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

SITE NAME: LAMBERT'S LANE PH.2 LOT 21
BUILDER: GREENPARK HOMES TYPE: PRESTON 1
DATE: Aug-19
PLAN: 2501 LOT: 82908

WINTER NATURAL AIR CHANGE RATE 0.262 HEAT LOSS ΔT °F. 74 CSA-F280-12
SUMMER NATURAL AIR CHANGE RATE 0.085 HEAT GAIN ΔT °F. 11 ENERGYSTAR

ROOM USE			MBR			ENS			WIC			BED-2			BED-3			BED-4			BATH			ENS-2				
EXP. WALL			32			23			8			32			36			13			6			9				
CLG. HT.			8			8			8			8			8			8			8			8				
	FACTORS																											
GRS.WALL AREA	LOSS	GAIN	259			186			65			259			291			105			48			73				
GLAZING				LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		
NORTH	18.6	15.1	0	0	0	8	148	121	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	16	297	242		
EAST	18.6	40.7	0	0	0	0	0	0	0	0	0	30	557	1222	30	557	1222	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	7	130	168	0	0	0		
WEST	18.6	40.7	32	594	1303	16	297	651	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		
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		
NET EXPOSED WALL	3.5	0.5	227	797	118	162	569	84	65	227	34	229	804	119	261	918	136	89	313	46	41	146	22	57	200	30		
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	252	316	140	132	165	74	136	170	76	258	323	144	143	179	80	225	282	125	108	135	60	108	135	60		
NO ATTIC EXPOSED CLG	2.7	1.2	0	0	0	0	0	0	0	0	0	0	0	0	26	70	31	0	0	0	0	0	0	0	0	0		
EXPOSED FLOOR	2.5	0.4	0	0	0	0	0	0	0	0	0	258	642	95	30	75	11	42	105	16	0	0	0	72	178	27		
BASEMENT/CRAWL HEAT LOSS				0			0			0			0			0			0			0			0			
SLAB ON GRADE HEAT LOSS				0			0			0			0			0			0			0			0			
SUBTOTAL HT LOSS				1707			1180			398			2326			1798			997			411			811			
SUB TOTAL HT GAIN					1562			931			110			1580			1479			572			250			359		
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			
AIR CHANGE HEAT LOSS				371			257			87			506			391			217			89			176			
AIR CHANGE HEAT GAIN					86			51			6			87			81			31			14			20		
DUCT LOSS				0			0			0			283			219			121			0			99			
DUCT GAIN					0			0			0			245			234			138			0			38		
HEAT GAIN PEOPLE	240		2		480	0		0	0		0	1		240	1		240	1		240	0		0	0		0		
HEAT GAIN APPLIANCES/LIGHTS					539			0			0			539			539			539			0			0		
TOTAL HT LOSS BTU/H				2078			1437			484			3115			2408			1335			501			1086		
TOTAL HT GAIN x 1.3 BTU/H					3466			1276			150			3497			3345			1977			343			541		

ROOM USE			LV/DN				KIT			FAM			LAUN			W/R			FOY			MUD				WOB			BAS		
EXP. WALL			40				39			36			12			14			18			25				13			155		
CLG. HT.			10				10			10			8			10			10			11				9			9		
	FACTORS																														
GRS.WALL AREA	LOSS	GAIN	400				390			360			97			140			180			275				117			930		
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	8	148	121	0	0	0	0	0	0	10	186	151		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	6	111	244	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	9	167	217	0	0	0	0	0	0		0	0	0	8	148	193
WEST	18.6	40.7	0	0	0		66	1224	2687	28	519	1140	0	0	0	0	0	0	0	0	0	0	0	0		4	74	163	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	0	0	0	0	0	0	0	0	0	40	986	146	20	493	73		21	518	77	20	493	73
NET EXPOSED WALL	3.5	0.5	372	1308	194		324	1139	169	332	1168	173	89	313	46	131	461	68	134	471	70	245	862	128		92	324	48	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	465	1634	242
EXPOSED CLG	1.3	0.6	0	0	0		0	0	0	0	0	0	144	180	80	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						2919		
SLAB ON GRADE HEAT LOSS				0				0			0			0			0			0			0			110					
SUBTOTAL HT LOSS				1828				2364			1714			642			628			1569			1540			1025			5268		
SUB TOTAL HT GAIN					868				2856			1325			248			285			460			352				288			568
LEVEL FACTOR / MULTIPLIER			0.30	0.35			0.30	0.35		0.30	0.35		0.20	0.22		0.30	0.35		0.30	0.35		0.30	0.35						0.50	0.89		
AIR CHANGE HEAT LOSS				635				821			595			140			218			545			535						5582		
AIR CHANGE HEAT GAIN					48				157			73			14			16			25			19							47	
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		0
HEAT GAIN APPLIANCES/LIGHTS					539				539			539			539			0			0			539				0			539
TOTAL HT LOSS BTU/H				2462				3185			2309			781			846			2113			2075			1025			10851		
TOTAL HT GAIN x 1.3 BTU/H					1890				4618			2518			1040			391			631			1183				374			1500

