

SITE NAME: RUSSEL GARDENS PHASE 3										LOT 17				DATE: Aug-20		WINTER NATURAL AIR CHANGE RATE 0.373				HEAT LOSS AT °F. 71		CSA-F280-12						
BUILDER: GREENPARK HOMES										TYPE: MOUNTAINASH 4				GFA: 3225		LO# 87384		SUMMER NATURAL AIR CHANGE RATE 0.134				HEAT GAIN AT °F. 13		SB-12 PACKAGE A1				
ROOM USE		EXP. WALL		CLG. HT.		FACTORS		MBR		ENS		FLEX		BED-2		BED-3		BED-4		ENS-3		WIC		S-ENS				
								40		28		44		14		30		13		6		10		6				
								9		9		9		9		9		9		9		9		9				
GRS.WALL AREA		LOSS		GAIN		380		252		396		126		270		117		64		90		54		54				
GLAZING		LOSS		GAIN		LOSS		GAIN		LOSS		GAIN		LOSS		GAIN		LOSS		GAIN		LOSS		GAIN				
NORTH		19.8	16.0	0	0	0	14	277	224	0	0	0	16	316	256	0	0	0	0	0	0	0	0	0	7	138	112	
EAST		19.8	41.6	0	0	0	0	0	0	72	1423	2992	0	0	0	57	1127	2388	0	0	0	0	0	0	0	0	0	
SOUTH		19.8	24.9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	16	316	398	7	138	174	0	0	0		
WEST		19.8	41.6	36	712	1496	23	455	956	0	0	0	0	0	0	0	0	0	0	0	0	0	23	455	956	0	0	
SKYLT.		34.6	101.5	0	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	4.3	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		4.1	0.8	324	1343	244	216	891	162	324	1343	244	110	456	83	213	883	160	101	419	78	47	195	35	67	278	50	
NET EXPOSED BSMT WALL ABOVE GR		3.3	0.6	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		1.2	0.6	360	429	212	192	229	113	190	227	112	233	278	137	194	231	114	200	238	118	56	114	56	60	72	35	
NO ATTIC EXPOSED CLG		2.6	1.3	0	0	0	0	0	0	30	77	38	0	0	0	20	61	25	0	0	0	0	0	0	0	0		
EXPOSED FLOOR		2.4	0.4	0	0	0	0	0	0	20	47	9	69	163	30	216	512	93	0	0	0	0	0	0	0	0		
BASEMENT/CRAWL HEAT LOSS																												
SLAB ON GRADE HEAT LOSS																												
SUBTOTAL HT LOSS						2484		1652		3117		1214		2804		973		448		804				739				
SUB TOTAL HT GAIN						1951		1454		3393		505		2781		592		265		1041				253				
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		
AIR CHANGE HEAT LOSS								697		520		875		341		787		273		126		226		208				
AIR CHANGE HEAT GAIN						127		95				221		33		180		39		17		66		17				
DUCT LOSS						0		0		399		155		359		0		0		0		0		95				
DUCT GAIN						0		0		425		141		381		0		0		0		0		28				
HEAT GAIN PEOPLE		240		2		480		0		0		1		240		1		240		0		0		0		0		
HEAT GAIN APPLIANCES/LIGHTS						633		0		633		633		633		633		633		0		0		0				
TOTAL HT LOSS BTU/H						3181		2371		4391		1710		3850		1247		573		1030				1041				
TOTAL HT GAIN x 1.3 BTU/H						4148		2013		6074		2017		5453		1954		368		1442				401				

ROOM USE		EXP. WALL		CLG. HT.		FACTORS		FAM		L/D		K/B		L/H		LND		W/R		FOY		WOB		BAS	
								34		24		37		18		8		26		42		46		146	
								11		11		11		11		9		12		11		9		9	
GRS.WALL AREA		LOSS		GAIN		374		264		407		198		72		312		462		414		876			
GLAZING		LOSS		GAIN		LOSS		GAIN		LOSS		GAIN		LOSS		GAIN		LOSS		GAIN		LOSS			
NORTH		19.8	16.0	8	158	128	0	0	0	0	0	0	0	0	0	7	138	112	0	0	0	0	0		
EAST		19.8	41.6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6	119	249	0	0			
SOUTH		19.8	24.9	0	0	0	33	652	822	0	0	0	12	237	299	7	138	174	0	0	0	0	0		
WEST		19.8	41.6	44	870	1828	0	0	0	73	1443	3033	0	0	0	0	0	0	0	0	0	0			
SKYLT.		34.6	101.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
DOORS		23.5	4.3	0	0	0	0	0	0	12	281	61	0	0	0	0	0	20	469	86	40	938	170		
NET EXPOSED WALL		4.1	0.8	322	1336	242	231	958	174	322	1335	242	188	771	140	65	269	49	285	1182	214	416	1725	313	
NET EXPOSED BSMT WALL ABOVE GR		3.3	0.6	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	0	0	0	0	0	0	0	0	0	0	0	0	120	143	71	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		
EXPOSED FLOOR		2.4	0.4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
BASEMENT/CRAWL HEAT LOSS																									
SLAB ON GRADE HEAT LOSS																									
SUBTOTAL HT LOSS						2363		1610		3059		1008		551		1789		2781				615		2503	
SUB TOTAL HT GAIN						2198		995		3326		439		294		411		732				3738		766	
LEVEL FACTOR / MULTIPLIER		0.30		0.50		0.30		0.50		0.30		0.50		0.30		0.50		0.30		0.50		0.50		1.28	
AIR CHANGE HEAT LOSS								1182		806		1531		505		155		895		1392				10518	
AIR CHANGE HEAT GAIN						143		65		217		29		19		0		27		48				294	
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	
HEAT GAIN APPLIANCES/LIGHTS						633		633		633		633		633		633		0		0				633	
TOTAL HT LOSS BTU/H						3545		2415		4590		1513		786		2584		4173				3643		15192	
TOTAL HT GAIN x 1.3 BTU/H						3887		2201		5423		1430		1229		569		1014				4880		2200	

