

SITE NAME: RUSSEL GARDENS PH 4		WUB		DATE: Apr-21		WINTER NATURAL AIR CHANGE RATE 0.310		HEAT LOSS AT *F. 71		CSA-F280-12	
BUILDER: GREENPARK HOMES		TYPE: SPRINGFIELD 3		LO# 90162		SUMMER NATURAL AIR CHANGE RATE 0.111		HEAT GAIN AT *F. 13		SB-12 PACKAGE A1	
ROOM USE		MBR	ENS	BED-2	BED-3	BED-4	ENS-3		FLEX	ENS-4	
EXP. WALL		42	30	34	37	23	0		20	6	
CLG. HT.		9	9	9	9	9	9		9	9	
FACTORS											
GRS.WALL AREA	LOSS GAIN	378	270	306	333	207	0		180	54	
GLAZING	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 0	0 0 0	0 0 0		32 633 511	0 0 0	
EAST	19.8 41.6	0 0 0	0 0 0	57 1127 2368	68 1344 2826	0 0 0	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	16 316 398	0 0 0		0 0 0	7 138 174	
WEST	19.8 41.6	32 633 1330	31 613 1288	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	
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	
NET EXPOSED WALL	4.1 0.8	346 1434 260	239 991 180	249 1032 187	265 1099 199	191 732 144	0 0 0		148 614 111	47 195 36	
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	
EXPOSED CLG	1.2 0.6	398 474 234	221 263 130	262 312 154	256 305 160	365 423 209	85 101 50		260 310 153	120 143 71	
NO ATTIC EXPOSED CLG	2.6 1.3	0 0 0	0 0 0	31 79 39	44 112 55	0 0 0	0 0 0		0 0 0	0 0 0	
EXPOSED FLOOR	2.4 0.4	0 0 0	0 0 0	293 594 126	0 0 0	0 0 0	85 201 37		159 377 68	0 0 0	
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		2541	1867	3246	2860	1531	303		1933	476	
SUB TOTAL HT GAIN		1824	1598	2874	3231	751	86		843	286	
LEVEL FACTOR / MULTIPLIER	0.20 0.26	0.20 0.26	0.20 0.26	0.20 0.26	0.20 0.26	0.20 0.26	0.20 0.26		0.20 0.26	0.20 0.26	
AIR CHANGE HEAT LOSS	665		489	849	748	401	79		506	125	
AIR CHANGE HEAT GAIN	124		109	196	220	51	6		58	19	
DUCT LOSS	0		0	409	0	0	38		244	0	
DUCT GAIN	0		0	388	0	0	9		147	0	
HEAT GAIN PEOPLE	240	2	480	1	240	1	240		0	0	
HEAT GAIN APPLIANCES/LIGHTS		566	0	566	566	566	0		566	0	
TOTAL HT LOSS BTU/H		3206	2356	4583	3609	1932	420		2682	601	
TOTAL HT GAIN x 1.3 BTU/H		3893	2219	5544	5535	2091	132		2098	389	

ROOM USE		FAM	LV/DN	K7/BF	L/H/G	LND	G-E/PD	FOY	MUD		WUB	BAS
EXP. WALL		39	35	42	25	0	6	18	27		17	173
CLG. HT.		10	10	10	11	9	10	11	11		9	9
FACTORS												
GRS.WALL AREA	LOSS GAIN	390	350	420	275	0	60	198	297		153	1038
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	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	8 158 128		0 0 0	5 99 80
EAST	19.8 41.6	0 0 0	0 0 0	0 0 0	56 1107 2327	0 0 0	0 0 0	12 237 499	0 0 0		0 0 0	0 0 0
SOUTH	19.8 24.9	0 0 0	35 712 896	0 0 0	0 0 0	0 0 0	7 138 174	0 0 0	0 0 0		0 0 0	10 198 249
WEST	19.8 41.6	40 791 1662	0 0 0	65 1285 2701	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
DOORS	23.5 4.3	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	35 821 159	20 469 85		20 469 85	20 469 85
NET EXPOSED WALL	4.1 0.8	350 1451 263	314 1302 236	366 1472 267	219 908 166	0 0 0	53 220 40	151 626 113	269 1115 422		133 551 106	0 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	519 1735 315
EXPOSED CLG	1.2 0.6	0 0 0	0 0 0	0 0 0	0 0 0	104 124 61	0 0 0	0 0 0	0 0 0		0 0 0	0 0 0
NO ATTIC EXPOSED CLG	2.6 1.3	10 26 13	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	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	0		0	0
SLAB ON GRADE HEAT LOSS		0	0	0	0	0	0	0	0		0	0
SUBTOTAL HT LOSS		2267	2013	2767	2016	124	358	214	415		134	8245
SUB TOTAL HT GAIN		1938	1132	2968	2492	61	214	415	415		1155	728
LEVEL FACTOR / MULTIPLIER	0.30 0.45	0.30 0.45	0.30 0.45	0.30 0.45	0.30 0.45	0.20 0.26	0.30 0.45	0.30 0.45	0.30 0.45		0.50 1.04	9734
AIR CHANGE HEAT LOSS	1032		916	1254	917	32	163	15	793		0	62
AIR CHANGE HEAT GAIN	132		77	203	170	4	0	0	28		0	0
DUCT LOSS	0		0	0	0	0	0	0	0		0	0
DUCT GAIN	0		0	0	0	0	0	0	0		0	0
HEAT GAIN PEOPLE	240	0	0	0	1	240	0	0	0		0	0
HEAT GAIN APPLIANCES/LIGHTS		566	566	566	566	566	0	0	0		0	566
TOTAL HT LOSS BTU/H		3299	2929	4011	2932	156	521	2460	2535		1155	17979
TOTAL HT GAIN x 1.3 BTU/H		3427	2309	4858	4508	821	297	1793	676		241	1784

CITY OF HAMILTON
 Building Division
 Permit No. 21-150623
 THESE STAMPED DRAWINGS SHALL BE AVAILABLE ON SITE
 THE OWNER AND/OR CONTRACTOR SHALL COMPLY WITH
 THE ONTARIO BUILDING CODE AND ALL OTHER APPLICABLE LAW
 These drawings and/or specifications have been reviewed by
 FOR CHIEF BUILDING OFFICIAL
 OCT 04 2021
 DATE

SITE NAME: RUSSEL GARDENS PH 4
 BUILDER: GREENPARK HOMES

 WUB
 TYPE: SPRINGFIELD 3

DATE: Apr-21

GFA: 3744 LO# 90162

 HEATING CFM 1504 COOLING CFM 1504
 TOTAL HEAT LOSS 57,277 TOTAL HEAT GAIN 42,496
 AIR FLOW RATE CFM 26.26 AIR FLOW RATE CFM 35.39

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

 #*GOODMAN
 GMCC960804CNA 80
 FAN SPEED
 LOW 868
 MEDLOW 978
 MEDIUM 1112
 MEDIUM HIGH 1504
 HIGH 1615

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

 DESIGN CFM = 1504
 CFM @ .6" E.S.P.

