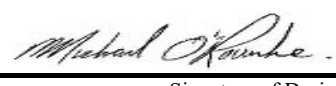


Schedule 1: Designer Information

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: 4506 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 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)										OPT 2ND					DATE: Jun-21					WINTER NATURAL AIR CHANGE RATE 0.233					HEAT LOSS ΔT °F. 78					CSA-F280-12									
BUILDER: ROYAL PINE HOMES										TYPE: 4506					GFA: 3348					LO# 87523					SUMMER NATURAL AIR CHANGE RATE 0.073					HEAT GAIN ΔT °F. 13					SB-12 PERFORMANCE				
ROOM USE				MBR				ENS				BED-2				BED-3				BED-4				BED-5				M-BATH				LAUN				S-BATH			
EXP. WALL				43				12				35				29				47				14				9				0				9			
CLG. HT.				11				9				9				9				9				9				9				9				9			
FACTORS																																							
GRS.WALL AREA		LOSS GAIN		473				108				315				261				423				126				81				0				81			
GLAZING				LOSS GAIN				LOSS GAIN				LOSS GAIN				LOSS GAIN				LOSS GAIN				LOSS GAIN				LOSS GAIN				LOSS GAIN				LOSS GAIN			
NORTH		21.8	14.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	7	152	102		
EAST		21.8	37.1	0	0	0	0	0	0	0	0	0	0	0	45	980	1671	45	980	1671	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
SOUTH		21.8	22.4	37	806	829	9	196	202	0	0	0	0	0	0	0	0	36	784	807	45	980	1009	13	283	291	0	0	0	0	0	0	0	0	0	0	0	0	0
WEST		21.8	37.1	30	654	1114	0	0	0	0	0	0	28	610	1039	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	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	0	0	0	0	
NET EXPOSED WALL		4.2	0.7	406	1707	281	99	416	68	287	1207	199	216	908	149	342	1438	237	81	341	56	68	286	47	0	0	0	74	311	51	0	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	0	0	0	0	
EXPOSED CLG		1.3	0.6	364	478	214	130	171	76	276	363	162	172	226	101	238	313	140	195	256	115	153	201	90	42	55	25	108	142	63	0	0	0	0	0	0	0	0	
NO ATTIC EXPOSED CLG		2.8	1.3	0	0	0	130	365	163	0	0	0	24	67	30	28	79	35	21	59	26	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	196	512	84	0	0	0	0	0	0	0	0	0	42	110	18	66	172	28	0	0	0	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				3645				1148				2180				2694				3594				1636				770				165				778			
SUB TOTAL HT GAIN						2438		510				1400				2035				2889				1206				428				43				245			
LEVEL FACTOR / MULTIPLIER		0.20	0.17					0.20	0.17			0.20		0.17				0.20	0.17					0.20	0.17			0.20	0.17			0.20		0.17					
AIR CHANGE HEAT LOSS				636				200				380				470				627				286				134				29				136			
AIR CHANGE HEAT GAIN						115		24				66				96				137				57				20				2				12			
DUCT LOSS				0				0				0				316				0				0				0				19				91			
DUCT GAIN				0				0				0				276				0				0				0				43				64			
HEAT GAIN PEOPLE		240		2	480	0		1	240	1		240	1		240	1		240	1		240	0		0		0		0		0		0		0		0		0	
HEAT GAIN APPLIANCES/LIGHTS				385				385				385				385				385				385				385				385				385			
TOTAL HT LOSS BTU/H				4282				1349				2560				3480				4222				1922				905				213				1005			
TOTAL HT GAIN x 1.3 BTU/H				4443				1194				2718				3941				4745				2453				1083				614				916			

