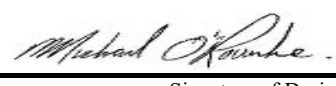


Schedule 1: Designer Information

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: 38-10 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.			
April 19, 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: 38-10

GFA: 2554

DATE: Apr-21
LO# 87612

WINTER NATURAL AIR CHANGE RATE 0.227
SUMMER NATURAL AIR CHANGE RATE 0.071

HEAT LOSS ΔT °F. 78
HEAT GAIN ΔT °F. 13

CSA-F280-12
SB-12 PERFORMANCE

ROOM USE	EXP. WALL	CLG. HT.	FACTORS	LOSS	GAIN	MBR	ENS	WIC	BED-2	BED-3	BED-4	BATH	ENS-2
						37	23	14	33	33	11	10	11
						9	9	9	9	9	9	9	9
GRS.WALL AREA	GLAZING					333	207	126	297	297	99	90	99
						LOSS	GAIN	LOSS	GAIN	LOSS	GAIN	LOSS	GAIN
NORTH	21.8	16.0	0	0	0	0	0	0	0	0	11	240	176
EAST	21.8	41.6	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
WEST	21.8	41.6	44	958	1828	17	370	706	0	0	0	0	0
SKYLT.	35.8	101.2	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
NET EXPOSED WALL	4.2	0.7	289	1215	200	181	761	125	126	530	87	257	1081
NET EXPOSED BSMT WALL ABOVE GR	3.7	0.6	0	0	0	0	0	0	0	0	0	0	0
EXPOSED CLG	1.3	0.6	276	363	162	126	166	74	112	147	66	165	217
NO ATTIC EXPOSED CLG	2.8	1.3	0	0	0	0	0	0	0	0	0	30	84
EXPOSED FLOOR	2.6	0.4	0	0	0	0	0	0	0	0	0	229	598
BASEMENT/CRAWL HEAT LOSS			0			0			0			0	
SLAB ON GRADE HEAT LOSS			0			0			0			0	
SUBTOTAL HT LOSS			2537			1493			677			879	
SUB TOTAL HT GAIN				2190		1130			153			357	
LEVEL FACTOR / MULTIPLIER	0.20	0.18				0.20	0.18		0.20	0.18		0.20	0.18
AIR CHANGE HEAT LOSS			447			263			119			155	
AIR CHANGE HEAT GAIN				118		61			8			19	
DUCT LOSS			0			0			0			95	
DUCT GAIN				0		0			0			0	
HEAT GAIN PEOPLE	240		2		480	0		0	1		240	1	240
HEAT GAIN APPLIANCES/LIGHTS					517	0		0			517		517
TOTAL HT LOSS BTU/H			2984			1756			796			1034	
TOTAL HT GAIN x 1.3 BTU/H				4297		1548			210			5036	

ROOM USE					FAM		KT/BR		LV/DN		LAUN				FOY		MUD								BAS	
EXP. WALL					39		35		41		15				15		10								162	
CLG. HT.					10		10		10		11				10		11								10	
FACTORS																										
GRS.WALL AREA	LOSS	GAIN			394		354		414		167				152		111								1134	
GLAZING			LOSS	GAIN	LOSS	GAIN	LOSS	GAIN	LOSS	GAIN	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	0	0	0	0	0	0	0	0	0
EAST	21.8	41.6	20	436	831	63	1372	2618	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	65	125	
SOUTH	21.8	24.9	16	349	398	0	0	0	12	261	299	0	0	0	0	0	0	0	0	0	0	9	196	224		
WEST	21.8	41.6	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	
DOORS	25.8	4.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	20	517	85		
NET EXPOSED WALL	4.2	0.7	358	1505	248	291	1222	201	402	1691	278	167	700	115	100	418	69	91	383	63			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			486	1790	295	
EXPOSED CLG	1.3	0.6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			0	0	0	
NO ATTIC EXPOSED CLG	2.8	1.3	0	0	0	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							
SLAB ON GRADE HEAT LOSS					0			0			0		0				0		0							
SUBTOTAL HT LOSS					2289			2594			1952		700				1714		900							
SUB TOTAL HT GAIN						1477					577		115				738		148							728
LEVEL FACTOR / MULTIPLIER	0.30	0.33				0.30	0.33		0.30	0.33		0.30	0.33		0.30	0.33		0.30	0.33				0.50	0.69		
AIR CHANGE HEAT LOSS					753			853			642		230				564		296							5565
AIR CHANGE HEAT GAIN						79					151		31				40		8							39
DUCT LOSS					0			0			0		0				0		0							0
DUCT GAIN						0					0		0				0		0							0
HEAT GAIN PEOPLE	240				0		0				0		0		0		0		0				0			0
HEAT GAIN APPLIANCES/LIGHTS						517					517		517				0		0							517
TOTAL HT LOSS BTU/H					3043			3448			2595		931				2278		1196							13596
TOTAL HT GAIN x 1.3 BTU/H						2695					4533		1462				1010		203							1670

