

Schedule 1: Designer Information

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

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

NOTE:

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

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

SITE NAME: CENTREFIELD (WEST GORMLEY)										OPT. GROUND				DATE: Jun-21				WINTER NATURAL AIR CHANGE RATE 0.219				HEAT LOSS ΔT °F. 78				CSA-F280-12																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																													
BUILDER: ROYAL PINE HOMES										TYPE: 4504 FLANKAGE				GFA: 3309				LO# 87516				SUMMER NATURAL AIR CHANGE RATE 0.068				HEAT GAIN ΔT °F. 13				SB-12 PERFORMANCE																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									
ROOM USE		EXP. WALL		CLG. HT.		FACTORS		LOSS		GAIN		336		LOSS		GAIN		216		LOSS		GAIN		280		LOSS		GAIN		360		LOSS		GAIN		120		LOSS		GAIN		72		LOSS		GAIN		40		LOSS		GAIN		72		LOSS		GAIN																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																													
NORTH		EAST		SOUTH		WEST		SKYLT.		DOORS		NET EXPOSED WALL		NET EXPOSED BSMT WALL ABOVE GR		EXPOSED CLG		NO ATTIC EXPOSED CLG		EXPOSED FLOOR		BASEMENT/CRAWL HEAT LOSS		SLAB ON GRADE HEAT LOSS		SUBTOTAL HT LOSS		SUB TOTAL HT GAIN		LEVEL FACTOR / MULTIPLIER		AIR CHANGE HEAT LOSS		AIR CHANGE HEAT GAIN		DUCT LOSS		DUCT GAIN		HEAT GAIN PEOPLE		HEAT GAIN APPLIANCES/LIGHTS		TOTAL HT LOSS BTU/H		TOTAL HT GAIN x 1.3 BTU/H																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									
42		27		8		216		280		360		120		72		40		72		216		280		360		120		72		40		72		216		280		360		120		72		40		72		216		280		360		120		72		40		72		216		280		360		120		72		40		72		216		280		360		120		72		40		72		216		280		360		120		72		40		72		216		280		360		120		72		40		72		216		280		360		120		72		40		72		216		280		360		120		72		40		72		216		280		360		120		72		40		72		216		280		360		120		72		40		72		216		280		360		120		72		40		72		216		280		360		120		72		40		72		216		280		360		120		72		40		72		216		280		360		120		72		40		72		216		280		360		120		72		40		72		216		280		360		120		72		40		72		216		280		360		120		72		40		72		216		280		360		120		72		40		72		216		280		360		120		72		40		72		216		280		360		120		72		40		72		216		280		360		120		72		40		72		216		280		360		120		72		40		72		216		280		360		120		72		40		72		216		280		360		120		72		40		72		216		280		360		120		72		40		72		216		280		360		120		72		40		72		216		280		360		120		72		40		72		216		280		360		120		72		40		72		216		280		360		120		72		40		72		216		280		360		120		72		40		72		216		280		360		120		72		40		72		216		280		360		120		72		40		72		216		280		360		120		72		40		72		216		280		360		120		72		40		72		216		280		360		120		72		40		72		216		280		360		120		72		40		72		216		280		360		120		72		40		72		216		280		360		120		72		40		72		216		280		360		120		72		40		72		216		280		360		120		72		40		72		216		280		360		120		72		40		72		216		280		360		120		72		40		72		216		280		360		120		72		40		72		216		280		360		120		72		40		72		216		280		360		120		72		40		72		216		280		360		120		72		40		72		216		280		360		120		72		40		72		216		280		360		120		72		40		72		216		280		360		120		72		40		72		216		280		360		120		72		40		72		216		280		360		120		72		40		72		216		280		360		120		72		40		72		216		280		360		120		72		40		72		216		280		360		120		72		40		72		216		280		360		120		72		40		72		216		280		360		120		72		40		72		216		280		360		120		72		40		72		216		280		360		120		72		40		72		216		280		360		120		72	

