

SITE NAME: RUSSEL GARDENS PH. 4				LOT 596				DATE: Oct-21				WINTER NATURAL AIR CHANGE RATE 0.365				HEAT LOSS AT °F. 71				CSA-F280-12																																															
BUILDER: GREENPARK HOMES				TYPE: GRANDVILLE 3				GFA: 4622				LO# 93174				SUMMER NATURAL AIR CHANGE RATE 0.130				HEAT GAIN AT °F. 13				SB-12 PACKAGE A1																																											
ROOM USE				MBR				ENS				WIC				BED-2				BED-3				BED-4				ENS-2				ENS-3				BED-5				ENS-4				LB/OF				GUEST																			
EXP. WALL				42				29				8				16				34				26				0				18				16				9				25				12																			
CLG. HT.				9				9				9				9				9				9				9				9				9				9				11				10																			
FACTORS																																																																			
GRS.WALL AREA				LOSS				GAIN				378				LOSS				GAIN				261				LOSS				GAIN				72				LOSS				GAIN				144				LOSS				GAIN											
GLAZING																																																																			
NORTH				19.8	16.0	0	0	0	7	138	112	0	0	0	16	316	256	0	0	0	0	0	0	0	0	0	14	277	224	0	0	0	0	0	0	0	0	0	0	0	18	356	288																								
EAST				19.8	41.6	0	0	0	0	0	0	0	0	0	0	0	0	46	909	1911	35	692	1494	0	0	0	23	466	966	0	0	0	0	0	0	0	0	0	42	830	1745	0	0	0																							
SOUTH				19.8	24.9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	16	316	398	7	138	174	0	0	0	0	0	0	0																									
WEST				19.8	41.6	32	633	1330	25	494	1039	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																							
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	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	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0																							
NET EXPOSED WALL				4.1	0.8	346	1434	260	229	949	172	72	298	54	128	531	96	260	1078	195	199	825	150	0	0	0	125	618	94	128	531	96	74	307	86	233	966	175	102	423	77																										
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	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0																							
EXPOSED CLG				1.2	0.6	492	587	289	215	256	126	130	165	76	230	274	135	232	277	136	120	143	71	35	101	50	160	179	88	228	272	134	72	86	42	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	30	77	39	0	0	0	125	319	157	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	0.4	0	0	0	0	0	0	0	0	0	0	0	0	232	550	100	0	0	0	15	36	6	25	59	11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0																						
BASEMENT/CRAWL HEAT LOSS						0																																																													
SLAB ON GRADE HEAT LOSS						0																																																													
SUBTOTAL HT LOSS						2654			1838			453		1198		2613		1979		137		1488		1119		531		1796		779																																					
SUB TOTAL HT GAIN						1879			1449		131		525		2343		1632		56		1372		829		272		1920		364																																						
LEVEL FACTOR / MULTIPLIER				0.20	0.39		0.20	0.39		0.20	0.39		0.20	0.39		0.20	0.39		0.20	0.39		0.20	0.39		0.20	0.39		0.20	0.39		0.30	0.63		0.30	0.63																																
AIR CHANGE HEAT LOSS						1026			711		175		483		1088		765		53		576		433		205		1126		488																																						
AIR CHANGE HEAT GAIN						179			138		12		50		223		174		5		131		60		26		183		35																																						
DUCT LOSS						0			0		0		0		390		0		19		206		0		0		0		0		0																																				
DUCT GAIN						0			0		0		0		366		0		6		150		0		0		0		0		0																																				
HEAT GAIN PEOPLE				240	2	480	0	0	0	0	0	1	240	1	240	1	240	0	0	0	0	0	1	240	0	0	0	0	0	0	0	0	0	0	0	0	1	240	0	1	240	0																									
HEAT GAIN APPLIANCES/LIGHTS						852			852		852		852		852		852		0		0		852		0		0		852		0																																				
TOTAL HT LOSS BTU/H						3679			2549		629		1661		4291		2744		209		2269		1551		736		2922		1267																																						
TOTAL HT GAIN x 1.3 BTU/H						4406			3170		1293		2166		5230		4027		88		2149		2314		388		3841		1937																																						