TOTAL HEAT GAIN BTU/H:

29935

TONS: 2.49

LOSS DUE TO VENTILATION LOAD BTU/H: 1670

STRUCTURAL HEAT LOSS: 42400

TOTAL COMBINED HEAT LOSS BTU/H: 44070

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

TYPE: 38-10

DATE: Apr-21

GFA: 2554

LO# 87612

HEATING CFM 970 COOLING CFM 970
TOTAL HEAT LOSS 42,400 TOTAL HEAT GAIN 29,660
AIR FLOW RATE CFM 22.88 AIR FLOW RATE CFM 32.7

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

**CARRIER

AFUE = 97 %

59TN6A-060-14V

60

INPUT (BTU/H) = 60,000

OUTPUT (BTU/H) = 58,000

FAN SPEED

LOW 820

MEDLOW 0

MEDIUM 970

MEDIUM HIGH 0

HIGH 1520

DESIGN CFM = 970

CFM @ .6" E.S.P.

TEMPERATURE RISE 55 °F

RUN COUNT	4th	3rd	2nd	1st	Bas
S/A	0	0	12	7	4
R/A	0	0	5	2	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	19	20	21	22	23	24
ROOM NAME	MBR	ENS	WIC	BED-2	BED-3	BED-4	BATH	BED-2	BED-3	MBR	ENS-2	BATH	FAM	KT/BR	KT/BR	LV/DN	LAUN	FOY	MUD	BAS	BAS	BAS	BAS
RM LOSS MBH.	1.49	1.76	0.80	1.33	2.02	1.03	0.52	1.33	2.02	1.49	1.00	0.52	3.04	1.72	1.72	2.59	0.93	2.28	1.20	3.40	3.40	3.40	3.40
CFM PER RUN HEAT	34	40	18	30	46	24	12	30	46	34	23	12	70	39	39	59	21	52	27	78	78	78	78
RM GAIN MBH.	2.15	1.55	0.21	1.84	2.52	1.47	0.13	1.84	2.52	2.15	0.74	0.13	2.70	2.27	2.27	1.46	0.83	1.01	0.20	0.42	0.42	0.42	0.42
CFM PER RUN COOLING	70	51	7	60	82	48	4	60	82	70	24	4	88	74	74	48	27	33	7	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	0.16	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17
ACTUAL DUCT LGH.	55	47	26	43	34	44	30	43	44	38	41	34	33	36	29	35	37	28	31	38	29	18	30
EQUIVALENT LENGTH	150	140	130	170	160	190	190	160	170	140	180	180	120	140	160	120	110	110	150	110	130	100	120
TOTAL EFFECTIVE LENGTH	205	187	156	213	194	234	220	203	214	178	221	214	153	176	189	155	147	138	181	148	159	118	150
ADJUSTED PRESSURE	0.08	0.09	0.11	0.08	0.08	0.07	0.08	0.08	0.08	0.1	0.08	0.08	0.11	0.1	0.09	0.11	0.12	0.12	0.1	0.12	0.11	0.15	0.11
ROUND DUCT SIZE	6	5	4	5	6	6	4	5	6	6	4	4	6	5	5	5	4	4	4	5	5	5	5
HEATING VELOCITY (ft/min)	173	294	207	220	235	122	138	220	235	173	264	138	357	286	286	433	241	597	310	573	573	573	573
COOLING VELOCITY (ft/min)	357	374	80	441	418	245	46	441	418	357	275	46	449	543	543	352	310	379	80	103	103	103	103
OUTLET GRILL SIZE	4X10	3X10	3X10	3X10	4X10	4X10	3X10	3X10	4X10	4X10	3X10	3X10	4X10	3X10	3X10	3X10	3X10	3X10	3X10	3X10	3X10	3X10	3X10
TRUNK	B	A	C	E	E	B	E	E	E	A	E	E	A	B	B	D	B	D	B	B	A	E	D