ROOM USE			LIV		DIN		KT/GT				LAUN		W/R		FOY		MUD										BAS					
EXP. WALL			25		28		87				0		6		23		22										170					
CLG. HT.			10		10		10				8		10		10		11										9					
FACTORS																																
GRS.WALL AREA	LOSS	GAIN	250		280		870				0		60		230		242										1020					
GLAZING			LOSS		GAIN		LOSS		GAIN		LOSS		GAIN		LOSS		GAIN										LOSS		GAIN			
NORTH	21.8	16.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	87	64		
EAST	21.8	41.6	37	806	1537	0	0	0	0	0	0	0	0	0	6	131	249	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
SOUTH	21.8	24.9	23	501	573	34	741	847	41	893	1021	0	0	0	9	196	224	0	0	0	0	0	0	0	0	0	0	8	174	199		
WEST	21.8	41.6	0	0	0	0	0	0	129	2810	5360	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	8	174	332		
SKYLT.	35.8	101.2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
DOORS	25.8	4.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	40	1034	170	20	517	85				20	517	85			
NET EXPOSED WALL	4.2	0.7	190	799	131	246	1035	170	700	2944	484	0	0	0	51	214	35	184	774	127	222	934	154				0	0	0	0	0	
NET EXPOSED BSMT WALL ABOVE GR	3.7	0.6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				510	1879	309			
EXPOSED CLG	1.3	0.6	0	0	0	0	0	0	0	0	0	106	139	62	0	0	0	0	0	0	0	0	0				0	0	0	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	
EXPOSED FLOOR	2.6	0.4	0	0	0	0	0	0	0	0	0	38	99	16	0	0	0	0	0	0	0	0				0	0	0	0	0	0	
BASEMENT/CRAWL HEAT LOSS				0			0	0				0				0			0			0									5751	
SLAB ON GRADE HEAT LOSS				0			0	0				0				0			0			0										
SUBTOTAL HT LOSS				2106			1775	6647				239				411			1938			1451										8583
SUB TOTAL HT GAIN					2242		1017						79		259			547			239											990
LEVEL FACTOR / MULTIPLIER	0.30	0.27				0.30	0.27	0.30	0.27			0.20	0.19			0.30	0.27		0.30	0.27		0.30	0.27					0.50	0.76			
AIR CHANGE HEAT LOSS				576			486	1819				46				112			531			397										6536
AIR CHANGE HEAT GAIN					96		43					3			11				23			10										42
DUCT LOSS				0			0	0				28				0			0			0										0
DUCT GAIN				0			0	0				89			0				0			0										0
HEAT GAIN PEOPLE	240		0		0	0	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0					0	0	0	0	0	0
HEAT GAIN APPLIANCES/LIGHTS					811		811					811			811				0			0										0
TOTAL HT LOSS BTU/H				2682			2261	8466				313			523			2469			1848											15119
TOTAL HT GAIN x 1.3 BTU/H				4092			2432	10360				1277			352			741			323											1341

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

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

OPT. GROUND
TYPE: 4504 FLANKAGE

DATE: Jun-21

GFA: 3309 LO# 87516

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

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

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

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

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

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

LOW 820
MEDLOW 0
MEDIUM 0
MEDIUM HIGH 1370
HIGH 1520

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

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

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

RUN #	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
ROOM NAME	MBR	ENS	ENS	BED-2	BED-3	BED-4	BATH	BED-2	BED-3	MBR	ENS-2	LIV	LIV	KT/GT	KT/GT	KT/GT	LAUN	W/R	FOY	MUD	BAS	BAS	BAS	BAS
RM LOSS MBH.	1.56	0.88	0.88	2.12	1.84	1.56	0.25	2.12	1.84	1.56	0.75	1.34	1.34	2.12	2.12	2.12	0.31	0.52	2.47	1.85	3.02	3.02	3.02	3.02
CFM PER RUN HEAT	43	24	24	58	50	43	7	58	50	43	21	37	37	58	58	58	9	14	68	51	83	83	83	83
RM GAIN MBH.	2.16	0.48	0.48	2.75	2.63	2.50	0.07	2.75	2.63	2.16	0.33	2.05	2.05	2.59	2.59	2.59	1.28	0.35	0.74	0.32	0.27	0.27	0.27	0.27
CFM PER RUN COOLING	73	16	16	93	89	84	2	93	89	73	11	69	69	87	87	87	43	12	25	11	9	9	9	9
ADJUSTED PRESSURE	0.17	0.17	0.17	0.16	0.16	0.16	0.17	0.16	0.16	0.17	0.17	0.17	0.17	0.16	0.16	0.16	0.17	0.17	0.17	0.17	0.16	0.16	0.16	0.16
ACTUAL DUCT LGH.	53	57	64	41	61	59	47	46	57	64	61	54	48	40	35	44	31	43	35	41	36	46	21	40
EQUIVALENT LENGTH	170	180	190	180	180	210	170	200	150	210	140	140	170	170	120	130	190	120	160	160	90	100	130	110
TOTAL EFFECTIVE LENGTH	223	237	254	221	241	269	217	246	207	274	201	194	218	210	155	174	221	163	195	201	126	146	151	150
ADJUSTED PRESSURE	0.08	0.07	0.07	0.07	0.07	0.06	0.08	0.07	0.08	0.06	0.09	0.09	0.08	0.08	0.1	0.09	0.08	0.11	0.09	0.09	0.13	0.11	0.11	0.11
ROUND DUCT SIZE	6	4	4	6	6	6	4	6	6	6	4	5	5	6	6	6	5	4	5	5	6	6	6	6
HEATING VELOCITY (ft/min)	219	275	275	296	255	219	80	296	255	219	241	272	272	296	296	296	66	161	499	374	423	423	423	423
COOLING VELOCITY (ft/min)	372	184	184	474	454	428	23	474	454	372	126	507	507	444	444	444	316	138	184	81	46	46	46	46
OUTLET GRILL SIZE	4X10	3X10	3X10	4X10	4X10	4X10	3X10	4X10	4X10	4X10	3X10	3X10	3X10	4X10	4X10	4X10	3X10	3X10	3X10	3X10	4X10	4X10	4X10	4X10
TRUNK	C	C	C	B	A	B	B	B	A	C	D	A	A	C	C	C	B	B	A	D	D	D	D	B

