

[illegible]

SITE NAME: RUSSEL GARDENS
BUILDING: GREENPARK HOMES

TYPE: HIGHGROVE 1

DATE: Jul-17

GFA: 1594 LO# 75019

HEATING CFM 890 COOLING CFM 890
TOTAL HEAT GAIN 23,575
AIR FLOW RATE CFM 37.75

#GOODMAN
GMEC960402BNA 40
FAN SPEED LOW

AFUE = 96 %
INPUT (BTU/H) = 40,000
OUTPUT (BTU/H) = 38,400

RUN COUNT	4th	3rd	2nd	1st	Bas
S/A	0	0	9	7	3
R/A	0	0	3	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	10	12	13	14	15
ROOM NAME	MBR	ENS	WIC	BED-2	BED-3	BED-2	BATH	BED-3	MBR	LV/DN	LV/DN	KT/BR	KT/BR
RM LOSS MBH	1.22	0.81	0.31	0.94	0.98	0.94	0.13	0.98	1.22	2.01	2.01	1.05	1.05
CFM PER RUN HEAT	37	25	9	29	30	29	4	30	37	62	62	32	32
RM GAIN MBH	2.05	1.03	0.11	1.63	1.97	1.63	0.07	1.97	2.05	2.39	2.39	0.68	0.68
CFM PER RUN COOLING	77	39	4	62	74	62	3	74	77	90	90	26	26
ADJUSTED PRESSURE	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
ACTUAL DUCT LGH	37	24	21	24	46	34	35	42	46	27	36	16	14
EQUIVALENT LENGTH	180	180	170	150	130	160	130	120	200	120	120	150	130
TOTAL EFFECTIVE LENGTH	227	204	191	174	176	194	165	162	246	147	156	166	144
ADJUSTED PRESSURE	0.08	0.08	0.09	0.1	0.1	0.09	0.1	0.11	0.07	0.11	0.11	0.1	0.12
ROUND DUCT SIZE	5	4	4	5	5	5	4	5	6	5	5	4	4
HEATING VELOCITY (ft/min)	272	287	103	213	220	213	46	220	189	455	455	367	367
COOLING VELOCITY (ft/min)	565	447	46	455	543	455	34	543	393	661	661	298	298
OUTLET GRILL SIZE	3X10	3X10	3X10	3X10	3X10	3X10	3X10	3X10	4X10	3X10	3X10	3X10	3X10
TRUNK	A	C	C	C	B	C	C	B	A	A	A	A	A

RUN #	15	16	17	18	19	20	21	22	23
ROOM NAME	PWD	FOY	MUD	BAS	BAS	BAS	BAS	BAS	BAS
RM LOSS MBH	0.49	2.82	1.18	3.64	3.64	3.64	3.64	3.64	3.64
CFM PER RUN HEAT	15	86	36	112	112	112	112	112	112
RM GAIN MBH	0.11	1.66	1.15	0.67	0.67	0.67	0.67	0.67	0.67
CFM PER RUN COOLING	4	63	43	25	25	25	25	25	25
ADJUSTED PRESSURE	0.17	0.16	0.17	0.15	0.15	0.15	0.15	0.15	0.15
ACTUAL DUCT LGH	23	35	18	27	13	29	13	29	29
EQUIVALENT LENGTH	120	140	190	120	170	110	170	110	110
TOTAL EFFECTIVE LENGTH	143	175	208	147	183	139	147	183	139
ADJUSTED PRESSURE	0.12	0.09	0.08	0.1	0.08	0.11	0.08	0.11	0.11
ROUND DUCT SIZE	4	5	4	6	6	4	6	6	4
HEATING VELOCITY (ft/min)	172	631	413	571	571	571	571	571	571
COOLING VELOCITY (ft/min)	46	463	493	127	127	127	127	127	127
OUTLET GRILL SIZE	3X10	3X10	3X10	4X10	4X10	4X10	4X10	4X10	4X10
TRUNK	B	B	A	A	A	A	A	A	B

TRUNK	CFM	STATIC PRESS	ROUND DUCT	RECT DUCT	VELOCITY (ft/min)	TRUNK	CFM	STATIC PRESS	ROUND DUCT	RECT DUCT	VELOCITY (ft/min)
TRUNK A	522	0.07	11.4	16	8	TRUNK P	0	0.06	0	0	8
TRUNK B	273	0.09	8.4	8	8	TRUNK Q	0	0.06	0	0	8
TRUNK C	369	0.08	9.7	12	8	TRUNK R	0	0.06	0	0	8
TRUNK D	0	0.00	0	0	0	TRUNK S	0	0.06	0	0	8
TRUNK E	0	0.00	0	0	0	TRUNK T	0	0.06	0	0	8
TRUNK F	0	0.00	0	0	0	TRUNK U	0	0.06	0	0	8
TRUNK G	0	0.00	0	0	0	TRUNK V	0	0.06	0	0	8
TRUNK H	0	0.00	0	0	0	TRUNK W	0	0.06	0	0	8
TRUNK I	0	0.00	0	0	0	TRUNK X	890	0.06	14.4	24	8
TRUNK J	0	0.00	0	0	0	TRUNK Y	365	0.06	10.3	12	8
TRUNK K	0	0.00	0	0	0	TRUNK Z	0	0.06	0	0	8
TRUNK L	0	0.00	0	0	0	DROP	890	0.06	14.4	24	10