ROOM USE			DIN		FAM		KT/BR		LIV		LAUN		G-ENS		FOY		MUD		FLEX				WOB		BAS						
EXP. WALL			15		54		32		22		0		17		23		10		9				52		196						
CLG. HT.			10		10		10		10		9		10		11		11		9				9		9						
GRS.WALL AREA	FACTORS		160		540		320		220		0		170		253		110		81				468		1176						
GLAZING	LOSS	GAIN	LOSS GAIN		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	0	0	0	0	0	0	0	0	0	0	0	7	138	112	0	0	0	0	0	0	0	0	0	10	198	160			
EAST	19.8	41.6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6	119	249	0	0	0	0	0	0	0	0	0			
SOUTH	19.8	24.9	42	830	1046	0	0	0	0	0	0	21	415	523	0	0	0	0	0	0	16	316	398	0	0	0	5	99	124		
WEST	19.8	41.6	0	0	0	40	791	1662	73	1443	3033	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	72	1423	2992		
SKYL.T.	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	0	0	0	0		
DOORS	23.5	4.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	40	938	170	20	469	85	0	0	0	20	469	85	20	469	85
NET EXPOSED WALL	4.1	0.8	108	448	81	500	2073	376	247	1024	186	199	825	150	0	0	0	163	676	123	207	858	156	90	373	68	65	269	49	0	0
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	0	0	0	0	0	
EXPOSED CLG	1.2	0.6	0	0	0	0	0	0	0	0	0	0	0	0	125	149	73	0	0	0	0	0	0	125	149	73	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	0	0	0	0	0	0	0	
EXPOSED FLOOR	2.4	0.4	0	0	0	0	0	0	0	0	0	15	36	6	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				1278			2864			2467			1260			185			814			1915			842			735			286
SUB TOTAL HT GAIN					1127			2038			3219			672			80			234			575			163			521		3359
LEVEL FACTOR / MULTIPLIER	0.30	0.63				0.30	0.63		0.30	0.63		0.30	0.63		0.20	0.39		0.30	0.63		0.30	0.63		0.30	0.63		0.20	0.39		0.50	1.48
AIR CHANGE HEAT LOSS				801			1795			1647			777			71			510			1200			528			284			14622
AIR CHANGE HEAT GAIN					107			194			307			64			8			22			56			15		50			388
DUCT LOSS				0			0			0			0			26			0			0			0			0			0
DUCT GAIN					0			0			0			0			94			0			0			0		0			0
HEAT GAIN PEOPLE	240		0			0		0		0		0		0		0		0		0		0		0		0		0		0	0
HEAT GAIN APPLIANCES/LIGHTS				852			852			852			852			852			852			852			852			852			852
TOTAL HT LOSS BTU/H				2079			4659			4014			2018			281			1324			3115			1370			1019			3737
TOTAL HT GAIN x 1.3 BTU/H					2711		4008			5690			2064				1343			334			1926			1324			1848		2566

TOTAL HEAT GAIN BTU/H:

59710

TONS: 4.98

LOSS DUE TO VENTILATION LOAD BTU/H: 2916

STRUCTURAL HEAT LOSS: 58890

TOTAL COMBINED HEAT LOSS BTU/H: 71806

SITE NAME: RUSSEL GARDENS PH. 4
BUILDER: GREENPARK HOMES

LOT 596
TYPE: GRANDVILLE 3

DATE: Oct-21

GFA: 4622 LO# 93174

HEATING CFM 1818 COOLING CFM 1818
TOTAL HEAT LOSS 68,890 TOTAL HEAT GAIN 59,182
AIR FLOW RATE CFM 26.39 AIR FLOW RATE CFM 30.72

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
max s/a dif press. loss 0.02
min adjusted pressure s/a 0.16

r/a pressure 0.17
r/a grille press. Loss 0.02
adjusted pressure r/a 0.15

~GOODMAN
GMVC961005CNA 100
FAN SPEED LOW 1360
MEDLOW 1818
MEDIUM 1870
MEDIUM HIGH 1910
HIGH 1957

AFUE = 96 %
INPUT (BTU/H) = 100,000
OUTPUT (BTU/H) = 96,000

DESIGN CFM = 1818
CFM @ .8" E.S.P.

