

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 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)

BUILDER: ROYAL PINE HOMES

TYPE: 4506

GFA: 3348

DATE: Jun-21

LO# 87522

WINTER NATURAL AIR CHANGE RATE 0.233

SUMMER NATURAL AIR CHANGE RATE 0.073

HEAT LOSS ΔT °F. 78

HEAT GAIN ΔT °F. 13

CSA-F280-12

SB-12 PERFORMANCE

ROOM USE	EXP. WALL	CLG. HT.	MBR	ENS	WIC	BED-2	BED-3	BED-4	BATH	COMP	LAUN	ENS-2		
			18	29	23	29	47	19	9	8	0	6		
			9	9	9	9	9	9	9	12	9	9		
GRS.WALL AREA	FACTORS													
GLAZING	LOSS GAIN		162	261	207	261	423	171	81	96	0	54		
NORTH	21.8 14.9	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	12 261 179	0 0 0	7 152 105		
EAST	21.8 38.4	0 0 0	0 0 0	0 0 0	0 0 0	45 980 1727	45 980 1727	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0		
SOUTH	21.8 23.1	0 0 0	37 806 856	0 0 0	0 0 0	0 0 0	36 784 832	45 980 1041	13 283 301	0 0 0	0 0 0	0 0 0		
WEST	21.8 38.4	28 610 1075	27 588 1036	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 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		
NET EXPOSED WALL	4.2 0.7	134 564 93	197 828 136	207 871 143	216 908 149	342 1438 237	126 530 87	68 286 47	84 353 58	0 0 0	47 198 33			
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		
EXPOSED CLG	1.3 0.6	306 402 180	66 87 39	102 134 60	172 226 101	238 313 140	302 397 178	153 201 90	80 105 47	42 55 25	66 87 39			
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	80 225 101	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	0 0 0	42 110 18	66 172 28			
BASEMENT/CRAWL HEAT LOSS		0	0	0	0	0	0	0	0	0	0			
SLAB ON GRADE HEAT LOSS		0	0	0	0	0	0	0	0	0	0			
SUBTOTAL HT LOSS		1576	2675	1005	2694	3594	1966	770	944	165	609			
SUB TOTAL HT GAIN		1347	2230	203	2092	2972	1332	438	385	43	204			
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	285		484	182	488	650	356	139	171	30	110			
AIR CHANGE HEAT GAIN		60	99	9	93	132	59	19	17	2	9			
DUCT LOSS	0		0	0	318	0	0	0	0	19	72			
DUCT GAIN		0	0	0	294	0	0	0	0	56	21			
HEAT GAIN PEOPLE	240	2	480	0	0	1	240	1	240	0	0			
HEAT GAIN APPLIANCES/LIGHTS			513	0	513	513	513	513	513	513	0			
TOTAL HT LOSS BTU/H		1861	3159	1186	3499	4245	2322	910	1115	214	791			
TOTAL HT GAIN x 1.3 BTU/H		3120	3028	276	4201	5013	2786	594	1189	797	305			

ROOM USE	EXP. WALL	CLG. HT.	DIN	FAM	KIT	LIV	WIC-3	W/R	FOY	MUD				BAS
			28	33	61	31	6	18	15	28				188
			11	11	11	11	9	11	11	11				9
GRS.WALL AREA	FACTORS													
GLAZING	LOSS GAIN		308	363	671	341	54	198	165	308				1128
NORTH	21.8 14.9	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0				0 0 0
EAST	21.8 38.4	0 0 0	0 0 0	0 0 0	0 0 0	43 937 1651	9 196 345	10 218 384	0 0 0	0 0 0				0 0 0
SOUTH	21.8 23.1	49 1067 1133	0 0 0	38 828 879	43 937 994	0 0 0	0 0 0	0 0 0	8 174 185	0 0 0				12 261 277
WEST	21.8 38.4	0 0 0	37 806 1420	71 1547 2726	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0				8 174 307
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	39 1008 166	20 517 85				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	288 1211 199					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				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				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	0 0 0	0 0 0	78 204 34	0 0 0	0 0 0	0 0 0	0 0 0				0 0 0
BASEMENT/CRAWL HEAT LOSS		0	0	0	0	0	0	0	0	0				6479
SLAB ON GRADE HEAT LOSS		0	0	0	0	0	0	0	0	0				
SUBTOTAL HT LOSS		2157	2177	4738	2946	691	1008	1679	1728					9509
SUB TOTAL HT GAIN		1312	1646	3993	2821	456	514	432	284					1011
LEVEL FACTOR / MULTIPLIER	0.30 0.28		0.30 0.28	0.30 0.28	0.30 0.28	0.20 0.18	0.30 0.28	0.30 0.28	0.30 0.28	0.30 0.28				0.50 0.79
AIR CHANGE HEAT LOSS	595		600	1306	812	125	278	463	476					7551
AIR CHANGE HEAT GAIN		58	73	177	125	20	23	19	13					45
DUCT LOSS	0		0	0	0	82	0	0	0					0
DUCT GAIN		0	0	0	0	48	0	0	0					0
HEAT GAIN PEOPLE	240	0	0	0	0	0	0	0	0					0
HEAT GAIN APPLIANCES/LIGHTS			513	513	513	513	513	513	513					513
TOTAL HT LOSS BTU/H		2751	2777	6044	3758	898	1286	2141	2205					17060
TOTAL HT GAIN x 1.3 BTU/H		2448	2901	6087	4497	681	698	587	1053					2040

TOTAL HEAT GAIN BTU/H:

42575

TONS: 3.55

LOSS DUE TO VENTILATION LOAD BTU/H: 1670

STRUCTURAL HEAT LOSS: 58223

TOTAL COMBINED HEAT LOSS BTU/H: 59893

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

TYPE: 4506

DATE: Jun-21

GFA: 3348

LO# 87522

HEATING CFM 1370 COOLING CFM 1370
TOTAL HEAT LOSS 58,223 TOTAL HEAT GAIN 42,300
AIR FLOW RATE CFM 23.53 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	16	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 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	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
ROOM NAME	MBR	ENS	WIC	BED-2	BED-3	BED-4	BATH	COMP	LAUN	MBR	ENS-2	DIN	FAM	KIT	KIT	LIV	WIC-3	W/R	FOY	MUD	BAS	BAS	BAS	BAS
RM LOSS MBH.	0.93	1.58	1.19	1.75	2.12	1.16	0.91	1.12	0.21	0.93	0.79	2.75	2.78	2.01	2.01	1.88	0.90	1.29	2.14	2.20	3.41	3.41	3.41	3.41
CFM PER RUN HEAT	22	37	28	41	50	27	21	26	5	22	19	65	65	47	47	44	21	30	50	52	80	80	80	80
RM GAIN MBH.	1.56	1.51	0.28	2.10	2.51	1.39	0.59	1.19	0.80	1.56	0.31	2.45	2.90	2.03	2.03	2.25	0.68	0.70	0.59	1.05	0.41	0.41	0.41	0.41
CFM PER RUN COOLING	51	49	9	68	81	45	19	39	26	51	10	79	94	66	66	73	22	23	19	34	13	13	13	13
ADJUSTED PRESSURE	0.17	0.17	0.17	0.17	0.16	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.16	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17
ACTUAL DUCT LGH.	42	60	54	48	82	52	25	26	38	49	76	49	14	37	32	66	55	58	65	16	43	20	21	39
EQUIVALENT LENGTH	220	160	195	150	150	210	200	150	140	150	170	130	140	150	130	140	150	180	160	110	130	150	130	140
TOTAL EFFECTIVE LENGTH	262	220	249	198	232	262	225	176	178	199	246	179	154	187	162	206	205	238	225	126	173	170	151	179
ADJUSTED PRESSURE	0.07	0.08	0.07	0.09	0.07	0.07	0.08	0.1	0.1	0.09	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	5	5	4	5	6	5	4	4	4	5	4	5	6	5	5	6	4	4	5	4	5	6	6	6
HEATING VELOCITY (ft/min)	162	272	321	301	255	198	241	298	57	162	218	477	331	345	345	224	241	344	367	597	587	408	408	408
COOLING VELOCITY (ft/min)	374	360	103	499	413	330	218	447	298	374	115	580	479	485	485	372	252	264	140	390	95	66	66	66
OUTLET GRILL SIZE	3X10	3X10	3X10	3X10	4X10	3X10	3X10	3X10	3X10	3X10	3X10	3X10	4X10	3X10	3X10	4X10	3X10	3X10	3X10	3X10	3X10	4X10	4X10	4X10
TRUNK	C	B	C	D	A	B	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-2	BED-3	BED-4	KIT	LIV
RM LOSS MBH.	3.41	1.58	1.75	2.12	1.16	2.01	1.88
CFM PER RUN HEAT	80	37	41	50	27	47	44
RM GAIN MBH.	0.41	1.51	2.10	2.51	1.39	2.03	2.25
CFM PER RUN COOLING	13	49	68	81	45	66	73
ADJUSTED PRESSURE	0.17	0.17	0.17	0.16	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	5	5	6
HEATING VELOCITY (ft/min)	408	272	301	255	198	345	224
COOLING VELOCITY (ft/min)	66	360	499	413	330	485	372
OUTLET GRILL SIZE	4X10	3X10	3X10	4X10	3X10	3X10	4X10
TRUNK	A	B	D	A	A	B	A

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	394	0.06	10.6	14	x	8	507	TRUNK G	0	0.00	0	0	x	8	0
TRUNK B	420	0.07	10.5	14	x	8	540	TRUNK H	0	0.00	0	0	x	8	0
TRUNK C	1093	0.06	15.6	28	x	8	703	TRUNK I	0	0.00	0	0	x	8	0
TRUNK D	1365	0.06	16.9	26	x	10	756	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	STATIC	ROUND	RECT		VELOCITY	
	CFM	PRESS.	DUCT	DUCT		(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	915	0.05	15.3	28	x	8	588
TRUNK Z	560	0.05	12.7	18	x	8	560
DROP	1370	0.05	17.7	24	x	12	685

RETURN AIR #	1	2	3	4	5	6	7	8								BR
AIR VOLUME	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	190
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	1	1	1	1	1	1	1	14
EQUIVALENT LENGTH	185	235	165	195	155	145	240	170	0	0	0	0	0	0	0	135
TOTAL EFFECTIVE LH	227	287	232	255	221	172	280	232	1	1	1	1	1	1	1	149
ADJUSTED PRESSURE	0.07	0.05	0.06	0.06	0.07	0.09	0.05	0.06	14.80	14.80	14.80	14.80	14.80	14.80	14.80	0.10
ROUND DUCT SIZE	7.5	6	6	6	6	7.2	10.4	7.5	0	0	0	0	0	0	0	7.1
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	14

TYPE: 4506
SITE NAME: CENTREFIELD (WEST GORMLEY)

LO # 87522

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>7</u> @ 10.6 cfm <u>74.2</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 79.5 cfm		

SUPPLEMENTAL VENTILATION CAPACITY		9.32.3.5.
Total Ventilation Capacity	<u>201.4</u> cfm	
Less Principal Ventil. Capacity	<u>79.5</u> cfm	
Required Supplemental Capacity	<u>121.9</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#: 87522	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
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																																																									
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																																																								
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																																																									
$HL_{vairb} = PVC \times DTD_h \times 1.08 \times (1 - E)$ 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)																																																												
$HL_{airr} = Level\ Factor \times HL_{airbv} \times \{(HL_{agcr} + HL_{bgcr}) \div (HL_{agclevel} + HL_{bgclevel})\}$ <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>Level</th> <th>Level Factor (LF)</th> <th>HLairve Air Leakage + Ventilation Heat Loss (Btu/h)</th> <th>Level Conductive Heat Loss: (HL_{level})</th> <th>Air Leakage Heat Loss Multiplier (LF x HLairbv / HLlevel)</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>0.5</td> <td rowspan="5" style="text-align: center; vertical-align: middle;">15,101</td> <td>9,509</td> <td>0.794</td> </tr> <tr> <td>2</td> <td>0.3</td> <td>16,432</td> <td>0.276</td> </tr> <tr> <td>3</td> <td>0.2</td> <td>16,689</td> <td>0.181</td> </tr> <tr> <td>4</td> <td>0</td> <td>0</td> <td>0.000</td> </tr> <tr> <td>5</td> <td>0</td> <td>0</td> <td>0.000</td> </tr> </tbody> </table> *HLairbv = Air leakage heat loss + ventilation heat loss *For a balanced or supply only ventilation system HLairve = 0					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	16,432	0.276	3	0.2	16,689	0.181	4	0	0	0.000	5	0	0	0.000																														
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		16,432	0.276																																																								
3	0.2		16,689	0.181																																																								
4	0		0	0.000																																																								
5	0		0	0.000																																																								

HEAT LOSS AND GAIN SUMMARY SHEET

MODEL: 4506	BUILDER: ROYAL PINE HOMES
SFQT: 3348	SITE: CENTREFIELD (WEST GORMLEY)
LO# 87522	

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:	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: 56.0 ft	WIDTH: 38.0 ft	EXPOSED PERIMETER:	188.0 ft

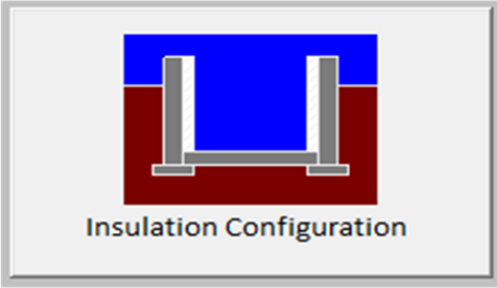
2012 OBC - COMPLIANCE PACKAGE		Compliance Package	
Component		SB-12 PERFORMANCE	
		Nominal	Min. Eff.
Ceiling with Attic Space Minimum RSI (R)-Value		60	59.20
Ceiling Without Attic Space Minimum RSI (R)-Value		31	27.70
Exposed Floor Minimum RSI (R)-Value		31	29.80
Walls Above Grade Minimum RSI (R)-Value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