ROOM USE			DIN		FAM		KIT		LIV		WIC-3		W/R		FOY		MUD								BAS							
EXP. WALL			28		33		61		31		6		18		15		28								188							
CLG. HT.			11		11		11		11		9		11		11		13								9							
FACTORS																																
GRS.WALL AREA			LOSS GAIN		308		363		671		341		54		198		165		364						1128							
GLAZING					LOSS GAIN		LOSS GAIN		LOSS GAIN		LOSS GAIN		LOSS GAIN		LOSS GAIN		LOSS GAIN		LOSS GAIN						LOSS GAIN							
NORTH			21.8	14.5	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	37.1	0	0	0	0	0	0	0	43	937	1596	9	196	334	10	218	371	0	0	0	0	0	0	0					
SOUTH			21.8	22.4	49	1067	1098	0	0	0	38	828	852	43	937	964	0	0	0	8	174	179	0	0	0	0	12	261	269			
WEST			21.8	37.1	0	0	0	37	806	1374	71	1547	2636	0	0	0	0	0	0	0	0	0	0	0	0	0	8	174	297			
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	20	517	85			
NET EXPOSED WALL			4.2	0.7	259	1089	179	326	1371	226	562	2363	389	255	1072	176	45	189	31	188	791	130	118	496	82	344	1447	238	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	564	2078	342		
EXPOSED CLG			1.3	0.6	0	0	0	0	0	0	0	0	0	0	0	0	78	103	46	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	78	204	34	0	0	0	0	0	0	0	0	0	0	0	0	0
BASEMENT/CRAWL HEAT LOSS					0		0		0		0		0		0		0		0		0		0		0				6479			
SLAB ON GRADE HEAT LOSS					0		0		0		0		0		0		0		0		0		0		0							
SUBTOTAL HT LOSS					2157		2177		4738		2946		691		1008		1679		1964								9509					
SUB TOTAL HT GAIN					1277		1599		3876		2736		445		501		427		323								993					
LEVEL FACTOR / MULTIPLIER			0.30	0.27			0.30	0.27			0.30	0.27			0.20	0.17			0.30	0.27			0.30	0.27			0.50		0.79			
AIR CHANGE HEAT LOSS					586		592		1288		801		121		274		456		534								7551					
AIR CHANGE HEAT GAIN					60		76		183		129		21		24		20		15								47					
DUCT LOSS					0		0		0		0		81		0		0		0								0					
DUCT GAIN					0		0		0		0		85		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	0	0	0	0	0	0	0
HEAT GAIN APPLIANCES/LIGHTS					385		385		385		385		385		385		0		385								385					
TOTAL HT LOSS BTU/H					2743		2769		6026		3746		893		1283		2135		2497								17060					
TOTAL HT GAIN x 1.3 BTU/H					2239		2677		5777		4225		1216		682		581		940								1852					

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

OPT 2ND
TYPE: 4506

DATE: Jun-21

GFA: 3348 LO# 87523

HEATING CFM 1370 COOLING CFM 1370
TOTAL HEAT LOSS 59,088 TOTAL HEAT GAIN 42,298
AIR FLOW RATE CFM 23.19 AIR FLOW RATE CFM 32.39

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-080-14V
FAN SPEED 80

AFUE = 97 %
INPUT (BTU/H) = 80,000
OUTPUT (BTU/H) = **78,000**

RUN COUNT	4th	3rd	2nd	1st	Bas
S/A	0	0	14	10	5
R/A	0	0	6	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 1030
MEDLOW 0
MEDIUM 1370
MEDIUM HIGH 0
HIGH 1800

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

TEMPERATURE RISE 53 °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	4	5	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
ROOM NAME	MBR	MBR	BED-3	BED-4	M-BATH	M-BATH	LAUN	BED-2	S-BATH	DIN	FAM	KIT	KIT	LIV	WIC-3	W/R	FOY	MUD	BAS	BAS	BAS	BAS
RM LOSS MBH.	2.14	2.14	1.74	2.11	0.45	0.45	0.21	2.56	1.01	2.74	2.77	2.01	2.01	1.87	0.89	1.28	2.13	2.50	3.41	3.41	3.41	3.41
CFM PER RUN HEAT	50	50	40	49	10	10	5	59	23	64	64	47	47	43	21	30	50	58	79	79	79	79
RM GAIN MBH.	2.22	2.22	1.97	2.37	0.54	0.54	0.61	2.72	0.92	2.24	2.68	1.93	1.93	2.11	1.22	0.68	0.58	0.94	0.37	0.37	0.37	0.37
CFM PER RUN COOLING	72	72	64	77	18	18	20	88	30	73	87	62	62	68	39	22	19	30	12	12	12	12
ADJUSTED PRESSURE	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.16	0.17	0.17	0.16	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17
ACTUAL DUCT LGH.	42	60	48	82	25	28	38	49	76	49	14	37	32	66	55	58	65	16	43	20	21	39
EQUIVALENT LENGTH	220	160	150	150	200	150	140	150	170	130	140	150	130	140	150	180	160	110	130	150	130	140
TOTAL EFFECTIVE LENGTH	262	220	198	232	225	178	178	199	246	179	154	187	162	206	205	238	225	126	173	170	151	179
ADJUSTED PRESSURE	0.07	0.08	0.09	0.07	0.08	0.1	0.1	0.08	0.07	0.1	0.11	0.09	0.11	0.08	0.08	0.07	0.08	0.14	0.1	0.1	0.11	0.1
ROUND DUCT SIZE	6	6	5	6	4	4	4	6	4	5	6	5	5	6	5	4	5	5	5	6	6	6
HEATING VELOCITY (ft/min)	255	255	294	250	115	115	57	301	264	470	326	345	345	219	154	344	367	426	580	403	403	403
COOLING VELOCITY (ft/min)	367	367	470	393	207	207	229	449	344	536	444	455	455	347	286	252	140	220	88	61	61	61
OUTLET GRILL SIZE	4X10	4X10	3X10	4X10	3X10	3X10	3X10	4X10	3X10	3X10	4X10	3X10	3X10	4X10	3X10	3X10	3X10	3X10	3X10	4X10	4X10	4X10
TRUNK	C	B	D	A	D	D	D	C	A	B	D	B	C	A	D	A	A	D	B	C	C	B