RUN #	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	19	20	21	22	23	24
ROOM NAME	MBR	ENS	WIC	BED-2	BED-3	BED-4	BATH	BED-2	BED-3	MBR	ENS-2	BATH	FAM	KT/BR	KT/BR	LV/DN	LAUN	FOY	MUD	BAS	BAS	BAS	BAS
RM LOSS MBH.	1.49	1.76	0.80	1.33	2.02	1.03	0.52	1.33	2.02	1.49	1.00	0.52	3.04	1.72	1.72	2.59	0.93	2.28	1.20	3.40	3.40	3.40	3.40
CFM PER RUN HEAT	34	40	18	30	46	24	12	30	46	34	23	12	70	39	39	59	21	52	27	78	78	78	78
RM GAIN MBH.	2.15	1.55	0.21	1.84	2.52	1.47	0.13	1.84	2.52	2.15	0.74	0.13	2.70	2.27	2.27	1.46	0.83	1.01	0.20	0.42	0.42	0.42	0.42
CFM PER RUN COOLING	70	51	7	60	82	48	4	60	82	70	24	4	88	74	74	48	27	33	7	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	0.16	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17
ACTUAL DUCT LGH.	55	47	26	43	34	44	30	43	44	38	41	34	33	36	29	35	37	28	31	38	29	18	30
EQUIVALENT LENGTH	150	140	130	170	160	190	190	160	170	140	180	180	120	140	160	120	110	110	150	110	130	100	120
TOTAL EFFECTIVE LENGTH	205	187	156	213	194	234	220	203	214	178	221	214	153	176	189	155	147	138	181	148	159	118	150
ADJUSTED PRESSURE	0.08	0.09	0.11	0.08	0.08	0.07	0.08	0.08	0.08	0.1	0.08	0.08	0.11	0.1	0.09	0.11	0.12	0.12	0.1	0.12	0.11	0.15	0.11
ROUND DUCT SIZE	6	5	4	5	6	6	4	5	6	6	4	4	6	5	5	5	4	4	4	5	5	5	5
HEATING VELOCITY (ft/min)	173	294	207	220	235	122	138	220	235	173	264	138	357	286	286	433	241	597	310	573	573	573	573
COOLING VELOCITY (ft/min)	357	374	80	441	418	245	46	441	418	357	275	46	449	543	543	352	310	379	80	103	103	103	103
OUTLET GRILL SIZE	4X10	3X10	3X10	3X10	4X10	4X10	3X10	3X10	4X10	4X10	3X10	3X10	4X10	3X10	3X10	3X10	3X10	3X10	3X10	3X10	3X10	3X10	3X10
TRUNK	B	A	C	E	E	B	E	E	E	A	E	E	A	B	B	D	B	D	B	B	A	E	D