RECD BY: [Signature]
DATE: [Date]

REFD TO: [Signature]
DATE: [Date]

CITY OF HAMILTON
BUILDING DEPARTMENT
Planning & Development Department
DEC 17 2020

TOTAL HEAT GAIN BTU/H: 46846
TONS: 3.51
LOSS DUE TO VENTILATION LOAD BTU/H: 1515
STRUCTURAL HEAT LOSS: 57958
TOTAL COMBINED HEAT LOSS BTU/H: 59473

ROOM USE	EXP. WALL		CLG. HT.		FAM		L/D		K/B		L/H		LND		W/R		FOY		WOB		BAS	
	34		11		24		11		37		18		8		26		42		46		146	
GRS.WALL AREA	374		264		407		198		72		312		462									
GLAZING	LOSS GAIN		LOSS GAIN		LOSS GAIN		LOSS GAIN		LOSS GAIN		LOSS GAIN		LOSS GAIN		LOSS GAIN		LOSS GAIN		LOSS GAIN		LOSS GAIN	
NORTH	19.8	16.0	8	158	128	0	0	0	0	0	0	0	0	0	0	7	138	112	0	0	0	0
EAST	19.8	41.6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
SOUTH	19.8	24.9	0	0	0	33	652	-822	0	0	0	12	237	299	7	138	174	0	0	0	7	138
WEST	19.8	41.6	44	870	1828	0	0	0	73	1443	3033	0	0	0	0	0	0	0	0	0	5	98
SKYLT.	34.6	101.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
DOORS	23.5	4.3	0	0	0	0	0	0	12	281	51	0	0	0	0	20	469	86	40	938	170	0
NET EXPOSED WALL	4.1	0.8	322	1335	242	231	958	174	322	1335	242	188	771	140	65	269	49	285	1182	214	416	1725
NET EXPOSED BSMT WALL ABOVE GR	3.3	0.6	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	0	0	0	0	0	0	0	0	0	0	0	0	120	143	71	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
EXPOSED FLOOR	2.4	0.4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
BASEMENT/CRAWL HEAT LOSS																						
SLAB ON GRADE HEAT LOSS																						
SUBTOTAL HT LOSS				2363			1610			3059			1008			551			1789			515
SUB TOTAL HT GAIN					2198			595			3326			439			294			2781		3543
LEVEL FACTOR / MULTIPLIER	0.30	0.50				0.30	0.50		0.30	0.50		0.30	0.50		0.20	0.28		0.30	0.50			3738
AIR CHANGE HEAT LOSS				1182			806			1531			505			155			895			0.50
AIR CHANGE HEAT GAIN					143		65			217			29			19			27			1.26
DUCT LOSS				0			0			0			0			0			0			10518
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
HEAT GAIN APPLIANCES/LIGHTS					633		633			633			633			633			0			0
TOTAL HT LOSS BTU/H				3545			2416			4590			1513			705			2684			3643
TOTAL HT GAIN x 1.3 BTU/H					3867			2201			5423			1430			1223			589		4860

REC'D BY

DATE

REF'D TO

DATE

CITY OF HAMILTON

BUILDING DEPARTMENT

Planning & Development Department

DEC 17 2020

TOTAL HEAT GAIN BTU/H:

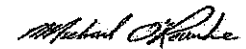
46945

TONS: 3.91

LOSS DUE TO VENTILATION LOAD BTU/H: 1515

STRUCTURAL HEAT LOSS: 57958

TOTAL COMBINED HEAT LOSS BTU/H: 59473



SITE NAME: RUSSEL GARDENS PHASE 3
 BUILDER: GREENPARK HOMES

 LOT 17
 TYPE: MOUNTAINASH 4

DATE: Aug-20

GFA: 3225 LO# 87364

 HEATING CFM 1504 COOLING CFM 1504
 TOTAL HEAT LOSS 57,958 TOTAL HEAT GAIN 46,670
 AIR FLOW RATE CFM 25.95 AIR FLOW RATE CFM 32.23

 furnace pressure 0.6
 furnace filter 0.05
 a/c coil pressure 0.2
 available pressure for s/a & r/a 0.35

