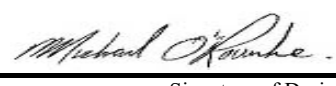


Schedule 1: Designer Information

Use one form for each individual who reviews and takes responsibility for design activities with respect to the project.

A. Project Information			
Building number, street name		Unit no.	Lot/con.
Municipality RICHMOND HILL	Postal code	Plan number/ other description	
B. Individual who reviews and takes responsibility for design activities			
Name MICHAEL O'ROURKE		Firm HVAC DESIGNS LTD.	
Street address 375 FINLEY AVE		Unit no. 202	Lot/con. N/A
Municipality AJAX	Postal code L1S 2E2	Province ONTARIO	E-mail info@hvacdesigns.ca
Telephone number (905) 619-2300	Fax number (905) 619-2375	Cell number ()	
C. Design activities undertaken by individual identified in Section B. [Building Code Table 3.5.2.1 OF Division C]			
☐ House ☐ Small Buildings ☐ Large Buildings ☐ Complex Buildings ☒ HVAC – House ☐ Building Services ☐ Detection, Lighting and Power ☐ Fire Protection ☐ Building Structural ☐ Plumbing – House ☐ Plumbing – All Buildings ☐ On-site Sewage Systems			
Description of designer's work HEAT LOSS / GAIN CALCULATIONS DUCT SIZING RESIDENTIAL MECHANICAL VENTILATION DESIGN SUMMARY RESIDENTIAL SYSTEM DESIGN per CSA-F280-12		Model: 4504 FLANKAGE Project: CENTREFIELD (WEST GORMLEY)	
D. Declaration of Designer			
I, <u>MICHAEL O'ROURKE</u> declare that (choose one as appropriate): (print name)			
☐ I review and take responsibility for the design work on behalf of a firm registered under subsection 3.2.4. of Division C, of the Building Code. I am qualified, and the firm is registered, in the appropriate classes/categories. Individual BCIN: _____ Firm BCIN: _____			
☒ I review and take responsibility for the design and am qualified in the appropriate category as an "other designer" under subsection 3.2.5. of Division C, of the Building Code. Individual BCIN: <u>19669</u> Basis for exemption from registration and qualification: <u>O.B.C SENTENCE 3.2.4.1 (4)</u>			
☐ The design work is exempt from the registration and qualification requirements of the Building Code. Basis for exemption from registration and qualification: _____			
I certify that:			
1. The information contained in this schedule is true to the best of my knowledge. 2. I have submitted this application with the knowledge and consent of the firm.			
June 7, 2021		 Signature of Designer	
Date			

NOTE:

- For the purposes of this form, "individual" means the "person" referred to in Clause 3.2.4.7(1) d) of Division C, Article 3.2.5.1. of Division C, and all other persons who are exempt from qualification under Subsections 3.2.4. and 3.2.5. of Division C.
- Schedule 1 is not required to be completed by a holder of a license, temporary license, or a certificate of authorization, issued by the Ontario Association of Architects. Schedule 1 is also not required to be completed by a holder of a license to practise, a limited license to practise, or a certificate of authorization, issued by the Association of Professional Engineers of Ontario.

Application for a Permit Construct or Demolish – Effective January 1, 2015

SITE NAME: CENTREFIELD (WEST GORMLEY)										DATE: Jun-21		WINTER NATURAL AIR CHANGE RATE 0.219				HEAT LOSS ΔT °F. 78		CSA-F280-12																
BUILDER: ROYAL PINE HOMES										TYPE: 4504 FLANKAGE		GFA: 3309		LO# 87515		SUMMER NATURAL AIR CHANGE RATE 0.068				HEAT GAIN ΔT °F. 13		SB-12 PERFORMANCE												
ROOM USE			MBR			ENS			BED-2			BED-3			BED-4			BATH			WIC-4			ENS-2										
EXP. WALL			42			27			35			45			15			9			5			9										
CLG. HT.			8			8			8			8			8			8			8			8										
FACTORS																																		
GRS.WALL AREA			LOSS GAIN			336			216			280			360			120			72			40			72							
GLAZING			LOSS GAIN			LOSS GAIN			LOSS GAIN			LOSS GAIN			LOSS GAIN			LOSS GAIN			LOSS GAIN			LOSS GAIN										
NORTH			21.8	16.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	7	152	112						
EAST			21.8	41.6	0	0	0	0	0	0	0	54	1176	2244	49	1067	2036	0	0	0	0	0	0	0	0	0	0	0	0					
SOUTH			21.8	24.9	0	0	0	19	414	473	0	0	0	0	19	414	473	24	523	598	0	0	0	0	19	414	473	0	0	0				
WEST			21.8	41.6	36	784	1496	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0					
SKYLT.			35.8	101.2	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			25.8	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					
NET EXPOSED WALL			4.2	0.7	300	1262	208	197	828	136	226	950	156	292	1228	202	96	404	66	72	303	50	21	88	15	65	273	45						
NET EXPOSED BSMT WALL ABOVE GR			3.7	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					
EXPOSED CLG			1.3	0.6	428	562	252	180	237	106	280	368	165	280	368	165	289	380	170	90	118	53	58	76	34	102	134	60						
NO ATTIC EXPOSED CLG			2.8	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					
EXPOSED FLOOR			2.6	0.4	0	0	0	0	0	0	280	731	120	0	0	0	0	0	0	0	0	0	0	0	0	5	13	2						
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						2608			1479			3226			3077			1306			421			578			573							
SUB TOTAL HT GAIN						1955			715			2685			2876			834			103			522			219							
LEVEL FACTOR / MULTIPLIER			0.20			0.19			0.20			0.19			0.20			0.19			0.20			0.19			0.20			0.19				
AIR CHANGE HEAT LOSS						505			286			624			596			253			81			112			111							
AIR CHANGE HEAT GAIN						84			31			115			123			36			4			22			9							
DUCT LOSS						0			0			385			0			0			0			0			68							
DUCT GAIN						0			0			379			0			0			0			0			23							
HEAT GAIN PEOPLE			240			2			480			0			1			240			1			240			0			0				
HEAT GAIN APPLIANCES/LIGHTS									747			0			747			747			0			0			0							
TOTAL HT LOSS BTU/H						3113			1765			4235			3673			1559			503			690			752							
TOTAL HT GAIN x 1.3 BTU/H						4246			970			5416			5183			2414			139			707			326							

ROOM USE	EXP. WALL	CLG. HT.	FACTORS		LIV	DIN	KT/GT	DEN	LAUN	W/R	FOY	MUD				BAS
			LOSS	GAIN									LOSS	GAIN		
GRS.WALL AREA			250		280		640	230	0	60	230	242				1020
GLAZING																
NORTH	21.8	16.0	0	0	0	0	0	0	0	0	0	0	0	0	4	87
EAST	21.8	41.6	37	806	1537	0	0	0	0	0	6	131	249	0	0	0
SOUTH	21.8	24.9	23	501	573	34	741	847	0	9	196	224	0	0	8	174
WEST	21.8	41.6	0	0	0	0	103	2244	4280	23	501	956	0	0	8	174
SKYLT.	35.8	101.2	0	0	0	0	0	0	0	0	0	0	0	0	0	0
DOORS	25.8	4.3	0	0	0	0	0	0	0	0	40	1034	170	20	517	85
NET EXPOSED WALL	4.2	0.7	190	799	131	246	1035	170	496	2086	343	207	871	143	0	0
NET EXPOSED BSMT WALL ABOVE GR	3.7	0.6	0	0	0	0	0	0	0	0	0	0	0	0	510	1879
EXPOSED CLG	1.3	0.6	0	0	0	0	0	0	0	106	139	62	0	0	0	0
NO ATTIC EXPOSED CLG	2.8	1.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0
EXPOSED FLOOR	2.6	0.4	0	0	0	0	0	0	38	99	16	0	0	0	0	0
BASEMENT/CRAWL HEAT LOSS			0		0		0		0			0		0		
SLAB ON GRADE HEAT LOSS			0		0		0		0			0		0		
SUBTOTAL HT LOSS			2106		1775		5223	1372	239		411	1938		1451		8583
SUB TOTAL HT GAIN				2242		1017		5644		1099		259		547		990
LEVEL FACTOR / MULTIPLIER			0.30	0.27		0.30	0.27		0.20	0.19		0.30	0.27		0.30	0.27
AIR CHANGE HEAT LOSS			579		488		1435		377		46	113		398		6536
AIR CHANGE HEAT GAIN				96		44		242		47		3		10		42
DUCT LOSS			0		0		0		0		0	0		0		0
DUCT GAIN				0		0		0		83		0		0		0
HEAT GAIN PEOPLE	240		0		0	0	0		0		0	0		0		0
HEAT GAIN APPLIANCES/LIGHTS					747	747		747		747		0		0		0
TOTAL HT LOSS BTU/H			2685		2263		6658	1748	313		523	2471		1849		15119
TOTAL HT GAIN x 1.3 BTU/H				4011		2350		8624		2462		1186		352		1342

TOTAL HEAT GAIN BTU/H: 41067 TONS: 3.42 LOSS DUE TO VENTILATION LOAD BTU/H: 1670 STRUCTURAL HEAT LOSS: 49919 TOTAL COMBINED HEAT LOSS BTU/H: 51589

SITE NAME: CENTREFIELD (WEST GORMLEY)
BUILDER: ROYAL PINE HOMES

TYPE: 4504 FLANKAGE

DATE: Jun-21

GFA: 3309 LO# 87515

HEATING CFM 1370 COOLING CFM 1370
TOTAL HEAT LOSS 49,919 TOTAL HEAT GAIN 40,793
AIR FLOW RATE CFM 27.44 AIR FLOW RATE CFM 33.58

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

****CARRIER**
59TN6A-060-14V
FAN SPEED 60

AFUE = 97 %
INPUT (BTU/H) = 60,000
OUTPUT (BTU/H) = **58,000**

RUN COUNT	4th	3rd	2nd	1st	Bas
S/A	0	0	14	10	5
R/A	0	0	5	3	1

plenium 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

LOW 820
MEDLOW 0
MEDIUM 0
MEDIUM HIGH 1370
HIGH 1520

DESIGN CFM = **1370**
CFM @ .6" E.S.P.

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	ENS	BED-2	BED-3	BED-4	BATH	BED-2	BED-3	MBR	ENS-2	LIV	LIV	KT/GT	KT/GT	KT/GT	LAUN	W/R	FOY	MUD	BAS	BAS	BAS	BAS
RM LOSS MBH.	1.56	0.88	0.88	2.12	1.84	1.56	0.25	2.12	1.84	1.56	0.75	1.34	1.34	2.22	2.22	2.22	0.31	0.52	2.47	1.85	3.02	3.02	3.02	3.02
CFM PER RUN HEAT	43	24	24	58	50	43	7	58	50	43	21	37	37	61	61	61	9	14	68	51	83	83	83	83
RM GAIN MBH.	2.12	0.48	0.48	2.71	2.59	2.41	0.07	2.71	2.59	2.12	0.33	2.01	2.01	2.87	2.87	2.87	1.19	0.35	0.74	0.32	0.27	0.27	0.27	0.27
CFM PER RUN COOLING	71	16	16	91	87	81	2	91	87	71	11	67	67	97	97	97	40	12	25	11	9	9	9	9
ADJUSTED PRESSURE	0.17	0.17	0.17	0.16	0.16	0.16	0.17	0.16	0.16	0.17	0.17	0.17	0.17	0.16	0.16	0.16	0.17	0.17	0.17	0.17	0.16	0.16	0.16	0.16
ACTUAL DUCT LGH.	53	57	64	41	61	59	47	46	57	64	61	54	48	40	35	44	31	43	35	41	36	46	21	40
EQUIVALENT LENGTH	200	160	150	180	180	210	170	200	150	220	140	140	170	170	130	160	190	120	160	160	90	100	130	110
TOTAL EFFECTIVE LENGTH	253	217	214	221	241	269	217	246	207	284	201	194	218	210	165	204	221	163	195	201	126	146	151	150
ADJUSTED PRESSURE	0.07	0.08	0.08	0.07	0.07	0.06	0.08	0.07	0.08	0.06	0.09	0.09	0.08	0.08	0.1	0.08	0.08	0.11	0.09	0.09	0.13	0.11	0.11	0.11
ROUND DUCT SIZE	6	4	4	6	6	6	4	6	6	6	4	5	5	6	6	6	4	4	5	5	6	6	6	6
HEATING VELOCITY (ft/min)	219	275	275	296	255	219	80	296	255	219	241	272	272	311	311	311	103	161	499	374	423	423	423	423
COOLING VELOCITY (ft/min)	362	184	184	464	444	413	23	464	444	362	126	492	492	495	495	495	459	138	184	81	46	46	46	46
OUTLET GRILL SIZE	4X10	3X10	3X10	4X10	4X10	4X10	3X10	4X10	4X10	4X10	3X10	3X10	3X10	4X10	4X10	4X10	3X10	3X10	3X10	3X10	4X10	4X10	4X10	4X10
TRUNK	C	C	C	B	A	B	B	B	A	C	D	A	A	C	C	C	B	B	A	D	D	D	D	B

RUN #	25	26	27	28	29
ROOM NAME	BAS	DIN	DEN	WIC-4	BATH
RM LOSS MBH.	3.02	2.26	1.75	0.69	0.25
CFM PER RUN HEAT	83	62	48	19	7
RM GAIN MBH.	0.27	2.35	2.46	0.71	0.07
CFM PER RUN COOLING	9	79	83	24	2
ADJUSTED PRESSURE	0.16	0.17	0.16	0.17	0.17
ACTUAL DUCT LGH.	39	33	43	26	47
EQUIVALENT LENGTH	150	140	210	140	150
TOTAL EFFECTIVE LENGTH	189	173	253	166	197
ADJUSTED PRESSURE	0.09	0.1	0.06	0.1	0.09
ROUND DUCT SIZE	6	6	6	4	4
HEATING VELOCITY (ft/min)	423	316	245	218	80
COOLING VELOCITY (ft/min)	46	403	423	275	23
OUTLET GRILL SIZE	4X10	4X10	4X10	3X10	3X10
TRUNK	A	B	C	E	B

SUPPLY AIR TRUNK SIZE

	TRUNK CFM	STATIC PRESS.	ROUND DUCT	RECT DUCT	VELOCITY (ft/min)		TRUNK CFM	STATIC PRESS.	ROUND DUCT	RECT DUCT	VELOCITY (ft/min)
TRUNK A	325	0.07	9.5	12	x 8	488	TRUNK G	0	0.00	0	0 x 8
TRUNK B	666	0.06	12.9	20	x 8	599	TRUNK H	0	0.00	0	0 x 8
TRUNK C	365	0.06	10.3	16	x 8	411	TRUNK I	0	0.00	0	0 x 8
TRUNK D	686	0.06	13.1	20	x 8	617	TRUNK J	0	0.00	0	0 x 8
TRUNK E	1370	0.06	17	26	x 10	759	TRUNK K	0	0.00	0	0 x 8
TRUNK F	0	0.00	0	0	x 8	0	TRUNK L	0	0.00	0	0 x 8

RETURN AIR TRUNK SIZE

	TRUNK CFM	STATIC PRESS.	ROUND DUCT	RECT DUCT	VELOCITY (ft/min)
TRUNK O	0	0.05	0	0	x 8
TRUNK P	0	0.05	0	0	x 8
TRUNK Q	0	0.05	0	0	x 8
TRUNK R	0	0.05	0	0	x 8
TRUNK S	0	0.05	0	0	x 8
TRUNK T	0	0.05	0	0	x 8
TRUNK U	0	0.05	0	0	x 8
TRUNK V	0	0.05	0	0	x 8
TRUNK W	0	0.05	0	0	x 8
TRUNK X	1025	0.05	15.9	30	x 8
TRUNK Y	0	0.05	0	0	x 8
TRUNK Z	0	0.05	0	0	x 8
DROP	1370	0.05	17.7	24	x 12

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	115	105	115	135	125	370	125	0	0	0	0	0	0	0	0	165							
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							
ACTUAL DUCT LGH.	53	47	73	45	42	48	23	57	1	1	1	1	1	1	1	1	14							
EQUIVALENT LENGTH	215	175	255	255	135	215	260	175	0	0	0	0	0	0	0	0	260							
TOTAL EFFECTIVE LH	268	222	328	300	177	263	283	232	1	1	1	1	1	1	1	1	274							
ADJUSTED PRESSURE	0.06	0.07	0.05	0.05	0.08	0.06	0.05	0.06	14.80	14.80	14.80	14.80	14.80	14.80	14.80	14.80	0.05							
ROUND DUCT SIZE	6.7	6.5	6.8	7	6.6	6.9	10.9	6.9	0	0	0	0	0	0	0	0	8							
INLET GRILL SIZE	8	8	8	8	8	8	8	8	0	0	0	0	0	0	0	0	8							
	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X							
INLET GRILL SIZE	14	14	14	14	14	14	30	14	0	0	0	0	0	0	0	0	24							

TYPE: 4504 FLANKAGE
SITE NAME: CENTREFIELD (WEST GORMLEY)

LO # 87515

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>3</u> @ 10.6 cfm <u>31.8</u> cfm	
Kitchen & Bathrooms	<u>5</u> @ 10.6 cfm <u>53</u> cfm	
Other Rooms	<u>6</u> @ 10.6 cfm <u>63.6</u> cfm	
Table 9.32.3.A.	TOTAL <u>190.8</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	79.5 cfm	

SUPPLEMENTAL VENTILATION CAPACITY		9.32.3.5.
Total Ventilation Capacity	<u>190.8</u> cfm	
Less Principal Ventil. Capacity	<u>79.5</u> cfm	
Required Supplemental Capacity	<u>111.3</u> cfm	

PRINCIPAL EXHAUST FAN CAPACITY	
Model: VANEE 65H	Location: BSMT
<u>79.5</u> cfm	☒ HVI Approved

PRINCIPAL EXHAUST HEAT LOSS CALCULATION				
CFM	ΔT °F	FACTOR	% LOSS	
79.5 CFM	X 78 F	X 1.08	X	0.25

SUPPLEMENTAL FANS		BY INSTALLING CONTRACTOR		
Location	Model	cfm	HVI	Sones
ENS	BY INSTALLING CONTRACTOR	50	☒	3.5
BATH	BY INSTALLING CONTRACTOR	50	☒	3.5
ENS-2	BY INSTALLING CONTRACTOR	50	☒	3.5
W/R	BY INSTALLING CONTRACTOR	50	☒	3.5

HEAT RECOVERY VENTILATOR		9.32.3.11.
Model: VANEE 65H		
<u>155</u> cfm high	<u>64</u> cfm low	
<u>75</u> % Sensible Efficiency @ 32 deg F (0 deg C)	☒ HVI Approved	

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

BUILDER: ROYAL PINE 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:	June-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

CSA F280-12 Residential Heat Loss and Heat Gain Calculations																																																												
Formula Sheet (For Air Leakage / Ventilation Calculation)																																																												
LO#: 87515	Model: 4504 FLANKAGE	Builder: ROYAL PINE HOMES	Date: 6/7/2021																																																									
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>1496</td> <td>9</td> <td>13464</td> </tr> <tr> <td>First</td> <td>1496</td> <td>10</td> <td>14960</td> </tr> <tr> <td>Second</td> <td>1813</td> <td>8</td> <td>14504</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="2" style="text-align: right;">Total:</td> <td></td> <td>42,928.0 ft³</td> </tr> <tr> <td colspan="2" style="text-align: right;">Total:</td> <td></td> <td>1215.6 m³</td> </tr> </tbody> </table>			Level	Floor Area (ft²)	Floor Height (ft)	Volume (ft³)	Bsmt	1496	9	13464	First	1496	10	14960	Second	1813	8	14504	Third	0	9	0	Fourth	0	9	0	Total:			42,928.0 ft³	Total:			1215.6 m³	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 80%;">WINTER NATURAL AIR CHANGE RATE</td> <td style="width: 20%; text-align: center;">0.219</td> </tr> <tr> <td>SUMMER NATURAL AIR CHANGE RATE</td> <td style="text-align: center;">0.068</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>Tin °C</th> <th>Tout °C</th> <th>ΔT °C</th> <th>ΔT °F</th> </tr> <tr> <td>Winter DTDh</td> <td style="text-align: center;">22</td> <td style="text-align: center;">-21</td> <td style="text-align: center;">43</td> <td style="text-align: center;">78</td> </tr> <tr> <td>Summer DTDc</td> <td style="text-align: center;">24</td> <td style="text-align: center;">31</td> <td style="text-align: center;">7</td> <td style="text-align: center;">13</td> </tr> </table>		WINTER NATURAL AIR CHANGE RATE	0.219	SUMMER NATURAL AIR CHANGE RATE	0.068	Design Temperature Difference						Tin °C	Tout °C	ΔT °C	ΔT °F	Winter DTDh	22	-21	43	78	Summer DTDc	24	31	7	13
Level	Floor Area (ft²)	Floor Height (ft)	Volume (ft³)																																																									
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5.2.3.1 Heat Loss due to Air Leakage			6.2.6 Sensible Gain due to Air Leakage																																																									
$HL_{airb} = LR_{airh} \times \frac{V_b}{3.6} \times DTD_h \times 1.2$ 0.219 x 337.66 x 43 °C x 1.2 = 3831 W = 13072 Btu/h			$HG_{salb} = LR_{airc} \times \frac{V_b}{3.6} \times DTD_c \times 1.2$ 0.068 x 337.66 x 7 °C x 1.2 = 196 W = 670 Btu/h																																																									
5.2.3.2 Heat Loss due to Mechanical Ventilation			6.2.7 Sensible heat Gain due to Ventilation																																																									
$HL_{vairb} = PVC \times DTD_h \times 1.08 \times (1 - E)$ 80 CFM x 78 °F x 1.08 x 0.25 = 1670 Btu/h			$HL_{vairb} = PVC \times DTD_h \times 1.08 \times (1 - E)$ 80 CFM x 13 °F x 1.08 x 0.25 = 275 Btu/h																																																									
5.2.3.3 Calculation of Air Change Heat Loss for Each Room (Floor Multiplier Section)																																																												
$HL_{airr} = Level\ Factor \times HL_{airbv} \times \{(HL_{agcr} + HL_{bgcr}) \div (HL_{agclevel} + HL_{bgclevel})\}$																																																												
Level	Level Factor (LF)	HLairve Air Leakage + Ventilation Heat Loss (Btu/h)	Level Conductive Heat Loss: (HL _{clevel})	Air Leakage Heat Loss Multiplier (LF x HLairbv / HLlevel)																																																								
1	0.5	13,072	8,583	0.762																																																								
2	0.3		14,275	0.275																																																								
3	0.2		13,508	0.194																																																								
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 HLairve = 0																																																												

HEAT LOSS AND GAIN SUMMARY SHEET

MODEL: 4504 FLANKAGE	BUILDER: ROYAL PINE HOMES
SFQT: 3309	SITE: CENTREFIELD (WEST GORMLEY)
LO# 87515	

DESIGN ASSUMPTIONS

HEATING	°F	COOLING	°F
OUTDOOR DESIGN TEMP.	-6	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:	2.50	ASSUMED (Y/N):	Y
AIR TIGHTNESS CATEGORY:	TIGHT	ASSUMED (Y/N):	Y
WIND EXPOSURE:	SHELTERED	ASSUMED (Y/N):	Y
HOUSE VOLUME (ft ³):	42928.0	ASSUMED (Y/N):	Y
INTERNAL SHADING:	BLINDS/CURTAINS	ASSUMED OCCUPANTS:	5
INTERIOR LIGHTING LOAD (Btu/h/ft ²):	1.40	DC BRUSHLESS MOTOR (Y/N):	Y
FOUNDATION CONFIGURATION	BCIN_1	DEPTH BELOW GRADE:	6.0 ft
LENGTH: 46.0 ft	WIDTH: 39.0 ft	EXPOSED PERIMETER:	170.0 ft

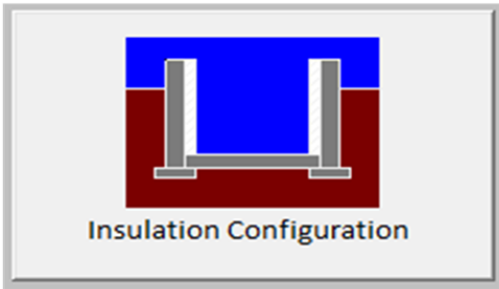
2012 OBC - COMPLIANCE PACKAGE		Compliance Package	
Component		SB-12 PERFORMANCE	
		Nominal	Min. Eff.
Ceiling with Attic Space Minimum RSI (R)-Value		60	59.20
Ceiling Without Attic Space Minimum RSI (R)-Value		31	27.70
Exposed Floor Minimum RSI (R)-Value		31	29.80
Walls Above Grade Minimum RSI (R)-Value		22+1.5	18.50
Basement Walls Minimum RSI (R)-Value		20	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		1.6	-
Skylights Maximum U-Value		2.6	-
Space Heating Equipment Minimum AFUE		0.96	-
HRV Minimum Efficiency		75%	-
Domestic Hot Water Heater Minimum EF		TE=94%	-