TEMPERATURE RISE 49 °F

RUN COUNT	4th	3rd	2nd	1st	Bas
S/A	0	0	18	12	7
R/A	0	0	6	4	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	ENS-2	ENS-3	BED-5	MBR	ENS-4	DIN	FAM	KT/BR	KT/BR	LIV	LAUN	G-ENS	FOY	MUD	BAS	BAS	BAS	BAS
RM LOSS MBH	1.84	1.27	0.63	1.66	1.43	1.37	0.21	1.13	1.55	1.84	0.74	2.08	2.33	2.01	2.01	2.02	0.28	1.32	3.12	1.37	3.50	3.50	3.50	3.50
CFM PER RUN HEAT	49	34	17	44	38	36	6	30	41	49	19	55	61	53	53	53	7	35	82	36	92	92	92	92
RM GAIN MBH	2.20	1.59	1.29	2.17	1.74	2.01	0.09	1.07	2.31	2.20	0.39	2.71	2.00	2.85	2.85	2.06	1.34	0.33	1.93	1.32	0.99	0.99	0.99	0.99
CFM PER RUN COOLING	68	49	40	67	54	62	3	33	71	68	12	83	62	87	87	63	41	10	59	41	30	30	30	30
ADJUSTED PRESSURE	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.16	0.17	0.16	0.16	0.17	0.17	0.17	0.16	0.17	0.16	0.16	0.16	0.16
ACTUAL DUCT LGH	66	47	26	32	40	65	36	67	62	51	60	51	31	44	37	47	41	50	48	19	65	35	43	46
EQUIVALENT LENGTH	160	180	180	130	130	180	160	190	170	140	150	130	150	120	140	120	190	110	170	170	120	130	140	100
TOTAL EFFECTIVE LENGTH	226	227	206	162	170	245	196	257	232	191	210	181	181	164	177	167	231	160	218	189	185	183	146	146
ADJUSTED PRESSURE	0.08	0.08	0.08	0.11	0.1	0.07	0.09	0.07	0.07	0.09	0.08	0.09	0.1	0.1	0.09	0.1	0.07	0.11	0.07	0.09	0.09	0.1	0.09	0.11
ROUND DUCT SIZE	6	5	4	6	6	6	4	5	6	6	4	6	5	6	6	5	5	4	6	4	6	6	6	6
HEATING VELOCITY (ft/min)	250	250	195	224	194	184	69	220	209	250	218	280	448	270	270	389	51	402	418	413	469	469	469	469
COOLING VELOCITY (ft/min)	347	360	459	342	275	316	34	242	362	347	138	423	455	444	444	463	301	115	301	470	153	153	153	153
OUTLET GRILL SIZE	4X10	3X10	3X10	4X10	4X10	4X10	3X10	3X10	4X10	4X10	3X10	4X10	3X10	4X10	4X10	3X10	3X10	3X10	4X10	3X10	4X10	4X10	4X10	4X10
TRUNK	B	B	B	E	E	H	E	H	B	B	H	G	A	A	A	G	B	D	G	G	A	A	D	A

RUN #	25	26	27	28	29	30	31	32	33	34	35	36	37
ROOM NAME	BAS	BAS	BAS	LB/OF	GUEST	FLEX	LB/OF	BED-3	BED-3	BED-4	ENS	ENS-3	FAM
RM LOSS MBH	3.50	3.50	3.50	1.46	1.27	1.02	1.46	1.43	1.43	1.37	1.27	1.13	2.33
CFM PER RUN HEAT	92	92	92	39	33	27	39	38	38	36	34	30	61
RM GAIN MBH	0.99	0.99	0.99	1.92	1.94	1.85	1.92	1.74	1.74	2.01	1.59	1.07	2.00
CFM PER RUN COOLING	30	30	30	59	60	57	59	54	54	62	49	33	62
ADJUSTED PRESSURE	0.16	0.16	0.16	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17
ACTUAL DUCT LGH	17	48	45	55	13	49	62	39	46	72	32	51	32
EQUIVALENT LENGTH	120	140	160	150	110	140	130	150	170	160	130	180	120
TOTAL EFFECTIVE LENGTH	137	188	205	205	123	189	192	189	216	232	162	231	162
ADJUSTED PRESSURE	0.12	0.09	0.08	0.08	0.14	0.09	0.09	0.09	0.08	0.07	0.11	0.07	0.11
ROUND DUCT SIZE	6	6	6	6	5	5	6	6	6	6	4	5	5
HEATING VELOCITY (ft/min)	469	469	469	199	242	198	199	194	194	184	390	220	448
COOLING VELOCITY (ft/min)	153	153	153	301	441	419	301	275	275	316	562	242	455
OUTLET GRILL SIZE	4X10	4X10	4X10	4X10	3X10	3X10	4X10	4X10	4X10	4X10	3X10	3X10	3X10
TRUNK	D	G	G	G	D	B	G	E	E	H	E	E	D

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
CFM	PRESS.	DUCT	DUCT	(ft/min)				CFM	PRESS.	DUCT	DUCT	(ft/min)				CFM	PRESS.	DUCT	DUCT	(ft/min)				CFM	PRESS.
TRUNK A	443	0.09	10	12	x	8	665	TRUNK G	488	0.07	11.1	14	x	8	627	TRUNK O	0	0.05	0	0	x	8	0	TRUNK P	0
TRUNK B	244	0.07	8.5	10	x	8	439	TRUNK H	141	0.07	7	8	x	8	317	TRUNK Q	0	0.05	0	0	x	8	0	TRUNK R	0
TRUNK C	667	0.07	12.5	18	x	8	667	TRUNK I	609	0.07	12	18	x	8	609	TRUNK S	0	0.05	0	0	x	8	0	TRUNK T	0
TRUNK D	313	0.09	8.8	10	x	8	563	TRUNK J	0	0.00	0	0	x	8	0	TRUNK U	0	0.05	0	0	x	8	0	TRUNK V	0
TRUNK E	255	0.07	8.7	10	x	8	459	TRUNK K	0	0.00	0	0	x	8	0	TRUNK W	0	0.05	0	0	x	8	0	TRUNK X	1818
TRUNK F	541	0.07	11.5	16	x	8	809	TRUNK L	0	0.00	0	0	x	8	0	TRUNK Y	450	0.05	11.7	16	x	8	506	TRUNK Z	0
																DROP	1818	0.05	19.7	24	x	16	682		