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

SUPPLY AIR TRUNK SIZE												RETURN AIR TRUNK SIZE											
TRUNK		STATIC	ROUND	RECT	VELOCITY		TRUNK		STATIC	ROUND	RECT	VELOCITY		TRUNK		STATIC	ROUND	RECT	VELOCITY				
CFM	PRESS.	DUCT	DUCT		(ft/min)	CFM	PRESS.	DUCT	DUCT		(ft/min)	CFM	PRESS.	DUCT	DUCT		(ft/min)						
TRUNK A	325	0.07	9.5	12	x 8	488	TRUNK G	0	0.00	0	0	x 8	0	TRUNK O	0	0.05	0	0	x 8	0			
TRUNK B	666	0.06	12.9	20	x 8	599	TRUNK H	0	0.00	0	0	x 8	0	TRUNK P	0	0.05	0	0	x 8	0			
TRUNK C	366	0.06	10.3	16	x 8	412	TRUNK I	0	0.00	0	0	x 8	0	TRUNK Q	0	0.05	0	0	x 8	0			
TRUNK D	687	0.06	13.1	20	x 8	618	TRUNK J	0	0.00	0	0	x 8	0	TRUNK R	0	0.05	0	0	x 8	0			
TRUNK E	1370	0.06	17	26	x 10	759	TRUNK K	0	0.00	0	0	x 8	0	TRUNK S	0	0.05	0	0	x 8	0			
TRUNK F	0	0.00	0	0	x 8	0	TRUNK L	0	0.00	0	0	x 8	0	TRUNK T	0	0.05	0	0	x 8	0			

RETURN AIR #	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
AIR VOLUME	125	125	115	115	135	125	370	125	0	0	0	0	0	0	0	0	135	1005	0.05	15.8	30	x 8	8	603
PLENUM PRESSURE	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0	0.05	0	0	x 8	8	0
ACTUAL DUCT LGH.	53	47	73	45	42	48	23	57	1	1	1	1	1	1	1	1	14	0	0.05	0	0	x 8	8	0
EQUIVALENT LENGTH	215	175	255	255	135	215	260	175	0	0	0	0	0	0	0	0	260	0	0.05	0	0	x 8	8	0
TOTAL EFFECTIVE LH	268	222	328	300	177	263	283	232	1	1	1	1	1	1	1	1	274	0	0.05	0	0	x 8	8	0
ADJUSTED PRESSURE	0.06	0.07	0.05	0.05	0.08	0.06	0.05	0.06	14.80	14.80	14.80	14.80	14.80	14.80	14.80	14.80	0.05	0	0.05	0	0	x 8	8	0
ROUND DUCT SIZE	6.9	6.7	7	7	6.6	6.9	10.9	6.9	0	0	0	0	0	0	0	0	7.5	0	0.05	0	0	x 8	8	0
INLET GRILL SIZE	8	8	8	8	8	8	8	8	0	0	0	0	0	0	0	0	8	0	0.05	0	0	x 8	8	0
INLET GRILL SIZE	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	14	0.05	17.7	24	x 12	12	685

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

LO # 87516
OPT. GROUND

RESIDENTIAL MECHANICAL VENTILATION DESIGN SUMMARY

COMBUSTION APPLIANCES		9.32.3.1(1)
a)	☒ Direct vent (sealed combustion) only	
b)	☐ Positive venting induced draft (except fireplaces)	
c)	☐ Natural draft, B-vent or induced draft gas fireplace	
d)	☐ Solid Fuel (including fireplaces)	
e)	☐ No Combustion Appliances	

HEATING SYSTEM	
☒ Forced Air	☐ Non Forced Air
☐ Electric Space Heat	

HOUSE TYPE		9.32.1(2)
☒ I	Type a) or b) appliance only, no solid fuel	
☐ II	Type I except with solid fuel (including fireplaces)	
☐ III	Any Type c) appliance	
☐ IV	Type I, or II with electric space heat	
☐	Other: Type I, II or IV no forced air	

SYSTEM DESIGN OPTIONS		O.N.H.W.P.
☐ 1	Exhaust only/Forced Air System	
☐ 2	HRV with Ducting/Forced Air System	
☒ 3	HRV Simplified/connected to forced air system	
☐ 4	HRV with Ducting/non forced air system	
☐	Part 6 Design	

TOTAL VENTILATION CAPACITY		9.32.3.3(1)
Basement + Master Bedroom	<u>2</u> @ 21.2 cfm	<u>42.4</u> cfm
Other Bedrooms	<u>3</u> @ 10.6 cfm	<u>31.8</u> cfm
Kitchen & Bathrooms	<u>5</u> @ 10.6 cfm	<u>53</u> cfm
Other Rooms	<u>5</u> @ 10.6 cfm	<u>53.0</u> cfm
Table 9.32.3.A.	TOTAL	<u>180.2</u> cfm

