

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: 4505 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 4, 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: 4505				GFA: 3289				LO# 87519				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			ENS-2			MEDIA			BATH									
EXP. WALL			37			34			34			44			15			11			0			9									
CLG. HT.			9			8			8			9			8			8			8			8									
FACTORS																																	
GRS.WALL AREA			333			272			272			374			120			88			0			72									
GLAZING			LOSS GAIN			LOSS GAIN			LOSS GAIN			LOSS GAIN			LOSS GAIN			LOSS GAIN			LOSS GAIN			LOSS GAIN									
NORTH			21.8	15.6	0	0	0	24	523	375	0	0	0	0	0	0	0	0	0	7	152	109	0	0	0	0	0	0	0	0			
EAST			21.8	40.5	0	0	0	0	0	0	58	1263	2347	64	1394	2590	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
SOUTH			21.8	24.3	0	0	0	0	0	0	0	0	0	0	0	0	17	370	413	0	0	0	0	0	0	0	7	152	170				
WEST			21.8	40.5	35	762	1416	13	283	526	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	298	1253	206	235	988	163	214	900	148	310	1304	214	103	433	71	81	341	56	0	0	0	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	0			
EXPOSED CLG			1.3	0.6	390	513	229	264	347	155	241	317	142	245	322	144	320	421	188	72	95	42	98	129	58	117	154	69					
NO ATTIC EXPOSED CLG			2.8	1.3	0	0	0	0	0	0	24	67	30	90	253	113	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	265	692	114	42	110	18	0	0	0	48	125	21	98	256	42	0	0	0	0	0			
BASEMENT/CRAWL HEAT LOSS			0			0			0			0			0			0			0			0			0						
SLAB ON GRADE HEAT LOSS			0			0			0			0			0			0			0			0			0						
SUBTOTAL HT LOSS			2528			2141			3239			3382			1224			713			385			580									
SUB TOTAL HT GAIN			1852			1219			2781			3080			672			228			100			284									
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	0.20	0.18	0.20	0.18	0.20	0.18	0.20	0.18			
AIR CHANGE HEAT LOSS			460			390			590			616			223			130			70			105									
AIR CHANGE HEAT GAIN			93			61			140			155			34			12			5			14									
DUCT LOSS			0			0			383			400			0			84			45			0									
DUCT GAIN			0			0			376			408			0			24			71			0									
HEAT GAIN PEOPLE			240	2	480	0	0	1	240	1	240	1	240	1	240	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
HEAT GAIN APPLIANCES/LIGHTS			601			0			601			601			601			0			601			0									
TOTAL HT LOSS BTU/H			2988			2531			4212			4398			1447			927			500			685									
TOTAL HT GAIN x 1.3 BTU/H			3934			1664			5379			5828			2011			343			1009			388									

ROOM USE			LIV				K/B/G		DIN		LAUN		W/R		FOY										BAS			
EXP. WALL			35				72		23		28		7		24										188			
CLG. HT.			10				10		10		11		10		10										9			
FACTORS																												
GRS.WALL AREA	LOSS GAIN		354				727		232		311		71		242										1128			
GLAZING			LOSS GAIN				LOSS GAIN		LOSS GAIN		LOSS GAIN		LOSS GAIN		LOSS GAIN										LOSS GAIN			
NORTH	21.8	15.6	0	0	0		0	0	0	0	0	8	174	125	0	0	0	0	0	0					3	65	47	
EAST	21.8	40.5	37	806	1497		0	0	0	0	0	0	0	0	0	0	0	12	261	486					0	0	0	
SOUTH	21.8	24.3	0	0	0		0	0	0	31	675	753	0	0	0	9	196	219	0	0	0			7	152	170		
WEST	21.8	40.5	0	0	0		75	1634	3035	0	0	0	0	0	0	0	0	0	0	0	0			3	65	121		
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		
DOORS	25.8	4.3	0	0	0		20	517	85	0	0	0	20	517	85	0	0	0	30	775	128			20	517	85		
NET EXPOSED WALL	4.2	0.7	317	1331	219		632	2659	437	201	847	139	283	1189	196	62	259	43	200	843	139			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			564	2078	342		
EXPOSED CLG	1.3	0.6	0	0	0		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			0	0	0		
NO ATTIC EXPOSED CLG	2.8	1.3	0	0	0		10	28	13	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	0	0	0	0	0	0			0	0	0		
BASEMENT/CRAWL HEAT LOSS			0				0		0		0		0		0		0		0						6330			
SLAB ON GRADE HEAT LOSS			0				0		0		0		0		0		0		0									
SUBTOTAL HT LOSS			2137				4837		1522		1881		456		1880										9207			
SUB TOTAL HT GAIN					1716				3570		892		406		261		752								765			
LEVEL FACTOR / MULTIPLIER	0.30		0.30				0.30		0.30		0.30		0.30		0.30		0.30		0.30						0.50		0.70	
AIR CHANGE HEAT LOSS			651				1474		464		573		139		573										6458			
AIR CHANGE HEAT GAIN			87				180		45		20		13		38										39			
DUCT LOSS			0				0		0		0		0		0										0			
DUCT GAIN			0				0		0		0		0		0		0								0			
HEAT GAIN PEOPLE	240		0		0		0		0		0		0		0		0		0						0			
HEAT GAIN APPLIANCES/LIGHTS			601				601		601		601		601		0		0								601			
TOTAL HT LOSS BTU/H			2788				6312		1986		2454		594		2452										15665			
TOTAL HT GAIN x 1.3 BTU/H			3124				5656		1999		1335		357		1027										1826			

