


## Schedule 1: Designer Information

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

<b>A. Project Information</b>			
Building number, street name		Unit no.	Lot/con.
Municipality RICHMOND HILL	Postal code	Plan number/ other description	
<b>B. Individual who reviews and takes responsibility for design activities</b>			
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 ( )	
<b>C. Design activities undertaken by individual identified in Section B. [Building Code Table 3.5.2.1 OF Division C]</b>			
<input type="checkbox"/> House <input type="checkbox"/> Small Buildings <input type="checkbox"/> Large Buildings <input type="checkbox"/> Complex Buildings <input checked="" type="checkbox"/> HVAC – House <input type="checkbox"/> Building Services <input type="checkbox"/> Detection, Lighting and Power <input type="checkbox"/> Fire Protection <input type="checkbox"/> Building Structural <input type="checkbox"/> Plumbing – House <input type="checkbox"/> Plumbing – All Buildings <input type="checkbox"/> 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: 38-13  Project: CENTREFIELD (WEST GORMLEY)	
<b>D. Declaration of Designer</b>			
I, <u>MICHAEL O'ROURKE</u> declare that (choose one as appropriate): (print name)			
<input type="checkbox"/> 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: _____			
<input checked="" type="checkbox"/> 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>			
<input type="checkbox"/> 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 21, 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)										DATE: Jun-21		WINTER NATURAL AIR CHANGE RATE 0.227				HEAT LOSS ΔT °F. 78		CSA-F280-12																	
BUILDER: ROYAL PINE HOMES										TYPE: 38-13		GFA: 2602		LO# 91282		SUMMER NATURAL AIR CHANGE RATE 0.071				HEAT GAIN ΔT °F. 13		SB-12 PERFORMANCE													
ROOM USE				MBR				ENS				WIC				BED-2				BED-3				BED-4				ENS-2				S-BATH			
EXP. WALL				35				22				8				36				27				13				6				6			
CLG. HT.				9				9				9				9				9				9				9				9			
FACTORS																																			
GRS.WALL AREA		LOSS GAIN		315				198				72				324				243				117				54				54			
GLAZING				LOSS GAIN				LOSS GAIN				LOSS GAIN				LOSS GAIN				LOSS GAIN				LOSS GAIN				LOSS GAIN				LOSS GAIN			
NORTH		21.8	16.0	0	0	0		0	0	0		0	0	0		0	0	0		0	0	0		18	392	288		0	0	0		8	174	128	
EAST		21.8	41.6	37	806	1537		18	392	748		0	0	0		0	0	0		0	0	0		0	0	0		0	0	0		0	0	0	
SOUTH		21.8	24.9	0	0	0		9	196	224		0	0	0		0	0	0		0	0	0		0	0	0		0	0	0		0	0	0	
WEST		21.8	41.6	0	0	0		0	0	0		0	0	0		52	1133	2161		64	1394	2659		0	0	0		15	327	623		0	0	0	
SKYLT.		35.8	101.2	0	0	0		0	0	0		0	0	0		0	0	0		0	0	0		0	0	0		0	0	0		0	0	0	
DOORS		25.8	4.3	0	0	0		0	0	0		0	0	0		0	0	0		0	0	0		0	0	0		0	0	0		0	0	0	
NET EXPOSED WALL		4.2	0.7	278	1169	192		171	719	118		72	303	50		272	1144	188		179	753	124		99	416	68		39	164	27		46	193	32	
NET EXPOSED BSMT WALL ABOVE GR		3.7	0.6	0	0	0		0	0	0		0	0	0		0	0	0		0	0	0		0	0	0		0	0	0		0	0	0	
EXPOSED CLG		1.3	0.6	303	398	178		123	162	72		75	99	44		195	256	115		160	210	94		210	276	123		85	112	50		75	99	44	
NO ATTIC EXPOSED CLG		2.8	1.3	0	0	0		0	0	0		0	0	0		0	0	0		45	126	57		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		205	535	88		95	248	41		85	222	37		75	196	32	
BASEMENT/CRAWL HEAT LOSS				0				0				0				0				0				0				0				0			
SLAB ON GRADE HEAT LOSS				0				0				0				0				0				0				0				0			
SUBTOTAL HT LOSS				2373				1469				401				2533				3019				1332				824				662			
SUB TOTAL HT GAIN				1908				1163				94				2464				3022				520				737				236			
LEVEL FACTOR / MULTIPLIER		0.20	0.16					0.20	0.16					0.20	0.16					0.20	0.16					0.20	0.16					0.20	0.16		
AIR CHANGE HEAT LOSS				382				237				65				408				486				215				133				107			
AIR CHANGE HEAT GAIN				87				53				4				112				137				24				34				11			
DUCT LOSS				0				0				0				0				351				155				96				77			
DUCT GAIN				0				0				0				0				399				138				77				25			
HEAT GAIN PEOPLE		240		2	480	0		0	0	0		1	240	1		240	1		240	1		240	1		240	0		0	0	0		0	0	0	
HEAT GAIN APPLIANCES/LIGHTS				593				0				0				593				593				593				0				0			
TOTAL HT LOSS BTU/H				2756				1706				466				2941				3856				1702				1053				846			
TOTAL HT GAIN x 1.3 BTU/H				3988				1580				128				4431				5709				1969				1101				353			