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

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

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

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

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

HEAT RECOVERY VENTILATOR		9.32.3.11.
Model: VANEE 65H		
<u>155</u> cfm high	<u>64</u> cfm low	
<u>75</u> % Sensible Efficiency	☒ 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#: 87516	Model: 4504 FLANKAGE	Builder: ROYAL PINE HOMES	Date: 6/7/2021																																																									
Volume Calculation			Air Change & Delta T Data																																																									
House Volume <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>Level</th> <th>Floor Area (ft²)</th> <th>Floor Height (ft)</th> <th>Volume (ft³)</th> </tr> </thead> <tbody> <tr> <td>Bsmt</td> <td>1496</td> <td>9</td> <td>13464</td> </tr> <tr> <td>First</td> <td>1496</td> <td>10</td> <td>14960</td> </tr> <tr> <td>Second</td> <td>1813</td> <td>8</td> <td>14504</td> </tr> <tr> <td>Third</td> <td>0</td> <td>9</td> <td>0</td> </tr> <tr> <td>Fourth</td> <td>0</td> <td>9</td> <td>0</td> </tr> <tr> <td colspan="2" style="text-align: right;">Total:</td> <td></td> <td>42,928.0 ft³</td> </tr> <tr> <td colspan="2" style="text-align: right;">Total:</td> <td></td> <td>1215.6 m³</td> </tr> </tbody> </table>			Level	Floor Area (ft²)	Floor Height (ft)	Volume (ft³)	Bsmt	1496	9	13464	First	1496	10	14960	Second	1813	8	14504	Third	0	9	0	Fourth	0	9	0	Total:			42,928.0 ft³	Total:			1215.6 m³	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 70%;">WINTER NATURAL AIR CHANGE RATE</td> <td style="width: 30%; text-align: center;">0.219</td> </tr> <tr> <td>SUMMER NATURAL AIR CHANGE RATE</td> <td style="text-align: center;">0.068</td> </tr> </table> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th colspan="5" style="text-align: center;">Design Temperature Difference</th> </tr> <tr> <th></th> <th>Tin °C</th> <th>Tout °C</th> <th>ΔT °C</th> <th>ΔT °F</th> </tr> <tr> <td>Winter DTDh</td> <td style="text-align: center;">22</td> <td style="text-align: center;">-21</td> <td style="text-align: center;">43</td> <td style="text-align: center;">78</td> </tr> <tr> <td>Summer DTDc</td> <td style="text-align: center;">24</td> <td style="text-align: center;">31</td> <td style="text-align: center;">7</td> <td style="text-align: center;">13</td> </tr> </table>		WINTER NATURAL AIR CHANGE RATE	0.219	SUMMER NATURAL AIR CHANGE RATE	0.068	Design Temperature Difference						Tin °C	Tout °C	ΔT °C	ΔT °F	Winter DTDh	22	-21	43	78	Summer DTDc	24	31	7	13
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5.2.3.1 Heat Loss due to Air Leakage			6.2.6 Sensible Gain due to Air Leakage																																																									
$HL_{airb} = LR_{airh} \times \frac{V_b}{3.6} \times DTD_h \times 1.2$ 0.219 x 337.66 x 43 °C x 1.2 = 3831 W = 13072 Btu/h			$HG_{salb} = LR_{airc} \times \frac{V_b}{3.6} \times DTD_c \times 1.2$ 0.068 x 337.66 x 7 °C x 1.2 = 196 W = 670 Btu/h																																																									
5.2.3.2 Heat Loss due to Mechanical Ventilation			6.2.7 Sensible heat Gain due to Ventilation																																																									
$HL_{vairb} = PVC \times DTD_h \times 1.08 \times (1 - E)$ 80 CFM x 78 °F x 1.08 x 0.25 = 1670 Btu/h			$HL_{vairb} = PVC \times DTD_h \times 1.08 \times (1 - E)$ 80 CFM x 13 °F x 1.08 x 0.25 = 275 Btu/h																																																									
5.2.3.3 Calculation of Air Change Heat Loss for Each Room (Floor Multiplier Section)																																																												
$HL_{airr} = Level\ Factor \times HL_{airbv} \times \{(HL_{agcr} + HL_{bgcr}) \div (HL_{agclevel} + HL_{bgclevel})\}$																																																												
Level	Level Factor (LF)	HLairve Air Leakage + Ventilation Heat Loss (Btu/h)	Level Conductive Heat Loss: (HL _{clevel})	Air Leakage Heat Loss Multiplier (LF x HLairbv / HLlevel)																																																								
1	0.5	13,072	8,583	0.762																																																								
2	0.3		14,328	0.274																																																								
3	0.2		13,508	0.194																																																								
4	0		0	0.000																																																								
5	0		0	0.000																																																								
*HLairbv = Air leakage heat loss + ventilation heat loss *For a balanced or supply only ventilation system HLairve = 0																																																												

