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: RUSSEL GARDENS — DATE: Jul-17 — WINTER NATURAL AIR CHANGE RATE 0.409 — HEAT LOSS ΔT °F. 71 — CSA-F280-12
BUILDER: GREENPARK HOMES — TYPE: HIGHGROVE 11 — GFA: 2451 — LO# 75033 — SUMMER NATURAL AIR CHANGE RATE 0.146 — HEAT GAIN ΔT °F. 14 — SB-12 PACKAGE A1

ROOM USE			MBR			ENS				BED-2			BED-3			BED-4			BATH				ENS-2				
EXP. WALL			44			24				17			32			21			10				5				
CLG. HT.			9			9				9			9			9			9				9				
	FACTORS																										
GRS.WALL AREA	LOSS	GAIN	396			216				153			288			189			90				45				
GLAZING				LOSS	GAIN		LOSS	GAIN			LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN			LOSS	GAIN		
NORTH	19.8	16.3	0	0	0	0	0	0		0	0	0	30	593	488	21	415	341	0	0	0		0	0	0		
EAST	19.8	41.8	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0	0	0	0		0	0	0		
SOUTH	19.8	25.2	26	514	655	21	415	529		0	0	0	0	0	0	0	0	0	0	0	0		0	0	0		
WEST	19.8	41.8	40	791	1673	0	0	0		21	415	878	14	277	586	0	0	0	11	217	460		0	0	0		
SKYLT.	34.6	102.0	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0	0	0	0		0	0	0		
DOORS	23.5	4.6	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0	0	0	0		0	0	0		
NET EXPOSED WALL	4.1	0.8	330	1368	267	195	808	158		132	547	107	244	1012	198	168	696	136	79	328	64		45	187	36		
NET EXPOSED BSMT WALL ABOVE GR	3.3	0.7	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0	0	0	0		0	0	0		
EXPOSED CLG	1.2	0.6	338	401	203	105	125	63		221	263	134	167	199	101	155	185	94	81	97	49		36	42	21		
NO ATTIC EXPOSED CLG	2.6	1.3	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0	0	0	0		0	0	0		
EXPOSED FLOOR	2.4	0.5	0	0	0	0	0	0		0	0	0	0	0	0	131	310	61	0	0	0		35	83	16		
BASEMENT/CRAWL HEAT LOSS				0			0				0			0			0			0			0				
SLAB ON GRADE HEAT LOSS				0			0				0			0			0			0			0				
SUBTOTAL HT LOSS				3073			1349				1226			2080			1607			642				311			
SUB TOTAL HT GAIN					2798			750				1119			1372			632			573				74		
LEVEL FACTOR / MULTIPLIER			0.20	0.34		0.20	0.34			0.20	0.34		0.20	0.34		0.20	0.34		0.20	0.34			0.20	0.34			
AIR CHANGE HEAT LOSS				1030			462				411			698			539			215				104			
AIR CHANGE HEAT GAIN					298			80				119			145			67			61				8		
DUCT LOSS				0			0				0			0			215			0				42			
DUCT GAIN					0			0				0			0			142			0				8		
HEAT GAIN PEOPLE	240		2		480	0		0		1		240	1		240	1		240	0		0		0		0		
HEAT GAIN APPLIANCES/LIGHTS					478			0				478			478			478			0				0		
TOTAL HT LOSS BTU/H				4104			1801				1637			2778			2360			857				457			
TOTAL HT GAIN x 1.3 BTU/H					5270			1079				2542			2906			2026			824				117		