RUN #	25	26	27	28	29	30	31
ROOM NAME	BAS	ENS	BED-3	BED-4	BED-5	KIT	LIV
RM LOSS MBH.	3.41	1.35	1.74	2.11	1.92	2.01	1.87
CFM PER RUN HEAT	79	31	40	49	45	47	43
RM GAIN MBH.	0.37	1.19	1.97	2.37	2.45	1.93	2.11
CFM PER RUN COOLING	12	39	64	77	79	62	68
ADJUSTED PRESSURE	0.17	0.17	0.17	0.17	0.17	0.17	0.17
ACTUAL DUCT LGH.	68	43	39	79	66	34	67
EQUIVALENT LENGTH	150	200	180	210	240	130	160
TOTAL EFFECTIVE LENGTH	218	243	219	289	306	164	227
ADJUSTED PRESSURE	0.08	0.07	0.08	0.06	0.06	0.1	0.08
ROUND DUCT SIZE	6	5	5	6	6	5	6
HEATING VELOCITY (ft/min)	403	228	294	250	229	345	219
COOLING VELOCITY (ft/min)	61	286	470	393	403	455	347
OUTLET GRILL SIZE	4X10	3X10	3X10	4X10	4X10	3X10	4X10
TRUNK	A	B	D	A	A	B	A

SUPPLY AIR TRUNK SIZE

TRUNK A							TRUNK G								
	TRUNK CFM	STATIC PRESS.	ROUND DUCT	RECT DUCT		VELOCITY (ft/min)		TRUNK CFM	STATIC PRESS.	ROUND DUCT	RECT DUCT		VELOCITY (ft/min)		
TRUNK A	411	0.06	10.8	14	x	8	528	TRUNK G	0	0.00	0	0	x	8	0
TRUNK B	397	0.07	10.3	12	x	8	596	TRUNK H	0	0.00	0	0	x	8	0
TRUNK C	1122	0.06	15.7	28	x	8	721	TRUNK I	0	0.00	0	0	x	8	0
TRUNK D	1370	0.06	17	26	x	10	759	TRUNK J	0	0.00	0	0	x	8	0
TRUNK E	0	0.00	0	0	x	8	0	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	155	0.05	7.8	8	x	8	349
TRUNK X	1370	0.05	17.7	30	x	10	658
TRUNK Y	910	0.05	15.2	26	x	8	630
TRUNK Z	575	0.05	12.8	20	x	8	518
DROP	1370	0.05	17.7	24	x	12	685

RETURN AIR #	1	2	3	4	5	6	7	8	9							BR
AIR VOLUME	85	75	85	85	95	180	330	155	85	0	0	0	0	0	0	195
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.	42	52	67	60	66	27	40	62	38	1	1	1	1	1	1	14
EQUIVALENT LENGTH	195	235	175	195	155	145	240	170	215	0	0	0	0	0	0	135
TOTAL EFFECTIVE LH	237	287	242	255	221	172	280	232	253	1	1	1	1	1	1	149
ADJUSTED PRESSURE	0.06	0.05	0.06	0.06	0.07	0.09	0.05	0.06	0.06	14.80	14.80	14.80	14.80	14.80	14.80	0.10
ROUND DUCT SIZE	6	6	6	6	6	7.2	10.4	7.5	6	0	0	0	0	0	0	7.2
INLET GRILL SIZE	8	8	8	8	8	8	8	8	8	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	14	0	0	0	0	0	0	14