TYPE: HIGHGROVE 1
SITE NAME: RUSSEL GARDENS

LO # 75019

RESIDENTIAL MECHANICAL VENTILATION DESIGN SUMMARY

COMBUSTION APPLIANCES		9.32.3.1(1)
a) ☒	Direct vent (sealed combustion) only	
b) ☐	Positive venting induced draft (except fireplaces)	
c) ☐	Natural draft, B-vent or induced draft gas fireplace	
d) ☐	Solid Fuel (including fireplaces)	
e) ☐	No Combustion Appliances	

HEATING SYSTEM	
☒	Forced Air
☐	Non Forced Air
☐	Electric Space Heat

HOUSE TYPE		9.32.1(2)
☒	I Type a) or b) appliance only, no solid fuel	
☐	II Type I except with solid fuel (including fireplaces)	
☐	III Any Type c) appliance	
☐	IV Type I, or II with electric space heat	
☐	Other: Type I, II or IV no forced air	

SYSTEM DESIGN OPTIONS		O.N.H.W.P.
☐	1 Exhaust only/Forced Air System	
☐	2 HRV with Ducting/Forced Air System	
☒	3 HRV Simplified/connected to forced air system	
☐	4 HRV with Ducting/non forced air system	
☐	Part 6 Design	

TOTAL VENTILATION CAPACITY		9.32.3.3(1)
Basement + Master Bedroom	<u>2</u> @ 21.2 cfm	<u>42.4</u> cfm
Other Bedrooms	<u>2</u> @ 10.6 cfm	<u>21.2</u> cfm
Kitchen & Bathrooms	<u>4</u> @ 10.6 cfm	<u>42.4</u> cfm
Other Rooms	<u>5</u> @ 10.6 cfm	<u>53.0</u> cfm
Table 9.32.3.A.	TOTAL	<u>159.0</u> cfm

PRINCIPAL VENTILATION CAPACITY REQUIRED		9.32.3.4.(1)
1 Bedroom	31.8	cfm
2 Bedroom	47.7	cfm
3 Bedroom	63.6	cfm
4 Bedroom	79.5	cfm
5 Bedroom	95.4	cfm
TOTAL	63.6	cfm

SUPPLEMENTAL VENTILATION CAPACITY		9.32.3.5.
Total Ventilation Capacity	<u>159</u>	cfm
Less Principal Ventil. Capacity	<u>139</u>	cfm
Required Supplemental Capacity	<u>20.0</u>	cfm

PRINCIPAL EXHAUST FAN CAPACITY	
Model: VANEE 60H-V+	Location: BSMT
<u>139.0</u> cfm	<u>3.0</u> sones
☒ HVI Approved	

PRINCIPAL EXHAUST HEAT LOSS CALCULATION	
CFM	$\Delta T ^\circ F$
139.0 CFM	71 F
X	X
FACTOR	% LOSS
1.08	0.25
X	X

SUPPLEMENTAL FANS		NUTONE	
Location	Model	cfm	HVI
ENS	QTXEN050C	50	☒
BATH	QTXEN050C	50	☒
PWD	QTXEN050C	50	☒
			Sones
			0.3

HEAT RECOVERY VENTILATOR		9.32.3.11.
Model: VANEE 60H-V+		
<u>139</u>	cfm high	<u>50</u> cfm low
<u>75</u>	% Sensible Efficiency	☒ HVI Approved
	@ 32 deg F (0 deg C)	

LOCATION OF INSTALLATION	
Lot:	Concession
Township	Plan:
Address	
Roll #	Building Permit #

BUILDER: GREENPARK HOMES	
Name:	
Address:	
City:	
Telephone #:	Fax #:

INSTALLING CONTRACTOR	
Name:	
Address:	
City:	
Telephone #:	Fax #:

DESIGNER CERTIFICATION	
I hereby certify that this ventilation system has been designed in accordance with the Ontario Building Code.	
Name:	HVAC Designs Ltd.
Signature:	
HRAI #	001820
Date:	July-17

HEAT LOSS AND GAIN SUMMARY SHEET**MODEL:** HIGHGROVE 1**BUILDER:** GREENPARK HOMES**SFQT:** 1594**LO#** 75019**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)	72