HEAT LOSS AND GAIN SUMMARY SHEET

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

DESIGN ASSUMPTIONS

HEATING	°F	COOLING	°F
OUTDOOR DESIGN TEMP.	-6	OUTDOOR DESIGN TEMP.	88
INDOOR DESIGN TEMP.	72	INDOOR DESIGN TEMP. (MAX 75°F)	75

BUILDING DATA

ATTACHMENT:	DETACHED	# OF STORIES (+BASEMENT):	3
FRONT FACES:	EAST	ASSUMED (Y/N):	Y
AIR CHANGES PER HOUR:	2.50	ASSUMED (Y/N):	Y
AIR TIGHTNESS CATEGORY:	TIGHT	ASSUMED (Y/N):	Y
WIND EXPOSURE:	SHELTERED	ASSUMED (Y/N):	Y
HOUSE VOLUME (ft ³):	42928.0	ASSUMED (Y/N):	Y
INTERNAL SHADING:	BLINDS/CURTAINS	ASSUMED OCCUPANTS:	5
INTERIOR LIGHTING LOAD (Btu/h/ft ²):	1.35	DC BRUSHLESS MOTOR (Y/N):	Y
FOUNDATION CONFIGURATION	BCIN_1	DEPTH BELOW GRADE:	6.0 ft
LENGTH: 46.0 ft	WIDTH: 39.0 ft	EXPOSED PERIMETER:	170.0 ft

2012 OBC - COMPLIANCE PACKAGE

Component	Compliance Package SB-12 PERFORMANCE	
	Nominal	Min. Eff.
Ceiling with Attic Space Minimum RSI (R)-Value	60	59.20
Ceiling Without Attic Space Minimum RSI (R)-Value	31	27.70
Exposed Floor Minimum RSI (R)-Value	31	29.80
Walls Above Grade Minimum RSI (R)-Value	22+1.5	18.50
Basement Walls Minimum RSI (R)-Value	20	21.12
Below Grade Slab Entire surface > 600 mm below grade Minimum RSI (R)-Value	-	-
Edge of Below Grade Slab ≤ 600 mm Below Grade Minimum RSI (R)-Value	10	10
Heated Slab or Slab ≤ 600 mm below grade Minimum RSI (R)-Value	10	11.13
Windows and Sliding Glass Doors Maximum U-Value	1.6	-
Skylights Maximum U-Value	2.6	-
Space Heating Equipment Minimum AFUE	0.96	-
HRV Minimum Efficiency	75%	-
Domestic Hot Water Heater Minimum EF	TE=94%	-

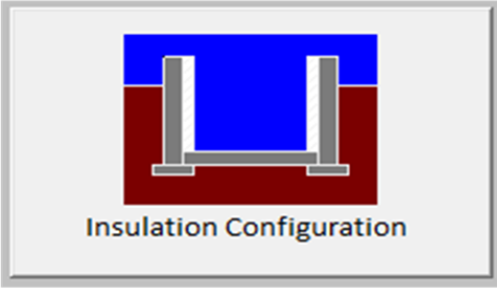
INDIVIDUAL BCIN: 19669

MICHAEL O'ROURKE



Residential Foundation Thermal Load Calculator

Supplemental tool for CAN/CSA-F280

Weather Station Description		
Province:	Ontario	
Region:	Richmond Hill	
Site Description		
Soil Conductivity:	Normal conductivity: dry sand, loam, clay	
Water Table:	Normal (7-10 m, 23-33 ft)	
Foundation Dimensions		
Floor Length (m):	14.0	
Floor Width (m):	11.9	
Exposed Perimeter (m):	0.0	
Wall Height (m):	2.7	
Depth Below Grade (m):	1.83	
Window Area (m ²):	1.9	
Door Area (m ²):	1.9	
Radiant Slab		
Heated Fraction of the Slab:	0	
Fluid Temperature (°C):	33	
Design Months		
Heating Month	1	
Foundation Loads		
Heating Load (Watts):		1685