TYPE: 4506
SITE NAME: CENTREFIELD (WEST GORMLEY)

LO # 87523
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
M-BATH	BY INSTALLING CONTRACTOR	50	☒	3.5
S-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	☒ 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#: 87523	Model: 4506	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>1497</td> <td>9</td> <td>13473</td> </tr> <tr> <td>First</td> <td>1497</td> <td>11</td> <td>16467</td> </tr> <tr> <td>Second</td> <td>1851</td> <td>9</td> <td>16659</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>46,599.0 ft³</td> </tr> <tr> <td colspan="2" style="text-align: right;">Total:</td> <td></td> <td>1319.5 m³</td> </tr> </tbody> </table>			Level	Floor Area (ft²)	Floor Height (ft)	Volume (ft³)	Bsmt	1497	9	13473	First	1497	11	16467	Second	1851	9	16659	Third	0	9	0	Fourth	0	9	0	Total:			46,599.0 ft³	Total:			1319.5 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%;">0.233</td> </tr> <tr> <td>SUMMER NATURAL AIR CHANGE RATE</td> <td>0.073</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	0.233	SUMMER NATURAL AIR CHANGE RATE	0.073	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																																																									
$HL_{airb} = LR_{airh} \times \frac{V_b}{3.6} \times DTD_h \times 1.2$ 0.233 x 366.54 x 43 °C x 1.2 = 4426 W = 15101 Btu/h			$HG_{salb} = LR_{airc} \times \frac{V_b}{3.6} \times DTD_c \times 1.2$ = 0.073 x 366.54 x 7 °C x 1.2 = 227 W = 775 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 _{level})	Air Leakage Heat Loss Multiplier (LF x HLairbv / HLlevel)																																																								
1	0.5	15,101	9,509	0.794																																																								
2	0.3		16,668	0.272																																																								
3	0.2		17,302	0.175																																																								
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: 4506	OPT 2ND	BUILDER: ROYAL PINE HOMES
SFQT: 3348	LO# 87523	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):	46599.0	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: 56.0 ft	WIDTH: 38.0 ft	EXPOSED PERIMETER:	188.0 ft

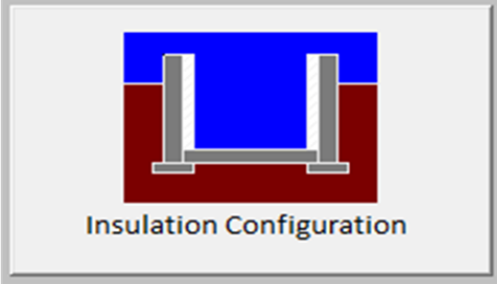
2012 OBC - COMPLIANCE PACKAGE		Compliance Package SB-12 PERFORMANCE	
Component		Nominal	Min. Eff.
Ceiling with Attic Space Minimum RSI (R)-Value		60	59.20
Ceiling Without Attic Space Minimum RSI (R)-Value		31	27.70
Exposed Floor Minimum RSI (R)-Value		31	29.80
Walls Above Grade Minimum RSI (R)-Value		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):	17.1	
Floor Width (m):	11.6	
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):		1898