SUPPLY AIR TRUNK SIZE	TRUNK	STATIC	ROUND	RECT	VELOCITY	TRUNK	STATIC	ROUND	RECT	VELOCITY	RETURN AIR TRUNK SIZE	TRUNK	STATIC	ROUND	RECT	VELOCITY
	CFM	PRESS.	DUCT	DUCT	(ft/min)	CFM	PRESS.	DUCT	DUCT	(ft/min)		CFM	PRESS.	DUCT	DUCT	(ft/min)
TRUNK A	222	0.09	7.7	8	x 8	500	0	0.00	0	0	x 8	0	0.05	0	0	x 8
TRUNK B	262	0.07	8.8	10	x 8	472	0	0.00	0	0	x 8	0	0.05	0	0	x 8
TRUNK C	502	0.07	11.2	14	x 8	645	0	0.00	0	0	x 8	0	0.05	0	0	x 8
TRUNK D	189	0.11	6.9	8	x 8	425	0	0.00	0	0	x 8	0	0.05	0	0	x 8
TRUNK E	466	0.08	10.5	14	x 8	599	0	0.00	0	0	x 8	0	0.05	0	0	x 8
TRUNK F	968	0.07	14.3	24	x 8	726	0	0.00	0	0	x 8	0	0.05	0	0	x 8

RETURN AIR #	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	19	20	21	22	23	24
AIR VOLUME	95	75	75	75	75	340	85	0	0	0	0	0	0	0	0	0	0	150	150	15.6	28	x 8	624
PLENUM PRESSURE	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15
ACTUAL DUCT LGH.	50	46	41	37	31	23	28	1	1	1	1	1	1	1	1	1	1	14	14	14	14	14	14
EQUIVALENT LENGTH	155	255	235	235	255	150	215	0	0	0	0	0	0	0	0	0	0	135	135	15.6	24	x 10	582
TOTAL EFFECTIVE LH	205	301	276	272	286	173	243	1	1	1	1	1	1	1	1	1	1	149	149	15.6	24	x 10	582
ADJUSTED PRESSURE	0.07	0.05	0.05	0.05	0.05	0.09	0.06	14.80	14.80	14.80	14.80	14.80	14.80	14.80	14.80	14.80	14.80	0.10	0.10	0.10	0.10	0.10	0.10
ROUND DUCT SIZE	6	6	6	6	6	9.1	6	0	0	0	0	0	0	0	0	0	0	6.5	6.5	6.5	6.5	6.5	6.5
INLET GRILL SIZE	8	8	8	8	8	8	8	0	0	0	0	0	0	0	0	0	0	8	8	8	8	8	8
INLET GRILL SIZE	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
INLET GRILL SIZE	14	14	14	14	14	30	14	0	0	0	0	0	0	0	0	0	0	14	14	14	14	14	14

TYPE: 38-10
SITE NAME: CENTREFIELD (WEST GORMLEY)

LO # 87612

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	79.5 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

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:	April-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#: 87612	Model: 38-10	Builder: ROYAL PINE HOMES	Date: 4/19/2021																																																									
Volume Calculation			Air Change & Delta T Data																																																									
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5.2.3.1 Heat Loss due to Air Leakage			6.2.6 Sensible Gain due to Air Leakage																																																									
$HL_{airb} = LR_{airh} \times \frac{V_b}{3.6} \times DTD_h \times 1.2$ 0.227 x 277.63 x 43 °C x 1.2 = 3262 W = 11130 Btu/h			$HG_{salb} = LR_{airc} \times \frac{V_b}{3.6} \times DTD_c \times 1.2$ = 0.071 x 277.63 x 7 °C x 1.2 = 167 W = 571 Btu/h																																																									
5.2.3.2 Heat Loss due to Mechanical Ventilation			6.2.7 Sensible heat Gain due to Ventilation																																																									
$HL_{vairb} = PVC \times DTD_h \times 1.08 \times (1 - E)$ 80 CFM x 78 °F x 1.08 x 0.25 = 1670 Btu/h			$HL_{vairb} = PVC \times DTD_h \times 1.08 \times (1 - E)$ 80 CFM x 13 °F x 1.08 x 0.25 = 275 Btu/h																																																									
5.2.3.3 Calculation of Air Change Heat Loss for Each Room (Floor Multiplier Section)																																																												
$HL_{airr} = Level\ Factor \times HL_{airbv} \times \{(HL_{agcr} + HL_{bgcr}) \div (HL_{agclevel} + HL_{bgclevel})\}$																																																												
Level	Level Factor (LF)	HLairve Air Leakage + Ventilation Heat Loss (Btu/h)	Level Conductive Heat Loss: (HL _{level})	Air Leakage Heat Loss Multiplier (LF x HLairbv / HLlevel)																																																								
1	0.5	11,130	8,030	0.693																																																								
2	0.3		10,149	0.329																																																								
3	0.2		12,627	0.176																																																								
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:** 38-10**BUILDER:** ROYAL PINE HOMES**SFQT:** 2554**LO#** 87612**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):	35295.9	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:	7.0 ft
LENGTH: 49.0 ft	WIDTH: 32.0 ft	EXPOSED PERIMETER:	162.0 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%	-