ROOM USE			GRT			KIT			LAUN			PWD			FOY			MUD												BAS		
EXP. WALL			60			32			14			10			35			20												168		
CLG. HT.			10			10			9			10			10			10												10		
FACTORS																																
GRS.WALL AREA	LOSS	GAIN	606			323			126			101			354			202									1176					
GLAZING			LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN						LOSS	GAIN						
NORTH	21.8	16.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	65	48						
EAST	21.8	41.6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	65	125							
SOUTH	21.8	24.9	0	0	0	0	0	0	32	697	797	9	196	224	0	0	0	0	0	0	0	0	6	131	149							
WEST	21.8	41.6	60	1307	2493	48	1046	1994	0	0	0	0	0	0	22	479	914	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	40	1034	170	20	517	85			20	517	85							
NET EXPOSED WALL	4.2	0.7	546	2296	378	275	1157	190	94	395	65	92	387	64	292	1226	202	182	765	126			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			504	1857	305							
EXPOSED CLG	1.3	0.6	0	0	0	0	0	0	110	145	65	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							
EXPOSED FLOOR	2.6	0.4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			0	0	0							
BASEMENT/CRAWL HEAT LOSS			0			0			0			0			0			0									5708					
SLAB ON GRADE HEAT LOSS			0			0			0			0			0			0														
SUBTOTAL HT LOSS			3603			2203			1237			583			2739			1282									8342					
SUB TOTAL HT GAIN			2871			2185			926			288			1286			211									712					
LEVEL FACTOR / MULTIPLIER	0.30	0.32				0.30	0.32		0.20	0.16		0.30	0.32		0.30	0.32		0.30	0.32					0.50	0.67							
AIR CHANGE HEAT LOSS			1159			708			199			187			881			412									5579					
AIR CHANGE HEAT GAIN			131			99			42			13			59			10									32					
DUCT LOSS			0			0			0			0			0			0									0					
DUCT GAIN			0			0			0			0			0			0									0					
HEAT GAIN PEOPLE	240		0			0			0			0			0			0									0					
HEAT GAIN APPLIANCES/LIGHTS			593			593			593			0			0			593									593					
TOTAL HT LOSS BTU/H			4762			2911			1436			770			3620			1695									13922					
TOTAL HT GAIN x 1.3 BTU/H			4673			3740			2030			391			1748			1058									1739					

TOTAL HEAT GAIN BTU/H: 34912 TONS: 2.91 LOSS DUE TO VENTILATION LOAD BTU/H: 1670 STRUCTURAL HEAT LOSS: 44440 TOTAL COMBINED HEAT LOSS BTU/H: 46110

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

TYPE: 38-13

DATE: Jun-21

GFA: 2602

LO# 91282

HEATING CFM 1115 COOLING CFM 1115  
TOTAL HEAT LOSS 44,440 TOTAL HEAT GAIN 34,637  
AIR FLOW RATE CFM 25.09 AIR FLOW RATE CFM 32.19

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

**\*\*CARRIER**  
**59TN6B-060-14V**  
FAN SPEED 60  
LOW 930  
MEDLOW 1050  
MEDIUM 1115  
MEDIUM HIGH 1245  
HIGH 1520

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

DESIGN CFM = **1115**  
CFM @ .6" E.S.P.