RETURN AIR #	1	2	3	4	5	6	7	8	9	10	BR
AIR VOLUME	240	115	85	115	115	75	370	260	105	75	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
ACTUAL DUCT LGH	49	54	53	69	80	65	23	54	15	57	1
EQUIVALENT LENGTH	195	270	195	255	205	245	135	230	155	255	1
TOTAL EFFECTIVE LENGTH	244	324	248	324	285	310	158	284	170	312	1
ADJUSTED PRESSURE	0.06	0.05	0.06	0.05	0.05	0.05	0.09	0.05	0.09	0.05	14.80
ROUND DUCT SIZE	8.8	7	6	7	7	6	9.4	9.5	5.9	6	0
INLET GRILL SIZE	8	8	8	8	8	8	8	8	8	8	0
INLET GRILL SIZE	X	X	X	X	X	X	X	X	X	X	X
INLET GRILL SIZE	30	14	14	14	14	14	30	30	14	14	0

TYPE: GRANDVILLE 3
SITE NAME: RUSSEL GARDENS PH. 4

LO # 93174
LOT 586

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	5	@ 10.6 cfm	53	cfm
Kitchen & Bathrooms	9	@ 10.6 cfm	95.4	cfm
Other Rooms	6	@ 10.6 cfm	63.6	cfm
Table 9.32.3.A.			TOTAL	254.4 cfm

PRINCIPAL VENTILATION CAPACITY REQUIRED 9.32.3.4(1)

6 Bedrooms

As Per Ashrea 62.2 Dwelling- Unit Ventilation

4.1.1 Total Ventilation Rate

$$Q_{tot} = 0.03A_{floor} + 7.5(N_{br} + 1)$$

TOTAL 191.2 cfm

SUPPLEMENTAL VENTILATION CAPACITY 9.32.3.6.

Total Ventilation Capacity	254.4	cfm
Less Principal Ventil. Capacity	191.2	cfm
Required Supplemental Capacity	63.2	cfm

PRINCIPAL EXHAUST FAN CAPACITY

Model: VANE G2400H ECM Location: BSMT

191.2 cfm ☒ HVI Approved

PRINCIPAL EXHAUST HEAT LOSS CALCULATION

CFM	AT °F	FACTOR	% LOSS
191.2 CFM	71 F	1.08	0.20

SUPPLEMENTAL FANS
BY INSTALLING CONTRACTOR

Location	Model	cfm	HVI	Sons
ENS	BY INSTALLING CONTRACTOR	50	☒	3.5
ENS-2	BY INSTALLING CONTRACTOR	50	☒	3.5
ENS-4	BY INSTALLING CONTRACTOR	50	☒	3.5
G-ENS	BY INSTALLING CONTRACTOR	50	☒	3.5

HEAT RECOVERY VENTILATOR 9.32.3.11.

Model: VANE G2400H ECM

210 cfm high 50 cfm low

80 % 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:

October-21

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* MICHAEL O'ROURKE

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

LO#: 93174

Model: GRANDVILLE 3

Builder: GREENPARK HOMES

Date: 2021-10-25

Volume Calculation
Air Change & Delta T Data
House Volume

Level	Floor Area (ft²)	Floor Height (ft)	Volume (ft³)
Bsmt	2173	9	19557
First	2173	10	21730
Second	2466	9	22194
Third	0	9	0
Fourth	0	9	0
Total:			63,481.0 ft³
Total:			1797.6 m³

WINTER NATURAL AIR CHANGE RATE	0.365
SUMMER NATURAL AIR CHANGE RATE	0.130

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
6.2.6 Sensible Gain due to Air Leakage

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

$$0.365 \times 499.33 \times 39^\circ\text{C} \times 1.2 = 8571 \text{ W}$$

$$= 29244 \text{ Btu/h}$$

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

$$= 0.130 \times 499.33 \times 7^\circ\text{C} \times 1.2 = 556 \text{ W}$$

$$= 1897 \text{ Btu/h}$$

5.2.3.2 Heat Loss due to Mechanical Ventilation
6.2.7 Sensible heat Gain due to Ventilation

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

$$191 \text{ CFM} \times 71^\circ\text{F} \times 1.08 \times 0.20 = 2916 \text{ Btu/h}$$

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

$$191 \text{ CFM} \times 13^\circ\text{F} \times 1.08 \times 0.20 = 529 \text{ Btu/h}$$