TYPE: 4506
LO# 87523

OPT 2ND

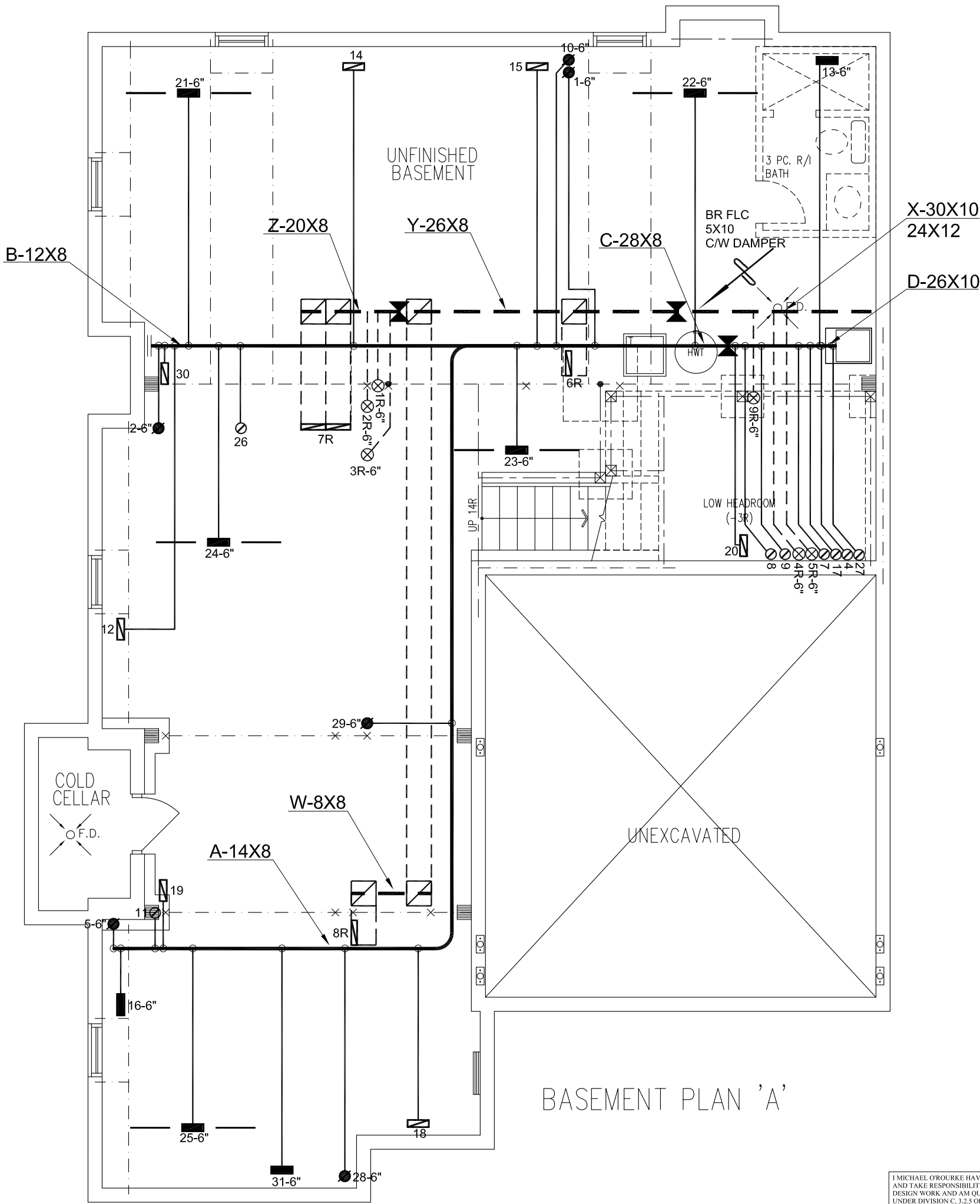
Air Infiltration Residential Load Calculator

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):	7.01			
Building Configuration				
Type:	Detached			
Number of Stories:	Two			
Foundation:	Full			
House Volume (m ³):	1319.5			
Air Leakage/Ventilation				
Air Tightness Type:	Energy Star Detached (2.5 ACH)			
Custom BDT Data:	ELA @ 10 Pa.	1231.8 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):	0.233			
Cooling Air Leakage Rate (ACH/H):	0.073			