 #*GOODMAN
 GMEC960804CNA 80

 AFUE = 96 %
 INPUT (BTU/H) = 80,000
 OUTPUT (BTU/H) = 76,800

RUN COUNT	4th	3rd	2nd	1st	Bas
S/A	0	0	14	8	5
R/A	0	0	5	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

 FAN SPEED LOW 868
 MEDLOW 978
 MEDIUM 1112
 MEDIUM HIGH 1504
 HIGH 1615

 DESIGN CFM = 1504
 CFM @ 5" 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	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	FLEX	BED-2	BED-3	BED-4	ENS-3	FLEX	BED-3	MBR	S-ENS	FAM	L/D	K/B	K/B	L/H	LND	W/R	FOY	WIC	BAS	BAS	BAS	BAS
RM LOSS MBH	1.59	2.37	2.20	1.71	1.98	1.25	0.57	2.20	1.98	1.59	0.52	1.77	2.42	2.30	2.30	1.51	0.71	2.68	4.17	1.03	3.77	3.77	3.77	3.77
CFM PER RUN HEAT	41	62	57	44	51	32	15	57	51	41	14	46	63	60	60	39	18	70	108	27	98	98	98	98
RM GAIN MBH	2.07	2.01	3.04	2.02	2.73	1.95	0.37	3.04	2.73	2.07	0.20	1.93	2.20	2.71	2.71	1.43	1.23	0.57	1.01	1.44	1.41	1.41	1.41	1.41
CFM PER RUN COOLING	67	65	98	65	88	63	12	98	88	67	6	62	71	87	87	46	40	18	33	46	46	46	46	46
ADJUSTED PRESSURE	0.17	0.17	0.16	0.17	0.16	0.17	0.17	0.16	0.16	0.17	0.17	0.17	0.17	0.16	0.16	0.17	0.17	0.17	0.15	0.17	0.16	0.16	0.16	0.16
ACTUAL DUCT LGH.	32	63	51	56	61	46	49	58	49	38	46	26	25	38	44	40	23	47	48	52	54	29	24	41
EQUIVALENT LENGTH	130	150	160	140	100	210	200	130	190	100	130	130	140	120	120	140	160	140	110	130	120	150	130	130
TOTAL EFFECTIVE LENGTH	162	213	211	196	161	256	249	188	239	138	176	156	165	158	164	180	183	187	158	182	174	179	154	171
ADJUSTED PRESSURE	0.11	0.08	0.08	0.09	0.1	0.07	0.07	0.09	0.07	0.12	0.1	0.11	0.1	0.1	0.1	0.1	0.09	0.09	0.1	0.09	0.09	0.09	0.11	0.09
ROUND DUCT SIZE	5	5	6	5	6	5	4	6	6	5	4	5	5	6	6	4	4	5	6	5	6	6	6	6
HEATING VELOCITY (ft/min)	301	455	291	323	280	235	172	291	260	301	161	338	463	306	306	447	207	514	551	198	500	500	500	500
COOLING VELOCITY (ft/min)	492	477	500	477	449	463	138	500	449	492	69	455	521	444	444	528	459	132	168	338	235	235	235	235
OUTLET GRILL SIZE	3X10	3X10	4X10	3X10	4X10	3X10	3X10	4X10	4X10	3X10	3X10	3X10	3X10	4X10	4X10	3X10	3X10	3X10	4X10	3X10	4X10	4X10	4X10	4X10
TRUNK	C	A	D	A	E	D	D	D	D	C	E	C	E	B	B	D	C	A	D	A	B	C	E	D

RUN #	25	26	27
ROOM NAME	S-ENS	BAS	FAM
RM LOSS MBH	0.52	3.77	1.77
CFM PER RUN HEAT	14	98	46
RM GAIN MBH	0.20	1.41	1.93
CFM PER RUN COOLING	6	46	62
ADJUSTED PRESSURE	0.17	0.16	0.17
ACTUAL DUCT LGH.	46	27	27
EQUIVALENT LENGTH	140	110	120
TOTAL EFFECTIVE LENGTH	186	137	147
ADJUSTED PRESSURE	0.09	0.12	0.12
ROUND DUCT SIZE	4	6	5
HEATING VELOCITY (ft/min)	161	500	338
COOLING VELOCITY (ft/min)	69	235	455
OUTLET GRILL SIZE	3X10	4X10	3X10
TRUNK	E	C	C