TOTAL HEAT GAIN BTU/H:

36153

TONS

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

TYPE: 4505

DATE: Jun-21

GFA: 3289

LO# 87519

HEATING CFM 1200 COOLING CFM 1200
TOTAL HEAT LOSS 49,940 TOTAL HEAT GAIN 35,878
AIR FLOW RATE CFM 24.03 AIR FLOW RATE CFM 33.45

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	12	8	4
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 1200
MEDIUM HIGH 0
HIGH 1520

DESIGN CFM = 1200
CFM @ .6" E.S.P.

TEMPERATURE RISE 45 °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	BED-2	BED-2	BED-3	BED-4	ENS-2	BED-3	MEDIA	MBR	BATH	LIV	K/B/G	K/B/G	K/B/G	DIN	LAUN	W/R	FOY	ENS	BAS	BAS	BAS	BAS
RM LOSS MBH.	1.49	1.27	2.11	2.11	2.20	1.45	0.93	2.20	0.50	1.49	0.69	2.79	2.10	2.10	2.10	1.99	2.45	0.59	2.45	1.27	3.92	3.92	3.92	3.92
CFM PER RUN HEAT	36	30	51	51	53	35	22	53	12	36	16	67	51	51	51	48	59	14	59	30	94	94	94	94
RM GAIN MBH.	1.97	0.83	2.69	2.69	2.91	2.01	0.34	2.91	1.01	1.97	0.39	3.12	1.89	1.89	1.89	2.00	1.33	0.36	1.03	0.83	0.46	0.46	0.46	0.46
CFM PER RUN COOLING	66	28	90	90	97	67	11	97	34	66	13	105	63	63	63	67	45	12	34	28	15	15	15	15
ADJUSTED PRESSURE	0.17	0.17	0.16	0.16	0.16	0.17	0.17	0.16	0.17	0.17	0.17	0.16	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.16	0.16	0.16	0.16
ACTUAL DUCT LGH.	32	58	58	51	49	29	37	47	39	49	27	31	28	39	51	6	43	17	36	46	45	26	8	27
EQUIVALENT LENGTH	150	150	130	120	180	130	140	170	140	150	140	90	130	130	100	140	120	150	100	160	110	120	150	110
TOTAL EFFECTIVE LENGTH	182	208	188	171	229	159	177	217	179	199	167	121	158	169	151	146	163	167	136	206	155	146	158	137
ADJUSTED PRESSURE	0.09	0.08	0.09	0.09	0.07	0.11	0.1	0.07	0.1	0.09	0.1	0.13	0.11	0.1	0.11	0.12	0.11	0.1	0.13	0.08	0.1	0.11	0.1	0.12
ROUND DUCT SIZE	5	5	6	6	6	6	4	6	4	5	4	6	5	5	5	6	5	4	5	4	6	6	6	6
HEATING VELOCITY (ft/min)	264	220	260	260	270	178	252	270	138	264	184	342	374	374	374	245	433	161	433	344	479	479	479	479
COOLING VELOCITY (ft/min)	485	206	459	459	495	342	126	495	390	485	149	535	463	463	463	342	330	138	250	321	76	76	76	76
OUTLET GRILL SIZE	3X10	3X10	4X10	4X10	4X10	4X10	3X10	4X10	3X10	3X10	3X10	4X10	3X10	3X10	3X10	4X10	3X10	3X10	3X10	3X10	4X10	4X10	4X10	4X10
TRUNK	D	D	B	B	A	B	B	A	B	D	A	A	D	C	C	B	C	A	A	C	C	D	B	A