TYPE: 4504 FLANKAGE
LO# 87516

OPT. GROUND

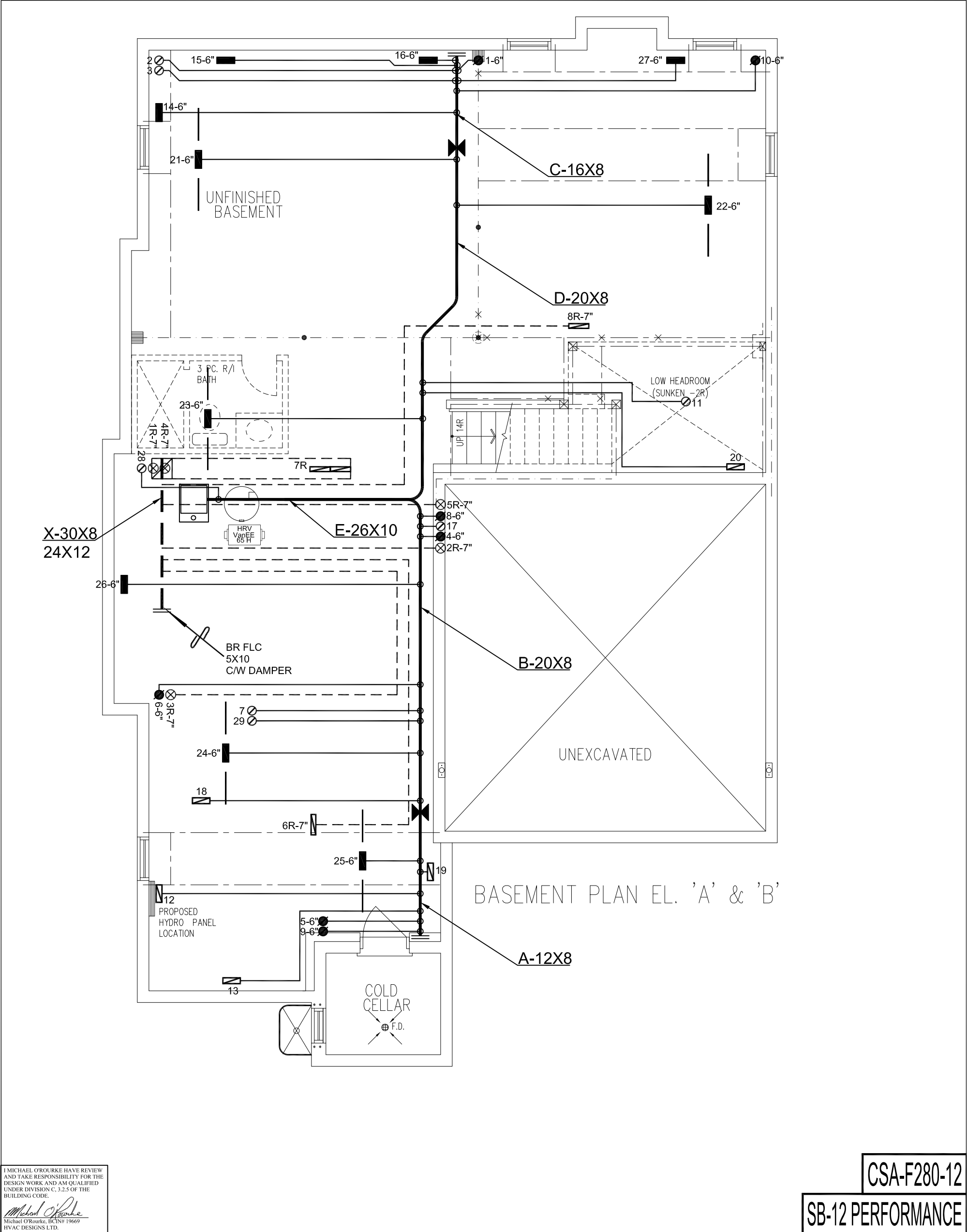
Air Infiltration Residential Load Calculator

Supplemental tool for CAN/CSA-F280

Weather Station Description				
Province:	Ontario			
Region:	Richmond Hill			
Weather Station Location:	Open flat terrain, grass			
Anemometer height (m):	10			
Local Shielding				
Building Site:	Suburban, forest			
Walls:	Heavy			
Flue:	Heavy			
Highest Ceiling Height (m):	6.40			
Building Configuration				
Type:	Detached			
Number of Stories:	Two			
Foundation:	Full			
House Volume (m ³):	1215.6			
Air Leakage/Ventilation				
Air Tightness Type:	Energy Star Detached (2.5 ACH)			
Custom BDT Data:	ELA @ 10 Pa.	1134.7 cm ²		
	2.50	ACH @ 50 Pa		
Mechanical Ventilation (L/s):	Total Supply	Total Exhaust		
	37.5	37.5		
Flue Size				
Flue #:	#1	#2	#3	#4
Diameter (mm):	0	0	0	0
Natural Infiltration Rates				
Heating Air Leakage Rate (ACH/H):	0.219			
Cooling Air Leakage Rate (ACH/H):	0.068			