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 (ft³):	22046.0	ASSUMED (Y/N):	Y
INTERNAL SHADING:	BLINDS/CURTAINS	ASSUMED OCCUPANTS:	4
INTERIOR LIGHTING LOAD (Btu/h/ft²):	2.00	DC BRUSHLESS MOTOR (Y/N):	Y
FOUNDATION CONFIGURATION	BCIN_1	DEPTH BELOW GRADE:	6.0 ft
LENGTH: 48.0 ft	WIDTH: 21.0 ft	EXPOSED PERIMETER:	102.0 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	-

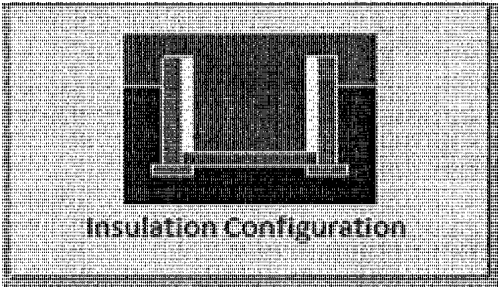
INDIVIDUAL BCIN: 19669

MICHAEL O'ROURKE



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 sand, loam, clay	
Water Table:	Normal (7-10 m, 23-33 ft)	
Foundation Dimensions		
Floor Length (m):	14.6	 Insulation Configuration
Floor Width (m):	6.4	
Exposed Perimeter (m):	31.1	
Wall Height (m):	2.7	
Depth Below Grade (m):	1.83	
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):		931