TYPE: 4506
LO# 87523

OPT 2ND



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Michael O'Rourke, BCIN# 19669
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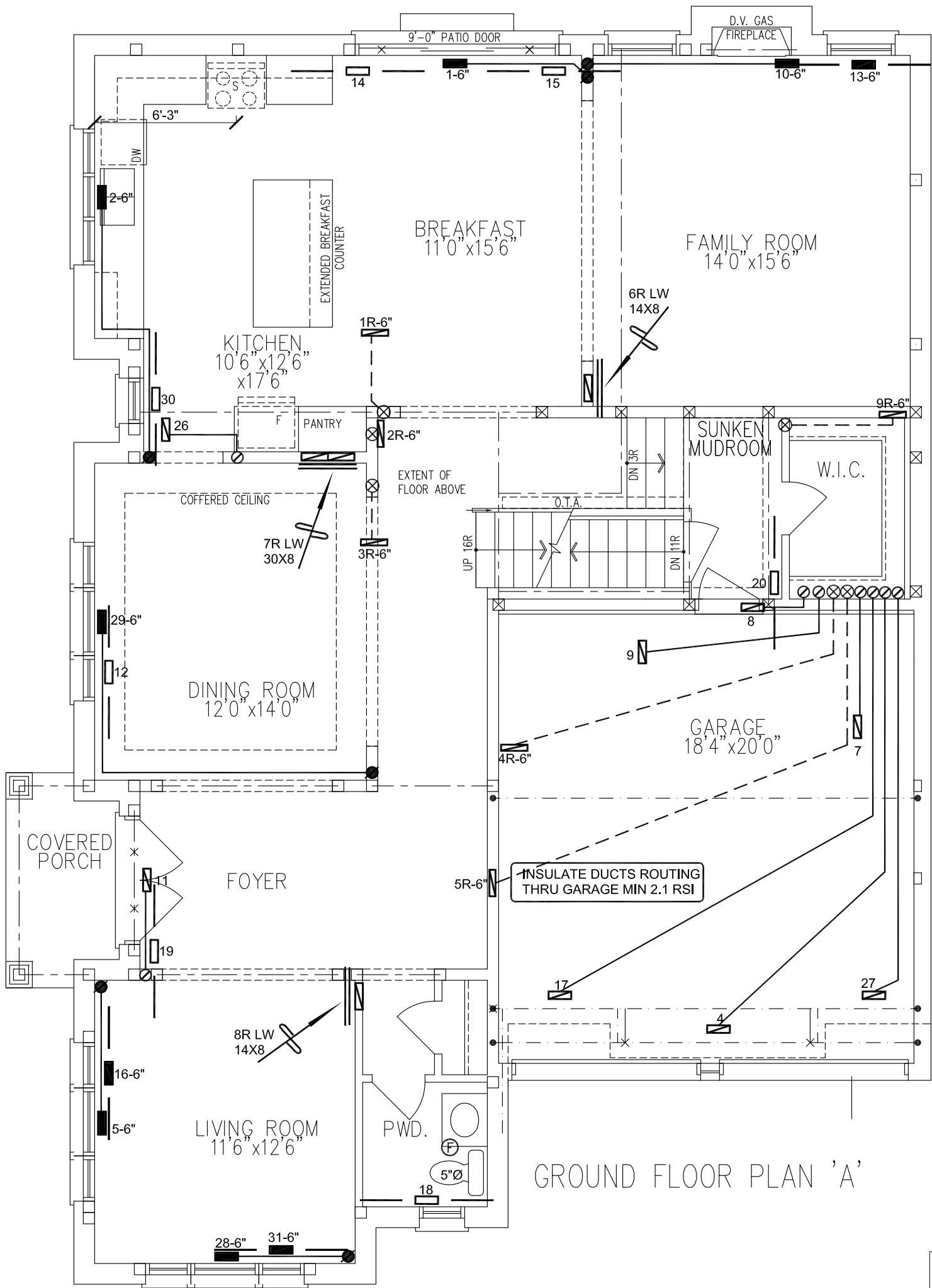
CSA-F280-12

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
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Client	ROYAL PINE HOMES		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 61092 BTU/H UNIT DATA		# OF RUNS S/A R/A FANS			Sheet Title		
Project Name CENTREFIELD (WEST GORMLEY) RICHMOND HILL, ONTARIO	OPT 2ND 4506	3348 sqft		MAKE	CARRIER	3RD FLOOR				BASEMENT HEATING LAYOUT	
				MODEL	59TN6A-080-14V	2ND FLOOR	14	6	4		
				INPUT	80 MBTU/H	1ST FLOOR	10	3	2		
				OUTPUT	78 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#	87523			



GROUND FLOOR PLAN 'A'

I MICHAEL O'ROURKE HAVE REVIEW
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BUILDING CODE.
Michael O'Rourke
Michael O'Rourke, BCIN# 19669
HVAC DESIGNS LTD.

