

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.
Municipality BRAMPTON			Postal code
Plan number/ other description			Lot/con.
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: 1701 OPT. GROUND Project: FORESTSIDE	
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.			
May 25, 2018 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: FORESTSIDE					OPT. GROUND					DATE: Apr-19					WINTER NATURAL AIR CHANGE RATE 0.433					HEAT LOSS ΔT °F. 74					CSA-F280-12									
BUILDER: ROYAL PINE HOMES					TYPE: 1701					GFA: 2472					LO# 78682					SUMMER NATURAL AIR CHANGE RATE 0.149					HEAT GAIN ΔT °F. 14					SB-12 PACKAGE A1				
ROOM USE				MBR				ENS				BED-2		BED-3				BATH																
EXP. WALL				17				0				14		7				0																
CLG. HT.				9				9				9		9				9																
FACTORS																																		
GRS.WALL AREA		LOSS GAIN		153		0		0		126		63		0																				
GLAZING				LOSS GAIN		LOSS GAIN		LOSS GAIN		LOSS GAIN		LOSS GAIN		LOSS GAIN																				
NORTH		20.8	16.3	0	0	0	0	0	0	0	0	0	0	0	0	0		0	0	0														
EAST		20.8	41.9	0	0	0	0	0	0	0	51	1060	2136	14	291	586		0	0	0														
SOUTH		20.8	25.2	0	0	0	0	0	0	0	0	0	0	0	0	0		0	0	0														
WEST		20.8	41.9	57	1184	2388	0	0	0	0	0	0	0	0	0	0		0	0	0														
SKYLT.		36.4	102.1	0	0	0	0	0	0	0	0	0	0	0	0	0		0	0	0														
DOORS		24.7	4.7	0	0	0	0	0	0	0	0	0	0	0	0	0		0	0	0														
NET EXPOSED WALL		4.4	0.8	96	418	79	0	0	0	0	75	327	62	49	213	40		0	0	0														
NET EXPOSED BSMT WALL ABOVE GR		3.5	0.7	0	0	0	0	0	0	0	0	0	0	0	0	0		0	0	0														
EXPOSED CLG		1.3	0.6	0	0	0	0	0	0	0	0	0	0	0	0	0		0	0	0														
NO ATTIC EXPOSED CLG		2.7	1.3	311	835	405	80	215	104	0	216	580	281	213	572	277		221	593	288														
EXPOSED FLOOR		2.5	0.5	102	254	48	0	0	0	0	0	0	0	0	0	0		0	0	0														
BASEMENT/CRAWL HEAT LOSS				0		0		0		0		0		0		0		0		0														
SLAB ON GRADE HEAT LOSS				0		0		0		0		0		0		0		0		0														
SUBTOTAL HT LOSS				2691		215				1966		1076		593																				
SUB TOTAL HT GAIN				2919		104				2479		904		288																				
LEVEL FACTOR / MULTIPLIER		0.10		0.25		0.10		0.25		0.10		0.25		0.10		0.25																		
AIR CHANGE HEAT LOSS				678		54		9		495		271		149		25																		
AIR CHANGE HEAT GAIN				258		9				219		80		74		31																		
DUCT LOSS				337		27				0		0		74		0																		
DUCT GAIN				431		11				0		0		31		0																		
HEAT GAIN PEOPLE		240		2		480		0		1		240		1		240		0		0														
HEAT GAIN APPLIANCES/LIGHTS				648		0				648		648		0		0																		
TOTAL HT LOSS BTU/H				3706		296				2461		1347		817		448																		
TOTAL HT GAIN x 1.3 BTU/H				6156		162				4662		2433		448																				