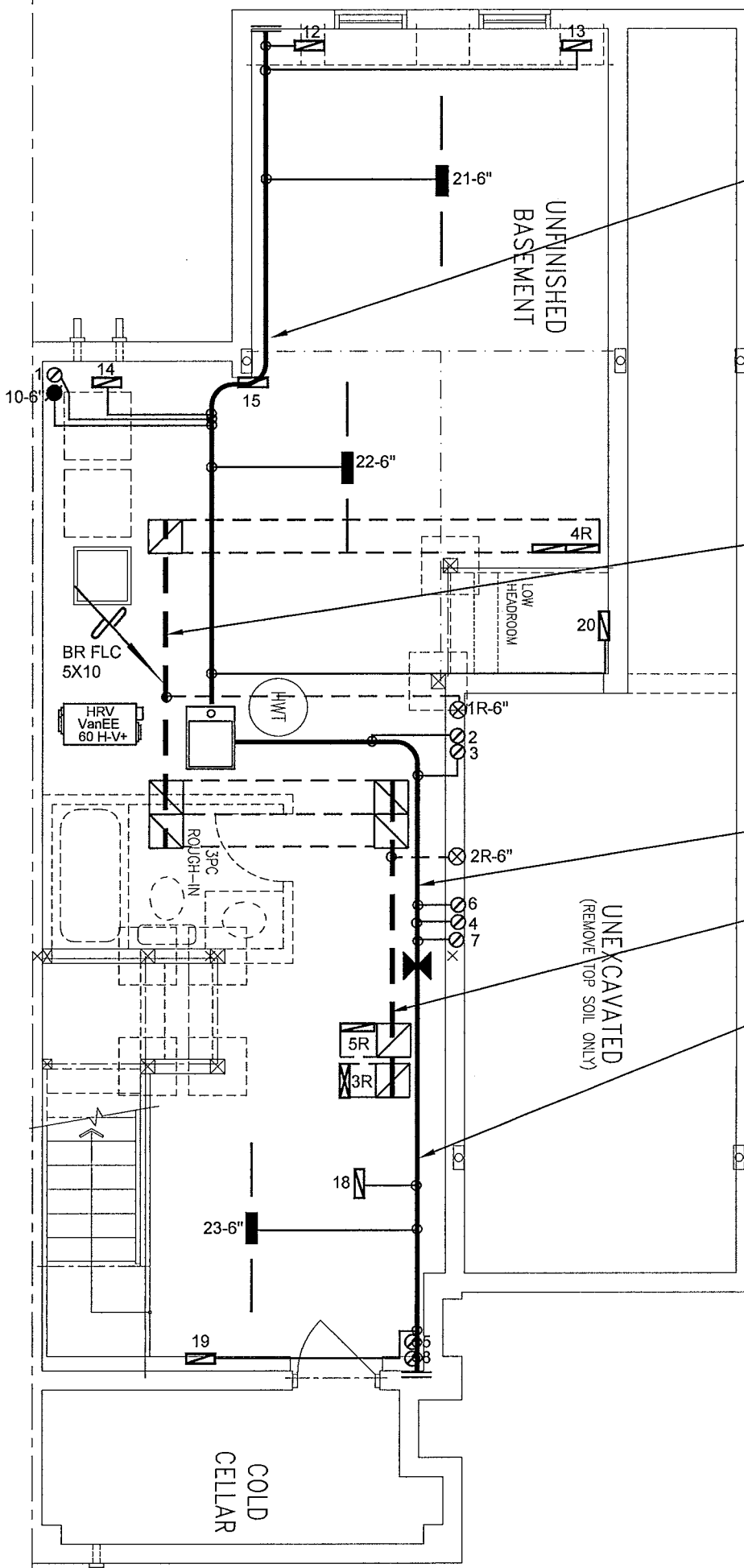
TYPE: HIGHGROVE 1
LO# 75019

Air Infiltration Residential Load Calculator

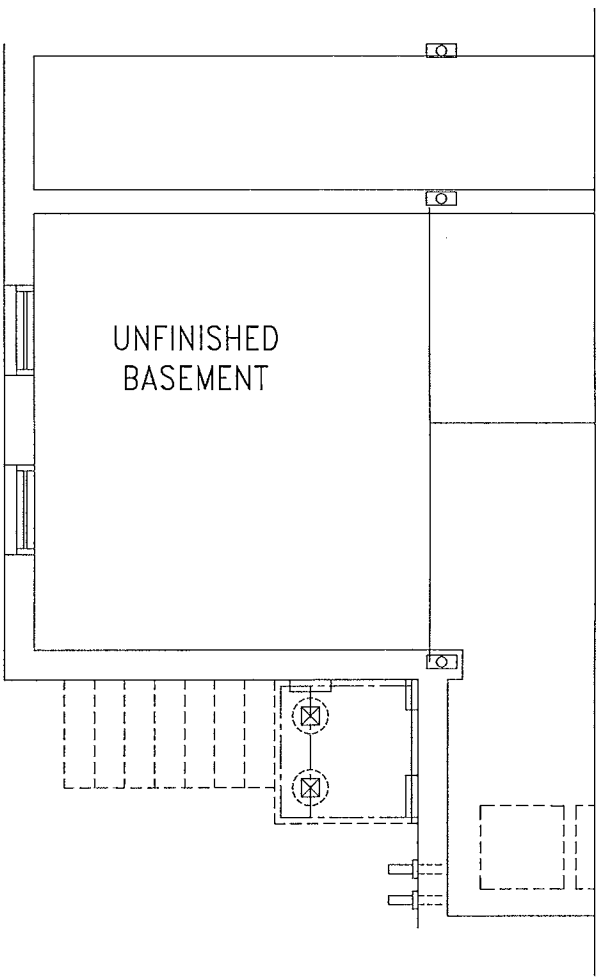
Supplemental tool for CAN/CSA-F280

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):	624.3			
Air Leakage/Ventilation				
Air Tightness Type:	Average (1946-1960) (4.55 ACH)			
Custom BDT Data:	ELA @ 10 Pa.	1060.6 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):	0.155			

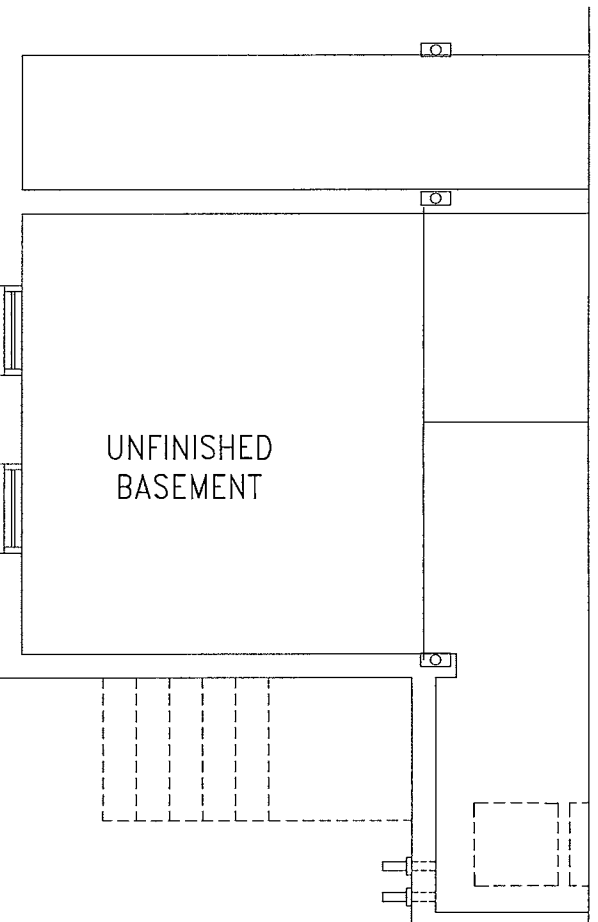
TYPE: HIGHGROVE 1
LO# 75019



BASEMENT PLAN – ELEV. 1, 2, &3



PART. BASEMENT PLAN W.O.D CONDITION (8R OR MORE)



PART. BASEMENT PLAN W.O.D CONDITION (4R TO 7R MAX.)

