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	**Postal code**	**Plan number/ other description**		
RICHMOND HILL				

B. Individual who reviews and takes responsibility for design activities

Name		Firm		
MICHAEL O'ROURKE		**HVAC DESIGNS LTD.**		
Street address			**Unit no.**	**Lot/con.**
375 FINLEY AVE			**202**	**N/A**
Municipality	**Postal code**	**Province**	**E-mail**	
AJAX	**L1S 2E2**	**ONTARIO**	**info@hvacdesigns.ca**	
Telephone number	**Fax number**		**Cell number**	
(905) 619-2300	**(905) 619-2375**		( )	

C. Design activities undertaken by individual identified in Section B. [Building Code Table 3.5.2.1 OF Division C]

☐ House	☒ HVAC – House	☐ Building Structural
☐ Small Buildings	☐ Building Services	☐ Plumbing – House
☐ Large Buildings	☐ Detection, Lighting and Power	☐ Plumbing – All Buildings
☐ Complex Buildings	☐ Fire Protection	☐ On-site Sewage Systems

Description of designer's work	
HEAT LOSS / GAIN CALCULATIONS **DUCT SIZING** **RESIDENTIAL MECHANICAL VENTILATION DESIGN SUMMARY** **RESIDENTIAL SYSTEM DESIGN per CSA-F280-12**	**Model:** 4504 **Project:** CENTREFIELD (WEST GORMLEY)

D. Declaration of Designer

I **MICHAEL O'ROURKE** 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 Di vision C, of the Building Code.

Individual BCIN: 19669
Basis for exemption from registration and qualification: O.B.C SENTENCE 3.2.4.1 (4)

☐ The design work is exempt from the registration and qualification requirements of the Building Code.
Basis for exemption from registration and qualification: _____

I certify that:

1. The information contained in this schedule is true to the best of my knowledge.
2. I have submitted this application with the knowledge and consent of the firm.

June 7, 2021
Date

Signature of Designer

NOTE:

1. 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.
2. 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.

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Web: www.hvacdesigns.ca E-mail: info@hvacdesigns.ca

SITE NAME: CENTREFIELD (WEST GORMLEY) | DATE: Jun-21 | WINTER NATURAL AIR CHANGE RATE 0.219 | HEAT LOSS ΔT °F. 78 | CSA-F280-12
BUILDER: ROYAL PINE HOMES | TYPE: 4504 | GFA: 3223 | LO# 87511 | SUMMER NATURAL AIR CHANGE RATE 0.068 | HEAT GAIN ΔT °F. 13 | SB-12 PERFORMANCE

ROOM USE			MBR			ENS				BED-2			BED-3			BED-4			BATH					ENS-2					
EXP. WALL			42			26				35			48			17			7					9					
CLG. HT.			9			8				8			8			8			8					8					
	FACTORS																												
GRS.WALL AREA	LOSS	GAIN	378			208				280			384			136			56					72					
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			7	152	112			
EAST	21.8	41.6	0	0	0	0	0	0		67	1460	2784	64	1394	2659	0	0	0	0	0	0			0	0	0			
SOUTH	21.8	24.9	0	0	0	8	174	199		0	0	0	0	0	0	16	349	398	7	152	174			0	0	0			
WEST	21.8	41.6	36	784	1496	18	392	748		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	0	0	0	0	0	0			0	0	0			
NET EXPOSED WALL	4.2	0.7	342	1438	237	182	765	126		213	896	147	320	1346	221	120	505	83	49	206	34			65	273	45			
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			
EXPOSED CLG	1.3	0.6	428	562	252	164	216	96		280	368	165	274	360	161	250	329	147	96	126	56			102	134	60			
NO ATTIC EXPOSED CLG	2.8	1.3	0	0	0	0	0	0		0	0	0	30	84	38	40	112	50	0	0	0			0	0	0			
EXPOSED FLOOR	2.6	0.4	0	0	0	0	0	0		280	731	120	0	0	0	0	0	0	0	0	0			5	13	2			
BASEMENT/CRAWL HEAT LOSS				0			0				0			0			0			0					0				
SLAB ON GRADE HEAT LOSS				0			0				0			0			0			0					0				
SUBTOTAL HT LOSS				2785			1547				3454			3184			1294			485					573				
SUB TOTAL HT GAIN					1984			1169				3216			3079			679			265					219			
LEVEL FACTOR / MULTIPLIER			0.20	0.19		0.20	0.19			0.20	0.19		0.20	0.19		0.20	0.19		0.20	0.19				0.20	0.19				
AIR CHANGE HEAT LOSS				522			290				648			597			243			91					107				
AIR CHANGE HEAT GAIN					82			49				133			128			28			11					9			
DUCT LOSS				0			0				410			0			0			0					68				
DUCT GAIN					0			0				424			0			0			0					23			
HEAT GAIN PEOPLE	240		2		480	0		0		1		240	1		240	1		240	0		0			0		0			
HEAT GAIN APPLIANCES/LIGHTS					655			0				655			655			655			0					0			
TOTAL HT LOSS BTU/H				3307			1838				4512			3782			1537			576					748				
TOTAL HT GAIN x 1.3 BTU/H					4161			1583				6069			5333			2082			358					326			

ROOM USE			LIV			DIN			KT/GT			DEN			LAUN			W/R			FOY			MUD						BAS		
EXP. WALL			25			25			63			23			0			6			23			22						188		
CLG. HT.			10			10			10			10			8			10			10			11						9		
	FACTORS																															
GRS.WALL AREA	LOSS	GAIN	250			250			630			230			0			60			230			242						1128		
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	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				4	87	64
EAST	21.8	41.6	40	871	1662	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	27	588	1122	0	0	0				0	0	0
SOUTH	21.8	24.9	0	0	0	28	610	697	16	349	398	0	0	0	0	0	0	9	196	224	0	0	0	0	0	0				8	174	199
WEST	21.8	41.6	0	0	0	0	0	0	103	2244	4280	23	501	956	0	0	0	0	0	0	0	0	0	0	0	0				8	174	332
SKYLT.	35.8	101.2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				0	0	0
DOORS	25.8	4.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	20	517	85	20	517	85				20	517	85
NET EXPOSED WALL	4.2	0.7	210	883	145	222	934	154	511	2149	354	207	871	143	0	0	0	51	214	35	183	770	127	222	934	154				0	0	0
NET EXPOSED BSMT WALL ABOVE GR	3.7	0.6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				564	2078	342
EXPOSED CLG	1.3	0.6	0	0	0	0	0	0	0	0	0	0	0	0	106	139	62	0	0	0	0	0	0	0	0	0				0	0	0
NO ATTIC EXPOSED CLG	2.8	1.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				0	0	0
EXPOSED FLOOR	2.6	0.4	0	0	0	0	0	0	0	0	0	0	0	0	38	99	16	0	0	0	0	0	0	0	0	0				0	0	0
BASEMENT/CRAWL HEAT LOSS				0			0			0			0			0			0			0			0					6474		
SLAB ON GRADE HEAT LOSS				0			0			0			0			0			0			0			0							
SUBTOTAL HT LOSS				1754			1544			4741			1372			239			411			1875			1451					9505		
SUB TOTAL HT GAIN					1807			851			5032			1099			79			259			1334			239						1022
LEVEL FACTOR / MULTIPLIER			0.30	0.29		0.30	0.29		0.30	0.29		0.30	0.29		0.20	0.19		0.30	0.29		0.30	0.29		0.30	0.29					0.50	0.67	
AIR CHANGE HEAT LOSS				509			448			1376			398			45			119			544			421					6359		
AIR CHANGE HEAT GAIN					75			35			209			46			3			11			55			10						42
DUCT LOSS				0			0			0			0			28			0			0			0					0		
DUCT GAIN					0			0			0			0			74			0			0			0						0
HEAT GAIN PEOPLE	240		0		0	0		0	0		0	0		0	0		0	0		0	0		0	0		0				0		0
HEAT GAIN APPLIANCES/LIGHTS					655			655			655			655			655			0			0			0						655
TOTAL HT LOSS BTU/H				2264			1992			6117			1770			312			530			2419			1872					15864		
TOTAL HT GAIN x 1.3 BTU/H					3298			2003			7664			2339			1053			351			1806			323						2235

TOTAL HEAT GAIN BTU/H: 41260 | TONS: 3.44 | LOSS DUE TO VENTILATION LOAD BTU/H: 1670 | STRUCTURAL HEAT LOSS: 49437 | TOTAL COMBINED HEAT LOSS BTU/H: 51107

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

HVAC DESIGNS LTD.

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

TYPE: 4504 DATE: Jun-21 GFA: 3223 LO# 87511

HEATING CFM	1370	COOLING CFM	1370
TOTAL HEAT LOSS	49,437	TOTAL HEAT GAIN	40,985
AIR FLOW RATE CFM	27.71	AIR FLOW RATE CFM	33.43

furnace pressure	0.6
furnace filter	0.05
a/c coil pressure	0.2
available pressure for s/a & r/a	0.35
plenum pressure s/a	0.18
max s/a dif press. loss	0.02
min adjusted pressure s/a	0.16
r/a pressure	0.17
r/a grille press. Loss	0.02
adjusted pressure r/a	0.15

**CARRIER
59TN6A-060-14V 60

FAN SPEED	
LOW	820
MEDLOW	0
MEDIUM	0
MEDIUM HIGH	1370
HIGH	1520

AFUE = 97 %
INPUT (BTU/H) = 60,000
OUTPUT (BTU/H) = 58,000
DESIGN CFM = 1370
CFM @ .6 " E.S.P.
TEMPERATURE RISE 39 °F

RUN COUNT	4th	3rd	2nd	1st	Bas
S/A	0	0	12	10	5
R/A	0	0	5	3	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	ENS	BED-2	BED-3	BED-4	BATH	BED-2	BED-3	MBR	ENS-2	LIV	LIV	KT/GT	KT/GT	KT/GT	LAUN	W/R	FOY	MUD	BAS	BAS	BAS	BAS
RM LOSS MBH.	1.65	0.92	0.92	2.26	1.89	1.54	0.58	2.26	1.89	1.65	0.75	1.13	1.13	2.04	2.04	2.04	0.31	0.53	2.42	1.87	3.17	3.17	3.17	3.17
CFM PER RUN HEAT	46	25	25	63	52	43	16	63	52	46	21	31	31	57	57	57	9	15	67	52	88	88	88	88
RM GAIN MBH.	2.08	0.79	0.79	3.03	2.67	2.08	0.36	3.03	2.67	2.08	0.33	1.65	1.65	2.55	2.55	2.55	1.05	0.35	1.81	0.32	0.45	0.45	0.45	0.45
CFM PER RUN COOLING	70	26	26	101	89	70	12	101	89	70	11	55	55	85	85	85	35	12	60	11	15	15	15	15
ADJUSTED PRESSURE	0.17	0.17	0.17	0.16	0.16	0.17	0.17	0.16	0.16	0.17	0.17	0.17	0.17	0.16	0.16	0.16	0.17	0.17	0.17	0.17	0.16	0.16	0.16	0.16
ACTUAL DUCT LGH.	45	42	60	54	71	66	56	62	66	34	56	61	55	34	26	14	45	49	49	41	30	16	17	38
EQUIVALENT LENGTH	150	180	180	120	170	170	170	140	150	160	170	170	170	120	140	110	130	120	160	190	90	120	120	110
TOTAL EFFECTIVE LENGTH	195	222	240	174	241	236	226	202	216	194	226	231	225	154	166	124	175	169	209	231	120	136	137	148
ADJUSTED PRESSURE	0.09	0.08	0.07	0.09	0.07	0.07	0.08	0.08	0.08	0.09	0.08	0.07	0.08	0.11	0.1	0.13	0.1	0.1	0.08	0.07	0.14	0.12	0.12	0.11
ROUND DUCT SIZE	5	4	4	**6**	**6**	**6**	4	**6**	**6**	5	4	5	5	**6**	**6**	**6**	4	4	5	5	**6**	**6**	**6**	**6**
HEATING VELOCITY (ft/min)	338	287	287	321	265	219	184	321	265	338	241	228	228	291	291	291	103	172	492	382	449	449	449	449
COOLING VELOCITY (ft/min)	514	298	298	515	454	357	138	515	454	514	126	404	404	433	433	433	402	138	441	81	76	76	76	76
OUTLET GRILL SIZE	3X10	3X10	3X10	4X10	4X10	4X10	3X10	4X10	4X10	3X10	3X10	3X10	3X10	4X10	4X10	4X10	3X10	3X10	3X10	3X10	4X10	4X10	4X10	4X10
TRUNK	D	D	D	C	A	B	B	C	A	E	C	A	A	E	D	D	C	B	A	C	E	E	C	B

RUN #	25	26	27
ROOM NAME	BAS	DIN	DEN
RM LOSS MBH.	3.17	1.99	1.77
CFM PER RUN HEAT	88	55	49
RM GAIN MBH.	0.45	2.00	2.34
CFM PER RUN COOLING	15	67	78
ADJUSTED PRESSURE	0.16	0.17	0.17
ACTUAL DUCT LGH.	47	39	22
EQUIVALENT LENGTH	150	140	150
TOTAL EFFECTIVE LENGTH	197	179	172
ADJUSTED PRESSURE	0.08	0.1	0.1
ROUND DUCT SIZE	**6**	**6**	5
HEATING VELOCITY (ft/min)	449	280	360
COOLING VELOCITY (ft/min)	76	342	573
OUTLET GRILL SIZE	4X10	4X10	3X10
TRUNK	A	B	E

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	321	0.07	9.5	12	x	8	482	TRUNK G	0	0.00	0	0	x	8	0
TRUNK B	538	0.07	11.5	16	x	8	605	TRUNK H	0	0.00	0	0	x	8	0
TRUNK C	834	0.07	13.5	20	x	10	600	TRUNK I	0	0.00	0	0	x	8	0
TRUNK D	210	0.07	8.1	10	x	8	378	TRUNK J	0	0.00	0	0	x	8	0
TRUNK E	538	0.07	11.5	16	x	8	605	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	245	0.05	9.3	10	x	8	441
TRUNK X	1230	0.05	17	26	x	10	681
TRUNK Y	1025	0.05	15.9	22	x	10	671
TRUNK Z	490	0.05	12.1	18	x	8	490
DROP	1370	0.05	17.7	24	x	12	685

RETURN AIR #	1	2	3	4	5	6	7	8								BR
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
AIR VOLUME	115	115	115	115	130	130	305	140	0	0	0	0	0	0	0	205
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.	85	55	88	78	50	57	37	15	1	1	1	1	1	1	1	19
EQUIVALENT LENGTH	195	245	215	235	205	190	245	145	0	0	0	0	0	0	0	155
TOTAL EFFECTIVE LH	280	300	303	313	255	247	282	160	1	1	1	1	1	1	1	174
ADJUSTED PRESSURE	0.05	0.05	0.05	0.05	0.06	0.06	0.05	0.09	14.80	14.80	14.80	14.80	14.80	14.80	14.80	0.09
ROUND DUCT SIZE	7	7	7	7	7	7	10.1	6.5	0	0	0	0	0	0	0	7.5
INLET GRILL SIZE	8	8	8	8	8	8	8	8	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	14	30	14	0	0	0	0	0	0	0	14

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

HVAC DESIGNS LTD.

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Tel: 905.619.2300 Fax: 905.619.2375
Web: www.hvacdesigns.ca E-mail: info@hvacdesigns.ca

TYPE: 4504 LO # 87511
SITE NAME: CENTREFIELD (WEST GORMLEY)

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	2	@ 21.2 cfm	42.4	cfm
Other Bedrooms	3	@ 10.6 cfm	31.8	cfm
Kitchen & Bathrooms	5	@ 10.6 cfm	53	cfm
Other Rooms	6	@ 10.6 cfm	63.6	cfm
Table 9.32.3.A.		TOTAL	190.8	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	190.8	cfm
Less Principal Ventil. Capacity	79.5	cfm
Required Supplemental Capacity	111.3	cfm

PRINCIPAL EXHAUST FAN CAPACITY

Model: VANEE 65H Location: BSMT

79.5 cfm [✓] HVI Approved

PRINCIPAL EXHAUST HEAT LOSS CALCULATION

CFM		ΔT °F		FACTOR		% LOSS
79.5 CFM	X	78 F	X	1.08	X	0.25

SUPPLEMENTAL FANS BY INSTALLING CONTRACTOR

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

HEAT RECOVERY VENTILATOR 9.32.3.11.

Model: VANEE 65H

155 cfm high 64 cfm low

75 % 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: Michael O'Rourke
HRAI # 001820
Date: June-21

I REVIEW AND TAKE RESPONIBILITY 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

HVAC DESIGNS LTD.

375 Finley Ave. Suite 202 Ajax, ON L1S 2E2
Tel: 905.619.2300 Fax: 905.619.2375
Web: www.hvacdesigns.ca E-mail: info@hvacdesigns.ca

CSA F280-12 Residential Heat Loss and Heat Gain Calculations

Formula Sheet (For Air Leakage / Ventiliation Calculation)

LO#: 87511 Model: 4504 Builder: ROYAL PINE HOMES Date: 6/7/2021

Volume Calculation

House Volume

Level	Floor Area (ft^2)	Floor Height (ft)	Volume (ft^3)
Bsmt	1453	9	13077
First	1453	10	14530
Second	1770	8	14160
Third	0	9	0
Fourth	0	9	0
		Total:	41,767.0 ft^3
		Total:	1182.7 m^3

Air Change & Delta T Data

WINTER NATURAL AIR CHANGE RATE	0.219
SUMMER NATURAL AIR CHANGE RATE	0.068

Design Temperature Difference

	Tin °C	Tout °C	ΔT °C	ΔT °F
Winter DTDh	22	-21	43	78
Summer DTDc	24	31	7	13

5.2.3.1 Heat Loss due to Air Leakage

$$HL_{airb} = LR_{airh} \times \frac{V_b}{3.6} \times DTD_h \times 1.2$$

0.219 x 328.53 x 43 °C x 1.2 = 3727 W

= 12718 Btu/h

6.2.6 Sensible Gain due to Air Leakage

$$HG_{salb} = LR_{airc} \times \frac{V_b}{3.6} \times DTD_c \times 1.2$$

= 0.068 x 328.53 x 7 °C x 1.2 = 191 W

= 652 Btu/h

5.2.3.2 Heat Loss due to Mechanical 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

6.2.7 Sensible heat Gain due to Ventilation

$$HL_{vairb} = PVC \times DTD_h \times 1.08 \times (1 - E)$$

80 CFM x 13 °F x 1.08 x 0.25 = 275 Btu/h

5.2.3.3 Calculation of Air Change Heat Loss for Each Room (Floor Multiplier Section)

$$HL_{airr} = Level\ Factor \times HL_{airbv} \times \{(HL_{agcr} + HL_{bgcr}) \div (HL_{agclevel} + HL_{bgclevel})\}$$

Level	Level Factor (LF)	HLairve Air Leakage + Ventilation Heat Loss (Btu/h)	Level Conductive Heat Loss: (HL_{clevel})	Air Leakage Heat Loss Multiplier (LF x HLairbv / HLlevel)
1	0.5	12,718	9,505	0.669
2	0.3		13,147	0.290
3	0.2		13,561	0.188
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

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HEAT LOSS AND GAIN SUMMARY SHEET

MODEL: 4504
SFQT: 3223 **LO#** 87511
BUILDER: ROYAL PINE HOMES
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):	41767.0	ASSUMED (Y/N):	Y
INTERNAL SHADING:	BLINDS/CURTAINS	ASSUMED OCCUPANTS:	5
INTERIOR LIGHTING LOAD (Btu/h/ft^2):	1.40	DC BRUSHLESS MOTOR (Y/N):	Y
FOUNDATION CONFIGURATION	BCIN_1	DEPTH BELOW GRADE:	6.0 ft
LENGTH: 57.0 ft	WIDTH: 37.0 ft	EXPOSED PERIMETER:	188.0 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

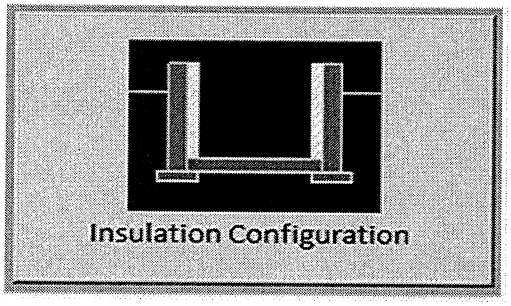
Michael O'Rourke

HVAC Designs Ltd.
375 Finley Ave, Suite 202
Ajax ON, L1S 2E2
905-619-2300

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):	**17.4**	 Insulation Configuration
Floor Width (m):	**11.3**	
Exposed Perimeter (m):	**0.0**	
Wall Height (m):	**2.7**	
Depth Below Grade (m):	**1.83**	
Window Area (m^2):	**1.9**	
Door Area (m^2):	**1.9**	
Radiant Slab		
Heated Fraction of the Slab:	**0**	
Fluid Temperature (°C):	**33**	
Design Months		
Heating Month	**1**	
Foundation Loads		
Heating Load (Watts):		**1897**

TYPE: 4504
LO# 87511

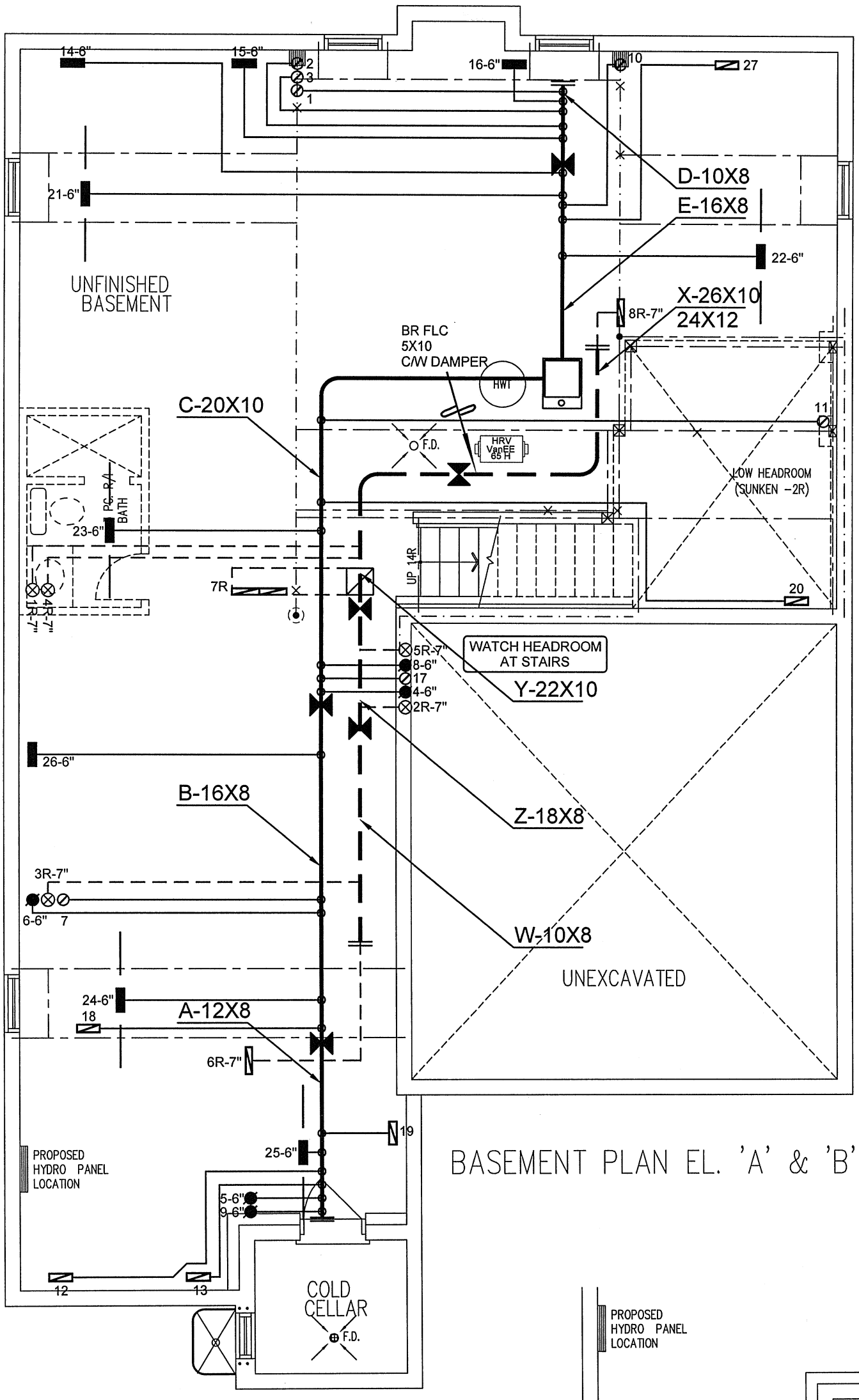
HVAC Designs Ltd.
375 Finley Ave, Suite 202
Ajax ON, L1S 2E2
905-619-2300

Air Infiltration Residential Load Calculator

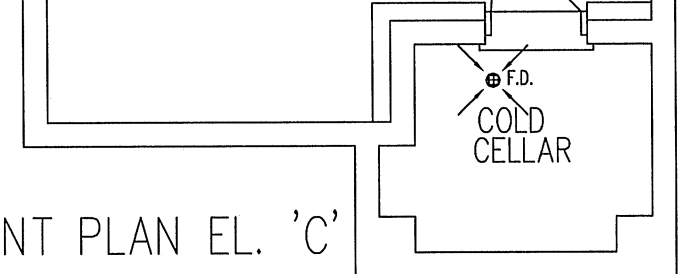
Supplemental tool for CAN/CSA-F280

Weather Station Description					
Province:	Ontario				
Region:	Richmond Hill				
Weather Station Location:	Open flat terrain, grass				
Anemometer height (m):	10				
Local Shielding					
Building Site:	Suburban, forest				
Walls:	Heavy				
Flue:	Heavy				
Highest Ceiling Height (m):	6.40				
Building Configuration					
Type:	Detached				
Number of Stories:	Two				
Foundation:	Full				
House Volume (m^3):	1182.7				
Air Leakage/Ventilation					
Air Tightness Type:	Energy Star Detached (2.5 ACH)				
Custom BDT Data:	ELA @ 10 Pa.				1104.1 cm^2
	2.50				ACH @ 50 Pa
Mechanical Ventilation (L/s):	Total Supply			Total Exhaust	
	37.5			37.5	
Flue Size					
Flue #:	#1	#2	#3	#4	
Diameter (mm):	0	0	0	0	
Natural Infiltration Rates					
Heating Air Leakage Rate (ACH/H):	**0.219**				
Cooling Air Leakage Rate (ACH/H):	**0.068**				

TYPE: 4504
LO# 87511



BASEMENT PLAN EL. 'A' & 'B'



BASEMENT PLAN EL. '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, BCIN# 19669
HVAC DESIGNS LTD.