TEMPERATURE RISE 47 °F

RUN COUNT	4th	3rd	2nd	1st	Bas
S/A	0	0	14	10	5
R/A	0	0	6	3	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	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
ROOM NAME	MBR	ENS	ENS	BED-2	BED-3	BED-4	ENS-3	FLEX	MBR	ENS-4	FAM	LV/DN	KT/BF	KT/BF	L/H/G	LND	G-E/PD	FOY	MUD	BAS	BAS	BAS	BAS
RM LOSS MBH	1.60	1.18	1.18	2.25	1.80	1.93	0.21	2.68	1.60	0.60	1.65	2.93	2.01	2.01	1.47	0.16	0.52	2.45	2.54	3.83	3.83	3.83	3.83
CFM PER RUN HEAT	42	31	31	59	47	51	6	70	42	16	43	77	53	53	38	4	14	64	100	100	100	100	100
RM GAIN MBH	1.95	1.11	1.11	2.77	2.77	2.09	0.07	2.10	1.95	0.39	1.71	2.31	2.43	2.43	2.25	0.82	0.30	1.79	0.58	0.40	0.40	0.40	0.40
CFM PER RUN COOLING	69	39	39	98	98	74	2	74	69	14	61	82	86	86	80	29	11	63	20	14	14	14	14
ADJUSTED PRESSURE	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	0.17	0.17	0.17	0.17	0.17	0.16	0.16	0.16	0.16
ACTUAL DUCT LGH	64	29	32	63	49	26	38	52	48	31	40	11	35	28	36	11	25	43	42	60	28	18	16
EQUIVALENT LENGTH	150	140	170	170	150	150	170	190	160	140	160	90	100	120	130	150	100	140	130	150	110	130	100
TOTAL EFFECTIVE LENGTH	214	169	202	233	199	176	208	242	208	171	200	101	135	148	166	161	126	183	172	210	138	148	116
ADJUSTED PRESSURE	0.08	0.1	0.09	0.07	0.08	0.1	0.08	0.07	0.08	0.1	0.09	0.16	0.12	0.11	0.1	0.11	0.14	0.09	0.1	0.08	0.12	0.11	0.14
ROUND DUCT SIZE	6	4	4	6	6	6	4	6	6	4	5	6	6	6	5	4	4	5	5	6	6	6	6
HEATING VELOCITY (ft/min)	214	356	356	301	240	260	69	357	214	184	316	393	270	270	279	46	161	470	492	510	510	510	510
COOLING VELOCITY (ft/min)	352	447	447	500	500	377	23	377	352	161	448	418	438	438	587	333	126	463	147	71	71	71	71
OUTLET GRILL SIZE	4X10	3X10	3X10	4X10	4X10	4X10	3X10	4X10	4X10	3X10	3X10	4X10	4X10	4X10	3X10	3X10	3X10	3X10	3X10	4X10	4X10	4X10	4X10
TRUNK	A	B	E	D	C	E	D	D	A	D	A	E	B	B	C	B	D	C	A	A	B	B	E

RUN #	25	26	27	28	29	30
ROOM NAME	BAS	BED-2	BED-3	FAM	L/H/G	ENS-3
RM LOSS MBH	3.83	2.25	1.80	1.65	1.47	0.21
CFM PER RUN HEAT	100	59	47	43	38	6
RM GAIN MBH	0.40	2.77	2.77	1.71	2.25	0.07
CFM PER RUN COOLING	14	98	98	61	80	2
ADJUSTED PRESSURE	0.16	0.16	0.16	0.17	0.17	0.17
ACTUAL DUCT LGH	34	61	53	47	37	41
EQUIVALENT LENGTH	150	150	180	140	120	130
TOTAL EFFECTIVE LENGTH	184	211	233	187	157	171
ADJUSTED PRESSURE	0.09	0.08	0.07	0.09	0.11	0.1
ROUND DUCT SIZE	6	6	6	5	5	4
HEATING VELOCITY (ft/min)	510	301	240	316	279	69
COOLING VELOCITY (ft/min)	71	500	500	448	587	23
OUTLET GRILL SIZE	4X10	4X10	4X10	3X10	3X10	3X10
TRUNK	C	D	C	A	C	D

SUPPLY AIR TRUNK SIZE										RETURN AIR TRUNK SIZE										
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)		
TRUNK A	337	0.08	9.3	10	X	8	607	TRUNK G	0	0.00	0	0	X	8	0	0	0	X	8	0
TRUNK B	678	0.08	12.1	18	X	8	678	TRUNK H	0	0.00	0	0	X	8	0	0	0	X	8	0
TRUNK C	334	0.07	9.6	14	X	8	429	TRUNK I	0	0.00	0	0	X	8	0	0	0	X	8	0
TRUNK D	564	0.07	11.7	18	X	8	564	TRUNK J	0	0.00	0	0	X	8	0	0	0	X	8	0
TRUNK E	823	0.07	13.5	22	X	8	673	TRUNK K	0	0.00	0	0	X	8	0	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	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	115	95	85	115	130	115	115	355	130	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	57	56	54	51	62	55	46	26	44	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
EQUIVALENT LENGTH	245	155	195	235	195	245	245	240	220	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL EFFECTIVE LH	302	211	249	286	257	300	291	266	264	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
ADJUSTED PRESSURE	0.05	0.07	0.06	0.05	0.06	0.05	0.05	0.06	0.06	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	6	6	7	7	7	7	10.2	7	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	6	8	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	14	14	14	14	14	14	30	14	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