TEMPERATURE RISE 48 °F

RUN COUNT	4th	3rd	2nd	1st	Bas
S/A	0	0	13	7	4
R/A	0	0	5	1	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	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	ENS-2	BED-2	BED-3	MBR	S-BATH	GRT	GRT	KIT	KIT	S-BATH	LAUN	PWD	FOY	MUD	BAS	BAS	BAS	BAS
RM LOSS MBH.	1.38	1.71	0.47	1.47	1.93	1.70	1.05	1.47	1.93	1.38	0.42	2.38	2.38	1.46	1.46	0.42	1.44	0.77	3.62	1.69	3.48	3.48	3.48	3.48
CFM PER RUN HEAT	35	43	12	37	48	43	26	37	48	35	11	60	60	37	37	11	36	19	91	43	87	87	87	87
RM GAIN MBH.	1.99	1.58	0.13	2.22	2.85	1.97	1.10	2.22	2.85	1.99	0.18	2.34	2.34	1.87	1.87	0.18	2.03	0.39	1.75	1.06	0.43	0.43	0.43	0.43
CFM PER RUN COOLING	64	51	4	71	92	63	35	71	92	64	6	75	75	60	60	6	65	13	56	34	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	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.16	0.17	0.16	0.16	0.16	0.16
ACTUAL DUCT LGH.	41	54	46	73	67	19	60	78	69	33	55	30	37	32	26	54	40	48	60	21	31	25	25	43
EQUIVALENT LENGTH	130	210	130	200	160	120	150	200	180	140	190	140	150	150	120	200	160	170	150	160	160	170	160	160
TOTAL EFFECTIVE LENGTH	171	264	176	273	227	139	210	278	249	173	245	170	187	182	146	254	200	218	210	181	191	195	185	203
ADJUSTED PRESSURE	0.1	0.07	0.1	0.06	0.07	0.12	0.08	0.06	0.07	0.1	0.07	0.1	0.09	0.09	0.12	0.07	0.09	0.08	0.08	0.1	0.08	0.08	0.09	0.08
ROUND DUCT SIZE	5	5	4	6	6	6	4	6	6	5	4	5	5	5	5	4	5	4	6	4	6	6	6	6
HEATING VELOCITY (ft/min)	257	316	138	189	245	219	298	189	245	257	126	441	441	272	272	126	264	218	464	493	444	444	444	444
COOLING VELOCITY (ft/min)	470	374	46	362	469	321	402	362	469	470	69	551	551	441	441	69	477	149	286	390	71	71	71	71
OUTLET GRILL SIZE	3X10	3X10	3X10	4X10	4X10	4X10	3X10	4X10	4X10	3X10	3X10	3X10	3X10	3X10	3X10	3X10	3X10	3X10	4X10	3X10	4X10	4X10	4X10	4X10
TRUNK	A	A	D	B	C	D	C	B	C	A	C	A	A	A	A	C	D	B	B	C	A	A	C	B

RUN #	ROOM NAME	RM LOSS MBH.	CFM PER RUN HEAT	RM GAIN MBH.	CFM PER RUN COOLING	ADJUSTED PRESSURE	ACTUAL DUCT LGH.	EQUIVALENT LENGTH	TOTAL EFFECTIVE LENGTH	ADJUSTED PRESSURE	ROUND DUCT SIZE	HEATING VELOCITY (ft/min)	COOLING VELOCITY (ft/min)	OUTLET GRILL SIZE	TRUNK
1	MBR	1.38	35	1.99	64	0.17	41	130	171	0.1	5	257	470	3X10	A
2	ENS	1.71	43	1.58	51	0.17	54	210	264	0.07	5	316	374	3X10	A
3	WIC	0.47	12	0.13	4	0.17	46	130	176	0.1	4	138	46	3X10	D
4	BED-2	1.47	37	2.22	71	0.17	73	200	273	0.06	6	189	362	4X10	B
5	BED-3	1.93	48	2.85	92	0.16	67	160	227	0.07	6	245	469	4X10	C
6	BED-4	1.70	43	1.97	63	0.17	19	120	139	0.12	6	219	321	4X10	D
7	ENS-2	1.05	26	1.10	35	0.17	60	150	210	0.08	4	298	402	3X10	C
8	BED-2	1.47	37	2.22	71	0.17	78	200	278	0.06	6	189	362	4X10	B
9	BED-3	1.93	48	2.85	92	0.16	69	180	249	0.07	6	245	469	4X10	C
10	MBR	1.38	35	1.99	64	0.17	33	140	173	0.1	5	257	470	3X10	A
11	S-BATH	0.42	11	0.18	6	0.17	55	190	245	0.07	4	126	69	3X10	C
12	GRT	2.38	60	2.34	75	0.17	30	140	170	0.1	5	441	551	3X10	A
13	GRT	2.38	60	2.34	75	0.17	37	150	187	0.09	5	441	551	3X10	A
14	KIT	1.46	37	1.87	60	0.17	32	150	182	0.09	5	272	441	3X10	A
15	KIT	1.46	37	1.87	60	0.17	26	120	146	0.12	5	272	441	3X10	A
16	S-BATH	0.42	11	0.18	6	0.17	54	200	254	0.07	4	126	69	3X10	C
17	LAUN	1.44	36	2.03	65	0.17	40	160	200	0.09	5	264	477	3X10	D
18	PWD	0.77	19	0.39	13	0.17	48	170	218	0.08	4	218	149	3X10	B
19	FOY	3.62	91	1.75	56	0.16	60	150	181	0.08	6	464	286	4X10	B
20	MUD	1.69	43	1.06	34	0.17	21	160	191	0.1	4	493	390	3X10	C
21	BAS	3.48	87	0.43	14	0.16	31	170	195	0.08	6	444	71	4X10	A
22	BAS	3.48	87	0.43	14	0.16	25	160	185	0.08	6	444	71	4X10	A
23	BAS	3.48	87	0.43	14	0.16	25	160	185	0.09	6	444	71	4X10	C
24	BAS	3.48	87	0.43	14	0.16	43	160	203	0.08	6	444	71	4X10	B