SUPPLY AIR TRUNK SIZE										RETURN AIR TRUNK SIZE									
TRUNK	STATIC	ROUND	RECT	VELOCITY	TRUNK	STATIC	ROUND	RECT	VELOCITY	TRUNK	STATIC	ROUND	RECT	VELOCITY	TRUNK	STATIC	ROUND	RECT	VELOCITY
CFM	PRESS.	DUCT	DUCT	(ft/min)	CFM	PRESS.	DUCT	DUCT	(ft/min)	CFM	PRESS.	DUCT	DUCT	(ft/min)	CFM	PRESS.	DUCT	DUCT	(ft/min)
TRUNK A	203	0.08	7.7	10	x	8	365			TRUNK G	0	0.00	0	0	x	8	0		
TRUNK B	218	0.09	7.7	10	x	8	392			TRUNK H	0	0.00	0	0	x	8	0		
TRUNK C	809	0.08	13	20	x	8	728			TRUNK I	0	0.00	0	0	x	8	0		
TRUNK D	457	0.07	10.8	14	x	8	588			TRUNK J	0	0.00	0	0	x	8	0		
TRUNK E	697	0.07	12.7	18	x	8	697			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	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
AIR VOLUME	130	190	115	125	115	420	175	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
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	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15
ACTUAL DUCT LGH.	51	42	51	53	63	26	26	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
EQUIVALENT LENGTH	205	165	155	205	210	185	190	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL EFFECTIVE LH	256	207	206	258	273	211	216	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
ADJUSTED PRESSURE	0.06	0.07	0.07	0.06	0.05	0.07	0.07	14.80	14.80	14.80	14.80	14.80	14.80	14.80	14.80	14.80	14.80	14.80	14.80	14.80	14.80	14.80	14.80	14.80
ROUND DUCT SIZE	7	7.8	6.5	6.9	7	10.5	7.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
INLET GRILL SIZE	8	8	8	8	8	8	8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
INLET GRILL SIZE	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
INLET GRILL SIZE	14	24	14	14	14	30	14	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

TYPE: MOUNTAINASH 4
 SITE NAME: RUSSEL GARDENS PHASE 3

 LO # 87364
 LOT 17

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	8 @ 10.6 cfm	84.8 cfm
Table 9.32.3.A.	TOTAL	212.0 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		9.32.3.6
Total Ventilation Capacity	212	cfm
Less Principal Ventil. Capacity	79.5	cfm
Required Supplemental Capacity	132.5	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
79.5 CFM	71 F
X	X
FACTOR	% LOSS
1.08	0.25
X	X

SUPPLEMENTAL FANS		PANASONIC	
Location	Model	cfm	HVI
ENS	FV-05-11VK1	50	☒
ENS-3	FV-05-11VK1	50	☒
S-ENS	FV-05-11VK1	50	☒
W/R	FV-05-11VK1	50	☒

HEAT RECOVERY VENTILATOR		9.32.3.11
Model:	VANEE 65H	
155 cfm high	64 cfm low	
75 % 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:	<i>Michael O'Rourke</i>
HRAI #	001820
Date:	August-20

CSA F280-12 Residential Heat Loss and Heat Gain Calculations
Formula Sheet (For Air Leakage / Ventilation Calculation)

LO#: 87364

Model: MOUNTAINASH 4

Builder: GREENPARK HOMES

Date: 28/08/2020

Volume Calculation
House Volume

Level	Floor Area (ft²)	Floor Height (ft)	Volume (ft³)
Bsmt	1416	9	12744
First	1416	11	15576
Second	1809	9	16281
Third	0	9	0
Fourth	0	9	0
Total:			44,601.0 ft³
Total:			1263.0 m³

Air Change & Delta T Data

WINTER NATURAL AIR CHANGE RATE	0.373
SUMMER NATURAL AIR CHANGE RATE	0.134

Design Temperature Difference				
	Tin °C	Tout °C	ΔT °C	ΔT °F
Winter DTDh	22	-17	39	71
Summer DTDc	24	31	7	13

5.2.3.1 Heat Loss due to Air Leakage

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

$$0.373 \times 350.82 \times 39^\circ\text{C} \times 1.2 = 6165 \text{ W}$$

$$= 21036 \text{ Btu/h}$$

6.2.6 Sensible Gain due to Air Leakage

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

$$0.134 \times 350.82 \times 7^\circ\text{C} \times 1.2 = 400 \text{ W}$$

$$= 1364 \text{ Btu/h}$$

5.2.3.2 Heat Loss due to Mechanical Ventilation

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

$$80 \text{ CFM} \times 71^\circ\text{F} \times 1.08 \times 0.25 = 1515 \text{ Btu/h}$$

6.2.7 Sensible heat Gain due to Ventilation

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

$$80 \text{ CFM} \times 13^\circ\text{F} \times 1.08 \times 0.25 = 275 \text{ Btu/h}$$