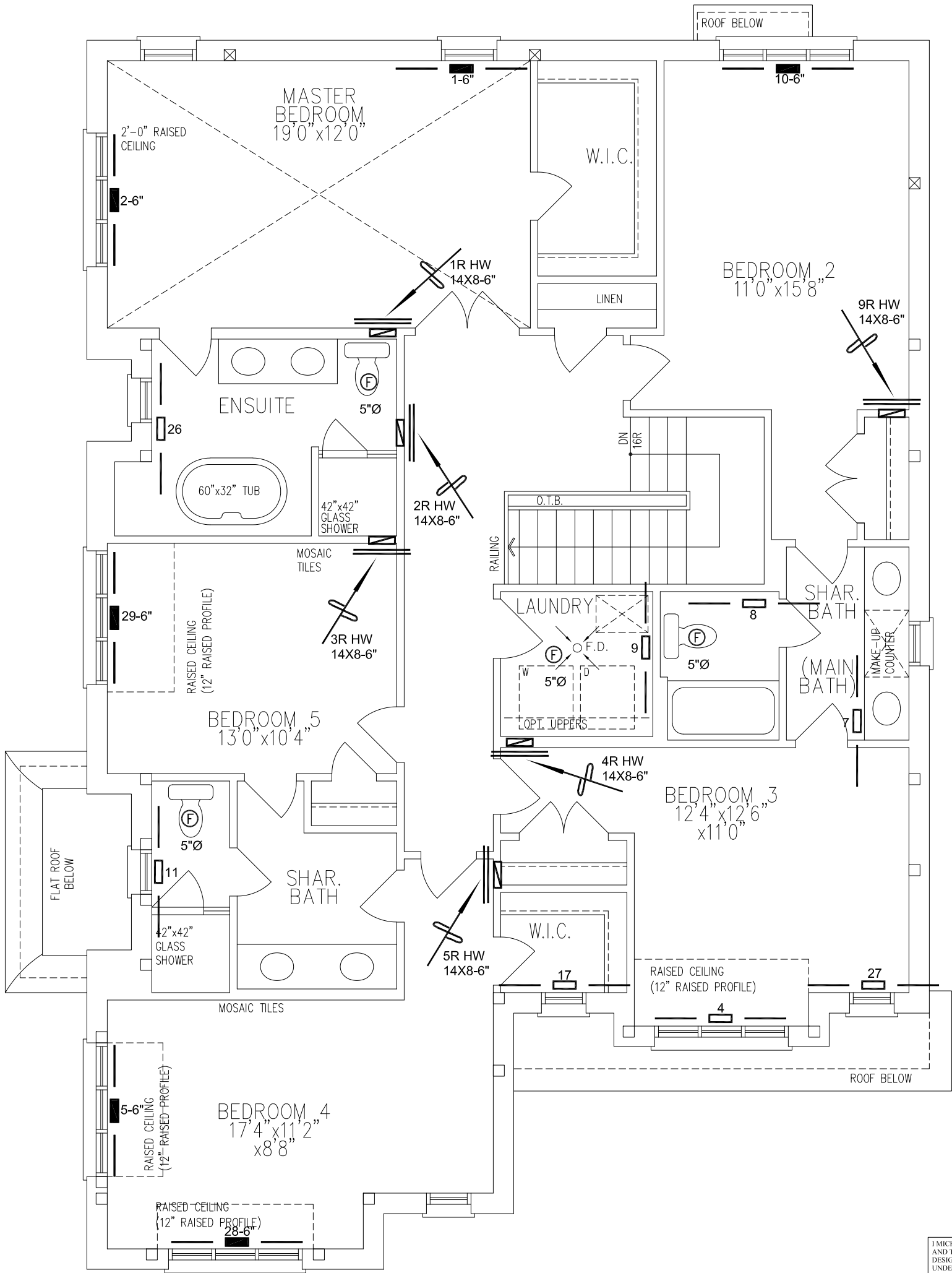
CSA-F280-12

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			Date	SEPT/2020
CENTREFIELD (WEST GORMLEY) RICHMOND HILL, ONTARIO			Scale	3/16" = 1'-0"
OPT 2ND 4506			BCIN# 19669	
3348 sqft			LO#	87523