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

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

Level	Level Factor (LF)	HLairbv Air Leakage + Ventilation Heat Loss (Btu/h)	Level Conductive Heat Loss: (HL _{cleve})	Air Leakage Heat Loss Multiplier (LF x HLairbv / HL _{cleve})
1	0.5	29,244	9,881	1.480
2	0.3		13,995	0.627
3	0.2		15,129	0.387
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: GRANDVILLE 3	LOT 596	BUILDER: GREENPARK HOMES
SFQT: 4622	LO# 93174	SITE: RUSSEL GARDENS PH. 4

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):	63481.0	ASSUMED (Y/N):	Y
INTERNAL SHADING:	BLINDS/CURTAINS	ASSUMED OCCUPANTS:	7
INTERIOR LIGHTING LOAD (Btu/h/ft²):	2.25	DC BRUSHLESS MOTOR (Y/N):	Y
FOUNDATION CONFIGURATION	BCIN_1	DEPTH BELOW GRADE:	6.0 ft
LENGTH: 65.0 ft	WIDTH: 43.0 ft	EXPOSED PERIMETER:	196.0 ft
WOB INSULATION CONFIGURATION	SCB_9	WOB EXPOSED PERIMETER	20.0 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	96%	-
HRV Minimum Efficiency	75%	-
Domestic Hot Water Heater Minimum EF	0.8	-

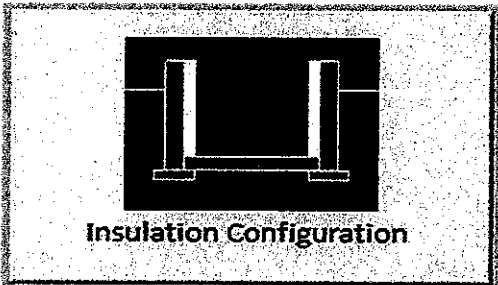
INDIVIDUAL BCIN: 19669

MICHAEL O'ROURKE



Residential Foundation Thermal Load Calculator

Supplemental tool for CAN/CSA-F280

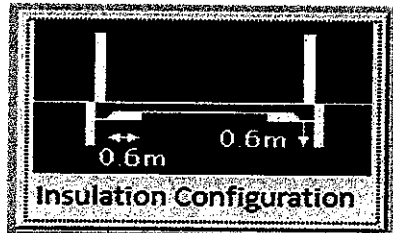
Weather Station Description		
Province:	Ontario	
Region:	Hamilton	
Site Description		
Soil Conductivity:	Normal conductivity: dry sand, loam, clay	
Water Table:	Normal (7-10 m, 23-33 ft)	
Foundation Dimensions		
Floor Length (m):	4.6	 Insulation Configuration
Floor Width (m):	13.1	
Exposed Perimeter (m):	59.7	
Wall Height (m):	2.7	
Depth Below Grade (m):	1.57	
Window Area (m ²):	1.4	
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):		1000

TYPE: GRANDVILLE 3
LO# 93174

LOT 596

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	 Insulation Configuration
Width (m):	12.8	
Exposed Perimeter (m):	6.1	
Radiant Slab		
Heated Fraction of the Slab:	0	
Fluid Temperature (°C):	33	
Design Months		
Heating Month	1	
Results		
Heating Load (Watts):		84