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	BED-2	BED-2	BED-3	BED-4	ENS-2	BED-3	MEDIA	MBR	BATH	LIV	K/B/G	K/B/G	K/B/G	DIN	LAUN	W/R	FOY	ENS	BAS	BAS	BAS	BAS
RM LOSS MBH.	1.49	1.27	2.11	2.11	2.20	1.45	0.93	2.20	0.50	1.49	0.69	2.79	2.10	2.10	2.10	1.99	2.45	0.59	2.45	1.27	3.92	3.92	3.92	3.92
CFM PER RUN HEAT	36	30	51	51	53	35	22	53	12	36	16	67	51	51	51	48	59	14	59	30	94	94	94	94
RM GAIN MBH.	1.97	0.83	2.69	2.69	2.91	2.01	0.34	2.91	1.01	1.97	0.39	3.12	1.89	1.89	1.89	2.00	1.33	0.36	1.03	0.83	0.46	0.46	0.46	0.46
CFM PER RUN COOLING	66	28	90	90	97	67	11	97	34	66	13	105	63	63	63	67	45	12	34	28	15	15	15	15
ADJUSTED PRESSURE	0.17	0.17	0.16	0.16	0.16	0.17	0.17	0.16	0.17	0.17	0.17	0.16	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.16	0.16	0.16	0.16
ACTUAL DUCT LGH.	32	58	58	51	49	29	37	47	39	49	27	31	28	39	51	6	43	17	36	46	45	26	8	27
EQUIVALENT LENGTH	150	150	130	120	180	130	140	170	140	150	140	90	130	130	100	140	120	150	100	160	110	120	150	110
TOTAL EFFECTIVE LENGTH	182	208	188	171	229	159	177	217	179	199	167	121	158	169	151	146	163	167	136	206	155	146	158	137
ADJUSTED PRESSURE	0.09	0.08	0.09	0.09	0.07	0.11	0.1	0.07	0.1	0.09	0.1	0.13	0.11	0.1	0.11	0.12	0.11	0.1	0.13	0.08	0.1	0.11	0.1	0.12
ROUND DUCT SIZE	5	5	6	6	6	6	4	6	4	5	4	6	5	5	5	6	5	4	5	4	6	6	6	6
HEATING VELOCITY (ft/min)	264	220	260	260	270	178	252	270	138	264	184	342	374	374	374	245	433	161	433	344	479	479	479	479
COOLING VELOCITY (ft/min)	485	206	459	459	495	342	126	495	390	485	149	535	463	463	463	342	330	138	250	321	76	76	76	76
OUTLET GRILL SIZE	3X10	3X10	4X10	4X10	4X10	4X10	3X10	4X10	3X10	3X10	3X10	4X10	3X10	3X10	3X10	4X10	3X10	3X10	3X10	3X10	4X10	4X10	4X10	4X10
TRUNK	D	D	B	B	A	B	B	A	B	D	A	A	D	C	C	B	C	A	A	C	C	D	B	A

SUPPLY AIR TRUNK SIZE	TRUNK	STATIC	ROUND	RECT	VELOCITY	TRUNK	STATIC	ROUND	RECT	VELOCITY	RETURN AIR TRUNK SIZE	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	356	0.07	9.8	12	x 8	534	0	0.00	0	0	x 8	0	0.05	0	0	x 8
TRUNK B	669	0.07	12.5	20	x 8	602	0	0.00	0	0	x 8	0	0.05	0	0	x 8
TRUNK C	285	0.08	8.8	10	x 8	513	0	0.00	0	0	x 8	0	0.05	0	0	x 8
TRUNK D	532	0.08	11.1	14	x 8	684	0	0.00	0	0	x 8	0	0.05	0	0	x 8
TRUNK E	0	0.00	0	0	x 8	0	0	0.00	0	0	x 8	0	0.05	0	0	x 8
TRUNK F	0	0.00	0	0	x 8	0	0	0.00	0	0	x 8	0	0.05	0	0	x 8