TYPE: 4504 FLANKAGE
LO# 87516

OPT. GROUND



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Michael O'Rourke
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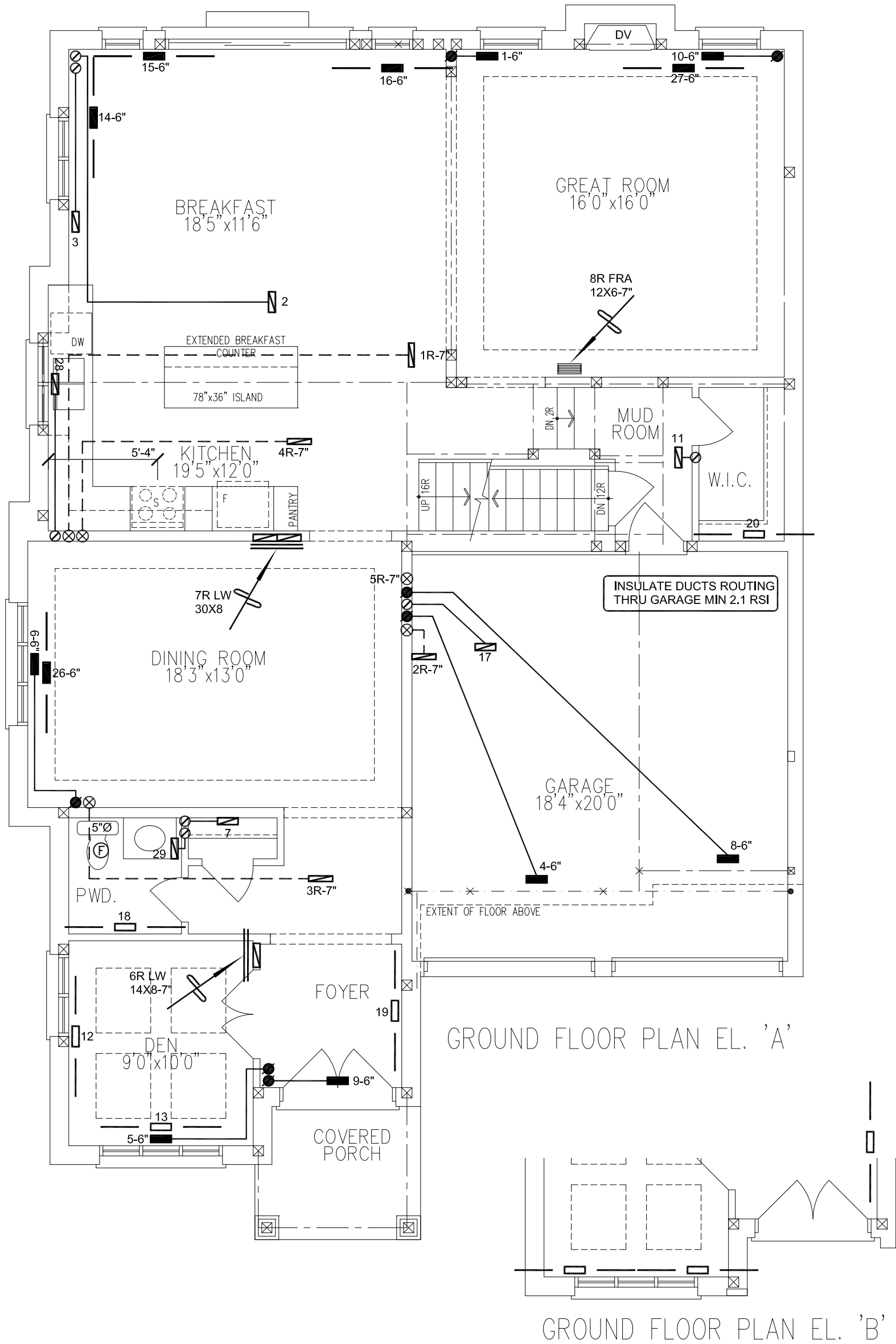
CSA-F280-12

SB-12 PERFORMANCE

HVAC LEGEND								3.	REVISED AS PER CAD	JUNE/2021
SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	2.	REVISED AS PER ARCHITECTURALS	APR/2021
	SUPPLY AIR GRILLE		6" SUPPLY AIR BOOT ABOVE		14"x8" RETURN AIR GRILLE		RETURN AIR STACK ABOVE	1.	REVISED TO PERFORMANCE	SEPT/2020
	SUPPLY AIR GRILLE 6" BOOT		SUPPLY AIR STACK FROM 2nd FLOOR		30"x8" RETURN AIR GRILLE		RETURN AIR STACK 2nd FLOOR	No.	Description	Date
	SUPPLY AIR BOOT ABOVE		6" SUPPLY AIR STACK 2nd FLOOR		FRA- FLOOR RETURN AIR GRILLE		REDUCER	REVISIONS		

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Client	HVACDESIGNS LTD. 375 Finley Ave. Suite 202 - Ajax, Ontario L1S 2E2 Tel. 905.619.2300 - 905.420.5300 Fax 905.619.2375 Email: info@hvacdesigns.ca Web: www.hvacdesigns.ca Specializing in Residential Mechanical Design Services		HEAT LOSS 51642 BTU/H UNIT DATA		# OF RUNS S/A R/A FANS			Sheet Title	
ROYAL PINE HOMES			MAKE CARRIER	3RD FLOOR				BASEMENT HEATING LAYOUT	
Project Name	CENTREFIELD (WEST GORMLEY) RICHMOND HILL, ONTARIO	MODEL 59SP5A-80-16	2ND FLOOR	14	5	5			
		INPUT 60 MBTU/H	1ST FLOOR	10	3	2			
		OUTPUT 58 MBTU/H	BASEMENT	5	1	0	Date	SEPT/2020	
		COOLING 3.5 TONS	ALL S/A DIFFUSERS 4 "x10" UNLESS NOTED OTHERWISE ON LAYOUT. ALL S/A RUNS 5"Ø UNLESS NOTED OTHERWISE ON LAYOUT. UNDERCUT DOORS 1" min. FOR R/A			Scale	3/16" = 1'-0"		
		FAN SPEED 1370 cfm @ 0.6" w.c.				BCIN# 19669			
OPT. GROUND 4504 FLANKAGE 3309 sqft		Installation to comply with the latest Ontario Building Code. All supply branch outlets shall be equipped with a manual balancing damper. Ductwork which passes through the garage or unheated spaces shall be adequately insulated and be gas-proofed.			LO#		87516		