TYPE: GRANDVILLE 3
LO# 93174

LOT 596

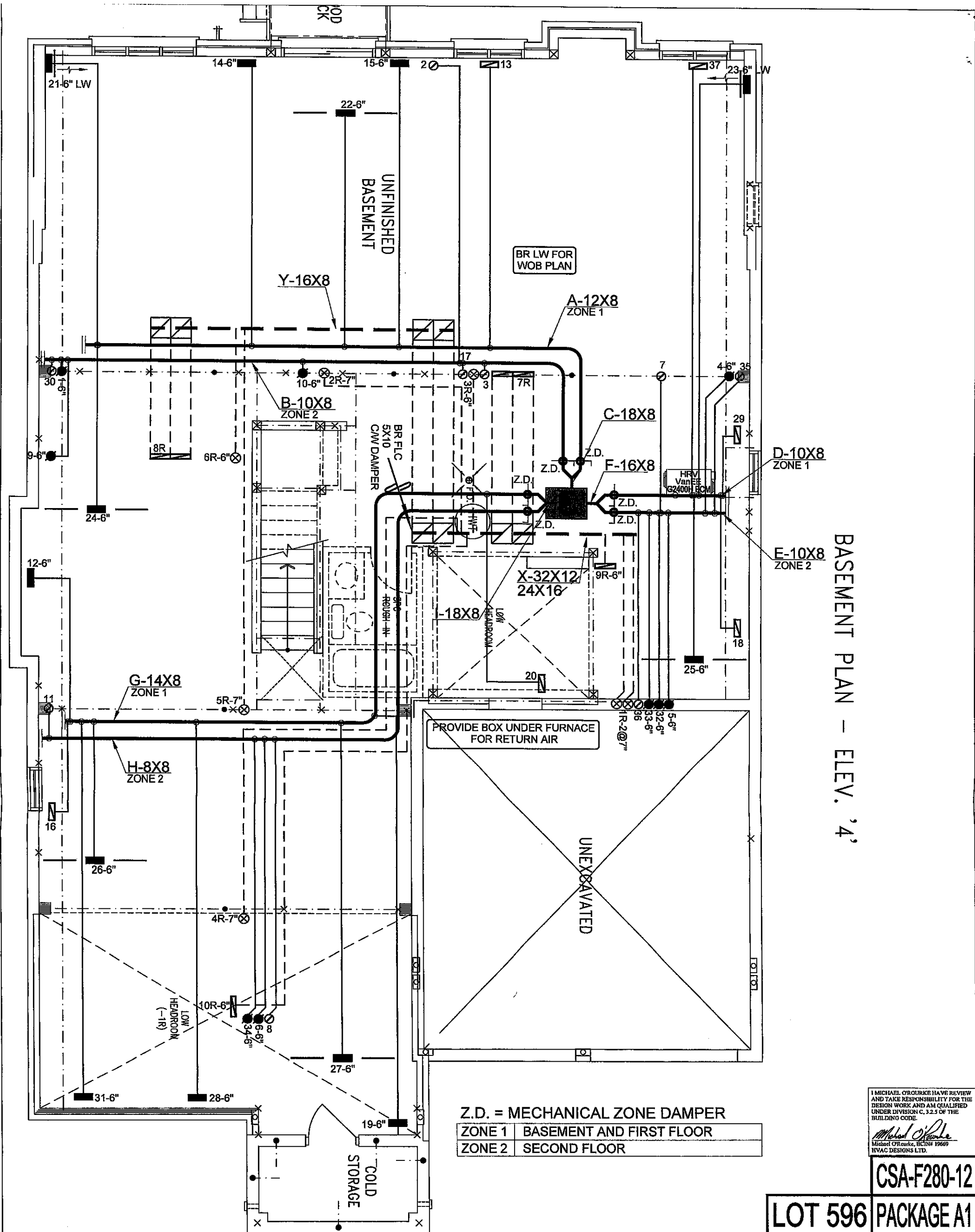
Air Infiltration Residential Load Calculator