RETURN AIR #	1	2	3	4	5	6	7	8											BR	TRUNK W	0	0.05	0	0	x	8	0
AIR VOLUME	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	x	8	616				
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	x	8	523				
ACTUAL DUCT LGH.	41	50	53	52	58	35	23	30	1	1	1	1	1	1	1	1	1	1	1	x	8	465					
EQUIVALENT LENGTH	215	205	245	165	175	200	185	190	0	0	0	0	0	0	0	0	0	0	0	x	8	600					
TOTAL EFFECTIVE LH	256	255	298	217	233	235	208	220	1	1	1	1	1	1	1	1	1	1	1	x	12						
ADJUSTED PRESSURE	0.06	0.06	0.05	0.07	0.06	0.06	0.07	0.07	14.80	14.80	14.80	14.80	14.80	14.80	14.80	14.80	14.80	14.80	14.80								
ROUND DUCT SIZE	7.5	6	6	5.8	6.7	7.5	7.5	7.5	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								
INLET GRILL SIZE	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X								
INLET GRILL SIZE	14	14	14	14	14	14	14	14	0	0	0	0	0	0	0	0	0	0	0								

TYPE: 4505
SITE NAME: CENTREFIELD (WEST GORMLEY)

LO # 87519

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
ENS-2	BY INSTALLING CONTRACTOR	50	☒	3.5
BATH	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#: 87519	Model: 4505	Builder: ROYAL PINE HOMES	Date: 2021-06-04																																																									
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>1434</td> <td>9</td> <td>12906</td> </tr> <tr> <td>First</td> <td>1434</td> <td>10</td> <td>14483.4</td> </tr> <tr> <td>Second</td> <td>1861</td> <td>8</td> <td>14888</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>42,277.4 ft³</td> </tr> <tr> <td colspan="2" style="text-align: right;">Total:</td> <td></td> <td>1197.2 m³</td> </tr> </tbody> </table>			Level	Floor Area (ft²)	Floor Height (ft)	Volume (ft³)	Bsmt	1434	9	12906	First	1434	10	14483.4	Second	1861	8	14888	Third	0	9	0	Fourth	0	9	0	Total:			42,277.4 ft³	Total:			1197.2 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%;">0.219</td> </tr> <tr> <td>SUMMER NATURAL AIR CHANGE RATE</td> <td>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>22</td> <td>-21</td> <td>43</td> <td>78</td> </tr> <tr> <td>Summer DTDc</td> <td>24</td> <td>31</td> <td>7</td> <td>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 332.55 x 43 °C x 1.2 = 3785 W = 12916 Btu/h			$HG_{salb} = LR_{airc} \times \frac{V_b}{3.6} \times DTD_c \times 1.2$ = 0.068 x 332.55 x 7 °C x 1.2 = 194 W = 662 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 _{level})	Air Leakage Heat Loss Multiplier (LF x HLairbv / HLlevel)																																																								
1	0.5	12,916	9,207	0.701																																																								
2	0.3		12,712	0.305																																																								
3	0.2		14,192	0.182																																																								
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: 4505	BUILDER: ROYAL PINE HOMES
SFQT: 3289	SITE: CENTREFIELD (WEST GORMLEY)
LO# 87519	

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):	42277.4	ASSUMED (Y/N):	Y
INTERNAL SHADING:	BLINDS/CURTAINS	ASSUMED OCCUPANTS:	5
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: 38.0 ft	WIDTH: 56.0 ft	EXPOSED PERIMETER:	188.0 ft

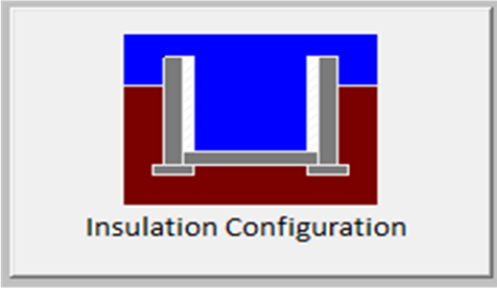
2012 OBC - COMPLIANCE PACKAGE		Compliance Package	
Component		SB-12 PERFORMANCE	
		Nominal	Min. Eff.
Ceiling with Attic Space Minimum RSI (R)-Value		60	59.20
Ceiling Without Attic Space Minimum RSI (R)-Value		31	27.70
Exposed Floor Minimum RSI (R)-Value		31	29.80
Walls Above Grade Minimum RSI (R)-Value		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):	11.6	
Floor Width (m):	17.1	
Exposed Perimeter (m):	0.0	
Wall Height (m):	2.7	
Depth Below Grade (m):	1.83	
Window Area (m ²):	1.2	
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):		1855