INDIVIDUAL BCIN: 19669
MICHAEL O'ROURKE



Residential Foundation Thermal Load Calculator

Supplemental tool for CAN/CSA-F280

Weather Station Description		
Province:	Ontario	
Region:	Richmond Hill	
Site Description		
Soil Conductivity:	Normal conductivity: dry sand, loam, clay	
Water Table:	Normal (7-10 m, 23-33 ft)	
Foundation Dimensions		
Floor Length (m):	14.0	
Floor Width (m):	11.9	
Exposed Perimeter (m):	0.0	
Wall Height (m):	2.7	
Depth Below Grade (m):	1.83	
Window Area (m ²):	1.9	
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):		1685

TYPE: 4504 FLANKAGE

LO# 87515

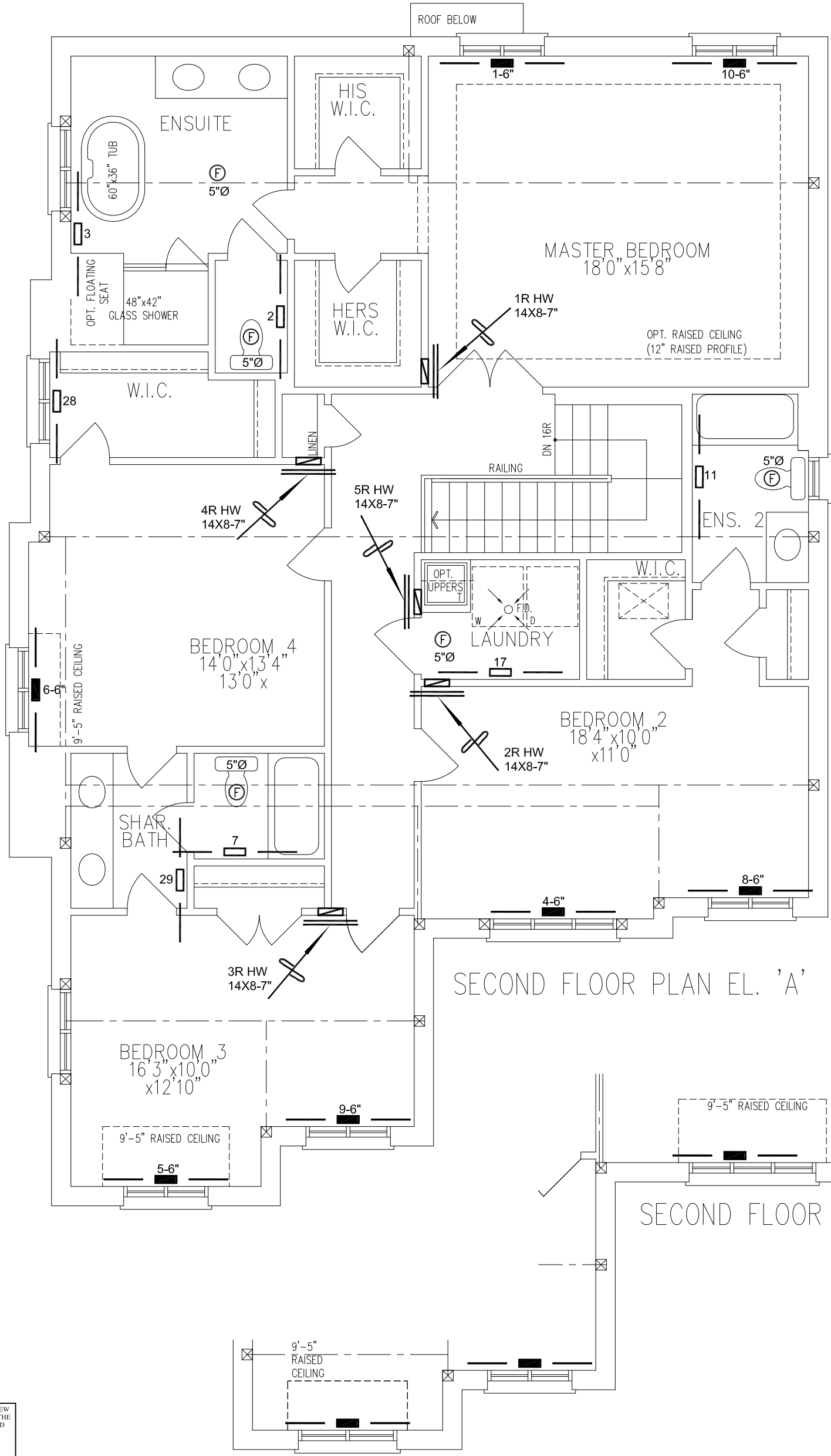
Air Infiltration Residential Load Calculator

Supplemental tool for CAN/CSA-F280

Weather Station Description				
Province:	Ontario			
Region:	Richmond Hill			
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):	6.40			
Building Configuration				
Type:	Detached			
Number of Stories:	Two			
Foundation:	Full			
House Volume (m ³):	1215.6			
Air Leakage/Ventilation				
Air Tightness Type:	Energy Star Detached (2.5 ACH)			
Custom BDT Data:	ELA @ 10 Pa.	1134.7 cm ²		
	2.50	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):	0.219			
Cooling Air Leakage Rate (ACH/H):	0.068			

TYPE: 4504 FLANKAGE

LO# 87515



SECOND FLOOR PLAN EL. 'A'

SECOND FLOOR PLAN EL. 'B'

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.

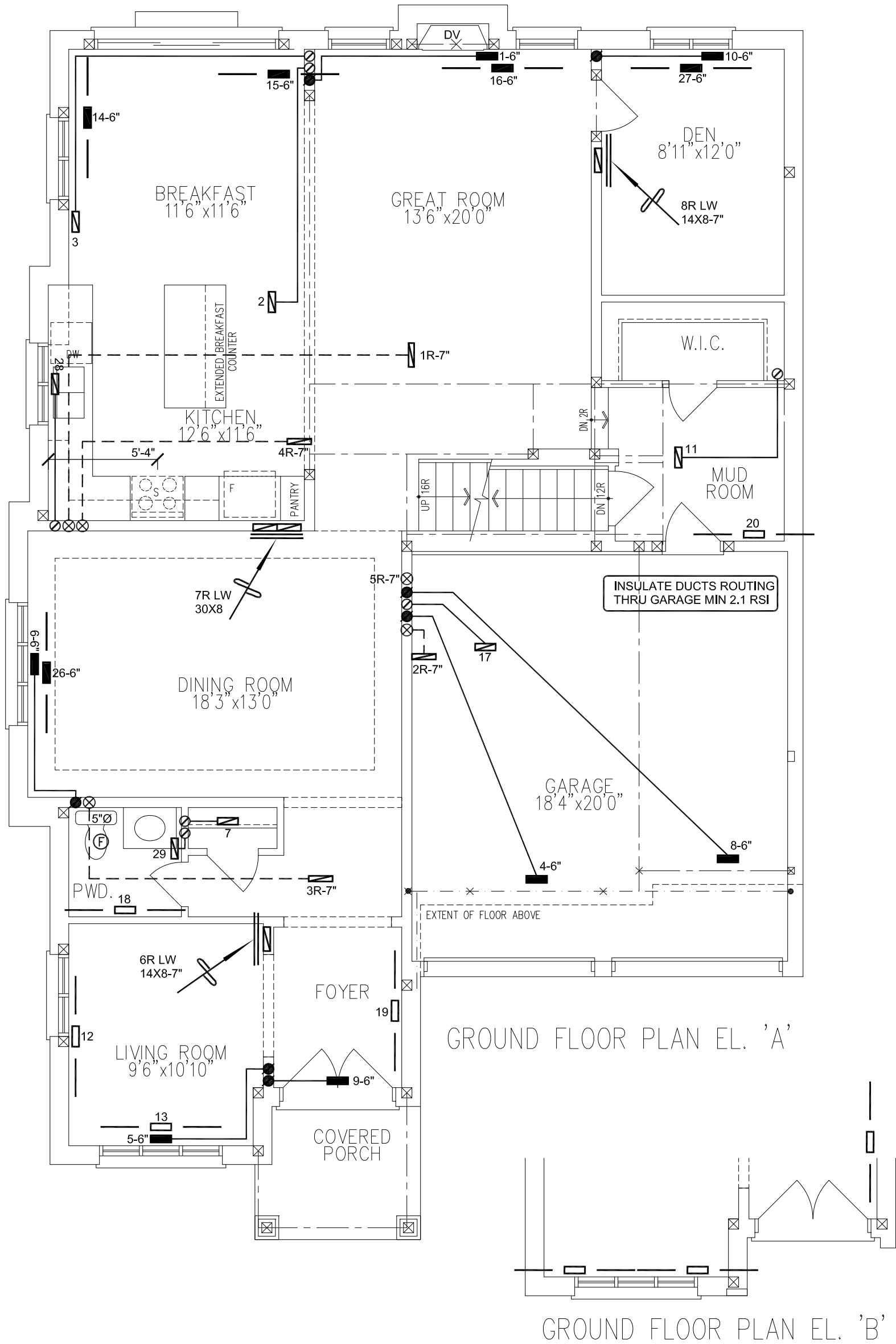
CSA-F280-12

SB-12 PERFORMANCE

HVAC LEGEND								3.	REVISED AS PER CAD	JUNE/2021
SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	2.	REVISED AS PER ARCHITECTURALS	APR/2021
	SUPPLY AIR GRILLE		6" SUPPLY AIR BOOT ABOVE		14"x8" RETURN AIR GRILLE		RETURN AIR STACK ABOVE	1.	REVISED TO PERFORMANCE	SEPT/2020
	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		

ALL DRAWINGS, CALCULATIONS AND SPECIFICATIONS ARE THE PROPERTY OF HVAC DESIGNS LTD.© AND MAY NOT BE REPRODUCED, MODIFIED OR ALTERED WITHOUT EXPRESSED WRITTEN CONSENT. THE DRAWINGS ARE DATED AND USE OF THESE DRAWINGS AFTER ONE YEAR FROM THE DATED NOTED IS NOT AUTHORIZED. CONTRACTOR SHALL CHECK ALL CONDITIONS BEFORE PROCEEDING WITH WORK. LATEST MUNICIPAL APPROVED DRAWINGS ONLY TO BE USED DURING INSTALLATION OF HEATING SYSTEM. HVAC DESIGNS LTD. IS NOT LIABLE FOR ANY CLAIMS ARISING FROM UNAUTHORIZED USE OF THE DRAWINGS OR FROM ANY CHANGES TO ACCEPTED STANDARDS AND/OR THE ONTARIO BUILDING CODE.

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.	Sheet Title	
ROYAL PINE HOMES			SECOND FLOOR HEATING LAYOUT	
Project Name			Date	SEPT/2020
CENTREFIELD (WEST GORMLEY) RICHMOND HILL, ONTARIO			Scale	3/16" = 1'-0"
4504 FLANKAGE 3309 sqft			BCIN# 19669	
			LO#	87515



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

SB-12 PERFORMANCE

HVAC LEGEND								3.	REVISED AS PER CAD	JUNE/2021
SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	2.	REVISED AS PER ARCHITECTURALS	APR/2021
	SUPPLY AIR GRILLE		6" SUPPLY AIR BOOT ABOVE		14"x8" RETURN AIR GRILLE		RETURN AIR STACK ABOVE	1.	REVISED TO PERFORMANCE	SEPT/2020
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ROYAL PINE HOMES			FIRST FLOOR HEATING LAYOUT	
Project Name			Date	SEPT/2020
CENTREFIELD (WEST GORMLEY) RICHMOND HILL, ONTARIO			Scale	3/16" = 1'-0"
4504 FLANKAGE 3309 sqft			BCIN# 19669	
			LO#	87515

Schedule 1: Designer Information

Use one form for each individual who reviews and takes responsibility for design activities with respect to the project.

A. Project Information			
Building number, street name		Unit no.	Lot/con.
Municipality RICHMOND HILL	Postal code	Plan number/ other description	
B. Individual who reviews and takes responsibility for design activities			
Name MICHAEL O'ROURKE		Firm HVAC DESIGNS LTD.	
Street address 375 FINLEY AVE		Unit no. 202	Lot/con. N/A
Municipality AJAX	Postal code L1S 2E2	Province ONTARIO	E-mail info@hvacdesigns.ca
Telephone number (905) 619-2300	Fax number (905) 619-2375	Cell number ()	
C. Design activities undertaken by individual identified in Section B. [Building Code Table 3.5.2.1 OF Division C]			
☐ House ☐ Small Buildings ☐ Large Buildings ☐ Complex Buildings ☒ HVAC – House ☐ Building Services ☐ Detection, Lighting and Power ☐ Fire Protection ☐ Building Structural ☐ Plumbing – House ☐ Plumbing – All Buildings ☐ On-site Sewage Systems			
Description of designer's work HEAT LOSS / GAIN CALCULATIONS DUCT SIZING RESIDENTIAL MECHANICAL VENTILATION DESIGN SUMMARY RESIDENTIAL SYSTEM DESIGN per CSA-F280-12		Model: 4504 FLANKAGE OPT. 2ND Project: CENTREFIELD (WEST GORMLEY)	
D. Declaration of Designer			
I, <u>MICHAEL O'ROURKE</u> declare that (choose one as appropriate): (print name)			
☐ I review and take responsibility for the design work on behalf of a firm registered under subsection 3.2.4. of Division C, of the Building Code. I am qualified, and the firm is registered, in the appropriate classes/categories. Individual BCIN: _____ Firm BCIN: _____			
☒ I review and take responsibility for the design and am qualified in the appropriate category as an "other designer" under subsection 3.2.5. of Division C, of the Building Code. Individual BCIN: <u>19669</u> Basis for exemption from registration and qualification: <u>O.B.C SENTENCE 3.2.4.1 (4)</u>			
☐ The design work is exempt from the registration and qualification requirements of the Building Code. Basis for exemption from registration and qualification: _____			
I certify that:			
1. The information contained in this schedule is true to the best of my knowledge. 2. I have submitted this application with the knowledge and consent of the firm.			
June 7, 2021			
Date		Signature of Designer	

NOTE:

- For the purposes of this form, "individual" means the "person" referred to in Clause 3.2.4.7(1) d) of Division C, Article 3.2.5.1. of Division C, and all other persons who are exempt from qualification under Subsections 3.2.4. and 3.2.5. of Division C.
- Schedule 1 is not required to be completed by a holder of a license, temporary license, or a certificate of authorization, issued by the Ontario Association of Architects. Schedule 1 is also not required to be completed by a holder of a license to practise, a limited license to practise, or a certificate of authorization, issued by the Association of Professional Engineers of Ontario.

Application for a Permit Construct or Demolish – Effective January 1, 2015

SITE NAME: CENTREFIELD (WEST GORMLEY)				OPT. 2ND				DATE: Jun-21				WINTER NATURAL AIR CHANGE RATE 0.219				HEAT LOSS ΔT °F. 78				CSA-F280-12							
BUILDER: ROYAL PINE HOMES				TYPE: 4504 FLANKAGE				GFA: 3309				LO# 87518				SUMMER NATURAL AIR CHANGE RATE 0.068				HEAT GAIN ΔT °F. 13				SB-12 PERFORMANCE			
ROOM USE				MBR		ENS		WIC		BED-2		BED-3		BED-4		ENS-4/5		BED-5				ENS-2/3					
EXP. WALL				33		8		5		37		13		45		23		15				7					
CLG. HT.				8		8		8		8		8		8		8		8				8					
FACTORS																											
GRS.WALL AREA		LOSS GAIN		264		64		40		296		104		360		184		120				56					
GLAZING				LOSS GAIN		LOSS GAIN		LOSS GAIN		LOSS GAIN		LOSS GAIN		LOSS GAIN		LOSS GAIN		LOSS GAIN				LOSS GAIN					
NORTH		21.8	16.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
EAST		21.8	41.6	0	0	0	0	0	0	0	0	0	36	784	1496	49	1067	2036	0	0	0	0	0	0	18	392	748
SOUTH		21.8	24.9	19	414	473	19	414	473	0	0	0	0	0	0	19	414	473	24	523	598	0	0	0	0	0	0
WEST		21.8	41.6	36	784	1496	0	0	0	0	0	0	28	610	1163	0	0	0	0	0	0	0	0	0	0	0	0
SKYLT.		35.8	101.2	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		25.8	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		4.2	0.7	209	879	145	45	189	31	40	168	28	268	1127	185	68	286	47	292	1228	202	160	673	111	120	505	83
NET EXPOSED BSMT WALL ABOVE GR		3.7	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		1.3	0.6	289	380	170	141	185	83	70	92	41	297	390	175	190	250	112	252	331	148	90	118	53	247	325	145
NO ATTIC EXPOSED CLG		2.8	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
EXPOSED FLOOR		2.6	0.4	0	0	0	0	0	0	0	0	0	0	0	0	190	496	82	0	0	0	0	0	0	0	0	0
BASEMENT/CRAWL HEAT LOSS				0		0		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		0		0	
SUBTOTAL HT LOSS				2457		788		260		2127		1816		3040		1314		829				992					
SUB TOTAL HT GAIN				2283		587		69		1523		1736		2859		761		228				888					
LEVEL FACTOR / MULTIPLIER		0.20	0.19				0.20	0.19		0.20	0.19		0.20	0.19		0.20	0.19		0.20	0.19			0.20	0.19			
AIR CHANGE HEAT LOSS				463		148		49		401		342		573		247		156				187					
AIR CHANGE HEAT GAIN				99		25		3		66		75		124		33		10				39					
DUCT LOSS				0		0		0		0		216		0		0		0				118					
DUCT GAIN				0		0		0		0		266		0		0		0				93					
HEAT GAIN PEOPLE		240		2	480	0	0	0	0	1	240	1	240	1	240	0	0	1	240	0	1	240	0	0	0	0	0
HEAT GAIN APPLIANCES/LIGHTS				610		0		0		610		610		610		0		610				0					
TOTAL HT LOSS BTU/H				2920		937		309		2528		2374		3613		1561		985				1296					
TOTAL HT GAIN x 1.3 BTU/H				4515		796		93		3172		3806		4984		1032		1415				1325					

ROOM USE		LIV	DIN	KT/GT	DEN	LAUN	W/R	FOY	MUD				BAS
EXP. WALL		25	28	64	23	0	6	23	22				170
CLG. HT.		10	10	10	10	8	10	10	11				9
FACTORS													
GRS.WALL AREA	LOSS GAIN	250	280	640	230	0	60	230	242				1020
GLAZING		LOSS GAIN	LOSS GAIN	LOSS GAIN	LOSS GAIN	LOSS GAIN	LOSS GAIN	LOSS GAIN	LOSS GAIN				LOSS GAIN
NORTH	21.8 16.0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0				4 87 64
EAST	21.8 41.6	37 806 1537	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	6 131 249	0 0 0				0 0 0
SOUTH	21.8 24.9	23 501 573	34 741 847	41 893 1021	0 0 0	0 0 0	9 196 224	0 0 0	0 0 0				8 174 199
WEST	21.8 41.6	0 0 0	0 0 0	103 2244 4280	23 501 956	0 0 0	0 0 0	0 0 0	0 0 0				8 174 332
SKYLT.	35.8 101.2	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	25.8 4.3	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	40 1034 170	20 517 85				20 517 85
NET EXPOSED WALL	4.2 0.7	190 799 131	246 1035 170	496 2086 343	207 871 143	0 0 0	51 214 35	184 774 127	222 934 154				0 0 0
NET EXPOSED BSMT WALL ABOVE GR	3.7 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				510 1879 309
EXPOSED CLG	1.3 0.6	0 0 0	0 0 0	0 0 0	0 0 0	125 164 73	0 0 0	0 0 0	0 0 0				0 0 0
NO ATTIC EXPOSED CLG	2.8 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
EXPOSED FLOOR	2.6 0.4	0 0 0	0 0 0	0 0 0	0 0 0	36 94 15	0 0 0	0 0 0	0 0 0				0 0 0
BASEMENT/CRAWL HEAT LOSS		0	0	0	0	0	0	0	0				5751
SLAB ON GRADE HEAT LOSS		0	0	0	0	0	0	0	0				
SUBTOTAL HT LOSS		2106	1775	5223	1372	258	411	1938	1451				8583
SUB TOTAL HT GAIN			2242	1017	5644	1099	89	259	547				990
LEVEL FACTOR / MULTIPLIER	0.30 0.27		0.30 0.27	0.30 0.27	0.30 0.27	0.20 0.19	0.30 0.27	0.30 0.27	0.30 0.27				0.50 0.76
AIR CHANGE HEAT LOSS		579	488	1435	377	49	113	532	398				6536
AIR CHANGE HEAT GAIN			97	44	245	48	4	11	24				43
DUCT LOSS		0	0	0	0	31	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
HEAT GAIN APPLIANCES/LIGHTS			610	610	610	610	610	0	0				0
TOTAL HT LOSS BTU/H		2685	2263	6658	1748	338	523	2471	1849				15119
TOTAL HT GAIN x 1.3 BTU/H			3834	2172	8449	2284	1005	352	324				1342

TOTAL HEAT GAIN BTU/H:

41971

TONS: 3.50

LOSS DUE TO VENTILATION LOAD BTU/H: 2004

STRUCTURAL HEAT LOSS: 50176

TOTAL COMBINED HEAT LOSS BTU/H: 52180

SITE NAME: CENTREFIELD (WEST GORMLEY)
BUILDER: ROYAL PINE HOMES

OPT. 2ND
TYPE: 4504 FLANKAGE

DATE: Jun-21

GFA: 3309 LO# 87518

HEATING CFM 1370 COOLING CFM 1370
TOTAL HEAT LOSS 50,176 TOTAL HEAT GAIN 41,642
AIR FLOW RATE CFM 27.3 AIR FLOW RATE CFM 32.9

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

**CARRIER
59TN6A-060-14V
FAN SPEED 60

AFUE = 97 %
INPUT (BTU/H) = 60,000
OUTPUT (BTU/H) = 58,000

RUN COUNT	4th	3rd	2nd	1st	Bas
S/A	0	0	14	10	5
R/A	0	0	5	3	1

plenium pressure s/a 0.18 r/a pressure 0.17
max s/a dif press. loss 0.02 r/a grille press. Loss 0.02
min unadjusted pressure s/a 0.16 adjusted pressure r/a 0.15

LOW 820
MEDLOW 0
MEDIUM 0
MEDIUM HIGH 1370
HIGH 1520

DESIGN CFM = 1370
CFM @ .6" E.S.P.