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

TOTAL HEAT GAIN BTU/H: 28978 TONS: 2.41 LOSS DUE TO VENTILATION LOAD BTU/H: 1593 STRUCTURAL HEAT LOSS: 38090 TOTAL COMBINED HEAT LOSS BTU/H: 39683

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 21
BUILDER: GREENPARK HOMES — TYPE: PRESTON 1 — DATE: Aug-19 — GFA: 2507 — LO# 82908

HEATING CFM 1131 — COOLING CFM 1131
TOTAL HEAT LOSS 38,090 — TOTAL HEAT GAIN 28,742
AIR FLOW RATE CFM 29.69 — AIR FLOW RATE CFM 39.35

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
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

#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	12	8	4
R/A	0	0	4	2	1

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

RUN #	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
ROOM NAME	MBR	ENS	WIC	BED-2	BED-3	BED-4	BATH	BED-2	BED-3	MBR	ENS-2	LV/DN	KIT	KIT	FAM	FAM	LAUN	W/R	FOY	MUD	BAS	BAS	BAS	BAS
RM LOSS MBH.	1.04	1.44	0.48	1.56	1.20	1.33	0.50	1.56	1.20	1.04	1.09	2.46	1.59	1.59	1.15	1.15	0.78	0.85	2.11	2.08	2.97	2.97	2.97	2.97
CFM PER RUN HEAT	31	43	14	46	36	40	15	46	36	31	32	73	47	47	34	34	23	25	63	62	88	88	88	88
RM GAIN MBH.	1.73	1.28	0.15	1.75	1.67	1.98	0.34	1.75	1.67	1.73	0.54	1.89	2.31	2.31	1.26	1.26	1.04	0.39	0.63	1.18	0.47	0.47	0.47	0.47
CFM PER RUN COOLING	68	50	6	69	66	78	14	69	66	68	21	74	91	91	50	50	41	15	25	47	18	18	18	18
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	0.16	0.16	0.17	0.17	0.17	0.17	0.17	0.17	0.16	0.16	0.16	0.16
ACTUAL DUCT LGH.	61	73	48	48	35	37	41	50	28	51	41	13	41	45	52	42	47	20	30	36	48	59	23	17
EQUIVALENT LENGTH	140	190	190	190	130	220	210	160	140	150	180	190	170	170	190	160	150	150	150	160	170	220	160	170
TOTAL EFFECTIVE LENGTH	201	263	238	238	165	257	251	210	168	201	221	203	211	215	242	202	197	170	180	196	218	279	183	187
ADJUSTED PRESSURE	0.09	0.07	0.07	0.07	0.1	0.07	0.07	0.08	0.1	0.09	0.08	0.08	0.08	0.08	0.07	0.09	0.09	0.1	0.1	0.09	0.07	0.06	0.09	0.09
ROUND DUCT SIZE	5	5	4	**6**	5	**6**	4	**6**	5	5	4	5	**6**	**6**	5	5	4	4	5	5	**6**	**6**	**6**	**6**
HEATING VELOCITY (ft/min)	228	316	161	235	264	204	172	235	264	228	367	536	240	240	250	250	264	287	463	455	449	449	449	449
COOLING VELOCITY (ft/min)	499	367	69	352	485	398	161	352	485	499	241	543	464	464	367	367	470	172	184	345	92	92	92	92
OUTLET GRILL SIZE	3X10	3X10	3X10	4X10	3X10	4X10	3X10	4X10	3X10	3X10	3X10	3X10	4X10	4X10	3X10	3X10	3X10	3X10	3X10	3X10	4X10	4X10	4X10	4X10
TRUNK	A	A	B	B	C	B	B	B	C	A	B	C	A	A	A	A	B	C	C	B	A	A	B	C

