	0	0	0	0	46	1134	168	20	493	73		20	493	73	20	493	73
NET EXPOSED WALL	3.5	0.5	287	1009	150	196	689	102	765	2690	399		73	257	38	69	243	36	229	805	119	313	1101	163		198	696	103	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	432	1518	225
EXPOSED CLG	1.3	0.6	0	0	0	0	0	0	0	0	0		187	234	104	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	10	27	12		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		0	0	0	0	0	0
BASEMENT/CRAWL HEAT LOSS				0			0			0				0			0			0			0							2651	
SLAB ON GRADE HEAT LOSS				0			0			0				0			0			0			0				647				
SUBTOTAL HT LOSS				1603			1134			4768				769			391			1939			1742				2913			4736	
SUB TOTAL HT GAIN					920			1079			3904				503			225			267			357					2538			394
LEVEL FACTOR / MULTIPLIER			0.30	0.44		0.30	0.44		0.30	0.44			0.20	0.28		0.30	0.44		0.30	0.44		0.30	0.44						0.50	1.11		
AIR CHANGE HEAT LOSS				704			498			2094				214			172			852			765							8474		
AIR CHANGE HEAT GAIN					51			60			218				28			13			16			20								183
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	0		0	0		0	0		0					0		0	0
HEAT GAIN APPLIANCES/LIGHTS					728			728			728				728			0			0			0								0
TOTAL HT LOSS BTU/H				2307			1633			6862				984			563			2791			2507				2913			13210	
TOTAL HT GAIN x 1.3 BTU/H					2209			2428			6305				1637			314			395			491					3289			725

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

TOTAL HEAT GAIN BTU/H: 36686 | TONS: 3.06 | LOSS DUE TO VENTILATION LOAD BTU/H: 1593 | STRUCTURAL HEAT LOSS: 48791 | TOTAL COMBINED HEAT LOSS BTU/H: 50383

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

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SITE NAME: LAMBERT'S LANE PH.2 — LOT 56
BUILDER: GREENPARK HOMES — TYPE: WOODCROFT 4 — DATE: Aug-19 — GFA: 3559 — LO# 83531

HEATING CFM	1131	COOLING CFM	1131	furnace pressure	0.6				#GOODMAN	AFUE = 96 %		
TOTAL HEAT LOSS	48,791	TOTAL HEAT GAIN	36,450	furnace filter	0.05				GMEC960603BNA	60	INPUT (BTU/H) = 60,000	
AIR FLOW RATE CFM	23.18	AIR FLOW RATE CFM	31.03	a/c coil pressure	0.2				FAN SPEED		OUTPUT (BTU/H) = 57,600	
				available pressure for s/a & r/a	0.35				LOW			
									MEDLOW		DESIGN CFM = 1131	
				plenum pressure s/a	0.18	r/a pressure	0.17		MEDIUM		CFM @ .8 " E.S.P.	
				max s/a dif press. loss	0.01	r/a grille press. Loss	0.02		MEDIUM HIGH			
				min adjusted pressure s/a	0.17	adjusted pressure r/a	0.15		HIGH	1131	TEMPERATURE RISE 47	°F