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	WIC	MBR	BED-3	BED-4	BED-5	ENS-4/5	ENS-2/3	BED-4	BED-2	BED-3	LIV	LIV	KT/GT	KT/GT	KT/GT	LAUN	W/R	FOY	MUD	BAS	BAS	BAS	BAS
RM LOSS MBH.	1.46	0.31	1.46	1.19	1.81	0.99	1.56	1.30	1.81	1.26	1.19	1.34	1.34	2.22	2.22	2.22	0.34	0.52	2.47	1.85	3.02	3.02	3.02	3.02
CFM PER RUN HEAT	40	8	40	32	49	27	43	35	49	35	32	37	37	61	61	61	9	14	67	50	83	83	83	83
RM GAIN MBH.	2.26	0.09	2.26	1.90	2.49	1.41	1.03	1.33	2.49	1.59	1.90	1.92	1.92	2.82	2.82	2.82	1.01	0.35	0.74	0.32	0.27	0.27	0.27	0.27
CFM PER RUN COOLING	74	3	74	63	82	47	34	44	82	52	63	63	63	93	93	93	33	12	24	11	9	9	9	9
ADJUSTED PRESSURE	0.17	0.17	0.17	0.17	0.16	0.17	0.17	0.17	0.16	0.17	0.17	0.17	0.17	0.16	0.16	0.16	0.17	0.17	0.17	0.17	0.16	0.16	0.16	0.16
ACTUAL DUCT LGH.	53	57	64	39	61	59	47	46	57	61	43	54	48	40	35	44	31	43	35	41	36	46	21	40
EQUIVALENT LENGTH	180	200	150	180	180	200	190	200	150	220	190	140	170	170	130	160	190	120	160	160	90	100	130	110
TOTAL EFFECTIVE LENGTH	233	257	214	219	241	259	237	246	207	281	233	194	218	210	165	204	221	163	195	201	126	146	151	150
ADJUSTED PRESSURE	0.07	0.07	0.08	0.08	0.07	0.07	0.07	0.07	0.08	0.06	0.07	0.09	0.08	0.08	0.1	0.08	0.08	0.11	0.09	0.09	0.13	0.11	0.11	0.11
ROUND DUCT SIZE	6	4	6	5	6	6	5	5	6	5	5	5	5	6	6	6	4	4	5	5	6	6	6	6
HEATING VELOCITY (ft/min)	204	92	204	235	250	138	316	257	250	257	235	272	272	311	311	311	103	161	492	367	423	423	423	423
COOLING VELOCITY (ft/min)	377	34	377	463	418	240	250	323	418	382	463	463	463	474	474	474	379	138	176	81	46	46	46	46
OUTLET GRILL SIZE	4X10	3X10	4X10	3X10	4X10	4X10	3X10	3X10	4X10	3X10	3X10	3X10	3X10	4X10	4X10	4X10	3X10	3X10	3X10	3X10	4X10	4X10	4X10	4X10
TRUNK	C	C	C	B	A	B	B	B	A	C	B	A	A	C	C	C	B	B	A	D	D	D	D	B

RUN #	25	26	27	28	29
ROOM NAME	BAS	DIN	DEN	ENS	BED-2
RM LOSS MBH.	3.02	2.26	1.75	0.94	1.26
CFM PER RUN HEAT	83	62	48	26	35
RM GAIN MBH.	0.27	2.17	2.28	0.80	1.59
CFM PER RUN COOLING	9	71	75	26	52
ADJUSTED PRESSURE	0.16	0.17	0.17	0.17	0.17
ACTUAL DUCT LGH.	39	33	43	26	70
EQUIVALENT LENGTH	150	140	210	140	230
TOTAL EFFECTIVE LENGTH	189	173	253	166	300
ADJUSTED PRESSURE	0.09	0.1	0.07	0.1	0.06
ROUND DUCT SIZE	6	6	6	4	5
HEATING VELOCITY (ft/min)	423	316	245	298	257
COOLING VELOCITY (ft/min)	46	362	382	298	382
OUTLET GRILL SIZE	4X10	4X10	4X10	3X10	3X10
TRUNK	A	B	C	E	C

SUPPLY AIR TRUNK SIZE

	TRUNK	STATIC	ROUND	RECT			VELOCITY		TRUNK	STATIC	ROUND	RECT			VELOCITY
	CFM	PRESS.	DUCT	DUCT			(ft/min)		CFM	PRESS.	DUCT	DUCT			(ft/min)
TRUNK A	322	0.07	9.5	12	x	8	483	TRUNK G	0	0.00	0	0	x	8	0
TRUNK B	659	0.07	12.4	18	x	8	659	TRUNK H	0	0.00	0	0	x	8	0
TRUNK C	389	0.06	10.6	16	x	8	438	TRUNK I	0	0.00	0	0	x	8	0
TRUNK D	688	0.06	13.1	20	x	8	619	TRUNK J	0	0.00	0	0	x	8	0
TRUNK E	1370	0.06	17	26	x	10	759	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 TRUNK SIZE

	TRUNK CFM	STATIC PRESS.	ROUND DUCT	RECT DUCT		VELOCITY (ft/min)	
TRUNK O	0	0.05	0	0	x	8	0
TRUNK P	0	0.05	0	0	x	8	0
TRUNK Q	0	0.05	0	0	x	8	0
TRUNK R	0	0.05	0	0	x	8	0
TRUNK S	0	0.05	0	0	x	8	0
TRUNK T	0	0.05	0	0	x	8	0
TRUNK U	0	0.05	0	0	x	8	0
TRUNK V	0	0.05	0	0	x	8	0
TRUNK W	0	0.05	0	0	x	8	0
TRUNK X	1025	0.05	15.9	30	x	8	615
TRUNK Y	0	0.05	0	0	x	8	0
TRUNK Z	0	0.05	0	0	x	8	0
DROP	1370	0.05	17.7	24	x	12	685

RETURN AIR #	1	2	3	4	5	6	7	8								BR
AIR VOLUME	115	115	105	105	135	125	370	125	0	0	0	0	0	0	0	175
PLENUM PRESSURE	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15
ACTUAL DUCT LGH.	53	47	73	45	42	48	23	57	1	1	1	1	1	1	1	14
EQUIVALENT LENGTH	215	175	255	255	135	215	260	175	0	0	0	0	0	0	0	260
TOTAL EFFECTIVE LH	268	222	328	300	177	263	283	232	1	1	1	1	1	1	1	274
ADJUSTED PRESSURE	0.06	0.07	0.05	0.05	0.08	0.06	0.05	0.06	14.80	14.80	14.80	14.80	14.80	14.80	14.80	0.05
ROUND DUCT SIZE	6.7	6.5	6.8	6.8	6.6	6.9	10.9	6.9	0	0	0	0	0	0	0	8.2
INLET GRILL SIZE	8	8	8	8	8	8	8	8	0	0	0	0	0	0	0	8
	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
INLET GRILL SIZE	14	14	14	14	14	14	30	14	0	0	0	0	0	0	0	24

TYPE: 4504 FLANKAGE
SITE NAME: CENTREFIELD (WEST GORMLEY)

LO # 87518
OPT. 2ND

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>4</u> @ 10.6 cfm	<u>42.4</u> cfm
Kitchen & Bathrooms	<u>5</u> @ 10.6 cfm	<u>53</u> cfm
Other Rooms	<u>6</u> @ 10.6 cfm	<u>63.6</u> cfm
Table 9.32.3.A.	TOTAL	<u>201.4</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		<u>95.4</u> cfm

SUPPLEMENTAL VENTILATION CAPACITY		9.32.3.5.
Total Ventilation Capacity	<u>201.4</u>	cfm
Less Principal Ventil. Capacity	<u>95.4</u>	cfm
Required Supplemental Capacity	<u>106.0</u>	cfm

PRINCIPAL EXHAUST FAN CAPACITY	
Model: VANEE 65H	Location: BSMT
<u>95.4</u> cfm	☒ HVI Approved

PRINCIPAL EXHAUST HEAT LOSS CALCULATION				
CFM	ΔT °F	FACTOR	% LOSS	
95.4 CFM	X 78 F	X 1.08	X	0.25

SUPPLEMENTAL FANS		BY INSTALLING CONTRACTOR		
Location	Model	cfm	HVI	Sones
ENS	BY INSTALLING CONTRACTOR	50	☒	3.5
ENS-4/5	BY INSTALLING CONTRACTOR	50	☒	3.5
ENS-2/3	BY INSTALLING CONTRACTOR	50	☒	3.5
W/R	BY INSTALLING CONTRACTOR	50	☒	3.5

HEAT RECOVERY VENTILATOR		9.32.3.11.
Model: VANEE 65H		
<u>155</u> cfm high	<u>64</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:	
ROYAL PINE 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:	June-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#: 87518	Model: 4504 FLANKAGE	Builder: ROYAL PINE HOMES	Date: 6/7/2021																																																									
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>1496</td> <td>9</td> <td>13464</td> </tr> <tr> <td>First</td> <td>1496</td> <td>10</td> <td>14960</td> </tr> <tr> <td>Second</td> <td>1813</td> <td>8</td> <td>14504</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="2" style="text-align: right;">Total:</td> <td></td> <td>42,928.0 ft³</td> </tr> <tr> <td colspan="2" style="text-align: right;">Total:</td> <td></td> <td>1215.6 m³</td> </tr> </tbody> </table>			Level	Floor Area (ft²)	Floor Height (ft)	Volume (ft³)	Bsmt	1496	9	13464	First	1496	10	14960	Second	1813	8	14504	Third	0	9	0	Fourth	0	9	0	Total:			42,928.0 ft³	Total:			1215.6 m³	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 80%;">WINTER NATURAL AIR CHANGE RATE</td> <td style="width: 20%; text-align: center;">0.219</td> </tr> <tr> <td>SUMMER NATURAL AIR CHANGE RATE</td> <td style="text-align: center;">0.068</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>Tin °C</th> <th>Tout °C</th> <th>ΔT °C</th> <th>ΔT °F</th> </tr> <tr> <td>Winter DTDh</td> <td style="text-align: center;">22</td> <td style="text-align: center;">-21</td> <td style="text-align: center;">43</td> <td style="text-align: center;">78</td> </tr> <tr> <td>Summer DTDc</td> <td style="text-align: center;">24</td> <td style="text-align: center;">31</td> <td style="text-align: center;">7</td> <td style="text-align: center;">13</td> </tr> </table>		WINTER NATURAL AIR CHANGE RATE	0.219	SUMMER NATURAL AIR CHANGE RATE	0.068	Design Temperature Difference						Tin °C	Tout °C	ΔT °C	ΔT °F	Winter DTDh	22	-21	43	78	Summer DTDc	24	31	7	13
Level	Floor Area (ft²)	Floor Height (ft)	Volume (ft³)																																																									
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5.2.3.1 Heat Loss due to Air Leakage			6.2.6 Sensible Gain due to Air Leakage																																																									
$HL_{airb} = LR_{airh} \times \frac{V_b}{3.6} \times DTD_h \times 1.2$ 0.219 x 337.66 x 43 °C x 1.2 = 3831 W = 13072 Btu/h			$HG_{salb} = LR_{airc} \times \frac{V_b}{3.6} \times DTD_c \times 1.2$ 0.068 x 337.66 x 7 °C x 1.2 = 196 W = 670 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 78 °F x 1.08 x 0.25 = 2004 Btu/h			$HL_{vairb} = PVC \times DTD_h \times 1.08 \times (1 - E)$ 95 CFM x 13 °F x 1.08 x 0.25 = 330 Btu/h																																																									
5.2.3.3 Calculation of Air Change Heat Loss for Each Room (Floor Multiplier Section)																																																												
$HL_{airr} = Level\ Factor \times HL_{airbv} \times \{(HL_{agcr} + HL_{bgcr}) \div (HL_{agclevel} + HL_{bgclevel})\}$																																																												
Level	Level Factor (LF)	HLairve Air Leakage + Ventilation Heat Loss (Btu/h)	Level Conductive Heat Loss: (HL _{clevel})	Air Leakage Heat Loss Multiplier (LF x HLairbv / HLlevel)																																																								
1	0.5	13,072	8,583	0.762																																																								
2	0.3		14,275	0.275																																																								
3	0.2		13,882	0.188																																																								
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 HLairve = 0																																																												

HEAT LOSS AND GAIN SUMMARY SHEET

MODEL: 4504 FLANKAGE	OPT. 2ND	BUILDER: ROYAL PINE HOMES
SFQT: 3309	LO# 87518	SITE: CENTREFIELD (WEST GORMLEY)

DESIGN ASSUMPTIONS

HEATING	°F	COOLING	°F
OUTDOOR DESIGN TEMP.	-6	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:	2.50	ASSUMED (Y/N):	Y
AIR TIGHTNESS CATEGORY:	TIGHT	ASSUMED (Y/N):	Y
WIND EXPOSURE:	SHELTERED	ASSUMED (Y/N):	Y
HOUSE VOLUME (ft ³):	42928.0	ASSUMED (Y/N):	Y
INTERNAL SHADING:	BLINDS/CURTAINS	ASSUMED OCCUPANTS:	6
INTERIOR LIGHTING LOAD (Btu/h/ft ²):	1.27	DC BRUSHLESS MOTOR (Y/N):	Y
FOUNDATION CONFIGURATION	BCIN_1	DEPTH BELOW GRADE:	6.0 ft
LENGTH: 46.0 ft	WIDTH: 39.0 ft	EXPOSED PERIMETER:	170.0 ft

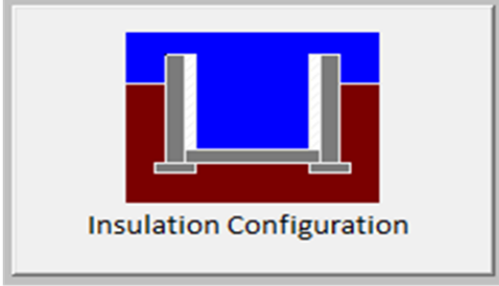
2012 OBC - COMPLIANCE PACKAGE		Compliance Package	
Component		SB-12 PERFORMANCE	
		Nominal	Min. Eff.
Ceiling with Attic Space Minimum RSI (R)-Value		60	59.20
Ceiling Without Attic Space Minimum RSI (R)-Value		31	27.70
Exposed Floor Minimum RSI (R)-Value		31	29.80
Walls Above Grade Minimum RSI (R)-Value		22+1.5	18.50
Basement Walls Minimum RSI (R)-Value		20	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		1.6	-
Skylights Maximum U-Value		2.6	-
Space Heating Equipment Minimum AFUE		0.96	-
HRV Minimum Efficiency		75%	-
Domestic Hot Water Heater Minimum EF		TE=94%	-

INDIVIDUAL BCIN: 19669
MICHAEL O'ROURKE



Residential Foundation Thermal Load Calculator

Supplemental tool for CAN/CSA-F280

Weather Station Description		
Province:	Ontario	
Region:	Richmond Hill	
Site Description		
Soil Conductivity:	Normal conductivity: dry sand, loam, clay	
Water Table:	Normal (7-10 m, 23-33 ft)	
Foundation Dimensions		
Floor Length (m):	14.0	 Insulation Configuration
Floor Width (m):	11.9	
Exposed Perimeter (m):	0.0	
Wall Height (m):	2.7	
Depth Below Grade (m):	1.83	
Window Area (m ²):	1.9	
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):		1685

TYPE: 4504 FLANKAGE
LO# 87518

OPT. 2ND

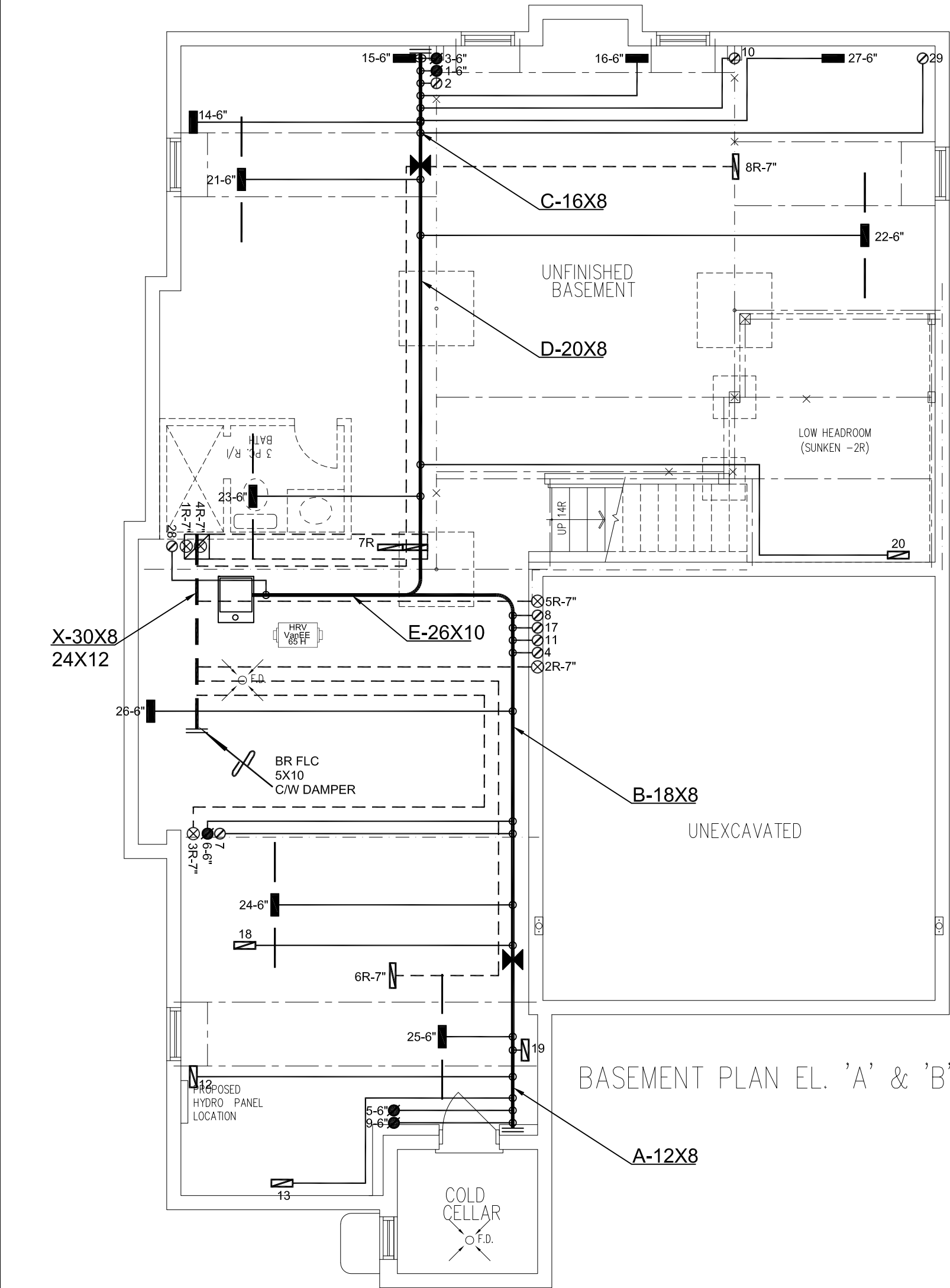
Air Infiltration Residential Load Calculator

Supplemental tool for CAN/CSA-F280

Weather Station Description				
Province:	Ontario			
Region:	Richmond Hill			
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):	6.40			
Building Configuration				
Type:	Detached			
Number of Stories:	Two			
Foundation:	Full			
House Volume (m ³):	1215.6			
Air Leakage/Ventilation				
Air Tightness Type:	Energy Star Detached (2.5 ACH)			
Custom BDT Data:	ELA @ 10 Pa.	1134.7 cm ²		
	2.50	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):	0.219			
Cooling Air Leakage Rate (ACH/H):	0.068			

TYPE: 4504 FLANKAGE
LO# 87518

OPT. 2ND



BASEMENT PLAN EL. 'A' & 'B'

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.

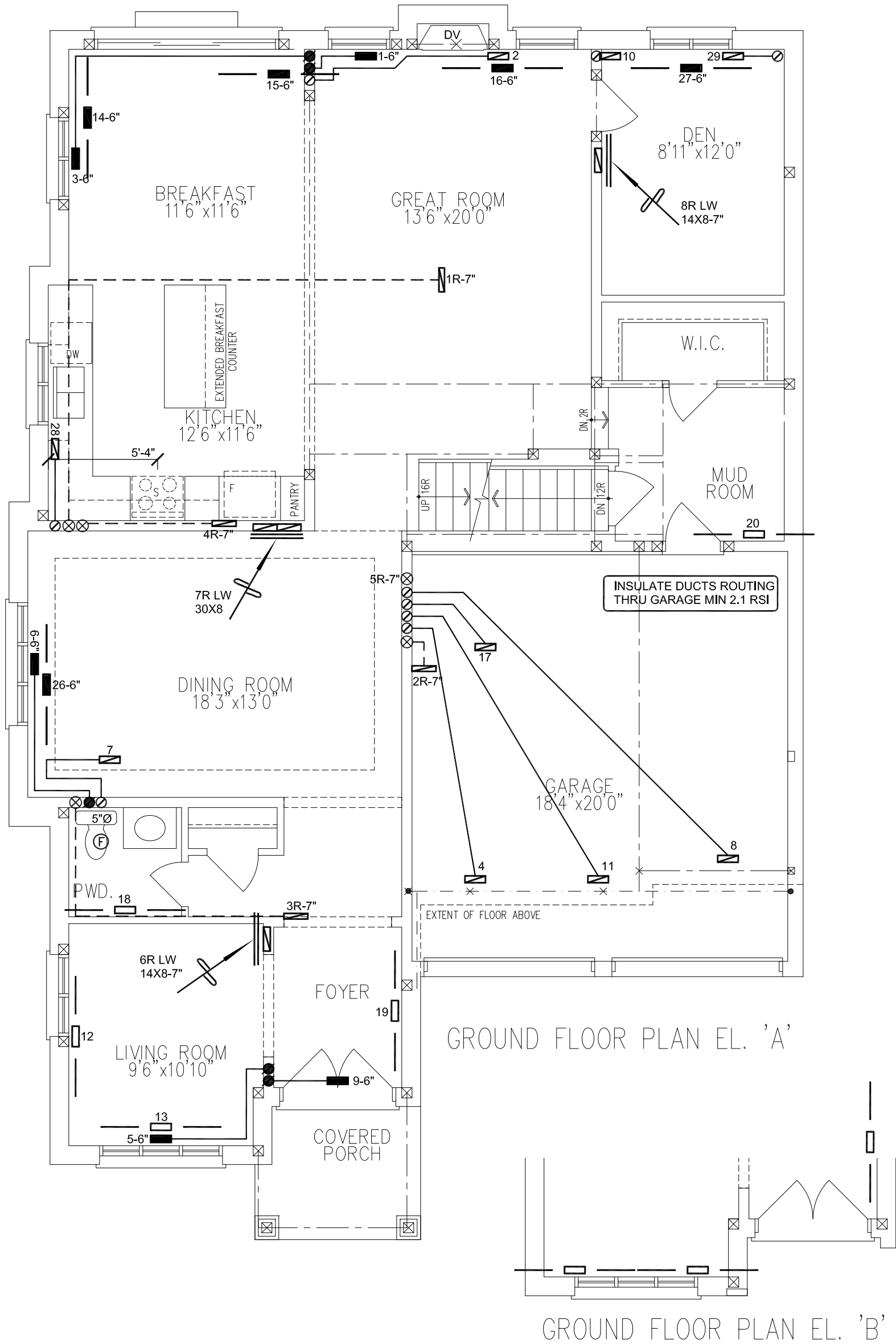
CSA-F280-12

SB-12 PERFORMANCE

HVAC LEGEND								3.	REVISED AS PER CAD	JUNE/2021
SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	2.	REVISED AS PER ARCHITECTURALS	APR/2021
	SUPPLY AIR GRILLE		6" SUPPLY AIR BOOT ABOVE		14"x8" RETURN AIR GRILLE		RETURN AIR STACK ABOVE	1.	REVISED TO PERFORMANCE	SEPT/2020
	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		

ALL DRAWINGS, CALCULATIONS AND SPECIFICATIONS ARE THE PROPERTY OF HVAC DESIGNS LTD.© AND MAY NOT BE REPRODUCED, MODIFIED OR ALTERED WITHOUT EXPRESSED WRITTEN CONSENT. THE DRAWINGS ARE DATED AND USE OF THESE DRAWINGS AFTER ONE YEAR FROM THE DATED NOTED IS NOT AUTHORIZED. CONTRACTOR SHALL CHECK ALL CONDITIONS BEFORE PROCEEDING WITH WORK. LATEST MUNICIPAL APPROVED DRAWINGS ONLY TO BE USED DURING INSTALLATION OF HEATING SYSTEM. HVAC DESIGNS LTD. IS NOT LIABLE FOR ANY CLAIMS ARISING FROM UNAUTHORIZED USE OF THE DRAWINGS OR FROM ANY CHANGES TO ACCEPTED STANDARDS AND/OR THE ONTARIO BUILDING CODE.

Client	HVACDESIGNS LTD. 375 Finley Ave. Suite 202 - Ajax, Ontario L1S 2E2 Tel. 905.619.2300 - 905.420.5300 Fax 905.619.2375 Email: info@hvacdesigns.ca Web: www.hvacdesigns.ca Specializing in Residential Mechanical Design Services Installation to comply with the latest Ontario Building Code. All supply branch outlets shall be equipped with a manual balancing damper. Ductwork which passes through the garage or unheated spaces shall be adequately insulated and be gas-proofed.		HEAT LOSS 52180 BTU/H		# OF RUNS S/A R/A FANS				Sheet Title			
ROYAL PINE HOMES			UNIT DATA	3RD FLOOR					BASEMENT HEATING LAYOUT			
Project Name	CENTREFIELD (WEST GORMLEY) RICHMOND HILL, ONTARIO	OPT. 2ND 4504 FLANKAGE 3309 sqft	MAKE	CARRIER	2ND FLOOR		14	5	4	Date	SEPT/2020	
			MODEL	59TN6A-060-14V	1ST FLOOR		10	3	2			
			INPUT	60 MBTU/H	BASEMENT		5	1	0			
			OUTPUT	58 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							
			COOLING	3.5 TONS								
		FAN SPEED	1370 cfm @ 0.6" w.c.									
										Scale 3/16" = 1'-0"		
										BCIN# 19669		
										LO#	87518	



GROUND FLOOR PLAN EL. 'A'

GROUND FLOOR PLAN EL. 'B'

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.