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

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	443	0.06	11.1	14	x	8	570	TRUNK G	0	0.00	0	0	x	8	0
TRUNK B	809	0.06	13.9	22	x	8	662	TRUNK H	0	0.00	0	0	x	8	0
TRUNK C	321	0.08	9.2	10	x	8	578	TRUNK I	0	0.00	0	0	x	8	0
TRUNK D	0	0.00	0	0	x	8	0	TRUNK J	0	0.00	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 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	285	0.05	9.9	12	x	8	428
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										BR
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
AIR VOLUME	130	135	135	100	310	155	0	0	0	0	0	0	0	0	0	166
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.	61	48	49	47	40	71	1	1	1	1	1	1	1	1	1	18
EQUIVALENT LENGTH	185	225	175	145	255	190	0	0	0	0	0	0	0	0	0	260
TOTAL EFFECTIVE LH	246	273	224	192	295	261	1	1	1	1	1	1	1	1	1	278
ADJUSTED PRESSURE	0.06	0.05	0.07	0.08	0.05	0.06	14.80	14.80	14.80	14.80	14.80	14.80	14.80	14.80	14.80	0.05
ROUND DUCT SIZE	7	7.5	6.8	5.9	10.2	7.5	0	0	0	0	0	0	0	0	0	8.1
INLET GRILL SIZE	8	8	8	8	8	8	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
INLET GRILL SIZE	14	14	14	14	30	14	0	0	0	0	0	0	0	0	0	24

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 1 LO # 82908
SITE NAME: LAMBERT'S LANE PH.2 LOT 21

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	6	@ 10.6 cfm	63.6	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
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

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

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HEAT LOSS AND GAIN SUMMARY SHEET

MODEL:	PRESTON 1		LOT 21	**BUILDER:**	GREENPARK HOMES
SFQT:	2507	**LO#**	82908	**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

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

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):	33415.0	ASSUMED (Y/N):	Y
INTERNAL SHADING:	BLINDS/CURTAINS	ASSUMED OCCUPANTS:	5
INTERIOR LIGHTING LOAD ($Btu/h/ft^2$):	1.50	DC BRUSHLESS MOTOR (Y/N):	Y
FOUNDATION CONFIGURATION	BCIN_1	DEPTH BELOW GRADE:	6.0 ft
LENGTH: 54.0 ft	WIDTH: 30.0 ft	EXPOSED PERIMETER:	155.0 ft
WOB INSULATION CONFIGURATION	SCB_9	WOB EXPOSED PERIMETER	13.0 ft

2012 OBC - COMPLIANCE PACKAGE	**Compliance Package ENERGYSTAR**	
Component	**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

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CSA F280-12 Residential Heat Loss and Heat Gain Calculations

Formula Sheet (For Air Leakage / Ventiliation Calculation)

LO#: 82908 Model: PRESTON 1 Builder: GREENPARK HOMES Date: 8/1/2019

Volume Calculation

House Volume

Level	Floor Area (ft^2)	Floor Height (ft)	Volume (ft^3)
Bsmt	1087	9	9783
First	1087	10	10870
Second	1418	8	11461.694
Third	0	9	0
Fourth	0	9	0
		Total:	32,114.7 ft^3
		Total:	909.4 m^3