TYPE: 4505
LO# 87519

Air Infiltration Residential Load Calculator

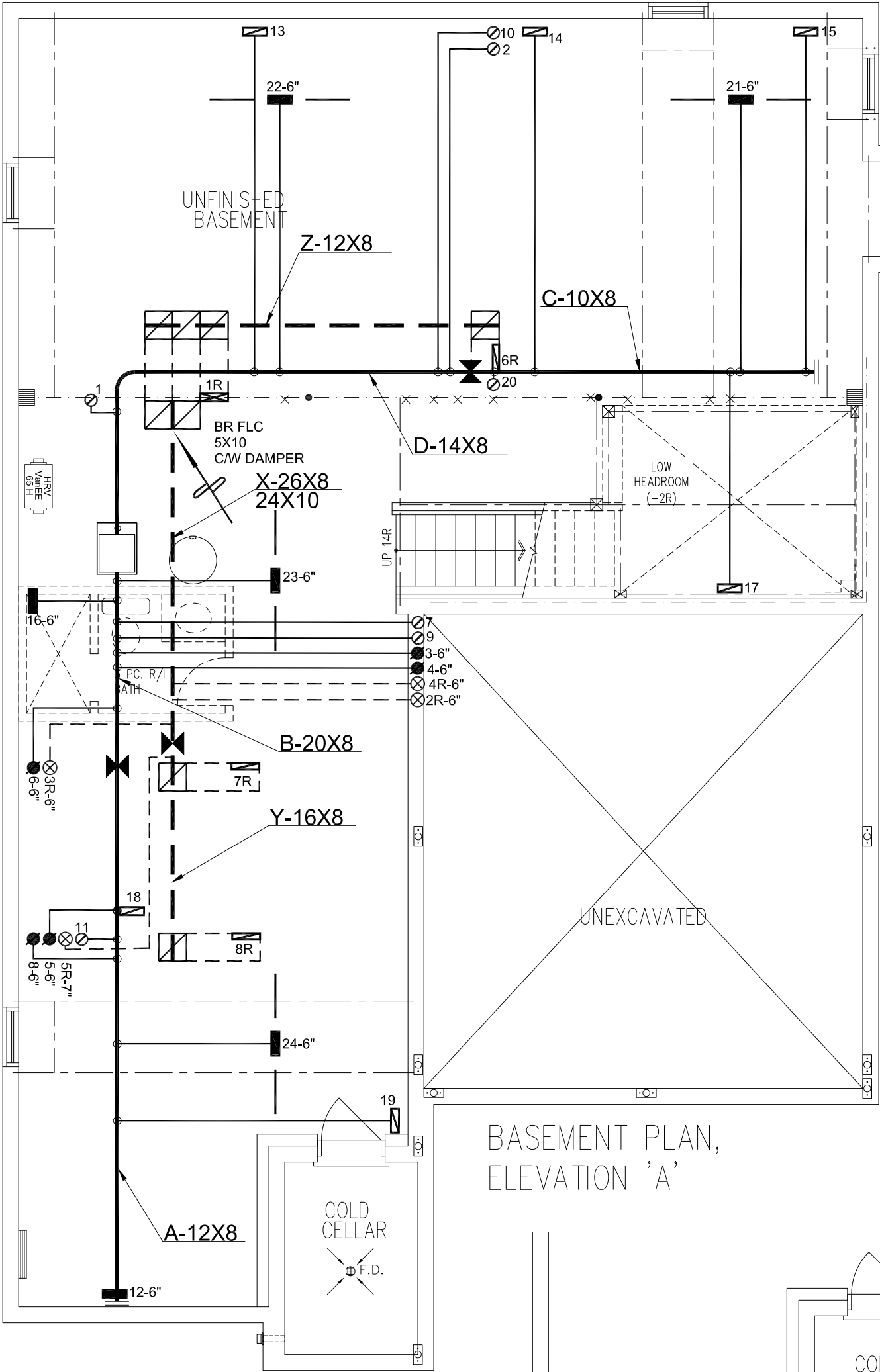
Supplemental tool for CAN/CSA-F280

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):	6.43			
Building Configuration				
Type:	Detached			
Number of Stories:	Two			
Foundation:	Full			
House Volume (m ³):	1197.2			
Air Leakage/Ventilation				
Air Tightness Type:	Energy Star Detached (2.5 ACH)			
Custom BDT Data:	ELA @ 10 Pa.	1117.5 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			