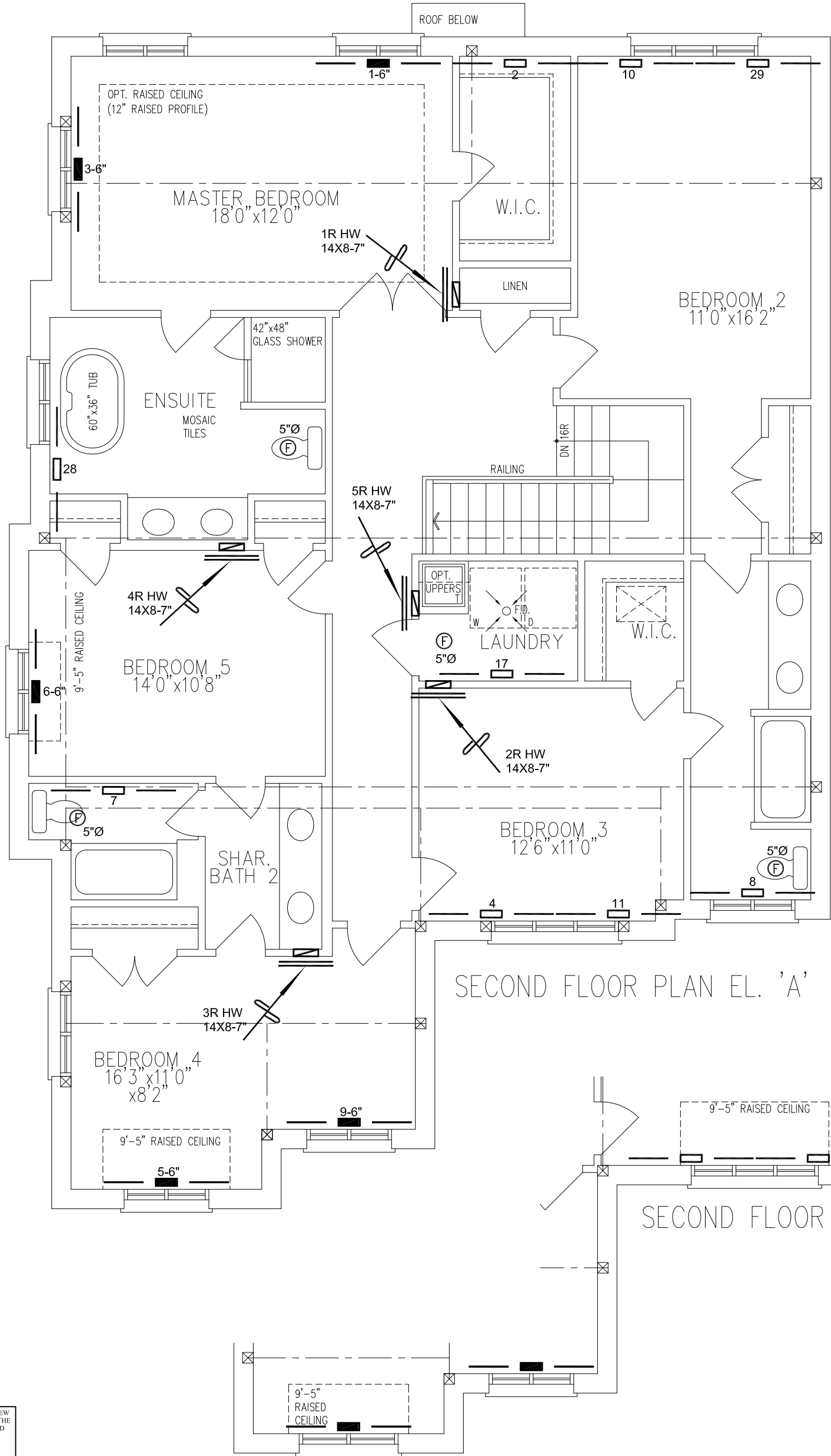
CSA-F280-12

SB-12 PERFORMANCE

HVAC LEGEND								3.	REVISED AS PER CAD	JUNE/2021
SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	2.	REVISED AS PER ARCHITECTURALS	APR/2021
	SUPPLY AIR GRILLE		6" SUPPLY AIR BOOT ABOVE		14"x8" RETURN AIR GRILLE		RETURN AIR STACK ABOVE	1.	REVISED TO PERFORMANCE	SEPT/2020
	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.	Sheet Title	
ROYAL PINE HOMES			FIRST FLOOR HEATING LAYOUT	
Project Name			Date	SEPT/2020
CENTREFIELD (WEST GORMLEY) RICHMOND HILL, ONTARIO			Scale	3/16" = 1'-0"
OPT. 2ND			BCIN# 19669	
4504 FLANKAGE 3309 sqft			LO#	87518



SECOND FLOOR PLAN EL. 'A'

SECOND FLOOR PLAN EL. 'B'

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

SB-12 PERFORMANCE

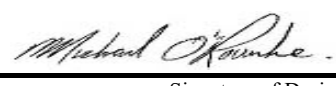
HVAC LEGEND								3.	REVISED AS PER CAD	JUNE/2021
SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	2.	REVISED AS PER ARCHITECTURALS	APR/2021
	SUPPLY AIR GRILLE		6" SUPPLY AIR BOOT ABOVE		14"x8" RETURN AIR GRILLE		RETURN AIR STACK ABOVE	1.	REVISED TO PERFORMANCE	SEPT/2020
	SUPPLY AIR GRILLE 6" BOOT		SUPPLY AIR STACK FROM 2nd FLOOR		30"x8" RETURN AIR GRILLE		RETURN AIR STACK 2nd FLOOR	No.	Description	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 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	
ROYAL PINE HOMES			SECOND FLOOR HEATING LAYOUT	
Project Name			Date	SEPT/2020
CENTREFIELD (WEST GORMLEY) RICHMOND HILL, ONTARIO			Scale	3/16" = 1'-0"
OPT. 2ND 4504 FLANKAGE 3309 sqft			BCIN# 19669	
			LO#	87518

Schedule 1: Designer Information

Use one form for each individual who reviews and takes responsibility for design activities with respect to the project.

A. Project Information			
Building number, street name		Unit no.	Lot/con.
Municipality RICHMOND HILL	Postal code	Plan number/ other description	
B. Individual who reviews and takes responsibility for design activities			
Name MICHAEL O'ROURKE		Firm HVAC DESIGNS LTD.	
Street address 375 FINLEY AVE		Unit no. 202	Lot/con. N/A
Municipality AJAX	Postal code L1S 2E2	Province ONTARIO	E-mail info@hvacdesigns.ca
Telephone number (905) 619-2300	Fax number (905) 619-2375	Cell number ()	
C. Design activities undertaken by individual identified in Section B. [Building Code Table 3.5.2.1 OF Division C]			
☐ House ☐ Small Buildings ☐ Large Buildings ☐ Complex Buildings ☒ HVAC – House ☐ Building Services ☐ Detection, Lighting and Power ☐ Fire Protection ☐ Building Structural ☐ Plumbing – House ☐ Plumbing – All Buildings ☐ On-site Sewage Systems			
Description of designer's work HEAT LOSS / GAIN CALCULATIONS DUCT SIZING RESIDENTIAL MECHANICAL VENTILATION DESIGN SUMMARY RESIDENTIAL SYSTEM DESIGN per CSA-F280-12		Model: 4504 FLANKAGE OPT. 5 BED 4 BATH Project: CENTREFIELD (WEST GORMLEY)	
D. Declaration of Designer			
I, <u>MICHAEL O'ROURKE</u> declare that (choose one as appropriate): (print name)			
☐ I review and take responsibility for the design work on behalf of a firm registered under subsection 3.2.4. of Division C, of the Building Code. I am qualified, and the firm is registered, in the appropriate classes/categories. Individual BCIN: _____ Firm BCIN: _____			
☒ I review and take responsibility for the design and am qualified in the appropriate category as an "other designer" under subsection 3.2.5. of Division C, of the Building Code. Individual BCIN: <u>19669</u> Basis for exemption from registration and qualification: <u>O.B.C SENTENCE 3.2.4.1 (4)</u>			
☐ The design work is exempt from the registration and qualification requirements of the Building Code. Basis for exemption from registration and qualification: _____			
I certify that:			
1. The information contained in this schedule is true to the best of my knowledge. 2. I have submitted this application with the knowledge and consent of the firm.			
June 7, 2021		 Signature of Designer	
Date			

NOTE:

- For the purposes of this form, "individual" means the "person" referred to in Clause 3.2.4.7(1) d) of Division C, Article 3.2.5.1. of Division C, and all other persons who are exempt from qualification under Subsections 3.2.4. and 3.2.5. of Division C.
- Schedule 1 is not required to be completed by a holder of a license, temporary license, or a certificate of authorization, issued by the Ontario Association of Architects. Schedule 1 is also not required to be completed by a holder of a license to practise, a limited license to practise, or a certificate of authorization, issued by the Association of Professional Engineers of Ontario.

Application for a Permit Construct or Demolish – Effective January 1, 2015

SITE NAME: CENTREFIELD (WEST GORMLEY)				OPT. 5 BED 4 BATH				DATE: Jun-21				WINTER NATURAL AIR CHANGE RATE 0.219				HEAT LOSS ΔT °F. 78				CSA-F280-12											
BUILDER: ROYAL PINE HOMES				TYPE: 4504 FLANKAGE				GFA: 3309				SUMMER NATURAL AIR CHANGE RATE 0.068				HEAT GAIN ΔT °F. 13				SB-12 PERFORMANCE											
ROOM USE		FACTORS		MBR		ENS		WIC		BED-2		BED-3		BED-4		ENS-4/5		BED-5		ENS-2		ENS-3		WIC-3							
EXP. WALL				33		8		5		30		13		45		23		15		7		9		16							
CLG. HT.				8		8		8		8		8		8		8		8		8		8		8							
GRS.WALL AREA		LOSS GAIN		264		64		40		240		104		360		184		120		56		72		128							
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							
NORTH		21.8	16.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	7	152	112	7	152	112	0	0	0			
EAST		21.8	41.6	0	0	0	0	0	0	0	0	0	0	36	784	1496	49	1067	2036	0	0	0	0	0	0	20	436	831			
SOUTH		21.8	24.9	19	414	473	19	414	473	0	0	0	0	0	0	0	19	414	473	24	523	598	0	0	0	0	0	0			
WEST		21.8	41.6	36	784	1496	0	0	0	0	0	0	28	610	1163	0	0	0	0	0	0	0	0	0	0	0	0	0			
SKYLT.		35.8	101.2	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		25.8	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			
NET EXPOSED WALL		4.2	0.7	209	879	145	45	189	31	40	168	28	212	892	147	68	286	47	292	1228	202	160	673	111	120	505	83	49	206	34	
NET EXPOSED BSMT WALL ABOVE GR		3.7	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		
EXPOSED CLG		1.3	0.6	289	380	170	141	185	83	70	92	41	227	298	133	190	250	112	252	331	148	90	118	53	247	325	145	70	92	41	
NO ATTIC EXPOSED CLG		2.8	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		
EXPOSED FLOOR		2.6	0.4	0	0	0	0	0	0	0	0	0	0	190	496	82	0	0	0	0	0	0	0	0	0	60	157	26	16	42	7
BASEMENT/CRAWL HEAT LOSS				0		0		0		0		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		0		0		0		0	
SUBTOTAL HT LOSS				2457		788		260		1800		1816		3040		1314		829		451		701		1014							
SUB TOTAL HT GAIN					2283		587		69		1444		1736		2859		761		228		187		235		950						
LEVEL FACTOR / MULTIPLIER		0.20	0.18			0.20	0.18		0.20	0.18		0.20	0.18		0.20	0.18		0.20	0.18		0.20	0.18		0.20	0.18		0.20	0.18		0.20	0.18
AIR CHANGE HEAT LOSS				436		140		46		319		322		540		233		147		80		124		180							
AIR CHANGE HEAT GAIN					97		25		3		62		74		122		32		10		8		10		40						
DUCT LOSS				0		0		0		0		214		0		0		0		0		83		119							
DUCT GAIN					0		0		0		0		266		0		0		0		0		25		99						
HEAT GAIN PEOPLE		240		2		480	0	0	0	1		240	1	240		0		1		240	0	0		0	0						
HEAT GAIN APPLIANCES/LIGHTS						610	0		0			610		610						610		0		0							
TOTAL HT LOSS BTU/H				2893		928		306		2119		2352		3580		1547		976		531		908		1314							
TOTAL HT GAIN x 1.3 BTU/H				4512		796		93		3062		3804		4981		1032		1415		253		351		1416							

ROOM USE		FACTORS		LIV		DIN		KT/GT		DEN		LAUN		W/R		FOY		MUD						BAS			
EXP. WALL				25		28		64		23		0		6		23		22						170			
CLG. HT.				10		10		10		10		8		10		10		11						9			
GRS.WALL AREA		LOSS GAIN		250		280		640		230		0		60		230		242						1020			
GLAZING		LOSS GAIN		LOSS GAIN		LOSS GAIN		LOSS GAIN		LOSS GAIN		LOSS GAIN		LOSS GAIN		LOSS GAIN		LOSS GAIN						LOSS GAIN			
NORTH		21.8	16.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	87	64	
EAST		21.8	41.6	37	806	1537	0	0	0	0	0	0	0	0	0	6	131	249	0	0	0	0	0	0	0	0	
SOUTH		21.8	24.9	23	501	573	34	741	847	41	893	1021	0	0	0	9	196	224	0	0	0	0	0	8	174	199	
WEST		21.8	41.6	0	0	0	0	0	0	103	2244	4280	23	501	956	0	0	0	0	0	0	0	0	8	174	332	
SKYLT.		35.8	101.2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
DOORS		25.8	4.3	0	0	0	0	0	0	0	0	0	0	0	0	40	1034	170	20	517	85		20	517	85		
NET EXPOSED WALL		4.2	0.7	190	799	131	246	1035	170	496	2086	343	207	871	143	51	214	35	184	774	127	222	934	154	0	0	0
NET EXPOSED BSMT WALL ABOVE GR		3.7	0.6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	510	1879	309	
EXPOSED CLG		1.3	0.6	0	0	0	0	0	0	0	0	0	125	164	73	0	0	0	0	0	0	0	0	0	0	0	
NO ATTIC EXPOSED CLG		2.8	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	
EXPOSED FLOOR		2.6	0.4	0	0	0	0	0	0	0	0	0	36	94	15	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		0		0	
SLAB ON GRADE HEAT LOSS				0		0		0		0		0		0		0		0		0		0		0		0	
SUBTOTAL HT LOSS				2106		1775		5223		1372		258		411		1938		1451						8583			
SUB TOTAL HT GAIN					2242		1017		5644		1099		89		259		547		239					990			
LEVEL FACTOR / MULTIPLIER		0.30	0.27			0.30 <td>0.27</td> <td></td> <td>0.30<td>0.27</td><td></td><td>0.20<td>0.18</td><td></td><td>0.30<td>0.27</td><td></td><td>0.30<td>0.27</td><td></td><td>0.30<td>0.27</td><td></td><td>0.50</td><td>0.76</td><td></td></td></td></td></td></td>	0.27		0.30 <td>0.27</td> <td></td> <td>0.20<td>0.18</td><td></td><td>0.30<td>0.27</td><td></td><td>0.30<td>0.27</td><td></td><td>0.30<td>0.27</td><td></td><td>0.50</td><td>0.76</td><td></td></td></td></td></td>	0.27		0.20 <td>0.18</td> <td></td> <td>0.30<td>0.27</td><td></td><td>0.30<td>0.27</td><td></td><td>0.30<td>0.27</td><td></td><td>0.50</td><td>0.76</td><td></td></td></td></td>	0.18		0.30 <td>0.27</td> <td></td> <td>0.30<td>0.27</td><td></td><td>0.30<td>0.27</td><td></td><td>0.50</td><td>0.76</td><td></td></td></td>	0.27		0.30 <td>0.27</td> <td></td> <td>0.30<td>0.27</td><td></td><td>0.50</td><td>0.76</td><td></td></td>	0.27		0.30 <td>0.27</td> <td></td> <td>0.50</td> <td>0.76</td> <td></td>	0.27		0.50	0.76		
AIR CHANGE HEAT LOSS				579		488		1435		377		46		113		532		398						6536			
AIR CHANGE HEAT GAIN					96		43		241	</																	

SITE NAME: CENTREFIELD (WEST GORMLEY)
BUILDER: ROYAL PINE HOMES

OPT. 5 BED 4 BATH
TYPE: 4504 FLANKAGE

DATE: Jun-21

GFA: 3309 LO# 91149

HEATING CFM 1370 COOLING CFM 1370
TOTAL HEAT LOSS 51,105 TOTAL HEAT GAIN 42,207
AIR FLOW RATE CFM 26.81 AIR FLOW RATE CFM 32.46

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

**CARRIER
59TN6A-060-14V
FAN SPEED 60

AFUE = 97 %
INPUT (BTU/H) = 60,000
OUTPUT (BTU/H) = 58,000

RUN COUNT	4th	3rd	2nd	1st	Bas
S/A	0	0	16	10	5
R/A	0	0	5	3	1

plenium pressure s/a 0.18 r/a pressure 0.17
max s/a dif press. loss 0.02 r/a grille press. Loss 0.02
min adjusted pressure s/a 0.16 adjusted pressure r/a 0.15

LOW 820
MEDLOW 0
MEDIUM 0
MEDIUM HIGH 1370
HIGH 1520

DESIGN CFM = 1370
CFM @ .6" E.S.P.

TEMPERATURE RISE 39 °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	WIC	MBR	BED-3	BED-4	BED-5	ENS-4/5	WIC-3	BED-4	BED-2	BED-3	LIV	LIV	KT/GT	KT/GT	KT/GT	LAUN	W/R	FOY	MUD	BAS	BAS	BAS	BAS
RM LOSS MBH.	1.45	0.31	1.45	1.18	1.79	0.98	1.55	1.31	1.79	1.06	1.18	1.34	1.34	2.22	2.22	2.22	0.33	0.52	2.47	1.85	3.02	3.02	3.02	3.02
CFM PER RUN HEAT	39	8	39	32	48	26	41	35	48	28	32	36	36	59	59	59	9	14	66	50	81	81	81	81
RM GAIN MBH.	2.26	0.09	2.26	1.90	2.49	1.41	1.03	1.42	2.49	1.53	1.90	1.92	1.92	2.81	2.81	2.81	1.01	0.35	0.74	0.32	0.27	0.27	0.27	0.27
CFM PER RUN COOLING	73	3	73	62	81	46	33	46	81	50	62	62	62	91	91	91	33	11	24	10	9	9	9	9
ADJUSTED PRESSURE	0.17	0.17	0.17	0.17	0.16	0.17	0.17	0.17	0.16	0.17	0.17	0.17	0.17	0.16	0.16	0.16	0.17	0.17	0.17	0.17	0.16	0.16	0.16	0.16
ACTUAL DUCT LGH.	53	57	64	39	61	59	47	46	57	61	43	54	48	40	35	44	31	43	35	41	36	46	21	40
EQUIVALENT LENGTH	180	200	150	180	180	200	190	200	150	220	190	140	170	170	130	160	190	120	160	160	90	100	130	110
TOTAL EFFECTIVE LENGTH	233	257	214	219	241	259	237	246	207	281	233	194	218	210	165	204	221	163	195	201	126	146	151	150
ADJUSTED PRESSURE	0.07	0.07	0.08	0.08	0.07	0.07	0.07	0.07	0.08	0.06	0.07	0.09	0.08	0.08	0.1	0.08	0.08	0.11	0.09	0.09	0.13	0.11	0.11	0.11
ROUND DUCT SIZE	6	4	6	5	6	6	5	5	6	5	5	5	5	6	6	6	4	4	5	5	6	6	6	6
HEATING VELOCITY (ft/min)	199	92	199	235	245	133	301	257	245	206	235	264	264	301	301	301	103	161	485	367	413	413	413	413
COOLING VELOCITY (ft/min)	372	34	372	455	413	235	242	338	413	367	455	455	455	464	464	464	379	126	176	73	46	46	46	46
OUTLET GRILL SIZE	4X10	3X10	4X10	3X10	4X10	4X10	3X10	3X10	4X10	3X10	3X10	3X10	3X10	4X10	4X10	4X10	3X10	3X10	3X10	3X10	4X10	4X10	4X10	4X10
TRUNK	C	C	C	B	A	B	B	B	A	C	B	A	A	C	C	C	B	B	A	D	D	D	D	B

RUN #	25	26	27	28	29	30	31
ROOM NAME	BAS	DIN	DEN	ENS	BED-2	ENS-2	ENS-3
RM LOSS MBH.	3.02	2.26	1.75	0.93	1.06	0.53	0.91
CFM PER RUN HEAT	81	61	47	25	28	14	24
RM GAIN MBH.	0.27	2.17	2.28	0.80	1.53	0.25	0.35
CFM PER RUN COOLING	9	70	74	26	50	8	11
ADJUSTED PRESSURE	0.16	0.17	0.17	0.17	0.17	0.17	0.17
ACTUAL DUCT LGH.	39	33	43	26	70	60	40
EQUIVALENT LENGTH	150	140	210	140	230	200	170
TOTAL EFFECTIVE LENGTH	189	173	253	166	300	260	210
ADJUSTED PRESSURE	0.09	0.1	0.07	0.1	0.06	0.07	0.08
ROUND DUCT SIZE	6	6	6	4	5	4	4
HEATING VELOCITY (ft/min)	413	311	240	287	206	161	275
COOLING VELOCITY (ft/min)	46	357	377	298	367	92	126
OUTLET GRILL SIZE	4X10	4X10	4X10	3X10	3X10	3X10	3X10
TRUNK	A	B	C	E	C	D	D

SUPPLY AIR TRUNK SIZE

	TRUNK CFM	STATIC PRESS.	ROUND DUCT	RECT DUCT	VELOCITY (ft/min)
TRUNK A	315	0.07	9.4	12	x 8 473
TRUNK B	646	0.07	12.3	18	x 8 646
TRUNK C	366	0.06	10.3	16	x 8 412
TRUNK D	697	0.06	13.2	20	x 8 627
TRUNK E	1370	0.06	17	26	x 10 759
TRUNK F	0	0.00	0	0	x 8 0

RETURN AIR TRUNK SIZE

	TRUNK CFM	STATIC PRESS.	ROUND DUCT	RECT DUCT	VELOCITY (ft/min)
TRUNK O	0	0.05	0	0	x 8 0
TRUNK P	0	0.05	0	0	x 8 0
TRUNK Q	0	0.05	0	0	x 8 0
TRUNK R	0	0.05	0	0	x 8 0
TRUNK S	0	0.05	0	0	x 8 0
TRUNK T	0	0.05	0	0	x 8 0
TRUNK U	0	0.05	0	0	x 8 0
TRUNK V	0	0.05	0	0	x 8 0
TRUNK W	0	0.05	0	0	x 8 0
TRUNK X	1025	0.05	15.9	30	x 8 615
TRUNK Y	0	0.05	0	0	x 8 0
TRUNK Z	0	0.05	0	0	x 8 0
DROP	1370	0.05	17.7	24	x 12 685

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	115	105	105	135	125	370	125	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.	53	47	73	45	42	48	23	57	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
EQUIVALENT LENGTH	215	175	255	255	135	215	260	175	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL EFFECTIVE LH	268	222	328	300	177	263	283	232	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
ADJUSTED PRESSURE	0.06	0.07	0.05	0.05	0.08	0.06	0.05	0.06	14.80	14.80	14.80	14.80	14.80	14.80	14.80	14.80	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05
ROUND DUCT SIZE	6.7	6.5	6.8	6.8	6.6	6.9	10.9	6.9	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	8	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	14	14	14	14	14	30	14	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

TYPE: 4504 FLANKAGE
SITE NAME: CENTREFIELD (WEST GORMLEY)

LO # 91149
OPT. 5 BED 4 BATH

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>4</u> @ 10.6 cfm	<u>42.4</u> cfm
Kitchen & Bathrooms	<u>6</u> @ 10.6 cfm	<u>63.6</u> cfm
Other Rooms	<u>6</u> @ 10.6 cfm	<u>63.6</u> cfm
Table 9.32.3.A.	TOTAL	<u>212.0</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		<u>95.4</u> cfm

SUPPLEMENTAL VENTILATION CAPACITY		9.32.3.5.
Total Ventilation Capacity	<u>212</u>	cfm
Less Principal Ventil. Capacity	<u>95.4</u>	cfm
Required Supplemental Capacity	<u>116.6</u>	cfm

PRINCIPAL EXHAUST FAN CAPACITY	
Model:	VANEE 65H
Location:	BSMT
<u>95.4</u> cfm	☒ HVI Approved

PRINCIPAL EXHAUST HEAT LOSS CALCULATION				
CFM	ΔT °F	FACTOR	% LOSS	
95.4 CFM	X 78 F	X 1.08	X	0.25

SUPPLEMENTAL FANS		BY INSTALLING CONTRACTOR		
Location	Model	cfm	HVI	Sones
ENS	BY INSTALLING CONTRACTOR	50	☒	3.5
ENS-4/5	BY INSTALLING CONTRACTOR	50	☒	3.5
ENS-3	BY INSTALLING CONTRACTOR	50	☒	3.5
W/R	BY INSTALLING CONTRACTOR	50	☒	3.5

HEAT RECOVERY VENTILATOR		9.32.3.11.
Model:	VANEE 65H	
<u>155</u> cfm high	<u>64</u> cfm low	
<u>75</u> % Sensible Efficiency @ 32 deg F (0 deg C)	☒ HVI Approved	