ROOM USE			LV/DN				KIT		BED-4						FOY		MUD								BAS	
EXP. WALL			19				17		12						6		17								36	
CLG. HT.			10				12		10						10		10								9	
FACTORS																										
GRS.WALL AREA	LOSS	GAIN	190				204		120						60		170								216	
GLAZING			LOSS	GAIN			LOSS	GAIN	LOSS	GAIN			LOSS	GAIN	LOSS	GAIN	LOSS	GAIN	LOSS	GAIN	LOSS	GAIN	LOSS	GAIN	LOSS	GAIN
NORTH	20.8	16.3	0	0	0		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
EAST	20.8	41.9	55	1143	2304		0	0	0	42	873	1759	0	0	0	4	83	168	0	0	0	0	12	249	503	
SOUTH	20.8	25.2	0	0	0		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
WEST	20.8	41.9	0	0	0		75	1558	3142	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
SKYLT.	36.4	102.1	0	0	0		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
DOORS	24.7	4.7	0	0	0		20	493	93	0	0	0	20	493	93	20	493	93	20	493	93	20	493	93	20	493
NET EXPOSED WALL	4.4	0.8	135	588	111		109	475	90	78	340	64	36	157	30	150	654	123	150	654	123	150	654	123	150	654
NET EXPOSED BSMT WALL ABOVE GR	3.5	0.7	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	0	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	2.7	1.3	0	0	0		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
EXPOSED FLOOR	2.5	0.5	0	0	0		306	762	144	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				1125	
SLAB ON GRADE HEAT LOSS					0				0			0			0			0			0				1125	
SUBTOTAL HT LOSS					1731				3288			1212			733			1147			733			1147		1754
SUB TOTAL HT GAIN					2415				3468			1823			290			216			290			216		574
LEVEL FACTOR / MULTIPLIER			0.20	0.66			0.20	0.66		0.30	1.60		0.30	1.60		0.30	1.60		0.30	1.60			0.40	3.76		
AIR CHANGE HEAT LOSS					1136				2158			1938			1172			1833			1172			1833		6589
AIR CHANGE HEAT GAIN					213				306			161			26			19			26			19		51
DUCT LOSS					0				545			0			0			0			0			0		0
DUCT GAIN					0				442			0			0			0			0			0		0
HEAT GAIN PEOPLE	240				0				0		1	240			0		0	0			0		0		0	0
HEAT GAIN APPLIANCES/LIGHTS					648				648			648			0			0			0			648		648
TOTAL HT LOSS BTU/H					2867				5991			3150			1905			2979			1905			8344		8344
TOTAL HT GAIN x 1.3 BTU/H					4259				6324			3734			411			306			411			1655		1655

SITE NAME: FORESTSIDE
BUILDER: ROYAL PINE HOMES

OPT. GROUND
TYPE: 1701

DATE: Apr-19

GFA: 2472 LO# 78682

HEATING CFM 875 COOLING CFM 875
TOTAL HEAT LOSS 33,863 TOTAL HEAT GAIN 30,549
AIR FLOW RATE CFM 25.84 AIR FLOW RATE CFM 28.64

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 %

59SP5A-40-10

40

INPUT (BTU/H) = 40,000

OUTPUT (BTU/H) = 39,000

FAN SPEED

LOW 0

MEDLOW 0

MEDIUM 0

MEDIUM HIGH 710

HIGH 875

DESIGN CFM = 875

CFM @ .6" E.S.P.

TEMPERATURE RISE 41 °F

RUN COUNT	4th	3rd	2nd	1st	Bas
S/A	0	7	5	3	3
R/A	0	4	2	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	4	5	6	7	10	11	12	13	14	15	16	19	20	21	22	23
ROOM NAME	MBR	ENS	BED-2	BED-3	BED-2	BATH	MBR	KIT	LV/DN	LV/DN	KIT	KIT	BED-4	FOY	MUD	BAS	BAS	BAS
RM LOSS MBH.	1.85	0.30	1.23	1.35	1.23	0.82	1.85	2.00	1.43	1.43	2.00	2.00	3.15	1.90	2.98	2.78	2.78	2.78
CFM PER RUN HEAT	48	8	32	35	32	21	48	52	37	37	52	52	81	49	77	72	72	72
RM GAIN MBH.	3.08	0.16	2.33	2.43	2.33	0.45	3.08	2.11	2.13	2.13	2.11	2.11	3.73	0.41	0.31	0.55	0.55	0.55
CFM PER RUN COOLING	88	5	67	70	67	13	88	60	61	61	60	60	107	12	9	16	16	16
ADJUSTED PRESSURE	0.16	0.17	0.17	0.17	0.17	0.17	0.16	0.17	0.17	0.17	0.17	0.17	0.15	0.17	0.17	0.17	0.17	0.17
ACTUAL DUCT LGH.	77	68	94	101	91	62	77	62	63	72	59	67	23	25	38	23	28	34
EQUIVALENT LENGTH	200	210	220	220	200	260	210	160	130	160	140	130	100	110	150	90	100	160
TOTAL EFFECTIVE LENGTH	277	278	314	321	291	322	287	222	193	232	199	197	123	135	188	113	128	194
ADJUSTED PRESSURE	0.06	0.06	0.05	0.05	0.06	0.05	0.06	0.08	0.09	0.07	0.09	0.09	0.12	0.13	0.09	0.15	0.13	0.09
ROUND DUCT SIZE	6	4	6	6	6	4	6	5	5	5	5	5	6	5	5	5	5	5
HEATING VELOCITY (ft/min)	245	92	163	178	163	241	245	382	272	272	382	382	413	360	565	529	529	529
COOLING VELOCITY (ft/min)	449	57	342	357	342	149	449	441	448	448	441	441	546	88	66	117	117	117
OUTLET GRILL SIZE	4X10	3X10	4X10	4X10	4X10	3X10	4X10	3X10	3X10	3X10	3X10	3X10	4X10	3X10	3X10	3X10	3X10	3X10
TRUNK	B	B	A	A	A	B	B	A	A	B	B	B	D	D	D	D	D	D