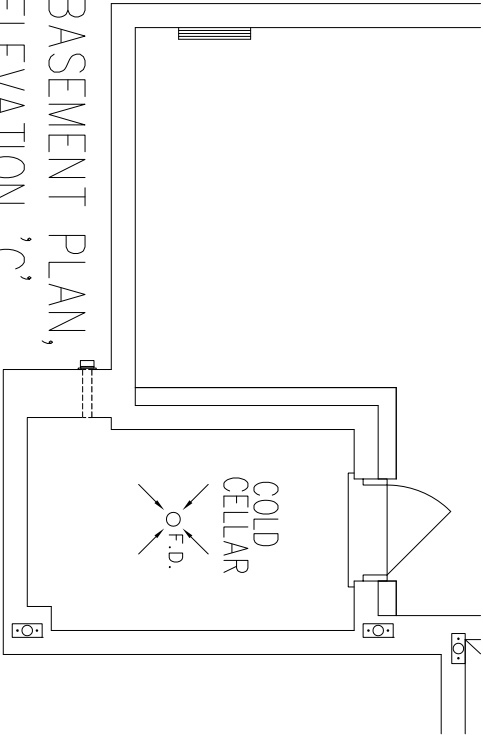
TYPE: 4505
LO# 87519

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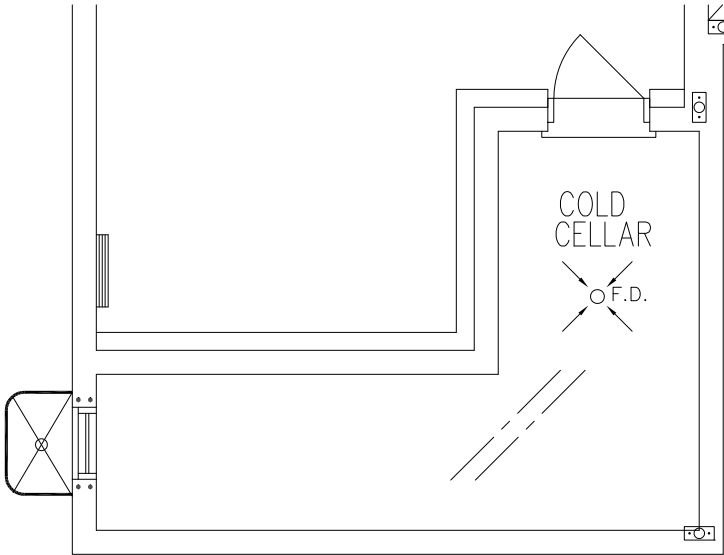
Michael O'Rourke
Michael O'Rourke, BCIN# 19669
HVAC DESIGNS LTD.



BASEMENT PLAN,
ELEVATION 'C'



BASEMENT PLAN,
ELEVATION 'A'



BASEMENT PLAN,
ELEVATION 'B'