5.2.3.3 Calculation of Air Change Heat Loss for Each Room (Floor Multiplier Section)

$$HL_{airr} = \text{Level Factor} \times HL_{airbv} \times \{(HL_{agcr} + HL_{bgcr}) \div (HL_{agclevel} + HL_{bgclevel})\}$$

Level	Level Factor (LF)	HLairbv Air Leakage + Ventilation Heat Loss (Btu/h)	Level Conductive Heat Loss: (HL _{level})	Air Leakage Heat Loss Multiplier (LF x HLairbv / HL _{level})
1	0.5	21,036	8,317	1.265
2	0.3		12,611	0.500
3	0.2		14,985	0.281
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 HLairv = 0

HEAT LOSS AND GAIN SUMMARY SHEET

MODEL: MOUNTAINASH 4	LOT 17	BUILDER: GREENPARK HOMES
SFQT: 3225	LO# 87364	SITE: RUSSEL GARDENS PHASE 3

DESIGN ASSUMPTIONS

HEATING	°F	COOLING	°F
OUTDOOR DESIGN TEMP.	1	OUTDOOR DESIGN TEMP.	88
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:	3.57	ASSUMED (Y/N):	Y
AIR TIGHTNESS CATEGORY:	AVERAGE	ASSUMED (Y/N):	Y
WIND EXPOSURE:	SHELTERED	ASSUMED (Y/N):	Y
HOUSE VOLUME (ft³):	44601.0	ASSUMED (Y/N):	Y
INTERNAL SHADING:	BLINDS/CURTAINS	ASSUMED OCCUPANTS:	5
INTERIOR LIGHTING LOAD (Btu/h/ft²):	1.50	DC BRUSHLESS MOTOR (Y/N):	Y
FOUNDATION CONFIGURATION	BCIN_1	DEPTH BELOW GRADE:	6.0 ft
LENGTH: 60.0 ft	WIDTH: 36.0 ft	EXPOSED PERIMETER:	146.0 ft
WOB INSULATION CONFIGURATION	SCB_9	WOB EXPOSED PERIMETER	46.0 ft

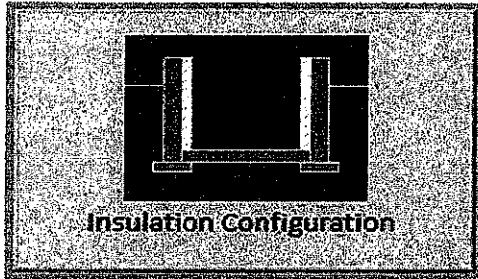
2012 OBC - COMPLIANCE PACKAGE		
Component	Compliance Package A1	
	Nominal	Min. Eff.
Ceiling with Attic Space Minimum RSI (R)-Value	60	59.22
Ceiling Without Attic Space Minimum RSI (R)-Value	31	27.65
Exposed Floor Minimum RSI (R)-Value	31	29.80
Walls Above Grade Minimum RSI (R)-Value	22	17.03
Basement 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

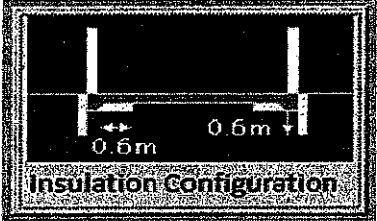
Weather Station Description		
Province:	Ontario	
Region:	Hamilton	
Site Description		
Soil Conductivity:	Normal conductivity: dry sand, loam, clay	
Water Table:	Normal (7-10 m, 23-33 ft)	
Foundation Dimensions		
Floor Length (m):	4.6	
Floor Width (m):	11.0	
Exposed Perimeter (m):	44.5	
Wall Height (m):	2.7	
Depth Below Grade (m):	1.55	
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):	734	

TYPE: MOUNTAINASH 4
LO# 87364

LOT 17

Residential Slab on Grade 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		
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):		180