RUN COUNT	4th	3rd	2nd	1st	Bas
S/A	0	0	15	8	5
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	17	18	19	20	21	22	23	24
ROOM NAME	MBR	BED-3	WIC	BED-4	BED-3	BED-2	ENS-2	BED-4	LIB	MBR	ENS-4	KT/FM	DIN	KT/FM	KT/FM	LAUN	W/R	FOY	OFF	BAS	BAS	BAS	BAS
RM LOSS MBH.	1.24	1.11	0.55	1.24	1.11	1.15	0.95	1.24	1.07	1.24	0.92	2.29	2.31	2.29	2.29	0.98	0.56	2.79	1.63	3.22	3.22	3.22	3.22
CFM PER RUN HEAT	29	26	13	29	26	27	22	29	25	29	21	53	53	53	53	23	13	65	38	75	75	75	75
RM GAIN MBH.	1.90	1.93	0.16	2.03	1.93	1.83	0.34	2.03	1.69	1.90	0.67	2.10	2.21	2.10	2.10	1.64	0.31	0.39	2.43	0.80	0.80	0.80	0.80
CFM PER RUN COOLING	59	60	5	63	60	57	11	63	52	59	21	65	69	65	65	51	10	12	75	25	25	25	25
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	0.17	0.17	0.17
ACTUAL DUCT LGH.	50	36	43	53	36	20	35	54	41	57	44	45	51	39	32	49	31	41	43	52	40	28	45
EQUIVALENT LENGTH	190	170	110	170	170	170	180	170	140	160	150	170	160	130	120	160	100	170	160	130	170	170	190
TOTAL EFFECTIVE LENGTH	240	206	153	223	206	190	215	224	181	217	194	215	211	169	152	209	131	211	203	182	210	198	235
ADJUSTED PRESSURE	0.07	0.08	0.11	0.08	0.08	0.09	0.08	0.08	0.1	0.08	0.09	0.08	0.08	0.1	0.11	0.08	0.13	0.08	0.08	0.09	0.08	0.09	0.07
ROUND DUCT SIZE	5	5	4	5	5	6	4	5	5	5	4	5	6	5	5	5	4	5	6	6	6	5	6
HEATING VELOCITY (ft/min)	213	191	149	213	191	138	252	213	184	213	241	389	270	389	389	169	149	477	194	382	382	551	382
COOLING VELOCITY (ft/min)	433	441	57	463	441	291	126	463	382	433	241	477	352	477	477	374	115	88	382	127	127	184	127
OUTLET GRILL SIZE	3X10	3X10	3X10	3X10	3X10	4X10	3X10	3X10	3X10	3X10	3X10	3X10	4X10	3X10	3X10	3X10	3X10	3X10	4X10	4X10	4X10	3X10	4X10
TRUNK	A	E	C	D	E	C	E	D	A	A	E	A	A	B	B	A	E	D	D	B	A	A	D

RUN #	25			28	29	30	31
ROOM NAME	BAS			MUD	WIC-2	ENS	ENS-3
RM LOSS MBH.	3.22			2.51	0.88	1.53	0.79
CFM PER RUN HEAT	75			58	20	36	18
RM GAIN MBH.	0.80			0.49	0.73	1.20	0.29
CFM PER RUN COOLING	25			15	23	37	9
ADJUSTED PRESSURE	0.17			0.17	0.17	0.17	0.17
ACTUAL DUCT LGH.	61			28	42	49	33
EQUIVALENT LENGTH	130			130	160	150	190
TOTAL EFFECTIVE LENGTH	191			158	202	199	223
ADJUSTED PRESSURE	0.09			0.11	0.09	0.09	0.08
ROUND DUCT SIZE	6			5	4	4	4
HEATING VELOCITY (ft/min)	382			426	229	413	207
COOLING VELOCITY (ft/min)	127			110	264	424	103
OUTLET GRILL SIZE	4X10			3X10	3X10	3X10	3X10
TRUNK	A			C	E	B	E

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

SUPPLY 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 A	437	0.07	10.6	14	x	8	562	TRUNK G	0	0.00	0	0	x	8	0
TRUNK B	217	0.09	7.7	8	x	8	488	TRUNK H	0	0.00	0	0	x	8	0
TRUNK C	752	0.07	13	20	x	8	677	TRUNK I	0	0.00	0	0	x	8	0
TRUNK D	236	0.07	8.4	8	x	8	531	TRUNK J	0	0.00	0	0	x	8	0
TRUNK E	382	0.07	10.1	14	x	8	491	TRUNK K	0	0.00	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

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	780	0.05	14.4	24	x	8	585
TRUNK Z	365	0.05	10.8	14	x	8	469
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	105	95	105	85	85	320	155	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.	54	41	42	47	39	28	38	1	1	1	1	1	1	1	1	14
EQUIVALENT LENGTH	235	145	240	170	175	185	195	0	0	0	0	0	0	0	0	135
TOTAL EFFECTIVE LH	289	186	282	217	214	213	233	1	1	1	1	1	1	1	1	149
ADJUSTED PRESSURE	0.05	0.08	0.05	0.07	0.07	0.07	0.06	14.80	14.80	14.80	14.80	14.80	14.80	14.80	14.80	0.10
ROUND DUCT SIZE	6.8	5.8	6.8	5.8	5.8	9.5	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	30	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: WOODCROFT 4 LO # 83531
SITE NAME: LAMBERT'S LANE PH.2 LOT 56

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	5	@ 10.6 cfm	53.0	cfm
Table 9.32.3.A.		TOTAL	190.8	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	190.8	cfm
Less Principal Ventil. Capacity	79.5	cfm
Required Supplemental Capacity	111.3	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-2	FV-05-11VK1	50	✓	0.3
ENS-4	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 @ 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: August-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 / Ventilation Calculation)

