

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: 38-14 Coventry 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 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)										OPT 2ND					DATE: Jun-21					WINTER NATURAL AIR CHANGE RATE 0.227					HEAT LOSS ΔT °F. 78		CSA-F280-12						
BUILDER: ROYAL PINE HOMES										TYPE: 38-14					GFA: 2724					LO# 91285					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-3		ENS-4		ENS-2													
EXP. WALL		37		22		6		33		29		11				6		6		5													
CLG. HT.		9		9		9		9		9		9				9		9		9													
FACTORS																																	
GRS.WALL AREA		LOSS GAIN		333		198		54		297		261		99		54		54		45													
GLAZING				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	8	174	128	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0								
EAST		21.8	41.6	38	828	1579	19	414	789	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0								
SOUTH		21.8	24.9	0	0	0	0	0	0	0	0	0	0	0	0	17	370	423	9	196	224	0	0	0	0								
WEST		21.8	41.6	0	0	0	0	0	0	0	0	0	56	1220	2327	50	1089	2078	0	0	0	18	392	748	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								
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								
NET EXPOSED WALL		4.2	0.7	295	1241	204	171	719	118	54	227	37	241	1014	167	211	887	146	82	345	57	45	189	31	27								
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								
EXPOSED CLG		1.3	0.6	346	455	203	124	163	73	105	138	62	170	223	100	206	271	121	195	256	115	60	79	35	85								
NO ATTIC EXPOSED CLG		2.8	1.3	0	0	0	0	0	0	0	0	0	45	126	57	45	126	57	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	251	655	108	175	457	75	0	0	0	50								
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				2523		1470		365		2583		3029		1428		464		464		748													
SUB TOTAL HT GAIN				1986		1108		99		2650		2509		670		290		290		838													
LEVEL FACTOR / MULTIPLIER		0.20	0.16			0.20	0.16			0.20	0.16			0.20	0.16			0.20	0.16														
AIR CHANGE HEAT LOSS				405		236		59		414		486		229		74		74		120													
AIR CHANGE HEAT GAIN				90		50		5		121		114		31		13		13		38													
DUCT LOSS				0		0		0		0		351		166		0		0		87													
DUCT GAIN				0		0		0		0		356		163		0		0		88													
HEAT GAIN PEOPLE		240		2	480	0	0	0	0	1	240	1	240	1	240	1	0	0	0	0	0	0	0	0	0								
HEAT GAIN APPLIANCES/LIGHTS				693		0		0		693		693		693		0		0		0													
TOTAL HT LOSS BTU/H				2928		1706		424		2997		3866		1823		539		539		955													
TOTAL HT GAIN x 1.3 BTU/H				4225		1507		135		4815		5085		2335		395		395		1253													

ROOM USE			GRT			KIT			DEN			PWD			FOY			MUD												BAS		
EXP. WALL			61			52			16			12			29			7												168		
CLG. HT.			10			10			9			10			11			11												10		
FACTORS																																
GRS.WALL AREA			616			525			144			121			322			78									1176					
LOSS GAIN			LOSS GAIN			LOSS GAIN			LOSS GAIN			LOSS GAIN			LOSS GAIN			LOSS GAIN									LOSS GAIN					
GLAZING			0 0 0			0 0 0			0 0 0			0 0 0			0 0 0			0 0 0									3 65 48					
NORTH			21.8 16.0			0 0 0			0 0 0			0 0 0			0 0 0			0 0 0									3 65 125					
EAST			21.8 41.6			60 1307 2493			71 1547 2950			0 0 0			0 0 0			0 0 0									6 131 149					
SOUTH			21.8 24.9			0 0 0			0 0 0			33 719 822			9 196 224			0 0 0			0 0 0						0 0 0					
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					
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					
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			556 2339 385			454 1910 314			111 467 77			112 472 78			282 1186 195			58 243 40						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			135 177 79			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									5708					
SLAB ON GRADE HEAT LOSS						0			0			0			0			0														
SUBTOTAL HT LOSS						3646			3457			1363			668			2219			760						8342					
SUB TOTAL HT GAIN						2878			3264			978			302			365			125						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 0.69					
AIR CHANGE HEAT LOSS						1178			1117			219			216			717			245						5787					
AIR CHANGE HEAT GAIN						131			149			45			14			17			6						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						693			693			693			0			0			0						693					
TOTAL HT LOSS BTU/H						4823			4573			1582			884			2936			1005						14130					
TOTAL HT GAIN x 1.3 BTU/H						4812			5338			2230			410			496			170						1869					