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

BUILDER:	
ROYAL PINE 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:	June-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#: 91149	Model: 4504 FLANKAGE	Builder: ROYAL PINE HOMES	Date: 6/7/2021																																																									
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>1496</td> <td>9</td> <td>13464</td> </tr> <tr> <td>First</td> <td>1496</td> <td>10</td> <td>14960</td> </tr> <tr> <td>Second</td> <td>1813</td> <td>8</td> <td>14504</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="2" style="text-align: right;">Total:</td> <td></td> <td>42,928.0 ft³</td> </tr> <tr> <td colspan="2" style="text-align: right;">Total:</td> <td></td> <td>1215.6 m³</td> </tr> </tbody> </table>			Level	Floor Area (ft²)	Floor Height (ft)	Volume (ft³)	Bsmt	1496	9	13464	First	1496	10	14960	Second	1813	8	14504	Third	0	9	0	Fourth	0	9	0	Total:			42,928.0 ft³	Total:			1215.6 m³	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 80%;">WINTER NATURAL AIR CHANGE RATE</td> <td style="width: 20%; text-align: center;">0.219</td> </tr> <tr> <td>SUMMER NATURAL AIR CHANGE RATE</td> <td style="text-align: center;">0.068</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>Tin °C</th> <th>Tout °C</th> <th>ΔT °C</th> <th>ΔT °F</th> </tr> <tr> <td>Winter DTDh</td> <td style="text-align: center;">22</td> <td style="text-align: center;">-21</td> <td style="text-align: center;">43</td> <td style="text-align: center;">78</td> </tr> <tr> <td>Summer DTDc</td> <td style="text-align: center;">24</td> <td style="text-align: center;">31</td> <td style="text-align: center;">7</td> <td style="text-align: center;">13</td> </tr> </table>		WINTER NATURAL AIR CHANGE RATE	0.219	SUMMER NATURAL AIR CHANGE RATE	0.068	Design Temperature Difference						Tin °C	Tout °C	ΔT °C	ΔT °F	Winter DTDh	22	-21	43	78	Summer DTDc	24	31	7	13
Level	Floor Area (ft²)	Floor Height (ft)	Volume (ft³)																																																									
Bsmt	1496	9	13464																																																									
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5.2.3.1 Heat Loss due to Air Leakage			6.2.6 Sensible Gain due to Air Leakage																																																									
$HL_{airb} = LR_{airh} \times \frac{V_b}{3.6} \times DTD_h \times 1.2$ 0.219 x 337.66 x 43 °C x 1.2 = 3831 W = 13072 Btu/h			$HG_{salb} = LR_{airc} \times \frac{V_b}{3.6} \times DTD_c \times 1.2$ = 0.068 x 337.66 x 7 °C x 1.2 = 196 W = 670 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 78 °F x 1.08 x 0.25 = 2004 Btu/h			$HL_{vairb} = PVC \times DTD_h \times 1.08 \times (1 - E)$ 95 CFM x 13 °F x 1.08 x 0.25 = 330 Btu/h																																																									
5.2.3.3 Calculation of Air Change Heat Loss for Each Room (Floor Multiplier Section)																																																												
$HL_{airr} = Level\ Factor \times HL_{airbv} \times \{(HL_{agcr} + HL_{bgcr}) \div (HL_{agclevel} + HL_{bgclevel})\}$																																																												
Level	Level Factor (LF)	HLairve Air Leakage + Ventilation Heat Loss (Btu/h)	Level Conductive Heat Loss: (HL _{clevel})	Air Leakage Heat Loss Multiplier (LF x HLairbv / HLlevel)																																																								
1	0.5	13,072	8,583	0.762																																																								
2	0.3		14,275	0.275																																																								
3	0.2		14,729	0.177																																																								
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 HLairve = 0																																																												

HEAT LOSS AND GAIN SUMMARY SHEET

MODEL: 4504 FLANKAGE	OPT. 5 BED 4 BATH	BUILDER: ROYAL PINE HOMES
SFQT: 3309	LO# 91149	SITE: CENTREFIELD (WEST GORMLEY)

DESIGN ASSUMPTIONS

HEATING	°F	COOLING	°F
OUTDOOR DESIGN TEMP.	-6	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:	2.50	ASSUMED (Y/N):	Y
AIR TIGHTNESS CATEGORY:	TIGHT	ASSUMED (Y/N):	Y
WIND EXPOSURE:	SHELTERED	ASSUMED (Y/N):	Y
HOUSE VOLUME (ft ³):	42928.0	ASSUMED (Y/N):	Y
INTERNAL SHADING:	BLINDS/CURTAINS	ASSUMED OCCUPANTS:	6
INTERIOR LIGHTING LOAD (Btu/h/ft ²):	1.27	DC BRUSHLESS MOTOR (Y/N):	Y
FOUNDATION CONFIGURATION	BCIN_1	DEPTH BELOW GRADE:	6.0 ft
LENGTH: 46.0 ft	WIDTH: 39.0 ft	EXPOSED PERIMETER:	170.0 ft

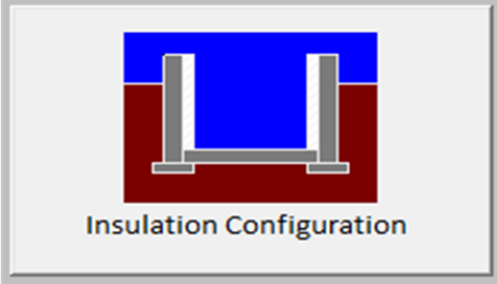
2012 OBC - COMPLIANCE PACKAGE		Compliance Package SB-12 PERFORMANCE	
Component		Nominal	Min. Eff.
Ceiling with Attic Space Minimum RSI (R)-Value		60	59.20
Ceiling Without Attic Space Minimum RSI (R)-Value		31	27.70
Exposed Floor Minimum RSI (R)-Value		31	29.80
Walls Above Grade Minimum RSI (R)-Value		22+1.5	18.50
Basement Walls Minimum RSI (R)-Value		20	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		1.6	-
Skylights Maximum U-Value		2.6	-
Space Heating Equipment Minimum AFUE		0.96	-
HRV Minimum Efficiency		75%	-
Domestic Hot Water Heater Minimum EF		TE=94%	-

INDIVIDUAL BCIN: 19669
MICHAEL O'ROURKE



Residential Foundation Thermal Load Calculator

Supplemental tool for CAN/CSA-F280

Weather Station Description		
Province:	Ontario	
Region:	Richmond Hill	
Site Description		
Soil Conductivity:	Normal conductivity: dry sand, loam, clay	
Water Table:	Normal (7-10 m, 23-33 ft)	
Foundation Dimensions		
Floor Length (m):	14.0	
Floor Width (m):	11.9	
Exposed Perimeter (m):	0.0	
Wall Height (m):	2.7	
Depth Below Grade (m):	1.83	
Window Area (m ²):	1.9	
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):		1685

TYPE: 4504 FLANKAGE
LO# 91149

OPT. 5 BED 4 BATH

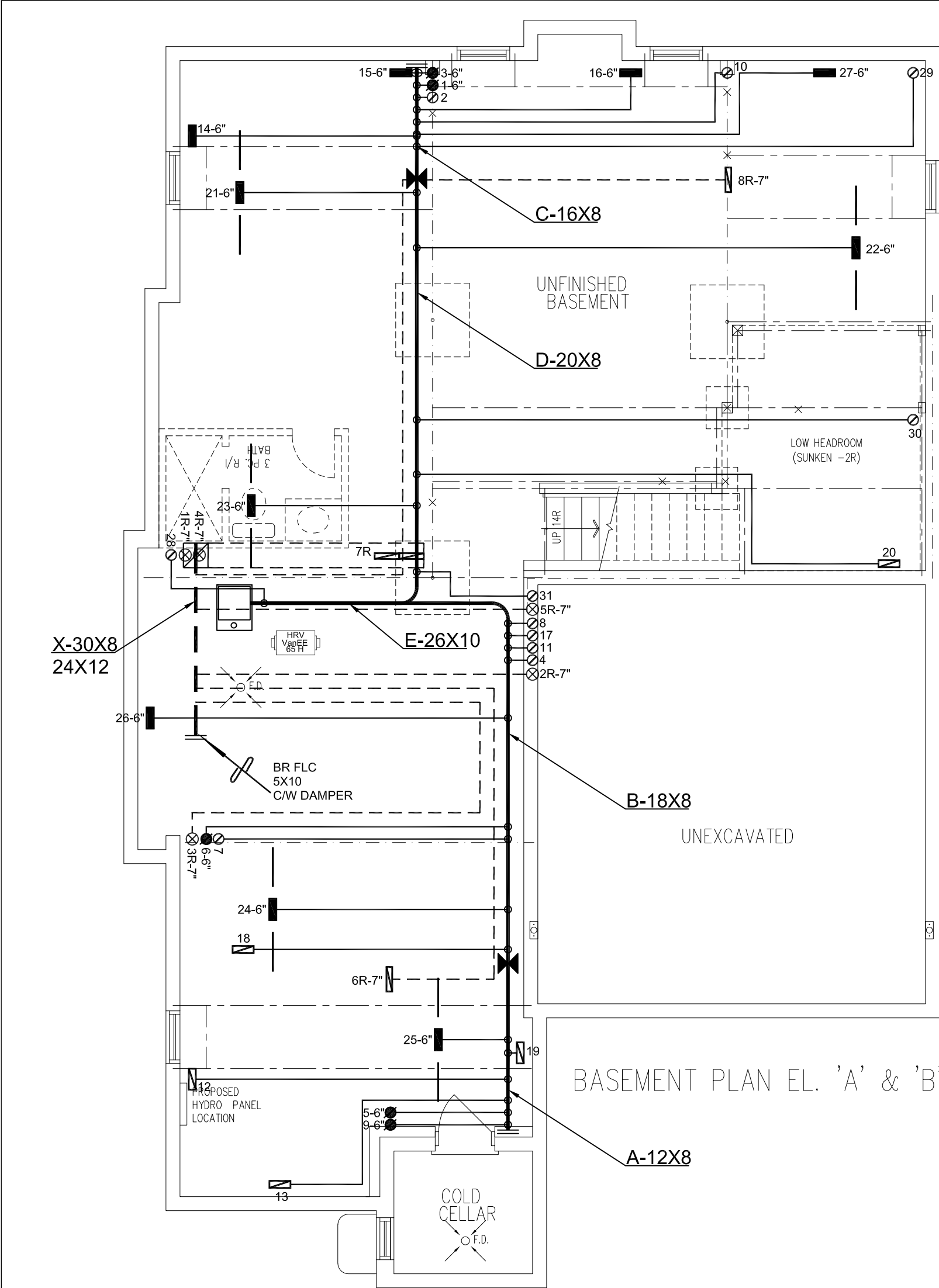
Air Infiltration Residential Load Calculator

Supplemental tool for CAN/CSA-F280

Weather Station Description				
Province:	Ontario			
Region:	Richmond Hill			
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):	6.40			
Building Configuration				
Type:	Detached			
Number of Stories:	Two			
Foundation:	Full			
House Volume (m ³):	1215.6			
Air Leakage/Ventilation				
Air Tightness Type:	Energy Star Detached (2.5 ACH)			
Custom BDT Data:	ELA @ 10 Pa.	1134.7 cm ²		
	2.50	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):	0.219			
Cooling Air Leakage Rate (ACH/H):	0.068			

TYPE: 4504 FLANKAGE
LO# 91149

OPT. 5 BED 4 BATH



BASEMENT PLAN EL. 'A' & 'B'

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.

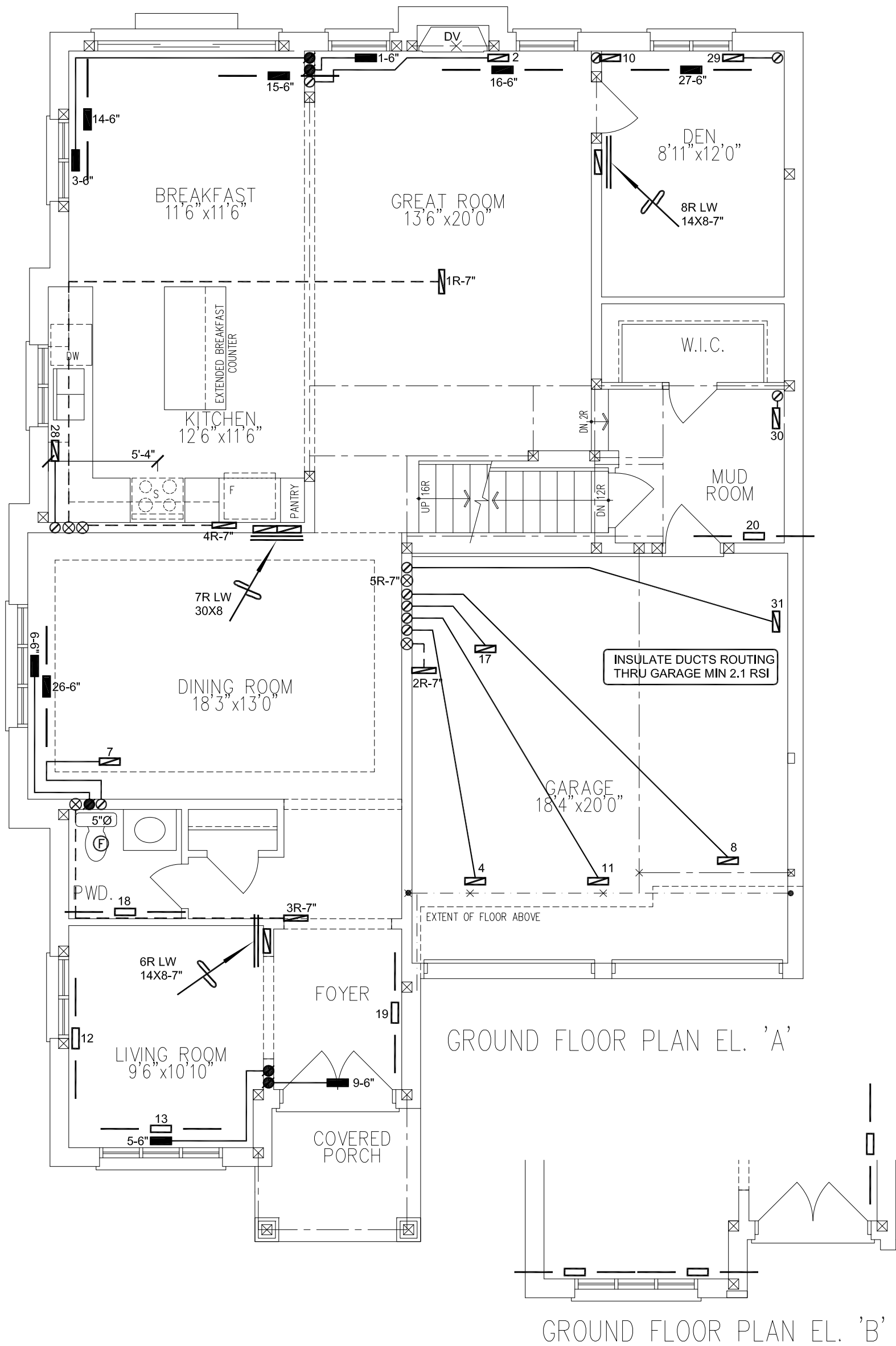
CSA-F280-12

SB-12 PERFORMANCE

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	HVACDESIGNS LTD. 375 Finley Ave. Suite 202 - Ajax, Ontario L1S 2E2 Tel. 905.619.2300 - 905.420.5300 Fax 905.619.2375 Email: info@hvacdesigns.ca Web: www.hvacdesigns.ca Specializing in Residential Mechanical Design Services Installation to comply with the latest Ontario Building Code. All supply branch outlets shall be equipped with a manual balancing damper. Ductwork which passes through the garage or unheated spaces shall be adequately insulated and be gas-proofed.		HEAT LOSS 53109 BTU/H		# OF RUNS S/A R/A FANS				Sheet Title		
ROYAL PINE HOMES			UNIT DATA	3RD FLOOR						BASEMENT HEATING LAYOUT	
Project Name CENTREFIELD (WEST GORMLEY) RICHMOND HILL, ONTARIO	MAKE CARRIER	2ND FLOOR			16	5	5				
	MODEL 59TN6A-060-14V	1ST FLOOR			10	3	2				
	INPUT 60 MBTU/H	BASEMENT			5	1	0	Date	JUNE/2021		
	OUTPUT 58 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							Scale	3/16" = 1'-0"	
	COOLING 3.5 TONS								BCIN# 19669		
OPT. 5 BED 4 BATH 4504 FLANKAGE 3309 sqft			FAN SPEED 1370 cfm @ 0.6" w.c.	LO# 91149							



GROUND FLOOR PLAN EL. 'A'

GROUND FLOOR PLAN EL. 'B'

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.

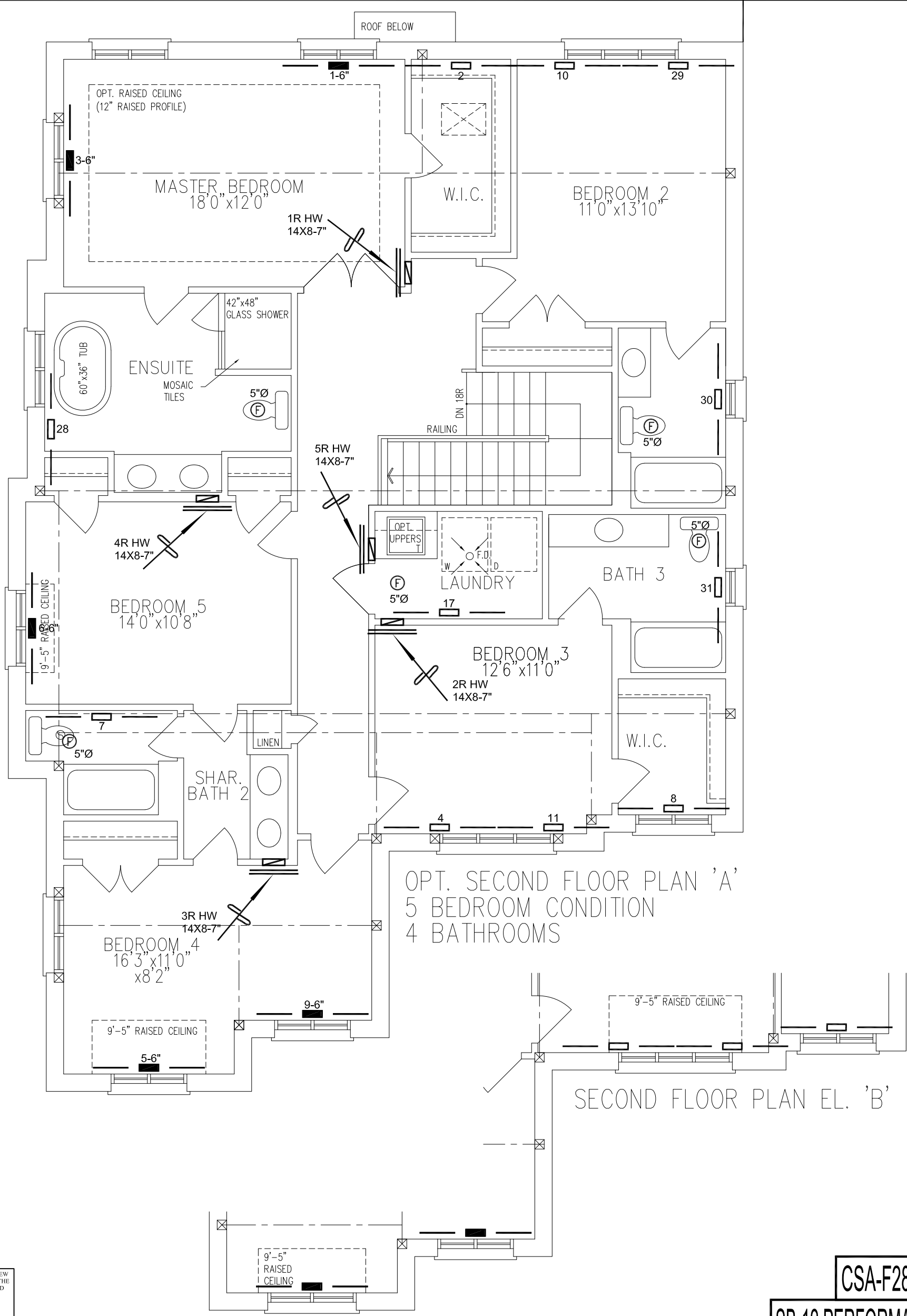
CSA-F280-12

SB-12 PERFORMANCE

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	Sheet Title	
ROYAL PINE HOMES			FIRST FLOOR HEATING LAYOUT	
Project Name		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.	Date	
CENTREFIELD (WEST GORMLEY) RICHMOND HILL, ONTARIO			JUNE/2021	
OPT. 5 BED 4 BATH 4504 FLANKAGE 3309 sqft			Scale	
			3/16" = 1'-0"	
			BCIN# 19669	
			LO#	91149



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

SB-12 PERFORMANCE

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.	Sheet Title	
ROYAL PINE HOMES			SECOND FLOOR HEATING LAYOUT	
Project Name			Date	JUNE/2021
CENTREFIELD (WEST GORMLEY) RICHMOND HILL, ONTARIO			Scale	3/16" = 1'-0"
OPT. 5 BED 4 BATH 4504 FLANKAGE 3309 sqft			BCIN# 19669	
			LO#	91149

Schedule 1: Designer Information

Use one form for each individual who reviews and takes responsibility for design activities with respect to the project.

A. Project Information			
Building number, street name		Unit no.	Lot/con.
Municipality RICHMOND HILL	Postal code	Plan number/ other description	
B. Individual who reviews and takes responsibility for design activities			
Name MICHAEL O'ROURKE		Firm HVAC DESIGNS LTD.	
Street address 375 FINLEY AVE		Unit no. 202	Lot/con. N/A
Municipality AJAX	Postal code L1S 2E2	Province ONTARIO	E-mail info@hvacdsgns.ca
Telephone number (905) 619-2300	Fax number (905) 619-2375	Cell number ()	
C. Design activities undertaken by individual identified in Section B. [Building Code Table 3.5.2.1 OF Division C]			
☐ House ☐ Small Buildings ☐ Large Buildings ☐ Complex Buildings ☒ HVAC – House ☐ Building Services ☐ Detection, Lighting and Power ☐ Fire Protection ☐ Building Structural ☐ Plumbing – House ☐ Plumbing – All Buildings ☐ On-site Sewage Systems			
Description of designer's work HEAT LOSS / GAIN CALCULATIONS DUCT SIZING RESIDENTIAL MECHANICAL VENTILATION DESIGN SUMMARY RESIDENTIAL SYSTEM DESIGN per CSA-F280-12		Model: 4504 FLANKAGE OPT. GROUND Project: CENTREFIELD (WEST GORMLEY)	
D. Declaration of Designer			
I, <u>MICHAEL O'ROURKE</u> (print name) declare that (choose one as appropriate):			
☐ I review and take responsibility for the design work on behalf of a firm registered under subsection 3.2.4. of Division C, of the Building Code. I am qualified, and the firm is registered, in the appropriate classes/categories. Individual BCIN: _____ Firm BCIN: _____			
☒ I review and take responsibility for the design and am qualified in the appropriate category as an "other designer" under subsection 3.2.5. of Division C, of the Building Code. Individual BCIN: <u>19669</u> Basis for exemption from registration and qualification: <u>O.B.C SENTENCE 3.2.4.1 (4)</u>			
☐ The design work is exempt from the registration and qualification requirements of the Building Code. Basis for exemption from registration and qualification: _____			
I certify that:			
1. The information contained in this schedule is true to the best of my knowledge. 2. I have submitted this application with the knowledge and consent of the firm.			
June 7, 2021			
Date		Signature of Designer	

NOTE:

- For the purposes of this form, "individual" means the "person" referred to in Clause 3.2.4.7(1) d) of Division C, Article 3.2.5.1. of Division C, and all other persons who are exempt from qualification under Subsections 3.2.4. and 3.2.5. of Division C.
- Schedule 1 is not required to be completed by a holder of a license, temporary license, or a certificate of authorization, issued by the Ontario Association of Architects. Schedule 1 is also not required to be completed by a holder of a license to practise, a limited license to practise, or a certificate of authorization, issued by the Association of Professional Engineers of Ontario.