LO#: 83531 Model: WOODCROFT 4 Builder: GREENPARK HOMES Date: 8/22/2019

Volume Calculation

House Volume

Level	Floor Area (ft²)	Floor Height (ft)	Volume (ft³)
Bsmt	1600	9	14400
First	1600	11	17600
Second	1959	8	15672
Third.	0	9	0
Fourth	0	9	0
		Total:	47,672.0 ft³
		Total:	1349.9 m³

Air Change & Delta T Data

WINTER NATURAL AIR CHANGE RATE	0.268
SUMMER NATURAL AIR CHANGE RATE	0.087

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

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

0.268 x 374.98 x 41 °C x 1.2 = 4967 W

= 16948 Btu/h

6.2.6 Sensible Gain due to Air Leakage

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

= 0.087 x 374.98 x 6 °C x 1.2 = 239 W

= 816 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_{dlevel})	Air Leakage Heat Loss Multiplier (LF x HLairbv / HLlevel)
1	0.5	16,948	7,648	1.108
2	0.3		11,578	0.439
3	0.2		12,176	0.278
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: WOODCROFT 4 LOT 56 **BUILDER:** GREENPARK HOMES
SFQT: 3559 **LO#** 83531 **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):	47672.0	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:	6.0 ft
LENGTH: 59.0 ft WIDTH:	36.0 ft	EXPOSED PERIMETER:	144.0 ft
WOB INSULATION CONFIGURATION	SCB_9	WOB EXPOSED PERIMETER	46.0 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

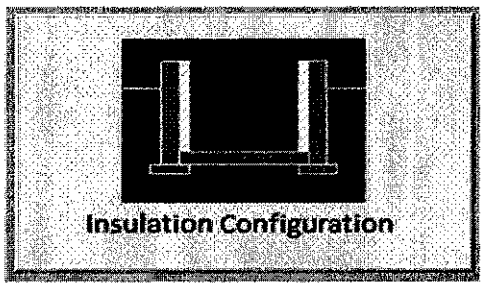
Michael O'Rourke

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):	11.0	
Exposed Perimeter (m):	43.9	
Wall Height (m):	2.7	
Depth Below Grade (m):	1.55	
Window Area (m^2):	0.4	
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):	**777**	

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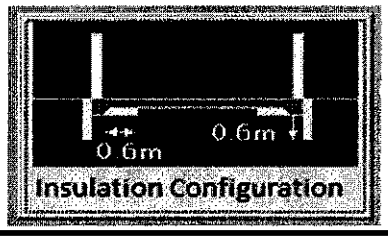
TYPE: WOODCROFT 4
LO# 83531

LOT 56

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):	**11.0**	
Exposed Perimeter (m):	**14.0**	
Radiant Slab		
Heated Fraction of the Slab:	**0**	
Fluid Temperature (°C):	**33**	
Design Months		
Heating Month	**1**	
Results		
Heating Load (Watts):	**190**	

TYPE: WOODCROFT 4 LOT 56
LO# 83531

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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):	8.53
Building Configuration	
Type:	Detached
Number of Stories:	Two
Foundation:	Full
House Volume (m^3):	1349.9
Air Leakage/Ventilation	
Air Tightness Type:	Energy Star Detached (2.5 ACH)
Custom BDT Data:	ELA @ 10 Pa. 1260.1 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):	**0.268**
Cooling Air Leakage Rate (ACH/H):	**0.087**