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

	TRUNK CFM	STATIC PRESS.	ROUND DUCT	RECT DUCT	VELOCITY (ft/min)		TRUNK CFM	STATIC PRESS.	ROUND DUCT	RECT DUCT	VELOCITY (ft/min)
TRUNK A	173	0.05	8.2	10	x 8	311	TRUNK G	0	0.00	0	0 x 8 0
TRUNK B	281	0.05	9.8	14	x 8	361	TRUNK H	0	0.00	0	0 x 8 0
TRUNK C	454	0.05	11.7	18	x 8	454	TRUNK I	0	0.00	0	0 x 8 0
TRUNK D	423	0.09	9.9	12	x 8	635	TRUNK J	0	0.00	0	0 x 8 0
TRUNK E	0	0.00	0	0	x 8	0	TRUNK K	0	0.00	0	0 x 8 0
TRUNK F	0	0.00	0	0	x 8	0	TRUNK L	0	0.00	0	0 x 8 0

RETURN AIR TRUNK SIZE

	TRUNK CFM	STATIC PRESS.	ROUND DUCT	RECT DUCT	VELOCITY (ft/min)
TRUNK O	0	0.05	0	0	x 8 0
TRUNK P	0	0.05	0	0	x 8 0
TRUNK Q	0	0.05	0	0	x 8 0
TRUNK R	0	0.05	0	0	x 8 0
TRUNK S	0	0.05	0	0	x 8 0
TRUNK T	0	0.05	0	0	x 8 0
TRUNK U	0	0.05	0	0	x 8 0
TRUNK V	0	0.05	0	0	x 8 0
TRUNK W	0	0.05	0	0	x 8 0
TRUNK X	875	0.05	15	26	x 8 606
TRUNK Y	320	0.05	10.3	12	x 8 480
TRUNK Z	0	0.05	0	0	x 8 0
DROP	875	0.05	15	24	x 10 525

RETURN AIR #	1	2	3	4	5	6	7	8	BR
AIR VOLUME	75	75	75	75	130	85	150	115	0 0 0 0 0 0 95
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
ACTUAL DUCT LGH.	69	70	51	58	41	30	25	69	1 1 1 1 1 1 14
EQUIVALENT LENGTH	255	175	165	205	215	185	185	255	0 0 0 0 0 0 190
TOTAL EFFECTIVE LH	324	245	216	263	256	215	210	324	1 1 1 1 1 1 204
ADJUSTED PRESSURE	0.05	0.06	0.07	0.06	0.06	0.07	0.07	0.05	14.80 14.80 14.80 14.80 14.80 14.80 0.07
ROUND DUCT SIZE	6	5.7	5.5	5.7	7	5.8	7.1	7	0 0 0 0 0 0 6
INLET GRILL SIZE	8	8	8	8	8	8	8	8	0 0 0 0 0 0 8
	X	X	X	X	X	X	X	X	X X X X X X X
INLET GRILL SIZE	14	14	14	14	14	14	14	14	0 0 0 0 0 0 14

TYPE: 1701
SITE NAME: FORESTSIDE

LO # 78682
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>2</u> @ 10.6 cfm	<u>21.2</u> cfm
Table 9.32.3.A.	TOTAL	<u>148.4</u> cfm