Air Change & Delta T Data

WINTER NATURAL AIR CHANGE RATE	0.262
SUMMER NATURAL AIR CHANGE RATE	0.085

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

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

0.262 x 252.61 x 41 °C x 1.2 = **3272 W**

= **11164 Btu/h**

6.2.6 Sensible Gain due to Air Leakage

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

= 0.085 x 252.61 x 6 °C x 1.2 = **158 W**

= **538 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	11,164	6,294	0.887
2	0.3		9,641	0.347
3	0.2		10,269	0.217
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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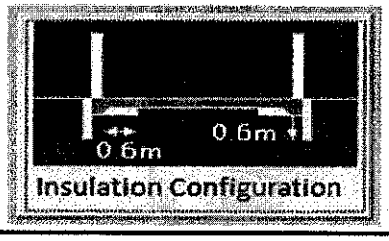
THIS STRUCTURE MUST BE CONSTRUCTED TO MEET OR EXCEED THE PROVISIONS OF THE ONTARIO BUILDING CODE

Residential Slab 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		
Length (m):	**1.5**	
Width (m):	**4.0**	
Exposed Perimeter (m):	**4.0**	
Radiant Slab		
Heated Fraction of the Slab:	**0**	
Fluid Temperature (°C):	**33**	
Design Months		
Heating Month	**1**	
Results		
Heating Load (Watts):	**32**	

TYPE: PRESTON 1 LOT 21
LO# 82908

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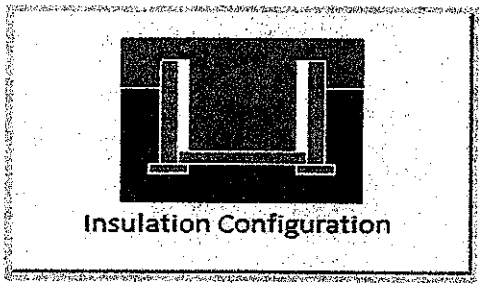
Residential Foundation Thermal Load Calculator

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):	4.6	
Floor Width (m):	9.1	
Exposed Perimeter (m):	47.2	
Wall Height (m):	2.7	
Depth Below Grade (m):	1.40	
Window Area (m^2):	1.1	
Door Area (m^2):	1.9	


Insulation Configuration

Radiant Slab		
Heated Fraction of the Slab:	0	
Fluid Temperature (°C):	33	
Design Months		
Heating Month	1	
Foundation Loads		
Heating Load (Watts):	**855**	