ROOM USE			DIN			OFF			KT/FM				LAUN			PWD			FOY				BAS			
EXP. WALL			22			33			65				10			18			11				139			
CLG. HT.			10			10			10				12			14			10				9			
	FACTORS																									
GRS.WALL AREA	LOSS	GAIN	220			330			650				120			252			110				834			
GLAZING				LOSS	GAIN		LOSS	GAIN		LOSS	GAIN			LOSS	GAIN		LOSS	GAIN		LOSS	GAIN			LOSS	GAIN	
NORTH	19.8	16.3	0	0	0	37	731	601	0	0	0		0	0	0	0	0	0	0	0	0		0	0	0	
EAST	19.8	41.8	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0		12	237	502	
SOUTH	19.8	25.2	0	0	0	0	0	0	80	1581	2014		0	0	0	0	0	0	0	0	0		0	0	0	
WEST	19.8	41.8	37	731	1548	15	297	627	37	731	1548		0	0	0	0	0	0	6	119	251		0	0	0	
SKYLT.	34.6	102.0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0		0	0	0	
DOORS	23.5	4.6	0	0	0	0	0	0	0	0	0		20	469	92	0	0	0	40	938	183		20	469	92	
NET EXPOSED WALL	4.1	0.8	183	759	148	278	1152	225	533	2210	432		100	416	81	252	1045	204	64	266	52		0	0	0	
NET EXPOSED BSMT WALL ABOVE GR	3.3	0.7	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0		417	1394	272	
EXPOSED CLG	1.2	0.6	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0		0	0	0	
NO ATTIC EXPOSED CLG	2.6	1.3	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0		0	0	0	
EXPOSED FLOOR	2.4	0.5	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				4577		
SLAB ON GRADE HEAT LOSS				0			0			0				0			0			0						
SUBTOTAL HT LOSS				1490			2180			4522				884			1045			1322				6677		
SUB TOTAL HT GAIN					1696			1454			3994				173			204			486					866	
LEVEL FACTOR / MULTIPLIER			0.30	0.45		0.30	0.45		0.30	0.45			0.30	0.45		0.30	0.45		0.30	0.45			0.50	1.29		
AIR CHANGE HEAT LOSS				674			986			2045				400			472			698				8624		
AIR CHANGE HEAT GAIN					180			155			425				18			22			52					92	
DUCT LOSS				0			0			0				0			0			0				0		
DUCT GAIN					0			0			0				0			0			0					0	
HEAT GAIN PEOPLE	240		0		0	0		0	0		0		0		0	0		0	0		0		0		0	
HEAT GAIN APPLIANCES/LIGHTS					478			478			478				478			0			0					478	
TOTAL HT LOSS BTU/H				2164			3166			6567				1283			1517			1920				15300		
TOTAL HT GAIN x 1.3 BTU/H					3060			2712			6365				869			294			699					1867	

TOTAL HEAT GAIN BTU/H: 31150 — TONS: 2.60 — LOSS DUE TO VENTILATION LOAD BTU/H: 2650 — STRUCTURAL HEAT LOSS: 46911 — TOTAL COMBINED HEAT LOSS BTU/H: 48561

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 D'ROURKE

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SITE NAME: RUSSEL GARDENS
BUILDER: GREENPARK HOMES
TYPE: HIGHGROVE 11 DATE: Jul-17 GFA: 2451 LO# 75033

HEATING CFM	1131	COOLING CFM	1131	furnace pressure	0.6
TOTAL HEAT LOSS	45,911	TOTAL HEAT GAIN	30,632	furnace filter	0.05
AIR FLOW RATE CFM	24.63	AIR FLOW RATE CFM	36.92	a/c coil pressure	0.2
				available pressure for s/a & r/a	0.35

RUN COUNT	4th	3rd	2nd	1st	Bas
S/A	0	0	10	10	4
R/A	0	0	4	2	1

plenum pressure s/a	0.18	r/a pressure	0.17
max s/a dif press. loss	0.03	r/a grille press. Loss	0.02
min adjusted pressure s/a	0.15	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