TYPE: MOUNTAINASH 4
LO# 87364

LOT 17

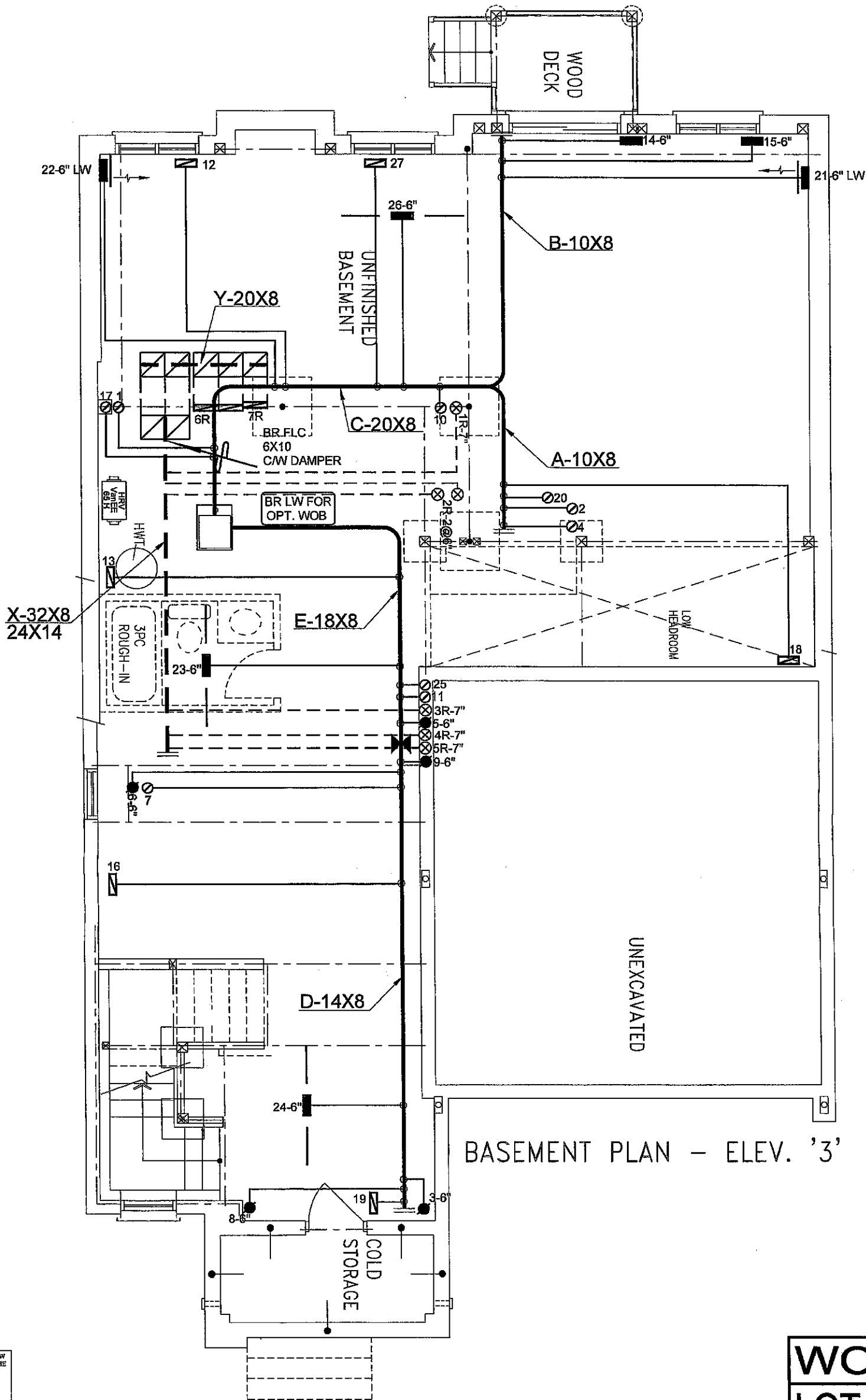
Air Infiltration Residential Load Calculator

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):	8.84			
Building Configuration				
Type:	Detached			
Number of Stories:	Two			
Foundation:	Full			
House Volume (m ³):	1263.0			
Air Leakage/Ventilation				
Air Tightness Type:	Present (1961-) (3.57 ACH)			
Custom BDT Data:	ELA @ 10 Pa.	1683.6 cm ²		
	3.57	ACH @ 50 Pa		
Mechanical Ventilation (L/s):	Total Supply	Total Exhaust		
	37.5	37.5		
Flue Size				
Flue #:	#1	#2	#3	#4
Diameter (mm):	0	0	0	0
Natural Infiltration Rates				
Heating Air Leakage Rate (ACH/H):	0.373			
Cooling Air Leakage Rate (ACH/H):	0.134			

TYPE: MOUNTAINASH 4
LO# 87364

LOT 17



BASEMENT PLAN - ELEV. '3'