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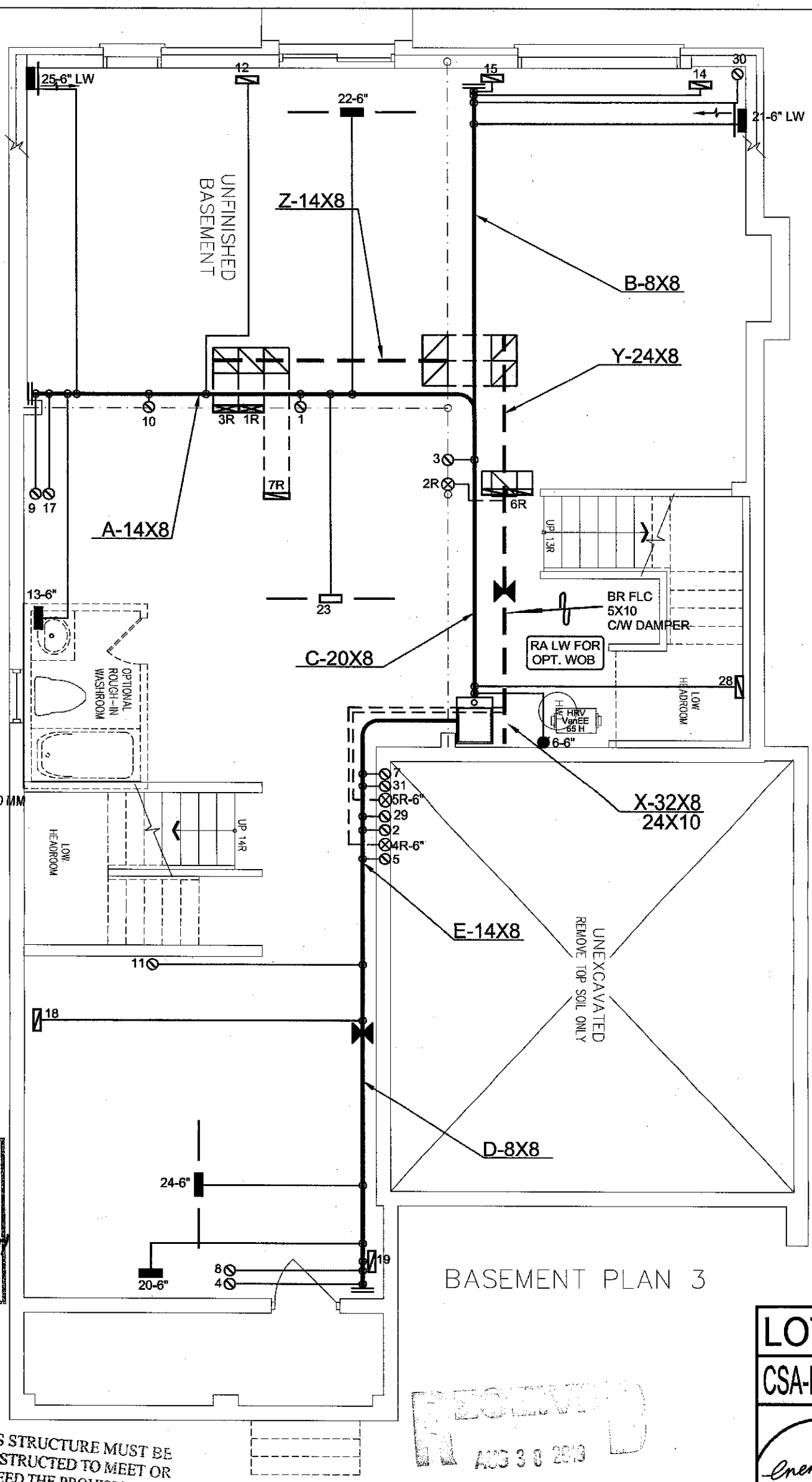
TYPE: WOODCROFT 4 LOT 56

LO# 83531



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

BASEMENT PLAN 3

APPROVED
For constuction as per the
Ontario Building Code
Town of Caledon Building Department
Initial S APPUHAMY
Date Sept 12, 2019
File # BA 19 0636

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.

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RECEIVED
AUG 30 2019
TOWN OF CALEDON
BUILDING SECTION
FILE NO

LOT 56
CSA-F280-12
ENERGYSTAR

HVAC LEGEND

SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION
	FLOOR SUPPLY AIR GRILLE		6" SUPPLY AIR BOOT ABOVE		14"x8" RETURN AIR GRILLE		RETURN AIR STACK ABOVE
	FLOOR 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

LOT 56
WOODCROFT 4 3559 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
Web: www.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.