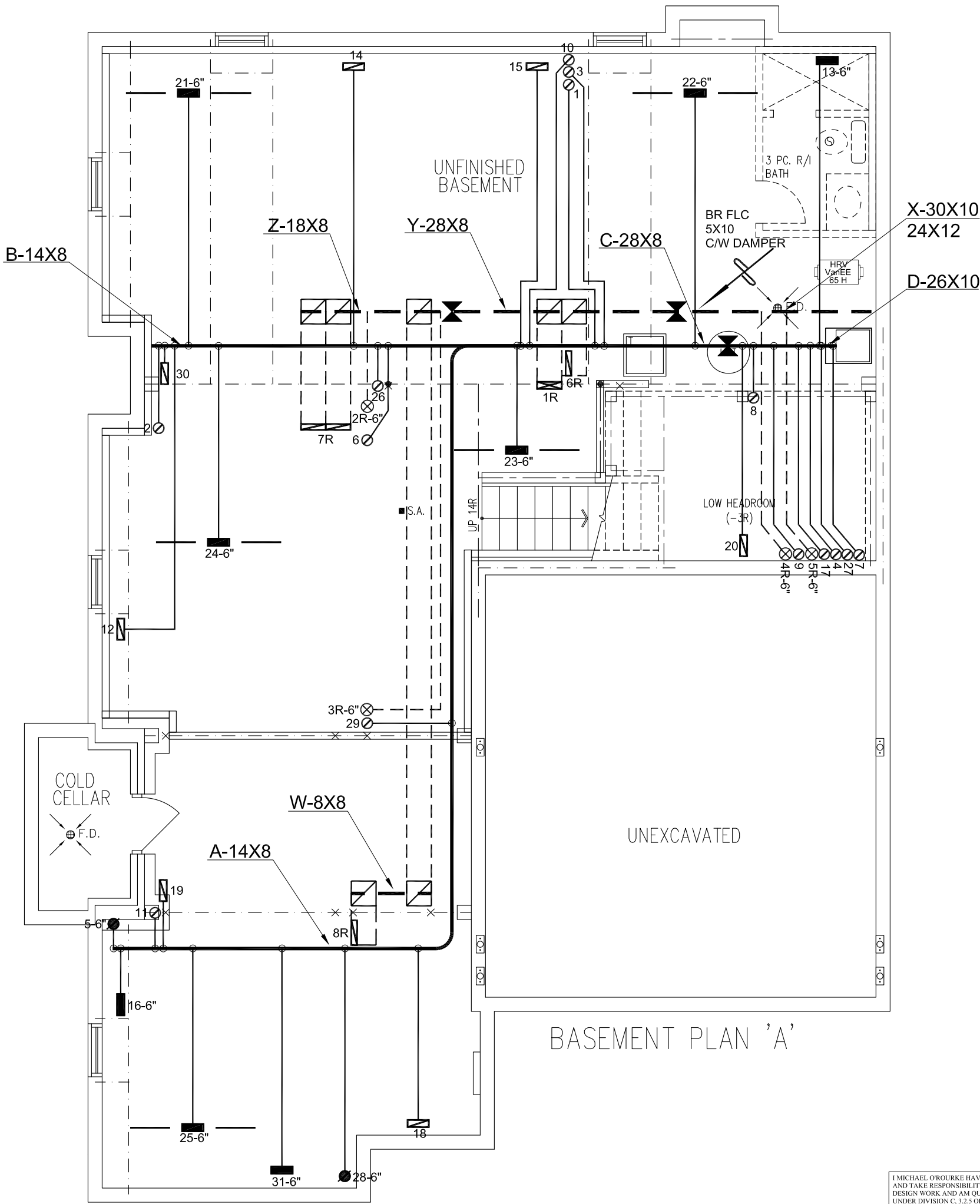
TYPE: 4506
LO# 87522

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		
	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):	0.233			
Cooling Air Leakage Rate (ACH/H):	0.073			

TYPE: 4506
LO# 87522



BASEMENT PLAN 'A'

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.

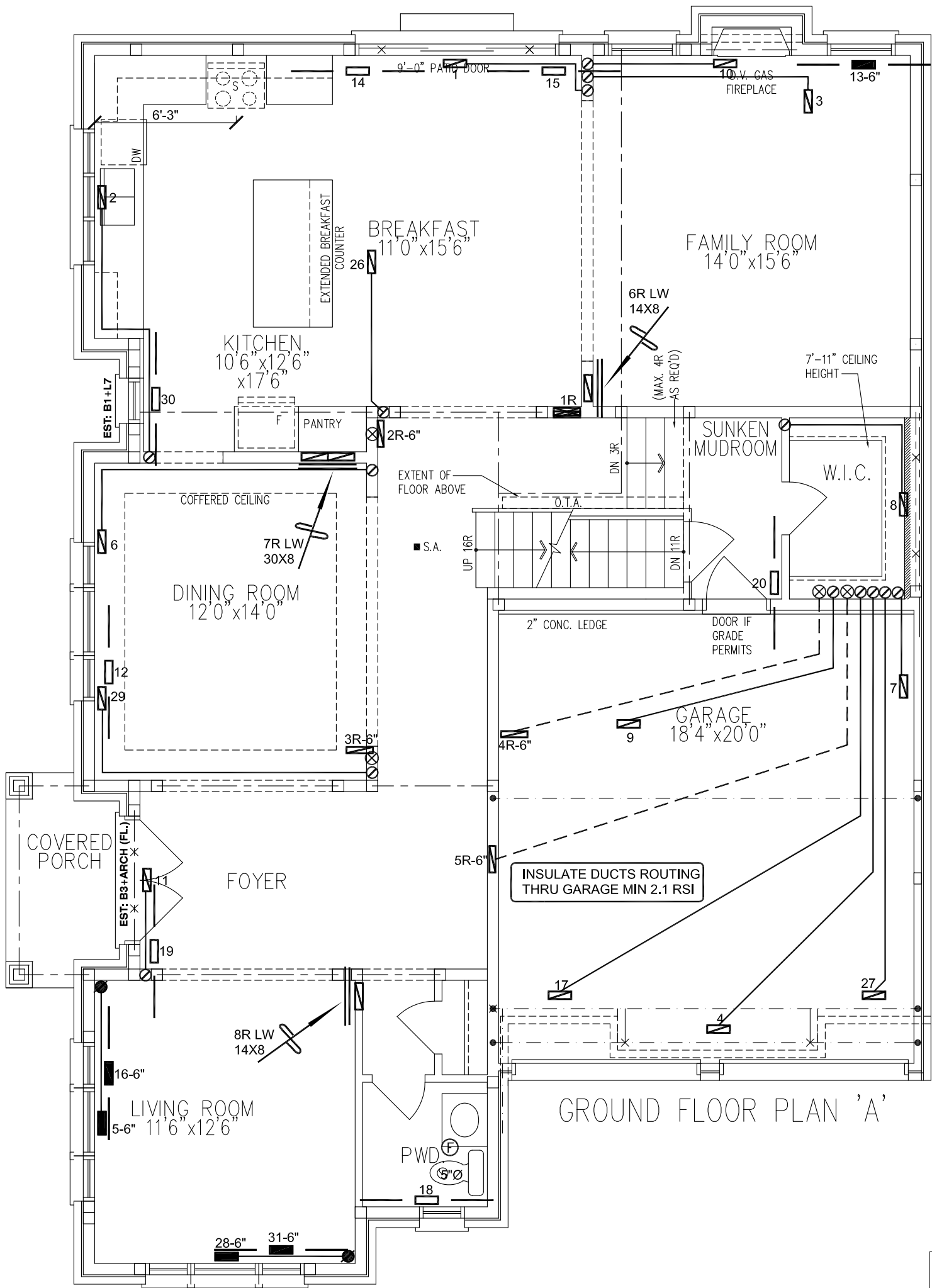
CSA-F280-12

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	 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 59893 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-080-14V	2ND FLOOR			16	5		5
CENTREFIELD (WEST GORMLEY) RICHMOND HILL, ONTARIO		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"			BCIN# 19669	
4506	3348 sqft	FAN SPEED 1370 cfm @ 0.6" w.c.				LO# 87522			



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.

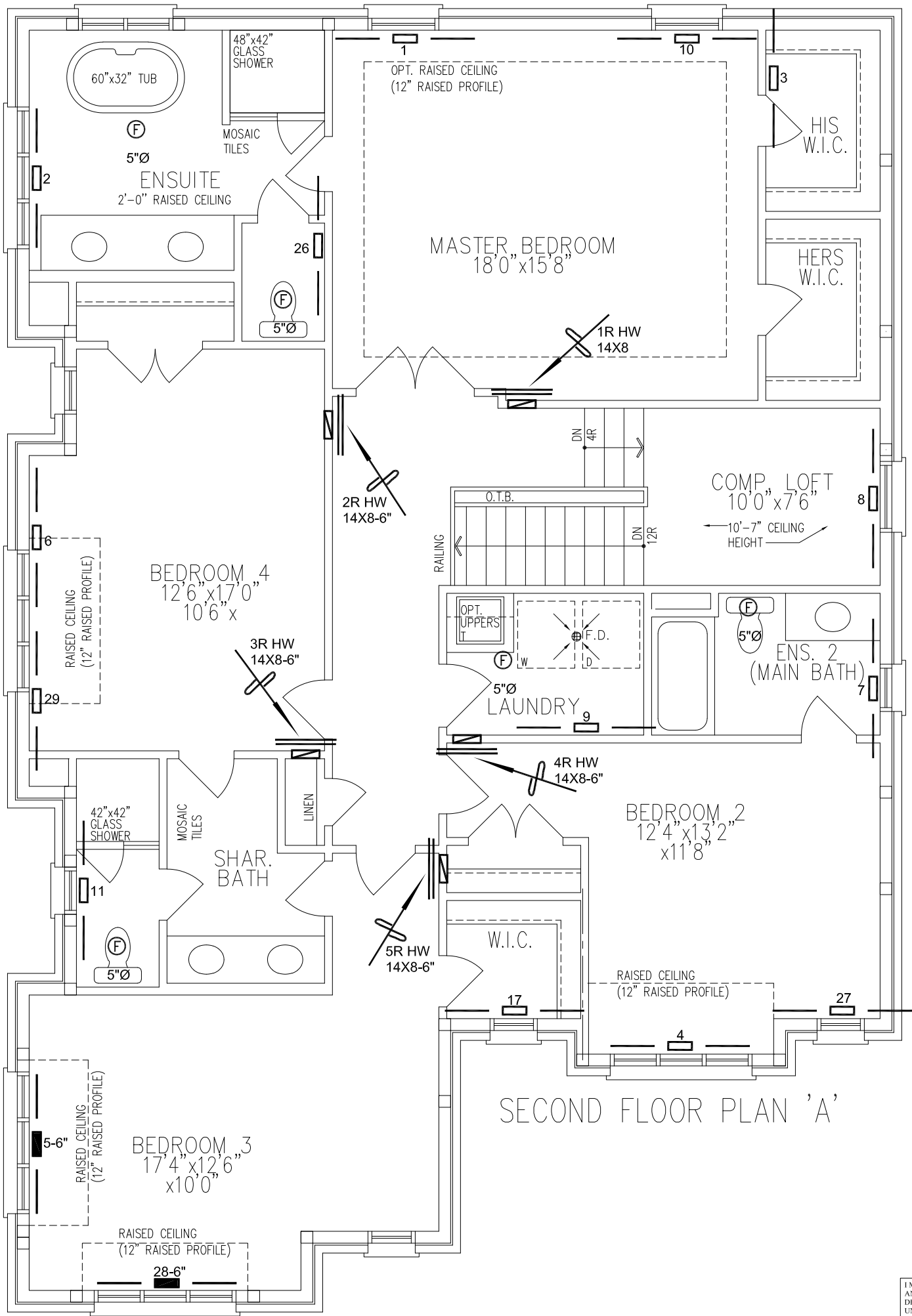
CSA-F280-12

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		 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
			Scale	3/16" = 1'-0"
		BCIN# 19669		
4506	3348 sqft	LO#	87522	



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.