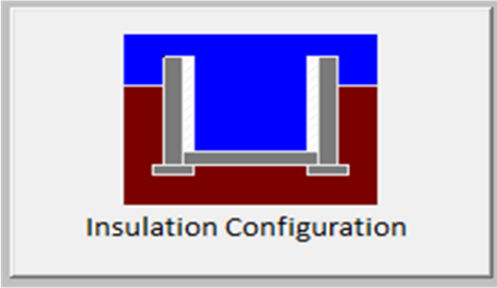
INDIVIDUAL BCIN: 19669

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):	14.9	 Insulation Configuration
Floor Width (m):	9.8	
Exposed Perimeter (m):	0.0	
Wall Height (m):	3.0	
Depth Below Grade (m):	2.13	
Window Area (m ²):	1.1	
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):		1600

TYPE: 38-10

LO# 87612

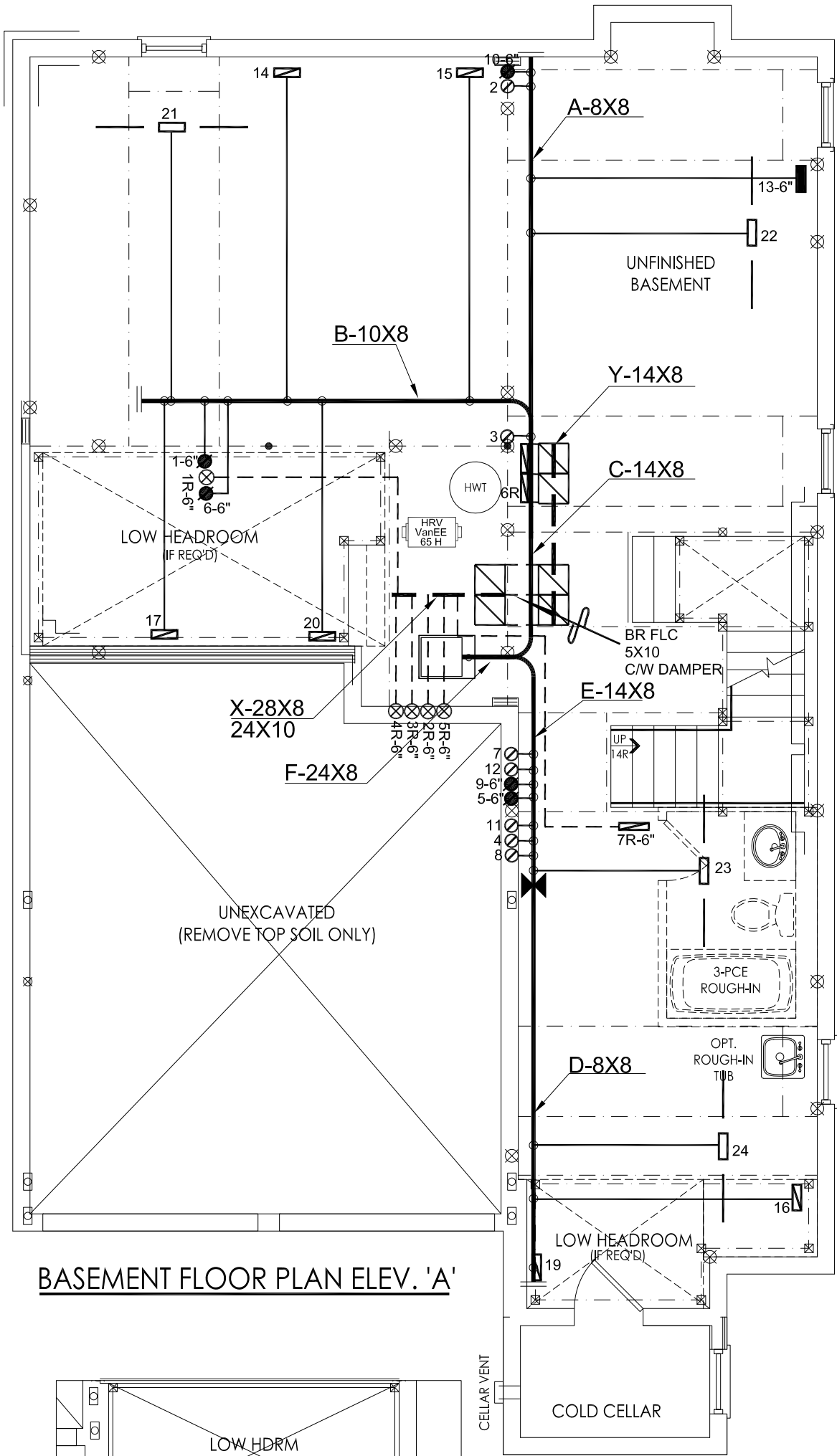
Air Infiltration Residential Load Calculator