Supplemental tool for CAN/CSA-F280

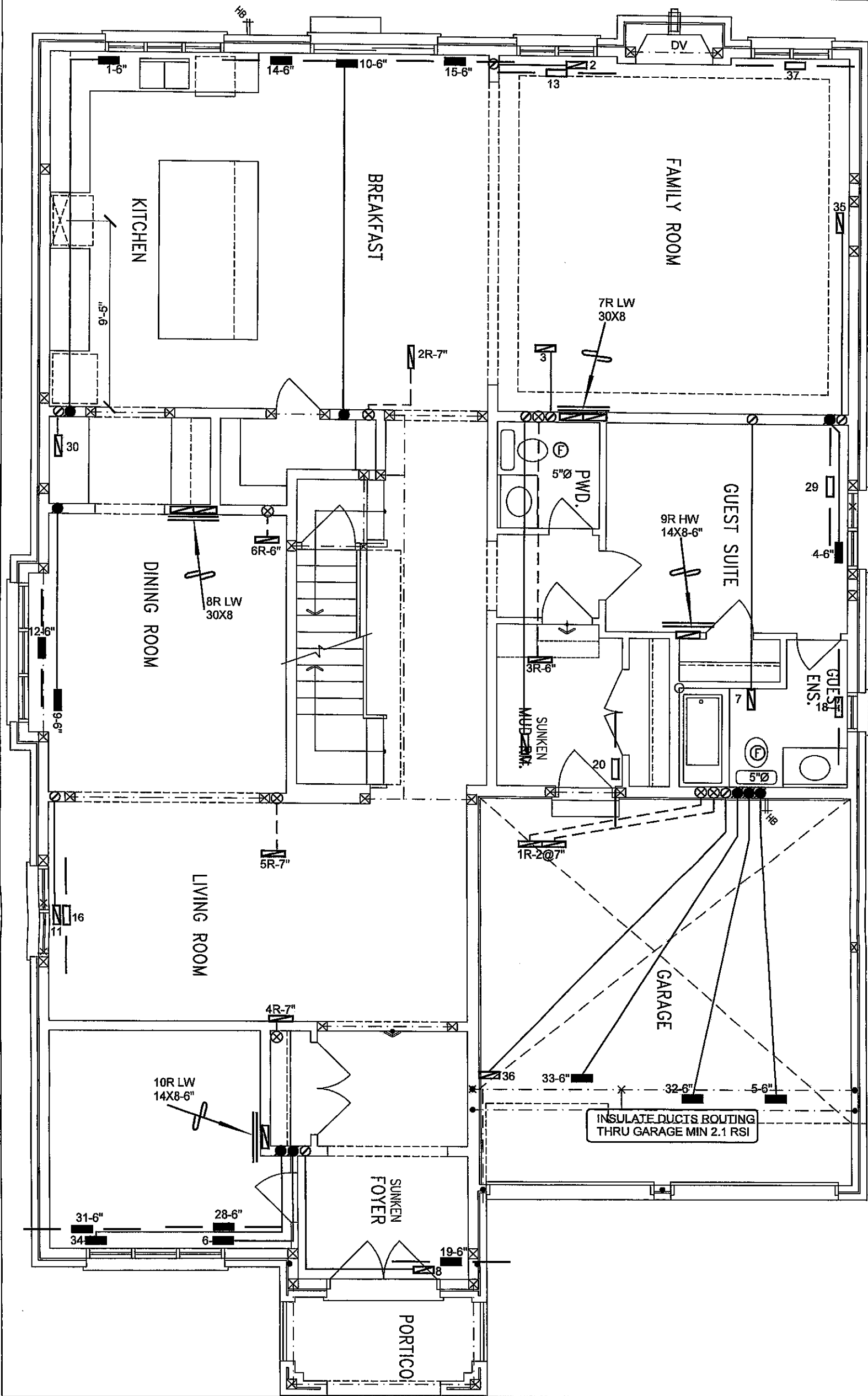
Weather Station Description				
Province:	Ontario			
Region:	Hamilton			
Weather Station Location:	Open flat terrain, grass			
Anemometer height (m):	10			
Local Shielding				
Building Site:	Suburban, forest			
Walls:	Heavy			
Flue:	Heavy			
Highest Ceiling Height (m):	8.53			
Building Configuration				
Type:	Detached			
Number of Stories:	Two			
Foundation:	Full			
House Volume (m ³):	1797.6			
Air Leakage/Ventilation				
Air Tightness Type:	Present (1961-) (3.57 ACH)			
Custom BDT Data:	ELA @ 10 Pa.	2396.2 cm ²		
	3.57	ACH @ 50 Pa		
Mechanical Ventilation (L/s):	Total Supply	Total Exhaust		
	90.2	90.2		
Flue Size				
Flue #:	#1	#2	#3	#4
Diameter (mm):	0	0	0	0
Natural Infiltration Rates				
Heating Air Leakage Rate (ACH/H):	0.365			
Cooling Air Leakage Rate (ACH/H):	0.130			

TYPE: GRANDVILLE 3
LO# 93174

LOT 596



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		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 71806 BTU/H		# OF RUNS S/A R/A FANS		Sheet Title	
GREENPARK HOMES					UNIT DATA		3RD FLOOR		BASEMENT HEATING LAYOUT	
					MAKE GOODMAN		2ND FLOOR			
					MODEL GMVC961005CNA		1ST FLOOR			
					INPUT 100 MBTU/H		BASEMENT			
Project Name		RUSSELL GARDENS PH. 4		OUTPUT 96 MBTU/H		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		Date OCT/2021		
HAMILTON, ONTARIO		LOT 596		COOLING 5.0 (2 STAGE) TONS				Scale 3/16" = 1'-0"		
		GRANDVILLE 3		FAN SPEED 1818 cfm @ 0.5" w.c.				BCIN# 19669		
4622 sqft								LO# 93174		



PARTIAL GROUND FLOOR PLAN – ELEV. '4' – (LOT 596)

I MICHAEL O'Rourke HAVE REVIEWED AND TAKE RESPONSIBILITY FOR THE DESIGN WORK AND AM QUALIFIED UNDER DIVISION C, 32.3 OF THE BUILDING CODE.
Michael O'Rourke
Michael O'Rourke, BCIN# 19669
HVAC DESIGNS LTD.