CSA-F280-12

SB-12 PERFORMANCE

HVAC LEGEND

SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION
—▭—	SUPPLY AIR GRILLE	▬	6" SUPPLY AIR BOOT ABOVE	▭	14"x8" RETURN AIR GRILLE	▭	RETURN AIR STACK ABOVE
—▬—	SUPPLY AIR GRILLE 6" BOOT	⊘	SUPPLY AIR STACK FROM 2nd FLOOR	▭	30"x8" RETURN AIR GRILLE	⊠	RETURN AIR STACK 2nd FLOOR
▭	SUPPLY AIR BOOT ABOVE	●	6" SUPPLY AIR STACK 2nd FLOOR	▬	FRA- FLOOR RETURN AIR GRILLE	⧗	REDUCER

No.	Description	Date
3.	REVISED AS PER CAD	JUNE/2021
2.	REVISED AS PER ARCHITECTURALS	APR/2021
1.	REVISED TO PERFORMANCE	SEPT/2020

REVISIONS

Client
ROYAL PINE HOMES

Project Name
CENTREFIELD (WEST GORMLEY)
RICHMOND HILL, ONTARIO

4504 3223 sqft

HVAC DESIGNS LTD.
375 Finley Ave. Suite 202 - Ajax, Ontario
L1S 2E2 Tel. 905.619.2300 - 905.420.5300 Fax 905.619.2375
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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.

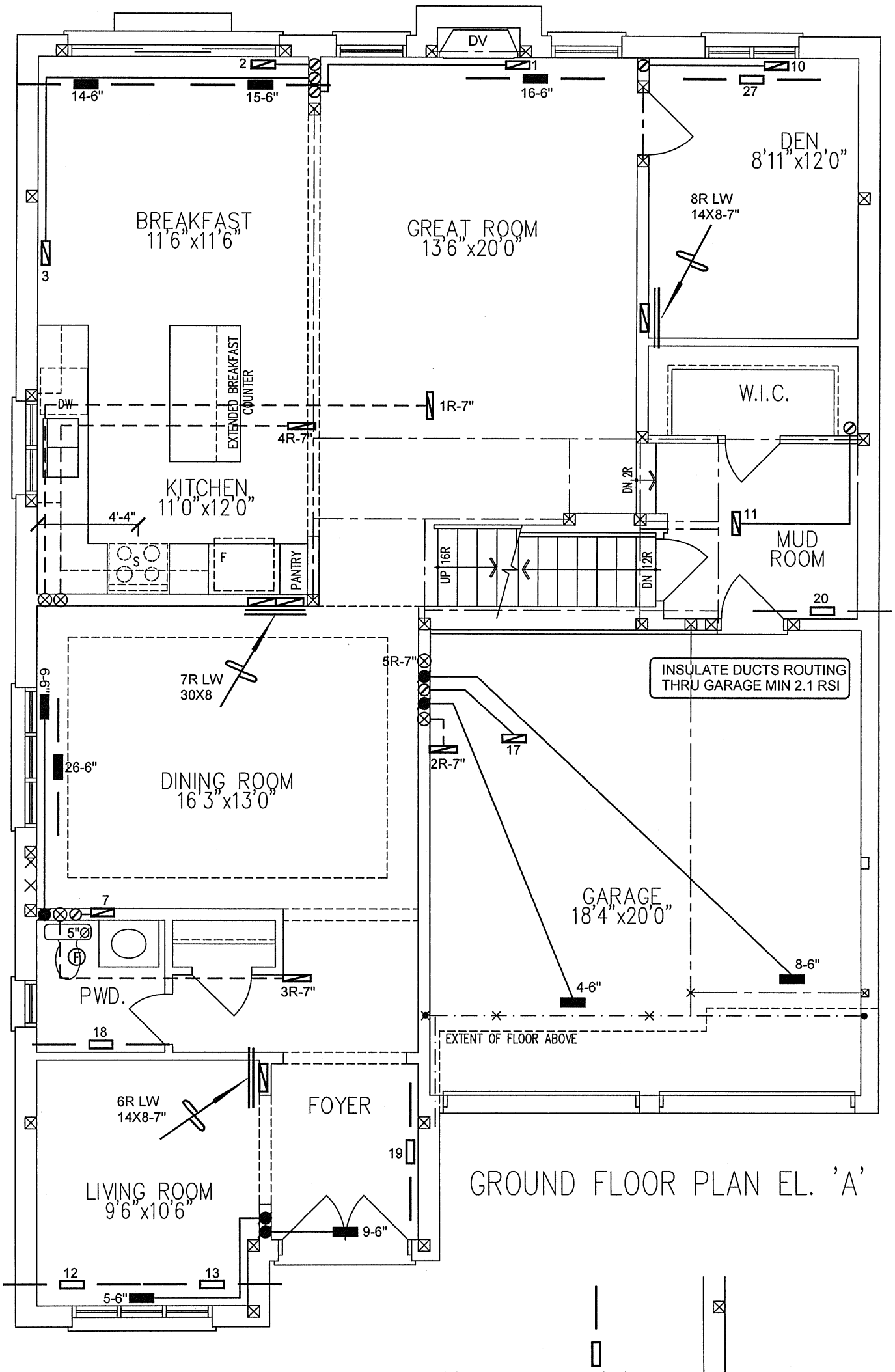
HEAT LOSS 51107 BTU/H	
UNIT DATA	
MAKE	CARRIER
MODEL	59TN6A-060-14V
INPUT	60 MBTU/H
OUTPUT	58 MBTU/H
COOLING	3.5 TONS
FAN SPEED	1370 cfm @ 0.6" w.c.

# OF RUNS	S/A	R/A	FANS
3RD FLOOR			
2ND FLOOR	12	5	5
1ST FLOOR	10	3	2
BASEMENT	5	1	0

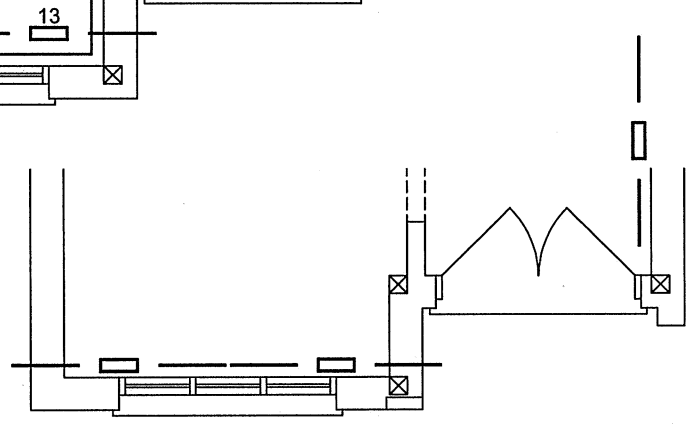
ALL S/A DIFFUSERS 4 "x10" UNLESS NOTED OTHERWISE ON LAYOUT. ALL S/A RUNS 5"Ø UNLESS NOTED OTHERWISE ON LAYOUT. UNDERCUT DOORS 1" min. FOR R/A

Sheet Title
BASEMENT HEATING LAYOUT

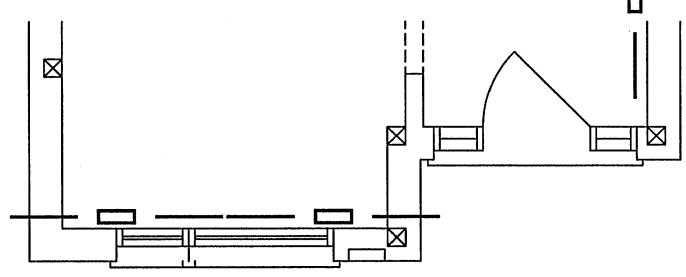
Date SEPT/2020
Scale 3/16" = 1'-0"
BCIN# 19669
LO# 87511



GROUND FLOOR PLAN EL. 'A'



GROUND FLOOR PLAN EL. 'B'



GROUND FLOOR PLAN EL. '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, BCIN# 19669
HVAC DESIGNS LTD.

CSA-F280-12

SB-12 PERFORMANCE

HVAC LEGEND

SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION
— ▭ —	SUPPLY AIR GRILLE	▬	6" SUPPLY AIR BOOT ABOVE	▭	14"x8" RETURN AIR GRILLE	▭	RETURN AIR STACK ABOVE
— ▬ —	SUPPLY AIR GRILLE 6" BOOT	⊘	SUPPLY AIR STACK FROM 2nd FLOOR	▭	30"x8" RETURN AIR GRILLE	▭	RETURN AIR STACK 2nd FLOOR
▭	SUPPLY AIR BOOT ABOVE	●	6" SUPPLY AIR STACK 2nd FLOOR	▬	FRA- FLOOR RETURN AIR GRILLE	⧗	REDUCER

No.	Description	Date
3.	REVISED AS PER CAD	JUNE/2021
2.	REVISED AS PER ARCHITECTURALS	APR/2021
1.	REVISED TO PERFORMANCE	SEPT/2020

REVISIONS

Client
ROYAL PINE HOMES

Project Name
CENTREFIELD (WEST GORMLEY)
RICHMOND HILL, ONTARIO

4504 3223 sqft

HVAC DESIGNS LTD.
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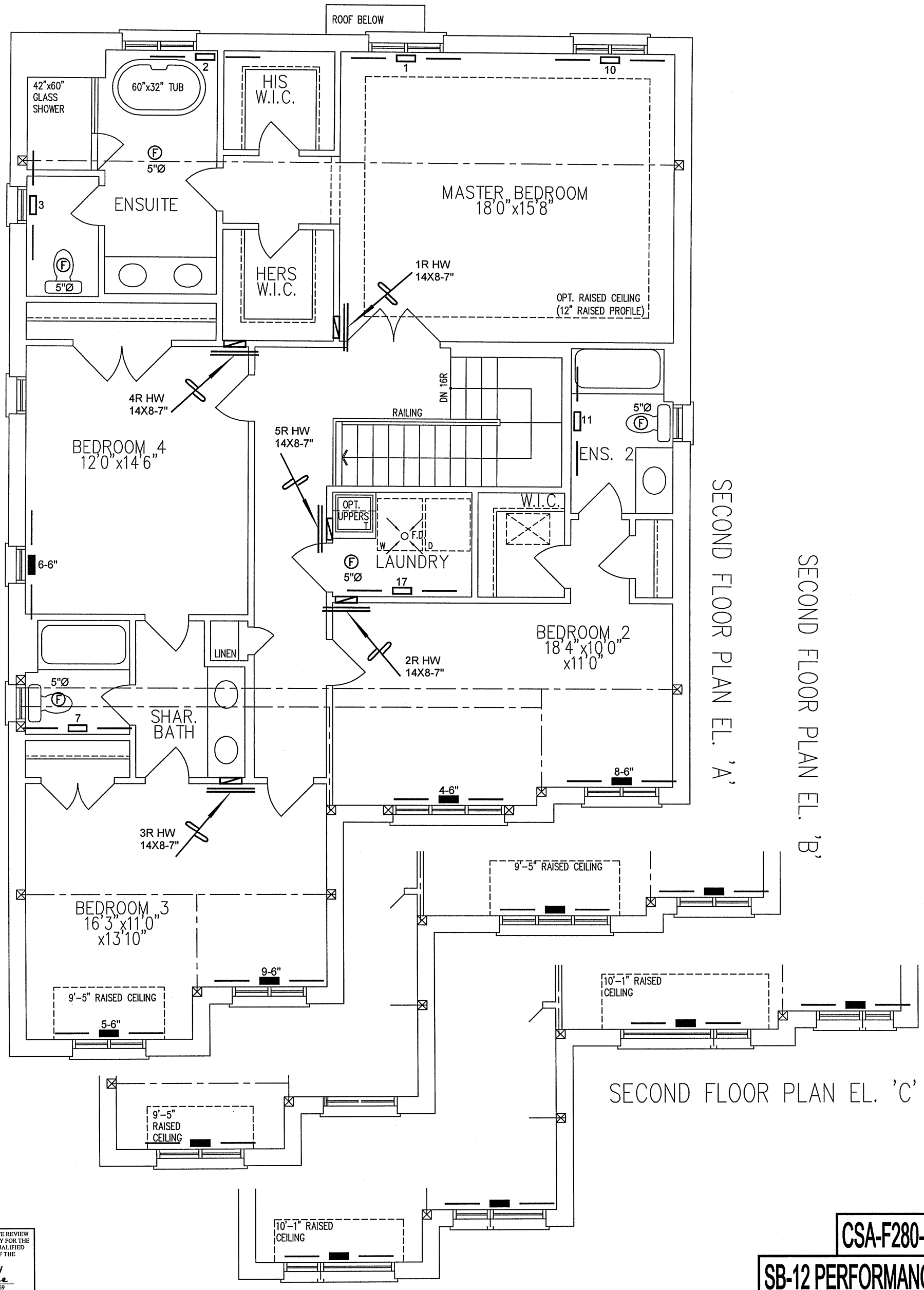
Email: info@hvacdesigns.ca
Web: www.hvacdesigns.ca
Specializing in Residential Mechanical Design Services

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
FIRST FLOOR HEATING LAYOUT

Date SEPT/2020
Scale 3/16" = 1'-0"
BCIN# 19669
LO# 87511



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, BCIN# 19669
HVAC DESIGNS LTD.

CSA-F280-12

SB-12 PERFORMANCE

HVAC LEGEND

SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION
	SUPPLY AIR GRILLE		6" SUPPLY AIR BOOT ABOVE		14"x8" RETURN AIR GRILLE		RETURN AIR STACK ABOVE
	SUPPLY AIR GRILLE 6" BOOT		SUPPLY AIR STACK FROM 2nd FLOOR		30"x8" RETURN AIR GRILLE		RETURN AIR STACK 2nd FLOOR
	SUPPLY AIR BOOT ABOVE		6" SUPPLY AIR STACK 2nd FLOOR		FRA- FLOOR RETURN AIR GRILLE		REDUCER

No.	Description	Date
3.	REVISED AS PER CAD	JUNE/2021
2.	REVISED AS PER ARCHITECTURALS	APR/2021
1.	REVISED TO PERFORMANCE	SEPT/2020

REVISIONS

Client
ROYAL PINE HOMES

Project Name
CENTREFIELD (WEST GORMLEY)
RICHMOND HILL, ONTARIO

4504 3223 sqft

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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
SECOND FLOOR HEATING LAYOUT

Date SEPT/2020
Scale 3/16" = 1'-0"
BCIN# 19669
LO# 87511

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	**Postal code**	**Plan number/ other description**		
RICHMOND HILL				

B. Individual who reviews and takes responsibility for design activities

Name			Firm	
MICHAEL O'ROURKE			**HVAC DESIGNS LTD.**	
Street address			**Unit no.**	**Lot/con.**
375 FINLEY AVE			**202**	**N/A**
Municipality	**Postal code**	**Province**	**E-mail**	
AJAX	**L1S 2E2**	**ONTARIO**	**info@hvacdesigns.ca**	
Telephone number	**Fax number**		**Cell number**	
(905) 619-2300	**(905) 619-2375**		( )	

C. Design activities undertaken by individual identified in Section B. [Building Code Table 3.5.2.1 OF Division C]

☐ House	☒ HVAC – House	☐ Building Structural
☐ Small Buildings	☐ Building Services	☐ Plumbing – House
☐ Large Buildings	☐ Detection, Lighting and Power	☐ Plumbing – All Buildings
☐ Complex Buildings	☐ Fire Protection	☐ On-site Sewage Systems

Description of designer's work	
HEAT LOSS / GAIN CALCULATIONS **DUCT SIZING** **RESIDENTIAL MECHANICAL VENTILATION DESIGN SUMMARY** **RESIDENTIAL SYSTEM DESIGN per CSA-F280-12**	**Model:** 4504 OPT. 2ND **Project:** CENTREFIELD (WEST GORMLEY)

D. Declaration of Designer

I **MICHAEL O'ROURKE** 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 Di vision C, of the Building Code.

Individual BCIN: 19669
Basis for exemption from registration and qualification: O.B.C SENTENCE 3.2.4.1 (4)

☐ The design work is exempt from the registration and qualification requirements of the Building Code.
Basis for exemption from registration and qualification: _____

I certify that:

1. The information contained in this schedule is true to the best of my knowledge.
2. I have submitted this application with the knowledge and consent of the firm.

June 7, 2021
Date

Signature of Designer

NOTE:

1. 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.
2. 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.

HVA DESIGNS LTD.

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Tel: 905.619.2300 Fax: 905.619.2375
Web: www.hvacdesigns.ca E-mail: info@hvacdesigns.ca

SITE NAME: CENTREFIELD (WEST GORMLEY) OPT. 2ND DATE: Jun-21 WINTER NATURAL AIR CHANGE RATE 0.219 HEAT LOSS ΔT °F. 78 CSA-F280-12

BUILDER: ROYAL PINE HOMES TYPE: 4504 GFA: 3223 LO# 87514 SUMMER NATURAL AIR CHANGE RATE 0.068 HEAT GAIN ΔT °F. 13 SB-12 PERFORMANCE

ROOM USE			MBR			ENS			WIC			BED-2			BED-3			BED-4			ENS-4/5			BED-5				ENS-2/3				
EXP. WALL			32			10			5			37			13			45			6			12				23				
CLG. HT.			9			8			8			8			8			8			8			8				8				
	FACTORS																															
GRS.WALL AREA	LOSS	GAIN	288			80			40			296			104			360			48			96				184				
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	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		7	152	112		
EAST	21.8	41.6	0	0	0	0	0	0	0	0	0	0	0	0	47	1024	1953	64	1394	2659	0	0	0	0	0	0		20	436	831		
SOUTH	21.8	24.9	0	0	0	15	327	373	0	0	0	0	0	0	0	0	0	0	0	0	7	152	174	16	349	398		0	0	0		
WEST	21.8	41.6	36	784	1496	0	0	0	0	0	0	26	566	1080	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	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		0	0	0		
NET EXPOSED WALL	4.2	0.7	252	1060	174	65	273	45	40	168	28	270	1135	187	57	240	39	296	1245	205	41	172	28	80	336	55		157	660	109		
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		0	0	0		
EXPOSED CLG	1.3	0.6	289	380	170	124	163	73	68	89	40	332	436	195	157	206	92	215	283	126	83	109	49	212	279	125		112	147	66		
NO ATTIC EXPOSED CLG	2.8	1.3	0	0	0	0	0	0	0	0	0	0	0	0	30	84	38	40	112	50	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	187	488	80	0	0	0	0	0	0	0	0	0		112	292	48		
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				2224			763			258			2138			2042			3034			434			964				1688			
SUB TOTAL HT GAIN					1840			491			68			1462			2203			3041			251			578				1165		
LEVEL FACTOR / MULTIPLIER			0.20	0.18		0.20	0.18		0.20	0.18		0.20	0.18		0.20	0.18		0.20	0.18		0.20	0.18		0.20	0.18			0.20	0.18			
AIR CHANGE HEAT LOSS				410			141			48			395			377			560			80			178				312			
AIR CHANGE HEAT GAIN					79			21			3			63			95			131			11			25				50		
DUCT LOSS				0			0			0			0			242			0			0			0				200			
DUCT GAIN					0			0			0			0			308			0			0			0				122		
HEAT GAIN PEOPLE	240		2		480	0		0	0		0	1		240	1		240	1		240	0		0	1		240		0		0		
HEAT GAIN APPLIANCES/LIGHTS					540			0			0			540			540			540			0			540				0		
TOTAL HT LOSS BTU/H				2634			904			305			2533			2661			3594			514			1141				2199			
TOTAL HT GAIN x 1.3 BTU/H					3821			666			92			2997			4401			5137			341			1798				1738		