Supplemental tool for CAN/CSA-F280

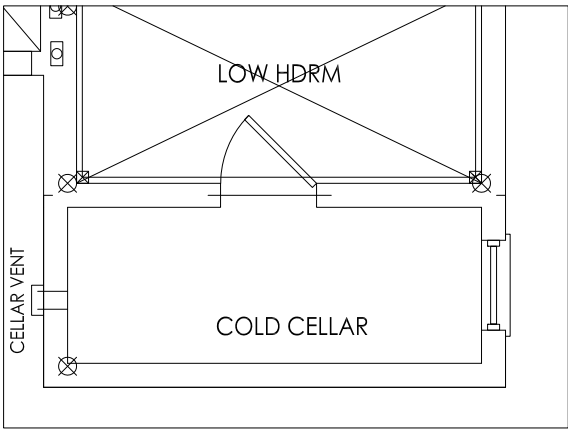
Weather Station Description				
Province:	Ontario			
Region:	Richmond Hill			
Weather Station Location:	Open flat terrain, grass			
Anemometer height (m):	10			
Local Shielding				
Building Site:	Suburban, forest			
Walls:	Heavy			
Flue:	Heavy			
Highest Ceiling Height (m):	6.74			
Building Configuration				
Type:	Detached			
Number of Stories:	Two			
Foundation:	Full			
House Volume (m ³):	999.5			
Air Leakage/Ventilation				
Air Tightness Type:	Energy Star Detached (2.5 ACH)			
Custom BDT Data:	ELA @ 10 Pa.	933.0 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):	0.227			
Cooling Air Leakage Rate (ACH/H):	0.071			

TYPE: 38-10

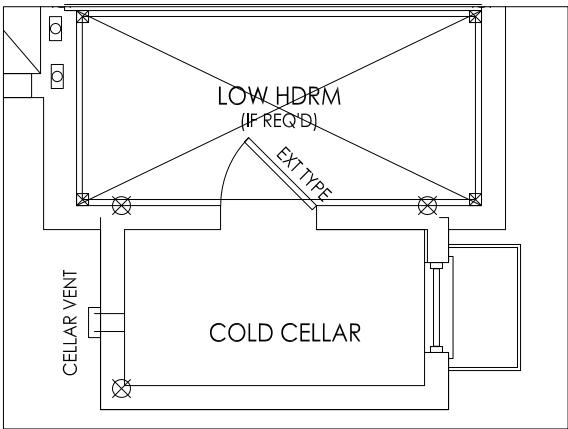
LO# 87612



BASEMENT FLOOR PLAN ELEV. 'A'



BASEMENT FLOOR PLAN ELEV. 'B'



BASEMENT FLOOR PLAN ELEV. 'C'