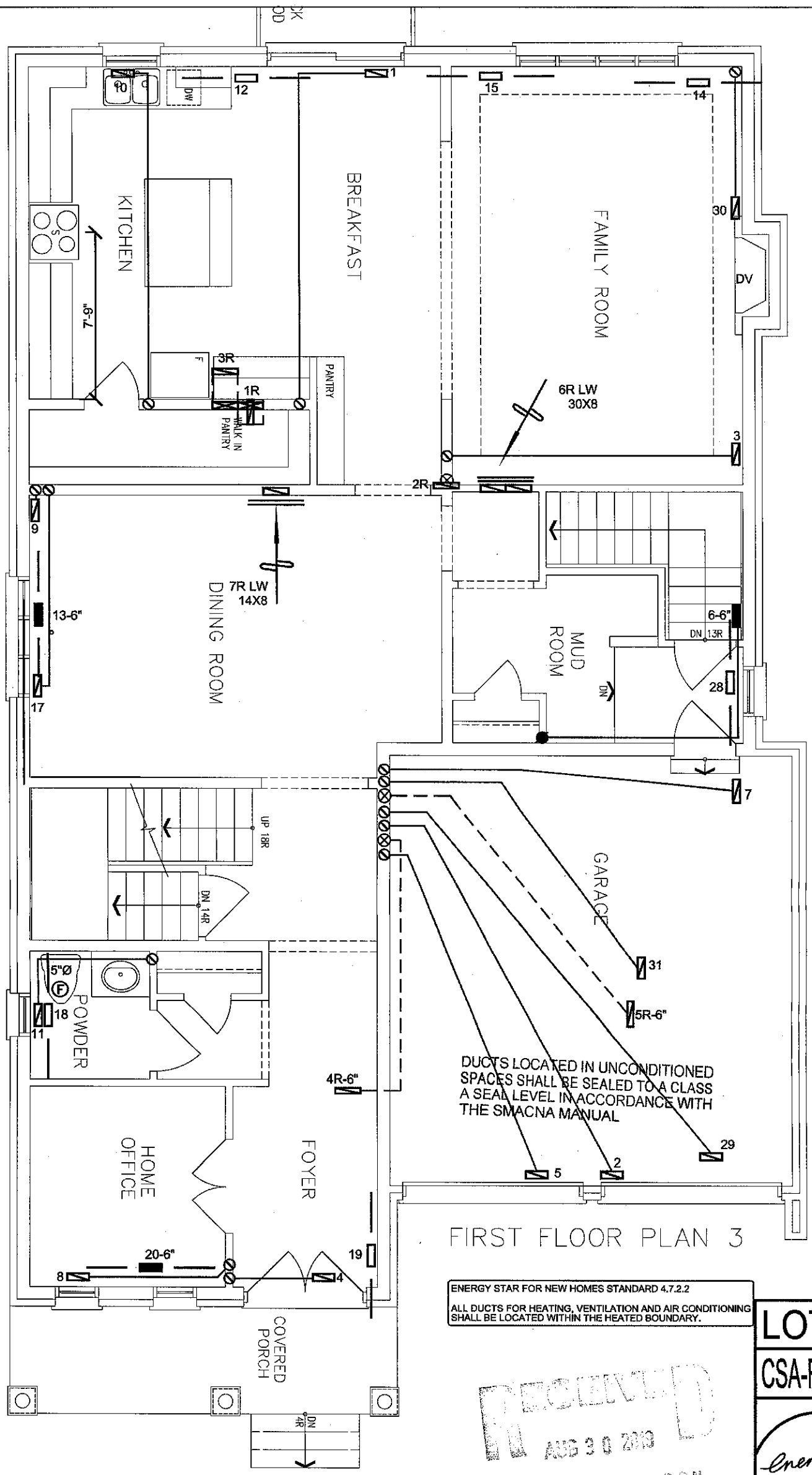
HEAT LOSS 50383 BTU/H	
UNIT DATA	
MAKE	GOODMAN
MODEL	GMEC960603BNA
INPUT	60 MBTU/H
OUTPUT	57.6 MBTU/H
COOLING	3.0 TONS
FAN SPEED	1131 cfm @ 0.5" w.c.

# OF RUNS	S/A	R/A	FANS
3RD FLOOR			
2ND FLOOR	15	5	4
1ST FLOOR	8	2	2
BASEMENT	5	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 AUG/2019
Scale 3/16" = 1'-0"
BCIN# 19669
LO# 83531



FIRST FLOOR PLAN 3

ENERGY STAR FOR NEW HOMES STANDARD 4.7.2.2

ALL DUCTS FOR HEATING, VENTILATION AND AIR CONDITIONING SHALL BE LOCATED WITHIN THE HEATED BOUNDARY.