TYPE: PRESTON 1 LOT 21
LO# 82908

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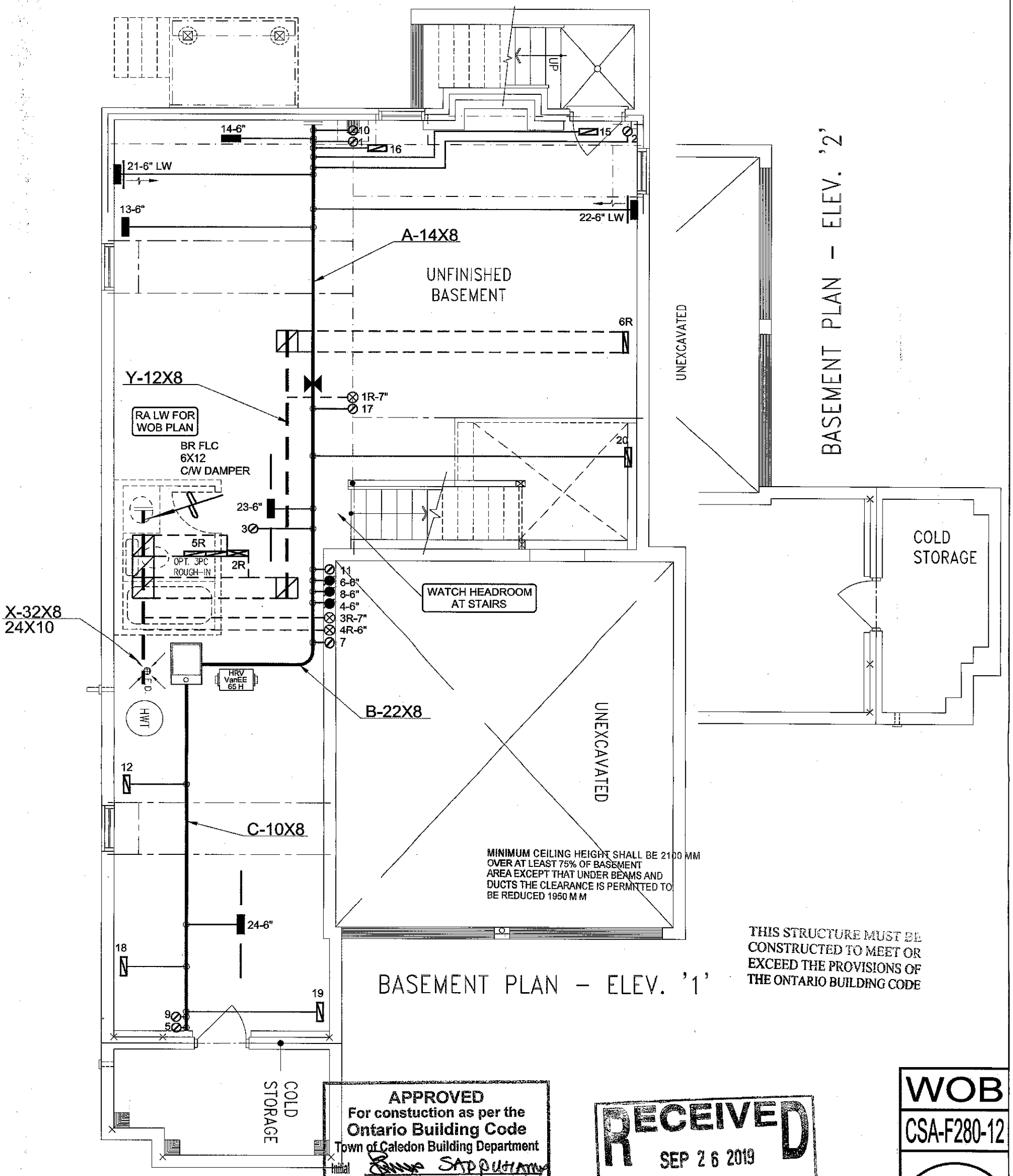
Air Infiltration Residential Load Calculator

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):	8.53
Building Configuration	
Type:	Detached
Number of Stories:	Two
Foundation:	Full
House Volume (m^3):	946.2
Air Leakage/Ventilation	
Air Tightness Type:	Energy Star Detached (2.5 ACH)
Custom BDT Data:	ELA @ 10 Pa. 883.3 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**

TYPE: PRESTON 1 LOT 21

LO# 82908



BASEMENT PLAN – ELEV. '1'

BASEMENT PLAN – ELEV. '2'

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

APPROVED
For constuction as per the
Ontario Building Code
Town of Caledon Building Department
Initial SAP BUILDING
Date Oct 09, 2019
File # BA 19 0702

RECEIVED
SEP 2 6 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

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

LOT 21
PRESTON 1 2507 sqft

HVAC DESIGNS LTD.
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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.