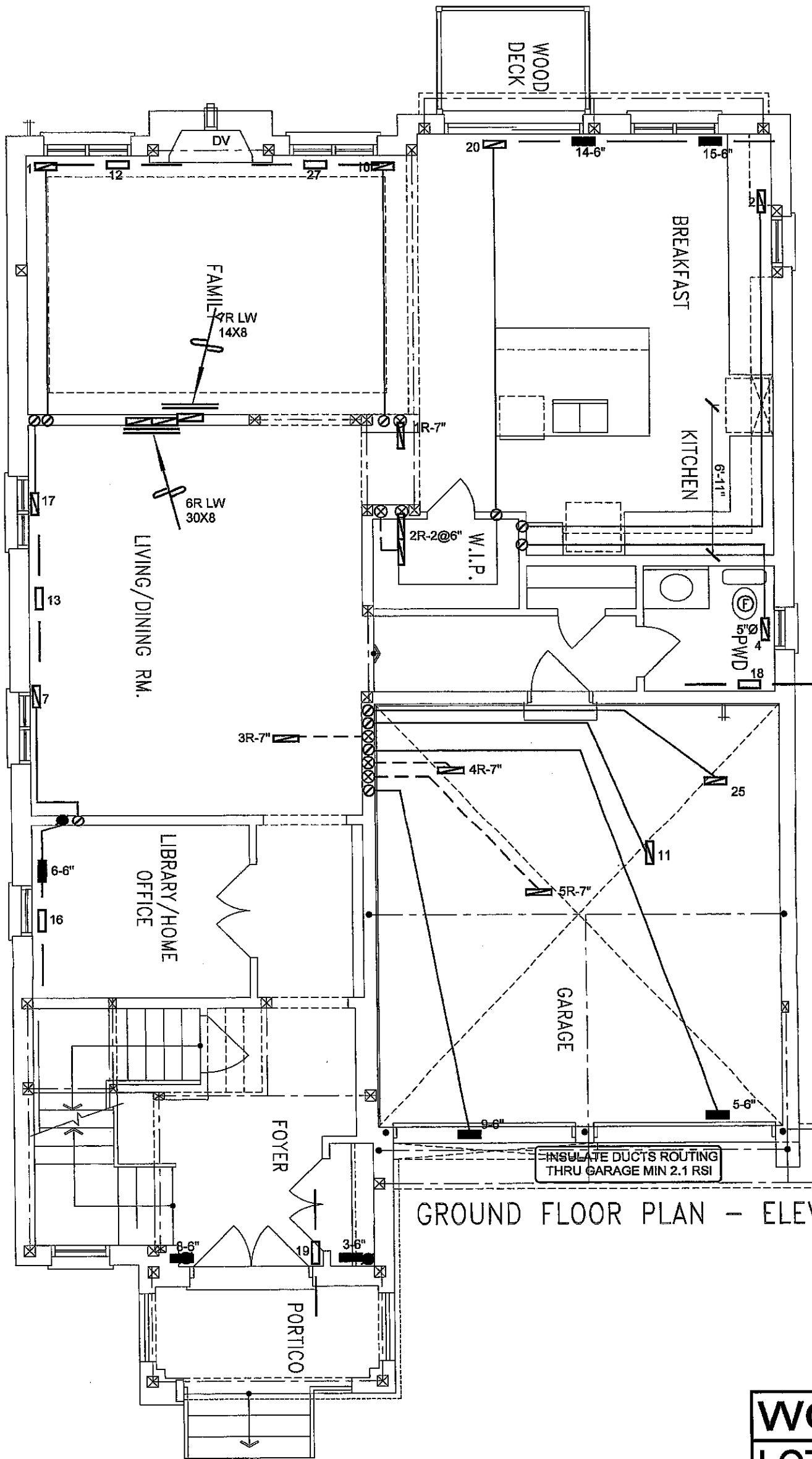
1 MICHAEL O'BROURKE HAVE REVIEW AND TAKE RESPONSIBILITY FOR THE DESIGN WORK AND AM QUALIFIED UNDER DIVISION C.3.2.3 OF THE BUILDING CODE.
Michael O'Brourke
Michael O'Brourke, BCIN# 19669
HVAC DESIGNS LTD.

WOB CSA-F280-12
LOT 17 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 PHASE 3 HAMILTON, ONTARIO LOT 17 MOUNTAINASH 4 3225 sqft	 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 59473 BTU/H UNIT DATA		# OF RUNS S/A R/A FANS				Sheet Title																					
		MAKE GOODMAN	MODEL GMEC960804CNA	INPUT 80	MBTU/H	OUTPUT 76.8	MBTU/H	COOLING 4.0	TONS	FAN SPEED 1504	cfm @ 0.5" w.c.	3RD FLOOR				2ND FLOOR	14	5	3	1ST FLOOR	8	2	2	BASEMENT	5	1	0	Date AUG/2020	
		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										Scale 3/16" = 1'-0"		BCIN# 19669		LO#	87364												



GROUND FLOOR PLAN – ELEV. '3'

I MICHAEL OROUNKE HAVE REVIEWED AND TAKE RESPONSIBILITY FOR THE DESIGN WORK AND AM QUALIFIED UNDER DIVISION C, 3.2.3 OF THE BUILDING CODE.
Michael Orounke
Michael Orounke, BCIN# 19669
HVAC DESIGNS LTD.