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

OPT 2ND
TYPE: 38-14

DATE: Jun-21

GFA: 2724 LO# 91285

HEATING CFM 1115 COOLING CFM 1115
TOTAL HEAT LOSS 45,708 TOTAL HEAT GAIN 35,469
AIR FLOW RATE CFM 24.39 AIR FLOW RATE CFM 31.44

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

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

RUN COUNT	4th	3rd	2nd	1st	Bas
S/A	0	0	13	7	4
R/A	0	0	5	1	1

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

LOW 930
MEDLOW 1050
MEDIUM 1115
MEDIUM HIGH 1245
HIGH 1520

DESIGN CFM = 1115
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	WIC	BED-2	BED-3	BED-4	ENS-4	BED-2	BED-3	MBR	ENS-3	GRT	GRT	KIT	KIT	ENS-2	DEN	PWD	FOY	MUD	BAS	BAS	BAS	BAS
RM LOSS MBH.	1.46	1.71	0.42	1.50	1.93	1.82	0.54	1.50	1.93	1.46	0.54	2.41	2.41	2.29	2.29	0.95	1.58	0.88	2.94	1.00	3.53	3.53	3.53	3.53
CFM PER RUN HEAT	36	42	10	37	47	44	13	37	47	36	13	59	59	56	56	23	39	22	72	25	86	86	86	86
RM GAIN MBH.	2.11	1.51	0.13	2.41	2.54	2.34	0.39	2.41	2.54	2.11	0.39	2.41	2.41	2.67	2.67	1.25	2.23	0.41	0.50	0.17	0.47	0.47	0.47	0.47
CFM PER RUN COOLING	66	47	4	76	80	73	12	76	80	66	12	76	76	84	84	39	70	13	16	5	15	15	15	15
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	0.17	0.17	0.16	0.16	0.17	0.17	0.17	0.17	0.16	0.16	0.16	0.16
ACTUAL DUCT LGH.	37	51	39	69	66	51	26	71	72	46	52	30	39	38	28	58	30	47	55	9	34	25	19	43
EQUIVALENT LENGTH	150	190	130	190	160	170	190	180	170	180	150	160	170	160	130	140	150	150	140	110	170	180	160	160
TOTAL EFFECTIVE LENGTH	187	241	169	259	226	221	216	251	242	226	202	190	209	198	158	198	180	197	195	119	204	205	179	203
ADJUSTED PRESSURE	0.09	0.07	0.1	0.07	0.08	0.08	0.08	0.07	0.07	0.08	0.09	0.09	0.08	0.08	0.1	0.09	0.1	0.09	0.09	0.14	0.08	0.08	0.09	0.08
ROUND DUCT SIZE	5	5	4	6	6	6	4	6	6	5	4	6	6	6	6	4	5	4	5	4	6	6	6	6
HEATING VELOCITY (ft/min)	264	308	115	189	240	224	149	189	240	264	149	301	301	286	286	264	286	252	529	287	438	438	438	438
COOLING VELOCITY (ft/min)	485	345	46	388	408	372	138	388	408	485	138	388	388	428	428	447	514	149	117	57	76	76	76	76
OUTLET GRILL SIZE	3X10	3X10	3X10	4X10	4X10	4X10	3X10	4X10	4X10	3X10	3X10	4X10	4X10	4X10	4X10	3X10	3X10	3X10	3X10	3X10	4X10	4X10	4X10	4X10
TRUNK	A	A	D	B	C	C	D	B	C	A	C	A	A	A	A	C	D	B	B	D	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	