Application for a Permit Construct or Demolish – Effective January 1, 2015

SITE NAME: CENTREFIELD (WEST GORMLEY)										OPT. GROUND				DATE: Jun-21				WINTER NATURAL AIR CHANGE RATE 0.219				HEAT LOSS ΔT °F. 78				CSA-F280-12											
BUILDER: ROYAL PINE HOMES										TYPE: 4504 FLANKAGE				GFA: 3309				LO# 87516				SUMMER NATURAL AIR CHANGE RATE 0.068				HEAT GAIN ΔT °F. 13				SB-12 PERFORMANCE							
ROOM USE				MBR				ENS				BED-2				BED-3				BED-4				BATH						WIC-4				ENS-2			
EXP. WALL				42				27				35				45				15				9						5				9			
CLG. HT.				8				8				8				8				8				8						8				8			
FACTORS																																					
GRS.WALL AREA		LOSS GAIN		336				216				280				360				120				72				40				72					
GLAZING				LOSS GAIN				LOSS GAIN				LOSS GAIN				LOSS GAIN				LOSS GAIN				LOSS GAIN				LOSS GAIN				LOSS GAIN					
NORTH		21.8	16.0	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	7	152	112				
EAST		21.8	41.6	0	0	0	0	0	0	0	0	54	1176	2244	49	1067	2036	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
SOUTH		21.8	24.9	0	0	0	0	19	414	473	0	0	0	0	19	414	473	24	523	598	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
WEST		21.8	41.6	36	784	1496	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.		35.8	101.2	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		25.8	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			
NET EXPOSED WALL		4.2	0.7	300	1262	208	197	828	136	226	950	156	292	1228	202	96	404	66	72	303	50	21	88	15	65	273	45	0	0	0	0	0	0	0			
NET EXPOSED BSMT WALL ABOVE GR		3.7	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			
EXPOSED CLG		1.3	0.6	428	562	252	180	237	106	280	368	165	280	368	165	289	380	170	90	118	53	58	76	34	102	134	60	0	0	0	0	0	0	0			
NO ATTIC EXPOSED CLG		2.8	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	0	0	0			
EXPOSED FLOOR		2.6	0.4	0	0	0	0	0	0	280	731	120	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5	13	2	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				2608				1479				3226				3077				1306				421				578				573					
SUB TOTAL HT GAIN						1955				715				2685				2876				834				103				522				219			
LEVEL FACTOR / MULTIPLIER		0.20	0.19					0.20	0.19			0.20	0.19			0.20	0.19			0.20	0.19			0.20	0.19			0.20	0.19			0.20	0.19				
AIR CHANGE HEAT LOSS				505				286				624				596				253				81				112				111					
AIR CHANGE HEAT GAIN						83		31				115				123				36				4				22				9					
DUCT LOSS				0				0				385				0				0				0				0				68					
DUCT GAIN				0				0				385				0				0				0				0				23					
HEAT GAIN PEOPLE		240		2		480	0	0		1		240	1		240	1		240	0		0		0		0		0		0		0		0				
HEAT GAIN APPLIANCES/LIGHTS						811		0				811				811				811				0				0				0					
TOTAL HT LOSS BTU/H				3113				1765				4235				3673				1559				503				690				752					
TOTAL HT GAIN x 1.3 BTU/H						4328		969						5506				5264				2496				139				707				326			

ROOM USE			LIV		DIN		KT/GT		LAUN		W/R		FOY		MUD										BAS						
EXP. WALL			25		28		87		0		6		23		22										170						
CLG. HT.			10		10		10		8		10		10		11										9						
FACTORS																															
GRS.WALL AREA	LOSS	GAIN	250		280		870		0		60		230		242										1020						
GLAZING			LOSS GAIN		LOSS GAIN		LOSS GAIN		LOSS GAIN		LOSS GAIN		LOSS GAIN		LOSS GAIN										LOSS GAIN						
NORTH	21.8	16.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	87	64			
EAST	21.8	41.6	37	806	1537	0	0	0	0	0	0	0	6	131	249	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
SOUTH	21.8	24.9	23	501	573	34	741	847	41	893	1021	0	9	196	224	0	0	0	0	0	0	0	0	0	0	8	174	199			
WEST	21.8	41.6	0	0	0	0	0	0	129	2810	5360	0	0	0	0	0	0	0	0	0	0	0	0	0	0	8	174	332			
SKYLT.	35.8	101.2	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	25.8	4.3	0	0	0	0	0	0	0	0	0	0	0	0	0	40	1034	170	20	517	85				20	517	85				
NET EXPOSED WALL	4.2	0.7	190	799	131	246	1035	170	700	2944	484	0	0	0	51	214	35	184	774	127	222	934	154			0	0	0			
NET EXPOSED BSMT WALL ABOVE GR	3.7	0.6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			510	1879	309			
EXPOSED CLG	1.3	0.6	0	0	0	0	0	0	0	0	0	106	139	62	0	0	0	0	0	0	0	0	0			0	0	0			
NO ATTIC EXPOSED CLG	2.8	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			
EXPOSED FLOOR	2.6	0.4	0	0	0	0	0	0	0	0	0	38	99	16	0	0	0	0	0	0	0	0	0			0	0	0			
BASEMENT/CRAWL HEAT LOSS																															
SLAB ON GRADE HEAT LOSS																															
SUBTOTAL HT LOSS				2106			1775			6647			239		411		1938		1451									8583			
SUB TOTAL HT GAIN					2242			1017			6865			79		259		547		239								990			
LEVEL FACTOR / MULTIPLIER	0.30	0.27				0.30	0.27		0.30	0.27		0.20	0.19		0.30	0.27		0.30	0.27		0.30	0.27					0.50	0.76			
AIR CHANGE HEAT LOSS				576			486			1819			46		112		531		397									6536			
AIR CHANGE HEAT GAIN					96		43			293			3		11		23		10										42		
DUCT LOSS				0			0			0			28		0		0		0									0			
DUCT GAIN					0		0			0			89		0		0		0		0		0						0		
HEAT GAIN PEOPLE	240		0		0	0	0	0	0	0		0	0	0	0	0	0	0	0	0	0	0	0			0	0	0			
HEAT GAIN APPLIANCES/LIGHTS					811		811			811			811		0		0		0		0		0						0		
TOTAL HT LOSS BTU/H				2682			2261			8466			313		523		2469		1848									15119			
TOTAL HT GAIN x 1.3 BTU/H				4092			2432			10360			1277		352		741		323										1341		

TOTAL HEAT GAIN BTU/H: 40931 TONS: 3.41 LOSS DUE TO VENTILATION LOAD BTU/H: 1670 STRUCTURAL HEAT LOSS: 49972 TOTAL COMBINED HEAT LOSS BTU/H: 51642

SITE NAME: CENTREFIELD (WEST GORMLEY)
BUILDER: ROYAL PINE HOMES

OPT. GROUND
TYPE: 4504 FLANKAGE

DATE: Jun-21

GFA: 3309 LO# 87516

HEATING CFM 1370 COOLING CFM 1370
TOTAL HEAT LOSS 49,972 TOTAL HEAT GAIN 40,656
AIR FLOW RATE CFM 27.42 AIR FLOW RATE CFM 33.7

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

****CARRIER**
59TN6A-060-14V
FAN SPEED 60

AFUE = 97 %
INPUT (BTU/H) = 60,000
OUTPUT (BTU/H) = **58,000**

RUN COUNT	4th	3rd	2nd	1st	Bas
S/A	0	0	14	10	5
R/A	0	0	5	3	1

plenum pressure s/a 0.18 r/a pressure 0.17
max s/a dif press. loss 0.02 r/a grille press. Loss 0.02
min adjusted pressure s/a 0.16 adjusted pressure r/a 0.15

LOW 820
MEDLOW 0
MEDIUM 0
MEDIUM HIGH 1370
HIGH 1520

DESIGN CFM = **1370**
CFM @ .6" E.S.P.

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	ENS	BED-2	BED-3	BED-4	BATH	BED-2	BED-3	MBR	ENS-2	LIV	LIV	KT/GT	KT/GT	KT/GT	LAUN	W/R	FOY	MUD	BAS	BAS	BAS	BAS
RM LOSS MBH.	1.56	0.88	0.88	2.12	1.84	1.56	0.25	2.12	1.84	1.56	0.75	1.34	1.34	2.12	2.12	2.12	0.31	0.52	2.47	1.85	3.02	3.02	3.02	3.02
CFM PER RUN HEAT	43	24	24	58	50	43	7	58	50	43	21	37	37	58	58	58	9	14	68	51	83	83	83	83
RM GAIN MBH.	2.16	0.48	0.48	2.75	2.63	2.50	0.07	2.75	2.63	2.16	0.33	2.05	2.05	2.59	2.59	2.59	1.28	0.35	0.74	0.32	0.27	0.27	0.27	0.27
CFM PER RUN COOLING	73	16	16	93	89	84	2	93	89	73	11	69	69	87	87	87	43	12	25	11	9	9	9	9
ADJUSTED PRESSURE	0.17	0.17	0.17	0.16	0.16	0.16	0.17	0.16	0.16	0.17	0.17	0.17	0.17	0.16	0.16	0.16	0.17	0.17	0.17	0.17	0.16	0.16	0.16	0.16
ACTUAL DUCT LGH.	53	57	64	41	61	59	47	46	57	64	61	54	48	40	35	44	31	43	35	41	36	46	21	40
EQUIVALENT LENGTH	170	180	190	180	180	210	170	200	150	210	140	140	170	170	120	130	190	120	160	160	90	100	130	110
TOTAL EFFECTIVE LENGTH	223	237	254	221	241	269	217	246	207	274	201	194	218	210	155	174	221	163	195	201	126	146	151	150
ADJUSTED PRESSURE	0.08	0.07	0.07	0.07	0.07	0.06	0.08	0.07	0.08	0.06	0.09	0.09	0.08	0.08	0.1	0.09	0.08	0.11	0.09	0.09	0.13	0.11	0.11	0.11
ROUND DUCT SIZE	6	4	4	6	6	6	4	6	6	6	4	5	5	6	6	6	5	4	5	5	6	6	6	6
HEATING VELOCITY (ft/min)	219	275	275	296	255	219	80	296	255	219	241	272	272	296	296	296	66	161	499	374	423	423	423	423
COOLING VELOCITY (ft/min)	372	184	184	474	454	428	23	474	454	372	126	507	507	444	444	444	316	138	184	81	46	46	46	46
OUTLET GRILL SIZE	4X10	3X10	3X10	4X10	4X10	4X10	3X10	4X10	4X10	4X10	3X10	3X10	3X10	4X10	4X10	4X10	3X10	3X10	3X10	3X10	4X10	4X10	4X10	4X10
TRUNK	C	C	C	B	A	B	B	B	A	C	D	A	A	C	C	C	B	B	A	D	D	D	D	B

RUN #	25	26	27	28	29
ROOM NAME	BAS	DIN	KT/GT	WIC-4	BATH
RM LOSS MBH.	3.02	2.26	2.12	0.69	0.25
CFM PER RUN HEAT	83	62	58	19	7
RM GAIN MBH.	0.27	2.43	2.59	0.71	0.07
CFM PER RUN COOLING	9	82	87	24	2
ADJUSTED PRESSURE	0.16	0.16	0.16	0.17	0.17
ACTUAL DUCT LGH.	39	33	43	26	47
EQUIVALENT LENGTH	150	140	160	140	150
TOTAL EFFECTIVE LENGTH	189	173	203	166	197
ADJUSTED PRESSURE	0.09	0.09	0.08	0.1	0.09
ROUND DUCT SIZE	6	6	6	4	4
HEATING VELOCITY (ft/min)	423	316	296	218	80
COOLING VELOCITY (ft/min)	46	418	444	275	23
OUTLET GRILL SIZE	4X10	4X10	4X10	3X10	3X10
TRUNK	A	B	C	E	B

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	325	0.07	9.5	12	x 8	488	TRUNK G	0	0.00	0	0	x 8	0	TRUNK O	0	0.05	0	0	x 8	0			
TRUNK B	666	0.06	12.9	20	x 8	599	TRUNK H	0	0.00	0	0	x 8	0	TRUNK P	0	0.05	0	0	x 8	0			
TRUNK C	366	0.06	10.3	16	x 8	412	TRUNK I	0	0.00	0	0	x 8	0	TRUNK Q	0	0.05	0	0	x 8	0			
TRUNK D	687	0.06	13.1	20	x 8	618	TRUNK J	0	0.00	0	0	x 8	0	TRUNK R	0	0.05	0	0	x 8	0			
TRUNK E	1370	0.06	17	26	x 10	759	TRUNK K	0	0.00	0	0	x 8	0	TRUNK S	0	0.05	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	TRUNK T	0	0.05	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	125	125	115	115	135	125	370	125	0	0	0	0	0	0	0	0	135	1005	0.05	15.8	30	x 8	8	603
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	0.05	0	0	x 8	8	0
ACTUAL DUCT LGH.	53	47	73	45	42	48	23	57	1	1	1	1	1	1	1	1	14	0	0.05	0	0	x 8	8	0
EQUIVALENT LENGTH	215	175	255	255	135	215	260	175	0	0	0	0	0	0	0	0	260	0	0.05	0	0	x 8	8	0
TOTAL EFFECTIVE LH	268	222	328	300	177	263	283	232	1	1	1	1	1	1	1	1	274	0	0.05	0	0	x 8	8	0
ADJUSTED PRESSURE	0.06	0.07	0.05	0.05	0.08	0.06	0.05	0.06	14.80	14.80	14.80	14.80	14.80	14.80	14.80	14.80	0.05	0	0.05	0	0	x 8	8	0
ROUND DUCT SIZE	6.9	6.7	7	7	6.6	6.9	10.9	6.9	0	0	0	0	0	0	0	0	7.5	0	0.05	0	0	x 8	8	0
INLET GRILL SIZE	8	8	8	8	8	8	8	8	0	0	0	0	0	0	0	0	8	0	0.05	0	0	x 8	8	0
INLET GRILL SIZE	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	14	0.05	17.7	24	x 12	12	685

TYPE: 4504 FLANKAGE
SITE NAME: CENTREFIELD (WEST GORMLEY)

LO # 87516
OPT. GROUND

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>3</u> @ 10.6 cfm <u>31.8</u> cfm	
Kitchen & Bathrooms	<u>5</u> @ 10.6 cfm <u>53</u> cfm	
Other Rooms	<u>5</u> @ 10.6 cfm <u>53.0</u> cfm	
Table 9.32.3.A.	TOTAL <u>180.2</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 79.5 cfm		

SUPPLEMENTAL VENTILATION CAPACITY		9.32.3.5.
Total Ventilation Capacity	<u>180.2</u> cfm	
Less Principal Ventil. Capacity	<u>79.5</u> cfm	
Required Supplemental Capacity	<u>100.7</u> cfm	

PRINCIPAL EXHAUST FAN CAPACITY	
Model: VANEE 65H	Location: BSMT
<u>79.5</u> cfm	☒ HVI Approved

PRINCIPAL EXHAUST HEAT LOSS CALCULATION				
CFM	ΔT °F	FACTOR	% LOSS	
79.5 CFM	X 78 F	X 1.08	X	0.25

SUPPLEMENTAL FANS		BY INSTALLING CONTRACTOR		
Location	Model	cfm	HVI	Sones
ENS	BY INSTALLING CONTRACTOR	50	☒	3.5
BATH	BY INSTALLING CONTRACTOR	50	☒	3.5
ENS-2	BY INSTALLING CONTRACTOR	50	☒	3.5
W/R	BY INSTALLING CONTRACTOR	50	☒	3.5

HEAT RECOVERY VENTILATOR		9.32.3.11.
Model: VANEE 65H		
<u>155</u> cfm high	<u>64</u> cfm low	
<u>75</u> % Sensible Efficiency @ 32 deg F (0 deg C)	☒ HVI Approved	

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

BUILDER: ROYAL PINE 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:	June-21

CSA F280-12 Residential Heat Loss and Heat Gain Calculations																																																												
Formula Sheet (For Air Leakage / Ventilation Calculation)																																																												
LO#: 87516	Model: 4504 FLANKAGE	Builder: ROYAL PINE HOMES	Date: 6/7/2021																																																									
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>1496</td> <td>9</td> <td>13464</td> </tr> <tr> <td>First</td> <td>1496</td> <td>10</td> <td>14960</td> </tr> <tr> <td>Second</td> <td>1813</td> <td>8</td> <td>14504</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="2" style="text-align: right;">Total:</td> <td></td> <td>42,928.0 ft³</td> </tr> <tr> <td colspan="2" style="text-align: right;">Total:</td> <td></td> <td>1215.6 m³</td> </tr> </tbody> </table>			Level	Floor Area (ft²)	Floor Height (ft)	Volume (ft³)	Bsmt	1496	9	13464	First	1496	10	14960	Second	1813	8	14504	Third	0	9	0	Fourth	0	9	0	Total:			42,928.0 ft³	Total:			1215.6 m³	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 80%;">WINTER NATURAL AIR CHANGE RATE</td> <td style="width: 20%; text-align: center;">0.219</td> </tr> <tr> <td>SUMMER NATURAL AIR CHANGE RATE</td> <td style="text-align: center;">0.068</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>Tin °C</th> <th>Tout °C</th> <th>ΔT °C</th> <th>ΔT °F</th> </tr> <tr> <td>Winter DTDh</td> <td style="text-align: center;">22</td> <td style="text-align: center;">-21</td> <td style="text-align: center;">43</td> <td style="text-align: center;">78</td> </tr> <tr> <td>Summer DTDc</td> <td style="text-align: center;">24</td> <td style="text-align: center;">31</td> <td style="text-align: center;">7</td> <td style="text-align: center;">13</td> </tr> </table>		WINTER NATURAL AIR CHANGE RATE	0.219	SUMMER NATURAL AIR CHANGE RATE	0.068	Design Temperature Difference						Tin °C	Tout °C	ΔT °C	ΔT °F	Winter DTDh	22	-21	43	78	Summer DTDc	24	31	7	13
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5.2.3.1 Heat Loss due to Air Leakage			6.2.6 Sensible Gain due to Air Leakage																																																									
$HL_{airb} = LR_{airh} \times \frac{V_b}{3.6} \times DTD_h \times 1.2$ 0.219 x 337.66 x 43 °C x 1.2 = 3831 W = 13072 Btu/h			$HG_{salb} = LR_{airc} \times \frac{V_b}{3.6} \times DTD_c \times 1.2$ = 0.068 x 337.66 x 7 °C x 1.2 = 196 W = 670 Btu/h																																																									
5.2.3.2 Heat Loss due to Mechanical Ventilation			6.2.7 Sensible heat Gain due to Ventilation																																																									
$HL_{vairb} = PVC \times DTD_h \times 1.08 \times (1 - E)$ 80 CFM x 78 °F x 1.08 x 0.25 = 1670 Btu/h			$HL_{vairb} = PVC \times DTD_h \times 1.08 \times (1 - E)$ 80 CFM x 13 °F x 1.08 x 0.25 = 275 Btu/h																																																									
5.2.3.3 Calculation of Air Change Heat Loss for Each Room (Floor Multiplier Section)																																																												
$HL_{airr} = Level\ Factor \times HL_{airbv} \times \{(HL_{agcr} + HL_{bgcr}) \div (HL_{agclevel} + HL_{bgclevel})\}$																																																												
Level	Level Factor (LF)	HLairve Air Leakage + Ventilation Heat Loss (Btu/h)	Level Conductive Heat Loss: (HL _{clevel})	Air Leakage Heat Loss Multiplier (LF x HLairbv / HLlevel)																																																								
1	0.5	13,072	8,583	0.762																																																								
2	0.3		14,328	0.274																																																								
3	0.2		13,508	0.194																																																								
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 HLairve = 0																																																												

HEAT LOSS AND GAIN SUMMARY SHEET

MODEL: 4504 FLANKAGE	OPT. GROUND	BUILDER: ROYAL PINE HOMES
SFQT: 3309	LO# 87516	SITE: CENTREFIELD (WEST GORMLEY)

DESIGN ASSUMPTIONS

HEATING	°F	COOLING	°F
OUTDOOR DESIGN TEMP.	-6	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:	2.50	ASSUMED (Y/N):	Y
AIR TIGHTNESS CATEGORY:	TIGHT	ASSUMED (Y/N):	Y
WIND EXPOSURE:	SHELTERED	ASSUMED (Y/N):	Y
HOUSE VOLUME (ft ³):	42928.0	ASSUMED (Y/N):	Y
INTERNAL SHADING:	BLINDS/CURTAINS	ASSUMED OCCUPANTS:	5
INTERIOR LIGHTING LOAD (Btu/h/ft ²):	1.35	DC BRUSHLESS MOTOR (Y/N):	Y
FOUNDATION CONFIGURATION	BCIN_1	DEPTH BELOW GRADE:	6.0 ft
LENGTH: 46.0 ft	WIDTH: 39.0 ft	EXPOSED PERIMETER:	170.0 ft

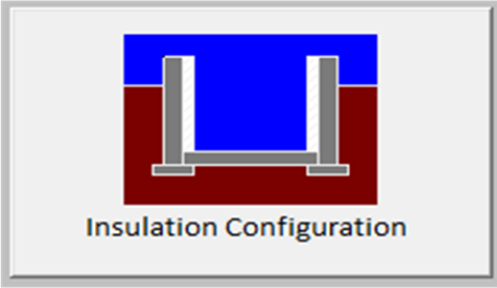
2012 OBC - COMPLIANCE PACKAGE		Compliance Package	
Component		SB-12 PERFORMANCE	
		Nominal	Min. Eff.
Ceiling with Attic Space Minimum RSI (R)-Value		60	59.20
Ceiling Without Attic Space Minimum RSI (R)-Value		31	27.70
Exposed Floor Minimum RSI (R)-Value		31	29.80
Walls Above Grade Minimum RSI (R)-Value		22+1.5	18.50
Basement Walls Minimum RSI (R)-Value		20	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		1.6	-
Skylights Maximum U-Value		2.6	-
Space Heating Equipment Minimum AFUE		0.96	-
HRV Minimum Efficiency		75%	-
Domestic Hot Water Heater Minimum EF		TE=94%	-

INDIVIDUAL BCIN: 19669
MICHAEL O'ROURKE



Residential Foundation Thermal Load Calculator

Supplemental tool for CAN/CSA-F280

Weather Station Description		
Province:	Ontario	
Region:	Richmond Hill	
Site Description		
Soil Conductivity:	Normal conductivity: dry sand, loam, clay	
Water Table:	Normal (7-10 m, 23-33 ft)	
Foundation Dimensions		
Floor Length (m):	14.0	
Floor Width (m):	11.9	
Exposed Perimeter (m):	0.0	
Wall Height (m):	2.7	
Depth Below Grade (m):	1.83	
Window Area (m ²):	1.9	
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):		1685

TYPE: 4504 FLANKAGE
LO# 87516

OPT. GROUND

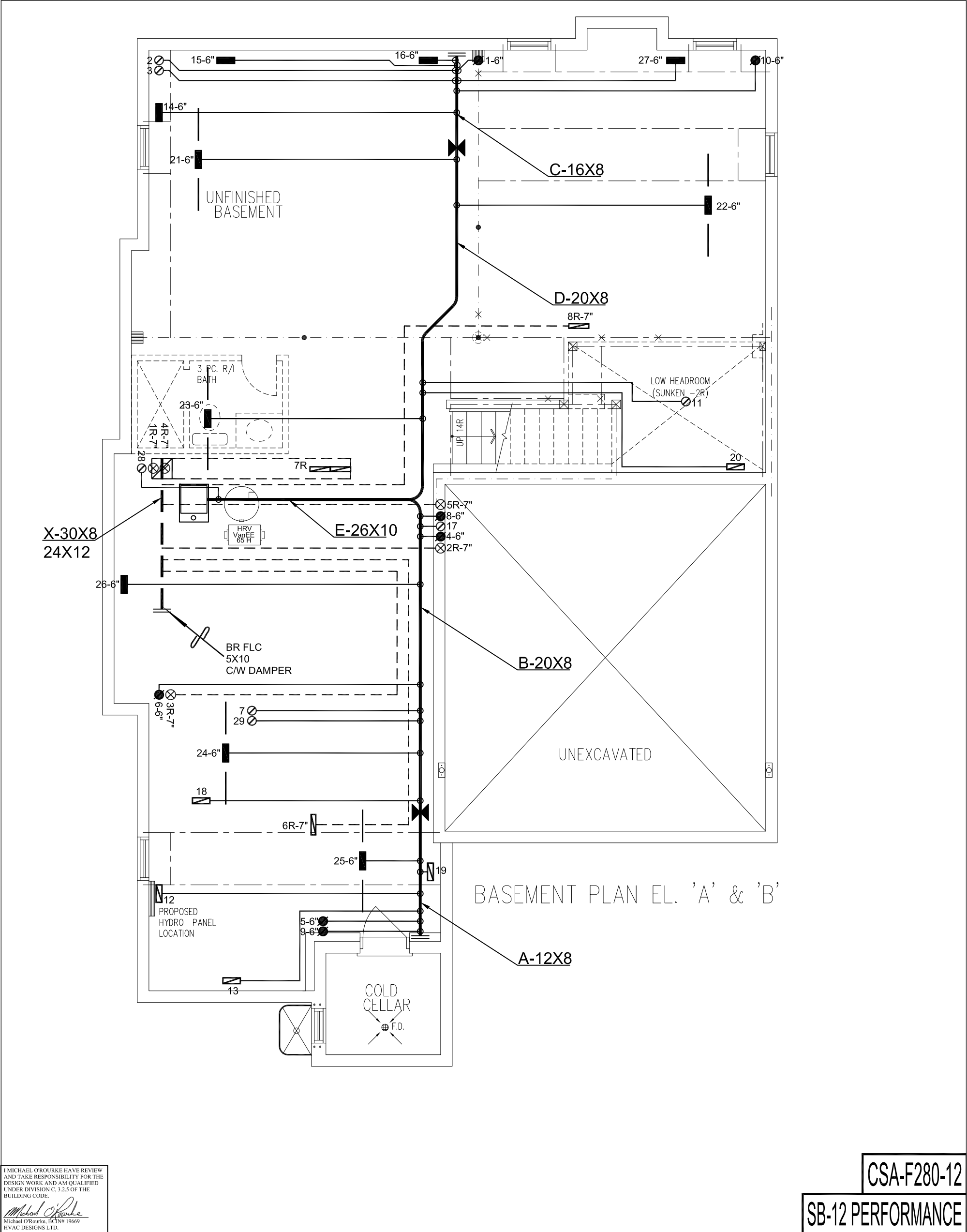
Air Infiltration Residential Load Calculator

Supplemental tool for CAN/CSA-F280

Weather Station Description				
Province:	Ontario			
Region:	Richmond Hill			
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):	6.40			
Building Configuration				
Type:	Detached			
Number of Stories:	Two			
Foundation:	Full			
House Volume (m ³):	1215.6			
Air Leakage/Ventilation				
Air Tightness Type:	Energy Star Detached (2.5 ACH)			
Custom BDT Data:	ELA @ 10 Pa.		1134.7 cm ²	
	2.50		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):	0.219			
Cooling Air Leakage Rate (ACH/H):	0.068			

TYPE: 4504 FLANKAGE
LO# 87516

OPT. GROUND



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.