TYPE: SPRINGFIELD 3
SITE NAME: RUSSEL GARDENS PH 4

LO # 90162
WUB

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	4 @ 10.6 cfm	42.4 cfm
Kitchen & Bathrooms	5 @ 10.6 cfm	53 cfm
Other Rooms	8 @ 10.6 cfm	84.8 cfm
Table 9.32.3.A.	TOTAL	222.6 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		95.4 cfm

SUPPLEMENTAL VENTILATION CAPACITY		9.32.3.5.
Total Ventilation Capacity	222.6	cfm
Less Principal Ventil. Capacity	95.4	cfm
Required Supplemental Capacity	127.2	cfm

PRINCIPAL EXHAUST FAN CAPACITY			
Model:	VANEE G2400H ECM		
Location:	BSMT		
95.4 cfm	☒ HVI Approved		
PRINCIPAL EXHAUST HEAT LOSS CALCULATION			
CFM	ΔT °F	FACTOR	% LOSS
95.4 CFM	X 71 F	X 1.08	X 0.20

SUPPLEMENTAL FANS		BY INSTALLING CONTRACTOR		
Location	Model	cfm	HVI	Score
ENS	BY INSTALLING CONTRACTOR	50	☒	3.5
ENS-3	BY INSTALLING CONTRACTOR	50	☒	3.5
ENS-4	BY INSTALLING CONTRACTOR	50	☒	3.5
G-E/PD	BY INSTALLING CONTRACTOR	50	☒	3.5

HEAT RECOVERY VENTILATOR		9.32.3.11.
Model:	VANEE 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:	<i>Michael O'Rourke</i>
HRAI #	001820
Date:	April-21

CSA F280-12 Residential Heat Loss and Heat Gain Calculations																																																												
Formula Sheet (For Air Leakage / Ventilation Calculation)																																																												
LO#: 90162	Model: SPRINGFIELD 3	Builder: GREENPARK HOMES	Date: 08/04/2021																																																									
Volume Calculation			Air Change & Delta T Data																																																									
House Volume <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>Level</th> <th>Floor Area (ft²)</th> <th>Floor Height (ft)</th> <th>Volume (ft³)</th> </tr> </thead> <tbody> <tr> <td>Bsmt</td> <td>1608</td> <td>9</td> <td>14472</td> </tr> <tr> <td>First</td> <td>1608</td> <td>10</td> <td>16080</td> </tr> <tr> <td>Second</td> <td>2136</td> <td>9</td> <td>19224</td> </tr> <tr> <td>Third</td> <td>0</td> <td>9</td> <td>0</td> </tr> <tr> <td>Fourth</td> <td>0</td> <td>9</td> <td>0</td> </tr> <tr> <td colspan="3" style="text-align: right;">Total:</td> <td>49,776.0 ft³</td> </tr> <tr> <td colspan="3" style="text-align: right;">Total:</td> <td>1409.5 m³</td> </tr> </tbody> </table>			Level	Floor Area (ft²)	Floor Height (ft)	Volume (ft³)	Bsmt	1608	9	14472	First	1608	10	16080	Second	2136	9	19224	Third	0	9	0	Fourth	0	9	0	Total:			49,776.0 ft³	Total:			1409.5 m³	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 70%;">WINTER NATURAL AIR CHANGE RATE</td> <td style="width: 30%;">0.310</td> </tr> <tr> <td>SUMMER NATURAL AIR CHANGE RATE</td> <td>0.111</td> </tr> </table> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th colspan="5" style="text-align: center;">Design Temperature Difference</th> </tr> <tr> <th></th> <th>T_{in} °C</th> <th>T_{out} °C</th> <th>ΔT °C</th> <th>ΔT °F</th> </tr> <tr> <td>Winter DTD_h</td> <td>22</td> <td>-17</td> <td>39</td> <td>71</td> </tr> <tr> <td>Summer DTD_c</td> <td>24</td> <td>31</td> <td>7</td> <td>13</td> </tr> </table>		WINTER NATURAL AIR CHANGE RATE	0.310	SUMMER NATURAL AIR CHANGE RATE	0.111	Design Temperature Difference						T _{in} °C	T _{out} °C	ΔT °C	ΔT °F	Winter DTD _h	22	-17	39	71	Summer DTD _c	24	31	7	13
Level	Floor Area (ft²)	Floor Height (ft)	Volume (ft³)																																																									
Bsmt	1608	9	14472																																																									
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Summer DTD _c	24	31	7	13																																																								
5.2.3.1 Heat Loss due to Air Leakage			6.2.6 Sensible Gain due to Air Leakage																																																									
$HL_{airb} = LR_{airh} \times \frac{V_b}{3.6} \times DTD_h \times 1.2$ 0.310 x 391.53 x 39 °C x 1.2 = 5706 W = 19469 Btu/h			$HG_{salb} = LR_{airc} \times \frac{V_b}{3.6} \times DTD_c \times 1.2$ = 0.111 x 391.53 x 7 °C x 1.2 = 370 W = 1264 Btu/h																																																									
5.2.3.2 Heat Loss due to Mechanical Ventilation			6.2.7 Sensible heat Gain due to Ventilation																																																									
$HL_{vairb} = PVC \times DTD_h \times 1.08 \times (1 - E)$ 95 CFM x 71 °F x 1.08 x 0.20 = 1455 Btu/h			$HL_{vairb} = PVC \times DTD_h \times 1.08 \times (1 - E)$ 95 CFM x 13 °F x 1.08 x 0.20 = 264 Btu/h																																																									
5.2.3.3 Calculation of Air Change Heat Loss for Each Room (Floor Multiplier Section)																																																												
$HL_{airr} = Level\ Factor \times HL_{airbv} \times \{(HL_{agcr} + HL_{bgcr}) \div (HL_{agcleve} + HL_{bgcleve})\}$ <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>Level</th> <th>Level Factor (LF)</th> <th>HL_{airve} Air Leakage + Ventilation Heat Loss (Btu/h)</th> <th>Level Conductive Heat Loss: (HL_{cleve})</th> <th>Air Leakage Heat Loss Multiplier (LF x HL_{airbv} / HL_{level})</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>0.5</td> <td rowspan="5" style="text-align: center;">19,469</td> <td>9,400</td> <td>1.036</td> </tr> <tr> <td>2</td> <td>0.3</td> <td>12,837</td> <td>0.455</td> </tr> <tr> <td>3</td> <td>0.2</td> <td>14,881</td> <td>0.262</td> </tr> <tr> <td>4</td> <td>0</td> <td>0</td> <td>0.000</td> </tr> <tr> <td>5</td> <td>0</td> <td>0</td> <td>0.000</td> </tr> </tbody> </table> *HL_{airbv} = Air leakage heat loss + ventilation heat loss *For a balanced or supply only ventilation system HL_{airve} = 0					Level	Level Factor (LF)	HL _{airve} Air Leakage + Ventilation Heat Loss (Btu/h)	Level Conductive Heat Loss: (HL _{cleve})	Air Leakage Heat Loss Multiplier (LF x HL _{airbv} / HL _{level})	1	0.5	19,469	9,400	1.036	2	0.3	12,837	0.455	3	0.2	14,881	0.262	4	0	0	0.000	5	0	0	0.000																														
Level	Level Factor (LF)	HL _{airve} Air Leakage + Ventilation Heat Loss (Btu/h)	Level Conductive Heat Loss: (HL _{cleve})	Air Leakage Heat Loss Multiplier (LF x HL _{airbv} / HL _{level})																																																								
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5	0		0	0.000																																																								