SUPPLY AIR TRUNK SIZE														RETURN 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	516	0.07	11.3	14	x	8	663	TRUNK G	0	0.00	0	0	x	8	0	TRUNK O	0	0.05	0	0	x	8	0				
TRUNK B	254	0.07	8.7	10	x	8	457	TRUNK H	0	0.00	0	0	x	8	0	TRUNK P	0	0.05	0	0	x	8	0				
TRUNK C	514	0.07	11.3	14	x	8	661	TRUNK I	0	0.00	0	0	x	8	0	TRUNK Q	0	0.05	0	0	x	8	0				
TRUNK D	1117	0.07	15.1	26	x	8	773	TRUNK J	0	0.00	0	0	x	8	0	TRUNK R	0	0.05	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 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										BR
AIR VOLUME	145	115	115	115	105	360	0	0	0	0	0	0	0	0	0	160
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.	34	62	71	65	30	25	1	1	1	1	1	1	1	1	1	14
EQUIVALENT LENGTH	175	250	245	205	155	175	0	0	0	0	0	0	0	0	0	135
TOTAL EFFECTIVE LH	209	312	316	270	185	200	1	1	1	1	1	1	1	1	1	149
ADJUSTED PRESSURE	0.07	0.05	0.05	0.05	0.08	0.07	14.80	14.80	14.80	14.80	14.80	14.80	14.80	14.80	14.80	0.10
ROUND DUCT SIZE	7	7	7	7	6	9.9	0	0	0	0	0	0	0	0	0	6.7
INLET GRILL SIZE	8	8	8	8	8	8	0	0	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	30	0	0	0	0	0	0	0	0	0	14

TYPE: 38-14
SITE NAME: CENTREFIELD (WEST GORMLEY)

LO # 91285
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>3</u> @ 10.6 cfm	<u>31.8</u> cfm
Kitchen & Bathrooms	<u>6</u> @ 10.6 cfm	<u>63.6</u> cfm
Other Rooms	<u>3</u> @ 10.6 cfm	<u>31.8</u> cfm
Table 9.32.3.A.	TOTAL	<u>169.6</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>169.6</u>	cfm
Less Principal Ventil. Capacity	<u>79.5</u>	cfm
Required Supplemental Capacity	<u>90.1</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
ENS	BY INSTALLING CONTRACTOR	50	☒
ENS-2	BY INSTALLING CONTRACTOR	50	☒
PWD	BY INSTALLING CONTRACTOR	50	☒

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#: 91285	Model: 38-14	Builder: ROYAL PINE HOMES	Date: 2021-06-21																																																									
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>1098</td> <td>10</td> <td>10980</td> </tr> <tr> <td>First</td> <td>1098</td> <td>10</td> <td>11089.8</td> </tr> <tr> <td>Second</td> <td>1626</td> <td>9</td> <td>14634</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="3" style="text-align: right;">Total:</td> <td>36,703.8 ft³</td> </tr> <tr> <td colspan="3" style="text-align: right;">Total:</td> <td>1039.3 m³</td> </tr> </tbody> </table>			Level	Floor Area (ft²)	Floor Height (ft)	Volume (ft³)	Bsmt	1098	10	10980	First	1098	10	11089.8	Second	1626	9	14634	Third	0	9	0	Fourth	0	9	0	Total:			36,703.8 ft³	Total:			1039.3 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%;">0.227</td> </tr> <tr> <td>SUMMER NATURAL AIR CHANGE RATE</td> <td>0.071</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	0.227	SUMMER NATURAL AIR CHANGE RATE	0.071	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	1098	10	10980																																																									
First	1098	10	11089.8																																																									
Second	1626	9	14634																																																									
Third	0	9	0																																																									
Fourth	0	9	0																																																									
Total:			36,703.8 ft³																																																									
Total:			1039.3 m³																																																									
WINTER NATURAL AIR CHANGE RATE	0.227																																																											
SUMMER NATURAL AIR CHANGE RATE	0.071																																																											
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																																																									
$HL_{airb} = LR_{airh} \times \frac{V_b}{3.6} \times DTD_h \times 1.2$ 0.227 x 288.70 x 43 °C x 1.2 = 3392 W = 11574 Btu/h			$HG_{salb} = LR_{airc} \times \frac{V_b}{3.6} \times DTD_c \times 1.2$ = 0.071 x 288.70 x 7 °C x 1.2 = 174 W = 594 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_{clevel})</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;">11,574</td> <td>8,342</td> <td>0.694</td> </tr> <tr> <td>2</td> <td>0.3</td> <td>10,749</td> <td>0.323</td> </tr> <tr> <td>3</td> <td>0.2</td> <td>14,438</td> <td>0.160</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 _{clevel})	Air Leakage Heat Loss Multiplier (LF x HLairbv / HLlevel)	1	0.5	11,574	8,342	0.694	2	0.3	10,749	0.323	3	0.2	14,438	0.160	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 _{clevel})	Air Leakage Heat Loss Multiplier (LF x HLairbv / HLlevel)																																																								
1	0.5	11,574	8,342	0.694																																																								
2	0.3		10,749	0.323																																																								
3	0.2		14,438	0.160																																																								
4	0		0	0.000																																																								
5	0		0	0.000																																																								