ROOM USE			LIV			DIN			KT/GT			DEN			LAUN			W/R			FOY			MUD				BAS				
EXP. WALL			25			25			63			23			0			6			23			22				166				
CLG. HT.			10			10			10			10			8			10			10			11				9				
	FACTORS																															
GRS.WALL AREA	LOSS	GAIN	250			250			630			230			0			60			230			242				996				
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	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		4	87	64		
EAST	21.8	41.6	40	871	1662	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	27	588	1122	0	0	0		0	0	0		
SOUTH	21.8	24.9	0	0	0	28	610	697	16	349	398	0	0	0	0	0	0	9	196	224	0	0	0	0	0	0		8	174	199		
WEST	21.8	41.6	0	0	0	0	0	0	103	2244	4280	23	501	956	0	0	0	0	0	0	0	0	0	0	0	0		8	174	332		
SKYLT.	35.8	101.2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		0	0	0		
DOORS	25.8	4.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	20	517	85	20	517	85		20	517	85		
NET EXPOSED WALL	4.2	0.7	210	883	145	222	934	154	511	2149	354	207	871	143	0	0	0	51	214	35	183	770	127	222	934	154		0	0	0		
NET EXPOSED BSMT WALL ABOVE GR	3.7	0.6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		498	1834	302		
EXPOSED CLG	1.3	0.6	0	0	0	0	0	0	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	0	0	0		0	0	0		
EXPOSED FLOOR	2.6	0.4	0	0	0	0	0	0	0	0	0	0	0	0	36	94	15	0	0	0	0	0	0	0	0	0		0	0	0		
BASEMENT/CRAWL HEAT LOSS				0			0			0			0			0			0			0			0				5591			
SLAB ON GRADE HEAT LOSS				0			0			0			0			0			0			0			0							
SUBTOTAL HT LOSS				1754			1544			4741			1372			239			411			1875			1451				8378			
SUB TOTAL HT GAIN					1807			851			5032			1099			80			259			1334			239				982		
LEVEL FACTOR / MULTIPLIER			0.30	0.29		0.30	0.29		0.30	0.29		0.30	0.29		0.20	0.18		0.30	0.29		0.30	0.29		0.30	0.29			0.50	0.76			
AIR CHANGE HEAT LOSS				509			448			1376			398			44			119			544			421				6359			
AIR CHANGE HEAT GAIN					78			37			217			47			3			11			57			10				42		
DUCT LOSS				0			0			0			0			28			0			0			0				0			
DUCT GAIN					0			0			0			0			62			0			0			0				0		
HEAT GAIN PEOPLE	240		0		0	0		0	0		0	0		0	0		0	0		0	0		0	0		0		0		0		
HEAT GAIN APPLIANCES/LIGHTS					540			540			540			540			540			0			0			0				0		
TOTAL HT LOSS BTU/H				2264			1992			6117			1770			311			530			2419			1872				14737		
TOTAL HT GAIN x 1.3 BTU/H					3153			1855			7525			2192			892			352			1808			324				2034		

TOTAL HEAT GAIN BTU/H: 41455 TONS: 3.45 LOSS DUE TO VENTILATION LOAD BTU/H: 2004 STRUCTURAL HEAT LOSS: 48496 TOTAL COMBINED HEAT LOSS BTU/H: 50499

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

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SITE NAME: CENTREFIELD (WEST GORMLEY) OPT. 2ND
BUILDER: ROYAL PINE HOMES TYPE: 4504 DATE: Jun-21 GFA: 3223 LO# 87514

HEATING CFM	1370	COOLING CFM	1370
TOTAL HEAT LOSS	48,496	TOTAL HEAT GAIN	41,126
AIR FLOW RATE CFM	28.25	AIR FLOW RATE CFM	33.31

furnace pressure	0.6
furnace filter	0.05
a/c coil pressure	0.2
available pressure for s/a & r/a	0.35
plenum pressure s/a	0.18
max s/a dif press. loss	0.02
min adjusted pressure s/a	0.16
r/a pressure	0.17
r/a grille press. Loss	0.02
adjusted pressure r/a	0.15

**CARRIER
59TN6A-060-14V 60
FAN SPEED
LOW 820
MEDLOW 0
MEDIUM 0
MEDIUM HIGH 1370
HIGH 1520

AFUE = 97 %
INPUT (BTU/H) = 60,000
OUTPUT (BTU/H) = **58,000**
DESIGN CFM = **1370**
CFM @ .6" E.S.P.
TEMPERATURE RISE 39 °F

RUN COUNT	4th	3rd	2nd	1st	Bas
S/A	0	0	14	10	5
R/A	0	0	5	3	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	WIC	MBR	MBR	BED-3	BED-4	BED-5	ENS-4/5	ENS-2/3	BED-4	BED-2	BED-2	LIV	LIV	KT/GT	KT/GT	KT/GT	LAUN	W/R	FOY	MUD	BAS	BAS	BAS	BAS
RM LOSS MBH.	0.31	1.32	1.32	1.33	1.80	1.14	0.51	2.20	1.80	1.27	1.27	1.13	1.13	2.04	2.04	2.04	0.31	0.53	2.42	1.87	2.95	2.95	2.95	2.95
CFM PER RUN HEAT	9	37	37	38	51	32	15	62	51	36	36	32	32	58	58	58	9	15	68	53	83	83	83	83
RM GAIN MBH.	0.09	1.91	1.91	2.20	2.57	1.80	0.34	1.74	2.57	1.50	1.50	1.58	1.58	2.51	2.51	2.51	0.89	0.35	1.81	0.32	0.41	0.41	0.41	0.41
CFM PER RUN COOLING	3	64	64	73	86	60	11	58	86	50	50	53	53	84	84	84	30	12	60	11	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	0.16	0.16	0.16	0.17	0.17	0.17	0.17	0.16	0.16	0.16	0.16
ACTUAL DUCT LGH.	45	42	49	54	71	66	56	62	66	34	56	61	55	34	26	14	45	49	49	41	30	16	17	38
EQUIVALENT LENGTH	150	180	180	120	170	170	170	140	150	160	170	170	170	120	140	110	130	120	160	190	90	120	120	110
TOTAL EFFECTIVE LENGTH	195	222	229	174	241	236	226	202	216	194	226	231	225	154	166	124	175	169	209	231	120	136	137	148
ADJUSTED PRESSURE	0.09	0.08	0.08	0.1	0.07	0.07	0.08	0.09	0.08	0.09	0.08	0.07	0.08	0.11	0.1	0.13	0.1	0.1	0.08	0.07	0.14	0.12	0.12	0.11
ROUND DUCT SIZE	4	5	5	5	**6**	**6**	4	5	**6**	5	5	5	5	**6**	**6**	**6**	4	4	5	5	**6**	**6**	**6**	**6**
HEATING VELOCITY (ft/min)	103	272	272	279	260	163	172	455	260	264	264	235	235	296	296	296	103	172	499	389	423	423	423	423
COOLING VELOCITY (ft/min)	34	470	470	536	438	306	126	426	438	367	367	389	389	428	428	428	344	138	441	81	71	71	71	71
OUTLET GRILL SIZE	3X10	3X10	3X10	3X10	4X10	4X10	3X10	3X10	4X10	3X10	3X10	3X10	3X10	4X10	4X10	4X10	3X10	3X10	3X10	3X10	4X10	4X10	4X10	4X10
TRUNK	D	D	D	C	A	B	B	C	A	E	E	A	A	E	D	D	C	B	A	C	E	E	C	B

RUN #	25	26	27	28	29
ROOM NAME	BAS	DIN	DEN	ENS	BED-3
RM LOSS MBH.	2.95	1.99	1.77	0.90	1.33
CFM PER RUN HEAT	83	56	50	26	38
RM GAIN MBH.	0.41	1.86	2.19	0.67	2.20
CFM PER RUN COOLING	14	62	73	22	73
ADJUSTED PRESSURE	0.16	0.17	0.17	0.17	0.17
ACTUAL DUCT LGH.	47	39	22	26	43
EQUIVALENT LENGTH	150	140	150	180	180
TOTAL EFFECTIVE LENGTH	197	179	172	206	223
ADJUSTED PRESSURE	0.08	0.1	0.1	0.08	0.08
ROUND DUCT SIZE	**6**	**6**	5	4	5
HEATING VELOCITY (ft/min)	423	286	367	298	279
COOLING VELOCITY (ft/min)	71	316	536	252	536
OUTLET GRILL SIZE	4X10	4X10	3X10	3X10	3X10
TRUNK	A	B	E	C	C

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	317	0.07	9.4	10	x	8	571	TRUNK G	0	0.00	0	0	x	8	0
TRUNK B	518	0.07	11.3	14	x	8	666	TRUNK H	0	0.00	0	0	x	8	0
TRUNK C	827	0.07	13.5	18	x	10	662	TRUNK I	0	0.00	0	0	x	8	0
TRUNK D	199	0.08	7.7	10	x	8	358	TRUNK J	0	0.00	0	0	x	8	0
TRUNK E	545	0.08	11.2	14	x	8	701	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	245	0.05	9.3	10	x	8	441
TRUNK X	1230	0.05	17	26	x	10	681
TRUNK Y	1025	0.05	15.9	22	x	10	671
TRUNK Z	490	0.05	12.1	18	x	8	490
DROP	1370	0.05	17.7	24	x	12	685

RETURN AIR #	1	2	3	4	5	6	7	8								BR
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
AIR VOLUME	115	115	115	115	130	130	305	140	0	0	0	0	0	0	0	205
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.	85	55	88	78	50	57	37	15	1	1	1	1	1	1	1	19
EQUIVALENT LENGTH	195	245	215	235	205	190	245	145	0	0	0	0	0	0	0	155
TOTAL EFFECTIVE LH	280	300	303	313	255	247	282	160	1	1	1	1	1	1	1	174
ADJUSTED PRESSURE	0.05	0.05	0.05	0.05	0.06	0.06	0.05	0.09	14.80	14.80	14.80	14.80	14.80	14.80	14.80	0.09
ROUND DUCT SIZE	7	7	7	7	7	7	10.1	6.5	0	0	0	0	0	0	0	7.5
INLET GRILL SIZE	8	8	8	8	8	8	8	8	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	14	30	14	0	0	0	0	0	0	0	14

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

HVAC DESIGNS LTD.

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TYPE: 4504 LO # 87514
SITE NAME: CENTREFIELD (WEST GORMLEY) 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	2	@ 21.2 cfm	42.4	cfm
Other Bedrooms	4	@ 10.6 cfm	42.4	cfm
Kitchen & Bathrooms	5	@ 10.6 cfm	53	cfm
Other Rooms	6	@ 10.6 cfm	63.6	cfm
Table 9.32.3.A.		TOTAL	201.4	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	**95.4**	**cfm**

SUPPLEMENTAL VENTILATION CAPACITY 9.32.3.5.

Total Ventilation Capacity	201.4	cfm
Less Principal Ventil. Capacity	95.4	cfm
Required Supplemental Capacity	106.0	cfm

PRINCIPAL EXHAUST FAN CAPACITY

Model: VANEE 65H Location: BSMT

95.4 cfm [✓] HVI Approved

PRINCIPAL EXHAUST HEAT LOSS CALCULATION

CFM		ΔT °F		FACTOR		% LOSS
95.4 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
ENS-4/5	BY INSTALLING CONTRACTOR	50	✓	3.5
ENS-2/3	BY INSTALLING CONTRACTOR	50	✓	3.5
W/R	BY INSTALLING CONTRACTOR	50	✓	3.5

HEAT RECOVERY VENTILATOR 9.32.3.11.

Model: VANEE 65H

155 cfm high 64 cfm low

75 % 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: Michael O'Rourke

HRAI # 001820

Date: June-21

I REVIEW AND TAKE RESPONIBILITY 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

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CSA F280-12 Residential Heat Loss and Heat Gain Calculations

Formula Sheet (For Air Leakage / Ventiliation Calculation)

LO#: 87514 Model: 4504 Builder: ROYAL PINE HOMES Date: 6/7/2021

Volume Calculation

House Volume

Level	Floor Area (ft²)	Floor Height (ft)	Volume (ft³)
Bsmt	1453	9	13077
First	1453	10	14530
Second	1770	8	14160
Third	0	9	0
Fourth	0	9	0
		Total:	41,767.0 ft³
		Total:	1182.7 m³

Air Change & Delta T Data

WINTER NATURAL AIR CHANGE RATE	0.219
SUMMER NATURAL AIR CHANGE RATE	0.068

Design Temperature Difference

	Tin °C	Tout °C	ΔT °C	ΔT °F
Winter DTDh	22	-21	43	78
Summer DTDc	24	31	7	13

5.2.3.1 Heat Loss due to Air Leakage

$$HL_{airb} = LR_{airh} \times \frac{V_b}{3.6} \times DTD_h \times 1.2$$

0.219 x 328.53 x 43 °C x 1.2 = 3727 W

= **12718 Btu/h**

6.2.6 Sensible Gain due to Air Leakage

$$HG_{salb} = LR_{airc} \times \frac{V_b}{3.6} \times DTD_c \times 1.2$$

= 0.068 x 328.53 x 7 °C x 1.2 = 191 W

= **652 Btu/h**

5.2.3.2 Heat Loss due to Mechanical Ventilation

$$HL_{vairb} = PVC \times DTD_h \times 1.08 \times (1 - E)$$

95 CFM x 78 °F x 1.08 x 0.25 = **2004 Btu/h**

6.2.7 Sensible heat Gain due to Ventilation

$$HL_{vairb} = PVC \times DTD_h \times 1.08 \times (1 - E)$$

95 CFM x 13 °F x 1.08 x 0.25 = **330 Btu/h**

5.2.3.3 Calculation of Air Change Heat Loss for Each Room (Floor Multiplier Section)

$$HL_{airr} = Level\ Factor \times HL_{airbv} \times \{(HL_{agcr} + HL_{bgcr}) \div (HL_{agclevel} + HL_{bgclevel})\}$$

Level	Level Factor (LF)	HLairve Air Leakage + Ventilation Heat Loss (Btu/h)	Level Conductive Heat Loss: (HL_{clevel})	Air Leakage Heat Loss Multiplier (LF x HLairbv / HLlevel)
1	0.5	12,718	8,378	0.759
2	0.3		13,147	0.290
3	0.2		13,783	0.185
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

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HEAT LOSS AND GAIN SUMMARY SHEET

MODEL: 4504 OPT. 2ND **BUILDER:** ROYAL PINE HOMES
SFQT: 3223 **LO#** 87514 **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):	41767.0	ASSUMED (Y/N):	Y
INTERNAL SHADING:	BLINDS/CURTAINS	ASSUMED OCCUPANTS:	6
INTERIOR LIGHTING LOAD ($Btu/h/ft^2$):	1.27	DC BRUSHLESS MOTOR (Y/N):	Y
FOUNDATION CONFIGURATION	BCIN_1	DEPTH BELOW GRADE:	6.0 ft
LENGTH: 46.0 ft	WIDTH: 37.0 ft	EXPOSED PERIMETER:	166.0 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

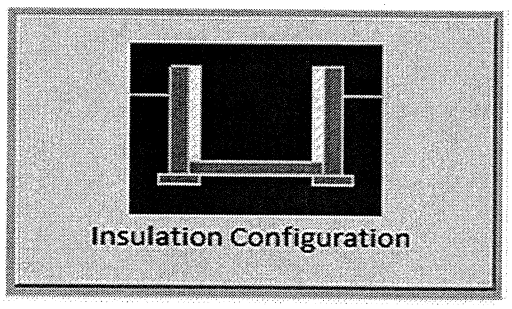
Michael O'Rourke

HVAC Designs Ltd.
375 Finley Ave, Suite 202
Ajax ON, L1S 2E2
905-619-2300

Residential Foundation Thermal Load Calculator

Supplemental tool for CAN/CSA-F280

Weather Station Description	
Province:	Ontario
Region:	Richmond Hill
Site Description	
Soil Conductivity:	Normal conductivity: dry sand, loam, clay
Water Table:	Normal (7-10 m, 23-33 ft)

Foundation Dimensions		
Floor Length (m):	**14.0**	 Insulation Configuration
Floor Width (m):	**11.3**	
Exposed Perimeter (m):	**0.0**	
Wall Height (m):	**2.7**	
Depth Below Grade (m):	**1.83**	
Window Area (m^2):	**1.9**	
Door Area (m^2):	**1.9**	
Radiant Slab		
Heated Fraction of the Slab:	**0**	
Fluid Temperature (°C):	**33**	
Design Months		
Heating Month	**1**	
Foundation Loads		
Heating Load (Watts):	**1638**	

TYPE: 4504 OPT. 2ND
LO# 87514

HVAC Designs Ltd.
375 Finley Ave, Suite 202
Ajax ON, L1S 2E2
905-619-2300

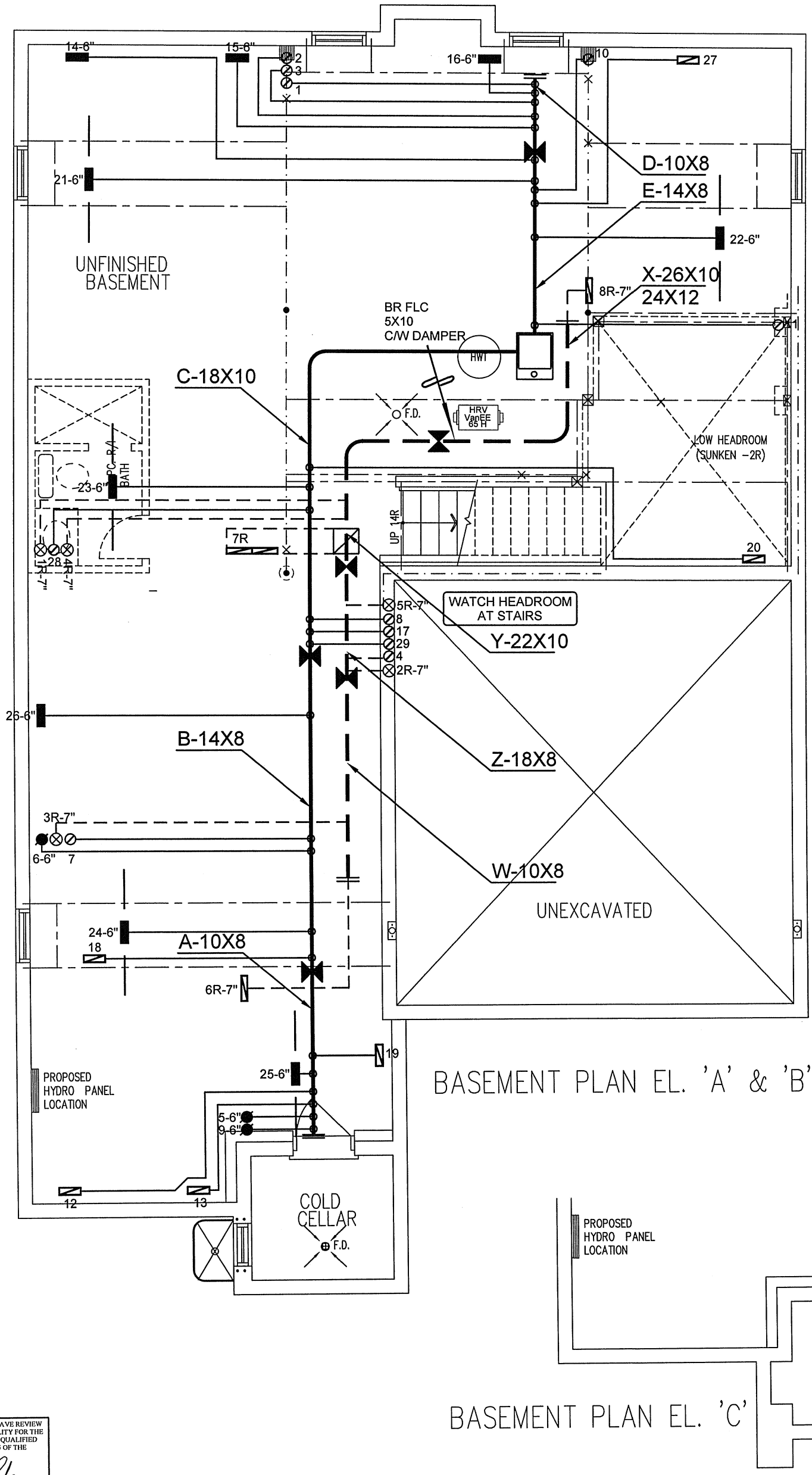
Air Infiltration Residential Load Calculator

Supplemental tool for CAN/CSA-F280

Weather Station Description	
Province:	Ontario
Region:	Richmond Hill
Weather Station Location:	Open flat terrain, grass
Anemometer height (m):	10
Local Shielding	
Building Site:	Suburban, forest
Walls:	Heavy
Flue:	Heavy
Highest Ceiling Height (m):	6.40
Building Configuration	
Type:	Detached
Number of Stories:	Two
Foundation:	Full
House Volume (m^3):	1182.7
Air Leakage/Ventilation	
Air Tightness Type:	Energy Star Detached (2.5 ACH)
Custom BDT Data:	ELA @ 10 Pa. 1104.1 cm^2
	2.50 ACH @ 50 Pa
Mechanical Ventilation (L/s):	Total Supply 45.0 / Total Exhaust 45.0
Flue Size	
Flue #:	#1 #2 #3 #4
Diameter (mm):	0 0 0 0
Natural Infiltration Rates	
Heating Air Leakage Rate (ACH/H):	**0.219**
Cooling Air Leakage Rate (ACH/H):	**0.068**

TYPE: 4504 OPT. 2ND

LO# 87514



BASEMENT PLAN EL. 'A' & 'B'

BASEMENT PLAN EL. '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, BCIN# 19669
HVAC DESIGNS LTD.

HVAC LEGEND

SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION
	SUPPLY AIR GRILLE		6" SUPPLY AIR BOOT ABOVE		14"x8" RETURN AIR GRILLE		RETURN AIR STACK ABOVE
	SUPPLY AIR GRILLE 6" BOOT		SUPPLY AIR STACK FROM 2nd FLOOR		30"x8" RETURN AIR GRILLE		RETURN AIR STACK 2nd FLOOR
	SUPPLY AIR BOOT ABOVE		6" SUPPLY AIR STACK 2nd FLOOR		FRA- FLOOR RETURN AIR GRILLE		REDUCER

No.	Description	Date
3.	REVISED AS PER CAD	JUNE/2021
2.	REVISED AS PER ARCHITECTURALS	APR/2021
1.	REVISED TO PERFORMANCE	SEPT/2020

REVISIONS

Client
ROYAL PINE HOMES

Project Name
CENTREFIELD (WEST GORMLEY)
RICHMOND HILL, ONTARIO

OPT. 2ND
4504 3223 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.