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		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-2	BED-3	BED-4	BATH	BED-3	BED-4	MBR	ENS-2	DIN	OFF	KT/FM	KT/FM	KT/FM	LAUN	PWD	FOY	KT/FM	BAS	BAS	BAS	BAS
RM LOSS MBH.	2.05	1.80		1.64	1.39	1.18	0.86	1.39	1.18	2.05	0.46	2.16	1.58	1.64	1.64	1.64	1.28	1.52	1.92	1.64	3.83	3.83	3.83	3.83
CFM PER RUN HEAT	51	44		40	34	29	21	34	29	51	11	53	39	40	40	40	32	37	47	40	94	94	94	94
RM GAIN MBH.	2.63	1.08		2.54	1.45	1.01	0.82	1.45	1.01	2.63	0.12	3.06	1.36	1.59	1.59	1.59	0.87	0.29	0.70	1.59	0.47	0.47	0.47	0.47
CFM PER RUN COOLING	97	40		94	54	37	30	54	37	97	4	113	50	59	59	59	32	11	26	59	17	17	17	17
ADJUSTED PRESSURE	0.16	0.17		0.16	0.17	0.17	0.17	0.17	0.17	0.16	0.17	0.15	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.	41	50		41	43	33	28	35	38	51	35	30	29	32	37	28	11	27	23	23	22	26	19	31
EQUIVALENT LENGTH	150	150		180	190	160	190	160	150	180	170	180	150	120	130	140	90	120	160	120	140	100	130	160
TOTAL EFFECTIVE LENGTH	191	200		221	233	193	218	195	188	231	205	210	179	152	167	168	101	147	183	143	162	126	149	191
ADJUSTED PRESSURE	0.08	0.09		0.07	0.07	0.09	0.08	0.09	0.09	0.07	0.08	0.07	0.1	0.11	0.1	0.1	0.17	0.12	0.09	0.12	0.1	0.13	0.11	0.08
ROUND DUCT SIZE	6	4		6	5	4	4	5	4	6	4	6	4	4	5	5	4	4	4	4	5	5	5	6
HEATING VELOCITY (ft/min)	260	505		204	250	333	241	250	333	260	126	270	447	459	294	294	367	424	539	459	690	690	690	479
COOLING VELOCITY (ft/min)	495	459		479	396	424	344	396	424	495	46	576	574	677	433	433	367	126	298	677	125	125	125	87
OUTLET GRILL SIZE	4X10	3X10		4X10	3X10	3X10	3X10	3X10	3X10	4X10	3X10	4X10	3X10	3X10	3X10	3X10	3X10	3X10	3X10	3X10	3X10	3X10	3X10	4X10
TRUNK	B	E		B	D	E	D	D	E	B	E	B	D	B	B	A	E	A	D	A	D	A	A	B

RUN #	25
ROOM NAME	OFF
RM LOSS MBH.	1.58
CFM PER RUN HEAT	39
RM GAIN MBH.	1.36
CFM PER RUN COOLING	50
ADJUSTED PRESSURE	0.17
ACTUAL DUCT LGH.	22
EQUIVALENT LENGTH	130
TOTAL EFFECTIVE LENGTH	152
ADJUSTED PRESSURE	0.11
ROUND DUCT SIZE	4
HEATING VELOCITY (ft/min)	447
COOLING VELOCITY (ft/min)	574
OUTLET GRILL SIZE	3X10
TRUNK	D

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	305	0.10	8.5	8	x	8	686	TRUNK G	0	0.00	0	0	x	8	0
TRUNK B	369	0.07	10	12	x	8	554	TRUNK H	0	0.00	0	0	x	8	0
TRUNK C	674	0.07	12.5	18	x	8	674	TRUNK I	0	0.00	0	0	x	8	0
TRUNK D	308	0.07	9.3	10	x	8	554	TRUNK J	0	0.00	0	0	x	8	0
TRUNK E	1127	0.07	15.2	26	x	8	780	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 #	1	2	3	4	5	6										BR
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
AIR VOLUME	100	95	135	155	135	330	0	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.	34	32	43	41	26	31	1	1	1	1	1	1	1	1	1	14
EQUIVALENT LENGTH	135	175	185	145	215	190	0	0	0	0	0	0	0	0	0	150
TOTAL EFFECTIVE LH	169	207	228	186	241	221	1	1	1	1	1	1	1	1	1	164
ADJUSTED PRESSURE	0.09	0.07	0.06	0.08	0.06	0.07	14.80	14.80	14.80	14.80	14.80	14.80	14.80	14.80	14.80	0.09
ROUND DUCT SIZE	5.7	6	7.1	7	7.1	9.6	0	0	0	0	0	0	0	0	0	7.2
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	14	30	0	0	0	0	0	0	0	0	0	14