HEAT LOSS AND GAIN SUMMARY SHEET

MODEL: 38-14	OPT 2ND	BUILDER: ROYAL PINE HOMES
SFQT: 2724	LO# 91285	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):	36703.8	ASSUMED (Y/N):	Y
INTERNAL SHADING:	BLINDS/CURTAINS	ASSUMED OCCUPANTS:	5
INTERIOR LIGHTING LOAD (Btu/h/ft ²):	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%	-

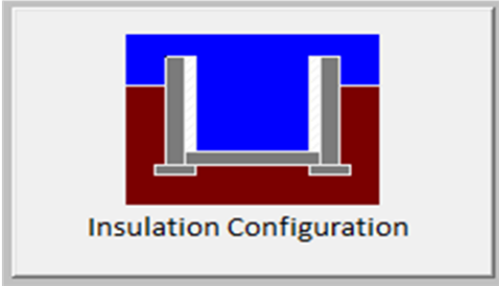
INDIVIDUAL BCIN: 19669

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	
Floor Width (m):	9.4	
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):		1672

TYPE: 38-14
LO# 91285

OPT 2ND

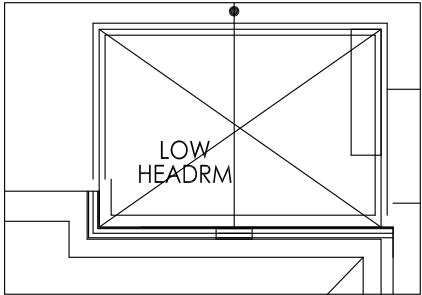
Air Infiltration Residential Load Calculator