I MICHAEL O'ROURKE HAVE REVIEWED 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.

CSA-F280-12
PACKAGE A1

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

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Client
GREENPARK HOMES

Project Name
**RUSSEL GARDENS
HAMILTON, ONTARIO**

HIGHGROVE 1 1594 sqft

HVACDESIGNS LTD.
375 Finley Ave. Suite 202 - Ajax, Ontario
L1S 2E2 Tel. 905.619.2300 - 905.420.5300 Fax 905.619.2375
Email: info@hvacdsgns.ca
Web: www.hvacdsgns.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 31718 BTU/H UNIT DATA		# OF RUNS	S/A	R/A	FANS
MAKE	GOODMAN	3RD FLOOR			
MODEL	GMEC960402BNA-40	2ND FLOOR	9	3	2
INPUT	40 MBTU/H	1ST FLOOR	7	2	2
OUTPUT	38.4 MBTU/H	BASEMENT	3	1	0
COOLING	2.0 TONS	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			
FAN SPEED	890 cfm @ 0.6" w.c.				

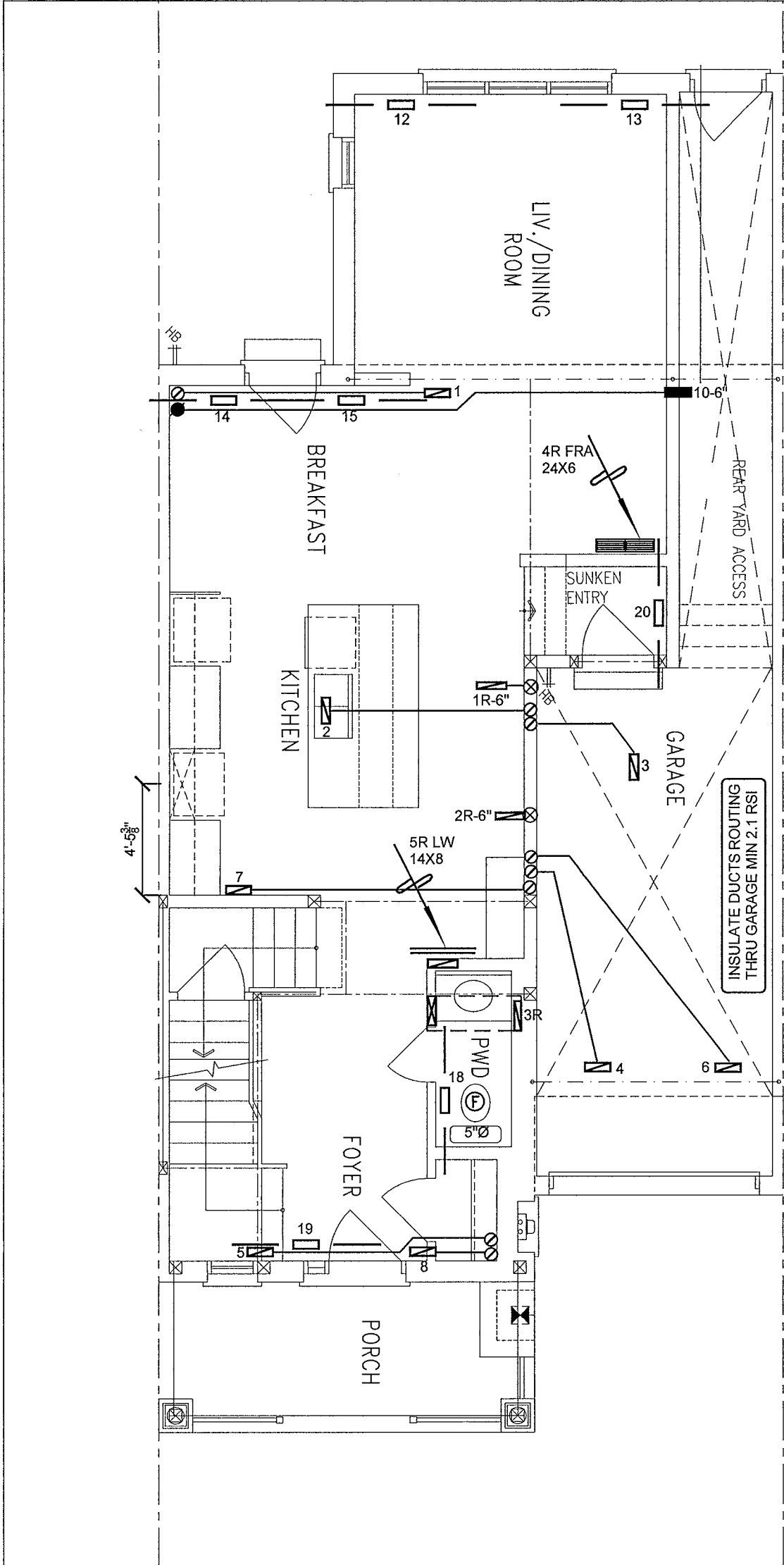
Sheet Title
**BASEMENT
HEATING
LAYOUT**

Date
JULY/2017

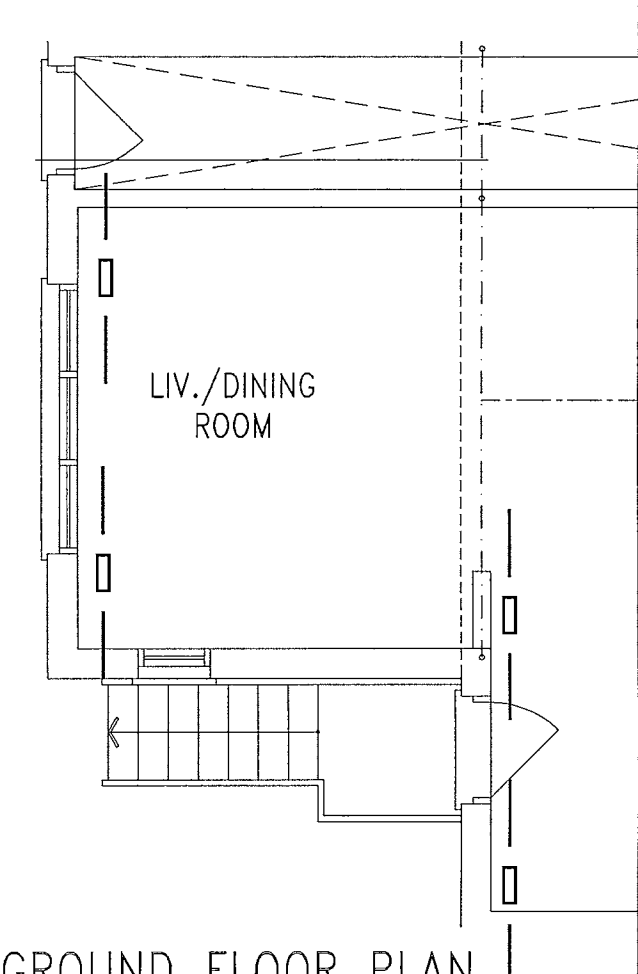
Scale
3/16" = 1'-0"

BCIN# 19669

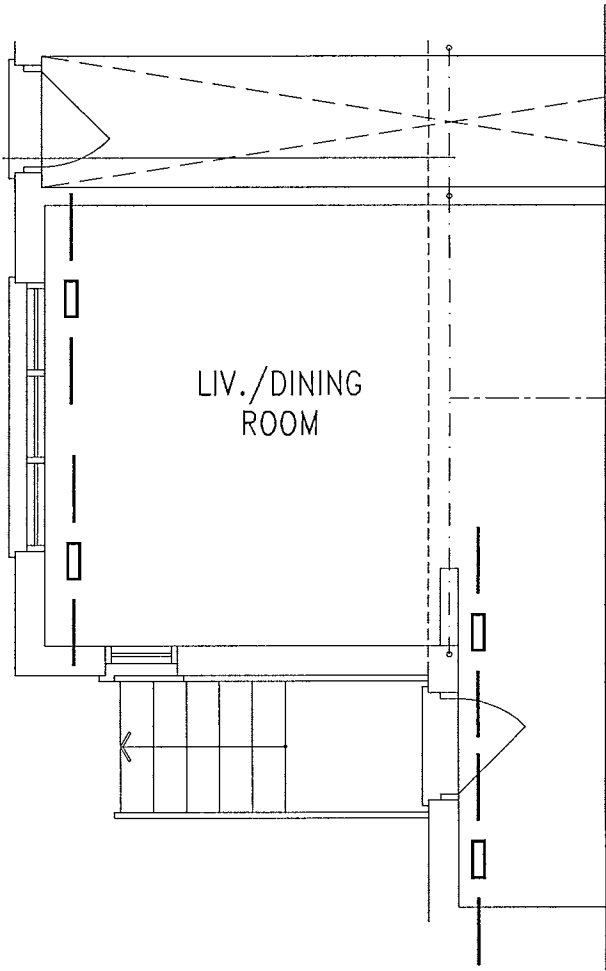
LO# 75019



GROUND FLOOR PLAN – ELEV. 1, 2 & 3



PART. GROUND FLOOR PLAN |
W.O.D CONDITION (8R OR MORE)



PART. GROUND FLOOR PLAN W.O.D
CONDITION (4R TO 7R MAX.)