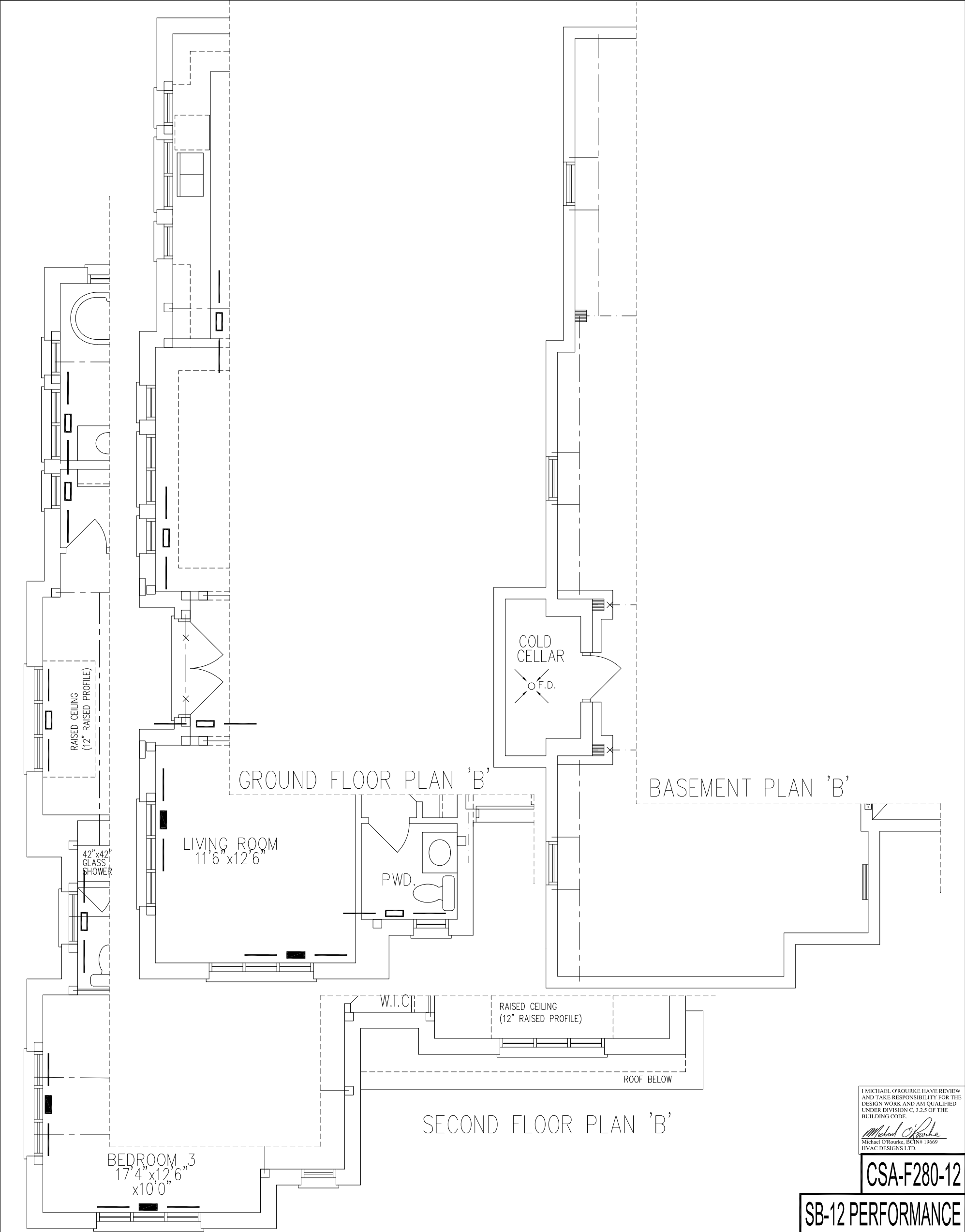
CSA-F280-12

SB-12 PERFORMANCE

HVAC LEGEND								3.	REVISED AS PER CAD	JUNE/2021
	SUPPLY AIR GRILLE		6" SUPPLY AIR BOOT ABOVE		14"x8" RETURN AIR GRILLE		RETURN AIR STACK ABOVE	2.	REVISED AS PER ARCHITECTURALS	APR/2021
	SUPPLY AIR GRILLE 6" BOOT		SUPPLY AIR STACK FROM 2nd FLOOR		30"x8" RETURN AIR GRILLE		RETURN AIR STACK 2nd FLOOR	1.	REVISED TO PERFORMANCE	SEPT/2020
	SUPPLY AIR BOOT ABOVE		6" SUPPLY AIR STACK 2nd FLOOR		FRA- FLOOR RETURN AIR GRILLE		REDUCER	No.	Description	Date
								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 CENTREFIELD (WEST GORMLEY) RICHMOND HILL, ONTARIO			Date	SEPT/2020
			Scale	3/16" = 1'-0"
		BCIN# 19669		
4506	3348 sqft	LO#	87522	



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		 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			THIRD FLOOR HEATING LAYOUT	
Project Name			Date	SEPT/2020
CENTREFIELD (WEST GORMLEY) RICHMOND HILL, ONTARIO			Scale	3/16" = 1'-0"
4506			BCIN# 19669	
3348 sqft			LO#	87522

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 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 4, 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.

SITE NAME: CENTREFIELD (WEST GORMLEY) BUILDER: ROYAL PINE HOMES										TYPE: 4506		GFA: 3348		DATE: Jun-21 LO# 91152		WINTER NATURAL AIR CHANGE RATE 0.233 SUMMER NATURAL AIR CHANGE RATE 0.073		HEAT LOSS AT °F. 78 HEAT GAIN AT °F. 13		CSA-F280-12 SB-12 PERFORMANCE			
ROOM USE		MBR		ENS		WIC		BED-2		BED-3		BED-4		BATH		COMP		LAUN		ENS-2		LAUN-2	
EXP. WALL		18 9		23 9		23 9		29 9		47 9		19 9		9 9		8 12		0 9		6 9		16 11	
CLG. HT.																							
FACTORS																							
GRS.WALL AREA		162		261		207		261		423		171		81		96		0		54		176	
GLAZING		LOSS		GAIN		LOSS		LOSS		LOSS		LOSS		LOSS		LOSS		LOSS		LOSS		LOSS	
NORTH		21.8		14.9		0		0		0		0		0		0		0		7		152	
EAST		21.8		38.4		0		45		980		1727		0		0		0		0		0	
SOUTH		21.8		23.1		0		37		806		856		0		0		0		0		0	
WEST		21.8		38.4		28		610		1075		27		588		1036		0		0		0	
SKYLT.		35.8		101.2		0		0		0		0		0		0		0		0		0	
DOORS		25.8		4.3		0		0		0		0		0		0		0		0		0	
NET EXPOSED WALL		4.2		0.7		134		564		93		197		828		136		207		871		143	
NET EXPOSED BSMT WALL ABOVE GR		3.7		0.6		0		0		0		0		0		0		0		47		198	
EXPOSED CLG		1.3		0.6		306		402		180		66		87		39		102		134		60	
NO ATTIC EXPOSED CLG		2.8		1.3		0		0		0		0		0		0		0		42		55	
EXPOSED FLOOR		2.6		0.4		0		0		0		0		0		0		0		66		172	
BASEMENT/CRAWL HEAT LOSS		0		0		0		0		0		0		0		0		0		28		0	
SLAB ON GRADE HEAT LOSS		0		0		0		0		0		0		0		0		0		0		0	
SUBTOTAL HT LOSS		1576		2675		1005		2694		3594		1966		770		944		165		609		740	
SUB TOTAL HT GAIN		0.20		0.18		0.20		0.18		0.20		0.18		0.20		0.18		0.20		0.18		0.20	
LEVEL FACTOR / MULTIPLIER		285		484		182		488		650		356		139		171		30		110		205	
AIR CHANGE HEAT LOSS		60		99		9		93		132		59		19		17		2		9		5	
AIR CHANGE HEAT GAIN		0		0		0		318		0		0		0		0		19		72		0	
DUCT LOSS		0		0		0		0		0		0		0		0		0		21		0	
DUCT GAIN		2		0		0		1		1		1		0		0		0		0		0	
HEAT GAIN PEOPLE		240		0		0		290		0		0		0		0		0		52		0	
HEAT GAIN APPLIANCES/LIGHTS		480		0		0		240		0		240		0		0		0		0		0	
TOTAL HT LOSS BTU/H		473		0		0		473		473		473		0		473		473		0		473	
TOTAL HT GAIN x 1.3 BTU/H		1861		3159		1186		3499		4245		2322		910		1115		214		791		945	
		3069		3028		276		4145		4961		2735		584		1138		741		305		781	

TOTAL HEAT GAIN BTU/H: 42554										TONS: 3.55		LOSS DUE TO VENTILATION LOAD BTU/H: 1670		STRUCTURAL HEAT LOSS: 56176		TOTAL COMBINED HEAT LOSS BTU/H: 59846	
ROOM USE	EXP. WALL	CLG. HT.	FACTORS		DIN	FAM	KIT	LIV	WIC-3	WIR	FOY	MUD	BAS	TOTAL		TOTAL	
GRS.WALL AREA	GLAZING		LOSS	GAIN	308	363	671	341	54	198	165	121	1128				
NORTH			21.8	14.9	0	0	0	0	0	0	0	0	0				
EAST			21.8	38.4	0	0	0	0	0	0	0	0	0				
SOUTH			21.8	23.1	49	1067	1133	43	937	1651	0	0	0				
WEST			21.8	38.4	0	0	0	0	0	0	0	0	0				
SKYLT.			35.8	101.2	0	0	0	0	0	0	0	0	0				
DOORS			25.8	4.3	0	0	0	0	0	0	0	0	0				
NET EXPOSED WALL			4.2	0.7	259	1089	179	326	1371	226	562	2363	389				
NET EXPOSED BSMT WALL ABOVE GR			3.7	0.6	0	0	0	0	0	0	0	0	0				
EXPOSED CLG			1.3	0.6	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				
BASEMENT/CRAWL HEAT LOSS			2.6	0.4	0	0	0	0	0	0	0	0	0				
SLAB ON GRADE HEAT LOSS					2167												
SUBTOTAL HT LOSS					2167												
SUB TOTAL HT GAIN					0.30	0.28	0.30	0.28	0.20	0.18	0.30	0.28	0.50				
LEVEL FACTOR / MULTIPLIER					596												
AIR CHANGE HEAT LOSS					58												
AIR CHANGE HEAT GAIN					0												
DUCT LOSS					0												
DUCT GAIN					0												
HEAT GAIN PEOPLE			240		473												
HEAT GAIN APPLIANCES/LIGHTS					473												
TOTAL HT LOSS BTU/H					2763												
TOTAL HT GAIN x 1.3 BTU/H					2397												

SITE NAME: CENTREFIELD (WEST GORMLEY)
BUILDER: ROYAL PINE HOMESOPT GROUND
TYPE: 4506

DATE: Jun-21

GFA: 3348 LO# 91152

HEATING CFM 1370 COOLING CFM 1370
TOTAL HEAT LOSS 58,176 TOTAL HEAT GAIN 42,280
AIR FLOW RATE CFM 23.55 AIR FLOW RATE CFM 32.459TN6A-080-14V 80
FAN SPEED
LOW 1030
MEDIUM 1370
HIGH 1800AFUE = 97 %
INPUT (BTU/H) = 80,000
OUTPUT (BTU/H) = 78,000

RUN COUNT	4th	3rd	2nd	1st	Bas
S/A	0	0	16	11	5
R/A	0	0	5	3	1

All S/A diffusers 4"x10" unless noted otherwise on layout.

All S/A runs 5"Ø unless noted otherwise on layout.

ROOM #	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
ROOM NAME	MBR	ENS	WIC	BED-2	BED-3	BED-4	BATH	COMP	LAUN	MBR	ENS-2	DIN	FAM	KIT	KIT	LIV	WIC-3	W/R	FOY	MUD	BAS	BAS	BAS	BAS
RM LOSS MBH	0.93	1.58	1.19	1.75	2.12	1.16	1.16	0.91	0.21	0.93	0.79	2.75	2.78	2.02	2.02	1.88	0.90	1.29	1.24	1.20	3.41	3.41	3.41	3.41
CFM PER RUN HEAT	22	37	28	41	50	27	21	26	5	22	19	65	65	47	47	44	21	30	50	28	80	80	80	80
RM GAIN MBH	1.53	1.51	0.28	2.07	2.48	1.37	0.59	1.14	0.74	1.53	0.31	2.40	2.85	2.01	2.01	2.22	0.68	0.70	0.59	0.83	0.40	0.40	0.40	0.40
CFM PER RUN COOLING	50	49	9	67	80	44	19	37	24	50	10	78	92	65	65	72	22	23	19	27	13	13	13	13
ADJUSTED PRESSURE	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	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	54	48	82	52	25	26	38	49	76	49	14	37	32	66	55	58	65	16	43	20	21	39
EQUIVALENT LENGTH	220	160	195	150	150	210	200	150	140	150	170	130	140	150	130	140	150	180	160	110	130	150	130	140
TOTAL EFFECTIVE LENGTH	262	220	249	198	232	262	262	225	176	178	199	246	179	154	187	206	205	238	225	126	173	170	151	179
ADJUSTED PRESSURE	0.07	0.08	0.07	0.09	0.07	0.07	0.08	0.1	0.1	0.09	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	5	5	4	5	6	5	4	4	4	5	4	5	5	5	5	6	4	4	5	4	5	6	6	6
HEATING VELOCITY (ft/min)	162	272	321	301	255	198	241	298	57	162	218	477	477	345	345	224	241	344	367	321	587	408	408	408
COOLING VELOCITY (ft/min)	367	360	103	492	408	323	218	424	275	367	115	573	675	477	477	367	252	264	140	310	95	66	66	66
OUTLET GRILL SIZE	3X10	3X10	3X10	3X10	4X10	3X10	3X10	3X10	3X10	3X10	3X10	3X10	3X10	3X10	3X10	4X10	3X10	3X10	3X10	3X10	3X10	4X10	4X10	4X10
TRUNK	C	B	C	D	A	B	D	D	D	C	A	B	D	B	C	A	D	A	A	D	B	C	C	B

ROOM #	25	26	27	28	29	30	31	32
ROOM NAME	BAS	ENS	BED-2	BED-3	BED-4	KIT	LIV	LAUN-2
RM LOSS MBH	3.41	1.58	1.75	2.12	1.16	2.02	1.88	0.94
CFM PER RUN HEAT	80	37	41	50	27	44	44	22
RM GAIN MBH	0.40	1.51	2.07	2.48	1.37	2.01	2.22	0.78
CFM PER RUN COOLING	13	49	67	80	44	65	72	25
ADJUSTED PRESSURE	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17
ACTUAL DUCT LGH	68	43	39	79	66	34	67	14
EQUIVALENT LENGTH	150	200	180	210	240	130	160	120
TOTAL EFFECTIVE LENGTH	218	243	219	289	306	164	227	134
ADJUSTED PRESSURE	0.08	0.07	0.08	0.06	0.06	0.1	0.08	0.13
ROUND DUCT SIZE	6	5	5	6	5	5	6	4
HEATING VELOCITY (ft/min)	408	272	301	255	198	345	224	252
COOLING VELOCITY (ft/min)	66	360	492	408	323	477	367	287
OUTLET GRILL SIZE	4X10	3X10	3X10	3X10	3X10	3X10	4X10	3X10
TRUNK	A	B	D	A	A	B	A	D

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 CFM	STATIC PRESS.	ROUND DUCT	RECT DUCT	VELOCITY (ft/min)
TRUNK A	394	0.06	10.6	14	8	0	0.00	0	0	8	0	0.00	0	0	8
TRUNK B	420	0.07	10.5	14	8	0	0.00	0	0	8	0	0.00	0	0	8
TRUNK C	1093	0.06	15.6	28	8	0	0.00	0	0	8	0	0.00	0	0	8
TRUNK D	1363	0.06	16.9	26	10	0	0.00	0	0	8	0	0.00	0	0	8
TRUNK E	0	0.00	0	0	8	0	0.00	0	0	8	0	0.00	0	0	8
TRUNK F	0	0.00	0	0	8	0	0.00	0	0	8	0	0.00	0	0	8