Supplemental tool for CAN/CSA-F280

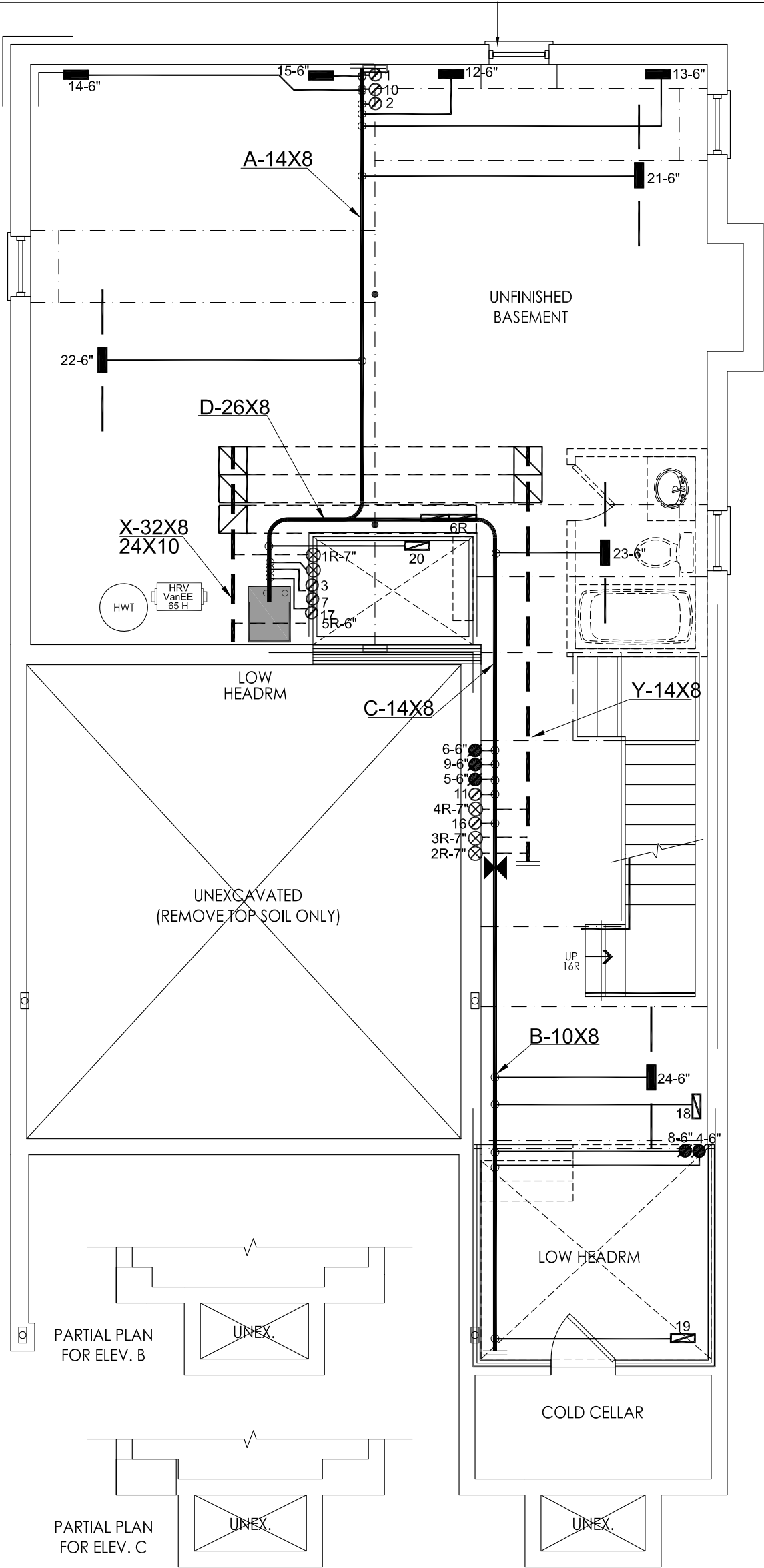
Weather Station Description				
Province:	Ontario			
Region:	Richmond Hill			
Weather Station Location:	Open flat terrain, grass			
Anemometer height (m):	10			
Local Shielding				
Building Site:	Suburban, forest			
Walls:	Heavy			
Flue:	Heavy			
Highest Ceiling Height (m):	6.74			
Building Configuration				
Type:	Detached			
Number of Stories:	Two			
Foundation:	Full			
House Volume (m ³):	1039.3			
Air Leakage/Ventilation				
Air Tightness Type:	Energy Star Detached (2.5 ACH)			
Custom BDT Data:	ELA @ 10 Pa.		970.2 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: 38-14
LO# 91285

OPT 2ND



BASEMENT FLOOR PLAN
ELEV 'A','B',&,'C' w/
LAUNDRY FOR PARTIAL
GROUND FLOOR



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

CSA-F280-12

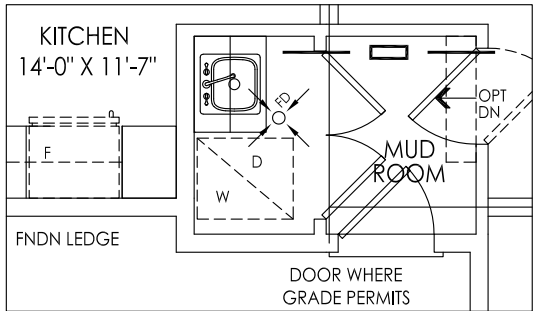
SB-12 PERFORMANCE

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.