RETURN AIR TRUNK SIZE

	TRUNK CFM	STATIC PRESS.	ROUND DUCT	RECT DUCT			VELOCITY (ft/min)
TRUNK O	0	0.06	0	0	x	8	0
TRUNK P	0	0.06	0	0	x	8	0
TRUNK Q	0	0.06	0	0	x	8	0
TRUNK R	0	0.06	0	0	x	8	0
TRUNK S	0	0.06	0	0	x	8	0
TRUNK T	0	0.06	0	0	x	8	0
TRUNK U	0	0.06	0	0	x	8	0
TRUNK V	0	0.06	0	0	x	8	0
TRUNK W	0	0.06	0	0	x	8	0
TRUNK X	1131	0.06	15.8	30	x	8	679
TRUNK Y	620	0.06	12.6	18	x	8	620
TRUNK Z	0	0.06	0	0	x	8	0
DROP	1131	0.06	15.8	24	x	10	679

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[signature] INDIVIDUAL BCIN: 19669 MICHAEL O'ROURKE

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TYPE: HIGHGROVE 11 LO # 75033
SITE NAME: RUSSEL GARDENS

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	4	@ 10.6 cfm	42.4	cfm
Table 9.32.3.A.		TOTAL	169.6	cfm

PRINCIPAL VENTILATION CAPACITY REQUIRED 9.32.3.4.(1)

1	Bedroom	31.8	cfm
2	Bedroom	47.7	cfm
3	Bedroom	63.6	cfm
4	Bedroom	79.5	cfm
5	Bedroom	95.4	cfm
	TOTAL	79.5	cfm

SUPPLEMENTAL VENTILATION CAPACITY 9.32.3.5.

Total Ventilation Capacity	169.6	cfm
Less Principal Ventil. Capacity	139	cfm
Required Supplemental Capacity	30.6	cfm

PRINCIPAL EXHAUST FAN CAPACITY

Model: VANEE 60H-V+ Location: BSMT

139.0 cfm 3.0 sones [✓] HVI Approved

PRINCIPAL EXHAUST HEAT LOSS CALCULATION

CFM		ΔT °F		FACTOR		% LOSS
139.0 CFM	X	71 F	X	1.08	X	0.25

SUPPLEMENTAL FANS NUTONE

Location	Model	cfm	HVI	Sones
ENS	QTXEN050C	50	✓	0.3
BATH	QTXEN050C	50	✓	0.3
ENS-2	QTXEN050C	50	✓	0.3
PWD	QTXEN050C	50	✓	0.3

HEAT RECOVERY VENTILATOR 9.32.3.11.

Model: VANEE 60H-V+

139 cfm high 50 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: July-17

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: HIGHGROVE 11 **BUILDER:** GREENPARK HOMES
SFQT: 2451 **LO#** 75033 **SITE:** RUSSEL GARDENS

DESIGN ASSUMPTIONS

HEATING	°F	COOLING	°F
OUTDOOR DESIGN TEMP.	1	OUTDOOR DESIGN TEMP.	88
INDOOR DESIGN TEMP.	72	INDOOR DESIGN TEMP. (MAX 75°F)	74

BUILDING DATA

ATTACHMENT:	ATTACHED	# OF STORIES (+BASEMENT):	3
FRONT FACES:	EAST	ASSUMED (Y/N):	Y
AIR CHANGES PER HOUR:	4.55	ASSUMED (Y/N):	Y
AIR TIGHTNESS CATEGORY:	AVERAGE	ASSUMED (Y/N):	Y
WIND EXPOSURE:	SHELTERED	ASSUMED (Y/N):	Y
HOUSE VOLUME (ft^3):	33379.0	ASSUMED (Y/N):	Y
INTERNAL SHADING:	BLINDS/CURTAINS	ASSUMED OCCUPANTS:	5
INTERIOR LIGHTING LOAD ($Btu/h/ft^2$):	1.20	DC BRUSHLESS MOTOR (Y/N):	Y
FOUNDATION CONFIGURATION	BCIN_1	DEPTH BELOW GRADE:	6.0 ft
LENGTH: 49.0 ft	WIDTH: 35.0 ft	EXPOSED PERIMETER:	139.0 ft