RETURN AIR #	1	2	3	4	5	6	7	8
AIR VOLUME	175	75	85	85	95	180	330	155
PLENUM PRESSURE	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
EQUIVALENT LENGTH	185	235	165	195	155	145	240	170
TOTAL EFFECTIVE LH	227	287	232	255	221	172	280	232
ADJUSTED PRESSURE	0.07	0.05	0.06	0.06	0.07	0.09	0.05	0.06
ROUND DUCT SIZE	7.5	6	6	6	8	7.2	10.4	7.5
INLET GRILL SIZE	X	X	X	X	X	X	X	X
INLET GRILL SIZE	14	14	14	14	14	14	30	14

Michael O'Rourke

TYPE: 4506
SITE NAME: CENTREFIELD (WEST GORMLEY)

LO # 91152
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	2 @ 21.2 cfm	42.4 cfm
Other Bedrooms	3 @ 10.6 cfm	31.8 cfm
Kitchen & Bathrooms	5 @ 10.6 cfm	53 cfm
Other Rooms	8 @ 10.6 cfm	84.8 cfm
Table 9.32.3.A.	TOTAL	212.0 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	212	cfm
Less Principal Ventil. Capacity	79.5	cfm
Required Supplemental Capacity	132.5	cfm

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

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

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

HEAT RECOVERY VENTILATOR		9.32.3.11.
Model: VANEE 65H		
155	cfm high	64 cfm low
75	% 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

CSA F280-12 Residential Heat Loss and Heat Gain Calculations																																																											
Formula Sheet (For Air Leakage / Ventilation Calculation)																																																											
LO#: 91152		Model: 4506		Builder: ROYAL PINE HOMES		Date: 2021-06-04																																																					
Volume Calculation					Air Change & Delta T Data																																																						
<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>House Volume 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>					House Volume 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;"> <thead> <tr> <th colspan="3" style="text-align: center;">Design Temperature Difference</th> </tr> <tr> <th>Tin °C</th> <th>Tout °C</th> <th>ΔT °C</th> </tr> </thead> <tbody> <tr> <td>Winter DTDh</td> <td>22</td> <td>-21</td> </tr> <tr> <td>Summer DTDc</td> <td>24</td> <td>31</td> </tr> <tr> <td></td> <td></td> <td>7</td> </tr> <tr> <td></td> <td></td> <td>13</td> </tr> </tbody> </table>					Design Temperature Difference			Tin °C	Tout °C	ΔT °C	Winter DTDh	22	-21	Summer DTDc	24	31			7			13
House Volume 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																																																								
Design Temperature Difference																																																											
Tin °C	Tout °C	ΔT °C																																																									
Winter DTDh	22	-21																																																									
Summer DTDc	24	31																																																									
		7																																																									
		13																																																									
5.2.3.1 Heat Loss due to Air Leakage					6.2.6 Sensible Gain due to Air Leakage																																																						
$HL_{airb} = LR_{airb} \times \frac{V_b}{3.6} \times DTD_h \times 1.2$					$HG_{salb} = LR_{airc} \times \frac{V_b}{3.6} \times DTD_c \times 1.2$																																																						
0.233 x 366.54 x 43 °C x 1.2 = 4426 W					= 0.073 x 366.54 x 7 °C x 1.2 = 227 W																																																						
= 15101 Btu/h					= 775 Btu/h																																																						
5.2.3.2 Heat Loss due to Mechanical Ventilation					6.2.7 Sensible heat Gain due to Ventilation																																																						
$HL_{vairb} = PVC \times DTD_h \times 1.08 \times (1 - E)$					$HL_{vairb} = PVC \times DTD_h \times 1.08 \times (1 - E)$																																																						
80 CFM x 78 °F x 1.08 x 0.25 = 1670 Btu/h					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)																																																											
$HL_{airr} = Level Factor \times HL_{airbv} \times \{(HL_{agcr} + HL_{bgcr}) \div (HL_{agclvl} + HL_{bgclvl})\}$																																																											
<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>Level</th> <th>Level Factor (LF)</th> <th>Hlaire Air Leakage + Ventilation Heat Loss (Btu/h)</th> <th>Level Conductive Heat Loss: (HL_{clvl})</th> <th>Air Leakage Heat Loss Multiplier (LF x Hlaireb / HL_{clvl})</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>0.5</td> <td rowspan="5" style="text-align: center; vertical-align: middle;">15,101</td> <td>9,509</td> <td>0.794</td> </tr> <tr> <td>2</td> <td>0.3</td> <td>16,386</td> <td>0.276</td> </tr> <tr> <td>3</td> <td>0.2</td> <td>16,689</td> <td>0.181</td> </tr> <tr> <td>4</td> <td>0</td> <td>0</td> <td>0.000</td> </tr> <tr> <td>5</td> <td>0</td> <td>0</td> <td>0.000</td> </tr> </tbody> </table>			Level	Level Factor (LF)	Hlaire Air Leakage + Ventilation Heat Loss (Btu/h)	Level Conductive Heat Loss: (HL _{clvl})	Air Leakage Heat Loss Multiplier (LF x Hlaireb / HL _{clvl})	1	0.5	15,101	9,509	0.794	2	0.3	16,386	0.276	3	0.2	16,689	0.181	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 Hlairev = 0																														
Level	Level Factor (LF)	Hlaire Air Leakage + Ventilation Heat Loss (Btu/h)	Level Conductive Heat Loss: (HL _{clvl})	Air Leakage Heat Loss Multiplier (LF x Hlaireb / HL _{clvl})																																																							
1	0.5	15,101	9,509	0.794																																																							
2	0.3		16,386	0.276																																																							
3	0.2		16,689	0.181																																																							
4	0		0	0.000																																																							
5	0		0	0.000																																																							

HEAT LOSS AND GAIN SUMMARY SHEET

MODEL: 4506	OPT GROUND	BUILDER: ROYAL PINE HOMES
SFQT: 3348	LO# 91152	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:	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: 56.0 ft	WIDTH: 38.0 ft	EXPOSED PERIMETER:	188.0 ft

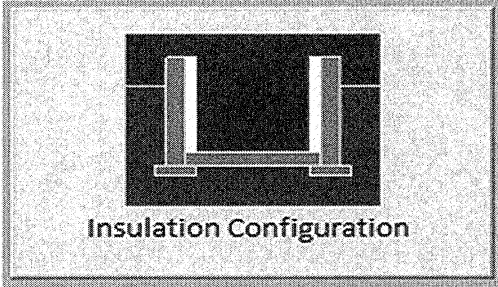
2012 OBC - COMPLIANCE PACKAGE		
Component	Compliance Package SB-12 PERFORMANCE	
	Nominal	Min. Eff.
Ceiling with Attic Space Minimum RSI (R)-Value	60	59.20
Ceiling Without Attic Space Minimum RSI (R)-Value	31	27.70
Exposed Floor Minimum RSI (R)-Value	31	29.80
Walls Above Grade Minimum RSI (R)-Value	22+1.5	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):	17.1	 Insulation Configuration
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# 91152

OPT GROUND

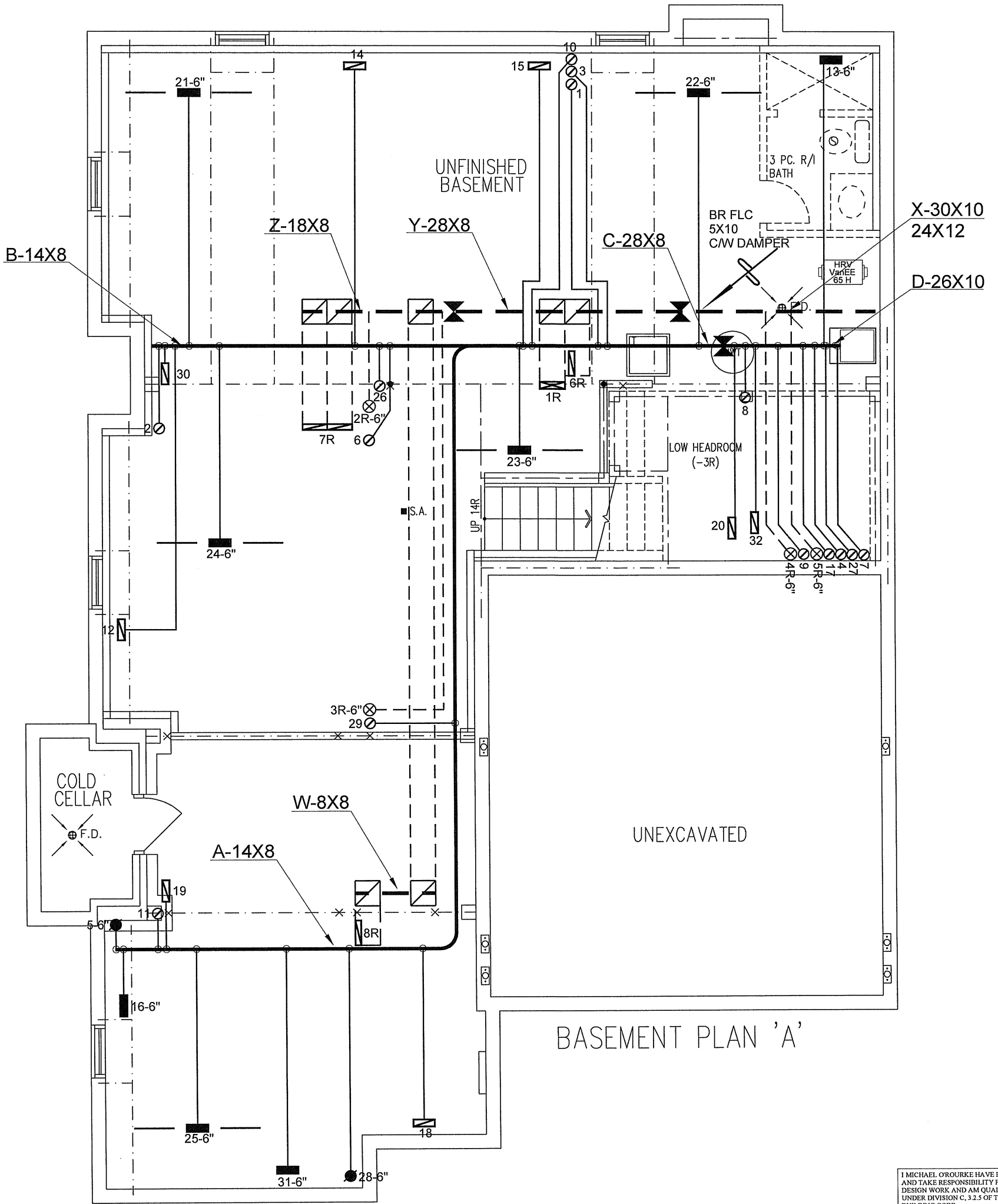
Air Infiltration Residential Load Calculator

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):	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		
	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):	0.233			
Cooling Air Leakage Rate (ACH/H):	0.073			

TYPE: 4506
LO# 91152

OPT GROUND



BASEMENT PLAN 'A'

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.

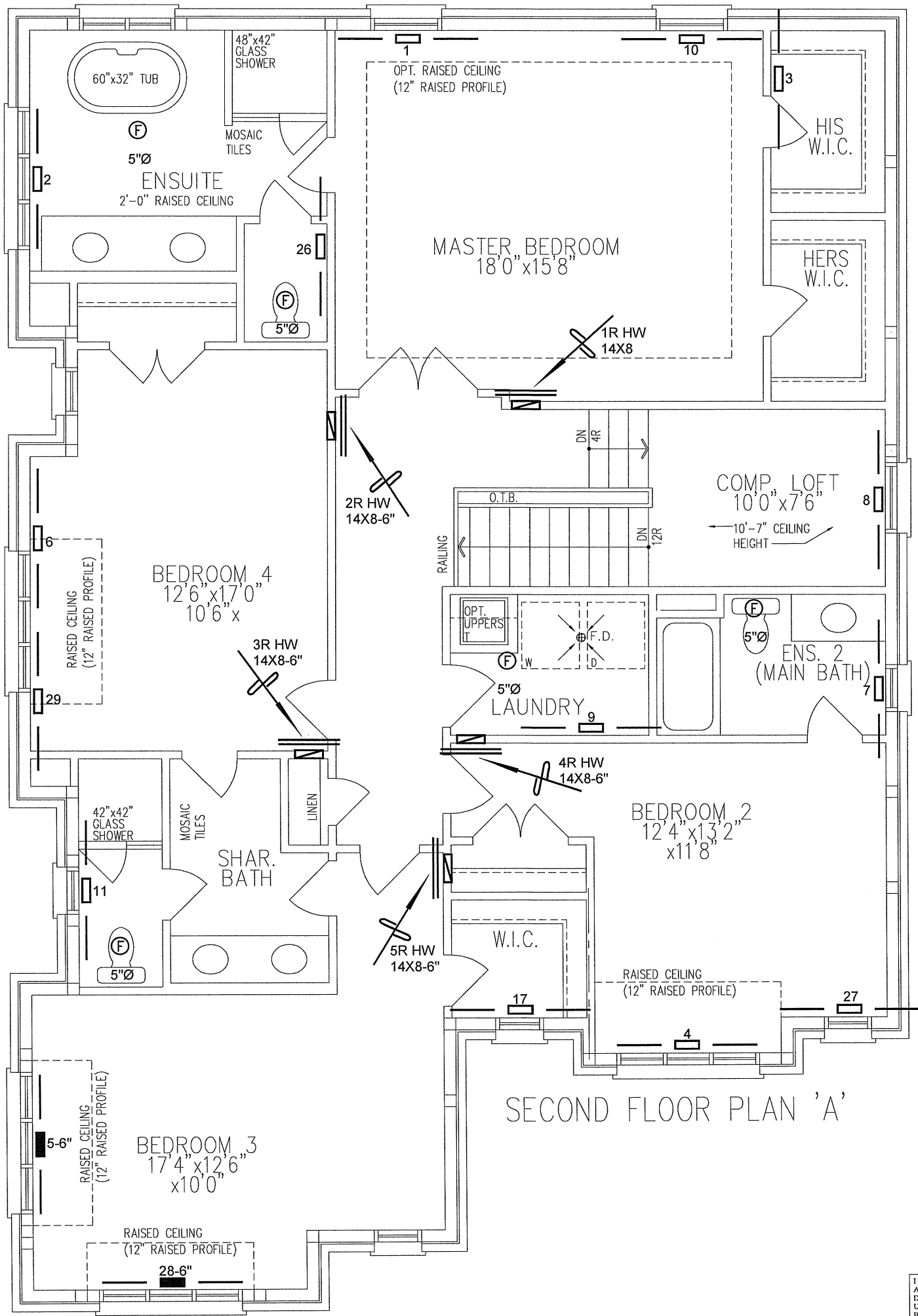
CSA-F280-12

SB-12 PERFORMANCE

HVAC LEGEND						3.		
SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	
	SUPPLY AIR GRILLE		6" SUPPLY AIR BOOT ABOVE		14"x8" RETURN AIR GRILLE		RETURN AIR STACK ABOVE	2.
	SUPPLY AIR GRILLE 6" BOOT		SUPPLY AIR STACK FROM 2nd FLOOR		30"x8" RETURN AIR GRILLE		RETURN AIR STACK 2nd FLOOR	1.
	SUPPLY AIR BOOT ABOVE		6" SUPPLY AIR STACK 2nd FLOOR		FRA- FLOOR RETURN AIR GRILLE		REDUCER	No.
							Description	Date
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	HEAT LOSS 59846 BTU/H UNIT DATA		# OF RUNS S/A R/A FANS			Sheet Title BASEMENT HEATING LAYOUT	
Project Name CENTREFIELD (WEST GORMLEY) RICHMOND HILL, ONTARIO			MAKE CARRIER		3RD FLOOR				
			MODEL 59TN6A-080-14V		2ND FLOOR	16	5		
			INPUT 80 MBTU/H		1ST FLOOR	11	3	3	
			OUTPUT 78 MBTU/H		BASEMENT	5	1	0	
OPT GROUND 4506		COOLING 3.5 TONS		ALL S/A DIFFUSERS 4 "x10" UNLESS NOTED OTHERWISE ON LAYOUT. ALL S/A RUNS 5"Ø UNLESS NOTED OTHERWISE ON LAYOUT. UNDERCUT DOORS 1" min. FOR R/A			Date JUNE/2021		
		FAN SPEED 1370 cfm @ 0.6" w.c.					Scale 3/16" = 1'-0"		
		3348 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.					BCIN# 19669
							LO# 91152		