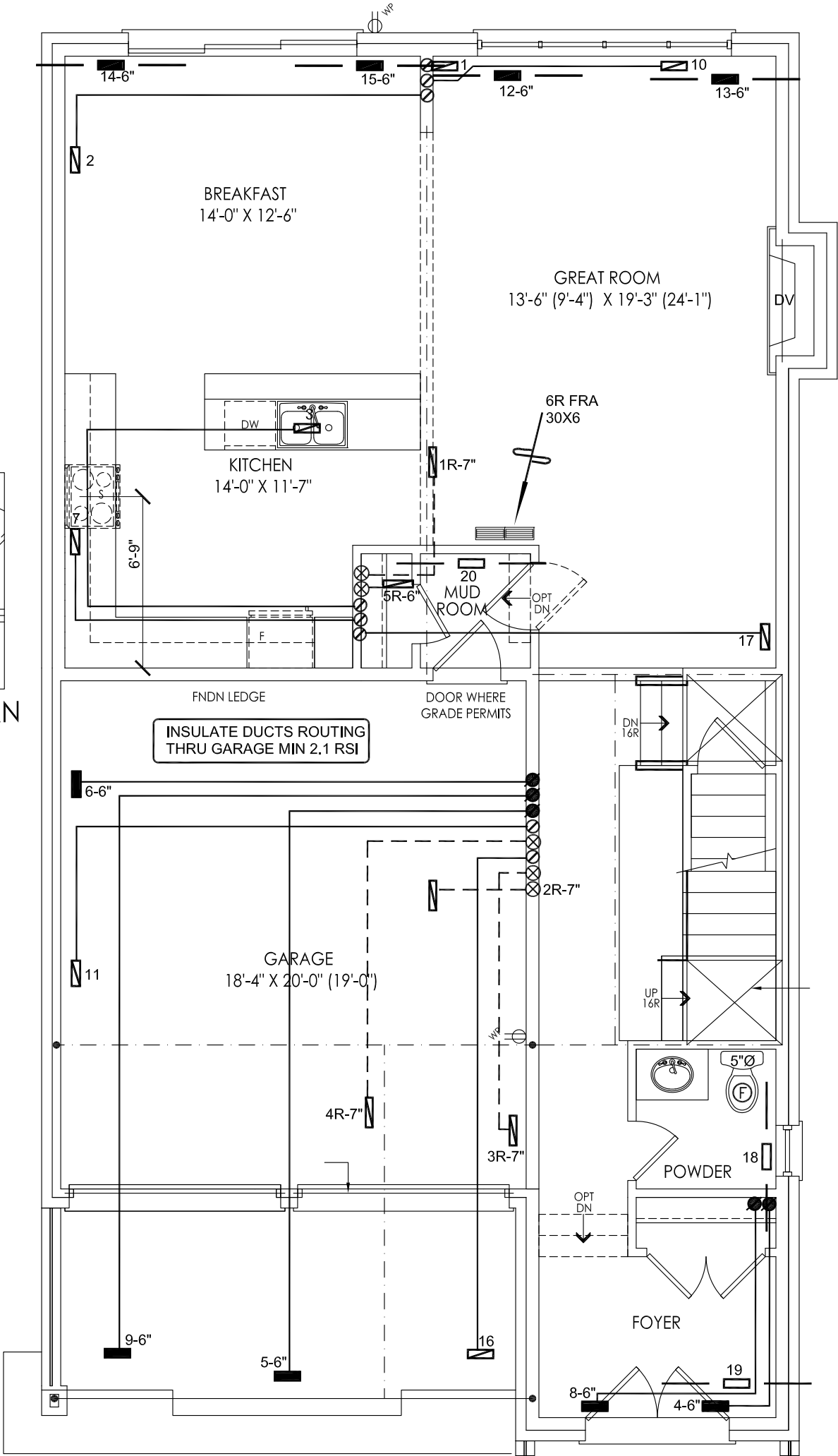
HVAC LEGEND							3.		
SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	2.	
	SUPPLY AIR GRILLE		6" SUPPLY AIR BOOT ABOVE		14"x8" RETURN AIR GRILLE		RETURN AIR STACK ABOVE	1.	
	SUPPLY AIR GRILLE 6" BOOT		SUPPLY AIR STACK FROM 2nd FLOOR		30"x8" RETURN AIR GRILLE		RETURN AIR STACK 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.