2012 OBC - COMPLIANCE PACKAGE **Component**	**Compliance Package A1**	
	Nominal	**Min. Eff.**
Ceiling with Attic Space Minimum RSI (R)-Value	60	59.22
Ceiling Without Attic Space Minimum RSI (R)-Value	31	27.65
Exposed Floor Minimum RSI (R)-Value	31	29.80
Walls Above Grade Minimum RSI (R)-Value	22	17.03
Basement Walls Minimum RSI (R)-Value	20 ci	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	0.28	-
Skylights Maximum U-Value	0.49	-
Space Heating Equipment Minimum AFUE	0.96	-
HRV Minimum Efficiency	75%	-
Domestic Hot Water Heater Minimum EF	0.8	-

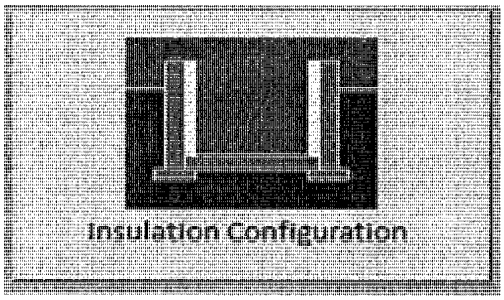
INDIVIDUAL BCIN: 19669
MICHAEL O'ROURKE

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:	Hamilton	
Site Description		
Soil Conductivity:	Normal conductivity: dry dand, loam, clay	
Water Table:	Normal (7-10 m, 23-33 ft)	
Foundation Dimensions		
Floor Length (m):	**14.9**	 Insulation Configuration
Floor Width (m):	**10.7**	
Exposed Perimeter (m):	**42.4**	
Wall Height (m):	**2.7**	
Depth Below Grade (m):	**1.83**	
Window Area (m^2):	**1.1**	
Door Area (m^2):	**1.9**	
Radiant Slab		
Heated Fraction of the Slab:	**0**	
Fluid Temperature (°C):	**33**	
Design Months		
Heating Month	**1**	
Foundation Loads		
Heating Load (Watts):		**1341**

TYPE: HIGHGROVE 11
LO# 75033

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Air Infiltration Residential Load Calculator

Supplemental tool for CAN/CSA-F280

Weather Station Description					
Province:	Ontario				
Region:	Hamilton				
Weather Station Location:	Open flat terrain, grass				
Anemometer height (m):	10				
Local Shielding					
Building Site:	Suburban, forest				
Walls:	Heavy				
Flue:	Heavy				
Highest Ceiling Height (m):	6.71				
Building Configuration					
Type:	Semi				
Number of Stories:	Two				
Foundation:	Full				
House Volume (m^3):	945.2				
Air Leakage/Ventilation					
Air Tightness Type:	Average (1946-1960) (4.55 ACH)				
Custom BDT Data:	ELA @ 10 Pa.				1605.8 cm^2
	4.55				ACH @ 50 Pa
Mechanical Ventilation (L/s):	Total Supply			Total Exhaust	
	65.6			65.6	
Flue Size					
Flue #:	#1	#2	#3	#4	
Diameter (mm):	0	0	0	0	
Natural Infiltration Rates					
Heating Air Leakage Rate (ACH/H):	**0.409**				
Cooling Air Leakage Rate (ACH/H):	**0.146**				