SECOND FLOOR PLAN 'A'

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.

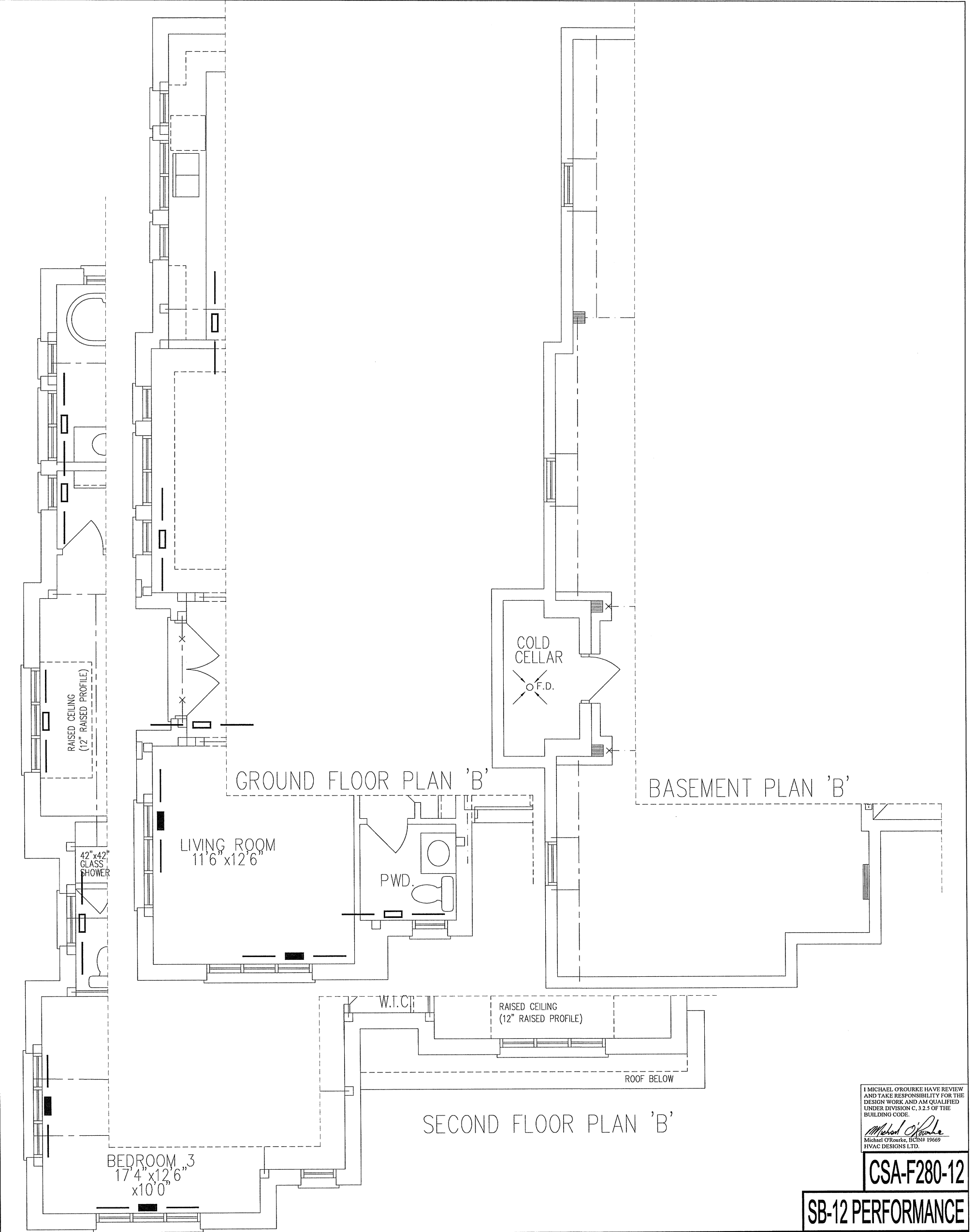
CSA-F280-12

SB-12 PERFORMANCE

HVAC LEGEND						3.		
SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	
	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.
	SUPPLY AIR BOOT ABOVE		6" SUPPLY AIR STACK 2nd FLOOR		FRA- FLOOR RETURN AIR GRILLE		REDUCER	
REVISIONS								
Description								Date

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 CENTREFIELD (WEST GORMLEY) RICHMOND HILL, ONTARIO			Date	JUNE/2021
			Scale	3/16" = 1'-0"
OPT GROUND 4506		BCIN# 19669		
3348 sqft		LO#	91152	



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	

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			THIRD FLOOR HEATING LAYOUT	
Project Name			Date	JUNE/2021
CENTREFIELD (WEST GORMLEY) RICHMOND HILL, ONTARIO			Scale	3/16" = 1'-0"
OPT GROUND 4506			BCIN# 19669	
3348 sqft			LO#	91152

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> (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 4, 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 0.233				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	7	152	102	
EAST		21.8	37.1	0	0	0	0	0	0	0	45	980	1671	45	980	1671	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	36	784	807	45	980	1009	13	283	291	0	0	0	0	
WEST		21.8	37.1	30	654	1114	0	0	0	28	610	1039	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	
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	
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	
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	
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	
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	
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	
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				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				
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	0	1	240	1	240	1	240	1	240	1	240	0	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
GRS.WALL AREA	FACTORS	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				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
EAST	21.8 37.1	0 0 0	0 0 0	0 0 0	43 937 1596	9 196 334	10 218 371	0 0 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	0 0 0	8 174 179	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 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 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	39 1008 166	20 517 85				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 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
BASEMENT/CRAWL HEAT LOSS		0	0	0	0	0	0	0	0				6479
SLAB ON GRADE HEAT LOSS		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	0.30 0.27	0.30 0.27	0.20 0.17	0.30 0.27	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
HEAT GAIN APPLIANCES/LIGHTS		385	385	385	385	385	385	385	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

TOTAL HEAT GAIN BTU/H:

42628

TONS: 3.55

LOSS DUE TO VENTILATION LOAD BTU/H: 2004

STRUCTURAL HEAT LOSS: 59088

TOTAL COMBINED HEAT LOSS BTU/H: 61092

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

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

FAN SPEED
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	STATIC	ROUND	RECT			VELOCITY		TRUNK	STATIC	ROUND	RECT			VELOCITY
	CFM	PRESS.	DUCT	DUCT			(ft/min)		CFM	PRESS.	DUCT	DUCT			(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

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
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																																																									
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																																																								
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

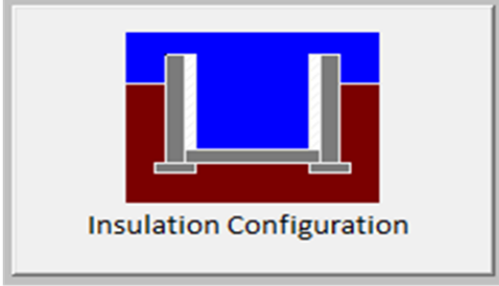
2012 OBC - COMPLIANCE PACKAGE		Compliance Package	
Component		SB-12 PERFORMANCE	
		Nominal	Min. Eff.
Ceiling with Attic Space Minimum RSI (R)-Value		60	59.20
Ceiling Without Attic Space Minimum RSI (R)-Value		31	27.70
Exposed Floor Minimum RSI (R)-Value		31	29.80
Walls Above Grade Minimum RSI (R)-Value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

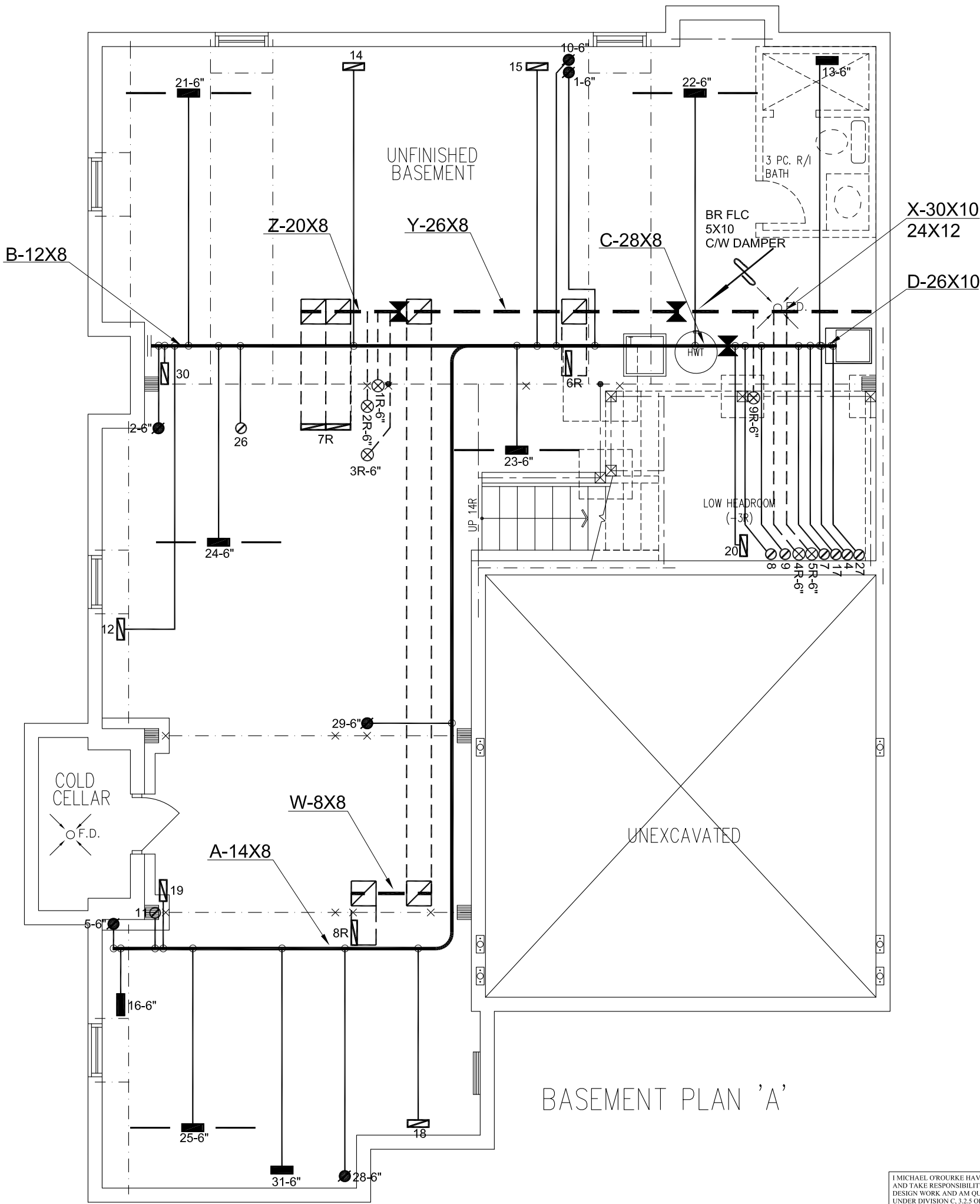
Air Infiltration Residential Load Calculator

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



BASEMENT PLAN 'A'

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.