SUPPLY AIR TRUNK SIZE															RETURN 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	481	0.07	11	14	x	8	618			TRUNK G	0	0.00	0	0	x	8	0		
TRUNK B	271	0.06	9.2	10	x	8	488			TRUNK H	0	0.00	0	0	x	8	0		
TRUNK C	545	0.06	12	16	x	8	613			TRUNK I	0	0.00	0	0	x	8	0		
TRUNK D	1117	0.06	15.7	28	x	8	718			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 #	1	2	3	4	5	6																BR																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																												
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TYPE: 38-13  
SITE NAME: CENTREFIELD (WEST GORMLEY)

LO # 91282

**RESIDENTIAL MECHANICAL VENTILATION DESIGN SUMMARY**

COMBUSTION APPLIANCES		9.32.3.1(1)
a)	<input checked="" type="checkbox"/> Direct vent (sealed combustion) only	
b)	<input type="checkbox"/> Positive venting induced draft (except fireplaces)	
c)	<input type="checkbox"/> Natural draft, B-vent or induced draft gas fireplace	
d)	<input type="checkbox"/> Solid Fuel (including fireplaces)	
e)	<input type="checkbox"/> No Combustion Appliances	

HEATING SYSTEM	
<input checked="" type="checkbox"/> Forced Air	<input type="checkbox"/> Non Forced Air
<input type="checkbox"/> Electric Space Heat	

HOUSE TYPE		9.32.1(2)
<input checked="" type="checkbox"/> I	Type a) or b) appliance only, no solid fuel	
<input type="checkbox"/> II	Type I except with solid fuel (including fireplaces)	
<input type="checkbox"/> III	Any Type c) appliance	
<input type="checkbox"/> IV	Type I, or II with electric space heat	
<input type="checkbox"/>	Other: Type I, II or IV no forced air	

SYSTEM DESIGN OPTIONS		O.N.H.W.P.
<input type="checkbox"/> 1	Exhaust only/Forced Air System	
<input type="checkbox"/> 2	HRV with Ducting/Forced Air System	
<input checked="" type="checkbox"/> 3	HRV Simplified/connected to forced air system	
<input type="checkbox"/> 4	HRV with Ducting/non forced air system	
<input type="checkbox"/>	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>3</u> @ 10.6 cfm	<u>31.8</u> cfm
Table 9.32.3.A.	TOTAL	<u>159.0</u> cfm

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

SUPPLEMENTAL VENTILATION CAPACITY		9.32.3.5.
Total Ventilation Capacity	<u>159</u>	cfm
Less Principal Ventil. Capacity	<u>79.5</u>	cfm
Required Supplemental Capacity	<u>79.5</u>	cfm

PRINCIPAL EXHAUST FAN CAPACITY	
Model: VANEE 65H	Location: BSMT
<u>79.5</u> cfm	<input checked="" type="checkbox"/> HVI Approved

PRINCIPAL EXHAUST HEAT LOSS CALCULATION				
CFM	$\Delta T$ °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	<input checked="" type="checkbox"/>	3.5
ENS-2	BY INSTALLING CONTRACTOR	50	<input checked="" type="checkbox"/>	3.5
S-BATH	BY INSTALLING CONTRACTOR	50	<input checked="" type="checkbox"/>	3.5
PWD	BY INSTALLING CONTRACTOR	50	<input checked="" type="checkbox"/>	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)	<input checked="" type="checkbox"/> HVI Approved	

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

BUILDER:	
ROYAL PINE HOMES	
Name:	
Address:	
City:	
Telephone #:	Fax #:

INSTALLING CONTRACTOR	
Name:	
Address:	
City:	
Telephone #:	Fax #:

DESIGNER CERTIFICATION	
I hereby certify that this ventilation system has been designed in accordance with the Ontario Building Code.	
Name:	HVAC Designs Ltd.
Signature:	<i>Michael O'Rourke</i>
HRAI #	001820
Date:	June-21

I REVIEW AND TAKE RESPONSIBILITY FOR THE DESIGN WORK AND AM QUALIFIED IN THE APPROPRIATE CATEGORY AS AN "OTHER DESIGNER" UNDER DIVISION C, 3.2.5 OF THE BUILDING CODE.  
INDIVIDUAL BCIN: 19669 *Michael O'Rourke* MICHAEL O'ROURKE