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

CSA-F280-12

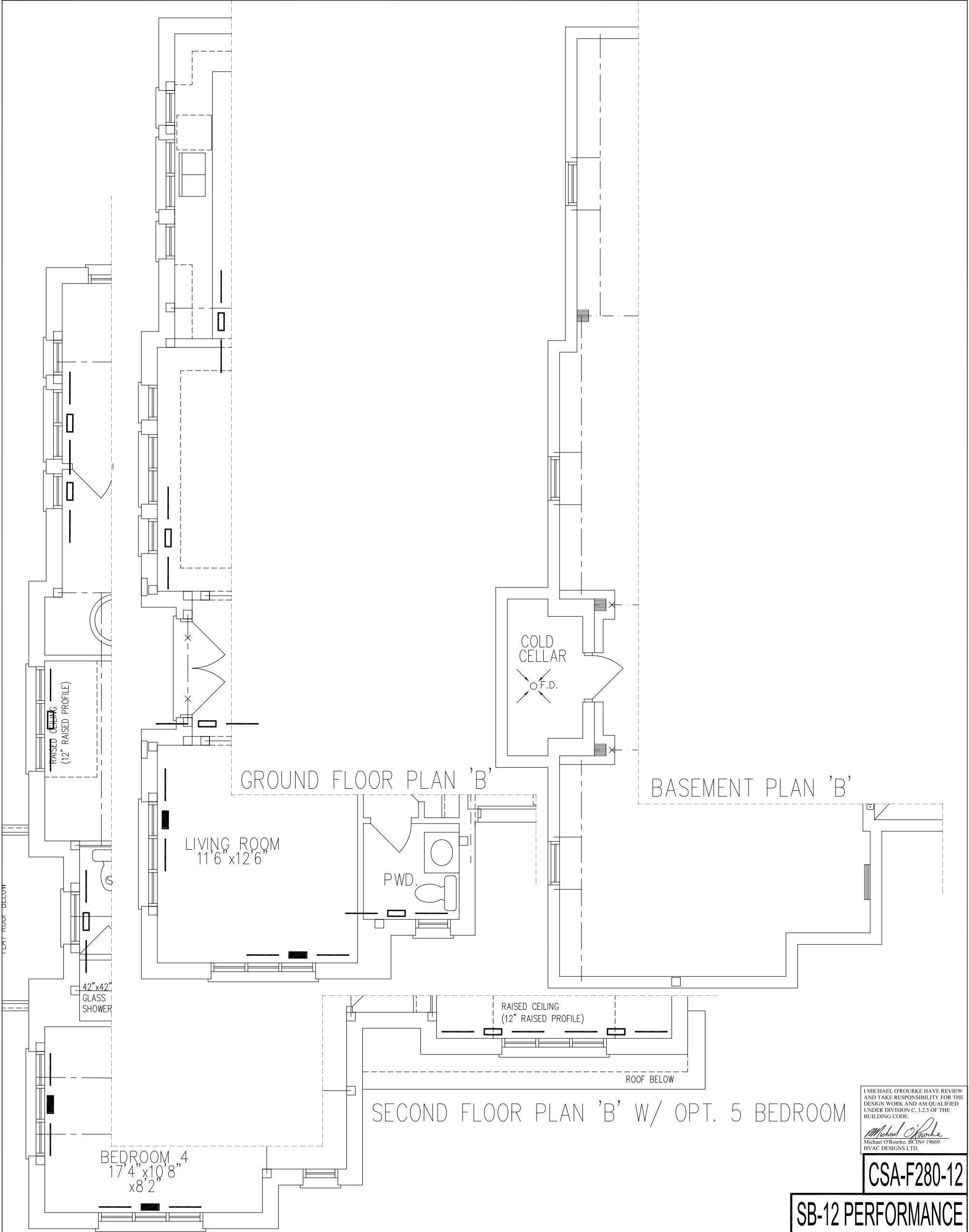
SECOND FLOOR PLAN 'A' W/ OPT. 5 BEDROOM

SB-12 PERFORMANCE

HVAC LEGEND								3.	REVISED AS PER CAD	JUNE/2021
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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 2ND 4506			BCIN# 19669	
3348 sqft			LO#	87523



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ROYAL PINE HOMES			THIRD FLOOR HEATING LAYOUT	
Project Name CENTREFIELD (WEST GORMLEY) RICHMOND HILL, ONTARIO			Date	SEPT/2020
OPT 2ND 4506 3348 sqft			Scale	3/16" = 1'-0"
			BCIN# 19669	
			LO#	87523