TYPE: HIGHGROVE 11
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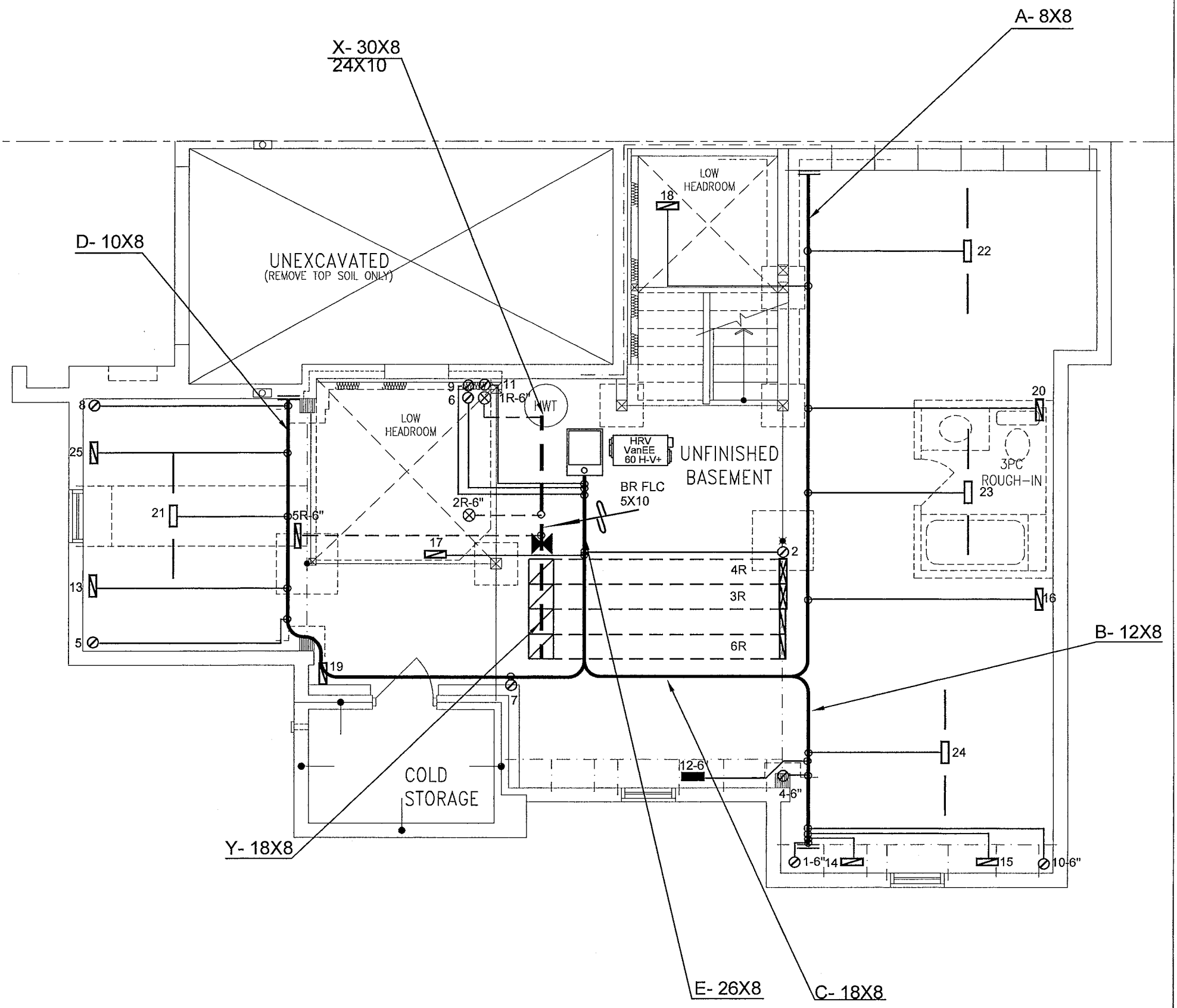


I MICHAEL O'ROURKE HAVE REVIEW AND TAKE RESPONSIBILITY FOR THE DESIGN WORK AND AM QUALIFIED UNDER DIVISION C, 3.2.5 OF THE BUILDING CODE.

Michael O'Rourke, BCIN# 19669
HVAC DESIGNS LTD.