CSA F280-12 Residential Heat Loss and Heat Gain Calculations																																																												
Formula Sheet (For Air Leakage / Ventilation Calculation)																																																												
LO#: 91282	Model: 38-13	Builder: ROYAL PINE HOMES	Date: 2021-06-21																																																									
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<b>5.2.3.1 Heat Loss due to Air Leakage</b>			<b>6.2.6 Sensible Gain due to Air Leakage</b>																																																									
$HL_{airb} = LR_{airh} \times \frac{V_b}{3.6} \times DTD_h \times 1.2$ <p>0.227 x 278.32 x 43 °C x 1.2 = 3270 W</p> <p>= 11158 Btu/h</p>			$HG_{salb} = LR_{airc} \times \frac{V_b}{3.6} \times DTD_c \times 1.2$ <p>= 0.071 x 278.32 x 7 °C x 1.2 = 168 W</p> <p>= 573 Btu/h</p>																																																									
<b>5.2.3.2 Heat Loss due to Mechanical Ventilation</b>			<b>6.2.7 Sensible heat Gain due to Ventilation</b>																																																									
$HL_{vairb} = PVC \times DTD_h \times 1.08 \times (1 - E)$ <p>80 CFM x 78 °F x 1.08 x 0.25 = 1670 Btu/h</p>			$HL_{vairb} = PVC \times DTD_h \times 1.08 \times (1 - E)$ <p>80 CFM x 13 °F x 1.08 x 0.25 = 275 Btu/h</p>																																																									
<b>5.2.3.3 Calculation of Air Change Heat Loss for Each Room (Floor Multiplier Section)</b>																																																												
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**HEAT LOSS AND GAIN SUMMARY SHEET****MODEL:** 38-13**BUILDER:** ROYAL PINE HOMES**SFQT:** 2602**LO#** 91282**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 <sup>3</sup> ):	35383.8	ASSUMED (Y/N):	Y
INTERNAL SHADING:	BLINDS/CURTAINS	ASSUMED OCCUPANTS:	5
INTERIOR LIGHTING LOAD (Btu/h/ft <sup>2</sup> ):	1.45	DC BRUSHLESS MOTOR (Y/N):	Y
FOUNDATION CONFIGURATION	BCIN_1	DEPTH BELOW GRADE:	7.0 ft
LENGTH: 53.0 ft	WIDTH: 31.0 ft	EXPOSED PERIMETER:	168.0 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%	-

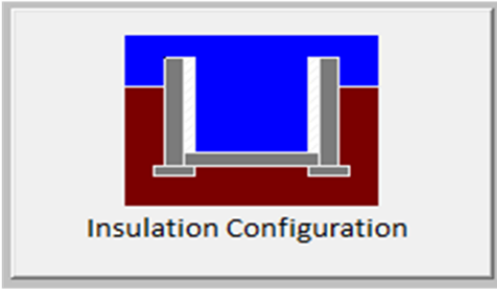
INDIVIDUAL BCIN: 19669

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):	16.2	 Insulation Configuration
Floor Width (m):	9.4	
Exposed Perimeter (m):	0.0	
Wall Height (m):	3.0	
Depth Below Grade (m):	2.13	
Window Area (m <sup>2</sup> ):	1.1	
Door Area (m <sup>2</sup> ):	1.9	
Radiant Slab		
Heated Fraction of the Slab:	0	
Fluid Temperature (°C):	33	
Design Months		
Heating Month	1	
Foundation Loads		
Heating Load (Watts):		1672