GROUND FLOOR PLAN EL. 'A'

GROUND FLOOR PLAN EL. 'B'

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

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

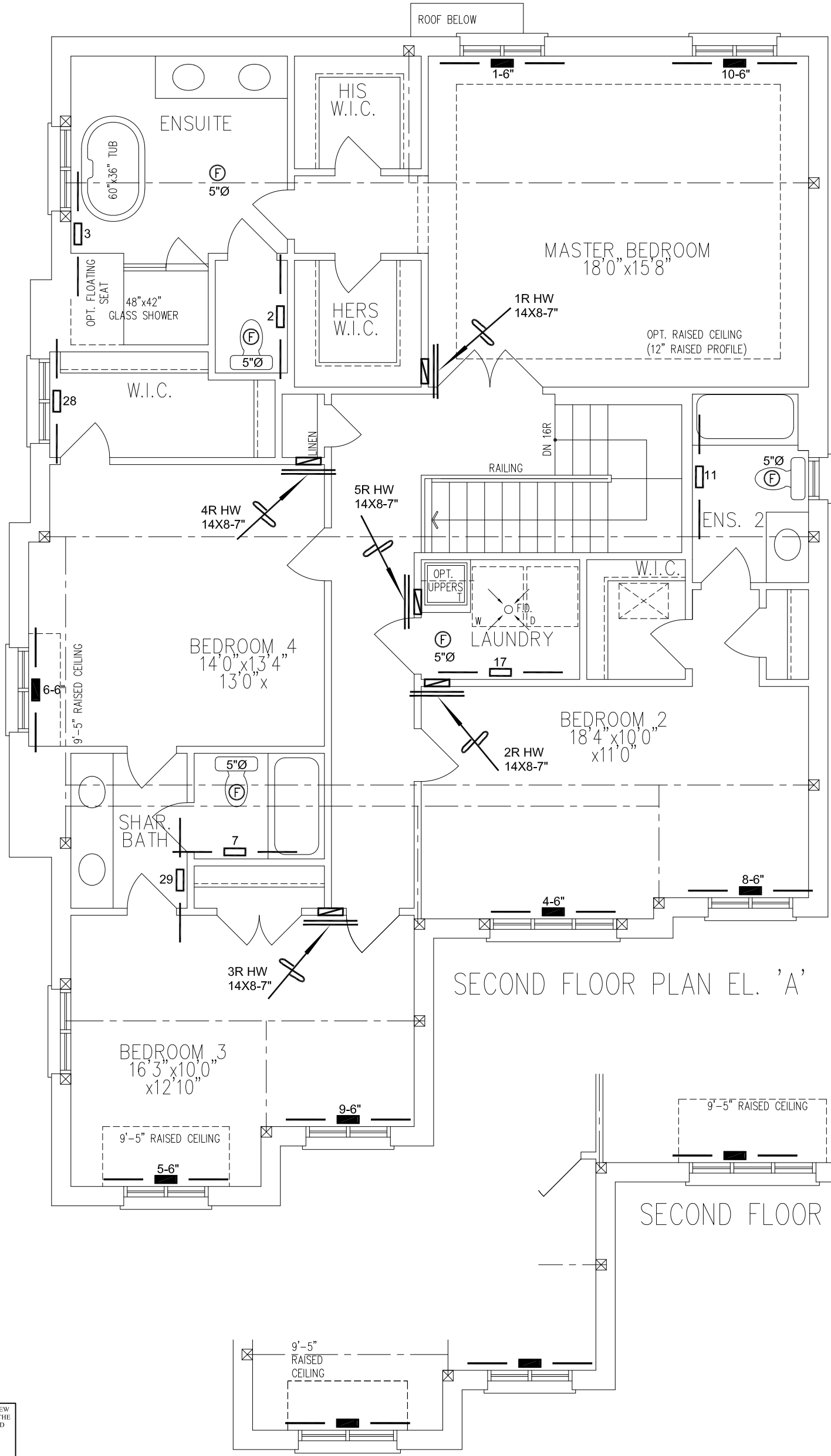
CSA-F280-12

SB-12 PERFORMANCE

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ROYAL PINE HOMES			FIRST FLOOR HEATING LAYOUT	
Project Name			Date	SEPT/2020
CENTREFIELD (WEST GORMLEY) RICHMOND HILL, ONTARIO			Scale	3/16" = 1'-0"
OPT. GROUND 4504 FLANKAGE 3309 sqft			BCIN# 19669	
			LO#	87516



SECOND FLOOR PLAN EL. 'A'

SECOND FLOOR PLAN EL. 'B'

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

CSA-F280-12

SB-12 PERFORMANCE

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