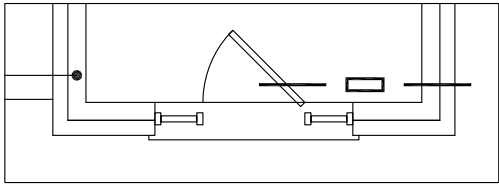
Client ROYAL PINE HOMES	 375 Finley Ave. Suite 202 - Ajax, Ontario L1S 2E2 Tel. 905.619.2300 - 905.420.5300 Fax 905.619.2375 Email: info@hvacdsgns.ca Web: www.hvacdsgns.ca Specializing in Residential Mechanical Design Services	HEAT LOSS 47378 BTU/H UNIT DATA MAKE CARRIER MODEL 59TN6B-060-14V INPUT 60 MBTU/H OUTPUT 58 MBTU/H COOLING 3.0 TONS FAN SPEED 1115 cfm @ 0.6" w.c.	# OF RUNS S/A R/A FANS 3RD FLOOR 2ND FLOOR 13 5 4 1ST FLOOR 7 1 2 BASEMENT 4 1 0	Sheet Title BASEMENT HEATING LAYOUT
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	Date JUNE/2021
				Scale 3/16" = 1'-0"
38-14 - OPT 2ND 2724 sqft				BCIN# 19669
				LO# 91285



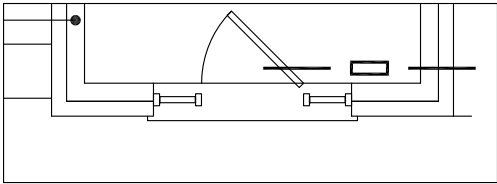
PARTIAL GROUND FLOOR PLAN
ELEV. 'A','B',&'C' w/ LAUNDRY



GROUND FLOOR PLAN ELEV 'A'



GROUND FLOOR PLAN ELEV 'B'



GROUND FLOOR PLAN ELEV 'C'

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.