TYPE: 38-13

LO# 91282

# Air Infiltration Residential Load Calculator

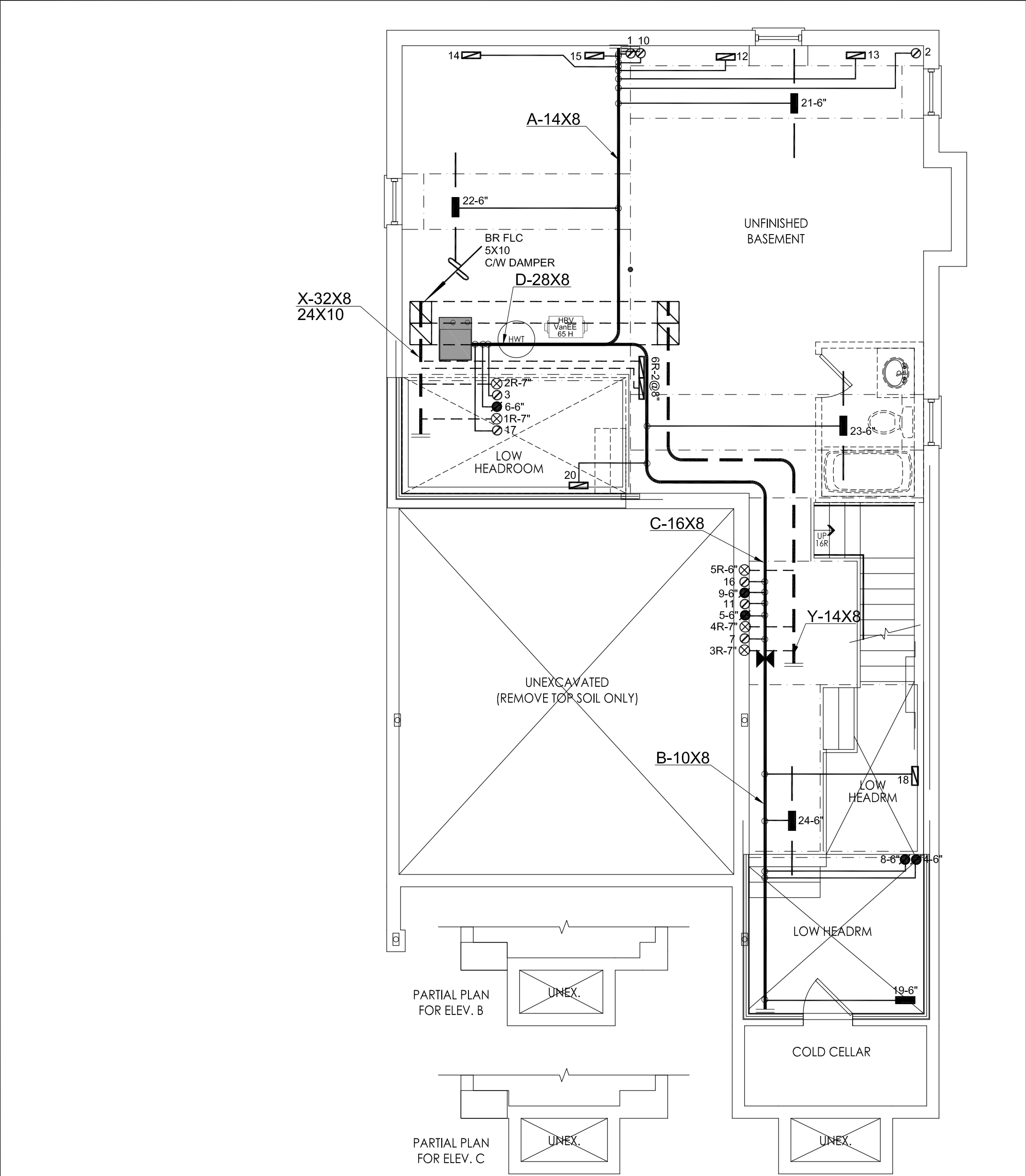
Supplemental tool for CAN/CSA-F280

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):	6.74			
Building Configuration				
Type:	Detached			
Number of Stories:	Two			
Foundation:	Full			
House Volume (m <sup>3</sup> ):	1002.0			
Air Leakage/Ventilation				
Air Tightness Type:	Energy Star Detached (2.5 ACH)			
Custom BDT Data:	ELA @ 10 Pa.		935.3 cm <sup>2</sup>	
	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):	0.227			
Cooling Air Leakage Rate (ACH/H):	0.071			

TYPE: 38-13

LO# 91282





BASEMENT FLOOR PLAN ELEV 'A', 'B' & 'C'