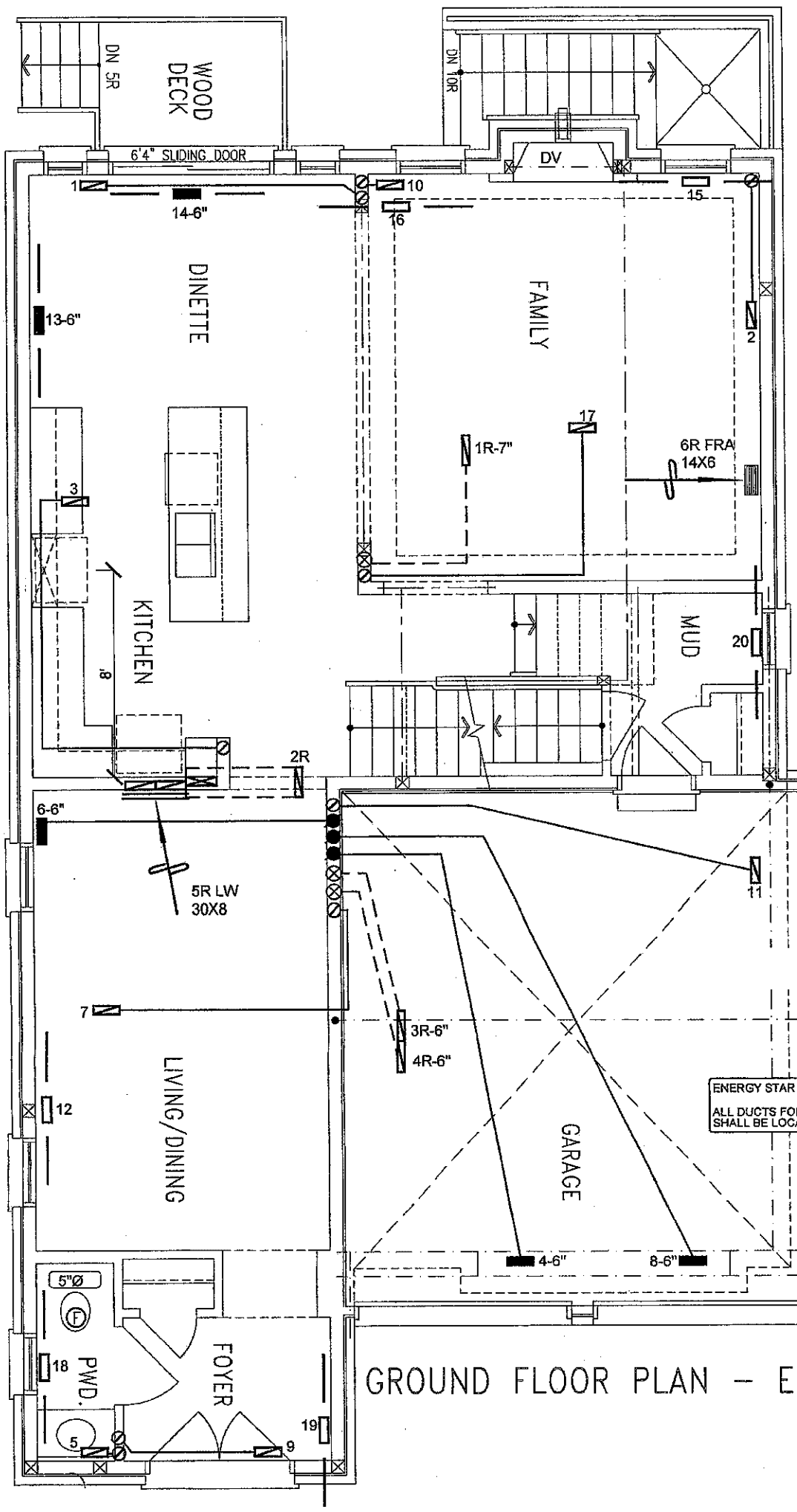
HEAT LOSS 39683 BTU/H	
UNIT DATA	
MAKE	GOODMAN
MODEL	GMEC960603BNA-60
INPUT	60 MBTU/H
OUTPUT	57.6 MBTU/H
COOLING	2.5 TONS
FAN SPEED	1131 cfm @ 0.6" w.c.