HEAT LOSS AND GAIN SUMMARY SHEET

MODEL: SPRINGFIELD 3	WUB	BUILDER: GREENPARK HOMES
SFQT: 3744	LO# 90162	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):	49776.0	ASSUMED (Y/N):	Y
INTERNAL SHADING:	BLINDS/CURTAINS	ASSUMED OCCUPANTS:	6
INTERIOR LIGHTING LOAD (Btu/h/ft²):	1.27	DC BRUSHLESS MOTOR (Y/N):	Y
FOUNDATION CONFIGURATION	BCIN_1	DEPTH BELOW GRADE:	6.0 ft
LENGTH: 55.0 ft	WIDTH: 40.0 ft	EXPOSED PERIMETER:	173.0 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	-

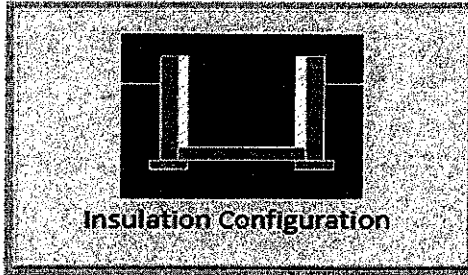
INDIVIDUAL BCIN: 19669

MICHAEL O'ROURKE



Residential Foundation Thermal Load Calculator

Supplemental tool for CAN/CSA-F280

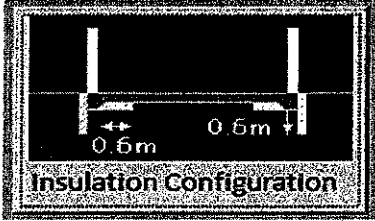
Weather Station Description		
Province:	Ontario	
Region:	Hamilton	
Site Description		
Soil Conductivity:	Normal conductivity: dry sand, loam, clay	
Water Table:	Normal (7-10 m, 23-33 ft)	
Foundation Dimensions		
Floor Length (m):	16.8	 Insulation Configuration
Floor Width (m):	12.2	
Exposed Perimeter (m):	52.7	
Wall Height (m):	2.7	
Depth Below Grade (m):	1.83	
Window Area (m ²):	1.4	
Door Area (m ²):	3.7	
Radiant Slab		
Heated Fraction of the Slab:	0	
Fluid Temperature (°C):	33	
Design Months		
Heating Month	1	
Foundation Loads		
Heating Load (Watts):		1683

TYPE: SPRINGFIELD 3
LO# 90162

WUB

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):	0.6	
Width (m):	4.6	
Exposed Perimeter (m):	5.2	
Radiant Slab		
Heated Fraction of the Slab:	0	
Fluid Temperature (°C):	33	
Design Months		
Heating Month	1	
Results		
Heating Load (Watts):		39