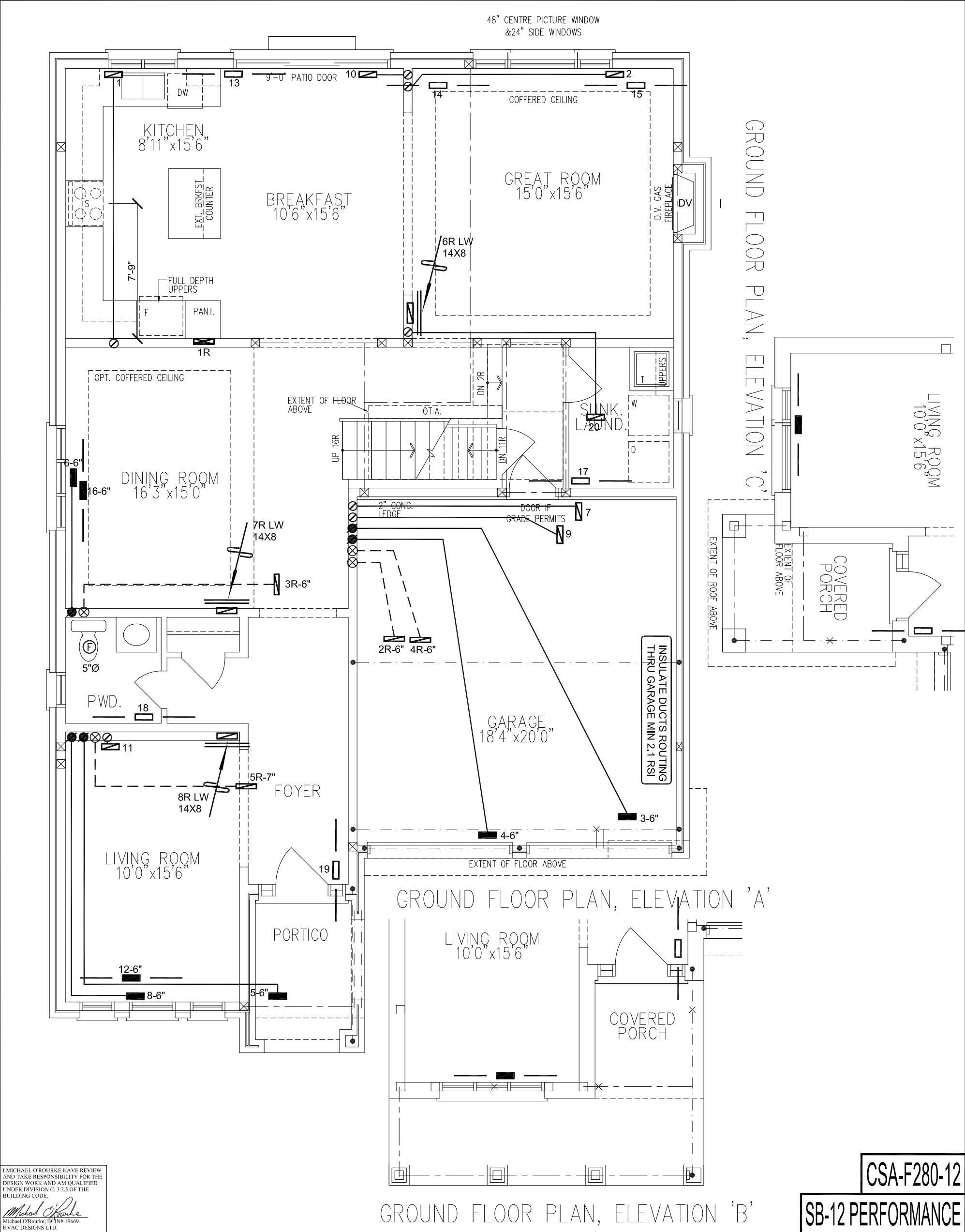
CSA-F280-12

SB-12 PERFORMANCE

HVAC LEGEND								3.	REVISED AS PER CAD	JUN/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		HEAT LOSS 51610 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				MODEL 59TN6A-060-14V		2ND FLOOR 12 5 4				
CENTREFIELD (WEST GORMLEY) RICHMOND HILL, ONTARIO				INPUT 60 MBTU/H		1ST FLOOR 8 3 2				
4505		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.		OUTPUT 58 MBTU/H		BASEMENT 4 1 0			Date	SEPT/2020
3289 sqft				COOLING 3,0 TONS		ALL S/A DIFFUSERS 4 "x10" UNLESS NOTED OTHERWISE ON LAYOUT. ALL S/A RUNS 5"Ø UNLESS NOTED OTHERWISE ON LAYOUT. UNDERCUT DOORS 1" min. FOR R/A			Scale	3/16" = 1'-0"
				FAN SPEED 1200 cfm @ 0.6" w.c.					BCIN# 19669	
									LO#	87519