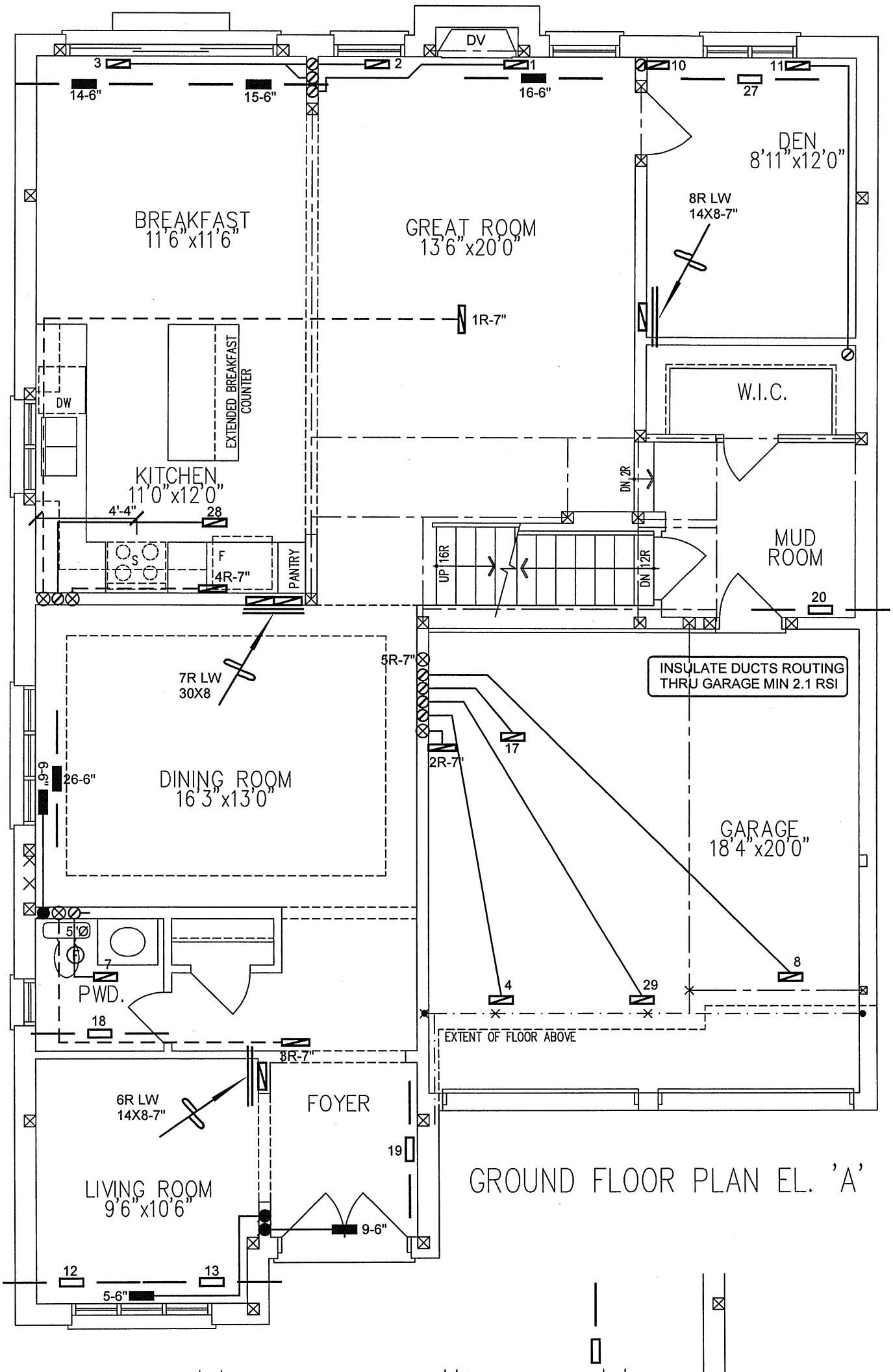
HEAT LOSS 50499 BTU/H	
UNIT DATA	
MAKE	CARRIER
MODEL	59TN6A-060-14V
INPUT	60 MBTU/H
OUTPUT	58 MBTU/H
COOLING	3.5 TONS
FAN SPEED	1370 cfm @ 0.6" w.c.

# OF RUNS	S/A	R/A	FANS
3RD FLOOR			
2ND FLOOR	14	5	4
1ST FLOOR	10	3	2
BASEMENT	5	1	0

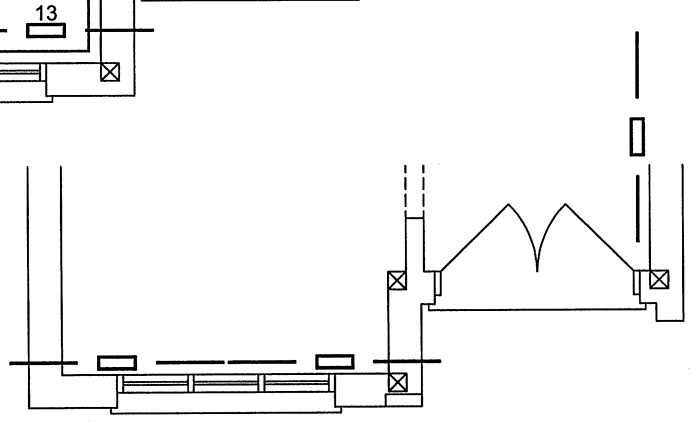
ALL S/A DIFFUSERS 4 "x10" UNLESS NOTED OTHERWISE ON LAYOUT. ALL S/A RUNS 5"Ø UNLESS NOTED OTHERWISE ON LAYOUT. UNDERCUT DOORS 1" min. FOR R/A

Sheet Title
BASEMENT HEATING LAYOUT

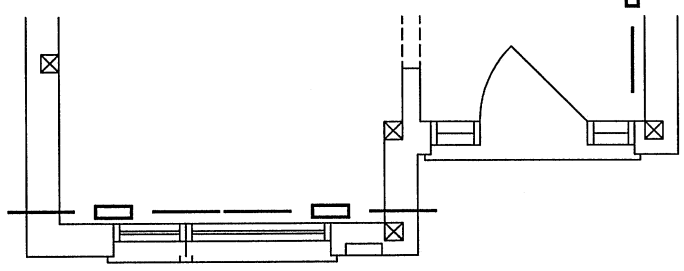
Date SEPT/2020
Scale 3/16" = 1'-0"
BCIN# 19669
LO# 87514



GROUND FLOOR PLAN EL. 'A'



GROUND FLOOR PLAN EL. 'B'



GROUND FLOOR PLAN EL. '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, BCIN# 19669
HVAC DESIGNS LTD.

CSA-F280-12

SB-12 PERFORMANCE

HVAC LEGEND

SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION
— ▭ —	SUPPLY AIR GRILLE	▬	6" SUPPLY AIR BOOT ABOVE	▭	14"x8" RETURN AIR GRILLE	▭	RETURN AIR STACK ABOVE
— ▬ —	SUPPLY AIR GRILLE 6" BOOT	⊘	SUPPLY AIR STACK FROM 2nd FLOOR	▭	30"x8" RETURN AIR GRILLE	⊠	RETURN AIR STACK 2nd FLOOR
▭	SUPPLY AIR BOOT ABOVE	●	6" SUPPLY AIR STACK 2nd FLOOR	▬	FRA- FLOOR RETURN AIR GRILLE	⧗	REDUCER

No.	Description	Date
3.	REVISED AS PER CAD	JUNE/2021
2.	REVISED AS PER ARCHITECTURALS	APR/2021
1.	REVISED TO PERFORMANCE	SEPT/2020

REVISIONS

Client
ROYAL PINE HOMES

Project Name
CENTREFIELD (WEST GORMLEY)
RICHMOND HILL, ONTARIO

OPT. 2ND
4504 3223 sqft

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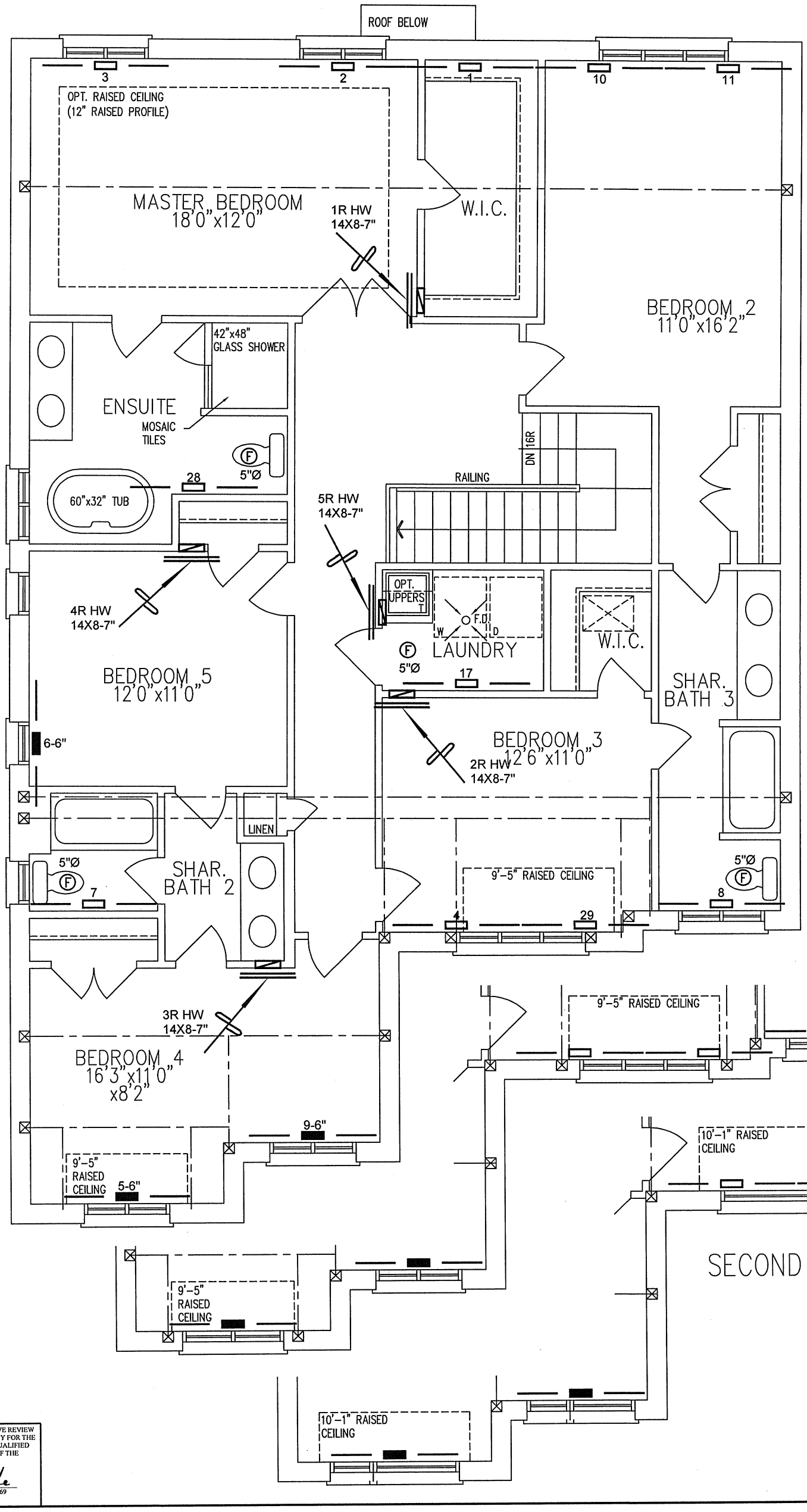
Installation to comply with the latest Ontario Building Code. All supply branch outlets shall be equipped with a manual balancing damper. Ductwork which passes through the garage or unheated spaces shall be adequately insulated and be gas-proofed.

Sheet Title
FIRST FLOOR HEATING LAYOUT

Date SEPT/2020
Scale 3/16" = 1'-0"
BCIN# 19669
LO# 87514



SECOND FLOOR PLAN EL. 'B'

OPT. SECOND FLOOR PLAN 'A'
5 BEDROOM CONDITION

SECOND FLOOR PLAN EL. '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, BCIN# 19669
HVAC DESIGNS LTD.

CSA-F280-12

SB-12 PERFORMANCE

HVAC LEGEND

SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION
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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
▨	SUPPLY AIR BOOT ABOVE	●	6" SUPPLY AIR STACK 2nd FLOOR	▬	FRA- FLOOR RETURN AIR GRILLE	⧗	REDUCER

No.	Description	Date
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REVISIONS

Client
ROYAL PINE HOMES

Project Name
CENTREFIELD (WEST GORMLEY)
RICHMOND HILL, ONTARIO

OPT. 2ND
4504 3223 sqft

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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
SECOND FLOOR HEATING LAYOUT

Date SEPT/2020
Scale 3/16" = 1'-0"
BCIN# 19669
LO# 87514

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	**Postal code**	**Plan number/ other description**		
RICHMOND HILL				

B. Individual who reviews and takes responsibility for design activities

Name			Firm	
MICHAEL O'ROURKE			**HVAC DESIGNS LTD.**	
Street address			**Unit no.**	**Lot/con.**
375 FINLEY AVE			**202**	**N/A**
Municipality	**Postal code**	**Province**	**E-mail**	
AJAX	**L1S 2E2**	**ONTARIO**	**info@hvacdesigns.ca**	
Telephone number	**Fax number**		**Cell number**	
(905) 619-2300	**(905) 619-2375**		( )	

C. Design activities undertaken by individual identified in Section B. [Building Code Table 3.5.2.1 OF Division C]

☐ House	☒ HVAC – House	☐ Building Structural
☐ Small Buildings	☐ Building Services	☐ Plumbing – House
☐ Large Buildings	☐ Detection, Lighting and Power	☐ Plumbing – All Buildings
☐ Complex Buildings	☐ Fire Protection	☐ On-site Sewage Systems

Description of designer's work	
HEAT LOSS / GAIN CALCULATIONS **DUCT SIZING** **RESIDENTIAL MECHANICAL VENTILATION DESIGN SUMMARY** **RESIDENTIAL SYSTEM DESIGN per CSA-F280-12**	**Model:** 4504 OPT 5 BED 4 BATH **Project:** CENTREFIELD (WEST GORMLEY)

D. Declaration of Designer

I **MICHAEL O'ROURKE** 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 Di vision C, of the Building Code.

Individual BCIN: 19669
Basis for exemption from registration and qualification: O.B.C SENTENCE 3.2.4.1 (4)

☐ The design work is exempt from the registration and qualification requirements of the Building Code.
Basis for exemption from registration and qualification: _____

I certify that:

1. The information contained in this schedule is true to the best of my knowledge.
2. I have submitted this application with the knowledge and consent of the firm.

June 7, 2021
Date

Michael O'Rourke
Signature of Designer

NOTE:

1. 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.
2. 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.

HVAC DESIGNS LTD.

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Tel: 905.619.2300 Fax: 905.619.2375
Web: www.hvacdesigns.ca E-mail: info@hvacdesigns.ca

SITE NAME: CENTREFIELD (WEST GORMLEY) OPT 5 BED 4 BATH DATE: Jun-21 WINTER NATURAL AIR CHANGE RATE 0.219 HEAT LOSS ΔT °F. 78 CSA-F280-12

BUILDER: ROYAL PINE HOMES TYPE: 4504 GFA: 3223 LO# 91146 SUMMER NATURAL AIR CHANGE RATE 0.068 HEAT GAIN ΔT °F. 13 SB-12 PERFORMANCE

ROOM USE			MBR			ENS			WIC			BED-2			BED-3			BED-4			ENS-4/5			BED-5			ENS-2			ENS-3			WIC-3		
EXP. WALL			32			10			5			27			13			45			6			12			10			9			16		
CLG. HT.			9			8			8			8			8			8			8			8			8			8			8		
	FACTORS																																		
GRS.WALL AREA	LOSS	GAIN	288			80			40			216			104			360			48			96			80			72			128		
GLAZING			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	7	152	112	7	152	112	0	0	0
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	0	0	0	0	0	0	0	0	0	0	0	0	0	0
SOUTH	21.8	24.9	0	0	0	15	327	373	0	0	0	0	0	0	47	1024	1953	64	1394	2659	0	0	0	0	0	0	0	0	0	0	0	20	436	831
WEST	21.8	41.6	36	784	1496	0	0	0	0	0	0	26	566	1080	0	0	0	0	0	0	7	152	174	16	349	398	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	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	0	0	0	0	0	0	0	0	0	0
NET EXPOSED WALL	4.2	0.7	252	1060	174	65	273	45	40	168	28	190	799	131	57	240	39	296	1245	205	41	172	28	80	336	55	73	307	51	65	273	45	108	454	75
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	0	0	0	0	0	0	0	0	0	0
EXPOSED CLG	1.3	0.6	289	380	170	124	163	73	68	89	40	262	344	154	157	206	92	216	283	126	83	109	49	212	279	125	70	92	41	90	118	53	63	83	37
NO ATTIC EXPOSED CLG	2.8	1.3	0	0	0	0	0	0	0	0	0	0	0	0	30	84	38	40	112	50	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	187	488	80	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			0			0			0			0			0		
SLAB ON GRADE HEAT LOSS			0			0			0			0			0			0			0			0			0			0			0		
SUBTOTAL HT LOSS			2224			763			258			1710			2042			3034			434			964			551			701			1137		
SUB TOTAL HT GAIN					1840			491			68			1366			2203			3041			251			578			203			235			970
LEVEL FACTOR / MULTIPLIER			0.20	0.18		0.20	0.18		0.20	0.18		0.20	0.18		0.20	0.18		0.20	0.18		0.20	0.18		0.20	0.18		0.20	0.18		0.20	0.18		0.20	0.18	
AIR CHANGE HEAT LOSS				402			138			47			309			370			549			79			174			100			127			206		
AIR CHANGE HEAT GAIN					79			21			3			58			94			130			11			25			9			10			42
DUCT LOSS				0			0			0			0			241			0			0			0			0			83			134	
DUCT GAIN					0			0			0			0			313			0			0			0			0			25			101
HEAT GAIN PEOPLE	240		2		480	0		0	0		0	1		240	1		240	1		240	0		0	1		240	0		0	0		0	0		0
HEAT GAIN APPLIANCES/LIGHTS					595			0			0			595			595			595			0			595			0			0			0
TOTAL HT LOSS BTU/H			2626			901			304			2019			2653			3583			513			1138			651			910			1477		
TOTAL HT GAIN x 1.3 BTU/H					3892			666			92			2937			4479			5208			341			1870			276			351			1446

ROOM USE			LIV			DIN			KT/GT			DEN			LAUN			W/R			FOY			MUD									BAS		
EXP. WALL			25			25			63			23			0			6			23			22									166		
CLG. HT.			10			10			10			10			8			10			10			11									9		
	FACTORS																																			
GRS.WALL AREA	LOSS	GAIN	250			250			630			230			0			60			230			242									996		
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	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0							4	87	64
EAST	21.8	41.6	40	871	1662	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	27	588	1122	0	0	0							0	0	0
SOUTH	21.8	24.9	0	0	0	28	610	697	16	349	398	0	0	0	0	0	0	9	196	224	0	0	0	0	0	0							8	174	199
WEST	21.8	41.6	0	0	0	0	0	0	103	2244	4280	23	501	956	0	0	0	0	0	0	0	0	0	0	0	0							8	174	332
SKYLT.	35.8	101.2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0							0	0	0
DOORS	25.8	4.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	20	517	85	20	517	85							20	517	85
NET EXPOSED WALL	4.2	0.7	210	883	145	222	934	154	511	2149	354	207	871	143	0	0	0	51	214	35	183	770	127	222	934	154							0	0	0
NET EXPOSED BSMT WALL ABOVE GR	3.7	0.6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0							498	1834	302
EXPOSED CLG	1.3	0.6	0	0	0	0	0	0	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	0	0	0							0	0	0
EXPOSED FLOOR	2.6	0.4	0	0	0	0	0	0	0	0	0	0	0	0	36	94	15	0	0	0	0	0	0	0	0	0							0	0	0
BASEMENT/CRAWL HEAT LOSS			0			0			0			0			0			0			0			0									5591		
SLAB ON GRADE HEAT LOSS			0			0			0			0			0			0			0			0											
SUBTOTAL HT LOSS			1754			1544			4741			1372			239			411			1875			1451									8378		
SUB TOTAL HT GAIN					1807			851			5032			1099			80			259			1334			239									982
LEVEL FACTOR / MULTIPLIER			0.30	0.29		0.30	0.29		0.30	0.29		0.30	0.29		0.20	0.18		0.30	0.29		0.30	0.29		0.30	0.29								0.50	0.76	
AIR CHANGE HEAT LOSS				509			448			1376			398			43			119			544			421									6359		
AIR CHANGE HEAT GAIN					77			36			215			47			3			11			57			10									42
DUCT LOSS				0			0			0			0			28			0			0			0											
DUCT GAIN					0			0			0			0			68			0			0			0									0	
HEAT GAIN PEOPLE	240		0		0	0		0	0		0	0		0	0		0	0		0	0		0	0		0									0	
HEAT GAIN APPLIANCES/LIGHTS					595			595			595			595			595			0			0			0									0	
TOTAL HT LOSS BTU/H			2264			1992			6117			1770			310			530			2419			1872											
TOTAL HT GAIN x 1.3 BTU/H					3224			1927			7595			2263			971			352			1808			324									14737	
																																			2105

TOTAL HEAT GAIN BTU/H: 42456 TONS: 3.54 LOSS DUE TO VENTILATION LOAD BTU/H: 2004 STRUCTURAL HEAT LOSS: 48785 TOTAL COMBINED HEAT LOSS BTU/H: 50789

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.

Michael O'Rourke

INDIVIDUAL BCIN: 19669 MICHAEL O'ROURKE

HVAC DESIGNS LTD.

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

OPT 5 BED 4 BATH
TYPE: 4504

DATE: Jun-21

GFA: 3223 LO# 91146

HEATING CFM	1370	COOLING CFM	1370
TOTAL HEAT LOSS	48,785	TOTAL HEAT GAIN	42,127
AIR FLOW RATE CFM	28.08	AIR FLOW RATE CFM	32.52

furnace pressure	0.6
furnace filter	0.05
a/c coil pressure	0.2
available pressure for s/a & r/a	0.35
plenum pressure s/a	0.18
max s/a dif press. loss	0.02
min adjusted pressure s/a	0.16
r/a pressure	0.17
r/a grille press. Loss	0.02
adjusted pressure r/a	0.15

**CARRIER
59TN6A-060-14V 60

FAN SPEED	
LOW	820
MEDLOW	0
MEDIUM	0
MEDIUM HIGH	1370
HIGH	1520

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

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

TEMPERATURE RISE 39 °F

RUN COUNT	4th	3rd	2nd	1st	Bas
S/A	0	0	16	10	5
R/A	0	0	5	3	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	WIC	MBR	MBR	BED-3	BED-4	BED-5	ENS-4/5	WIC-3	BED-4	BED-2	BED-2	LIV	LIV	KT/GT	KT/GT	KT/GT	LAUN	W/R	FOY	MUD	BAS	BAS	BAS	BAS
RM LOSS MBH.	0.30	1.31	1.31	1.33	1.79	1.14	0.51	1.48	1.79	1.01	1.01	1.13	1.13	2.04	2.04	2.04	0.31	0.53	2.42	1.87	2.95	2.95	2.95	2.95
CFM PER RUN HEAT	9	37	37	37	50	32	14	41	50	28	28	32	32	57	57	57	9	15	68	53	83	83	83	83
RM GAIN MBH.	0.09	1.95	1.95	2.24	2.60	1.87	0.34	1.45	2.60	1.47	1.47	1.61	1.61	2.53	2.53	2.53	0.97	0.35	1.81	0.32	0.42	0.42	0.42	0.42
CFM PER RUN COOLING	3	63	63	73	85	61	11	47	85	48	48	52	52	82	82	82	32	11	59	11	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	0.16	0.16	0.16	0.17	0.17	0.17	0.17	0.16	0.16	0.16	0.16
ACTUAL DUCT LGH.	45	42	49	54	71	66	56	62	66	34	56	61	55	34	26	14	45	49	49	41	30	16	17	38
EQUIVALENT LENGTH	150	180	180	120	170	170	170	140	150	160	170	170	170	120	140	110	130	120	160	190	90	120	120	110
TOTAL EFFECTIVE LENGTH	195	222	229	174	241	236	226	202	216	194	226	231	225	154	166	124	175	169	209	231	120	136	137	148
ADJUSTED PRESSURE	0.09	0.08	0.08	0.1	0.07	0.07	0.08	0.09	0.08	0.09	0.08	0.07	0.08	0.11	0.1	0.13	0.1	0.1	0.08	0.07	0.14	0.12	0.12	0.11
ROUND DUCT SIZE	4	5	5	5	**6**	**6**	4	5	**6**	5	5	5	5	**6**	**6**	**6**	4	4	5	5	**6**	**6**	**6**	**6**
HEATING VELOCITY (ft/min)	103	272	272	272	255	163	161	301	255	206	206	235	235	291	291	291	103	172	499	389	423	423	423	423
COOLING VELOCITY (ft/min)	34	463	463	536	433	311	126	345	433	352	352	382	382	418	418	418	367	126	433	81	71	71	71	71
OUTLET GRILL SIZE	3X10	3X10	3X10	3X10	4X10	4X10	3X10	3X10	4X10	3X10	3X10	3X10	3X10	4X10	4X10	4X10	3X10	3X10	3X10	3X10	4X10	4X10	4X10	4X10
TRUNK	D	D	D	C	A	B	B	C	A	E	E	A	A	**E**	D	D	C	B	A	C	E	E	C	B

RUN #	25	26	27	28	29	30	31
ROOM NAME	BAS	DIN	DEN	ENS	BED-3	ENS-2	ENS-3
RM LOSS MBH.	2.95	1.99	1.77	0.90	1.33	0.65	0.91
CFM PER RUN HEAT	83	56	50	25	37	18	26
RM GAIN MBH.	0.42	1.93	2.26	0.67	2.24	0.28	0.35
CFM PER RUN COOLING	14	63	74	22	73	9	11
ADJUSTED PRESSURE	0.16	0.17	0.17	0.17	0.17	0.17	0.17
ACTUAL DUCT LGH.	47	39	22	26	43	60	40
EQUIVALENT LENGTH	150	140	150	180	180	150	170
TOTAL EFFECTIVE LENGTH	197	179	172	206	223	210	210
ADJUSTED PRESSURE	0.08	0.1	0.1	0.08	0.08	0.08	0.08
ROUND DUCT SIZE	**6**	**6**	5	4	5	4	4
HEATING VELOCITY (ft/min)	423	286	367	287	272	207	298
COOLING VELOCITY (ft/min)	71	321	543	252	536	103	126
OUTLET GRILL SIZE	4X10	4X10	3X10	3X10	3X10	3X10	3X10
TRUNK	A	B	E	C	C	C	E

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	315	0.07	9.4	10	x	8	567	TRUNK G	0	0.00	0	0	x	8	0
TRUNK B	515	0.07	11.3	14	x	8	662	TRUNK H	0	0.00	0	0	x	8	0
TRUNK C	818	0.07	13.4	18	x	10	654	TRUNK I	0	0.00	0	0	x	8	0
TRUNK D	197	0.08	7.6	10	x	8	355	TRUNK J	0	0.00	0	0	x	8	0
TRUNK E	552	0.08	11.2	16	x	8	621	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	245	0.05	9.3	10	x	8	441
TRUNK X	1230	0.05	17	26	x	10	681
TRUNK Y	1025	0.05	15.9	22	x	10	671
TRUNK Z	490	0.05	12.1	18	x	8	490
DROP	1370	0.05	17.7	24	x	12	685

RETURN AIR #	1	2	3	4	5	6	7	8								BR
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
AIR VOLUME	115	115	115	115	130	130	305	140	0	0	0	0	0	0	0	205
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.	85	55	88	78	50	57	37	15	1	1	1	1	1	1	1	19
EQUIVALENT LENGTH	195	245	215	235	205	190	245	145	0	0	0	0	0	0	0	155
TOTAL EFFECTIVE LH	280	300	303	313	255	247	282	160	1	1	1	1	1	1	1	174
ADJUSTED PRESSURE	0.05	0.05	0.05	0.05	0.06	0.06	0.05	0.09	14.80	14.80	14.80	14.80	14.80	14.80	14.80	0.09
ROUND DUCT SIZE	7	7	7	7	7	7	10.1	6.5	0	0	0	0	0	0	0	7.5
INLET GRILL SIZE	8	8	8	8	8	8	8	8	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	14	30	14	0	0	0	0	0	0	0	14

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

HVAC DESIGNS LTD.