TYPE: SPRINGFIELD 3
LO# 90162

WUB

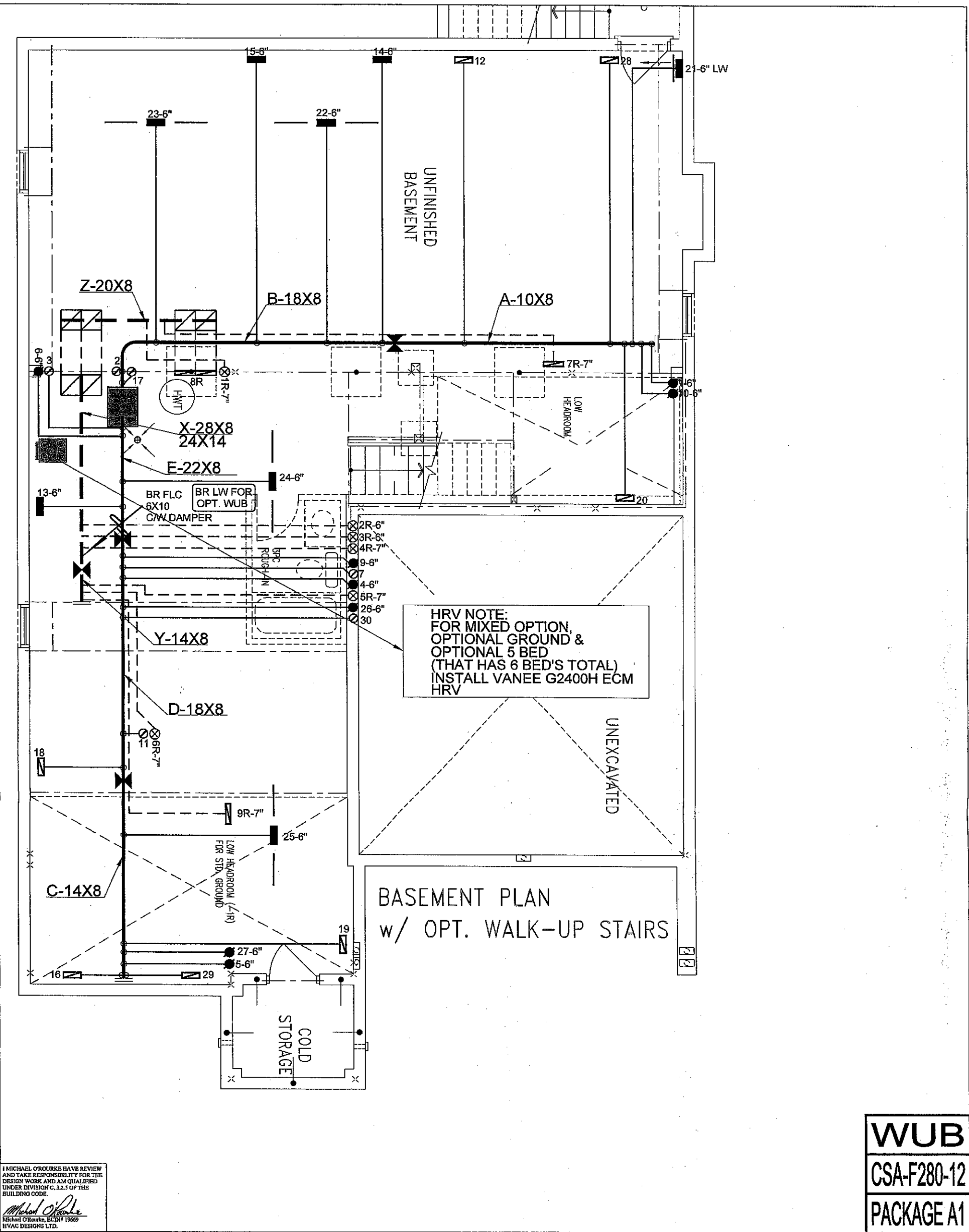
Air Infiltration Residential Load Calculator

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:	Detached			
Number of Stories:	Two			
Foundation:	Full			
House Volume (m ³):	1409.5			
Air Leakage/Ventilation				
Air Tightness Type:	Present (1961-) (3.57 ACH)			
Custom BDT Data:	ELA @ 10 Pa.	1878.9 cm ²		
	3.57	ACH @ 50 Pa		
Mechanical Ventilation (L/s):	Total Supply	Total Exhaust		
	45.0	45.0		
Flue Size				
Flue #:	#1	#2	#3	#4
Diameter (mm):	0	0	0	0
Natural Infiltration Rates				
Heating Air Leakage Rate (ACH/H):	0.310			
Cooling Air Leakage Rate (ACH/H):	0.111			

TYPE: SPRINGFIELD 3
LO# 90162

WUB



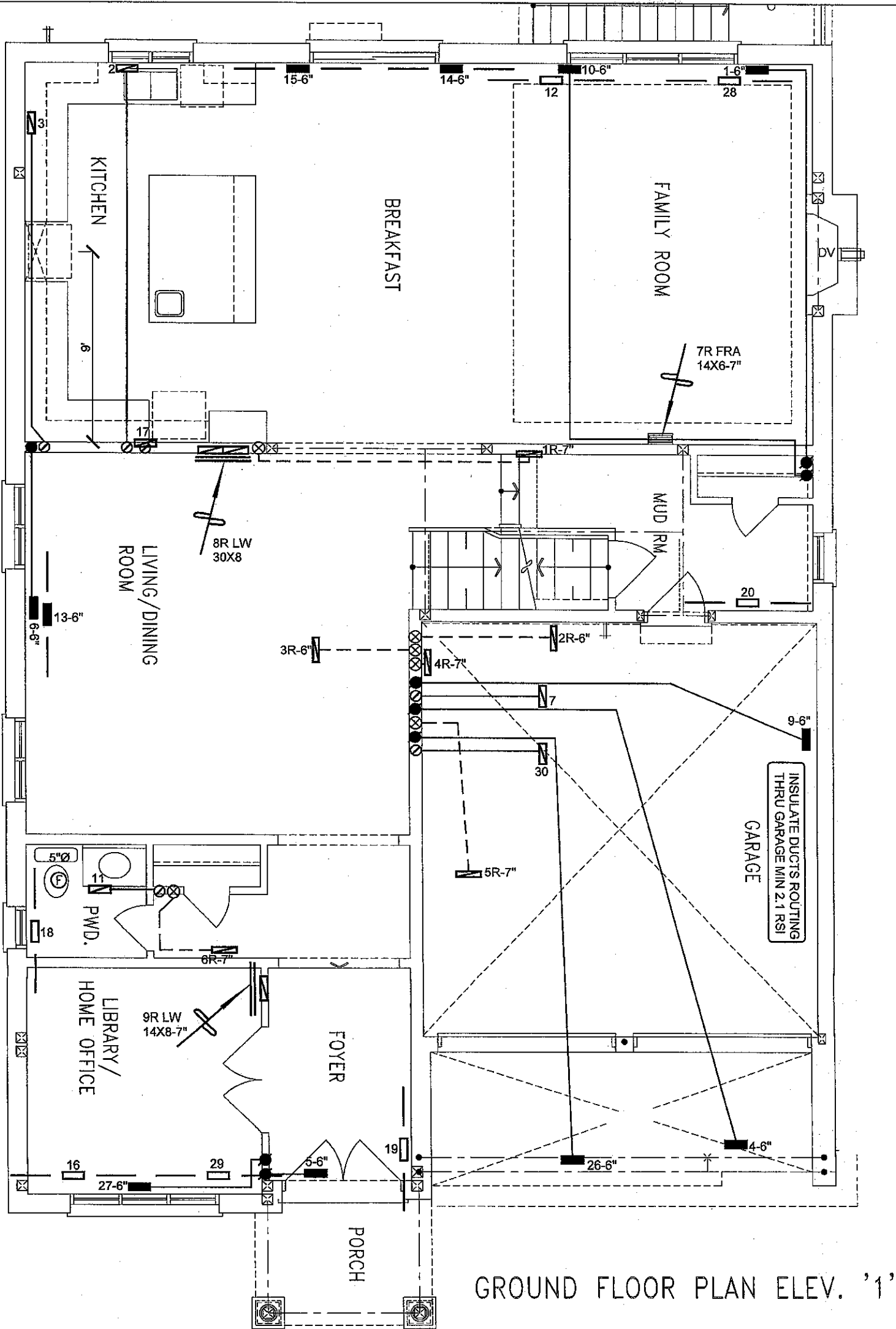
I MICHAEL O'DONNELL HAVE REVIEWED AND TAKE RESPONSIBILITY FOR THE DESIGN WORK AND AM QUALIFIED UNDER DIVISION C, 32.5 OF THE BUILDING CODE.