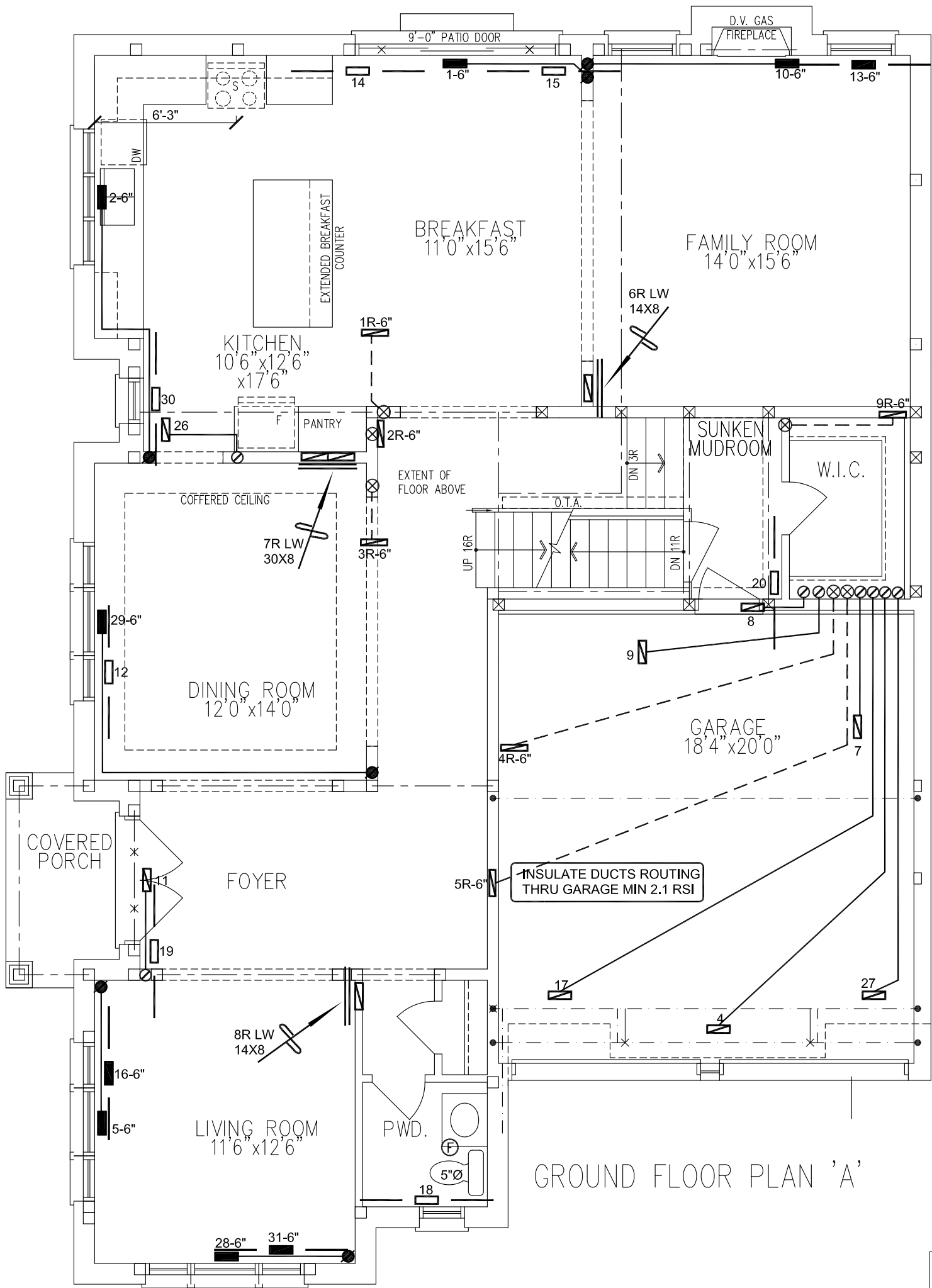
CSA-F280-12

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 61092 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 59TN6A-080-14V		2ND FLOOR	14	6	4	
		INPUT 80 MBTU/H		1ST FLOOR	10	3	2	Date SEPT/2020
		OUTPUT 78 MBTU/H		BASEMENT	5	1	0	Scale 3/16" = 1'-0"
OPT 2ND 4506	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				BCIN# 19669	
3348 sqft	FAN SPEED 1370 cfm @ 0.6" w.c.						LO#	87523



GROUND FLOOR PLAN 'A'

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.

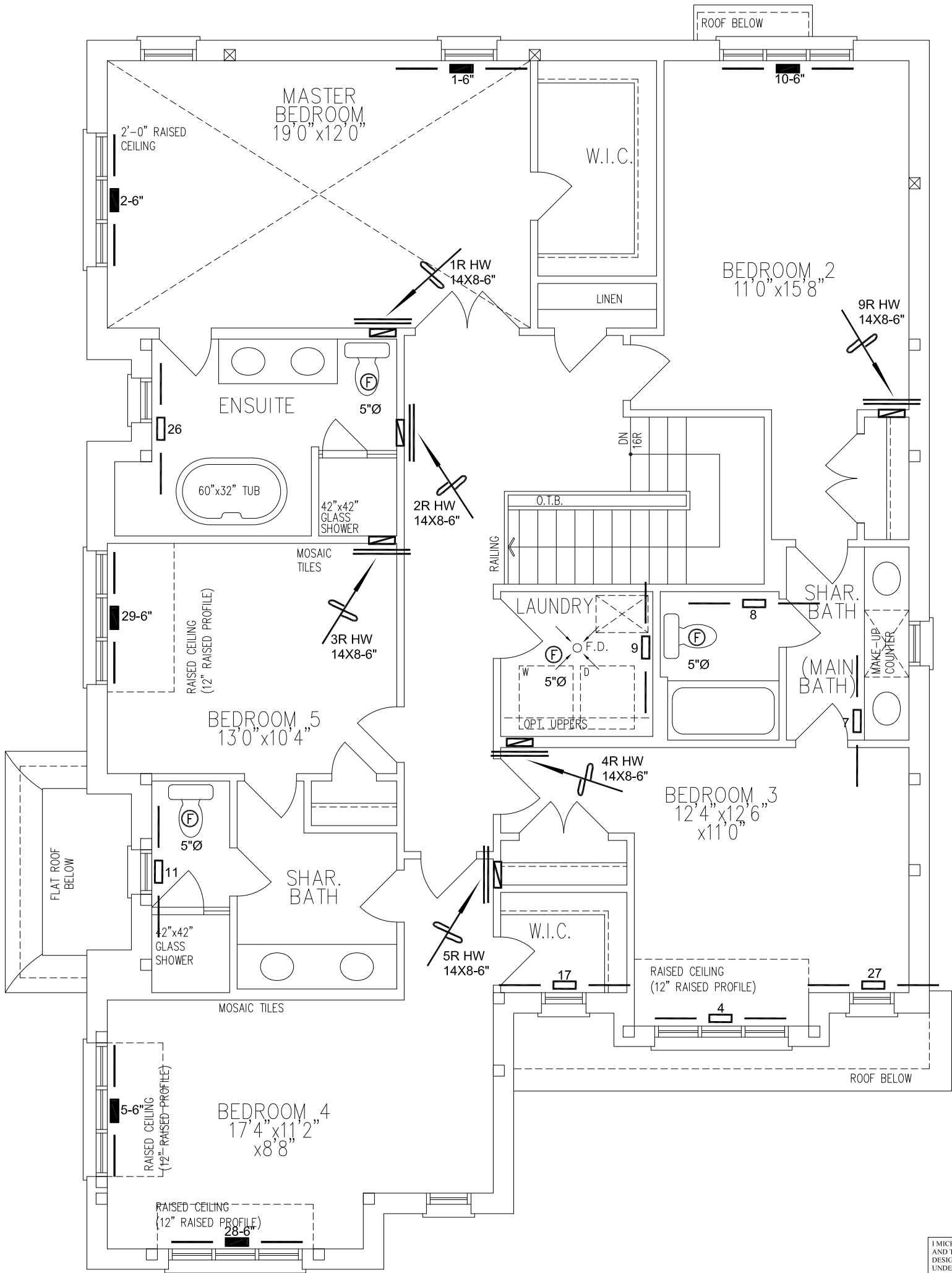
CSA-F280-12

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		 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



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.

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

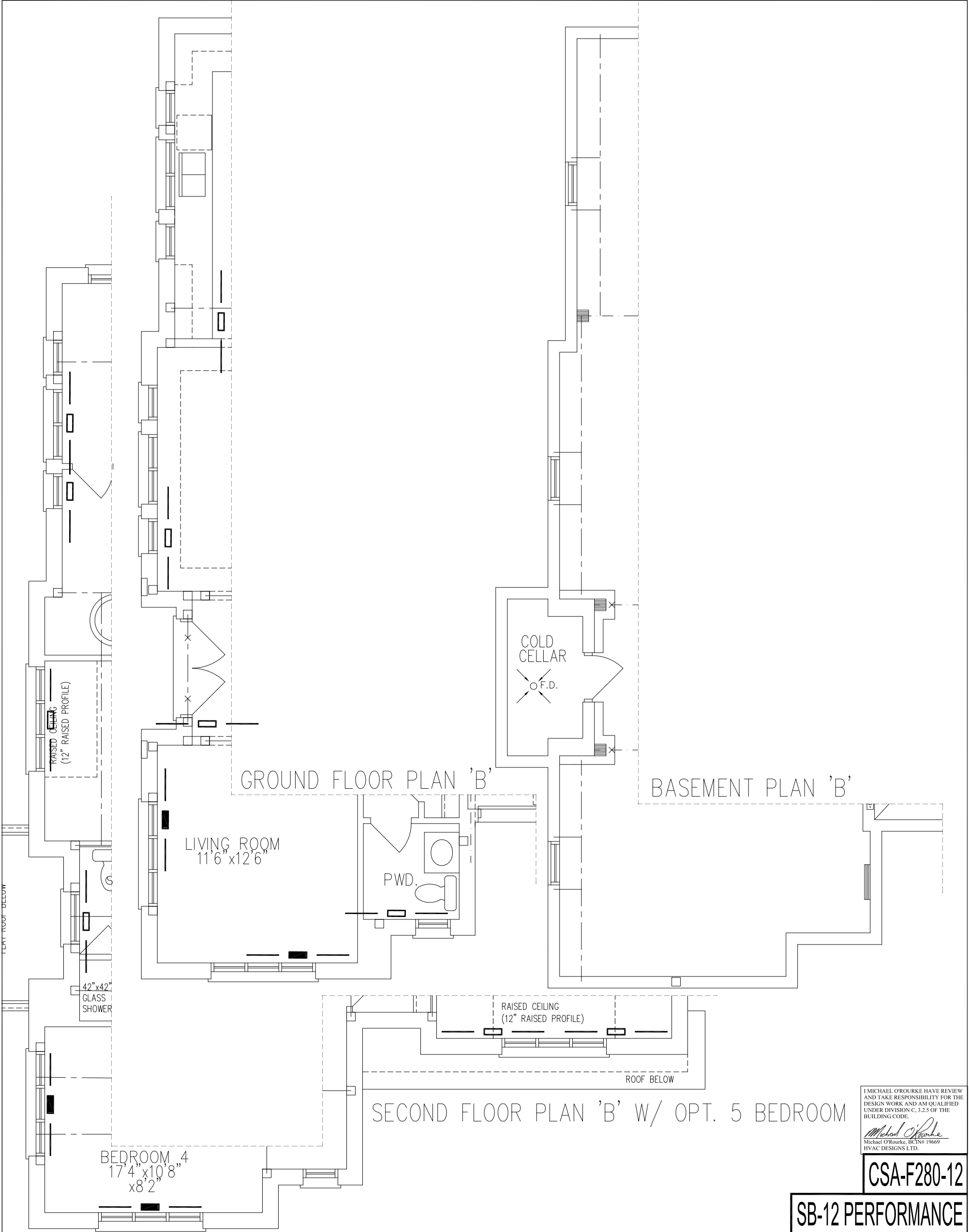
CSA-F280-12

SB-12 PERFORMANCE

HVAC LEGEND								3.	REVISED AS PER CAD	JUNE/2021
	SUPPLY AIR GRILLE		6" SUPPLY AIR BOOT ABOVE		14"x8" RETURN AIR GRILLE		RETURN AIR STACK ABOVE	2.	REVISED AS PER ARCHITECTURALS	APR/2021
	SUPPLY AIR GRILLE 6" BOOT		SUPPLY AIR STACK FROM 2nd FLOOR		30"x8" RETURN AIR GRILLE		RETURN AIR STACK 2nd FLOOR	1.	REVISED TO PERFORMANCE	SEPT/2020
	SUPPLY AIR BOOT ABOVE		6" SUPPLY AIR STACK 2nd FLOOR		FRA- FLOOR RETURN AIR GRILLE		REDUCER	No.	Description	Date
								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"
OPT 2ND 4506			BCIN# 19669	
3348 sqft			LO#	87523



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

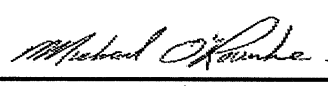
HVAC LEGEND								3.	REVISED AS PER CAD	JUNE/2021
SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	2.	REVISED AS PER ARCHITECTURALS	APR/2021
	SUPPLY AIR GRILLE		6" SUPPLY AIR BOOT ABOVE		14"x8" RETURN AIR GRILLE		RETURN AIR STACK ABOVE	1.	REVISED TO PERFORMANCE	SEPT/2020
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

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: 4506 OPT 5 BED 4 BATH 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 10, 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.