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TYPE: 4504 LO # 91146
SITE NAME: CENTREFIELD (WEST GORMLEY) OPT 5 BED 4 BATH

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	2	@ 21.2 cfm	42.4	cfm
Other Bedrooms	4	@ 10.6 cfm	42.4	cfm
Kitchen & Bathrooms	6	@ 10.6 cfm	63.6	cfm
Other Rooms	6	@ 10.6 cfm	63.6	cfm
Table 9.32.3.A.		TOTAL	212.0	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	95.4	cfm

SUPPLEMENTAL VENTILATION CAPACITY 9.32.3.5.

Total Ventilation Capacity	212	cfm
Less Principal Ventil. Capacity	95.4	cfm
Required Supplemental Capacity	116.6	cfm

PRINCIPAL EXHAUST FAN CAPACITY

Model: VANEE 65H Location: BSMT

95.4 cfm [✓] HVI Approved

PRINCIPAL EXHAUST HEAT LOSS CALCULATION

CFM		ΔT °F		FACTOR		% LOSS
95.4 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
ENS-4/5	BY INSTALLING CONTRACTOR	50	✓	3.5
ENS-3	BY INSTALLING CONTRACTOR	50	✓	3.5
W/R	BY INSTALLING CONTRACTOR	50	✓	3.5

HEAT RECOVERY VENTILATOR 9.32.3.11.

Model: VANEE 65H

155 cfm high 64 cfm low

75 % 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: Michael O'Rourke
HRAI # 001820
Date: June-21

I REVIEW AND TAKE RESPONIBILITY 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

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CSA F280-12 Residential Heat Loss and Heat Gain Calculations

Formula Sheet (For Air Leakage / Ventiliation Calculation)

LO#: 91146 Model: 4504 Builder: ROYAL PINE HOMES Date: 6/7/2021

Volume Calculation

House Volume

Level	Floor Area (ft²)	Floor Height (ft)	Volume (ft³)
Bsmt	1453	9	13077
First	1453	10	14530
Second	1770	8	14160
Third	0	9	0
Fourth	0	9	0
		Total:	41,767.0 ft³
		Total:	1182.7 m³

Air Change & Delta T Data

WINTER NATURAL AIR CHANGE RATE	0.219
SUMMER NATURAL AIR CHANGE RATE	0.068

Design Temperature Difference

	Tin °C	Tout °C	ΔT °C	ΔT °F
Winter DTDh	22	-21	43	78
Summer DTDc	24	31	7	13

5.2.3.1 Heat Loss due to Air Leakage

$$HL_{airb} = LR_{airh} \times \frac{V_b}{3.6} \times DTD_h \times 1.2$$

0.219 x 328.53 x 43 °C x 1.2 = 3727 W

= **12718 Btu/h**

6.2.6 Sensible Gain due to Air Leakage

$$HG_{salb} = LR_{airc} \times \frac{V_b}{3.6} \times DTD_c \times 1.2$$

= 0.068 x 328.53 x 7 °C x 1.2 = 191 W

= **652 Btu/h**

5.2.3.2 Heat Loss due to Mechanical Ventilation

$$HL_{vairb} = PVC \times DTD_h \times 1.08 \times (1 - E)$$

95 CFM x 78 °F x 1.08 x 0.25 = **2004 Btu/h**

6.2.7 Sensible heat Gain due to Ventilation

$$HL_{vairb} = PVC \times DTD_h \times 1.08 \times (1 - E)$$

95 CFM x 13 °F x 1.08 x 0.25 = **330 Btu/h**

5.2.3.3 Calculation of Air Change Heat Loss for Each Room (Floor Multiplier Section)

$$HL_{airr} = Level\ Factor \times HL_{airbv} \times \{(HL_{agcr} + HL_{bgcr}) \div (HL_{agclevel} + HL_{bgclevel})\}$$

Level	Level Factor (LF)	HLairve Air Leakage + Ventilation Heat Loss (Btu/h)	Level Conductive Heat Loss: (HL_{clevel})	Air Leakage Heat Loss Multiplier (LF x HLairbv / HLlevel)
1	0.5	12,718	8,378	0.759
2	0.3		13,147	0.290
3	0.2		14,056	0.181
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

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HEAT LOSS AND GAIN SUMMARY SHEET

MODEL: 4504 OPT 5 BED 4 BATH **BUILDER:** ROYAL PINE HOMES
SFQT: 3223 **LO#** 91146 **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):	41767.0	ASSUMED (Y/N):	Y
INTERNAL SHADING:	BLINDS/CURTAINS	ASSUMED OCCUPANTS:	6
INTERIOR LIGHTING LOAD ($Btu/h/ft^2$):	1.40	DC BRUSHLESS MOTOR (Y/N):	Y
FOUNDATION CONFIGURATION	BCIN_1	DEPTH BELOW GRADE:	6.0 ft
LENGTH: 46.0 ft	WIDTH: 37.0 ft	EXPOSED PERIMETER:	166.0 ft

2012 OBC - COMPLIANCE PACKAGE	**Compliance Package SB-12 PERFORMANCE**	
Component	**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

Michael O'Rourke

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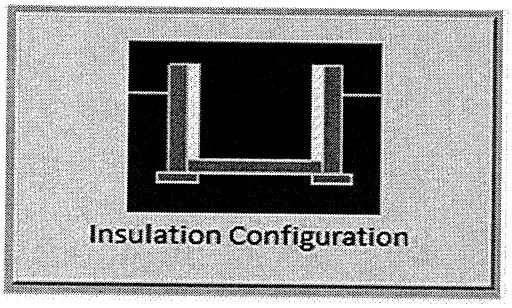
Residential Foundation Thermal Load Calculator

Supplemental tool for CAN/CSA-F280

Weather Station Description	
Province:	Ontario
Region:	Richmond Hill
Site Description	
Soil Conductivity:	Normal conductivity: dry sand, loam, clay
Water Table:	Normal (7-10 m, 23-33 ft)

Foundation Dimensions		
Floor Length (m):	**14.0**	 Insulation Configuration
Floor Width (m):	**11.3**	
Exposed Perimeter (m):	**0.0**	
Wall Height (m):	**2.7**	
Depth Below Grade (m):	**1.83**	
Window Area (m^2):	**1.9**	
Door Area (m^2):	**1.9**	
Radiant Slab		
Heated Fraction of the Slab:	**0**	
Fluid Temperature (°C):	**33**	
Design Months		
Heating Month	**1**	
Foundation Loads		
Heating Load (Watts):	**1638**	

TYPE: 4504
LO# 91146

OPT 5 BED 4 BATH

HVAC Designs Ltd.
375 Finley Ave, Suite 202
Ajax ON, L1S 2E2
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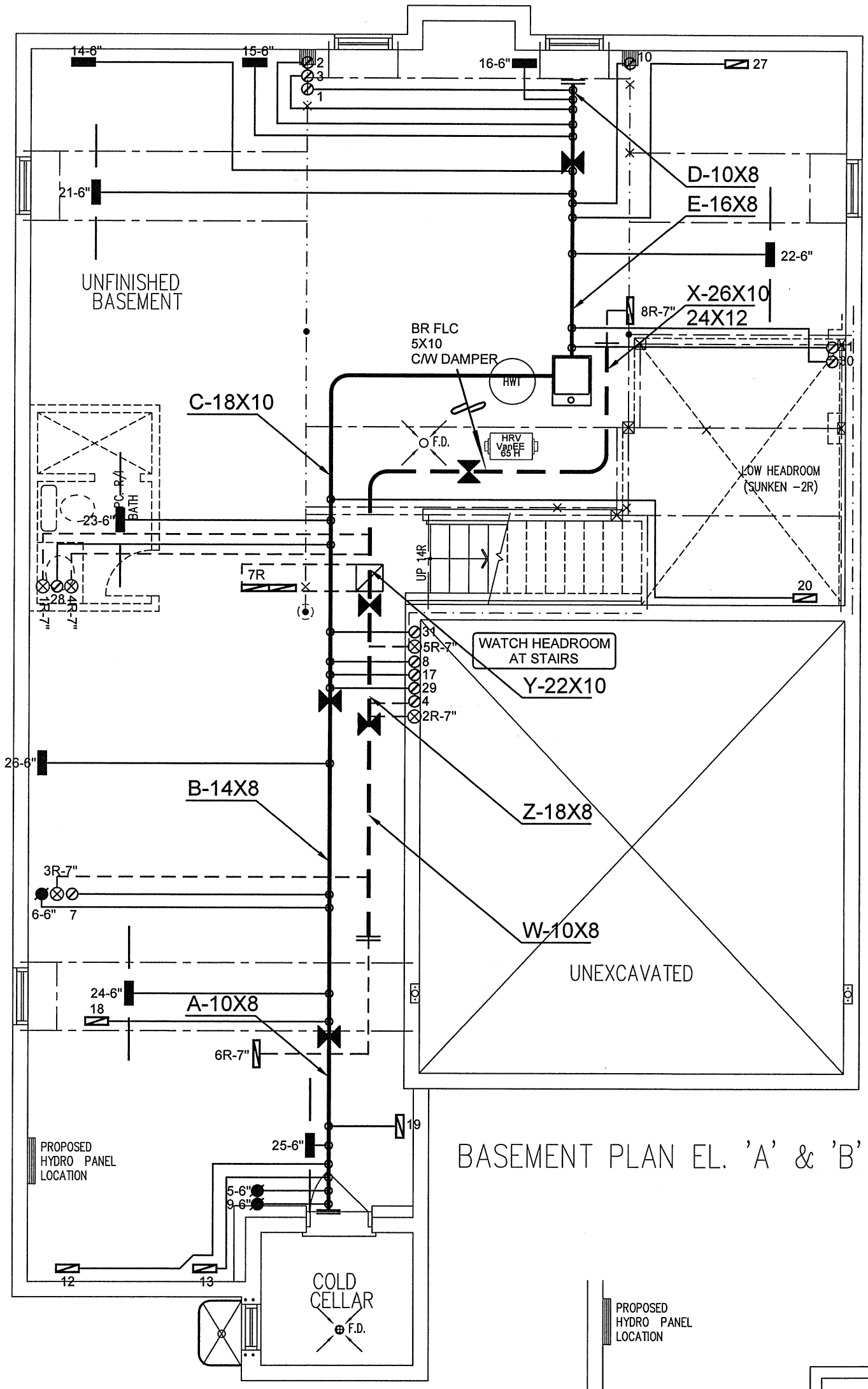
Air Infiltration Residential Load Calculator

Supplemental tool for CAN/CSA-F280

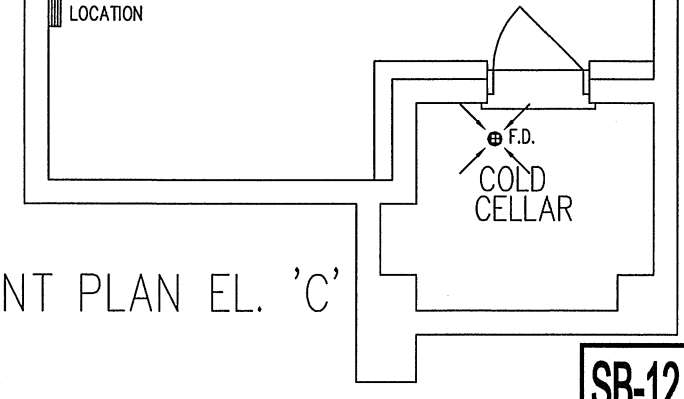
Weather Station Description					
Province:	Ontario				
Region:	Richmond Hill				
Weather Station Location:	Open flat terrain, grass				
Anemometer height (m):	10				
Local Shielding					
Building Site:	Suburban, forest				
Walls:	Heavy				
Flue:	Heavy				
Highest Ceiling Height (m):	6.40				
Building Configuration					
Type:	Detached				
Number of Stories:	Two				
Foundation:	Full				
House Volume (m^3):	1182.7				
Air Leakage/Ventilation					
Air Tightness Type:	Energy Star Detached (2.5 ACH)				
Custom BDT Data:	ELA @ 10 Pa.				1104.1 cm^2
	2.50				ACH @ 50 Pa
Mechanical Ventilation (L/s):	Total Supply			Total Exhaust	
	45.0			45.0	
Flue Size					
Flue #:	#1	#2	#3	#4	
Diameter (mm):	0	0	0	0	
Natural Infiltration Rates					
Heating Air Leakage Rate (ACH/H):	**0.219**				
Cooling Air Leakage Rate (ACH/H):	**0.068**				

TYPE: 4504
LO# 91146

OPT 5 BED 4 BATH



BASEMENT PLAN EL. 'A' & 'B'



BASEMENT PLAN EL. '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, BCIN# 19669
HVAC DESIGNS LTD.

CSA-F280-12

SB-12 PERFORMANCE

HVAC LEGEND

SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION
— ▭ —	SUPPLY AIR GRILLE	▬	6" SUPPLY AIR BOOT ABOVE	▱	14"x8" RETURN AIR GRILLE	▱	RETURN AIR STACK ABOVE
— ▬ —	SUPPLY AIR GRILLE 6" BOOT	⊘	SUPPLY AIR STACK FROM 2nd FLOOR	▱▱	30"x8" RETURN AIR GRILLE	⊠	RETURN AIR STACK 2nd FLOOR
▱	SUPPLY AIR BOOT ABOVE	●	6" SUPPLY AIR STACK 2nd FLOOR	■	FRA- FLOOR RETURN AIR GRILLE	⧗	REDUCER

No.	Description	Date
3.		
2.		
1.		

REVISIONS

Client
ROYAL PINE HOMES

Project Name
CENTREFIELD (WEST GORMLEY)
RICHMOND HILL, ONTARIO

OPT. 5 BED 4 BATH
4504 3223 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.

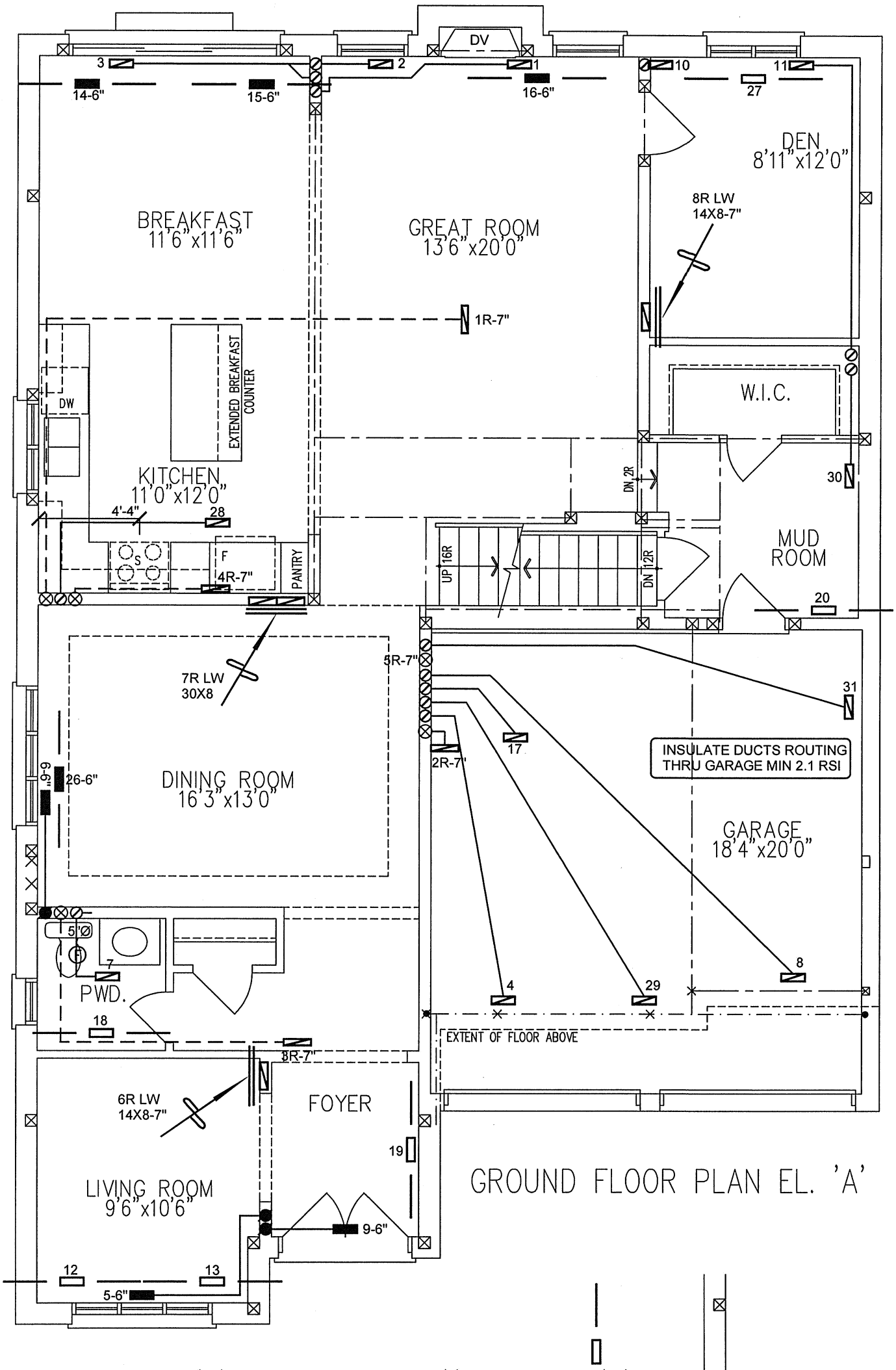
HEAT LOSS 50789 BTU/H	
UNIT DATA	
MAKE	CARRIER
MODEL	59TN6A-060-14V
INPUT	60 MBTU/H
OUTPUT	58 MBTU/H
COOLING	3.5 TONS
FAN SPEED	1370 cfm @ 0.6" w.c.

# OF RUNS	S/A	R/A	FANS
3RD FLOOR			
2ND FLOOR	16	5	5
1ST FLOOR	10	3	2
BASEMENT	5	1	0

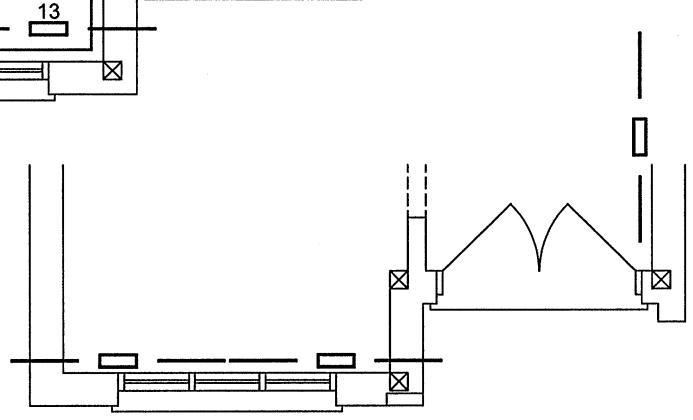
ALL S/A DIFFUSERS 4 "x10" UNLESS NOTED OTHERWISE ON LAYOUT. ALL S/A RUNS 5"Ø UNLESS NOTED OTHERWISE ON LAYOUT. UNDERCUT DOORS 1" min. FOR R/A

Sheet Title
BASEMENT HEATING LAYOUT

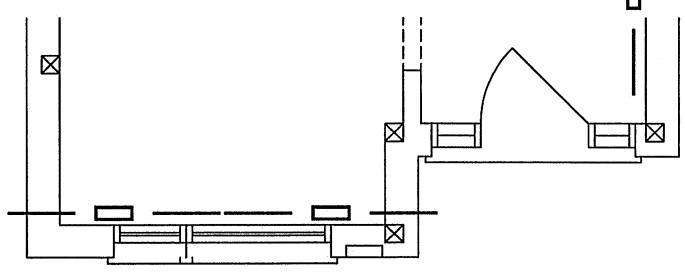
Date JUNE/2021
Scale 3/16" = 1'-0"
BCIN# 19669
LO# 91146



GROUND FLOOR PLAN EL. 'A'



GROUND FLOOR PLAN EL. 'B'



GROUND FLOOR PLAN EL. '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, BCIN# 19669
HVAC DESIGNS LTD.

CSA-F280-12

SB-12 PERFORMANCE

HVAC LEGEND

SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION
— ▭ —	SUPPLY AIR GRILLE	▬	6" SUPPLY AIR BOOT ABOVE	▱	14"x8" RETURN AIR GRILLE	▱	RETURN AIR STACK ABOVE
— ▬ —	SUPPLY AIR GRILLE 6" BOOT	⊘	SUPPLY AIR STACK FROM 2nd FLOOR	▱▱	30"x8" RETURN AIR GRILLE	⊠	RETURN AIR STACK 2nd FLOOR
▱	SUPPLY AIR BOOT ABOVE	●	6" SUPPLY AIR STACK 2nd FLOOR	▬	FRA- FLOOR RETURN AIR GRILLE	⧗	REDUCER

No.	Description	Date
3.		
2.		
1.		