WUB
CSA-F280-12
PACKAGE A1

HVAC LEGEND						3.	
SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	2.	
	SUPPLY AIR GRILLE		6" SUPPLY AIR BOOT ABOVE		14"x8" RETURN AIR GRILLE	1.	
	SUPPLY AIR GRILLE 6" BOOT		SUPPLY AIR STACK FROM 2nd FLOOR		30"x8" RETURN AIR GRILLE	No.	Description
	SUPPLY AIR BOOT ABOVE		6" SUPPLY AIR STACK 2nd FLOOR		FRA- FLOOR RETURN AIR GRILLE	Date	
					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 58732 BTU/H UNIT DATA		# OF RUNS S/A R/A FANS				Sheet Title	
Project Name RUSSELL GARDENS PH 4 HAMILTON, ONTARIO			MAKE GOODMAN	3RD FLOOR					BASEMENT HEATING LAYOUT	
			MODEL GMEC960804CNA	2ND FLOOR		14	6	5		
			INPUT 80 MBTU/H	1ST FLOOR		10	3	2		
			OUTPUT 76.8 MBTU/H	BASEMENT		5	1	0		
WUB SPRINGFIELD 3 3744 sqft		COOLING 3.5 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		Date APR/2021		Scale 3/16" = 1'-0"			
		FAN SPEED 1504 cfm @ 0.5" w.g.			BCIN# 19669					
				LO# 90162						



GROUND FLOOR PLAN ELEV. '1'

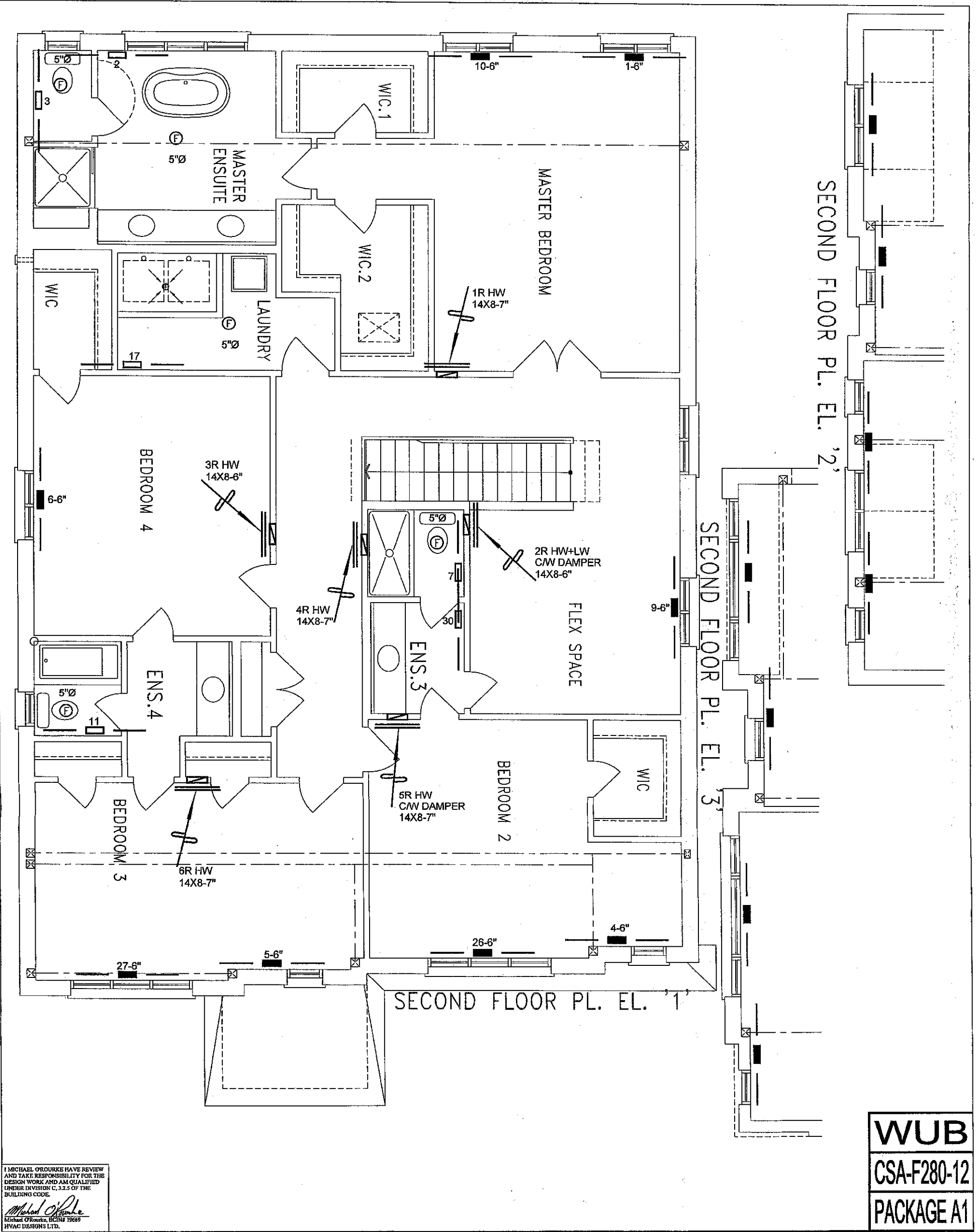
I MICHAEL O'DRISCOLL HAVE REVIEWED AND TAKE RESPONSIBILITY FOR THE DESIGN WORK AND AM QUALIFIED UNDER DIVISION C, 3.3.5 OF THE BUILDING CODE.
Michael O'Driscoll
Michael O'Driscoll, BCIN# 19669
HVAC DESIGNS LTD.