# OF RUNS	S/A	R/A	FANS
3RD FLOOR			
2ND FLOOR	12	4	4
1ST FLOOR	8	2	2
BASEMENT	4	1	0

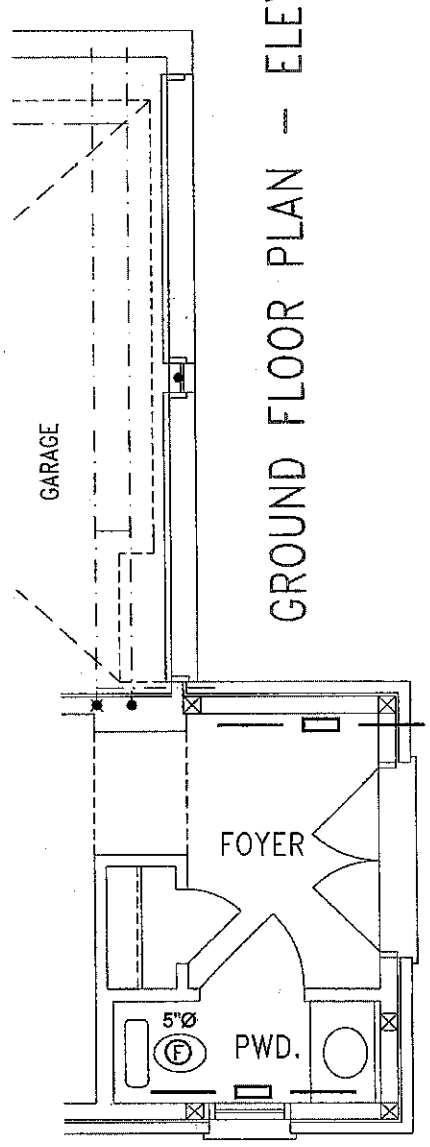
ALL S/A DIFFUSERS 4 "x10" UNLESS NOTED OTHERWISE ON LAYOUT. ALL S/A RUNS 5"Ø UNLESS NOTED OTHERWISE ON LAYOUT. UNDERCUT DOORS 1" min. FOR R/A

Sheet Title
BASEMENT HEATING LAYOUT

Date JUNE/2019
Scale 3/16" = 1'-0"
BCIN# 19669
LO# 82908



GROUND FLOOR PLAN – ELEV. '1'



GROUND FLOOR PLAN – ELEV. '2'

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.

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

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
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BUILDING SECTION
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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
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REVISIONS