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

SUPPLEMENTAL VENTILATION CAPACITY		9.32.3.5.
Total Ventilation Capacity	<u>148.4</u>	cfm
Less Principal Ventil. Capacity	<u>79.5</u>	cfm
Required Supplemental Capacity	<u>68.9</u>	cfm

PRINCIPAL EXHAUST FAN CAPACITY	
Model:	VANEE 65H
Location:	BSMT
<u>79.5</u> cfm	<u>3.0</u> sones
☒ HVI Approved	

PRINCIPAL EXHAUST HEAT LOSS CALCULATION				
CFM	ΔT °F	FACTOR	% LOSS	
79.5 CFM	X 74 F	X 1.08	X	0.25

SUPPLEMENTAL FANS		NUTONE		
Location	Model	cfm	HVI	Sones
ENS	QTXEN050C	50	☒	0.3
BATH	QTXEN050C	50	☒	0.3
PWD-2	QTXEN050C	50	☒	0.3
PWD	QTXEN050C	50	☒	0.3

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:	
HRAI #	001820
Date:	April-19

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#: 78682	Model: 1701	Builder: ROYAL PINE HOMES	Date: 4/22/2019																																																									
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>549</td> <td>9</td> <td>4941</td> </tr> <tr> <td>First</td> <td>549</td> <td>10</td> <td>5490</td> </tr> <tr> <td>Second</td> <td>909</td> <td>10</td> <td>9090</td> </tr> <tr> <td>Third</td> <td>1016</td> <td>9</td> <td>9144</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>28,665.0 ft³</td> </tr> <tr> <td colspan="2" style="text-align: right;">Total:</td> <td></td> <td>811.7 m³</td> </tr> </tbody> </table>			Level	Floor Area (ft²)	Floor Height (ft)	Volume (ft³)	Bsmt	549	9	4941	First	549	10	5490	Second	909	10	9090	Third	1016	9	9144	Fourth	0	9	0	Total:			28,665.0 ft³	Total:			811.7 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%; text-align: center;">0.433</td> </tr> <tr> <td>SUMMER NATURAL AIR CHANGE RATE</td> <td style="text-align: center;">0.149</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>-19</td> <td>41</td> <td>74</td> </tr> <tr> <td>Summer DTDc</td> <td>22</td> <td>30</td> <td>8</td> <td>14</td> </tr> </table>		WINTER NATURAL AIR CHANGE RATE	0.433	SUMMER NATURAL AIR CHANGE RATE	0.149	Design Temperature Difference						Tin °C	Tout °C	ΔT °C	ΔT °F	Winter DTDh	22	-19	41	74	Summer DTDc	22	30	8	14
Level	Floor Area (ft²)	Floor Height (ft)	Volume (ft³)																																																									
Bsmt	549	9	4941																																																									
First	549	10	5490																																																									
Second	909	10	9090																																																									
Third	1016	9	9144																																																									
Fourth	0	9	0																																																									
Total:			28,665.0 ft³																																																									
Total:			811.7 m³																																																									
WINTER NATURAL AIR CHANGE RATE	0.433																																																											
SUMMER NATURAL AIR CHANGE RATE	0.149																																																											
Design Temperature Difference																																																												
	Tin °C	Tout °C	ΔT °C	ΔT °F																																																								
Winter DTDh	22	-19	41	74																																																								
Summer DTDc	22	30	8	14																																																								
5.2.3.1 Heat Loss due to Air Leakage			6.2.6 Sensible Gain due to Air Leakage																																																									
$HL_{airb} = LR_{airh} \times \frac{V_b}{3.6} \times DTD_h \times 1.2$ 0.433 x 225.47 x 41 °C x 1.2 = 4828 W = 16474 Btu/h			$HG_{salb} = LR_{airc} \times \frac{V_b}{3.6} \times DTD_c \times 1.2$ = 0.149 x 225.47 x 8 °C x 1.2 = 313 W = 1067 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 74 °F x 1.08 x 0.25 = 1593 Btu/h			$HL_{vairb} = PVC \times DTD_h \times 1.08 \times (1 - E)$ 80 CFM x 14 °F x 1.08 x 0.25 = 301 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	0.4	16,474	1,754	3.757																																																								
2	0.3		3,092	1.598																																																								
3	0.2		5,019	0.656																																																								
4	0.1		6,541	0.252																																																								
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: 1701	OPT. GROUND	BUILDER: ROYAL PINE HOMES
SFQT: 2472	LO# 78682	SITE: FORESTSIDE