REVISIONS

Client
ROYAL PINE HOMES

Project Name
CENTREFIELD (WEST GORMLEY)
RICHMOND HILL, ONTARIO

OPT. 5 BED 4 BATH
4504 3223 sqft

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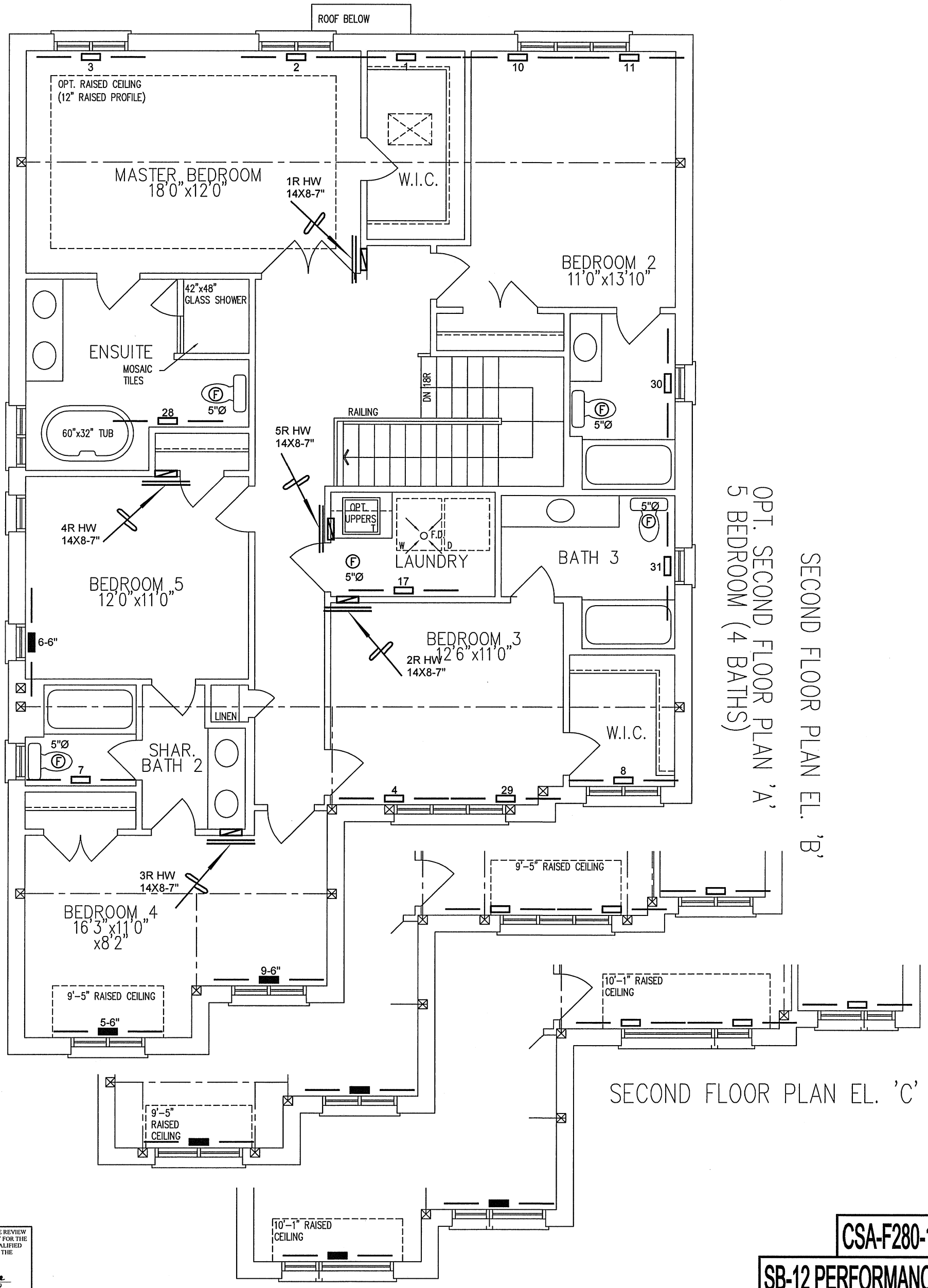
Installation to comply with the latest Ontario Building Code. All supply branch outlets shall be equipped with a manual balancing damper. Ductwork which passes through the garage or unheated spaces shall be adequately insulated and be gas-proofed.

Sheet Title
FIRST FLOOR HEATING LAYOUT

Date JUNE/2021
Scale 3/16" = 1'-0"
BCIN# 19669
LO# 91146



OPT. SECOND FLOOR PLAN 'A'
5 BEDROOM (4 BATHS)

SECOND FLOOR PLAN EL. 'B'

SECOND FLOOR PLAN EL. '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, BCIN# 19669
HVAC DESIGNS LTD.

CSA-F280-12

SB-12 PERFORMANCE

HVAC LEGEND

SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION
— ▭ —	SUPPLY AIR GRILLE	▬	6" SUPPLY AIR BOOT ABOVE	▭	14"x8" RETURN AIR GRILLE	▭	RETURN AIR STACK ABOVE
— ▬ —	SUPPLY AIR GRILLE 6" BOOT	⊘	SUPPLY AIR STACK FROM 2nd FLOOR	▭	30"x8" RETURN AIR GRILLE	⊠	RETURN AIR STACK 2nd FLOOR
▭	SUPPLY AIR BOOT ABOVE	●	6" SUPPLY AIR STACK 2nd FLOOR	▬	FRA- FLOOR RETURN AIR GRILLE	⧗	REDUCER

No.	Description	Date
3.		
2.		
1.		

REVISIONS

Client

ROYAL PINE HOMES

Project Name

CENTREFIELD (WEST GORMLEY)
RICHMOND HILL, ONTARIO

OPT. 5 BED 4 BATH
4504 3223 sqft

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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

SECOND FLOOR HEATING LAYOUT

Date JUNE/2021

Scale 3/16" = 1'-0"

BCIN# 19669

LO# 91146

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	**Postal code**	**Plan number/ other description**		
RICHMOND HILL				

B. Individual who reviews and takes responsibility for design activities

Name		Firm		
MICHAEL O'ROURKE		**HVAC DESIGNS LTD.**		
Street address			Unit no.	Lot/con.
375 FINLEY AVE			**202**	**N/A**
Municipality	Postal code	Province	E-mail	
AJAX	**L1S 2E2**	**ONTARIO**	**info@hvacdesigns.ca**	
Telephone number	Fax number		Cell number	
(905) 619-2300	**(905) 619-2375**		( )	

C. Design activities undertaken by individual identified in Section B. [Building Code Table 3.5.2.1 OF Division C]

☐ House	☒ HVAC – House	☐ Building Structural
☐ Small Buildings	☐ Building Services	☐ Plumbing – House
☐ Large Buildings	☐ Detection, Lighting and Power	☐ Plumbing – All Buildings
☐ Complex Buildings	☐ Fire Protection	☐ On-site Sewage Systems

Description of designer's work	
HEAT LOSS / GAIN CALCULATIONS **DUCT SIZING** **RESIDENTIAL MECHANICAL VENTILATION DESIGN SUMMARY** **RESIDENTIAL SYSTEM DESIGN per CSA-F280-12**	**Model:** 4504 OPT. GROUND - 5 BED 4 BATH **Project:** CENTREFIELD (WEST GORMLEY)

D. Declaration of Designer

I **MICHAEL O'ROURKE** 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 Di vision C, of the Building Code.

Individual BCIN: 19669
Basis for exemption from registration and qualification: O.B.C SENTENCE 3.2.4.1 (4)

☐ The design work is exempt from the registration and qualification requirements of the Building Code.
Basis for exemption from registration and qualification: _____

I certify that:

1. The information contained in this schedule is true to the best of my knowledge.
2. I have submitted this application with the knowledge and consent of the firm.

June 7, 2021
Date

Michael O'Rourke
Signature of Designer

NOTE:

1. 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.
2. 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.

HVAC DESIGNS LTD.

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Tel: 905.619.2300 Fax: 905.619.2375
Web: www.hvacdesigns.ca E-mail: info@hvacdesigns.ca

SITE NAME: CENTREFIELD (WEST GORMLEY) | OPT. GROUND - 5 BED 4 BATH | DATE: Jun-21 | WINTER NATURAL AIR CHANGE RATE 0.219 | HEAT LOSS ΔT °F. 78 | CSA-F280-12

BUILDER: ROYAL PINE HOMES | TYPE: 4504 | GFA: 3223 | LO# 91148 | SUMMER NATURAL AIR CHANGE RATE 0.068 | HEAT GAIN ΔT °F. 13 | SB-12 PERFORMANCE

ROOM USE			MBR			ENS			WIC			BED-2			BED-3			BED-4			ENS-4/5			BED-5			ENS-2			ENS 3			WIC-3		
EXP. WALL			32			10			5			27			13			45			6			12			10			9			16		
CLG. HT.			10			9			9			9			9			9			9			9			9			9			10		
	FACTORS																																		
GRS.WALL AREA	LOSS	GAIN	320			90			45			243			117			405			54			108			90			81			160		
GLAZING			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	7	152	112	7	152	112	0	0	0
EAST	21.8	41.6	0	0	0	0	0	0	0	0	0	0	0	0	47	1024	1953	64	1394	2659	0	0	0	0	0	0	0	0	0	0	0	20	436	831
SOUTH	21.8	24.9	0	0	0	15	327	373	0	0	0	0	0	0	0	0	0	0	0	0	7	152	174	16	349	398	0	0	0	0	0	0	0	0	0
WEST	21.8	41.6	36	784	1496	0	0	0	0	0	0	26	566	1080	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	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	0	0	0	0	0	0	0	0	0
NET EXPOSED WALL	4.2	0.7	284	1194	196	75	315	52	45	189	31	217	913	150	70	294	48	341	1434	236	47	198	33	92	387	64	83	349	57	74	311	51	140	589	97
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	0	0	0	0	0	0	0	0	0
EXPOSED CLG	1.3	0.6	289	380	170	124	163	73	68	89	40	332	436	195	187	246	110	255	335	150	83	109	49	212	279	125	0	0	0	90	118	53	63	83	37
NO ATTIC EXPOSED CLG	2.8	1.3	0	0	0	0	0	0	0	0	0	0	0	0	30	84	38	40	112	50	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	187	488	80	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			0			0			0			0			0		
SLAB ON GRADE HEAT LOSS			0			0			0			0			0			0			0			0			0			0			0		
SUBTOTAL HT LOSS			2358			805			279			1915			2136			3276			459			1014			502			739			1272		
SUB TOTAL HT GAIN					1862			498			71			1426			2229			3095			256			587			169			242			992
LEVEL FACTOR / MULTIPLIER			0.20	0.19		0.20	0.19		0.20	0.19		0.20	0.19		0.20	0.19		0.20	0.19		0.20	0.19		0.20	0.19		0.20	0.19		0.20	0.19		0.30	0.27	
AIR CHANGE HEAT LOSS				437			149			52			355			396			607			85			188			93			137			338		
AIR CHANGE HEAT GAIN					79			21			3			61			95			132			11			25			7			10			42
DUCT LOSS				0			0			0			0			253			0			0			0			0			88			161	
DUCT GAIN					0			0			0			0			322			0			0			0			0			25			103
HEAT GAIN PEOPLE	240		2		480	0		0	0		0	1		240	1		240	1		240	0		0	1		240	0		0	0		0	0		0
HEAT GAIN APPLIANCES/LIGHTS					655			0			0			655			655			655			0			655			0			0			0
TOTAL HT LOSS BTU/H				2796			954			330			2270			2786			3883			544			1202			595			963			1770		
TOTAL HT GAIN x 1.3 BTU/H					3999			675			96			3095			4603			5358			346			1958			229			360			1479

ROOM USE			LIV			DIN			KT/GT				LAUN			W/R			FOY			MUD									BAS		
EXP. WALL			25			25			92				0			6			23			16									166		
CLG. HT.			10			10			10				8			10			10			11									9		
	FACTORS																																	
GRS.WALL AREA	LOSS	GAIN	250			250			920				0			60			230			176									996		
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	0	0	0	0	0	0							4	87	64
EAST	21.8	41.6	40	871	1662	0	0	0	0	0	0		0	0	0	0	0	0	25	545	1039	0	0	0							0	0	0
SOUTH	21.8	24.9	0	0	0	28	610	697	16	349	398		0	0	0	9	196	224	0	0	0	0	0	0							8	174	199
WEST	21.8	41.6	0	0	0	0	0	0	127	2767	5277		0	0	0	0	0	0	0	0	0	0	0	0							8	174	332
SKYLT.	35.8	101.2	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0	0	0	0							0	0	0
DOORS	25.8	4.3	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0	20	517	85	20	517	85							20	517	85
NET EXPOSED WALL	4.2	0.7	210	883	145	222	934	154	777	3268	538		0	0	0	51	214	35	185	778	128	156	656	108							0	0	0
NET EXPOSED BSMT WALL ABOVE GR	3.7	0.6	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0	0	0	0							498	1834	302
EXPOSED CLG	1.3	0.6	0	0	0	0	0	0	0	0	0		106	139	62	0	0	0	0	0	0	0	0	0							0	0	0
NO ATTIC EXPOSED CLG	2.8	1.3	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0	0	0	0							0	0	0
EXPOSED FLOOR	2.6	0.4	0	0	0	0	0	0	0	0	0		38	99	16	0	0	0	0	0	0	0	0	0							0	0	0
BASEMENT/CRAWL HEAT LOSS			0			0			0				0			0			0			0									5591		
SLAB ON GRADE HEAT LOSS			0			0			0				0			0			0			0											
SUBTOTAL HT LOSS			1754			1544			6383				239			411			1840			1173									8378		
SUB TOTAL HT GAIN					1807			851			6213				79			259			1252			193									982
LEVEL FACTOR / MULTIPLIER			0.30	0.27		0.30	0.27		0.30	0.27			0.20	0.19		0.30	0.27		0.30	0.27		0.30	0.27								0.50	0.76	
AIR CHANGE HEAT LOSS				466			410			1694				44			109			488			311									6359		
AIR CHANGE HEAT GAIN					77			36			265				3			11			53			8											42
DUCT LOSS				0			0			0				28			0			0			0											
DUCT GAIN					0			0			0				74			0			0			0									0		
HEAT GAIN PEOPLE	240		0		0	0		0	0		0		0		0	0		0	0		0	0		0											0
HEAT GAIN APPLIANCES/LIGHTS					655			655			655				655			0			0			0							0				0
TOTAL HT LOSS BTU/H				2220			1953			8077				311			519			2328			1484									14737		
TOTAL HT GAIN x 1.3 BTU/H					3301			2004			9272				1053			352			1697			262											2182

TOTAL HEAT GAIN BTU/H: 42653 | TONS: 3.55 | LOSS DUE TO VENTILATION LOAD BTU/H: 2004 | STRUCTURAL HEAT LOSS: 49723 | TOTAL COMBINED HEAT LOSS BTU/H: 51727

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

HVAC DESIGNS LTD.

375 Finley Ave. Suite 202 Ajax, ON L1S 2E2
Tel: 905.619.2300 Fax: 905.619.2375
Web: www.hvacdesigns.ca E-mail: info@hvacdesigns.ca

SITE NAME: CENTREFIELD (WEST GORMLEY) — OPT. GROUND - 5 BED 4 BATH
BUILDER: ROYAL PINE HOMES — TYPE: 4504 — DATE: Jun-21 — GFA: 3223 — LO# 91148

HEATING CFM	1370	COOLING CFM	1370
TOTAL HEAT LOSS	49,723	TOTAL HEAT GAIN	42,323
AIR FLOW RATE CFM	27.55	AIR FLOW RATE CFM	32.37

furnace pressure	0.6
furnace filter	0.05
a/c coil pressure	0.2
available pressure for s/a & r/a	0.35
plenum pressure s/a	0.18
max s/a dif press. loss	0.02
min adjusted pressure s/a	0.16
r/a pressure	0.17
r/a grille press. Loss	0.02
adjusted pressure r/a	0.15

**CARRIER
59TN6A-060-14V 60

FAN SPEED	
LOW	820
MEDLOW	0
MEDIUM	0
MEDIUM HIGH	1370
HIGH	1520

AFUE = 97 %
INPUT (BTU/H) = 60,000
OUTPUT (BTU/H) = **58,000**
DESIGN CFM = **1370**
CFM @ .6 " E.S.P.
TEMPERATURE RISE 39 °F

RUN COUNT	4th	3rd	2nd	1st	Bas
S/A	0	0	16	10	5
R/A	0	0	5	3	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	WIC	MBR	MBR	BED-3	BED-4	BED-5	ENS-4/5	ENS 3	BED-4	BED-2	BED-2	LIV	LIV	KT/GT	KT/GT	KT/GT	LAUN	W/R	FOY	MUD	BAS	BAS	BAS	BAS
RM LOSS MBH.	0.33	1.40	1.40	1.39	1.94	1.20	0.54	0.48	1.94	1.14	1.14	1.11	1.11	2.02	2.02	2.02	0.31	0.52	2.33	1.48	2.95	2.95	2.95	2.95
CFM PER RUN HEAT	9	39	39	38	53	33	15	13	53	31	31	31	31	56	56	56	9	14	64	41	81	81	81	81
RM GAIN MBH.	0.10	2.00	2.00	2.30	2.68	1.96	0.35	0.18	2.68	1.55	1.55	1.65	1.65	2.32	2.32	2.32	1.05	0.35	1.70	0.26	0.44	0.44	0.44	0.44
CFM PER RUN COOLING	3	65	65	74	87	63	11	6	87	50	50	53	53	75	75	75	34	11	55	8	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	0.17	0.17	0.16	0.16	0.16	0.16
ACTUAL DUCT LGH.	47	69	67	54	81	76	66	72	76	70	66	71	65	43	30	38	55	59	59	51	30	16	27	48
EQUIVALENT LENGTH	140	150	160	120	160	170	170	140	150	140	170	170	170	130	120	140	130	120	160	190	90	120	120	110
TOTAL EFFECTIVE LENGTH	187	219	227	174	241	246	236	212	226	210	236	241	235	173	150	178	185	179	219	241	120	136	147	158
ADJUSTED PRESSURE	0.09	0.08	0.08	0.1	0.07	0.07	0.07	0.08	0.07	0.08	0.07	0.07	0.07	0.1	0.11	0.1	0.09	0.1	0.08	0.07	0.14	0.12	0.11	0.1
ROUND DUCT SIZE	4	5	5	5	**6**	**6**	4	4	**6**	5	5	5	5	5	5	5	4	4	5	5	**6**	**6**	**6**	**6**
HEATING VELOCITY (ft/min)	103	286	286	279	270	168	172	149	270	228	228	228	228	411	411	411	103	161	470	301	413	413	413	413
COOLING VELOCITY (ft/min)	34	477	477	543	444	321	126	69	444	367	367	389	389	551	551	551	390	126	404	59	71	71	71	71
OUTLET GRILL SIZE	3X10	3X10	3X10	3X10	4X10	4X10	3X10	3X10	4X10	3X10	3X10	3X10	3X10	3X10	3X10	3X10	3X10	3X10	3X10	3X10	4X10	4X10	4X10	4X10
TRUNK	D	E	E	C	A	B	B	C	A	E	D	A	A	D	D	D	C	B	A	C	E	E	C	B

RUN #	25	26	27	28	29	30	31
ROOM NAME	BAS	DIN	KT/GT	ENS	BED-3	ENS-2	ENS 3
RM LOSS MBH.	2.95	1.95	2.02	0.95	1.39	0.59	0.48
CFM PER RUN HEAT	81	54	56	26	38	16	13
RM GAIN MBH.	0.44	2.00	2.32	0.68	2.30	0.23	0.18
CFM PER RUN COOLING	14	65	75	22	74	7	6
ADJUSTED PRESSURE	0.16	0.17	0.17	0.17	0.17	0.17	0.17
ACTUAL DUCT LGH.	57	49	44	43	40	60	40
EQUIVALENT LENGTH	150	140	150	180	180	150	170
TOTAL EFFECTIVE LENGTH	207	189	194	223	220	210	210
ADJUSTED PRESSURE	0.08	0.09	0.09	0.08	0.08	0.08	0.08
ROUND DUCT SIZE	**6**	**6**	5	4	5	4	4
HEATING VELOCITY (ft/min)	413	275	411	298	279	184	149
COOLING VELOCITY (ft/min)	71	331	551	252	543	80	69
OUTLET GRILL SIZE	4X10	4X10	3X10	3X10	3X10	3X10	3X10
TRUNK	A	B	D	C	C	C	F

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	313	0.07	9.4	10	x	8	563	TRUNK G	0	0.00	0	0	x	8	0
TRUNK B	510	0.07	11.3	14	x	8	656	TRUNK H	0	0.00	0	0	x	8	0
TRUNK C	772	0.07	13.2	20	x	8	695	TRUNK I	0	0.00	0	0	x	8	0
TRUNK D	264	0.07	8.8	10	x	8	475	TRUNK J	0	0.00	0	0	x	8	0
TRUNK E	535	0.07	11.5	16	x	8	602	TRUNK K	0	0.00	0	0	x	8	0
TRUNK F	1370	0.07	16.3	26	x	10	759	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	245	0.05	9.3	10	x	8	441
TRUNK X	1370	0.05	17.7	30	x	10	658
TRUNK Y	1025	0.05	15.9	22	x	10	671
TRUNK Z	490	0.05	12.1	18	x	8	490
DROP	1370	0.05	17.7	24	x	12	685

RETURN AIR #	1	2	3	4	5	6	7	8								BR
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
AIR VOLUME	115	115	115	115	130	130	305	140	0	0	0	0	0	0	0	205
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.	95	65	98	88	60	67	47	18	1	1	1	1	1	1	1	19
EQUIVALENT LENGTH	195	245	215	235	205	190	245	145	0	0	0	0	0	0	0	155
TOTAL EFFECTIVE LH	290	310	313	323	265	257	292	163	1	1	1	1	1	1	1	174
ADJUSTED PRESSURE	0.05	0.05	0.05	0.05	0.06	0.06	0.05	0.09	14.80	14.80	14.80	14.80	14.80	14.80	14.80	0.09
ROUND DUCT SIZE	7	7	7	7	7	7	10.1	6.5	0	0	0	0	0	0	0	7.5
INLET GRILL SIZE	8	8	8	8	8	8	8	8	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	14	30	14	0	0	0	0	0	0	0	14

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

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TYPE: 4504 LO # 91148
SITE NAME: CENTREFIELD (WEST GORMLEY) OPT. GROUND - 5 BED 4 BATH

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	2	@ 21.2 cfm	42.4	cfm
Other Bedrooms	4	@ 10.6 cfm	42.4	cfm
Kitchen & Bathrooms	6	@ 10.6 cfm	63.6	cfm
Other Rooms	5	@ 10.6 cfm	53.0	cfm
Table 9.32.3.A.		TOTAL	201.4	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	95.4	cfm

SUPPLEMENTAL VENTILATION CAPACITY 9.32.3.5.

Total Ventilation Capacity	201.4	cfm
Less Principal Ventil. Capacity	95.4	cfm
Required Supplemental Capacity	106.0	cfm

PRINCIPAL EXHAUST FAN CAPACITY

Model: VANEE 65H Location: BSMT

95.4 cfm [✓] HVI Approved

PRINCIPAL EXHAUST HEAT LOSS CALCULATION

CFM		ΔT °F		FACTOR		% LOSS
95.4 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
ENS-4/5	BY INSTALLING CONTRACTOR	50	✓	3.5
ENS 3	BY INSTALLING CONTRACTOR	50	✓	3.5
W/R	BY INSTALLING CONTRACTOR	50	✓	3.5

HEAT RECOVERY VENTILATOR 9.32.3.11.