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LOT 21
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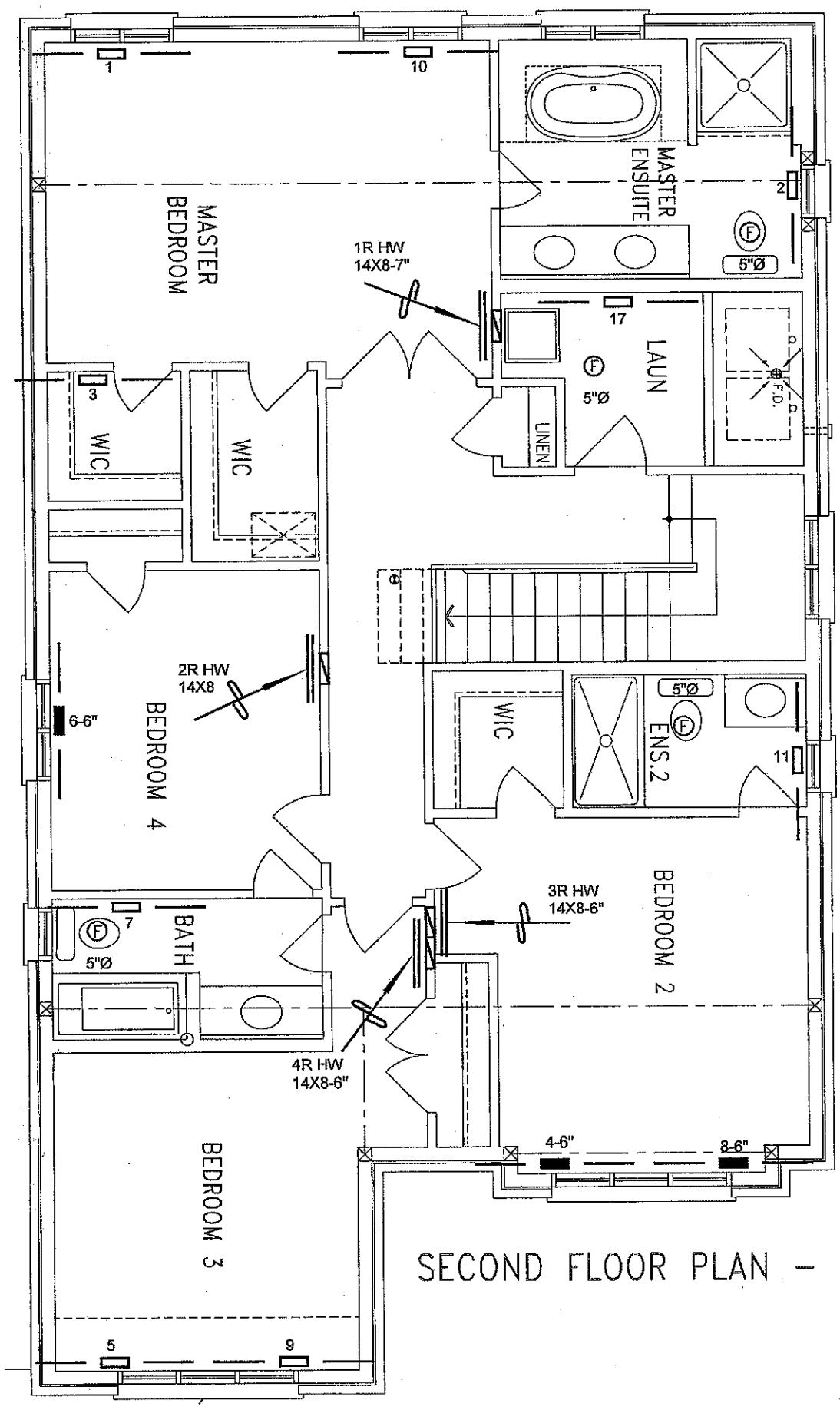
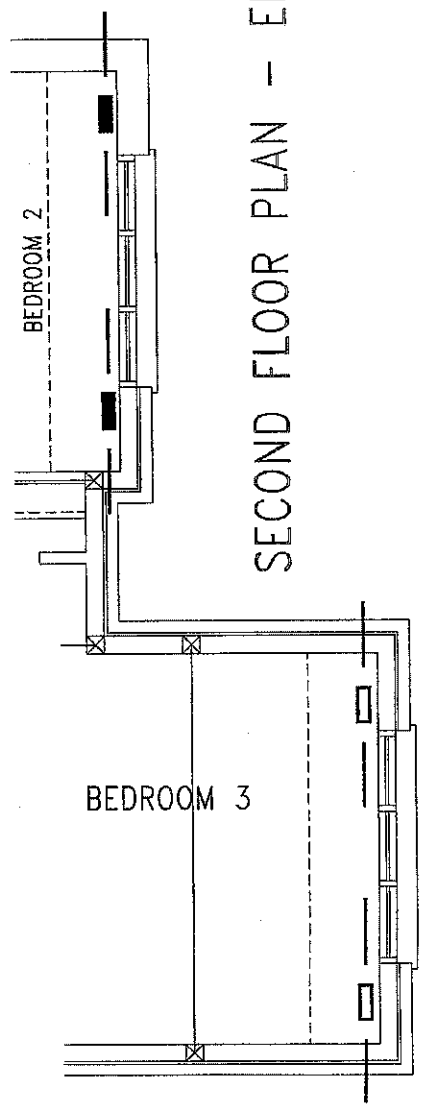
THIS STRUCTURE MUST BE CONSTRUCTED TO MEET OR EXCEED THE PROVISIONS OF [illegible] BUILDING CODE

Sheet Title
FIRST FLOOR HEATING LAYOUT

Date JUNE/2019
Scale 3/16" = 1'-0"
BCIN# 19669
LO# 82908



SECOND FLOOR PLAN – ELEV. '1'



SECOND FLOOR PLAN – ELEV. '2'

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energy
ENERGY STAR

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THE ONTARIO

Sheet Title
SECOND FLOOR HEATING LAYOUT

Date JUNE/2019
Scale 3/16" = 1'-0"
BCIN# 19669
LO# 82908