DESIGN ASSUMPTIONS

HEATING	°F	COOLING	°F
OUTDOOR DESIGN TEMP.	-2	OUTDOOR DESIGN TEMP.	86
INDOOR DESIGN TEMP.	72	INDOOR DESIGN TEMP. (MAX 75°F)	72

BUILDING DATA

ATTACHMENT:	ATTACHED	# OF STORIES (+BASEMENT):	4
FRONT FACES:	EAST	ASSUMED (Y/N):	Y
AIR CHANGES PER HOUR:	3.57	ASSUMED (Y/N):	Y
AIR TIGHTNESS CATEGORY:	AVERAGE	ASSUMED (Y/N):	Y
WIND EXPOSURE:	SHELTERED	ASSUMED (Y/N):	Y
HOUSE VOLUME (ft ³):	28665.0	ASSUMED (Y/N):	Y
INTERNAL SHADING:	BLINDS/CURTAINS	ASSUMED OCCUPANTS:	5
INTERIOR LIGHTING LOAD (Btu/h/ft ²):	1.50	DC BRUSHLESS MOTOR (Y/N):	Y
FOUNDATION CONFIGURATION	BCIN_1	DEPTH BELOW GRADE:	6.0 ft
LENGTH: 33.0 ft	WIDTH: 17.0 ft	EXPOSED PERIMETER:	36.0 ft

2012 OBC - COMPLIANCE PACKAGE**Component****Compliance Package
A1****Nominal Min. Eff.**

Ceiling with Attic Space Minimum RSI (R)-Value	60	59.22
Ceiling Without Attic Space Minimum RSI (R)-Value	31	27.65
Exposed Floor Minimum RSI (R)-Value	31	29.80
Walls Above Grade Minimum RSI (R)-Value	22	17.03
Basement Walls Minimum RSI (R)-Value	20 ci	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	0.28	-
Skylights Maximum U-Value	0.49	-
Space Heating Equipment Minimum AFUE	0.96	-
HRV Minimum Efficiency	75%	-
Domestic Hot Water Heater Minimum EF	0.8	-

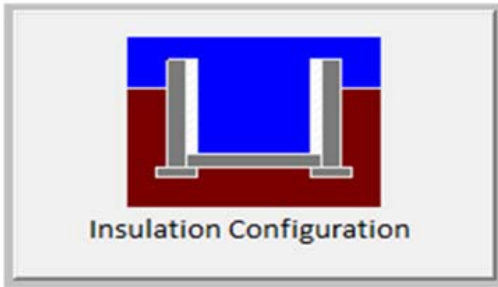
INDIVIDUAL BCIN: 19669

MICHAEL O'ROURKE



Residential Foundation Thermal Load Calculator

Supplemental tool for CAN/CSA-F280

Weather Station Description		
Province:	Ontario	
Region:	Brampton	
Site Description		
Soil Conductivity:	Normal conductivity: dry sand, loam, clay	
Water Table:	Normal (7-10 m, 23-33 ft)	
Foundation Dimensions		
Floor Length (m):	10.1	
Floor Width (m):	5.2	
Exposed Perimeter (m):	11.0	
Wall Height (m):	2.7	
Depth Below Grade (m):	1.83	
Window Area (m ²):	1.1	
Door Area (m ²):	0.0	
Radiant Slab		
Heated Fraction of the Slab:	0	
Fluid Temperature (°C):	33	
Design Months		
Heating Month	1	
Foundation Loads		
Heating Load (Watts):		330