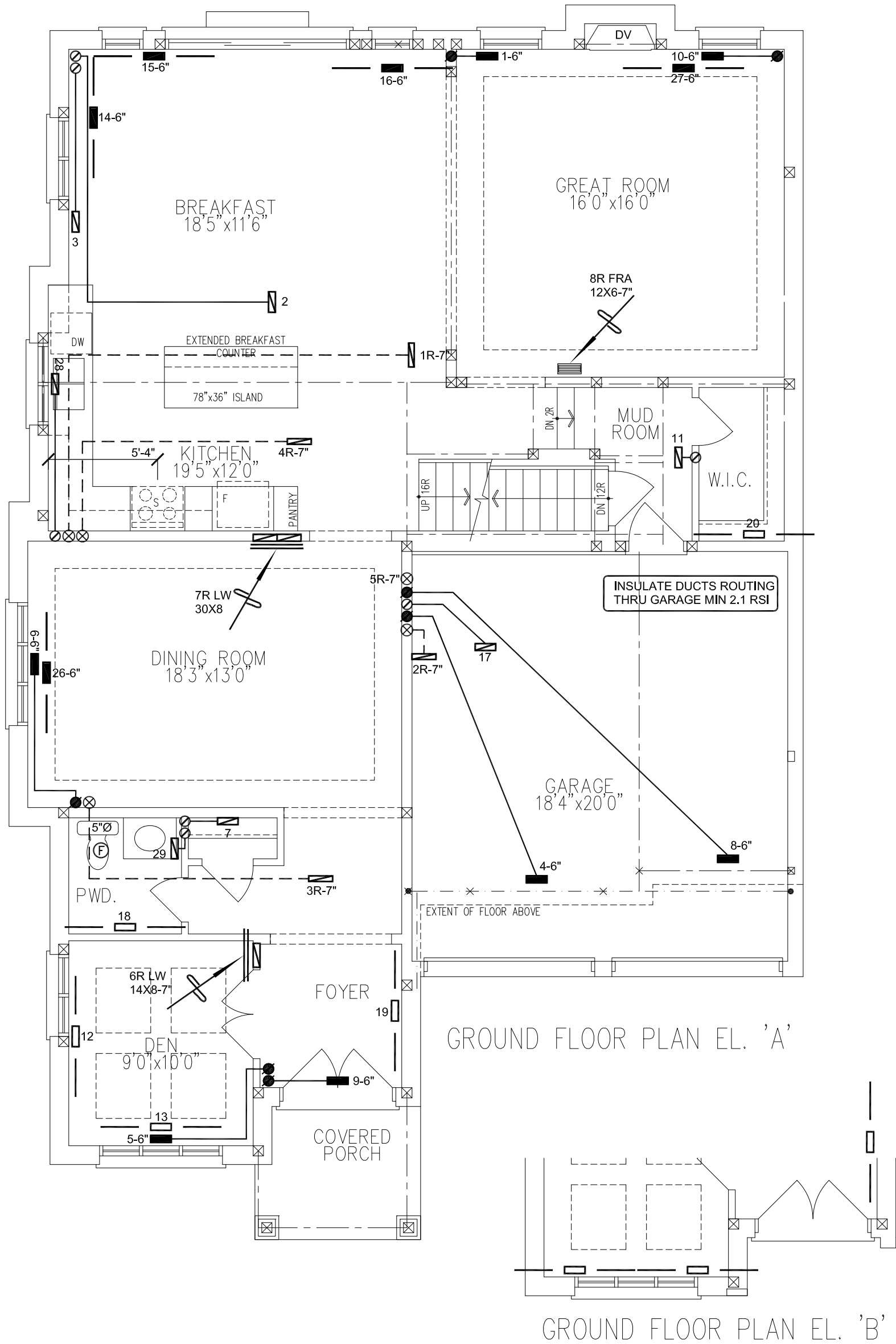
CSA-F280-12

SB-12 PERFORMANCE

HVAC LEGEND								3.	REVISED AS PER CAD	JUNE/2021
SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	2.	REVISED AS PER ARCHITECTURALS	APR/2021
	SUPPLY AIR GRILLE		6" SUPPLY AIR BOOT ABOVE		14"x8" RETURN AIR GRILLE		RETURN AIR STACK ABOVE	1.	REVISED TO PERFORMANCE	SEPT/2020
	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		

ALL DRAWINGS, CALCULATIONS AND SPECIFICATIONS ARE THE PROPERTY OF HVAC DESIGNS LTD.© AND MAY NOT BE REPRODUCED, MODIFIED OR ALTERED WITHOUT EXPRESSED WRITTEN CONSENT. THE DRAWINGS ARE DATED AND USE OF THESE DRAWINGS AFTER ONE YEAR FROM THE DATED NOTED IS NOT AUTHORIZED. CONTRACTOR SHALL CHECK ALL CONDITIONS BEFORE PROCEEDING WITH WORK. LATEST MUNICIPAL APPROVED DRAWINGS ONLY TO BE USED DURING INSTALLATION OF HEATING SYSTEM. HVAC DESIGNS LTD. IS NOT LIABLE FOR ANY CLAIMS ARISING FROM UNAUTHORIZED USE OF THE DRAWINGS OR FROM ANY CHANGES TO ACCEPTED STANDARDS AND/OR THE ONTARIO BUILDING CODE.

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	HEAT LOSS 51642 BTU/H UNIT DATA		# OF RUNS S/A R/A FANS				Sheet Title	
ROYAL PINE HOMES			MAKE CARRIER		3RD FLOOR				BASEMENT HEATING LAYOUT	
Project Name CENTREFIELD (WEST GORMLEY) RICHMOND HILL, ONTARIO			MODEL 59SP5A-80-16		2ND FLOOR	14	5	5		
			INPUT 60 MBTU/H		1ST FLOOR	10	3	2		
OPT. GROUND 4504 FLANKAGE 3309 sqft			OUTPUT 58 MBTU/H		BASEMENT	5	1	0	Date	SEPT/2020
		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				Scale	3/16" = 1'-0"	
		FAN SPEED 1370 cfm @ 0.6" w.c.						BCIN# 19669		
								LO#	87516	



GROUND FLOOR PLAN EL. 'A'

GROUND FLOOR PLAN EL. 'B'

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.

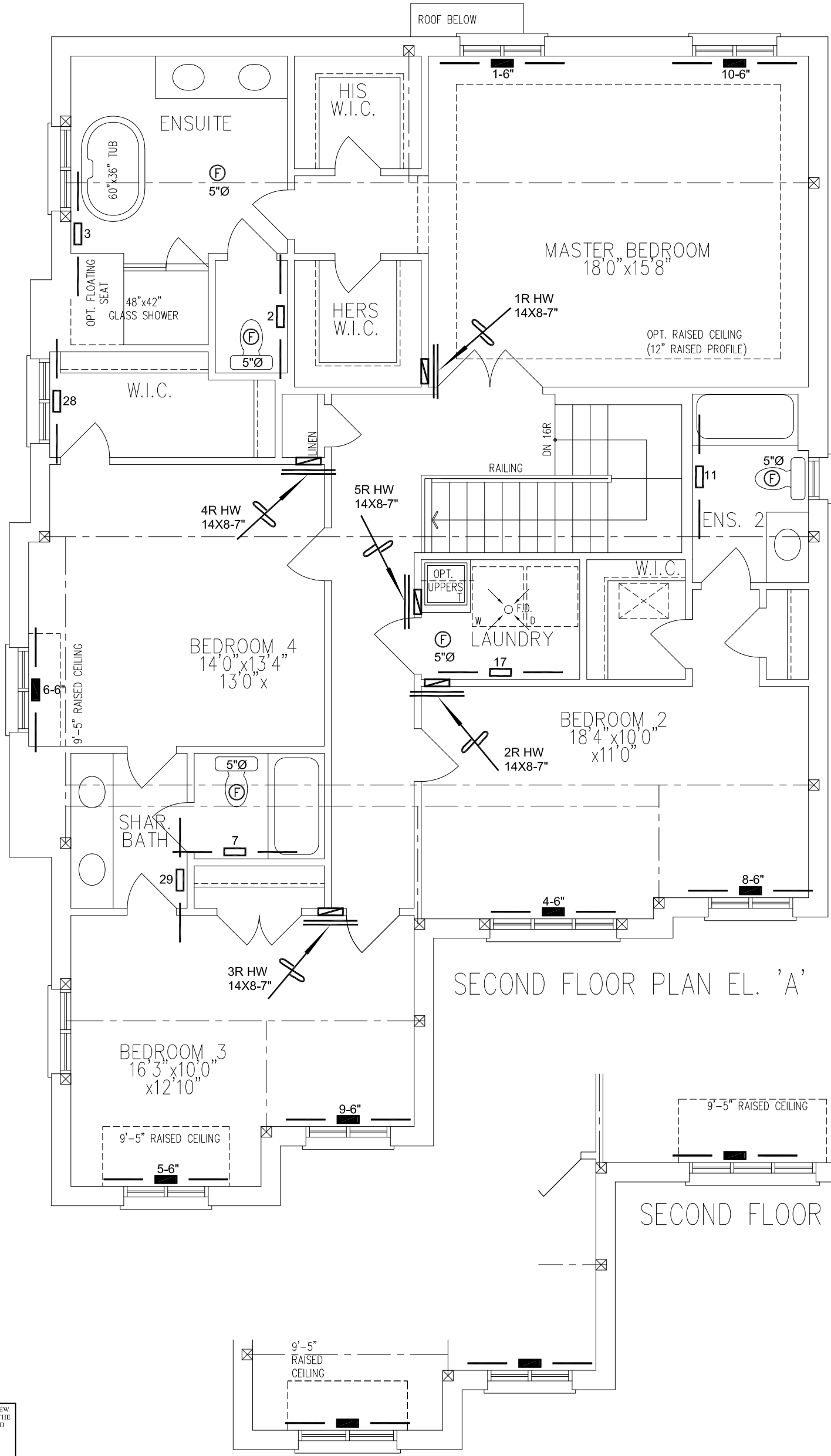
CSA-F280-12

SB-12 PERFORMANCE

HVAC LEGEND								3.	REVISED AS PER CAD	JUNE/2021
SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	2.	REVISED AS PER ARCHITECTURALS	APR/2021
	SUPPLY AIR GRILLE		6" SUPPLY AIR BOOT ABOVE		14"x8" RETURN AIR GRILLE		RETURN AIR STACK ABOVE	1.	REVISED TO PERFORMANCE	SEPT/2020
	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.	Sheet Title	
ROYAL PINE HOMES			FIRST FLOOR HEATING LAYOUT	
Project Name			Date	SEPT/2020
CENTREFIELD (WEST GORMLEY) RICHMOND HILL, ONTARIO			Scale	3/16" = 1'-0"
OPT. GROUND 4504 FLANKAGE 3309 sqft			BCIN# 19669	
			LO#	87516



SECOND FLOOR PLAN EL. 'A'

SECOND FLOOR PLAN EL. 'B'

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

SB-12 PERFORMANCE

HVAC LEGEND								3.	REVISED AS PER CAD	JUNE/2021
SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	2.	REVISED AS PER ARCHITECTURALS	APR/2021
	SUPPLY AIR GRILLE		6" SUPPLY AIR BOOT ABOVE		14"x8" RETURN AIR GRILLE		RETURN AIR STACK ABOVE	1.	REVISED TO PERFORMANCE	SEPT/2020
	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	Sheet Title		SECOND FLOOR HEATING LAYOUT	
Project Name			Date	SEPT/2020		
CENTREFIELD (WEST GORMLEY) RICHMOND HILL, ONTARIO		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.	Scale	3/16" = 1'-0"		
OPT. GROUND 4504 FLANKAGE 3309 sqft			BCIN# 19669			
			LO#	87516		

Schedule 1: Designer Information

Use one form for each individual who reviews and takes responsibility for design activities with respect to the project.

A. Project Information			
Building number, street name		Unit no.	Lot/con.
Municipality RICHMOND HILL	Postal code	Plan number/ other description	
B. Individual who reviews and takes responsibility for design activities			
Name MICHAEL O'ROURKE		Firm HVAC DESIGNS LTD.	
Street address 375 FINLEY AVE		Unit no. 202	Lot/con. N/A
Municipality AJAX	Postal code L1S 2E2	Province ONTARIO	E-mail info@hvacdesigns.ca
Telephone number (905) 619-2300	Fax number (905) 619-2375	Cell number ()	
C. Design activities undertaken by individual identified in Section B. [Building Code Table 3.5.2.1 OF Division C]			
☐ House ☐ Small Buildings ☐ Large Buildings ☐ Complex Buildings ☒ HVAC – House ☐ Building Services ☐ Detection, Lighting and Power ☐ Fire Protection ☐ Building Structural ☐ Plumbing – House ☐ Plumbing – All Buildings ☐ On-site Sewage Systems			
Description of designer's work HEAT LOSS / GAIN CALCULATIONS DUCT SIZING RESIDENTIAL MECHANICAL VENTILATION DESIGN SUMMARY RESIDENTIAL SYSTEM DESIGN per CSA-F280-12		Model: 4504 FLANKAGE OPT. IN LAW Project: CENTREFIELD (WEST GORMLEY)	
D. Declaration of Designer			
I, <u>MICHAEL O'ROURKE</u> declare that (choose one as appropriate): (print name)			
☐ I review and take responsibility for the design work on behalf of a firm registered under subsection 3.2.4. of Division C, of the Building Code. I am qualified, and the firm is registered, in the appropriate classes/categories. Individual BCIN: _____ Firm BCIN: _____			
☒ I review and take responsibility for the design and am qualified in the appropriate category as an "other designer" under subsection 3.2.5. of Division C, of the Building Code. Individual BCIN: <u>19669</u> Basis for exemption from registration and qualification: <u>O.B.C SENTENCE 3.2.4.1 (4)</u>			
☐ The design work is exempt from the registration and qualification requirements of the Building Code. Basis for exemption from registration and qualification: _____			
I certify that:			
1. The information contained in this schedule is true to the best of my knowledge. 2. I have submitted this application with the knowledge and consent of the firm.			
June 7, 2021			
Date		Signature of Designer	

NOTE:

- For the purposes of this form, "individual" means the "person" referred to in Clause 3.2.4.7(1) d) of Division C, Article 3.2.5.1. of Division C, and all other persons who are exempt from qualification under Subsections 3.2.4. and 3.2.5. of Division C.
- Schedule 1 is not required to be completed by a holder of a license, temporary license, or a certificate of authorization, issued by the Ontario Association of Architects. Schedule 1 is also not required to be completed by a holder of a license to practise, a limited license to practise, or a certificate of authorization, issued by the Association of Professional Engineers of Ontario.

Application for a Permit Construct or Demolish – Effective January 1, 2015

SITE NAME: CENTREFIELD (WEST GORMLEY)						OPT. IN LAW				DATE: Jun-21				WINTER NATURAL AIR CHANGE RATE 0.219				HEAT LOSS ΔT °F. 78				CSA-F280-12																			
BUILDER: ROYAL PINE HOMES						TYPE: 4504 FLANKAGE				GFA: 3309				LO# 87517				SUMMER NATURAL AIR CHANGE RATE 0.068				HEAT GAIN ΔT °F. 13				SB-12 PERFORMANCE															
ROOM USE			MBR			ENS			BED-2			BED-3			BED-4			BATH						WIC-4			ENS-2			IL-ENS											
EXP. WALL			42			27			35			45			15			9						5			9			6											
CLG. HT.			8			8			8			8			8			8						8			8			10											
FACTORS																																									
GRS.WALL AREA			LOSS			GAIN			336			216			280			360			120			72			40			72			60								
GLAZING			LOSS			GAIN			LOSS			GAIN			LOSS			GAIN			LOSS			GAIN			LOSS			GAIN			LOSS			GAIN					
NORTH			21.8	16.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	7	152	112	9	196	144							
EAST			21.8	41.6	0	0	0	0	0	0	0	0	54	1176	2244	49	1067	2036	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0							
SOUTH			21.8	24.9	0	0	0	0	19	414	473	0	0	0	0	19	414	473	24	523	598	0	0	0	0	0	0	19	414	473	0	0	0	0	0						
WEST			21.8	41.6	36	784	1496	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.			35.8	101.2	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			25.8	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							
NET EXPOSED WALL			4.2	0.7	300	1262	208	197	828	136	226	950	156	292	1228	202	96	404	66	72	303	50	21	88	15	65	273	45	51	214	35										
NET EXPOSED BSMT WALL ABOVE GR			3.7	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							
EXPOSED CLG			1.3	0.6	428	562	252	180	237	106	280	368	165	280	368	165	289	380	170	90	118	53	58	76	34	102	134	60	0	0	0	0	0	0							
NO ATTIC EXPOSED CLG			2.8	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	0	0							
EXPOSED FLOOR			2.6	0.4	0	0	0	0	0	0	280	731	120	0	0	0	0	0	0	0	0	0	0	0	0	5	13	2	0	0	0	0	0	0							
BASEMENT/CRAWL HEAT LOSS						0			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			0					
SUBTOTAL HT LOSS						2608			1479			3226			3077			1306			421			578			573			411											
SUB TOTAL HT GAIN						1955			715			2685			2876			834			103			522			219			179											
LEVEL FACTOR / MULTIPLIER			0.20			0.19			0.20			0.19			0.20			0.19			0.20			0.19			0.20			0.19			0.30			0.27					
AIR CHANGE HEAT LOSS						505			286			624			596			253			81			112			111			112											
AIR CHANGE HEAT GAIN						88			32			121			130			38			5			24			10			8											
DUCT LOSS						0			0			385			0			0			0			0			68			0											
DUCT GAIN						0			0			366			0			0			0			0			23			0											
HEAT GAIN PEOPLE			240			2			480			0			1			240			1			240			0			0			0			0			0		
HEAT GAIN APPLIANCES/LIGHTS									610			0			610			610			610			0			0			0			0			0			0		
TOTAL HT LOSS BTU/H						3113			1765			4235			3673			1559			503			690			752			522											
TOTAL HT GAIN x 1.3 BTU/H						4074			972			5229			5013			2238			140			709			327			243											

ROOM USE			LIV		DIN		KT/GT		INLAW		LAUN		W/R		FOY		MUD								BAS		
EXP. WALL			25		28		64		23		0		6		23		16								170		
CLG. HT.			10		10		10		10		8		10		10		11								9		
FACTORS																											
GRS.WALL AREA	LOSS	GAIN	250		280		640		230		0		60		230		176								1020		
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	
NORTH	21.8	16.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	87	64		
EAST	21.8	41.6	37	806	1537	0	0	0	0	0	0	0	0	0	6	131	249	0	0	0	0	0	0	0	0	0	
SOUTH	21.8	24.9	23	501	573	34	741	847	41	893	1021	0	0	0	9	196	224	0	0	0	0	8	174	199			
WEST	21.8	41.6	0	0	0	0	0	0	103	2244	4280	23	501	956	0	0	0	0	0	0	0	8	174	332			
SKYLT.	35.8	101.2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
DOORS	25.8	4.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	40	1034	170	20	517	85				
NET EXPOSED WALL	4.2	0.7	190	799	131	246	1035	170	496	2086	343	207	871	143	0	0	0	51	214	35	184	774	127	156	656	108	
NET EXPOSED BSMT WALL ABOVE GR	3.7	0.6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	510	1879	309			
EXPOSED CLG	1.3	0.6	0	0	0	0	0	0	0	0	0	0	0	0	106	139	62	0	0	0	0	0	0	0	0		
NO ATTIC EXPOSED CLG	2.8	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		
EXPOSED FLOOR	2.6	0.4	0	0	0	0	0	0	0	0	0	38	99	16	0	0	0	0	0	0	0	0	0	0	0		
BASEMENT/CRAWL HEAT LOSS																											
SLAB ON GRADE HEAT LOSS																											
SUBTOTAL HT LOSS					2106			1775			5223			1372			239			411			1938			8583	
SUB TOTAL HT GAIN						2242			1017			5644			1099			79		259			547			193	
LEVEL FACTOR / MULTIPLIER			0.30	0.27		0.30	0.27		0.30	0.27		0.30	0.27		0.20	0.19		0.30	0.27		0.30	0.27		0.50	0.76		
AIR CHANGE HEAT LOSS					573			483			1422			373			46			112			528			6536	
AIR CHANGE HEAT GAIN						101			46			255			50			4		12			25			9	
DUCT LOSS					0			0			0			0			28			0			0			0	
DUCT GAIN					0			0			0			69			0			0			0			0	
HEAT GAIN PEOPLE	240		0		0		0	0	0	1	240	0		0	0		0	0	0	0	0	0	0	0	0	0	
HEAT GAIN APPLIANCES/LIGHTS					610			610			610			610			610			0			610			0	
TOTAL HT LOSS BTU/H					2679			2258			6644			1745			313			522			2466			15119	
TOTAL HT GAIN x 1.3 BTU/H						3839			2175			8462			2598			990		352			743			1056	
																										1345	

TOTAL HEAT GAIN BTU/H: 40832 TONS: 3.40 LOSS DUE TO VENTILATION LOAD BTU/H: 2004 STRUCTURAL HEAT LOSS: 50052 TOTAL COMBINED HEAT LOSS BTU/H: 52056

SITE NAME: CENTREFIELD (WEST GORMLEY)
BUILDER: ROYAL PINE HOMES

OPT. IN LAW
TYPE: 4504 FLANKAGE

DATE: Jun-21

GFA: 3309 LO# 87517

HEATING CFM 1370 COOLING CFM 1370
TOTAL HEAT LOSS 50,052 TOTAL HEAT GAIN 40,503
AIR FLOW RATE CFM 27.37 AIR FLOW RATE CFM 33.82

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

****CARRIER**
59TN6A-060-14V
FAN SPEED 60

AFUE = 97 %
INPUT (BTU/H) = 60,000
OUTPUT (BTU/H) = **58,000**

RUN COUNT	4th	3rd	2nd	1st	Bas
S/A	0	0	14	11	5
R/A	0	0	5	3	1

plenium 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

LOW 820
MEDLOW 0
MEDIUM 1370
MEDIUM HIGH 0
HIGH 1520

DESIGN CFM = **1370**
CFM @ .6" E.S.P.

TEMPERATURE RISE 39 °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	ENS	BED-2	BED-3	BED-4	BATH	BED-2	BED-3	MBR	ENS-2	LIV	LIV	KT/GT	KT/GT	KT/GT	LAUN	W/R	FOY	MUD	BAS	BAS	BAS	BAS
RM LOSS MBH.	1.56	0.88	0.88	2.12	1.84	1.56	0.25	2.12	1.84	1.56	0.75	1.34	1.34	2.21	2.21	2.21	0.31	0.52	2.47	1.49	3.02	3.02	3.02	3.02
CFM PER RUN HEAT	43	24	24	58	50	43	7	58	50	43	21	37	37	61	61	61	9	14	67	41	83	83	83	83
RM GAIN MBH.	2.04	0.49	0.49	2.61	2.51	2.24	0.07	2.61	2.51	2.04	0.33	1.92	1.92	2.82	2.82	2.82	0.99	0.35	0.74	1.06	0.27	0.27	0.27	0.27
CFM PER RUN COOLING	69	16	16	88	85	76	2	88	85	69	11	65	65	95	95	95	33	12	25	36	9	9	9	9
ADJUSTED PRESSURE	0.17	0.17	0.17	0.16	0.16	0.17	0.17	0.16	0.16	0.17	0.17	0.17	0.17	0.16	0.16	0.16	0.17	0.17	0.17	0.17	0.16	0.16	0.16	0.16
ACTUAL DUCT LGH.	53	57	64	41	61	59	47	46	57	64	61	54	48	40	35	44	31	43	35	41	36	46	21	40
EQUIVALENT LENGTH	200	160	150	180	180	210	170	200	150	220	140	140	170	170	130	160	190	120	160	160	90	100	130	110
TOTAL EFFECTIVE LENGTH	253	217	214	221	241	269	217	246	207	284	201	194	218	210	165	204	221	163	195	201	126	146	151	150
ADJUSTED PRESSURE	0.07	0.08	0.08	0.07	0.07	0.06	0.08	0.07	0.08	0.06	0.09	0.09	0.08	0.08	0.1	0.08	0.08	0.11	0.09	0.09	0.13	0.11	0.11	0.11
ROUND DUCT SIZE	6	4	4	6	6	6	4	6	6	6	4	5	5	6	6	6	4	4	5	4	6	6	6	6
HEATING VELOCITY (ft/min)	219	275	275	296	255	219	80	296	255	219	241	272	272	311	311	311	103	161	492	470	423	423	423	423
COOLING VELOCITY (ft/min)	352	184	184	449	433	388	23	449	433	352	126	477	477	484	484	484	379	138	184	413	46	46	46	46
OUTLET GRILL SIZE	4X10	3X10	3X10	4X10	4X10	4X10	3X10	4X10	4X10	4X10	3X10	3X10	3X10	4X10	4X10	4X10	3X10	3X10	3X10	3X10	4X10	4X10	4X10	4X10
TRUNK	C	C	C	B	A	B	B	B	A	C	D	A	A	C	C	C	B	B	A	D	D	D	D	B

RUN #	25	26	27	28	29	30
ROOM NAME	BAS	DIN	INLAW	WIC-4	BATH	IL-ENS
RM LOSS MBH.	3.02	2.26	1.74	0.69	0.25	0.52
CFM PER RUN HEAT	83	62	48	19	7	14
RM GAIN MBH.	0.27	2.17	2.60	0.71	0.07	0.24
CFM PER RUN COOLING	9	74	88	24	2	8
ADJUSTED PRESSURE	0.16	0.17	0.16	0.17	0.17	0.17
ACTUAL DUCT LGH.	39	33	43	26	47	45
EQUIVALENT LENGTH	150	140	210	140	150	110
TOTAL EFFECTIVE LENGTH	189	173	253	166	197	155
ADJUSTED PRESSURE	0.09	0.1	0.06	0.1	0.09	0.11
ROUND DUCT SIZE	6	6	6	4	4	4
HEATING VELOCITY (ft/min)	423	316	245	218	80	161
COOLING VELOCITY (ft/min)	46	377	449	275	23	92
OUTLET GRILL SIZE	4X10	4X10	4X10	3X10	3X10	3X10
TRUNK	A	B	C	E	B	D