CSA-F280-12

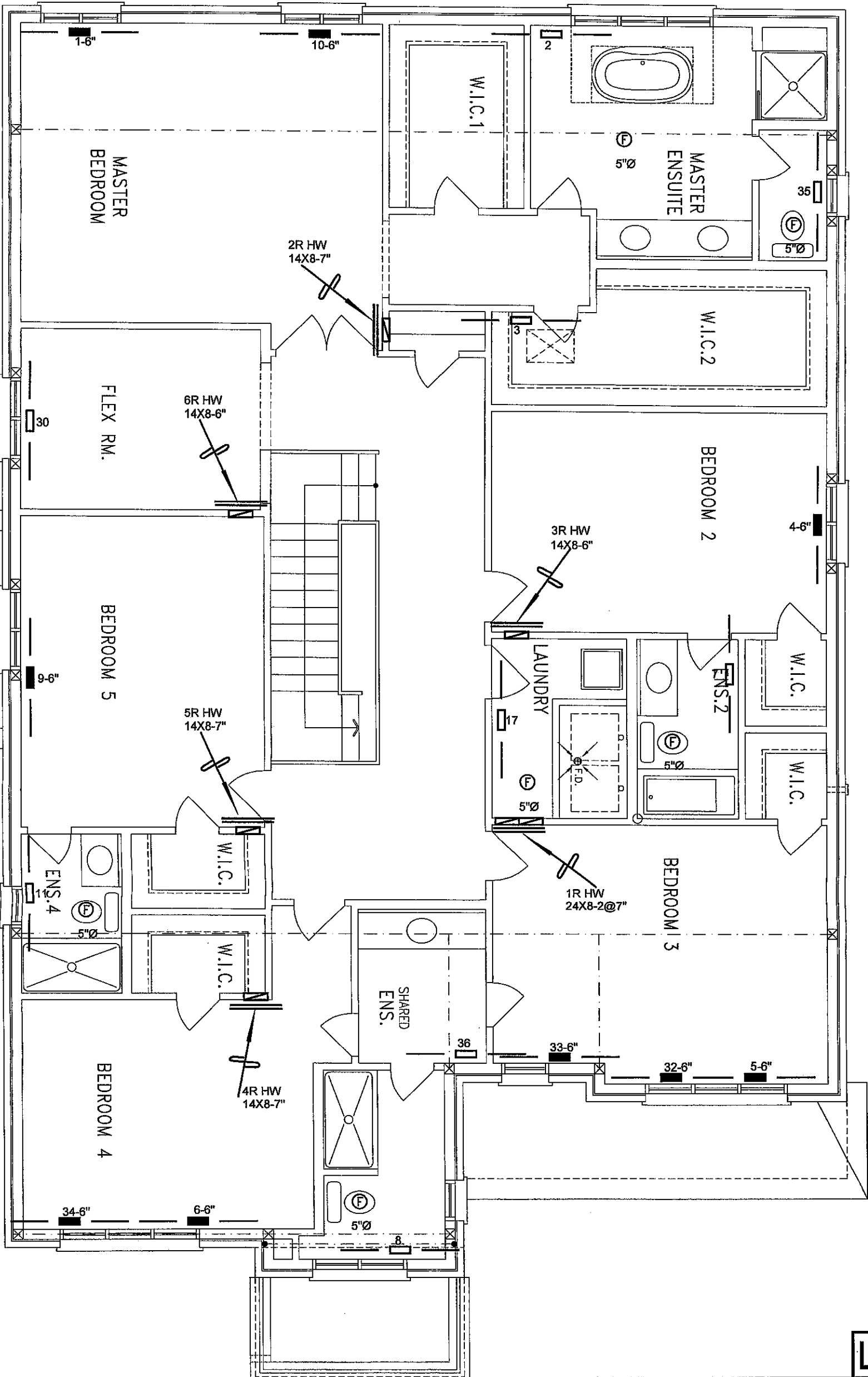
LOT 596 PACKAGE A1

HVAC LEGEND						REVISIONS	
SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	No.	Description
	SUPPLY AIR GRILLE		6" SUPPLY AIR BOOT ABOVE		14"x8" RETURN AIR GRILLE	3.	
	SUPPLY AIR GRILLE 6" BOOT		SUPPLY AIR STACK FROM 2nd FLOOR		30"x6" RETURN AIR GRILLE	2.	
	SUPPLY AIR BOOT ABOVE		6" SUPPLY AIR STACK 2nd FLOOR		FRA- FLOOR RETURN AIR GRILLE	1.	
					REDUCER	No.	Date

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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 RUSSELL GARDENS PH. 4 HAMILTON, ONTARIO			Date OCT/2021	
LOT 596 GRANDVILLE 3 4622 sqft			Scale 3/16" = 1'-0"	
			BCIN# 19669	
			LO#	93174

PARTIAL SECOND FLOOR PLAN - ELEV. '4' (LOT 596)



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.

CSA-F280-12

LOT 596 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.
	SUPPLY AIR GRILLE 6" BOOT		SUPPLY AIR STACK FROM 2nd FLOOR		30"x8" RETURN AIR GRILLE		RETURN AIR STACK 2nd FLOOR	1.
	SUPPLY AIR BOOT ABOVE		6" SUPPLY AIR STACK 2nd FLOOR		FRA - FLOOR RETURN AIR GRILLE		REDUCER	No.
REVISIONS								Date

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Client		 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	Sheet Title	
GREENPARK HOMES			SECOND FLOOR	
Project Name			HEATING	
RUSSELL GARDENS PH. 4 HAMILTON, ONTARIO			LAYOUT	
LOT 596		Date		OCT/2021
GRANDVILLE 3 4622 sqft		Scale		3/16" = 1'-0"
				BCIN# 19669
		LO#		93174