WUB
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

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GREENPARK HOMES			FIRST FLOOR HEATING LAYOUT	
Project Name			Date	
RUSSELL GARDENS PH 4 HAMILTON, ONTARIO			APR/2021	
		Scale		
		3/16" = 1'-0"		
		BCIN# 19669		
WUB		LO#	90162	
SPRINGFIELD 3 3744 sqft				



I MICHAEL O'DRISKE HAVE REVIEWED AND TAKE RESPONSIBILITY FOR THE DESIGN WORK AND AM QUALIFIED UNDER DIVISION C, 32.5 OF THE BUILDING CODE.
Michael O'Drisko
Michael O'Drisko, BCIN# 19669
HVAC DESIGNS LTD.

WUB
CSA-F280-12
PACKAGE A1

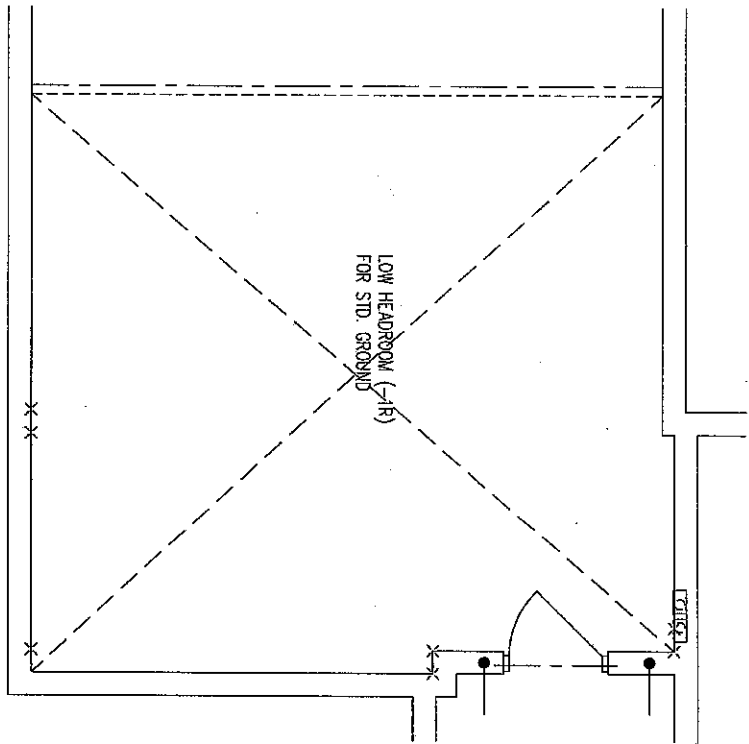
HVAC LEGEND						3.		
SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	
	SUPPLY AIR GRILLE		6" SUPPLY AIR BOOT ABOVE		14"x8" RETURN AIR GRILLE		RETURN AIR STACK ABOVE	2.
	SUPPLY AIR GRILLE 6" BOOT		SUPPLY AIR STACK FROM 2nd FLOOR		30"x8" RETURN AIR GRILLE		RETURN AIR STACK 2nd FLOOR	1.
	SUPPLY AIR BOOT ABOVE		6" SUPPLY AIR STACK 2nd FLOOR		FRA- FLOOR RETURN AIR GRILLE		REDUCER	No. Description Date
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Client GREENPARK HOMES						Sheet Title SECOND FLOOR HEATING LAYOUT		
Project Name RUSSELL GARDENS PH 4 HAMILTON, ONTARIO						Date APR/2021		
WUB SPRINGFIELD 3 3744 sqft						Scale 3/16" = 1'-0"		
						BCIN# 19669		
						LO# 90162		

HVACDESIGNS LTD.

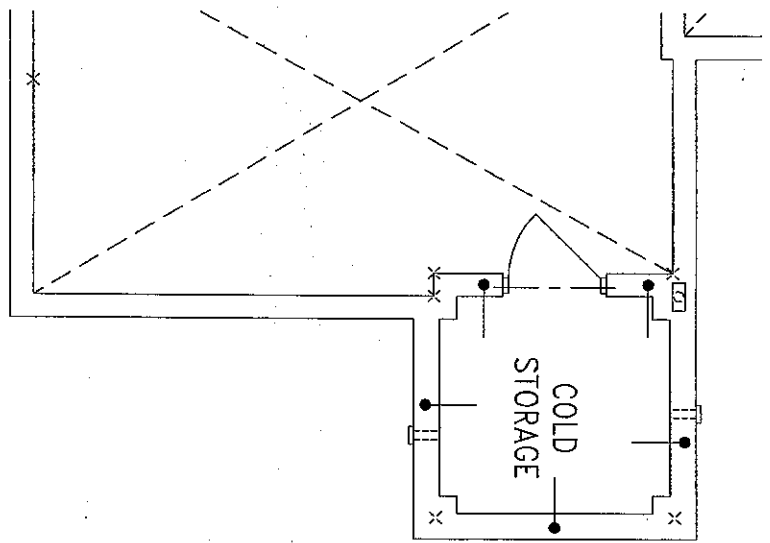
375 Finley Ave. Suite 202 - Ajax, Ontario
L1S 2E2 Tel. 905.619.2300 - 905.420.5300 Fax 905.619.2375
Email: info@hvacdsgns.ca
Web: www.hvacdesigns.ca