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

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

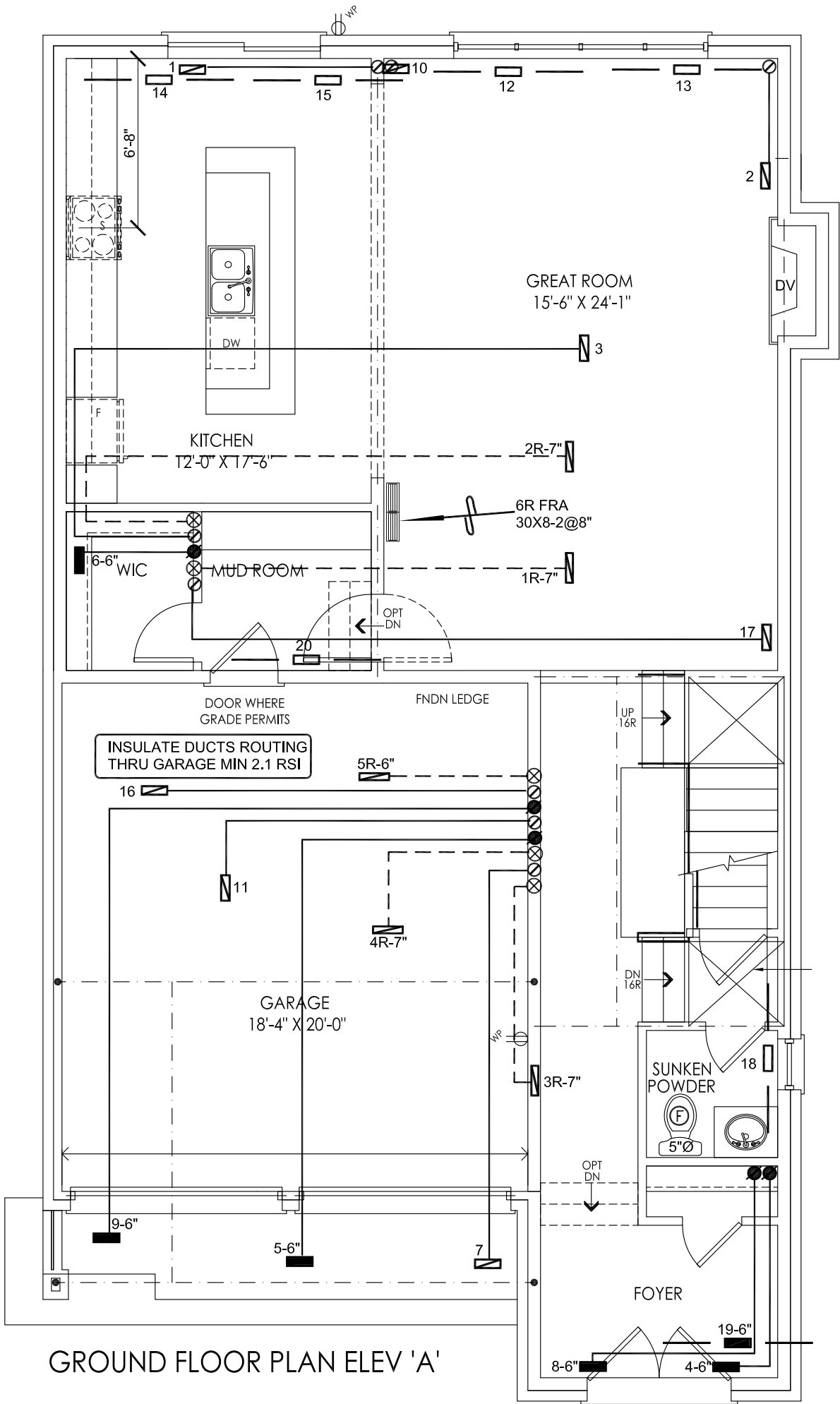
CSA-F280-12

SB-12 PERFORMANCE

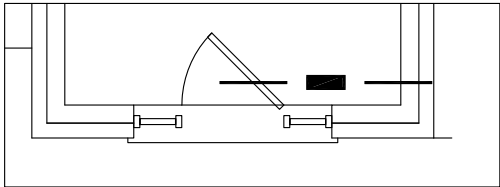
HVAC LEGEND							3.		
SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	2.	
	SUPPLY AIR GRILLE		6" SUPPLY AIR BOOT ABOVE		14"x8" RETURN AIR GRILLE		RETURN AIR STACK ABOVE	1.	
	SUPPLY AIR GRILLE 6" BOOT		SUPPLY AIR STACK FROM 2nd FLOOR		30"x8" RETURN AIR GRILLE		RETURN AIR STACK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

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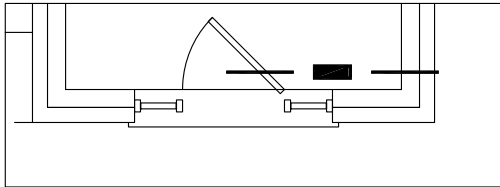
Client		<div></div> <div>375 Finley Ave. Suite 202 - Ajax, Ontario L1S 2E2 Tel. 905.619.2300 - 905.420.5300 Fax 905.619.2375 Email: info@hvacdesigns.ca Web: www.hvacdesigns.ca Specializing in Residential Mechanical Design Services</div>	HEAT LOSS 46110 BTU/H UNIT DATA		# OF RUNS S/A R/A FANS			Sheet Title	
ROYAL PINE HOMES			MAKE	CARRIER	3RD FLOOR				BASEMENT HEATING LAYOUT
Project Name			MODEL	59TN6B-060-14V	2ND FLOOR	13	5	3	
CENTREFIELD (WEST GORMLEY) RICHMOND HILL, ONTARIO			INPUT	60 MBTU/H	1ST FLOOR	7	1	2	
38-13			OUTPUT	58 MBTU/H	BASEMENT	4	1	0	Date
2602 sqft		COOLING 3,0 TONS		ALL S/A DIFFUSERS 4 "x10" UNLESS NOTED OTHERWISE ON LAYOUT. ALL S/A RUNS 5"Ø UNLESS NOTED OTHERWISE ON LAYOUT. UNDERCUT DOORS 1" min. FOR R/A				Scale	3/16" = 1'-0"
		FAN SPEED 1115 cfm @ 0.6" w.c.						BCIN# 19669	
								LO#	91282



GROUND FLOOR PLAN ELEV 'A'