I MICHAEL O'ROURKE HAVE REVIEWED 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.

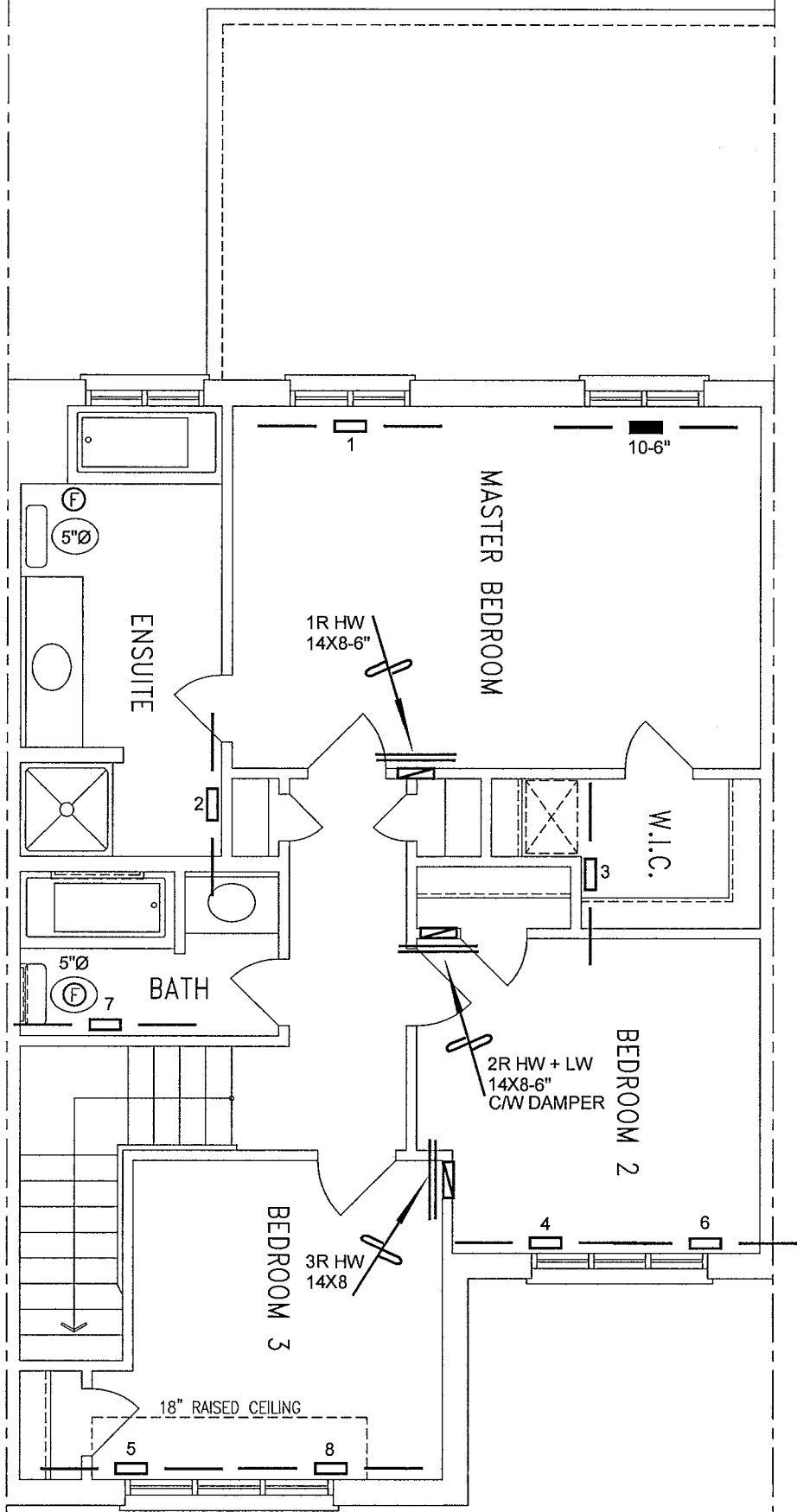
CSA-F280-12

PACKAGE A1

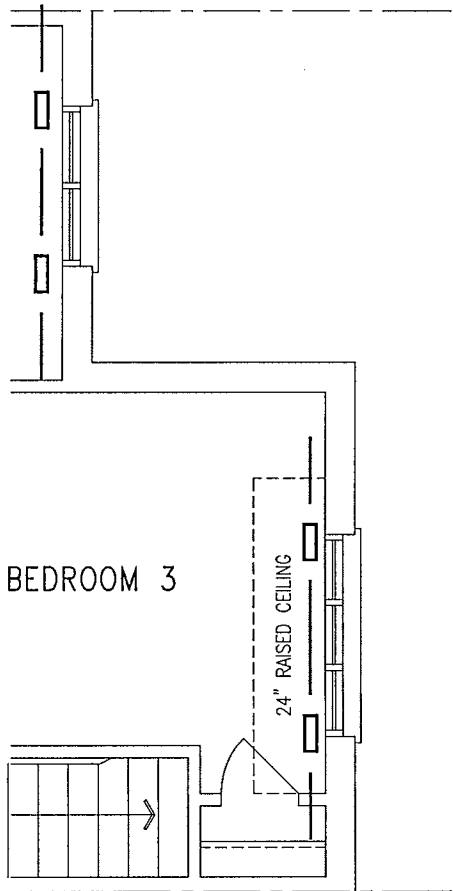
HVAC LEGEND						3.		
SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	
	SUPPLY AIR GRILLE		6" SUPPLY AIR BOOT ABOVE		14"x8" RETURN AIR GRILLE		RETURN AIR STACK ABOVE	2.
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	SUPPLY AIR BOOT ABOVE		6" SUPPLY AIR STACK 2nd FLOOR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

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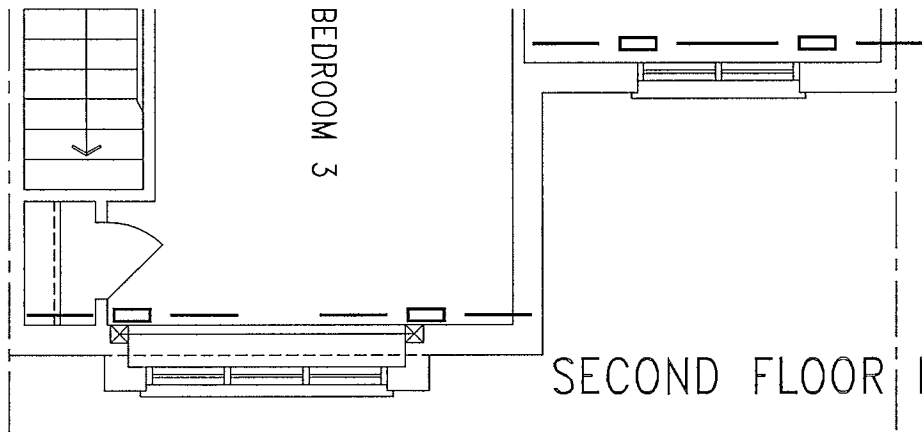
Client GREENPARK HOMES		 375 Finley Ave. Suite 202 - Ajax, Ontario L1S 2E2 Tel. 905.619.2300 - 905.420.5300 Fax 905.619.2375 Email: info@hvacdesigns.ca Web: www.hvacdesigns.ca Specializing in Residential Mechanical Design Services Installation to comply with the latest Ontario Building Code. All supply branch outlets shall be equipped with a manual balancing damper. Ductwork which passes through the garage or unheated spaces shall be adequately insulated and be gas-proofed.	Sheet Title FIRST FLOOR HEATING LAYOUT	
Project Name RUSSEL GARDENS HAMILTON, ONTARIO	HIGHGROVE 1 1594 sqft		Date JULY/2017	