CSA-F280-12

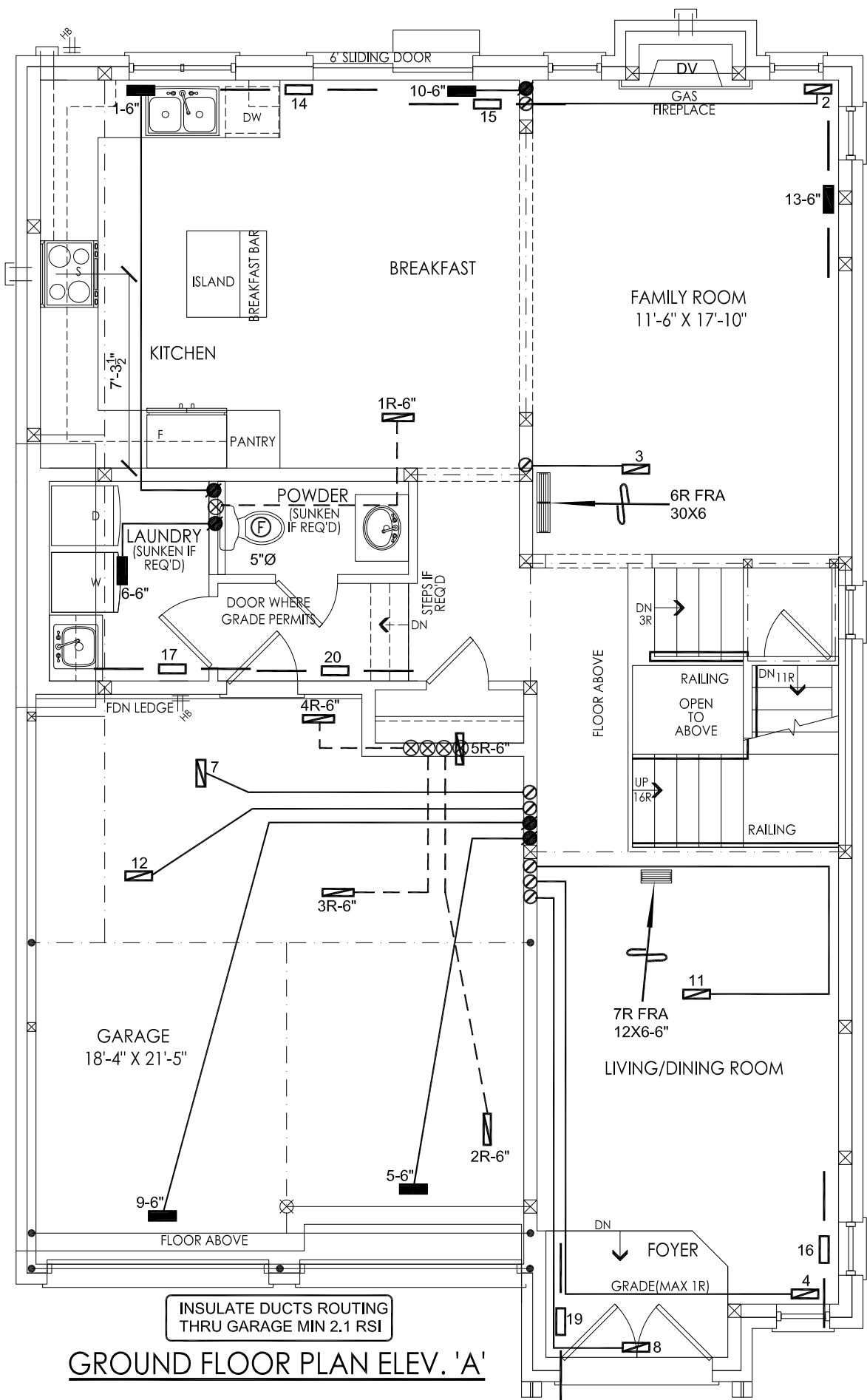
SB-12 PERFORMANCE

I MICHAEL O'ROURKE HAVE REVIEWED AND TAKE RESPONSIBILITY FOR THE DESIGN WORK AND AM QUALIFIED UNDER DIVISION C, 3.2.5 OF THE BUILDING CODE.
Michael O'Rourke
Michael O'Rourke, BCIN# 19669
HVAC DESIGNS LTD.