Specializing in Residential Mechanical Design Services

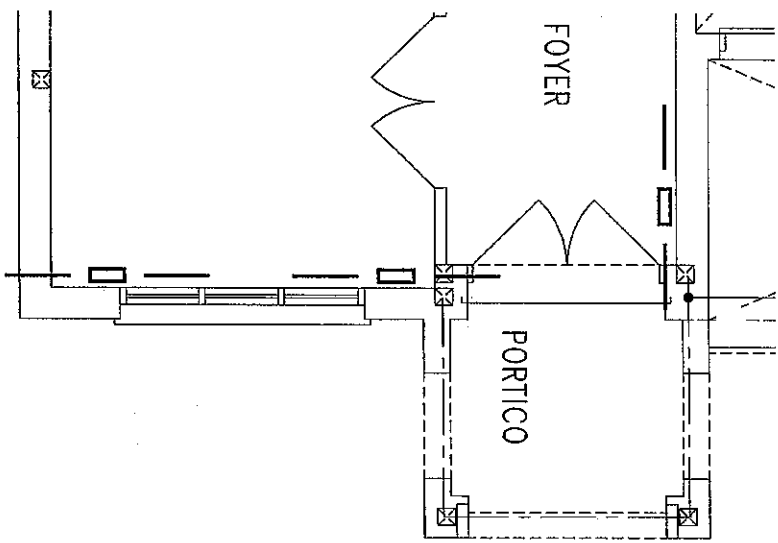
Installation to comply with the latest Ontario Building Code. All supply branch outlets shall be equipped with a manual balancing damper. Ductwork which passes through the garage or unheated spaces shall be adequately insulated and be gas-proofed.



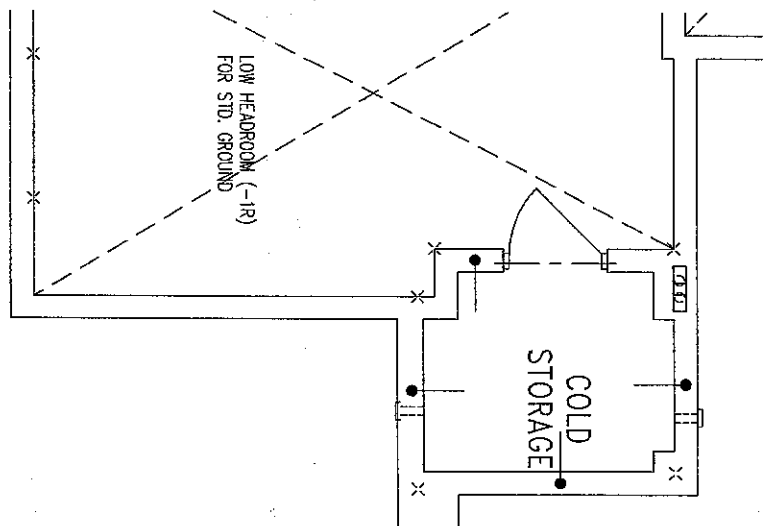
PART. BASEMENT PLAN ELEV. '1'
FOR OPT. GUEST SUITE COND.



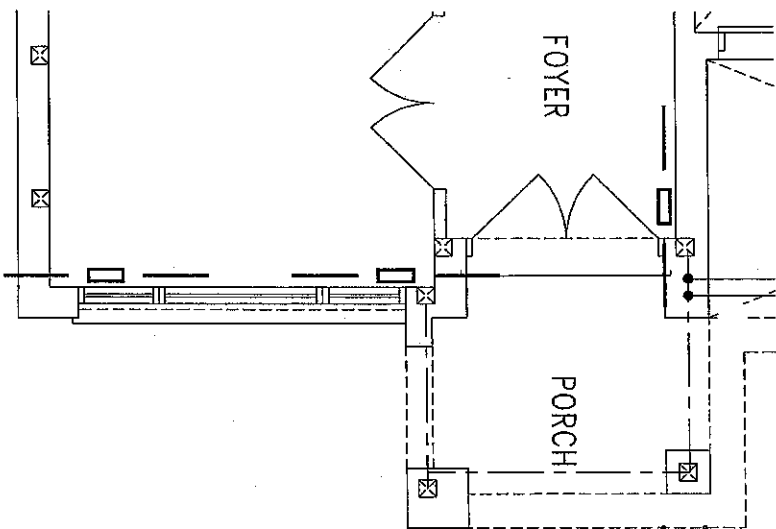
BASEMENT PLAN ELEV. '2'



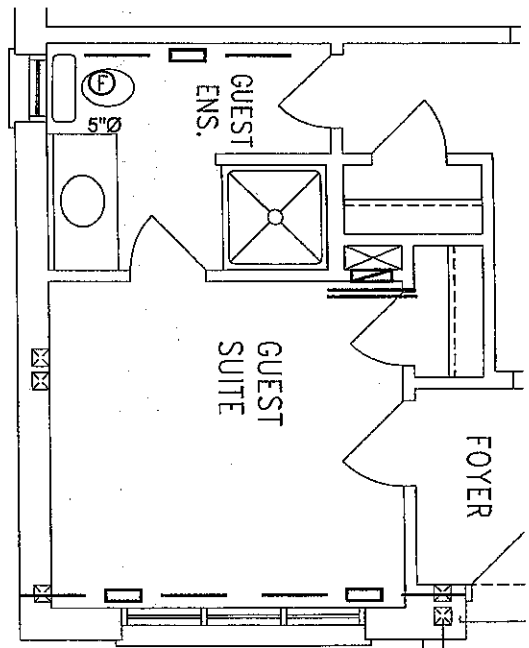
GROUND FLOOR PLAN ELEV. '2'



BASEMENT PLAN ELEV. '3'



GROUND FLOOR PLAN ELEV. '3'



PART. GROUND FLOOR PLAN -
W/ OPT. GUEST SUITE

WUB
CSA-F280-12
PACKAGE A1

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

HVAC LEGEND						3.	
SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	2.	
	SUPPLY AIR GRILLE		6" SUPPLY AIR BOOT ABOVE		14"x8" RETURN AIR GRILLE	1.	
	SUPPLY AIR GRILLE 6" BOOT		SUPPLY AIR STACK FROM 2nd FLOOR		30"x8" RETURN AIR GRILLE	No.	Description
	SUPPLY AIR BOOT ABOVE		6" SUPPLY AIR STACK 2nd FLOOR		FRA- FLOOR RETURN AIR GRILLE	Date	
					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 ELEVATIONS & OPT GUEST HEATING LAYOUT	
Project Name RUSSELL GARDENS PH 4 HAMILTON, ONTARIO			Date APR/2021	
WUB SPRINGFIELD 3 3744 sqft			Scale 3/16" = 1'-0"	
			BCIN# 19669	
			LO#	90162