LOT 56

CSA-F280-12

ENERGYSTAR

RECEIVED
AUG 30 2019
TOWN OF CALEDON
BUILDING SECTION
FILE NO

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

SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION
— ▭ —	FLOOR SUPPLY AIR GRILLE	▬	6" SUPPLY AIR BOOT ABOVE	▭	14"x8" RETURN AIR GRILLE	▭	RETURN AIR STACK ABOVE
— ▬ —	FLOOR 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

LOT 56
WOODCROFT 4 3559 sqft

HVAC DESIGNS LTD.
375 Finley Ave, Suite 202 - Ajax, Ontario
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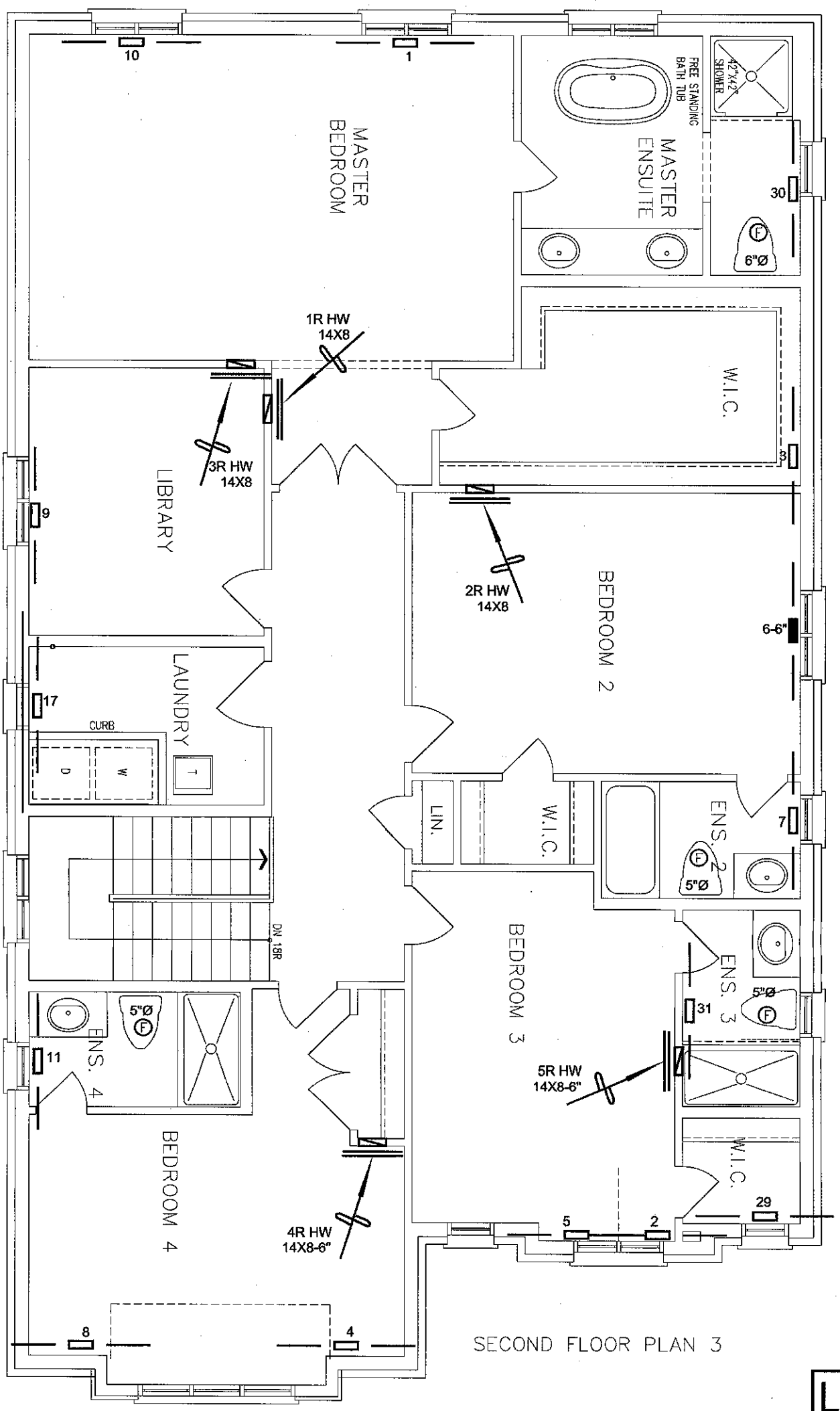
Sheet Title
FIRST FLOOR HEATING LAYOUT

Date AUG/2019
Scale 3/16" = 1'-0"
BCIN# 19669
LO# 83531



SECOND FLOOR PLAN 3

LOT 56

CSA-F280-12

ENERGYSTAR

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

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Sheet Title
SECOND FLOOR HEATING LAYOUT

Date AUG/2019
Scale 3/16" = 1'-0"
BCIN# 19669
LO# 83531