TYPE: 1701
LO# 78682

OPT. GROUND

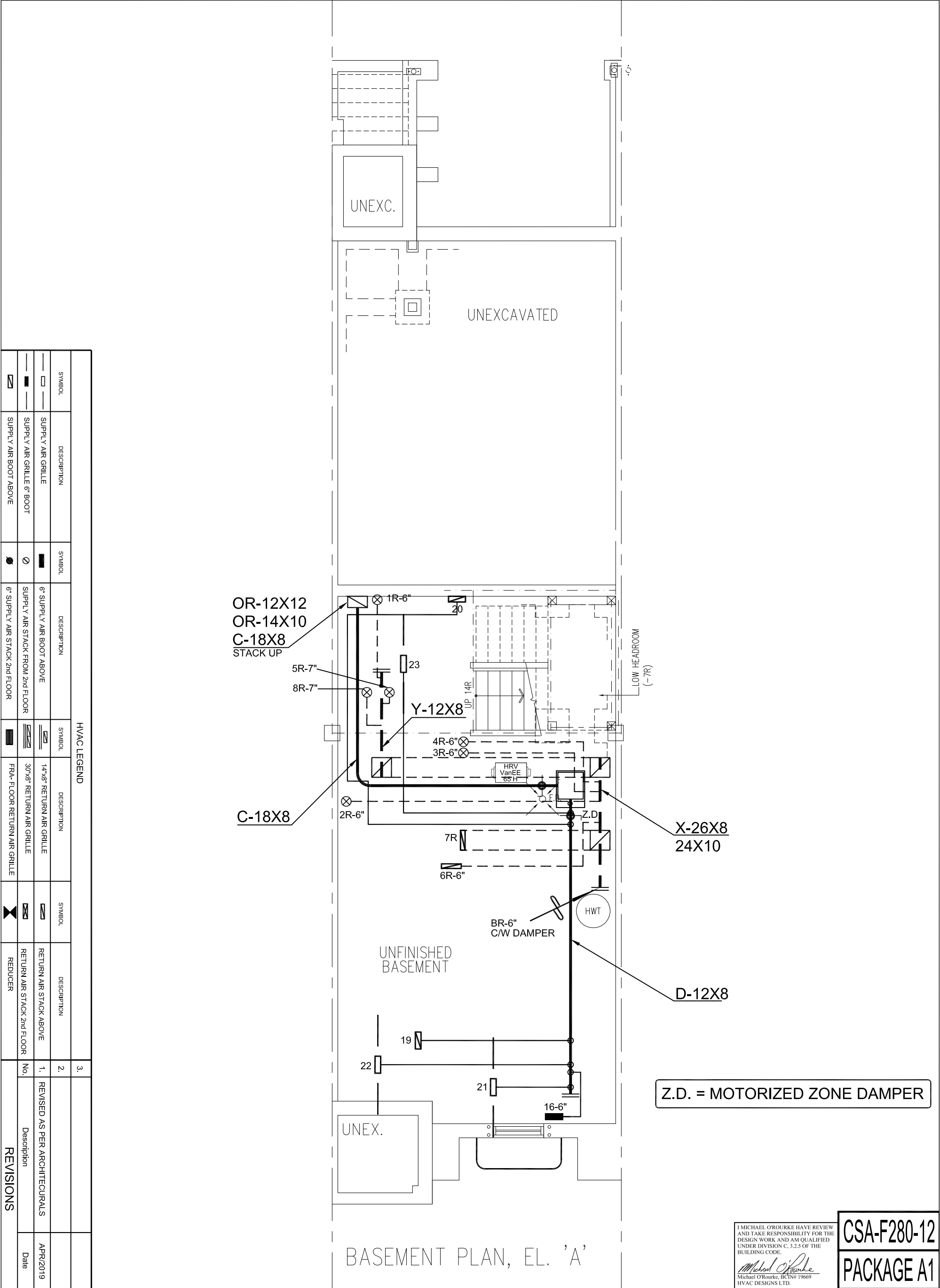
Air Infiltration Residential Load Calculator

Supplemental tool for CAN/CSA-F280

Weather Station Description				
Province:	Ontario			
Region:	Brampton			
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):	9.75			
Building Configuration				
Type:	Semi			
Number of Stories:	Three			
Foundation:	Full			
House Volume (m ³):	811.7			
Air Leakage/Ventilation				
Air Tightness Type:	Present (1961-) (3.57 ACH)			
Custom BDT Data:	ELA @ 10 Pa.	1082.0 cm ²		
	3.57	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):	0.433			
Cooling Air Leakage Rate (ACH/H):	0.149			