SUPPLY AIR TRUNK SIZE

	TRUNK CFM	STATIC PRESS.	ROUND DUCT	RECT DUCT	VELOCITY (ft/min)
TRUNK A	324	0.07	9.5	12	x 8 486
TRUNK B	665	0.06	12.9	20	x 8 599
TRUNK C	365	0.06	10.3	16	x 8 411
TRUNK D	690	0.06	13.1	20	x 8 621
TRUNK E	1374	0.06	17	26	x 10 761
TRUNK F	0	0.00	0	0	x 8 0

RETURN AIR TRUNK SIZE

	TRUNK CFM	STATIC PRESS.	ROUND DUCT	RECT DUCT	VELOCITY (ft/min)
TRUNK O	0	0.05	0	0	x 8 0
TRUNK P	0	0.05	0	0	x 8 0
TRUNK Q	0	0.05	0	0	x 8 0
TRUNK R	0	0.05	0	0	x 8 0
TRUNK S	0	0.05	0	0	x 8 0
TRUNK T	0	0.05	0	0	x 8 0
TRUNK U	0	0.05	0	0	x 8 0
TRUNK V	0	0.05	0	0	x 8 0
TRUNK W	0	0.05	0	0	x 8 0
TRUNK X	1005	0.05	15.8	30	x 8 603
TRUNK Y	0	0.05	0	0	x 8 0
TRUNK Z	0	0.05	0	0	x 8 0
DROP	1370	0.05	17.7	24	x 12 685

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	125	125	115	115	135	125	370	125	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.	53	47	73	45	42	48	23	57	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
EQUIVALENT LENGTH	215	175	255	255	135	215	260	175	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL EFFECTIVE LH	268	222	328	300	177	263	283	232	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
ADJUSTED PRESSURE	0.06	0.07	0.05	0.05	0.08	0.06	0.05	0.06	14.80	14.80	14.80	14.80	14.80	14.80	14.80	14.80	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05
ROUND DUCT SIZE	6.9	6.7	7	7	6.6	6.9	10.9	6.9	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	8	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	14	14	14	14	14	30	14	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

TYPE: 4504 FLANKAGE
SITE NAME: CENTREFIELD (WEST GORMLEY)

LO # 87517
OPT. IN LAW

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>4</u> @ 10.6 cfm	<u>42.4</u> cfm
Kitchen & Bathrooms	<u>6</u> @ 10.6 cfm	<u>63.6</u> cfm
Other Rooms	<u>6</u> @ 10.6 cfm	<u>63.6</u> cfm
Table 9.32.3.A.	TOTAL	<u>212.0</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		<u>95.4</u> cfm

SUPPLEMENTAL VENTILATION CAPACITY		9.32.3.5.
Total Ventilation Capacity	<u>212</u>	cfm
Less Principal Ventil. Capacity	<u>95.4</u>	cfm
Required Supplemental Capacity	<u>116.6</u>	cfm

PRINCIPAL EXHAUST FAN CAPACITY	
Model:	VANEE 65H
Location:	BSMT
<u>95.4</u> cfm	☒ HVI Approved

PRINCIPAL EXHAUST HEAT LOSS CALCULATION				
CFM	ΔT °F	FACTOR	% LOSS	
95.4 CFM	X 78 F	X 1.08	X	0.25

SUPPLEMENTAL FANS		BY INSTALLING CONTRACTOR		
Location	Model	cfm	HVI	Sones
ENS	BY INSTALLING CONTRACTOR	50	☒	3.5
BATH	BY INSTALLING CONTRACTOR	50	☒	3.5
ENS-2	BY INSTALLING CONTRACTOR	50	☒	3.5
W/R	BY INSTALLING CONTRACTOR	50	☒	3.5

HEAT RECOVERY VENTILATOR		9.32.3.11.
Model:	VANEE 65H	
<u>155</u> cfm high	<u>64</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:	
ROYAL PINE 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:	June-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#: 87517	Model: 4504 FLANKAGE	Builder: ROYAL PINE HOMES	Date: 6/7/2021																																																									
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>1496</td> <td>9</td> <td>13464</td> </tr> <tr> <td>First</td> <td>1496</td> <td>10</td> <td>14960</td> </tr> <tr> <td>Second</td> <td>1813</td> <td>8</td> <td>14504</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="2" style="text-align: right;">Total:</td> <td></td> <td>42,928.0 ft³</td> </tr> <tr> <td colspan="2" style="text-align: right;">Total:</td> <td></td> <td>1215.6 m³</td> </tr> </tbody> </table>			Level	Floor Area (ft²)	Floor Height (ft)	Volume (ft³)	Bsmt	1496	9	13464	First	1496	10	14960	Second	1813	8	14504	Third	0	9	0	Fourth	0	9	0	Total:			42,928.0 ft³	Total:			1215.6 m³	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 80%;">WINTER NATURAL AIR CHANGE RATE</td> <td style="width: 20%; text-align: center;">0.219</td> </tr> <tr> <td>SUMMER NATURAL AIR CHANGE RATE</td> <td style="text-align: center;">0.068</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>Tin °C</th> <th>Tout °C</th> <th>ΔT °C</th> <th>ΔT °F</th> </tr> <tr> <td>Winter DTDh</td> <td style="text-align: center;">22</td> <td style="text-align: center;">-21</td> <td style="text-align: center;">43</td> <td style="text-align: center;">78</td> </tr> <tr> <td>Summer DTDc</td> <td style="text-align: center;">24</td> <td style="text-align: center;">31</td> <td style="text-align: center;">7</td> <td style="text-align: center;">13</td> </tr> </table>		WINTER NATURAL AIR CHANGE RATE	0.219	SUMMER NATURAL AIR CHANGE RATE	0.068	Design Temperature Difference						Tin °C	Tout °C	ΔT °C	ΔT °F	Winter DTDh	22	-21	43	78	Summer DTDc	24	31	7	13
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5.2.3.1 Heat Loss due to Air Leakage			6.2.6 Sensible Gain due to Air Leakage																																																									
$HL_{airb} = LR_{airh} \times \frac{V_b}{3.6} \times DTD_h \times 1.2$ 0.219 x 337.66 x 43 °C x 1.2 = 3831 W = 13072 Btu/h			$HG_{salb} = LR_{airc} \times \frac{V_b}{3.6} \times DTD_c \times 1.2$ = 0.068 x 337.66 x 7 °C x 1.2 = 196 W = 670 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 78 °F x 1.08 x 0.25 = 2004 Btu/h			$HL_{vairb} = PVC \times DTD_h \times 1.08 \times (1 - E)$ 95 CFM x 13 °F x 1.08 x 0.25 = 330 Btu/h																																																									
5.2.3.3 Calculation of Air Change Heat Loss for Each Room (Floor Multiplier Section)																																																												
$HL_{airr} = Level\ Factor \times HL_{airbv} \times \{(HL_{agcr} + HL_{bgcr}) \div (HL_{agclevel} + HL_{bgclevel})\}$																																																												
Level	Level Factor (LF)	HLairve Air Leakage + Ventilation Heat Loss (Btu/h)	Level Conductive Heat Loss: (HL _{clevel})	Air Leakage Heat Loss Multiplier (LF x HLairbv / HLlevel)																																																								
1	0.5	13,072	8,583	0.762																																																								
2	0.3		14,408	0.272																																																								
3	0.2		13,508	0.194																																																								
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 HLairve = 0																																																												

HEAT LOSS AND GAIN SUMMARY SHEET

MODEL: 4504 FLANKAGE	OPT. IN LAW	BUILDER: ROYAL PINE HOMES
SFQT: 3309	LO# 87517	SITE: CENTREFIELD (WEST GORMLEY)

DESIGN ASSUMPTIONS

HEATING	°F	COOLING	°F
OUTDOOR DESIGN TEMP.	-6	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:	2.50	ASSUMED (Y/N):	Y
AIR TIGHTNESS CATEGORY:	TIGHT	ASSUMED (Y/N):	Y
WIND EXPOSURE:	SHELTERED	ASSUMED (Y/N):	Y
HOUSE VOLUME (ft ³):	42928.0	ASSUMED (Y/N):	Y
INTERNAL SHADING:	BLINDS/CURTAINS	ASSUMED OCCUPANTS:	6
INTERIOR LIGHTING LOAD (Btu/h/ft ²):	1.27	DC BRUSHLESS MOTOR (Y/N):	Y
FOUNDATION CONFIGURATION	BCIN_1	DEPTH BELOW GRADE:	6.0 ft
LENGTH: 46.0 ft	WIDTH: 39.0 ft	EXPOSED PERIMETER:	170.0 ft

2012 OBC - COMPLIANCE PACKAGE

Component	Compliance Package SB-12 PERFORMANCE	
	Nominal	Min. Eff.
Ceiling with Attic Space Minimum RSI (R)-Value	60	59.20
Ceiling Without Attic Space Minimum RSI (R)-Value	31	27.70
Exposed Floor Minimum RSI (R)-Value	31	29.80
Walls Above Grade Minimum RSI (R)-Value	22+1.5	18.50
Basement Walls Minimum RSI (R)-Value	20	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	1.6	-
Skylights Maximum U-Value	2.6	-
Space Heating Equipment Minimum AFUE	0.96	-
HRV Minimum Efficiency	75%	-
Domestic Hot Water Heater Minimum EF	TE=94%	-

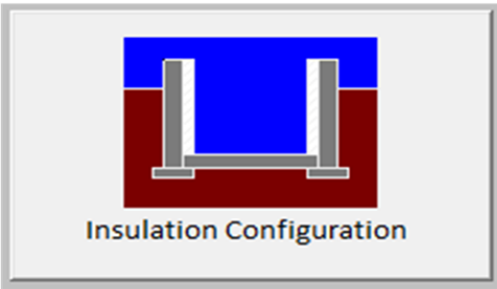
INDIVIDUAL BCIN: 19669

MICHAEL O'ROURKE



Residential Foundation Thermal Load Calculator

Supplemental tool for CAN/CSA-F280

Weather Station Description		
Province:	Ontario	
Region:	Richmond Hill	
Site Description		
Soil Conductivity:	Normal conductivity: dry sand, loam, clay	
Water Table:	Normal (7-10 m, 23-33 ft)	
Foundation Dimensions		
Floor Length (m):	14.0	 Insulation Configuration
Floor Width (m):	11.9	
Exposed Perimeter (m):	0.0	
Wall Height (m):	2.7	
Depth Below Grade (m):	1.83	
Window Area (m ²):	1.9	
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):		1685

TYPE: 4504 FLANKAGE
LO# 87517

OPT. IN LAW

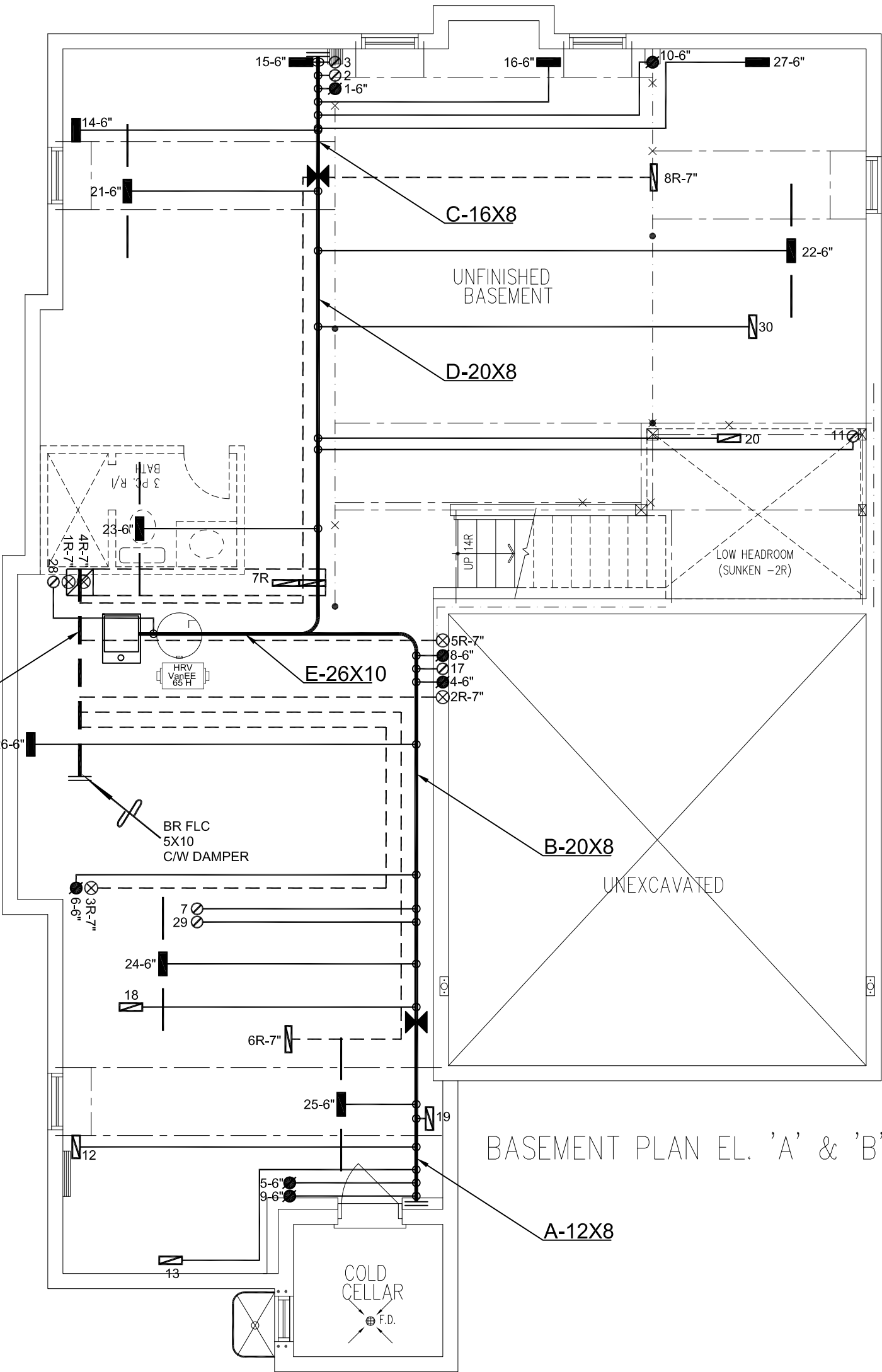
Air Infiltration Residential Load Calculator

Supplemental tool for CAN/CSA-F280

Weather Station Description				
Province:	Ontario			
Region:	Richmond Hill			
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):	6.40			
Building Configuration				
Type:	Detached			
Number of Stories:	Two			
Foundation:	Full			
House Volume (m ³):	1215.6			
Air Leakage/Ventilation				
Air Tightness Type:	Energy Star Detached (2.5 ACH)			
Custom BDT Data:	ELA @ 10 Pa.	1134.7 cm ²		
	2.50	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):	0.219			
Cooling Air Leakage Rate (ACH/H):	0.068			

TYPE: 4504 FLANKAGE
LO# 87517

OPT. IN LAW



BASEMENT PLAN EL. 'A' & 'B'

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
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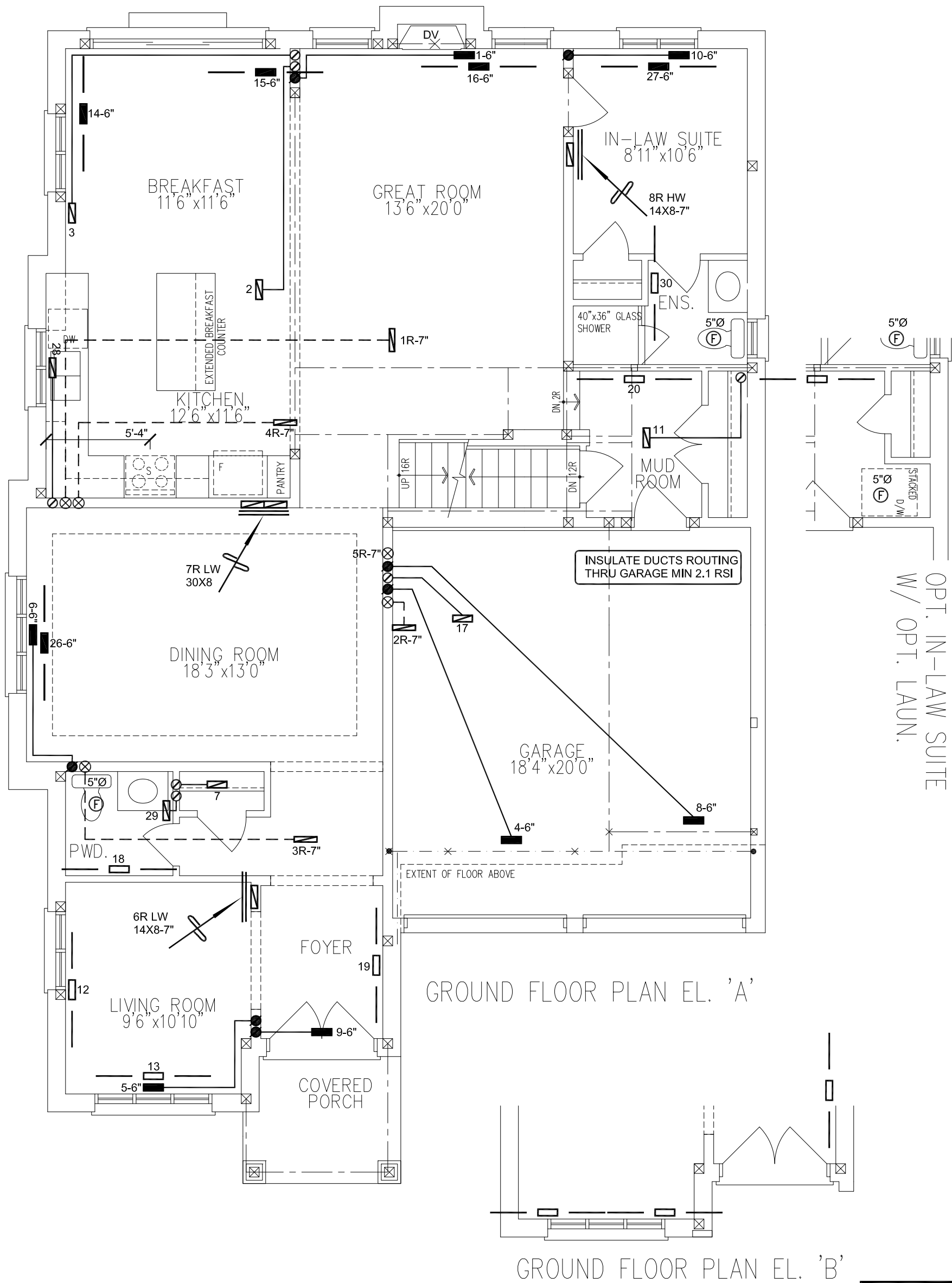
CSA-F280-12

SB-12 PERFORMANCE

HVAC LEGEND								3.	REVISED AS PER CAD	JUNE/2021
SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	2.	REVISED AS PER ARCHITECTURALS	APR/2021
	SUPPLY AIR GRILLE		6" SUPPLY AIR BOOT ABOVE		14"x8" RETURN AIR GRILLE		RETURN AIR STACK ABOVE	1.	REVISED TO PERFORMANCE	SEPT/2020
	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	HVACDESIGNS 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		HEAT LOSS 52056 BTU/H		# OF RUNS S/A R/A FANS			Sheet Title	
ROYAL PINE HOMES			UNIT DATA	3RD FLOOR				BASEMENT HEATING LAYOUT	
Project Name	CENTREFIELD (WEST GORMLEY) RICHMOND HILL, ONTARIO	MAKE	CARRIER	2ND FLOOR	14	5	5		
		MODEL	59TN6A-060-14V	1ST FLOOR	11	3	2(3)		
OPT. IN LAW 4504 FLANKAGE 3309 sqft	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.	INPUT	60 MBTU/H	BASEMENT	5	1	0	Date	SEPT/2020
		OUTPUT	58 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					
		COOLING	3,5 TONS						
		FAN SPEED	1370 cfm @ 0.6" w.c.						
				BCIN# 19669				LO#	87517



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.

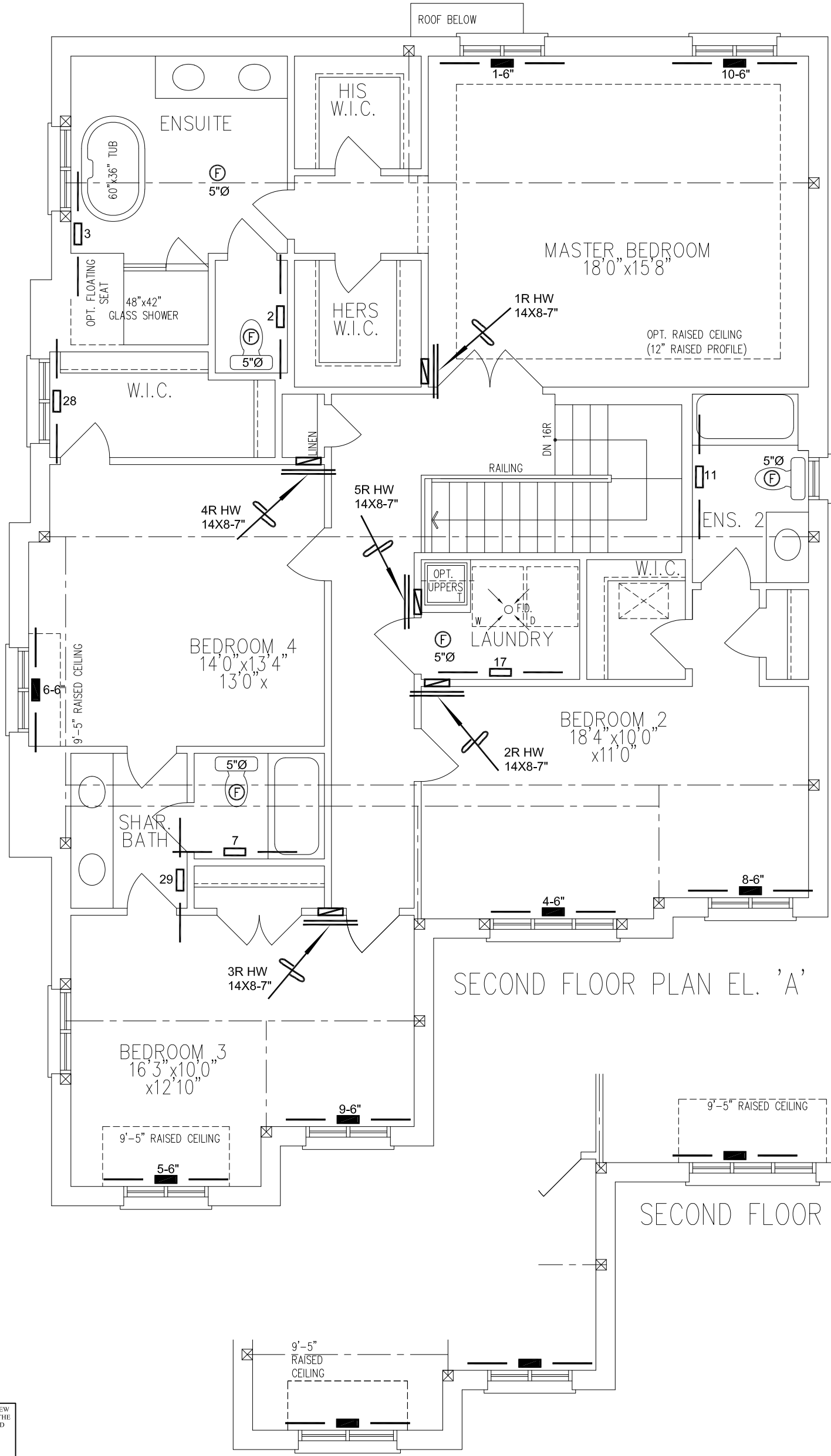
CSA-F280-12

SB-12 PERFORMANCE

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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.	Sheet Title	
ROYAL PINE HOMES			FIRST FLOOR HEATING LAYOUT	
Project Name CENTREFIELD (WEST GORMLEY) RICHMOND HILL, ONTARIO			Date	SEPT/2020
OPT. IN LAW 4504 FLANKAGE 3309 sqft			Scale	3/16" = 1'-0"
			BCIN# 19669	
			LO#	87517



SECOND FLOOR PLAN EL. 'A'

SECOND FLOOR PLAN EL. 'B'

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

CSA-F280-12

SB-12 PERFORMANCE

HVAC LEGEND						3.	REVISED AS PER CAD	JUNE/2021
SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	
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	SUPPLY AIR BOOT ABOVE		6" SUPPLY AIR STACK 2nd FLOOR		FRA- FLOOR RETURN AIR GRILLE		REDUCER	No.
						REVISIONS		
						Description		
						Date		

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ROYAL PINE HOMES			SECOND FLOOR HEATING LAYOUT	
Project Name			Date	SEPT/2020
CENTREFIELD (WEST GORMLEY) RICHMOND HILL, ONTARIO			Scale	3/16" = 1'-0"
OPT. IN LAW			BCIN# 19669	
4504 FLANKAGE 3309 sqft			LO#	87517