SITE NAME: CENTREFIELD (WEST GORMLEY) BUILDER: ROYAL PINE HOMES OPT 5 BED 4 BATH TYPE: 4506 DATE: Jun-21 LOW# 91163 GFA: 3348 WINTER NATURAL AIR CHANGE RATE 0.233 SUMMER NATURAL AIR CHANGE RATE 0.073 HEAT LOSS AT °F. 78 HEAT GAIN AT °F. 13 CSA-F280-12 SB-12 PERFORMANCE

ROOM USE	EXP. WALL	CLG. HT.	MBR	ENS	WIC	BED-3	BED-4	BED-5	BATH	BED-2	BTH-4
GRS.WALL AREA	324	261	54	261	261	423	47	171	81	315	54
GLAZING	0	0	0	0	0	0	0	0	0	0	0
NORTH	21.8	14.9	0	0	0	0	0	0	0	0	0
EAST	21.8	38.4	0	0	0	0	0	0	0	0	0
SOUTH	21.8	23.1	36	196	208	0	0	0	0	0	0
WEST	21.8	38.4	28	610	1075	0	0	0	0	0	0
SKYLT.	35.8	101.2	0	0	0	0	0	0	0	0	0
DOORS	25.8	4.3	0	0	0	0	0	0	0	0	0
NET EXPOSED WALL	4.2	0.7	260	1093	180	54	227	37	216	908	1438
NET EXPOSED BSMT WALL ABOVE GR	3.7	0.6	0	0	0	0	0	0	0	0	0
EXPOSED CLG	1.3	0.6	276	363	162	-5	-7	-3	75	99	44
NO ATTIC EXPOSED CLG	2.8	1.3	0	0	0	0	0	0	0	0	0
EXPOSED FLOOR	2.6	0.4	0	0	0	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	2850	1614	2249	543	81	2092	2972	1060	682	2147	609
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
AIR CHANGE HEAT LOSS	527	298	60	498	664	564	144	306	126	397	113
AIR CHANGE HEAT GAIN	109	26	0	319	0	0	0	0	0	0	0
DUCT LOSS	0	0	0	0	0	0	0	0	0	0	0
DUCT GAIN	0	0	0	0	0	0	0	0	0	0	0
HEAT GAIN PEOPLE	2	480	0	0	0	0	0	0	0	0	0
HEAT GAIN APPLIANCES/LIGHTS	559	559	0	0	0	559	559	559	0	559	0
TOTAL HT LOSS BTU/H	3377	1913	386	3511	4280	4259	5089	1958	808	2544	794
TOTAL HT GAIN x 1.3 BTU/H	4417	740	740	4572	4572	901	684	700	2156	2976	306

ROOM USE	EXP. WALL	CLG. HT.	DIN	FAM	KIT	LIV	BTH-3	WIR	FOY	MUD	BAS
GRS.WALL AREA	308	363	671	341	341	341	54	198	165	308	1316
GLAZING	0	0	0	0	0	0	0	0	0	0	0
NORTH	21.8	14.9	0	0	0	0	0	0	0	0	0
EAST	21.8	38.4	0	0	0	0	0	0	0	0	0
SOUTH	21.8	23.1	49	1067	1133	0	0	0	0	0	0
WEST	21.8	38.4	0	0	0	0	0	0	0	0	0
SKYLT.	35.8	101.2	0	0	0	0	0	0	0	0	0
DOORS	25.8	4.3	0	0	0	0	0	0	0	0	0
NET EXPOSED WALL	4.2	0.7	259	1089	179	326	1371	226	562	2363	389
NET EXPOSED BSMT WALL ABOVE GR	3.7	0.6	0	0	0	0	0	0	0	0	0
EXPOSED CLG	1.3	0.6	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
EXPOSED FLOOR	2.6	0.4	0	0	0	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	2157	2177	1646	4738	3993	2821	456	1008	1679	1728	9502
SUB TOTAL HT GAIN	1312	1312	1312	1312	1312	1312	1312	1312	1312	1312	1011
LEVEL FACTOR / MULTIPLIER	0.30	0.28	0.30	0.28	0.30	0.28	0.20	0.30	0.30	0.30	0.50
AIR CHANGE HEAT LOSS	614	619	614	1348	838	838	128	287	478	492	7793
AIR CHANGE HEAT GAIN	63	80	0	0	0	0	22	0	0	14	49
DUCT LOSS	0	0	0	0	0	0	0	0	0	0	0
DUCT GAIN	0	0	0	0	0	0	0	0	0	0	0
HEAT GAIN PEOPLE	240	559	559	559	559	559	0	0	0	0	0
HEAT GAIN APPLIANCES/LIGHTS	559	559	559	559	559	559	0	0	0	0	0
TOTAL HT LOSS BTU/H	2770	2796	6086	6169	3784	3784	901	1295	2156	2220	17295
TOTAL HT GAIN x 1.3 BTU/H	2516	2970	4572	4572	4572	4572	684	700	2156	1115	2106

TOTAL HEAT GAIN BTU/H: 42509 TONS: 3.54 LOSS DUE TO VENTILATION LOAD BTU/H: 2004 STRUCTURAL HEAT LOSS: 5885 TOTAL COMBINED HEAT LOSS BTU/H: 60859

Michael O'Rourke

SITE NAME: CENTREFIELD (WEST GORMLEY)
BUILDER: ROYAL PINE HOMESTYPE: 4508
OPT 5 BED 4 BATH
furnace pressure 0.6
furnace filter 0.05
a/c coil pressure 0.2
available pressure for s/a & r/a 0.35

GFA: 3348 LO# 91153

DATE: Jun-21

HEATING CFM 1370 COOLING CFM 1370
TOTAL HEAT LOSS 58,855 TOTAL HEAT GAIN 42,179
AIR FLOW RATE CFM 23.28 AIR FLOW RATE CFM 32.48**CARRIER
59TN6A-080-14V 80
FAN SPEED LOW 1030
MEDIUM 1370
HIGH 1800
AFUE = 97 %
INPUT (BTU/H) = 80,000
OUTPUT (BTU/H) = 78,000
DESIGN CFM = 1370
CFM @ .5" E.S.P.

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

All S/A diffusers 4"x10" unless noted otherwise on layout.

All S/A runs 5'Ø unless noted otherwise on layout.

RUN #	1	2	3	4	5	6	7	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
ROOM NAME	MBR	MBR	WIC	BED-3	BED-4	ENS	BATH	BATH	BED-2	BTH-4	DIN	FAM	KIT	KIT	LIV	BTH-3	W/R	FOY	MUD	BAS	BAS	BAS	BAS
RM LOSS MBH	1.69	1.69	0.39	1.76	2.13	1.91	0.40	0.40	2.54	0.79	2.77	2.80	2.03	2.03	1.89	0.90	1.30	2.16	2.22	3.46	3.46	3.46	3.46
CFM PER RUN HEAT	39	39	9	41	50	45	9	9	59	18	64	65	47	47	44	21	30	50	52	81	81	81	81
RM GAIN MBH	2.21	2.21	0.11	2.14	2.54	0.74	0.18	0.18	2.98	0.31	2.52	2.97	2.06	2.06	2.29	0.68	0.70	0.59	1.11	0.42	0.42	0.42	0.42
CFM PER RUN COOLING	72	72	4	70	83	24	6	6	97	10	82	96	67	67	74	22	23	19	36	14	14	14	14
ADJUSTED PRESSURE	0.17	0.17	0.17	0.17	0.16	0.17	0.17	0.17	0.16	0.17	0.16	0.16	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	42	60	54	48	82	52	25	38	49	76	49	14	37	32	66	55	58	65	16	43	20	21	39
EQUIVALENT LENGTH	220	160	195	150	150	210	200	140	150	170	130	140	150	130	140	150	180	160	110	130	150	130	140
TOTAL EFFECTIVE LENGTH	262	220	249	198	232	262	225	178	199	246	179	154	187	182	206	205	238	225	126	173	170	151	179
ADJUSTED PRESSURE	0.07	0.08	0.07	0.09	0.07	0.07	0.08	0.1	0.08	0.07	0.09	0.11	0.09	0.11	0.11	0.08	0.07	0.08	0.14	0.09	0.1	0.11	0.09
ROUND DUCT SIZE	6	6	4	5	6	5	4	4	6	4	6	6	5	5	6	4	4	5	4	6	6	6	6
HEATING VELOCITY (ft/min)	199	199	103	301	255	330	103	103	301	207	326	331	345	345	224	241	344	367	597	413	413	413	413
COOLING VELOCITY (ft/min)	367	367	46	514	423	176	69	69	495	115	418	489	492	492	377	252	264	140	413	71	71	71	71
OUTLET GRILL SIZE	4X10	4X10	3X10	3X10	4X10	3X10	3X10	3X10	4X10	3X10	4X10	4X10	3X10	3X10	3X10	3X10	3X10	3X10	3X10	4X10	4X10	4X10	4X10
TRUNK	C	B	C	D	A	B	D	D	C	A	B	D	B	C	A	D	A	A	D	B	C	C	B

RUN #	25	27	28	29	30	31
ROOM NAME	BAS	BED-3	BED-4	BED-5	KIT	LIV
RM LOSS MBH	3.46	1.76	2.13	1.96	2.03	1.89
CFM PER RUN HEAT	81	41	50	46	47	44
RM GAIN MBH	0.42	2.14	2.54	2.48	2.06	2.29
CFM PER RUN COOLING	14	70	83	81	67	74
ADJUSTED PRESSURE	0.16	0.17	0.16	0.16	0.17	0.17
ACTUAL DUCT LGH	68	39	79	66	34	67
EQUIVALENT LENGTH	150	180	210	220	130	160
TOTAL EFFECTIVE LENGTH	218	219	289	286	164	227
ADJUSTED PRESSURE	0.07	0.08	0.06	0.06	0.1	0.08
ROUND DUCT SIZE	6	5	6	6	5	6
HEATING VELOCITY (ft/min)	413	301	255	235	345	224
COOLING VELOCITY (ft/min)	71	514	423	413	492	377
OUTLET GRILL SIZE	4X10	3X10	4X10	4X10	3X10	3X10
TRUNK	A	D	A	A	B	A

TRUNK	CFM	STATIC PRESS.	ROUND DUCT	RECT DUCT	VELOCITY (ft/min)	TRUNK	CFM	STATIC PRESS.	ROUND DUCT	RECT DUCT	VELOCITY (ft/min)	TRUNK	CFM	STATIC PRESS.	ROUND DUCT	RECT DUCT	VELOCITY (ft/min)
TRUNK A	413	0.06	10.8	14	531	TRUNK G	0	0.00	0	0	0	TRUNK O	0	0.05	0	0	8
TRUNK B	404	0.07	10.3	12	606	TRUNK H	0	0.00	0	0	0	TRUNK P	0	0.05	0	0	8
TRUNK C	1133	0.06	15.8	28	728	TRUNK I	0	0.00	0	0	0	TRUNK Q	0	0.05	0	0	8
TRUNK D	1371	0.06	17	26	759	TRUNK J	0	0.00	0	0	0	TRUNK R	0	0.05	0	0	8
TRUNK E	0	0.00	0	0	0	TRUNK K	0	0.00	0	0	0	TRUNK S	0	0.05	0	0	8
TRUNK F	0	0.00	0	0	0	TRUNK L	0	0.00	0	0	0	TRUNK T	0	0.05	0	0	8

TRUNK	CFM	STATIC PRESS.	ROUND DUCT	RECT DUCT	VELOCITY (ft/min)	TRUNK	CFM	STATIC PRESS.	ROUND DUCT	RECT DUCT	VELOCITY (ft/min)	TRUNK	CFM	STATIC PRESS.	ROUND DUCT	RECT DUCT	VELOCITY (ft/min)
TRUNK A	175	0.15	85	14	330	TRUNK W	155	0.05	7.8	8	349	TRUNK X	1370	0.05	17.7	30	8
PLENUM PRESSURE	0.15	0.15	0.15	0.15	0.15	TRUNK V	0	0.05	0	0	0	TRUNK Y	915	0.05	15.3	28	8
ACTUAL DUCT LGH	42	52	67	60	40	TRUNK Z	560	0.05	12.7	18	588	TRUNK Z	560	0.05	12.7	18	8
EQUIVALENT LENGTH	185	235	165	195	145	BR	1370	0.05	17.7	24	685	DROP	1370	0.05	17.7	24	12
TOTAL EFFECTIVE LENGTH	227	287	232	255	280												
ADJUSTED PRESSURE	0.07	0.05	0.06	0.06	0.05												
ROUND DUCT SIZE	7.5	6	6	6	7.2												
INLET GRILL SIZE	X	X	X	X	X												
INLET GRILL SIZE	14	14	14	14	30												

TYPE: 4506
SITE NAME: CENTREFIELD (WEST GORMLEY)

LO # 91153
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	2 @ 21.2 cfm	42.4 cfm
Other Bedrooms	4 @ 10.6 cfm	42.4 cfm
Kitchen & Bathrooms	6 @ 10.6 cfm	63.6 cfm
Other Rooms	5 @ 10.6 cfm	53.0 cfm
Table 9.32.3.A.	TOTAL	201.4 cfm

PRINCIPAL VENTILATION CAPACITY REQUIRED		9.32.3.4.(1)
1 Bedroom	31.8	cfm
2 Bedroom	47.7	cfm
3 Bedroom	63.6	cfm
4 Bedroom	79.5	cfm
5 Bedroom	95.4	cfm
TOTAL		95.4 cfm

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

PRINCIPAL EXHAUST FAN CAPACITY	
Model: VANEE 65H	Location: BSMT
95.4 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

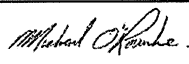
SUPPLEMENTAL FANS		BY INSTALLING CONTRACTOR		
Location	Model	cfm	HVI	Sones
ENS	BY INSTALLING CONTRACTOR	50	☒	3.5
BATH	BY INSTALLING CONTRACTOR	50	☒	3.5
BTH-4	BY INSTALLING CONTRACTOR	50	☒	3.5
W/R	BY INSTALLING CONTRACTOR	50	☒	3.5

HEAT RECOVERY VENTILATOR		9.32.3.11.
Model: VANEE 65H		
155 cfm high	64 cfm low	
75 % 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:	
HRAI #	001820
Date:	June-21