CSA-F280-12

PACKAGE A1

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

RUSSEL GARDENS
HAMILTON, ONTARIO

HIGHGROVE 11 2451 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
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 48561 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	10	4	3
1ST FLOOR	10	2	3
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

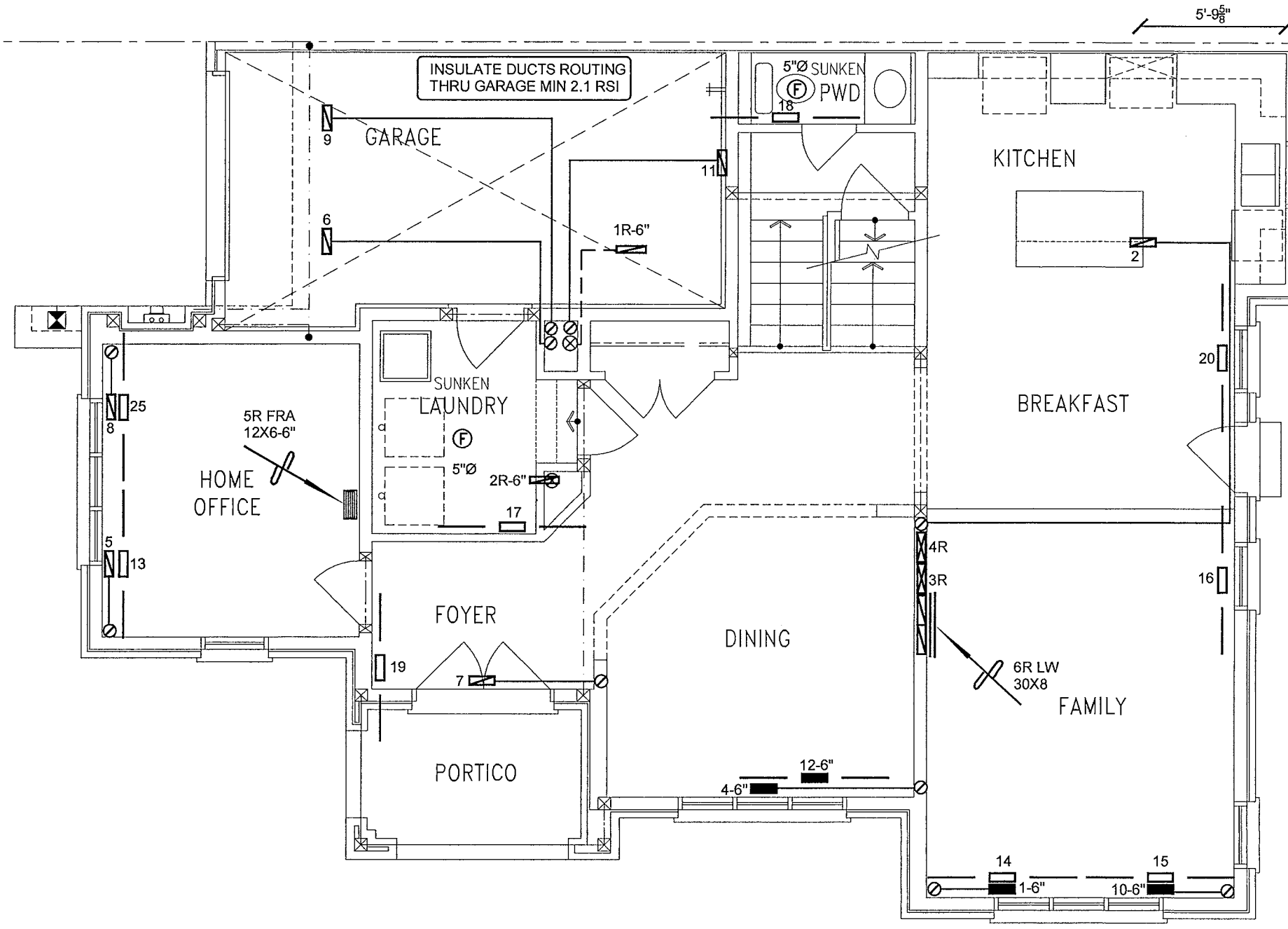
BASEMENT
HEATING
LAYOUT

Date JULY/2017

Scale 3/16" = 1'-0"

BCIN# 19669

LO# 75033



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— ▬ —	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