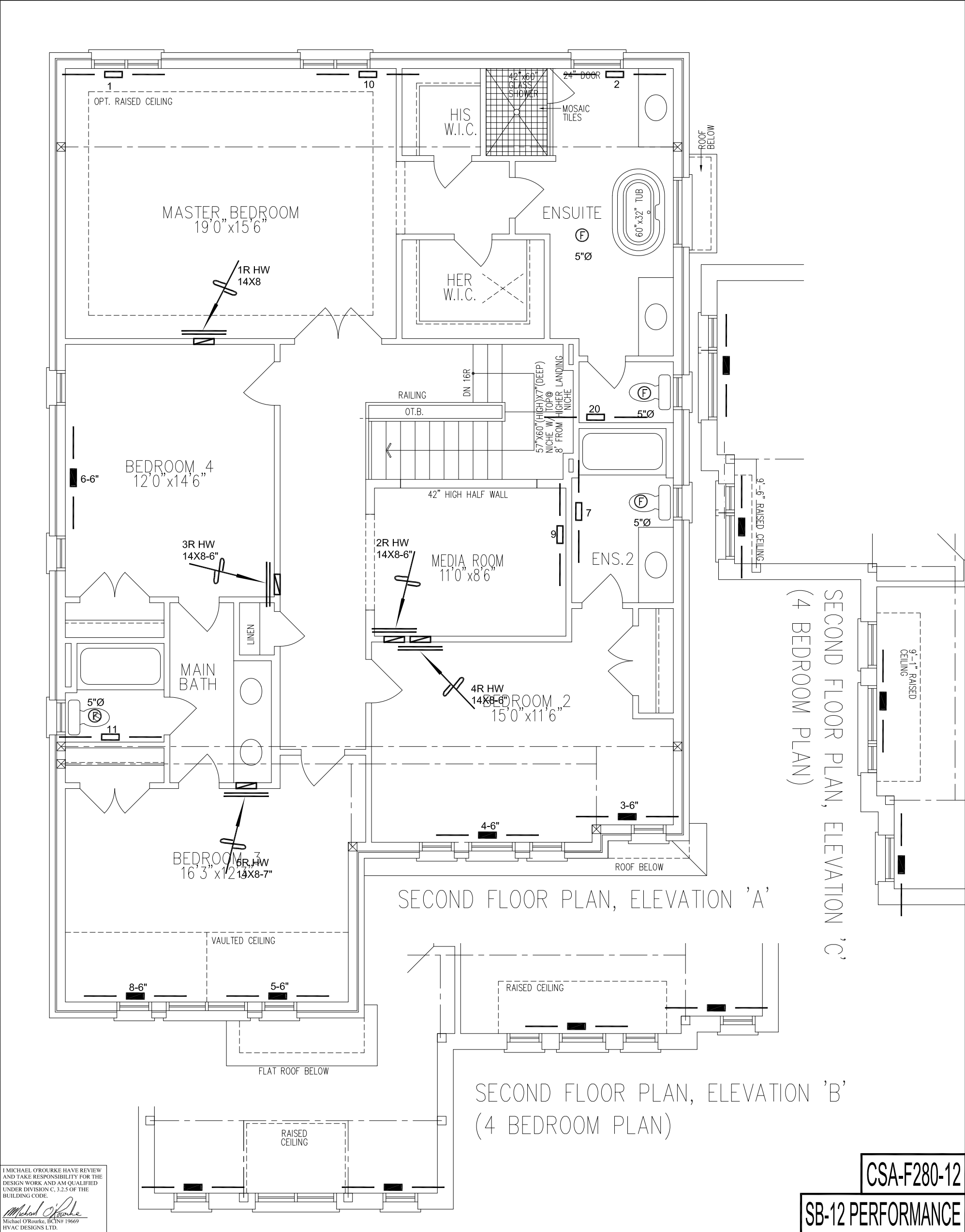
I MICHAEL O'ROURKE HAVE REVIEWED AND TAKE RESPONSIBILITY FOR THE DESIGN WORK AND AM QUALIFIED UNDER DIVISION C, 3.2.5 OF THE BUILDING CODE.

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

HVAC LEGEND								3.	REVISED AS PER CAD	JUN/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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Project Name			FIRST FLOOR HEATING LAYOUT	
ROYAL PINE HOMES			Date	SEPT/2020
CENTREFIELD (WEST GORMLEY) RICHMOND HILL, ONTARIO			Scale	3/16" = 1'-0"
4505			BCIN# 19669	
3289 sqft			LO#	87519



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Michael O'Rourke
Michael O'Rourke, BCIN# 19669
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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"
		BCIN# 19669		
45053289 sqft		LO#	87519	