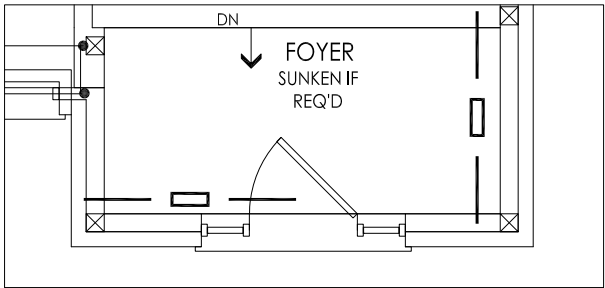
HVAC LEGEND								3.		
SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	2.	REVISED AS PER ARCHITECTURALS	APR/2021
	SUPPLY AIR GRILLE		6" SUPPLY AIR BOOT ABOVE		14"x8" RETURN AIR GRILLE		RETURN AIR STACK ABOVE	1.	REVISED TO PERFORMANCE	SEPT/2020
	SUPPLY AIR GRILLE 6" BOOT		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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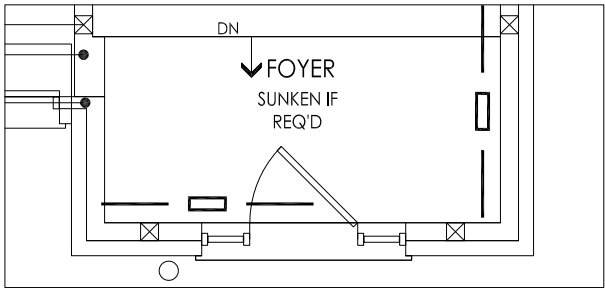
Client ROYAL PINE HOMES	 375 Finley Ave. Suite 202 - Ajax, Ontario L1S 2E2 Tel. 905.619.2300 - 905.420.5300 Fax 905.619.2375 Email: info@hvacdsgns.ca Web: www.hvacdsgns.ca Specializing in Residential Mechanical Design Services	HEAT LOSS 44070 BTU/H UNIT DATA MAKE 59TN6A-060-14V MODEL CARRIER INPUT 60 MBTU/H OUTPUT 58 MBTU/H COOLING 2.5 TONS FAN SPEED 970 cfm @ 0.6" w.c.	# OF RUNS S/A R/A FANS 3RD FLOOR 2ND FLOOR 12 5 3 1ST FLOOR 7 2 3 BASEMENT 4 1 0	Sheet Title BASEMENT HEATING LAYOUT	
				Date	SEPT/2020
Project Name 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.		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	
38-10	2554 sqft			LO#	87612



GROUND FLOOR PLAN ELEV. 'A'



GROUND FLOOR PLAN ELEV. 'B'



GROUND FLOOR PLAN ELEV. '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.	REVISED AS PER ARCHITECTURALS	APR/2021
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	SUPPLY AIR BOOT ABOVE		6" SUPPLY AIR STACK 2nd FLOOR		FRA- FLOOR RETURN AIR GRILLE		REDUCER	REVISIONS		

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Client		 375 Finley Ave. Suite 202 - Ajax, Ontario L1S 2E2 Tel. 905.619.2300 - 905.420.5300 Fax 905.619.2375 Email: info@hvacdesigns.ca Web: www.hvacdesigns.ca Specializing in Residential Mechanical Design Services 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	
Project Name			FIRST FLOOR HEATING LAYOUT	
CENTREFIELD (WEST GORMLEY) RICHMOND HILL, ONTARIO			Date SEPT/2020	
38-10		2554 sqft	Scale 3/16" = 1'-0"	
			BCIN# 19669	
			LO#	87612



SB-12 PERFORMANCE

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ROYAL PINE HOMES		SECOND FLOOR HEATING LAYOUT	
Project Name		Date	SEPT/2020
CENTREFIELD (WEST GORMLEY) RICHMOND HILL, ONTARIO		Scale	3/16" = 1'-0"
	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	
38-10	2554 sqft	LO#	87612