GROUND FLOOR PLAN ELEV 'B'



GROUND FLOOR PLAN ELEV 'C'

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

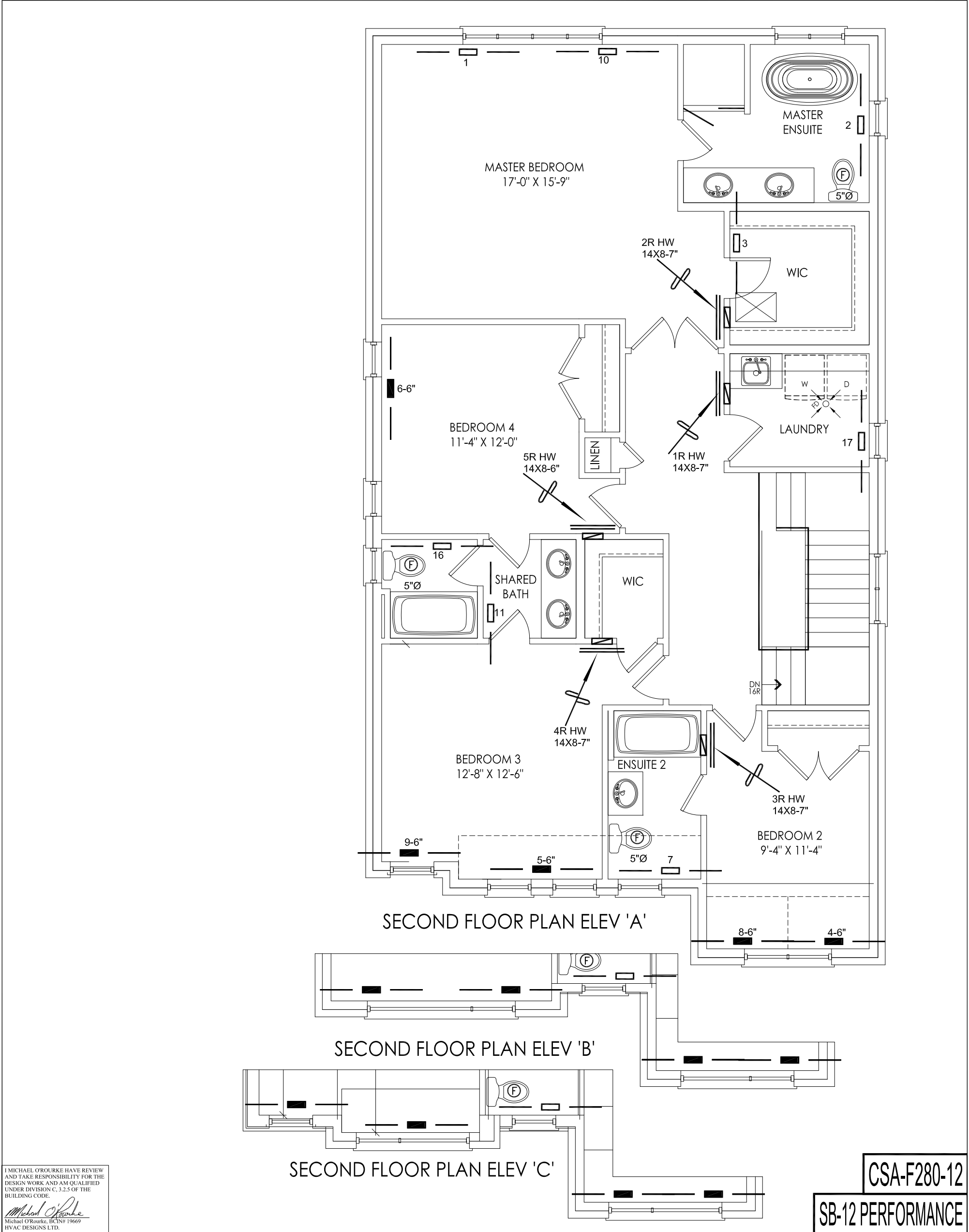
CSA-F280-12

SB-12 PERFORMANCE

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	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		<div></div> <div>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</div>	Sheet Title	
ROYAL PINE HOMES			FIRST FLOOR HEATING LAYOUT	
Project Name CENTREFIELD (WEST GORMLEY) RICHMOND HILL, ONTARIO			Date	JUNE/2021
			Scale	3/16" = 1'-0"
		BCIN# 19669		
38-13		LO# 91282		
2602 sqft				



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*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.	
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ROYAL PINE HOMES			SECOND FLOOR HEATING LAYOUT	
Project Name CENTREFIELD (WEST GORMLEY) RICHMOND HILL, ONTARIO			Date	JUNE/2021
38-132602 sqft			Scale	3/16" = 1'-0"
		BCIN# 19669		
		LO#	91282	