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Sheet Title

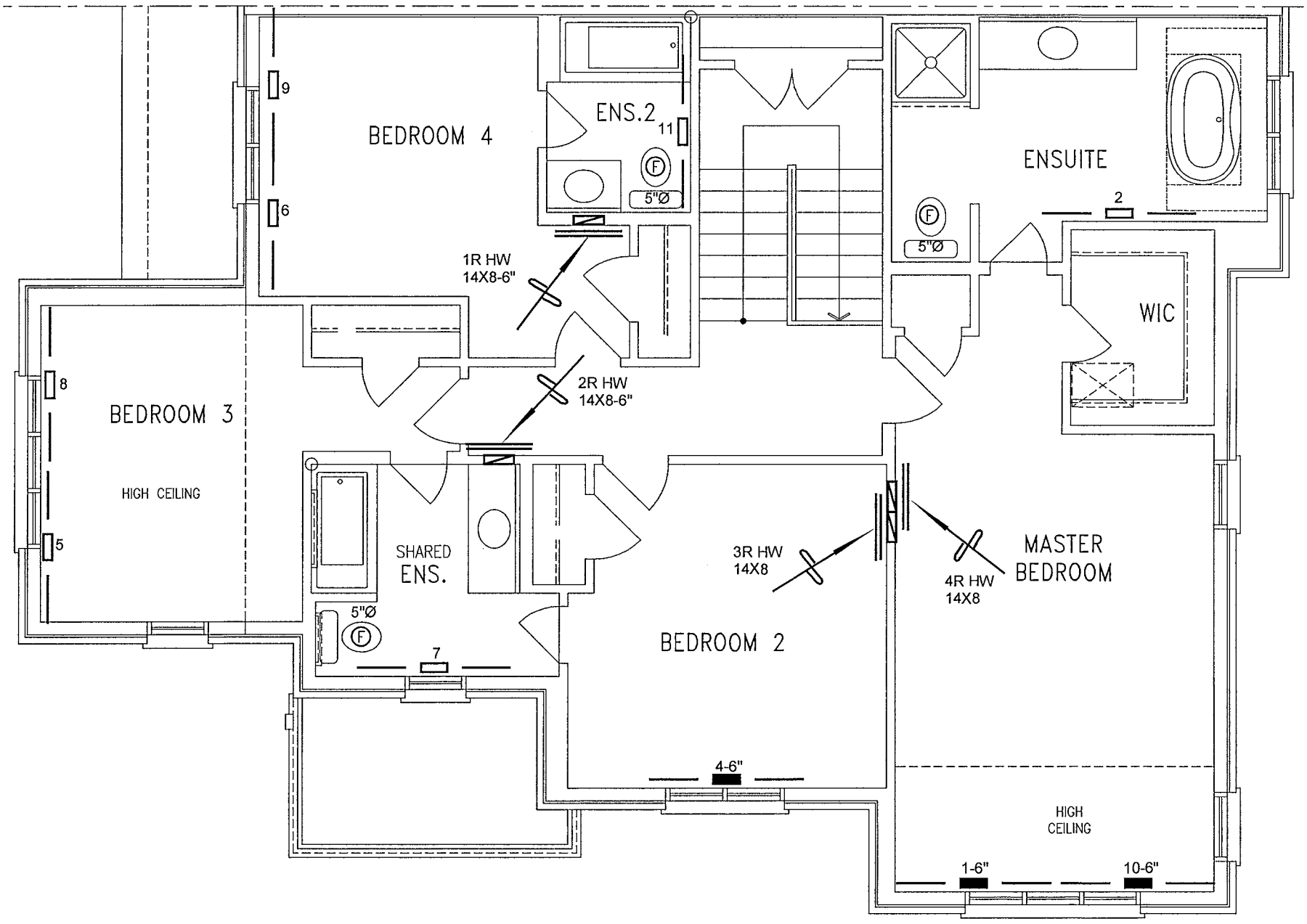
FIRST FLOOR
HEATING
LAYOUT

Date JULY/2017

Scale 3/16" = 1'-0"

BCIN# 19669

LO# 75033



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Sheet Title
SECOND FLOOR HEATING LAYOUT

Date JULY/2017
Scale 3/16" = 1'-0"
BCIN# 19669
LO# 75033