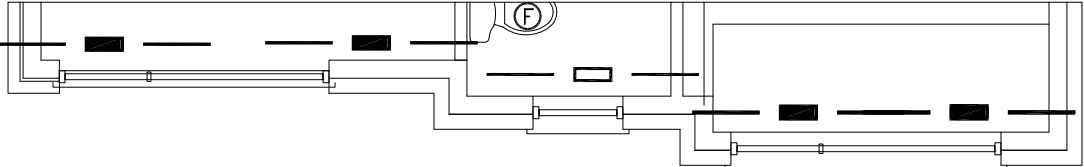
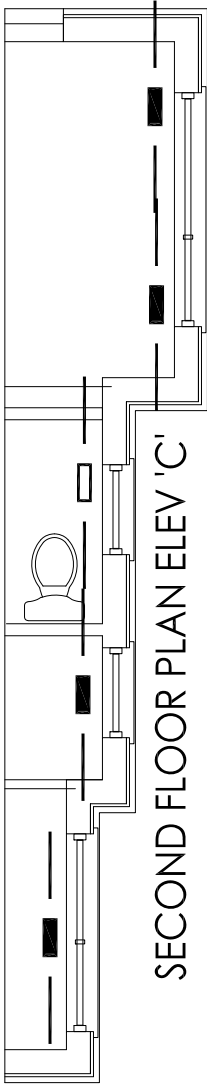
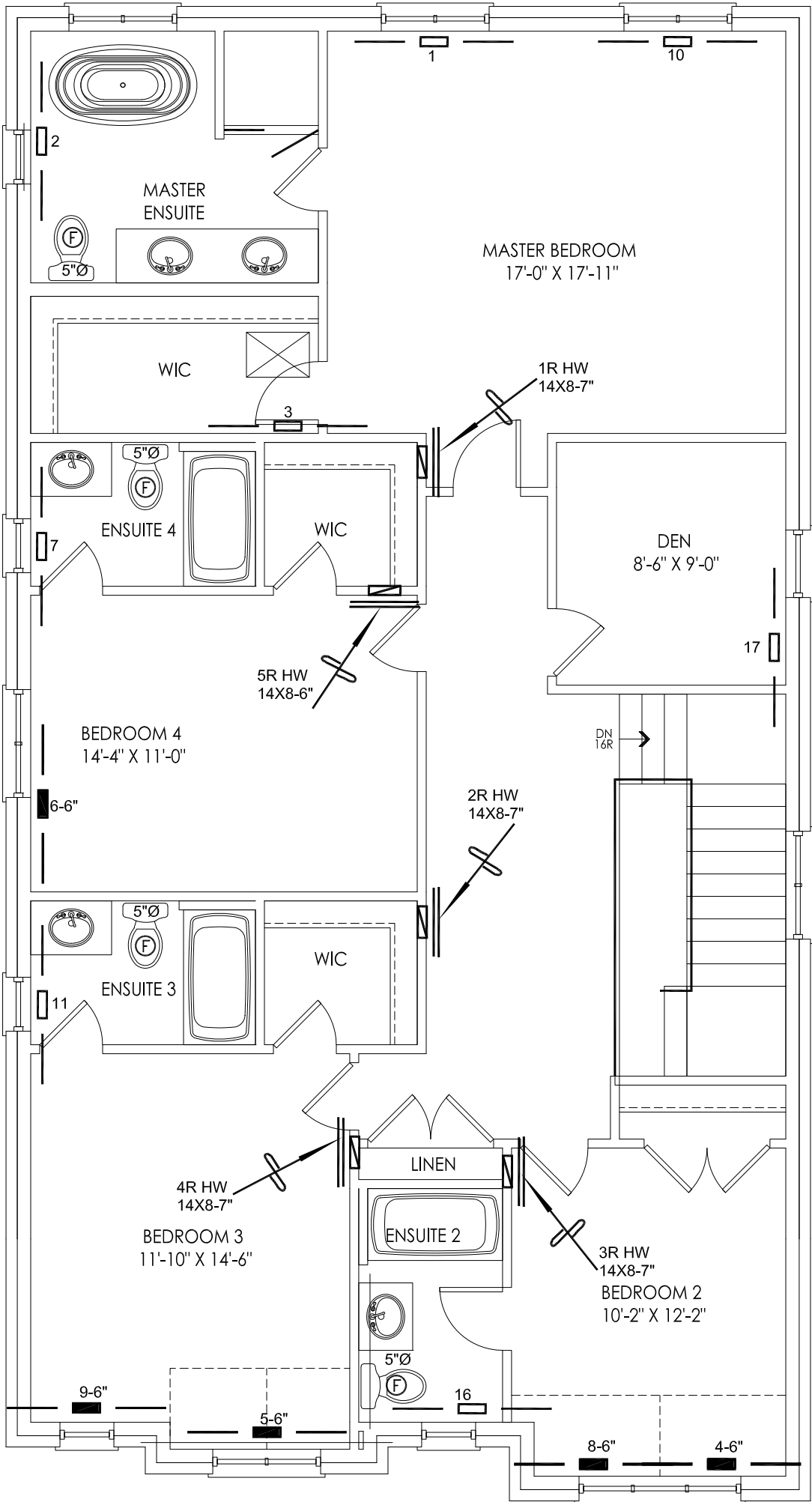
CSA-F280-12

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	Sheet Title	
ROYAL PINE HOMES			FIRST FLOOR HEATING LAYOUT	
Project Name CENTREFIELD (WEST GORMLEY) RICHMOND HILL, ONTARIO			Date	JUNE/2021
38-14 - OPT 2ND 2724 sqft		Scale	3/16" = 1'-0"	
		BCIN# 19669		
		LO#	91285	
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.				



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			SECOND FLOOR HEATING LAYOUT	
Project Name			Date	JUNE/2021
CENTREFIELD (WEST GORMLEY) RICHMOND HILL, ONTARIO			Scale	3/16" = 1'-0"
38-14 - OPT 2ND 2724 sqft			BCIN# 19669	
			LO#	91285