CSA F280-12 Residential Heat Loss and Heat Gain Calculations																																																																										
Formula Sheet (For Air Leakage / Ventilation Calculation)																																																																										
LO#: 91153	Model: 4506	Builder: ROYAL PINE HOMES	Date: 2021-06-10																																																																							
Volume Calculation		Air Change & Delta T Data																																																																								
<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th>House Volume</th> <th>Floor Area (ft²)</th> <th>Floor Height (ft)</th> <th>Volume (ft³)</th> </tr> <tr> <td>Level</td> <td></td> <td></td> <td></td> </tr> <tr> <td>Bsmt</td> <td>1497</td> <td>10</td> <td>14970</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>Total:</td> <td></td> <td></td> <td>48,096.0 ft³</td> </tr> <tr> <td>Total:</td> <td></td> <td></td> <td>1361.9 m³</td> </tr> </table>		House Volume	Floor Area (ft²)	Floor Height (ft)	Volume (ft³)	Level				Bsmt	1497	10	14970	First	1497	11	16467	Second	1851	9	16659	Third	0	9	0	Fourth	0	9	0	Total:			48,096.0 ft³	Total:			1361.9 m³	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th colspan="4">WINTER NATURAL AIR CHANGE RATE</th> </tr> <tr> <td></td> <td></td> <td></td> <td>0.233</td> </tr> <tr> <th colspan="4">SUMMER NATURAL AIR CHANGE RATE</th> </tr> <tr> <td></td> <td></td> <td></td> <td>0.073</td> </tr> </table> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th colspan="4">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
House Volume	Floor Area (ft²)	Floor Height (ft)	Volume (ft³)																																																																							
Level																																																																										
Bsmt	1497	10	14970																																																																							
First	1497	11	16467																																																																							
Second	1851	9	16659																																																																							
Third	0	9	0																																																																							
Fourth	0	9	0																																																																							
Total:			48,096.0 ft³																																																																							
Total:			1361.9 m³																																																																							
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																																																																						
6.2.6 Sensible Gain due to Air Leakage																																																																										
$HG_{salb} = LR_{airc} \times \frac{V_b}{3.6} \times DTD_c \times 1.2$																																																																										
0.233	x	378.31	x	7 °C	x	1.2	=	234 W																																																																		
							=	800 Btu/h																																																																		
6.2.7 Sensible heat Gain due to Ventilation																																																																										
$HL_{vaib} = PVC \times DTD_h \times 1.08 \times (1 - E)$																																																																										
95 CFM	x	78 °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)																																																																										
$HL_{airr} = Level Factor \times HL_{airbv} \times \{(HL_{agcr} + HL_{bgcr}) \div (HL_{agclevel} + HL_{bgclevel})\}$																																																																										
<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th>Level</th> <th>Level Factor (LF)</th> <th>HLairbv Air Leakage + Ventilation Heat Loss (Btu/h)</th> <th>Level Conductive Heat Loss: (HLclevel)</th> <th>Air Leakage Heat Loss Multiplier (LF x HLairbv / HLlevel)</th> </tr> <tr> <td>1</td> <td>0.5</td> <td rowspan="5">15,586</td> <td>9,502</td> <td>0.820</td> </tr> <tr> <td>2</td> <td>0.3</td> <td>16,432</td> <td>0.285</td> </tr> <tr> <td>3</td> <td>0.2</td> <td>16,861</td> <td>0.185</td> </tr> <tr> <td>4</td> <td>0</td> <td>0</td> <td>0.000</td> </tr> <tr> <td>5</td> <td>0</td> <td>0</td> <td>0.000</td> </tr> </table>				Level	Level Factor (LF)	HLairbv Air Leakage + Ventilation Heat Loss (Btu/h)	Level Conductive Heat Loss: (HLclevel)	Air Leakage Heat Loss Multiplier (LF x HLairbv / HLlevel)	1	0.5	15,586	9,502	0.820	2	0.3	16,432	0.285	3	0.2	16,861	0.185	4	0	0	0.000	5	0	0	0.000																																													
Level	Level Factor (LF)	HLairbv Air Leakage + Ventilation Heat Loss (Btu/h)	Level Conductive Heat Loss: (HLclevel)	Air Leakage Heat Loss Multiplier (LF x HLairbv / HLlevel)																																																																						
1	0.5	15,586	9,502	0.820																																																																						
2	0.3		16,432	0.285																																																																						
3	0.2		16,861	0.185																																																																						
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 5 BED 4 BATH	BUILDER: ROYAL PINE HOMES
SFQT: 3348	LO# 91153	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):	48096.0	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:	7.0 ft
LENGTH: 56.0 ft	WIDTH: 38.0 ft	EXPOSED PERIMETER:	188.0 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%	-

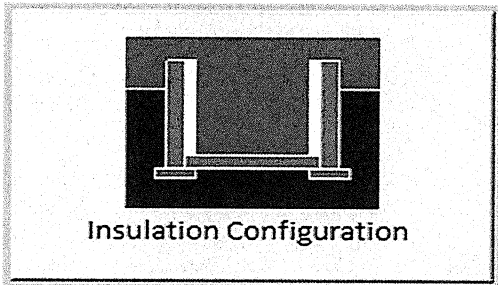
INDIVIDUAL BCIN: 19669

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):	17.1	 Insulation Configuration
Floor Width (m):	11.6	
Exposed Perimeter (m):	0.0	
Wall Height (m):	3.0	
Depth Below Grade (m):	2.13	
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):		1896

TYPE: 4506
LO# 91153

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):	7.01			
Building Configuration				
Type:	Detached			
Number of Stories:	Two			
Foundation:	Full			
House Volume (m ³):	1361.9			
Air Leakage/Ventilation				
Air Tightness Type:	Energy Star Detached (2.5 ACH)			
Custom BDT Data:	ELA @ 10 Pa.	1271.4 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# 91153

OPT 5 BED 4 BATH

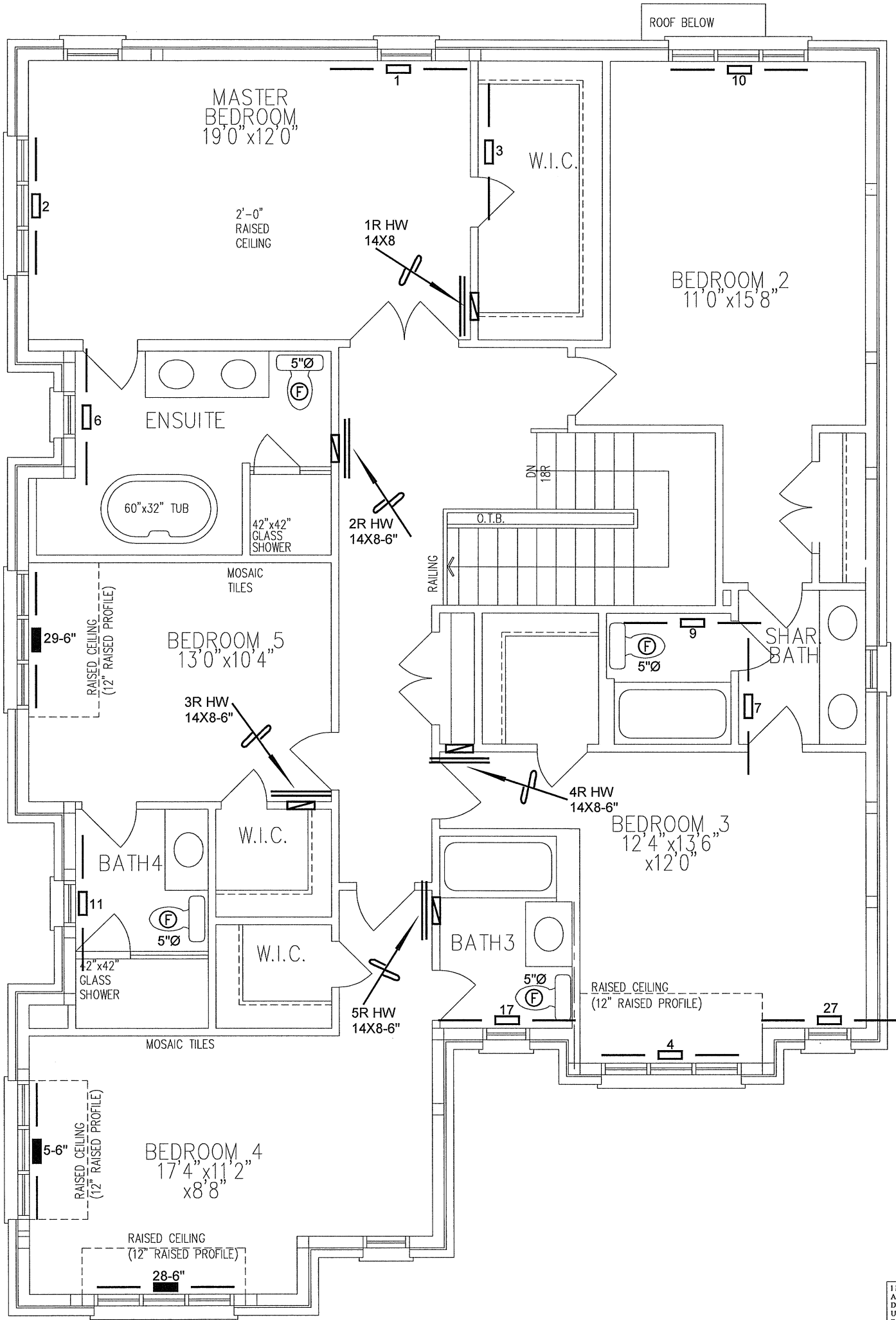


Michael O'Rourke
Michael O'Rourke, BCIN# 19669
HVAC DESIGNS LTD.

SB-12 PERFORMANCE

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			Sheet Title	FIRST FLOOR HEATING LAYOUT	
Project Name	375 Finley Ave. Suite 202 - Ajax, Ontario L1S 2E2 Tel. 905.619.2300 - 905.420.5300 Fax 905.619.2375 Email: info@hvacdsgns.ca Web: www.hvacdsgns.ca Specializing in Residential Mechanical Design Services		Date	JUNE/2021	
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 5 BED 4 BATH 4506 3348 sqft			BCIN# 19669		
			LO#	91153	



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.

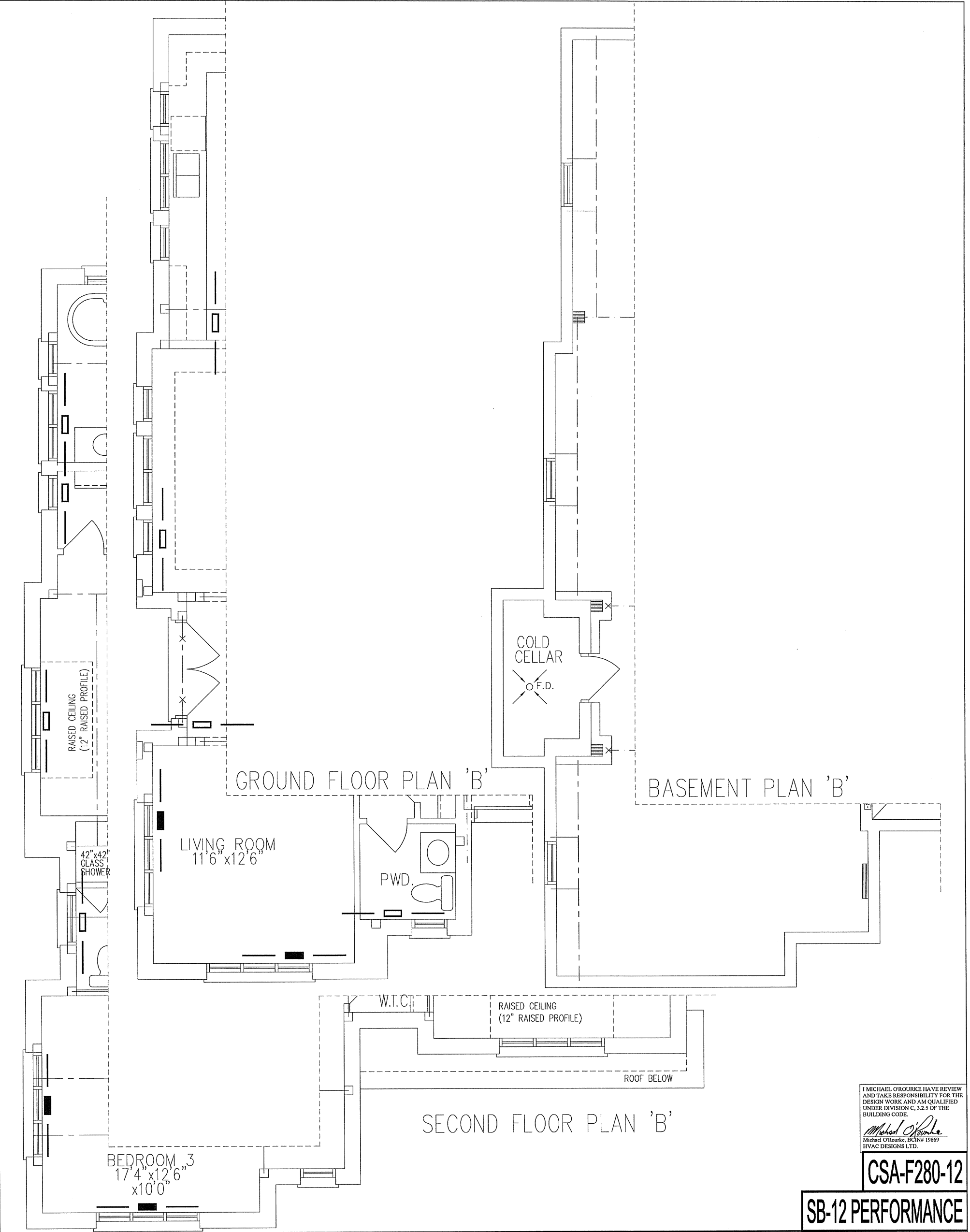
CSA-F280-12

SB-12 PERFORMANCE

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

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 CENTREFIELD (WEST GORMLEY) RICHMOND HILL, ONTARIO			Date	JUNE/2021
			Scale	3/16" = 1'-0"
OPT 5 BED 4 BATH 4506		BCIN# 19669		
3348 sqft		LO#	91153	



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	
	SUPPLY AIR GRILLE		6" SUPPLY AIR BOOT ABOVE		14"x8" RETURN AIR GRILLE		RETURN AIR STACK ABOVE	2.
	SUPPLY AIR GRILLE 6" BOOT		SUPPLY AIR STACK FROM 2nd FLOOR		30"x8" RETURN AIR GRILLE		RETURN AIR STACK 2nd FLOOR	1.
	SUPPLY AIR BOOT ABOVE		6" SUPPLY AIR STACK 2nd FLOOR		FRA- FLOOR RETURN AIR GRILLE		REDUCER	No.
REVISIONS								Date

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 ROYAL PINE HOMES		 375 Finley Ave. Suite 202 - Ajax, Ontario L1S 2E2 Tel. 905.619.2300 - 905.420.5300 Fax 905.619.2375 Email: info@hvacdesigns.ca Web: www.hvacdesigns.ca Specializing in Residential Mechanical Design Services Installation to comply with the latest Ontario Building Code. All supply branch outlets shall be equipped with a manual balancing damper. Ductwork which passes through the garage or unheated spaces shall be adequately insulated and be gas-proofed.	Sheet Title THIRD FLOOR HEATING LAYOUT	
Project Name CENTREFIELD (WEST GORMLEY) RICHMOND HILL, ONTARIO			Date JUNE/2021	
OPT 5 BED 4 BATH 4506			Scale 3/16" = 1'-0"	
3348 sqft			BCIN# 19669	
			LO#	91153