TYPE: 1701
LO# 78682

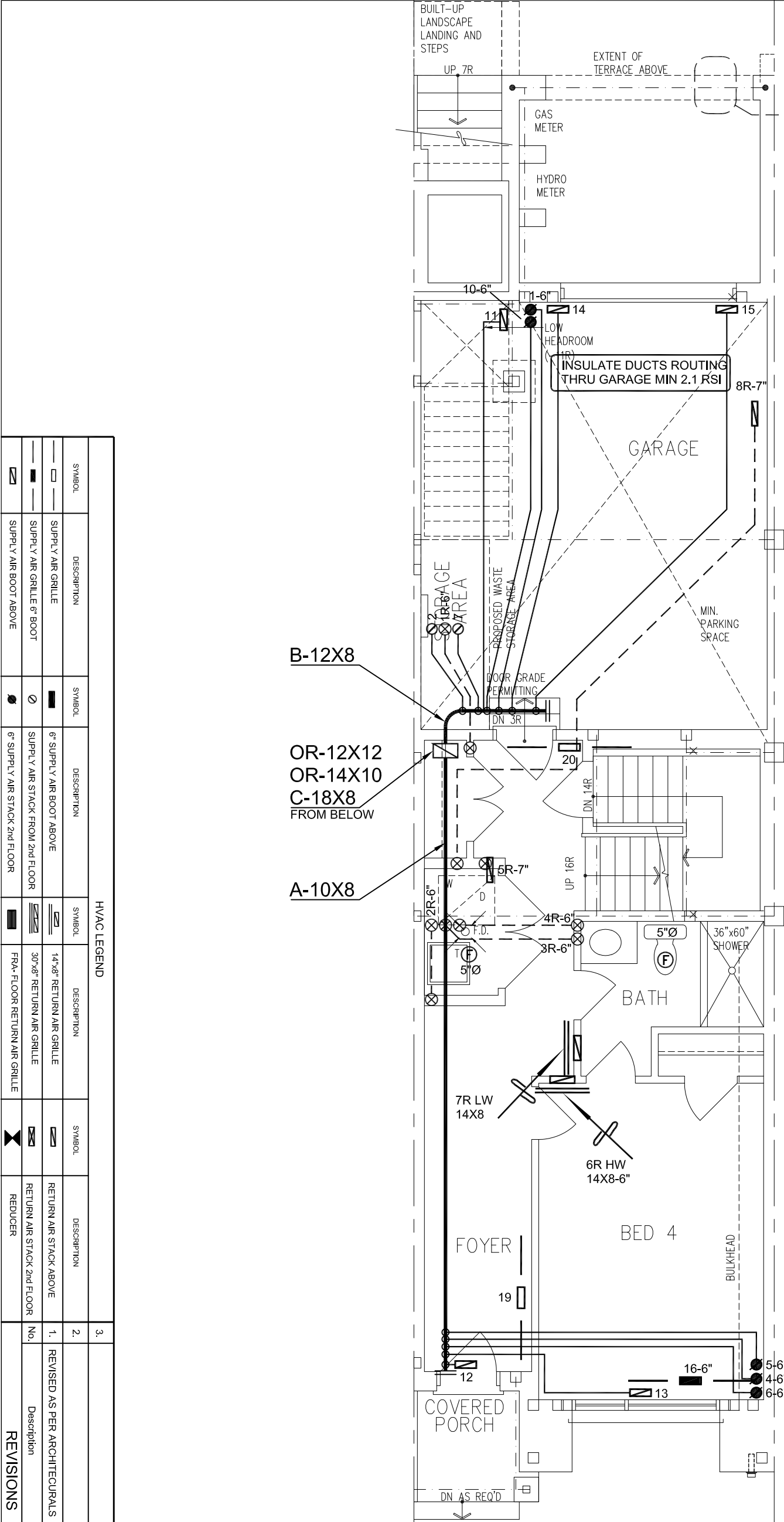
OPT. GROUND



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

ALL DRAWINGS, CALCULATIONS AND SPECIFICATIONS ARE THE PROPERTY OF HVAC DESIGNS LTD.© AND MAY NOT BE REPRODUCED, MODIFIED OR ALTERED WITHOUT EXPRESSED WRITTEN CONSENT. THE DRAWINGS ARE DATED AND USE OF THESE DRAWINGS AFTER ONE YEAR FROM THE DATED NOTED IS NOT AUTHORIZED. CONTRACTOR SHALL CHECK ALL CONDITIONS BEFORE PROCEEDING WITH WORK. LATEST MUNICIPAL APPROVED DRAWINGS ONLY TO BE USED DURING INSTALLATION OF HEATING SYSTEM. HVAC DESIGNS LTD. IS NOT LIABLE FOR ANY CLAIMS ARISING FROM UNAUTHORIZED USE OF THE DRAWINGS OR FROM ANY CHANGES TO ACCEPTED STANDARDS AND/OR THE ONTARIO BUILDING CODE.