		Scale 3/16" = 1'-0"		
		BCIN# 19669		
		LO# 75019		



SECOND FLOOR PLAN - ELEV. 1



SECOND FLOOR PLAN - ELEV. 2



SECOND FLOOR PLAN - ELEV. 3

I MICHAEL O'ROURKE HAVE REVIEWED 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.

CSA-F280-12
PACKAGE A1

HVAC LEGEND								3.		
SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	2.		
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	SUPPLY AIR BOOT ABOVE		6" SUPPLY AIR STACK 2nd FLOOR		FRA- FLOOR RETURN AIR GRILLE		REDUCER	REVISIONS		

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Client GREENPARK HOMES		 375 Finley Ave. Suite 202 - Ajax, Ontario L1S 2E2 Tel. 905.619.2300 - 905.420.5300 Fax 905.619.2375 Email: info@hvacdesigns.ca Web: www.hvacdesigns.ca Specializing in Residential Mechanical Design Services Installation to comply with the latest Ontario Building Code. All supply branch outlets shall be equipped with a manual balancing damper. Ductwork which passes through the garage or unheated spaces shall be adequately insulated and be gas-proofed.	Sheet Title SECOND FLOOR HEATING LAYOUT	
Project Name RUSSEL GARDENS HAMILTON, ONTARIO			Date JULY/2017	
HIGHGROVE 1 1594 sqft			Scale 3/16" = 1'-0"	
			BCIN# 19669	
			LO# 75019	