Model: VANEE 65H

155 cfm high 64 cfm low

75 % 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: Michael O'Rourke
HRAI # 001820
Date: June-21

I REVIEW AND TAKE RESPONIBILITY 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

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CSA F280-12 Residential Heat Loss and Heat Gain Calculations

Formula Sheet (For Air Leakage / Ventiliation Calculation)

LO#: 91148 Model: 4504 Builder: ROYAL PINE HOMES Date: 6/7/2021

Volume Calculation

House Volume

Level	Floor Area (ft²)	Floor Height (ft)	Volume (ft³)
Bsmt	1453	9	13077
First	1453	10	14530
Second	1770	8	14160
Third	0	9	0
Fourth	0	9	0
		Total:	41,767.0 ft³
		Total:	1182.7 m³

Air Change & Delta T Data

WINTER NATURAL AIR CHANGE RATE	0.219
SUMMER NATURAL AIR CHANGE RATE	0.068

Design Temperature Difference

	Tin °C	Tout °C	ΔT °C	ΔT °F
Winter DTDh	22	-21	43	78
Summer DTDc	24	31	7	13

5.2.3.1 Heat Loss due to Air Leakage

$$HL_{airb} = LR_{airh} \times \frac{V_b}{3.6} \times DTD_h \times 1.2$$

0.219 x 328.53 x 43 °C x 1.2 = 3727 W

= **12718 Btu/h**

6.2.6 Sensible Gain due to Air Leakage

$$HG_{salb} = LR_{airc} \times \frac{V_b}{3.6} \times DTD_c \times 1.2$$

= 0.068 x 328.53 x 7 °C x 1.2 = 191 W

= **652 Btu/h**

5.2.3.2 Heat Loss due to Mechanical Ventilation

$$HL_{vairb} = PVC \times DTD_h \times 1.08 \times (1 - E)$$

95 CFM x 78 °F x 1.08 x 0.25 = **2004 Btu/h**

6.2.7 Sensible heat Gain due to Ventilation

$$HL_{vairb} = PVC \times DTD_h \times 1.08 \times (1 - E)$$

95 CFM x 13 °F x 1.08 x 0.25 = **330 Btu/h**

5.2.3.3 Calculation of Air Change Heat Loss for Each Room (Floor Multiplier Section)

$$HL_{airr} = Level\ Factor \times HL_{airbv} \times \{(HL_{agcr} + HL_{bgcr}) \div (HL_{agclevel} + HL_{bgclevel})\}$$

Level	Level Factor (LF)	HLairve Air Leakage + Ventilation Heat Loss (Btu/h)	Level Conductive Heat Loss: (HL_{clevel})	Air Leakage Heat Loss Multiplier (LF x HLairbv / HLlevel)
1	0.5	12,718	8,378	0.759
2	0.3		14,376	0.265
3	0.2		13,721	0.185
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

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HEAT LOSS AND GAIN SUMMARY SHEET

MODEL: 4504 OPT. GROUND - 5 BED 4 BATH **BUILDER:** ROYAL PINE HOMES
SFQT: 3223 **LO#** 91148 **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):	41767.0	ASSUMED (Y/N):	Y
INTERNAL SHADING:	BLINDS/CURTAINS	ASSUMED OCCUPANTS:	6
INTERIOR LIGHTING LOAD ($Btu/h/ft^2$):	1.40	DC BRUSHLESS MOTOR (Y/N):	Y
FOUNDATION CONFIGURATION	BCIN_1	DEPTH BELOW GRADE:	6.0 ft
LENGTH: 46.0 ft	WIDTH: 37.0 ft	EXPOSED PERIMETER:	166.0 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

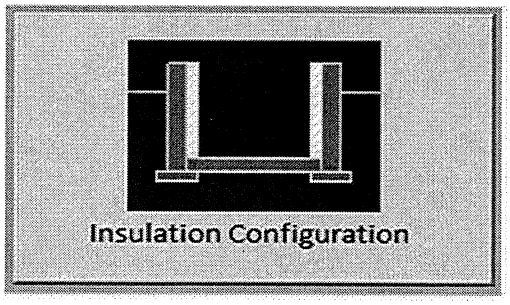
Michael O'Rourke

HVAC Designs Ltd.
375 Finley Ave, Suite 202
Ajax ON, L1S 2E2
905-619-2300

Residential Foundation Thermal Load Calculator

Supplemental tool for CAN/CSA-F280

Weather Station Description	
Province:	Ontario
Region:	Richmond Hill
Site Description	
Soil Conductivity:	Normal conductivity: dry sand, loam, clay
Water Table:	Normal (7-10 m, 23-33 ft)

Foundation Dimensions		
Floor Length (m):	**14.0**	 Insulation Configuration
Floor Width (m):	**11.3**	
Exposed Perimeter (m):	**0.0**	
Wall Height (m):	**2.7**	
Depth Below Grade (m):	**1.83**	
Window Area (m^2):	**1.9**	
Door Area (m^2):	**1.9**	
Radiant Slab		
Heated Fraction of the Slab:	**0**	
Fluid Temperature (°C):	**33**	
Design Months		
Heating Month	**1**	
Foundation Loads		
Heating Load (Watts):	**1638**	

TYPE: 4504
LO# 91148

OPT. GROUND - 5 BED 4 BATH

HVAC Designs Ltd.
375 Finley Ave, Suite 202
Ajax ON, L1S 2E2
905-619-2300

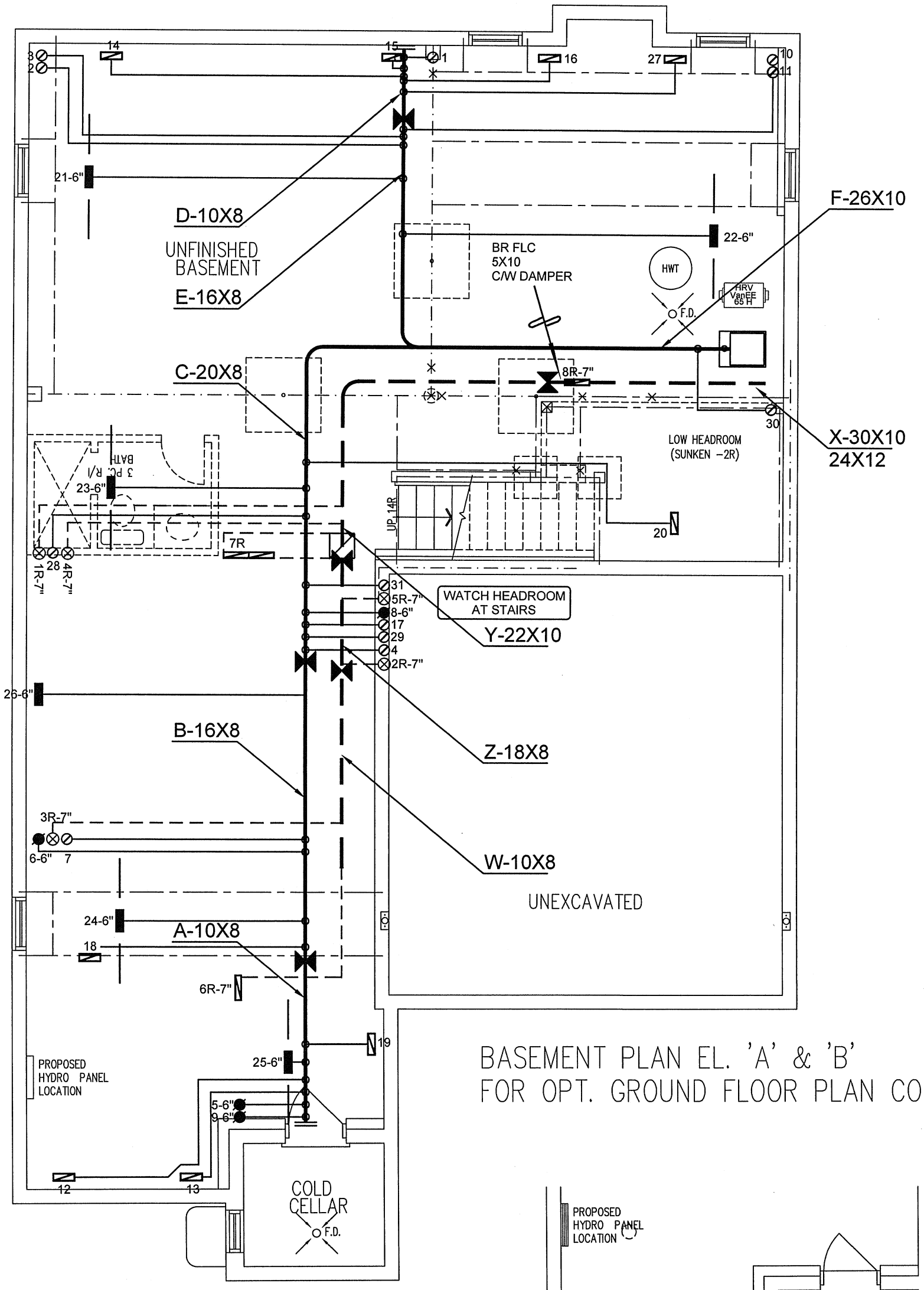
Air Infiltration Residential Load Calculator

Supplemental tool for CAN/CSA-F280

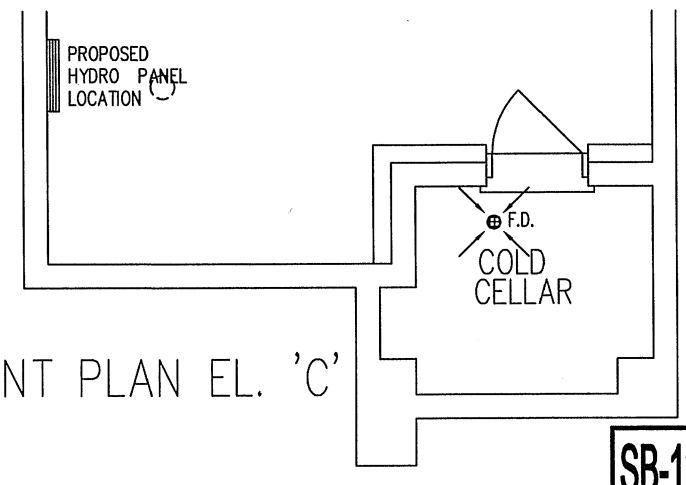
Weather Station Description		
Province:	Ontario	
Region:	Richmond Hill	
Weather Station Location:	Open flat terrain, grass	
Anemometer height (m):	10	
Local Shielding		
Building Site:	Suburban, forest	
Walls:	Heavy	
Flue:	Heavy	
Highest Ceiling Height (m):	6.40	
Building Configuration		
Type:	Detached	
Number of Stories:	Two	
Foundation:	Full	
House Volume (m^3):	1182.7	
Air Leakage/Ventilation		
Air Tightness Type:	Energy Star Detached (2.5 ACH)	
Custom BDT Data:	ELA @ 10 Pa.	1104.1 cm^2
	2.50	ACH @ 50 Pa
Mechanical Ventilation (L/s):	Total Supply	Total Exhaust
	45.0	45.0
Flue Size		
Flue #:	#1 #2 #3 #4	
Diameter (mm):	0 0 0 0	
Natural Infiltration Rates		
Heating Air Leakage Rate (ACH/H):	**0.219**	
Cooling Air Leakage Rate (ACH/H):	**0.068**	

TYPE: 4504
LO# 91148

OPT. GROUND - 5 BED 4 BATH



BASEMENT PLAN EL. 'A' & 'B'
FOR OPT. GROUND FLOOR PLAN COND.



BASEMENT PLAN EL. '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, BCIN# 19669
HVAC DESIGNS LTD.

HVAC LEGEND

SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION
	SUPPLY AIR GRILLE		6" SUPPLY AIR BOOT ABOVE		14"x8" RETURN AIR GRILLE		RETURN AIR STACK ABOVE
	SUPPLY AIR GRILLE 6" BOOT		SUPPLY AIR STACK FROM 2nd FLOOR		30"x8" RETURN AIR GRILLE		RETURN AIR STACK 2nd FLOOR
	SUPPLY AIR BOOT ABOVE		6" SUPPLY AIR STACK 2nd FLOOR		FRA- FLOOR RETURN AIR GRILLE		REDUCER

No.	Description	Date
3.		
2.		
1.		

REVISIONS

Client
ROYAL PINE HOMES

Project Name
CENTREFIELD (WEST GORMLEY)
RICHMOND HILL, ONTARIO
OPT. GROUND -
5 BED 4 BATH
4504 3223 sqft

HVAC DESIGNS LTD.
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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.

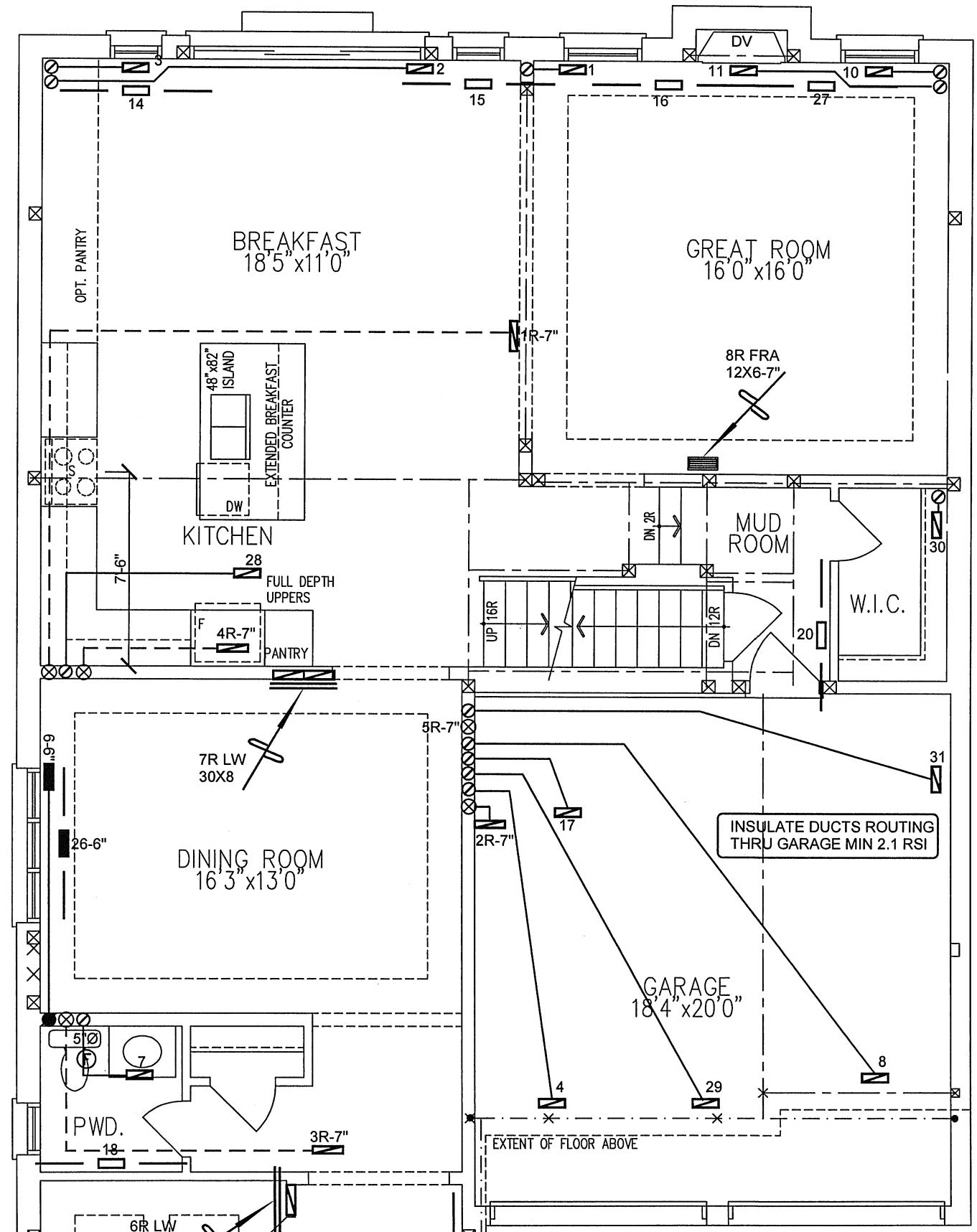
HEAT LOSS 51727 BTU/H	
UNIT DATA	
MAKE	CARRIER
MODEL	59TN6A-060-14V
INPUT	60 MBTU/H
OUTPUT	58 MBTU/H
COOLING	3.5 TONS
FAN SPEED	1370 cfm @ 0.6" w.c.

# OF RUNS	S/A	R/A	FANS
3RD FLOOR			
2ND FLOOR	16	5	5
1ST FLOOR	10	3	2
BASEMENT	5	1	0

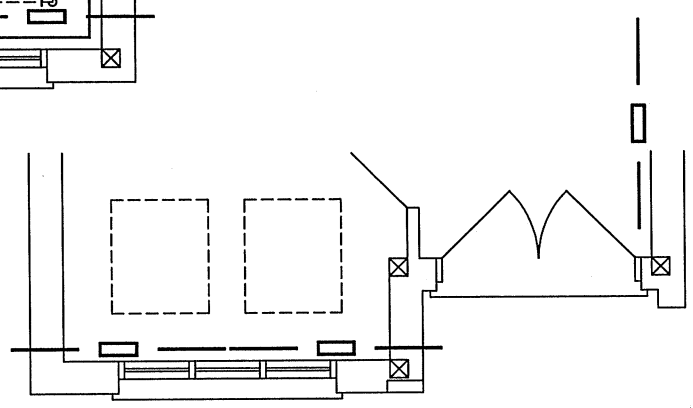
ALL S/A DIFFUSERS 4 "x10" UNLESS NOTED OTHERWISE ON LAYOUT. ALL S/A RUNS 5"Ø UNLESS NOTED OTHERWISE ON LAYOUT. UNDERCUT DOORS 1" min. FOR R/A

Sheet Title
BASEMENT HEATING LAYOUT

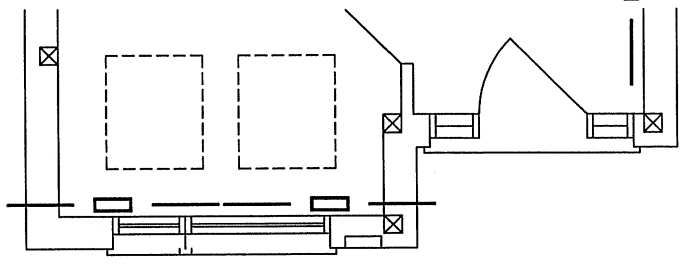
Date JUNE/2021
Scale 3/16" = 1'-0"
BCIN# 19669
LO# 91148



GROUND FLOOR PLAN EL. 'A'



GROUND FLOOR PLAN EL. 'B'



GROUND FLOOR PLAN EL. '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, BCIN# 19669
HVAC DESIGNS LTD.

CSA-F280-12

SB-12 PERFORMANCE

HVAC LEGEND

SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION
— ▭ —	SUPPLY AIR GRILLE	▬	6" SUPPLY AIR BOOT ABOVE	▭	14"x8" RETURN AIR GRILLE	▭	RETURN AIR STACK ABOVE
— ▬ —	SUPPLY AIR GRILLE 6" BOOT	⊘	SUPPLY AIR STACK FROM 2nd FLOOR	▭	30"x8" RETURN AIR GRILLE	▭	RETURN AIR STACK 2nd FLOOR
▭	SUPPLY AIR BOOT ABOVE	●	6" SUPPLY AIR STACK 2nd FLOOR	▬	FRA- FLOOR RETURN AIR GRILLE	⧗	REDUCER

No.	Description	Date
3.		
2.		
1.		

REVISIONS

Client
ROYAL PINE HOMES

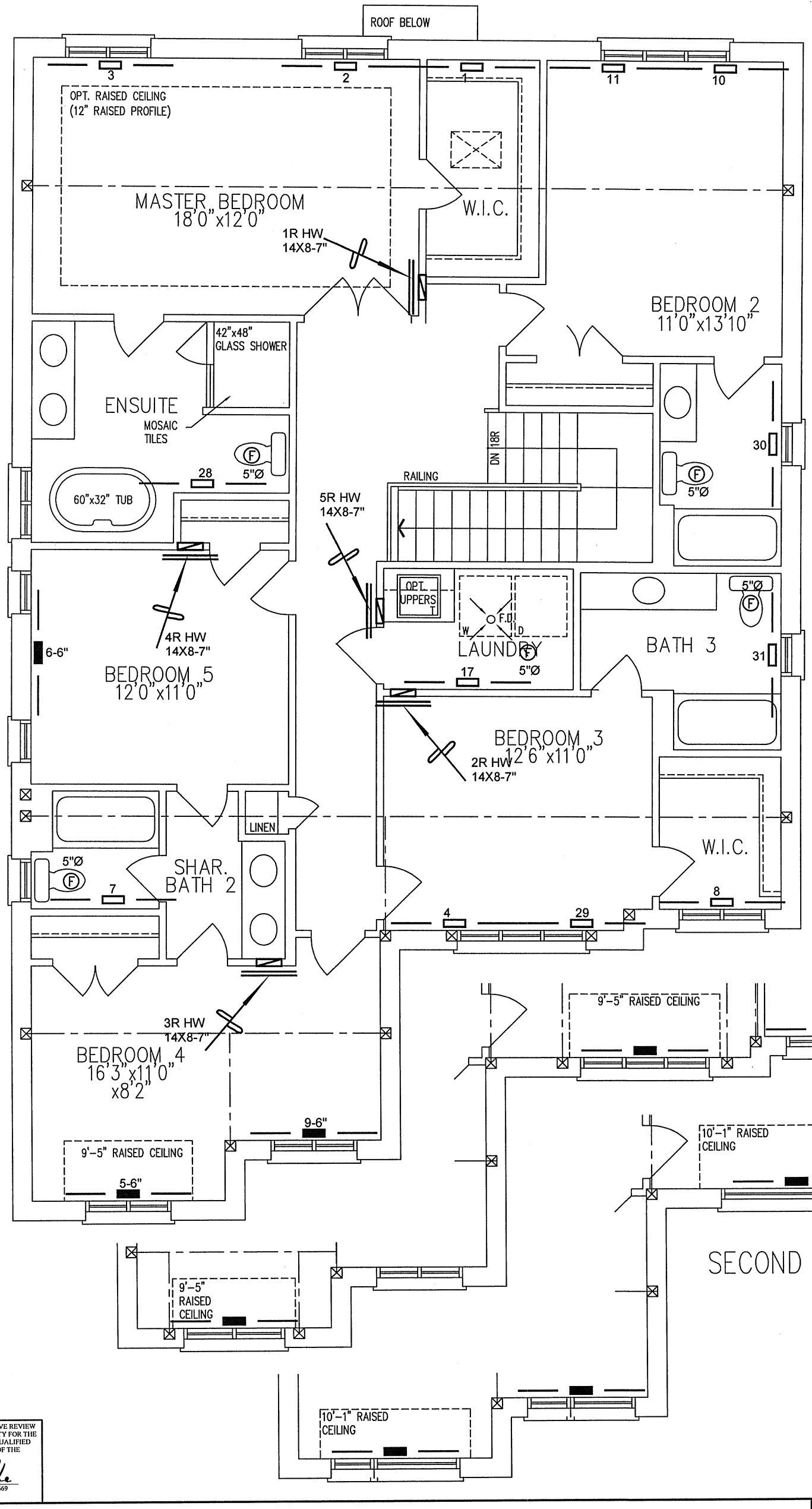
Project Name
CENTREFIELD (WEST GORMLEY)
RICHMOND HILL, ONTARIO
OPT. GROUND -
5 BED 4 BATH
4504 3223 sqft

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.