WOB CSA-F280-12
LOT 17 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
	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

REVISIONS

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Client
GREENPARK HOMES

Project Name
**RUSSEL GARDENS PHASE 3
HAMILTON, ONTARIO**

**LOT 17
MOUNTAINASH 4 3225 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.

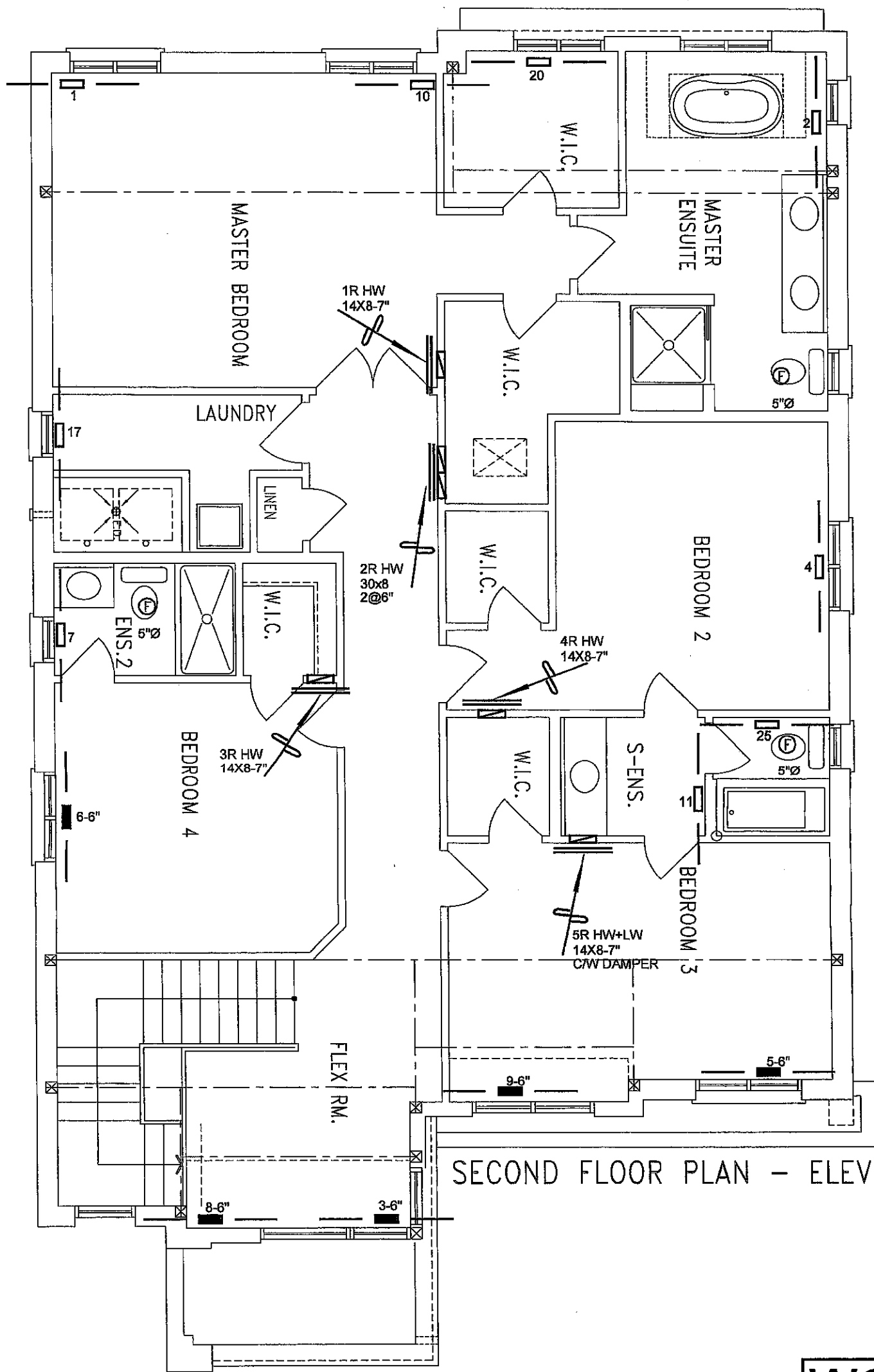
Sheet Title
**FIRST FLOOR
HEATING
LAYOUT**

Date
AUG/2020

Scale
3/16" = 1'-0"

BCIN# 19669

LO# **87364**



SECOND FLOOR PLAN - ELEV. '3'

I MICHAEL OZOURKE HAVE REVIEWED AND TAKE RESPONSIBILITY FOR THE DESIGN WORK AND AM QUALIFIED UNDER DIVISION C, 3.2.5 OF THE BUILDING CODE.
Michael Ozourke
Michael Ozourke, BCIN# 19669
HVAC DESIGNS LTD.

WOB	CSA-F280-12
LOT 17	PACKAGE A1

HVAC LEGEND							3.		
SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION		
	SUPPLY AIR GRILLE		6" SUPPLY AIR BOOT ABOVE		14"x6" RETURN AIR GRILLE		RETURN AIR STACK ABOVE	1.	
	SUPPLY AIR GRILLE 6" BOOT		SUPPLY AIR STACK FROM 2nd FLOOR		30"x6" 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 PHASE 3 HAMILTON, ONTARIO LOT 17 MOUNTAINASH 4 3225 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.	Sheet Title SECOND FLOOR HEATING LAYOUT Date AUG/2020 Scale 3/16" = 1'-0" BCIN# 19669 LO# 87364
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