Client		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 35455 BTU/H UNIT DATA		# OF RUNS S/A R/A FANS				Sheet Title BASEMENT HEATING LAYOUT	
ROYAL PINE HOMES			MAKE	CARRIER	3RD FLOOR	7	4	2		
Project Name FORESTSIDE BRAMPTON, ONTARIO			MODEL	59SP5A-40-10	2ND FLOOR	5	2	2		
OPT. GROUND 1701 2472 sqft			INPUT	40 MBTU/H	1ST FLOOR	3	2	2	Date	MAY/2018
			OUTPUT	39 MBTU/H	BASEMENT	3	1	0	Scale	3/16" = 1'-0"
		COOLING	2.5 TONS	ALL S/A DIFFUSERS 4 "x10" UNLESS NOTED OTHERWISE ON LAYOUT. ALL S/A RUNS 5"Ø UNLESS NOTED OTHERWISE ON LAYOUT. UNDERCUT DOORS 1" min. FOR R/A					BCIN# 19669	
		FAN SPEED	875 cfm @ 0.6" w.c.						LO# 78682	



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

ALL DRAWINGS, CALCULATIONS AND SPECIFICATIONS ARE THE PROPERTY OF HVAC DESIGNS LTD.© AND MAY NOT BE REPRODUCED, MODIFIED OR ALTERED WITHOUT EXPRESSED WRITTEN CONSENT. THE DRAWINGS ARE DATED AND USE OF THESE DRAWINGS AFTER ONE YEAR FROM THE DATED NOTED IS NOT AUTHORIZED. CONTRACTOR SHALL CHECK ALL CONDITIONS BEFORE PROCEEDING WITH WORK. LATEST MUNICIPAL APPROVED DRAWINGS ONLY TO BE USED DURING INSTALLATION OF HEATING SYSTEM. HVAC DESIGNS LTD. IS NOT LIABLE FOR ANY CLAIMS ARISING FROM UNAUTHORIZED USE OF THE DRAWINGS OR FROM ANY CHANGES TO ACCEPTED STANDARDS AND/OR THE ONTARIO BUILDING CODE.

Client		 375 Finley Ave. Suite 202 - Ajax, Ontario L1S 2E2 Tel. 905.619.2300 - 905.420.5300 Fax 905.619.2375 Email: info@hvacdesigns.ca Web: www.hvacdesigns.ca Specializing in Residential Mechanical Design Services Installation to comply with the latest Ontario Building Code. All supply branch outlets shall be equipped with a manual balancing damper. Ductwork which passes through the garage or unheated spaces shall be adequately insulated and be gas-proofed.	Sheet Title	
ROYAL PINE HOMES			FIRST FLOOR HEATING LAYOUT	
Project Name			Date	MAY/2018
FORESTSIDE BRAMPTON, ONTARIO			Scale	3/16" = 1'-0"
OPT. GROUND 1701			BCIN# 19669	
2472 sqft		LO#	78682	



Client	
ROYAL PINE HOMES	
Project Name	
FORESTSIDE BRAMPTON, ONTARIO	
OPT. GROUND	
1701	2472 sqft

HVAC DESIGNS LTD.

375 Finley Ave. Suite 202 - Ajax, Ontario
L1S 2E2 Tel. 905.619.2300 - 905.420.5300 Fax 905.619.2375
Email: info@hvacdesigns.ca
Web: www.hvacdesigns.ca
Specializing in Residential Mechanical Design Services

Installation to comply with the latest Ontario Building Code. All supply branch outlets shall be equipped with a manual balancing damper. Ductwork which passes through the garage or unheated spaces shall be adequately insulated and be gas-proofed.

VE REVIEW TY FOR THE OF THE		CSA-F280-12	
e 69		PACKAGE A1	
THE DRAWINGS ARE DATED AND OVED DRAWINGS ONLY TO BE STANDARDS AND/OR THE			
Sheet Title			
THIRD FLOOR HEATING LAYOUT			
Date		MAY/2018	
Scale		3/16" = 1'-0"	
BCIN# 19669			
LO#		78682	