Sheet Title
FIRST FLOOR HEATING LAYOUT

Date JUNE/2021
Scale 3/16" = 1'-0"
BCIN# 19669
LO# 91148



SECOND FLOOR PLAN EL. 'B'

OPT. SECOND FLOOR PLAN 'A'
5 BEDROOM (4 BATHS)

SECOND FLOOR PLAN EL. '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, BCIN# 19669
HVAC DESIGNS LTD.

CSA-F280-12

SB-12 PERFORMANCE

HVAC LEGEND

SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION
— ▭ —	SUPPLY AIR GRILLE	▬	6" SUPPLY AIR BOOT ABOVE	▱	14"x8" RETURN AIR GRILLE	▱	RETURN AIR STACK ABOVE
— ▬ —	SUPPLY AIR GRILLE 6" BOOT	⊘	SUPPLY AIR STACK FROM 2nd FLOOR	▱▱	30"x8" RETURN AIR GRILLE	⊠	RETURN AIR STACK 2nd FLOOR
▱	SUPPLY AIR BOOT ABOVE	●	6" SUPPLY AIR STACK 2nd FLOOR	▬	FRA- FLOOR RETURN AIR GRILLE	⧗	REDUCER

No.	Description	Date
3.		
2.		
1.		

REVISIONS

Client
ROYAL PINE HOMES

Project Name
CENTREFIELD (WEST GORMLEY)
RICHMOND HILL, ONTARIO
OPT. GROUND -
5 BED 4 BATH
4504 3223 sqft

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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
SECOND FLOOR HEATING LAYOUT

Date JUNE/2021
Scale 3/16" = 1'-0"
BCIN# 19669
LO# 91148

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	**Postal code**	**Plan number/ other description**		
RICHMOND HILL				

B. Individual who reviews and takes responsibility for design activities

Name		Firm		
MICHAEL O'ROURKE		**HVAC DESIGNS LTD.**		
Street address			**Unit no.**	**Lot/con.**
375 FINLEY AVE			**202**	**N/A**
Municipality	**Postal code**	**Province**	**E-mail**	
AJAX	**L1S 2E2**	**ONTARIO**	**info@hvacdesigns.ca**	
Telephone number	**Fax number**		**Cell number**	
(905) 619-2300	**(905) 619-2375**		( )	

C. Design activities undertaken by individual identified in Section B. [Building Code Table 3.5.2.1 OF Division C]

☐ House	☒ HVAC – House	☐ Building Structural
☐ Small Buildings	☐ Building Services	☐ Plumbing – House
☐ Large Buildings	☐ Detection, Lighting and Power	☐ Plumbing – All Buildings
☐ Complex Buildings	☐ Fire Protection	☐ On-site Sewage Systems

Description of designer's work	
HEAT LOSS / GAIN CALCULATIONS **DUCT SIZING** **RESIDENTIAL MECHANICAL VENTILATION DESIGN SUMMARY** **RESIDENTIAL SYSTEM DESIGN per CSA-F280-12**	**Model:** 4504 OPT. GROUND & OPT 2ND **Project:** CENTREFIELD (WEST GORMLEY)

D. Declaration of Designer

I **MICHAEL O'ROURKE** 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 Di vision C, of the Building Code.

Individual BCIN: 19669
Basis for exemption from registration and qualification: O.B.C SENTENCE 3.2.4.1 (4)

☐ The design work is exempt from the registration and qualification requirements of the Building Code.
Basis for exemption from registration and qualification: _____

I certify that:

1. The information contained in this schedule is true to the best of my knowledge.
2. I have submitted this application with the knowledge and consent of the firm.

June 7, 2021
Date

Michael O'Rourke
Signature of Designer

NOTE:

1. 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.
2. 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.

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Web: www.hvacdesigns.ca E-mail: info@hvacdesigns.ca

SITE NAME: CENTREFIELD (WEST GORMLEY) | OPT. GROUND & OPT 2ND | DATE: Jun-21 | WINTER NATURAL AIR CHANGE RATE 0.219 | HEAT LOSS ΔT °F. 78 | CSA-F280-12

BUILDER: ROYAL PINE HOMES | TYPE: 4504 | GFA: 3223 | LO# 90464 | SUMMER NATURAL AIR CHANGE RATE 0.068 | HEAT GAIN ΔT °F. 13 | SB-12 PERFORMANCE

ROOM USE			MBR			ENS			WIC			BED-2			BED-3			BED-4			ENS-4/5			BED-5				ENS 3				
EXP. WALL			32			10			5			37			13			45			6			12				23				
CLG. HT.			10			9			9			9			9			9			9			9				9				
	FACTORS																															
GRS.WALL AREA	LOSS	GAIN	320			90			45			333			117			405			54			108				207				
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	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	0	0	0	0	0	0	0	0	0	0	0	47	1024	1953	64	1394	2659	0	0	0	0	0	0		20	436	831		
SOUTH	21.8	24.9	0	0	0	15	327	373	0	0	0	0	0	0	0	0	0	0	0	7	152	174	16	349	398		0	0	0		
WEST	21.8	41.6	36	784	1496	0	0	0	0	0	0	26	566	1080	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		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	0	0		
NET EXPOSED WALL	4.2	0.7	284	1194	196	75	315	52	45	189	31	307	1291	212	70	294	48	341	1434	236	47	198	33	92	387	64		187	786	129		
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	0	0		
EXPOSED CLG	1.3	0.6	289	380	170	124	163	73	68	89	40	332	436	195	187	246	110	255	335	150	83	109	49	212	279	125		112	147	66		
NO ATTIC EXPOSED CLG	2.8	1.3	0	0	0	0	0	0	0	0	0	0	0	0	30	84	38	40	112	50	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	187	488	80	0	0	0	0	0	0	0	0	0		112	292	48		
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				2358			805			279			2294			2136			3276			459			1014				1662			
SUB TOTAL HT GAIN					1862			498			71			1488			2229			3095			256			587				1074		
LEVEL FACTOR / MULTIPLIER			0.20	0.18		0.20	0.18		0.20	0.18		0.20	0.18		0.20	0.18		0.20	0.18		0.20	0.18		0.20	0.18			0.20	0.18			
AIR CHANGE HEAT LOSS				413			141			49			402			374			574			80			178				291			
AIR CHANGE HEAT GAIN					80			21			3			64			96			133			11			25				46		
DUCT LOSS				0			0			0			0			251			0			0			0				195			
DUCT GAIN					0			0			0			0			322			0			0			0				112		
HEAT GAIN PEOPLE	240		2		480	0		0	0		0	1		240	1		240	1		240	0		0	1		240		0		0		
HEAT GAIN APPLIANCES/LIGHTS					655			0			0			655			655			655			0			655				0		
TOTAL HT LOSS BTU/H				2771			946			327			2696			2762			3849			540			1192				2148			
TOTAL HT GAIN x 1.3 BTU/H					4000			676			96			3181			4605			5360			347			1959				1603		

ROOM USE			LIV			DIN			KT/GT				LAUN			W/R			FOY			MUD					BAS				
EXP. WALL			25			25			92				0			6			23			16					166				
CLG. HT.			10			10			10				8			10			10			11					9				
	FACTORS																															
GRS.WALL AREA	LOSS	GAIN	250			250			920				0			60			230			176					996				
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	0	0	0	0	0	0								
EAST	21.8	41.6	40	871	1662	0	0	0	0	0	0		0	0	0	0	0	0	25	545	1039	0	0	0			4	87	64			
SOUTH	21.8	24.9	0	0	0	28	610	697	16	349	398		0	0	0	9	196	224	0	0	0	0	0	0			0	0	0			
WEST	21.8	41.6	0	0	0	0	0	0	127	2767	5277		0	0	0	0	0	0	0	0	0	0	0	0			8	174	199			
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			8	174	332			
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	210	883	145	222	934	154	777	3268	538		0	0	0	51	214	35	185	778	128	156	656	108			20	517	85			
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	0	0	0	0	0	0	0	0	0		106	139	62	0	0	0	0	0	0	0	0	0			498	1834	302			
NO ATTIC EXPOSED CLG	2.8	1.3	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0	0	0	0			0	0	0			
EXPOSED FLOOR	2.6	0.4	0	0	0	0	0	0	0	0	0		38	99	16	0	0	0	0	0	0	0	0	0			0	0	0			
BASEMENT/CRAWL HEAT LOSS				0			0			0				0			0			0			0					5591			
SLAB ON GRADE HEAT LOSS				0			0			0				0			0			0			0								
SUBTOTAL HT LOSS				1754			1544			6383				239			411			1840			1173					8378			
SUB TOTAL HT GAIN					1807			851			6213				79			259			1252			193						982		
LEVEL FACTOR / MULTIPLIER			0.30	0.29		0.30	0.29		0.30	0.29			0.20	0.18		0.30	0.29		0.30	0.29		0.30	0.29				0.50	0.76			
AIR CHANGE HEAT LOSS				511			449			1858				42			120			536			342					6359			
AIR CHANGE HEAT GAIN					78			37			268				3			11			54			8						42		
DUCT LOSS				0			0			0				28			0			0			0					0			
DUCT GAIN					0			0			0				74			0			0			0						0		
HEAT GAIN PEOPLE	240		0		0	0		0	0		0		0		0	0		0	0		0	0		0				0				
HEAT GAIN APPLIANCES/LIGHTS					655			655			655				655			0			0			0				0				
TOTAL HT LOSS BTU/H				2265			1993			8241				308			530			2375			1515					14737			
TOTAL HT GAIN x 1.3 BTU/H					3302			2005			9276				1053			352			1697			262						2183		

TOTAL HEAT GAIN BTU/H: 42285 | TONS: 3.52 | LOSS DUE TO VENTILATION LOAD BTU/H: 2004 | STRUCTURAL HEAT LOSS: 49195 | TOTAL COMBINED HEAT LOSS BTU/H: 51199

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.

Michael O'Rourke

INDIVIDUAL BCIN: 19669 MICHAEL O'ROURKE

HVAC DESIGNS LTD.

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SITE NAME: CENTREFIELD (WEST GORMLEY) — OPT. GROUND & OPT 2ND
BUILDER: ROYAL PINE HOMES — TYPE: 4504 — DATE: Jun-21 — GFA: 3223 — LO# 90464

HEATING CFM	1370	COOLING CFM	1370
TOTAL HEAT LOSS	49,195	TOTAL HEAT GAIN	41,955
AIR FLOW RATE CFM	27.85	AIR FLOW RATE CFM	32.65

furnace pressure	0.6
furnace filter	0.05
a/c coil pressure	0.2
available pressure for s/a & r/a	0.35
plenum pressure s/a	0.18
max s/a dif press. loss	0.02
min adjusted pressure s/a	0.16
r/a pressure	0.17
r/a grille press. Loss	0.02
adjusted pressure r/a	0.15

**CARRIER
59TN6A-060-14V 60

FAN SPEED	
LOW	820
MEDLOW	0
MEDIUM	0
MEDIUM HIGH	1370
HIGH	1520

AFUE = 97 %
INPUT (BTU/H) = 60,000
OUTPUT (BTU/H) = **58,000**
DESIGN CFM = **1370** CFM @ .6 " E.S.P.
TEMPERATURE RISE 39 °F

RUN COUNT	4th	3rd	2nd	1st	Bas
S/A	0	0	14	10	5
R/A	0	0	5	3	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	WIC	MBR	MBR	BED-3	BED-4	BED-5	ENS-4/5	ENS 3	BED-4	BED-2	BED-2	LIV	LIV	KT/GT	KT/GT	KT/GT	LAUN	W/R	FOY	MUD	BAS	BAS	BAS	BAS
RM LOSS MBH.	0.33	1.39	1.39	1.38	1.92	1.19	0.54	2.15	1.92	1.35	1.35	1.13	1.13	2.06	2.06	2.06	0.31	0.53	2.38	1.51	2.95	2.95	2.95	2.95
CFM PER RUN HEAT	9	39	39	38	54	33	15	60	54	38	38	32	32	57	57	57	9	15	66	42	82	82	82	82
RM GAIN MBH.	0.10	2.00	2.00	2.30	2.68	1.96	0.35	1.60	2.68	1.59	1.59	1.65	1.65	2.32	2.32	2.32	1.05	0.35	1.70	0.26	0.44	0.44	0.44	0.44
CFM PER RUN COOLING	3	65	65	75	88	64	11	52	88	52	52	54	54	76	76	76	34	11	55	9	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	0.17	0.17	0.16	0.16	0.16	0.16
ACTUAL DUCT LGH.	47	69	67	54	81	76	66	72	76	70	66	71	65	43	30	38	55	59	59	51	30	16	27	48
EQUIVALENT LENGTH	140	150	160	120	160	170	170	140	150	140	170	170	170	130	120	140	130	120	160	190	90	120	120	110
TOTAL EFFECTIVE LENGTH	187	219	227	174	241	246	236	212	226	210	236	241	235	173	150	178	185	179	219	241	120	136	147	158
ADJUSTED PRESSURE	0.09	0.08	0.08	0.1	0.07	0.07	0.07	0.08	0.07	0.08	0.07	0.07	0.07	0.1	0.11	0.1	0.09	0.1	0.08	0.07	0.14	0.12	0.11	0.1
ROUND DUCT SIZE	4	5	5	5	**6**	**6**	4	5	**6**	5	5	5	5	5	5	5	4	4	5	5	**6**	**6**	**6**	**6**
HEATING VELOCITY (ft/min)	103	286	286	279	275	168	172	441	275	279	279	235	235	419	419	419	103	172	485	308	418	418	418	418
COOLING VELOCITY (ft/min)	34	477	477	551	449	326	126	382	449	382	382	396	396	558	558	558	390	126	404	66	71	71	71	71
OUTLET GRILL SIZE	3X10	3X10	3X10	3X10	4X10	4X10	3X10	3X10	4X10	3X10	3X10	3X10	3X10	3X10	3X10	3X10	3X10	3X10	3X10	3X10	4X10	4X10	4X10	4X10
TRUNK	D	E	E	C	A	B	B	C	A	E	D	A	A	D	D	D	C	B	A	C	E	E	C	B

RUN #	25	26	27	28	29
ROOM NAME	BAS	DIN	KT/GT	ENS	BED-3
RM LOSS MBH.	2.95	1.99	2.06	0.95	1.38
CFM PER RUN HEAT	82	56	57	26	38
RM GAIN MBH.	0.44	2.00	2.32	0.68	2.30
CFM PER RUN COOLING	14	65	76	22	75
ADJUSTED PRESSURE	0.16	0.17	0.17	0.17	0.17
ACTUAL DUCT LGH.	57	49	44	43	40
EQUIVALENT LENGTH	150	140	150	180	180
TOTAL EFFECTIVE LENGTH	207	189	194	223	220
ADJUSTED PRESSURE	0.08	0.09	0.09	0.08	0.08
ROUND DUCT SIZE	**6**	**6**	5	4	**6**
HEATING VELOCITY (ft/min)	418	286	419	298	194
COOLING VELOCITY (ft/min)	71	331	558	252	382
OUTLET GRILL SIZE	4X10	4X10	3X10	3X10	4X10
TRUNK	A	B	D	C	C

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	320	0.07	9.5	10	x	8	576	TRUNK G	0	0.00	0	0	x	8	0
TRUNK B	521	0.07	11.4	16	x	8	586	TRUNK H	0	0.00	0	0	x	8	0
TRUNK C	816	0.07	13.4	20	x	8	734	TRUNK I	0	0.00	0	0	x	8	0
TRUNK D	275	0.07	8.9	10	x	8	495	TRUNK J	0	0.00	0	0	x	8	0
TRUNK E	555	0.07	11.6	16	x	8	624	TRUNK K	0	0.00	0	0	x	8	0
TRUNK F	1370	0.07	16.3	26	x	10	759	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	245	0.05	9.3	10	x	8	441
TRUNK X	1370	0.05	17.7	30	x	10	658
TRUNK Y	1025	0.05	15.9	22	x	10	671
TRUNK Z	490	0.05	12.1	18	x	8	490
DROP	1370	0.05	17.7	24	x	12	685

RETURN AIR #	1	2	3	4	5	6	7	8									BR
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
AIR VOLUME	115	115	115	115	130	130	305	140	0	0	0	0	0	0	0	0	205
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
ACTUAL DUCT LGH.	95	65	98	88	60	67	47	18	1	1	1	1	1	1	1	1	19
EQUIVALENT LENGTH	195	245	215	235	205	190	245	145	0	0	0	0	0	0	0	0	155
TOTAL EFFECTIVE LH	290	310	313	323	265	257	292	163	1	1	1	1	1	1	1	1	174
ADJUSTED PRESSURE	0.05	0.05	0.05	0.05	0.06	0.06	0.05	0.09	14.80	14.80	14.80	14.80	14.80	14.80	14.80	14.80	0.09
ROUND DUCT SIZE	7	7	7	7	7	7	10.1	6.5	0	0	0	0	0	0	0	0	7.5
INLET GRILL SIZE	8	8	8	8	8	8	8	8	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	X
INLET GRILL SIZE	14	14	14	14	14	14	30	14	0	0	0	0	0	0	0	0	14

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

HVAC DESIGNS LTD.

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Tel: 905.619.2300 Fax: 905.619.2375
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TYPE: 4504 LO # 90464
SITE NAME: CENTREFIELD (WEST GORMLEY) OPT. GROUND & 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	2	@ 21.2 cfm	42.4	cfm
Other Bedrooms	4	@ 10.6 cfm	42.4	cfm
Kitchen & Bathrooms	5	@ 10.6 cfm	53	cfm
Other Rooms	5	@ 10.6 cfm	53.0	cfm
Table 9.32.3.A.		TOTAL	190.8	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	**95.4**	**cfm**

SUPPLEMENTAL VENTILATION CAPACITY 9.32.3.5.

Total Ventilation Capacity	190.8	cfm
Less Principal Ventil. Capacity	95.4	cfm
Required Supplemental Capacity	95.4	cfm

PRINCIPAL EXHAUST FAN CAPACITY

Model: VANEE 65H Location: BSMT

95.4 cfm [✓] HVI Approved

PRINCIPAL EXHAUST HEAT LOSS CALCULATION

CFM		ΔT °F		FACTOR		% LOSS
95.4 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
ENS-4/5	BY INSTALLING CONTRACTOR	50	✓	3.5
ENS 3	BY INSTALLING CONTRACTOR	50	✓	3.5
W/R	BY INSTALLING CONTRACTOR	50	✓	3.5

HEAT RECOVERY VENTILATOR 9.32.3.11.

Model: VANEE 65H

155 cfm high 64 cfm low

75 % 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: Michael O'Rourke
HRAI # 001820
Date: June-21

I REVIEW AND TAKE RESPONIBILITY 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

HVAC DESIGNS LTD.

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CSA F280-12 Residential Heat Loss and Heat Gain Calculations

Formula Sheet (For Air Leakage / Ventiliation Calculation)

LO#: 90464 Model: 4504 Builder: ROYAL PINE HOMES Date: 6/7/2021

Volume Calculation

House Volume

Level	Floor Area (ft²)	Floor Height (ft)	Volume (ft³)
Bsmt	1453	9	13077
First	1453	10	14530
Second	1770	8	14160
Third	0	9	0
Fourth	0	9	0
		Total:	41,767.0 ft³
		Total:	1182.7 m³

Air Change & Delta T Data

WINTER NATURAL AIR CHANGE RATE	0.219
SUMMER NATURAL AIR CHANGE RATE	0.068

Design Temperature Difference

	Tin °C	Tout °C	ΔT °C	ΔT °F
Winter DTDh	22	-21	43	78
Summer DTDc	24	31	7	13

5.2.3.1 Heat Loss due to Air Leakage

$$HL_{airb} = LR_{airh} \times \frac{V_b}{3.6} \times DTD_h \times 1.2$$

0.219 x 328.53 x 43 °C x 1.2 = 3727 W

= 12718 Btu/h

6.2.6 Sensible Gain due to Air Leakage

$$HG_{salb} = LR_{airc} \times \frac{V_b}{3.6} \times DTD_c \times 1.2$$

= 0.068 x 328.53 x 7 °C x 1.2 = 191 W

= 652 Btu/h

5.2.3.2 Heat Loss due to Mechanical Ventilation

$$HL_{vairb} = PVC \times DTD_h \times 1.08 \times (1 - E)$$

95 CFM x 78 °F x 1.08 x 0.25 = 2004 Btu/h

6.2.7 Sensible heat Gain due to Ventilation

$$HL_{vairb} = PVC \times DTD_h \times 1.08 \times (1 - E)$$

95 CFM x 13 °F x 1.08 x 0.25 = 330 Btu/h

5.2.3.3 Calculation of Air Change Heat Loss for Each Room (Floor Multiplier Section)

$$HL_{airr} = Level\ Factor \times HL_{airbv} \times \{(HL_{agcr} + HL_{bgcr}) \div (HL_{agclevel} + HL_{bgclevel})\}$$

Level	Level Factor (LF)	HLairve Air Leakage + Ventilation Heat Loss (Btu/h)	Level Conductive Heat Loss: (HL_{clevel})	Air Leakage Heat Loss Multiplier (LF x HLairbv / HLlevel)
1	0.5	12,718	8,378	0.759
2	0.3		13,104	0.291
3	0.2		14,521	0.175
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

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HEAT LOSS AND GAIN SUMMARY SHEET

MODEL: 4504 OPT. GROUND & OPT 2ND **BUILDER:** ROYAL PINE HOMES
SFQT: 3223 **LO#** 90464 **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):	41767.0	ASSUMED (Y/N):	Y
INTERNAL SHADING:	BLINDS/CURTAINS	ASSUMED OCCUPANTS:	6
INTERIOR LIGHTING LOAD ($Btu/h/ft^2$):	1.40	DC BRUSHLESS MOTOR (Y/N):	Y
FOUNDATION CONFIGURATION	BCIN_1	DEPTH BELOW GRADE:	6.0 ft
LENGTH: 46.0 ft	WIDTH: 37.0 ft	EXPOSED PERIMETER:	166.0 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

Michael O'Rourke

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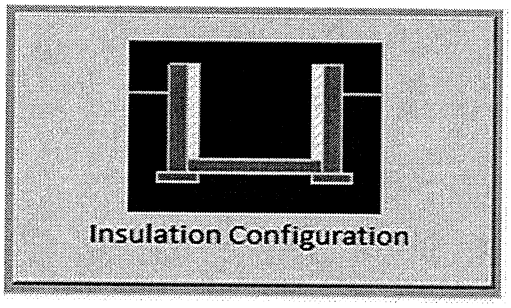
Ajax ON, L1S 2E2
905-619-2300

Residential Foundation Thermal Load Calculator

Supplemental tool for CAN/CSA-F280

Weather Station Description	
Province:	Ontario
Region:	Richmond Hill
Site Description	
Soil Conductivity:	Normal conductivity: dry sand, loam, clay
Water Table:	Normal (7-10 m, 23-33 ft)
Foundation Dimensions	
Floor Length (m):	**14.0**
Floor Width (m):	**11.3**
Exposed Perimeter (m):	**0.0**
Wall Height (m):	**2.7**
Depth Below Grade (m):	**1.83**
Window Area (m^2):	**1.9**
Door Area (m^2):	**1.9**
Radiant Slab	
Heated Fraction of the Slab:	**0**
Fluid Temperature (°C):	**33**
Design Months	
Heating Month	**1**
Foundation Loads	
Heating Load (Watts):	**1638**



TYPE: 4504
LO# 90464

OPT. GROUND & OPT 2ND

HVAC Designs Ltd.
375 Finley Ave, Suite 202
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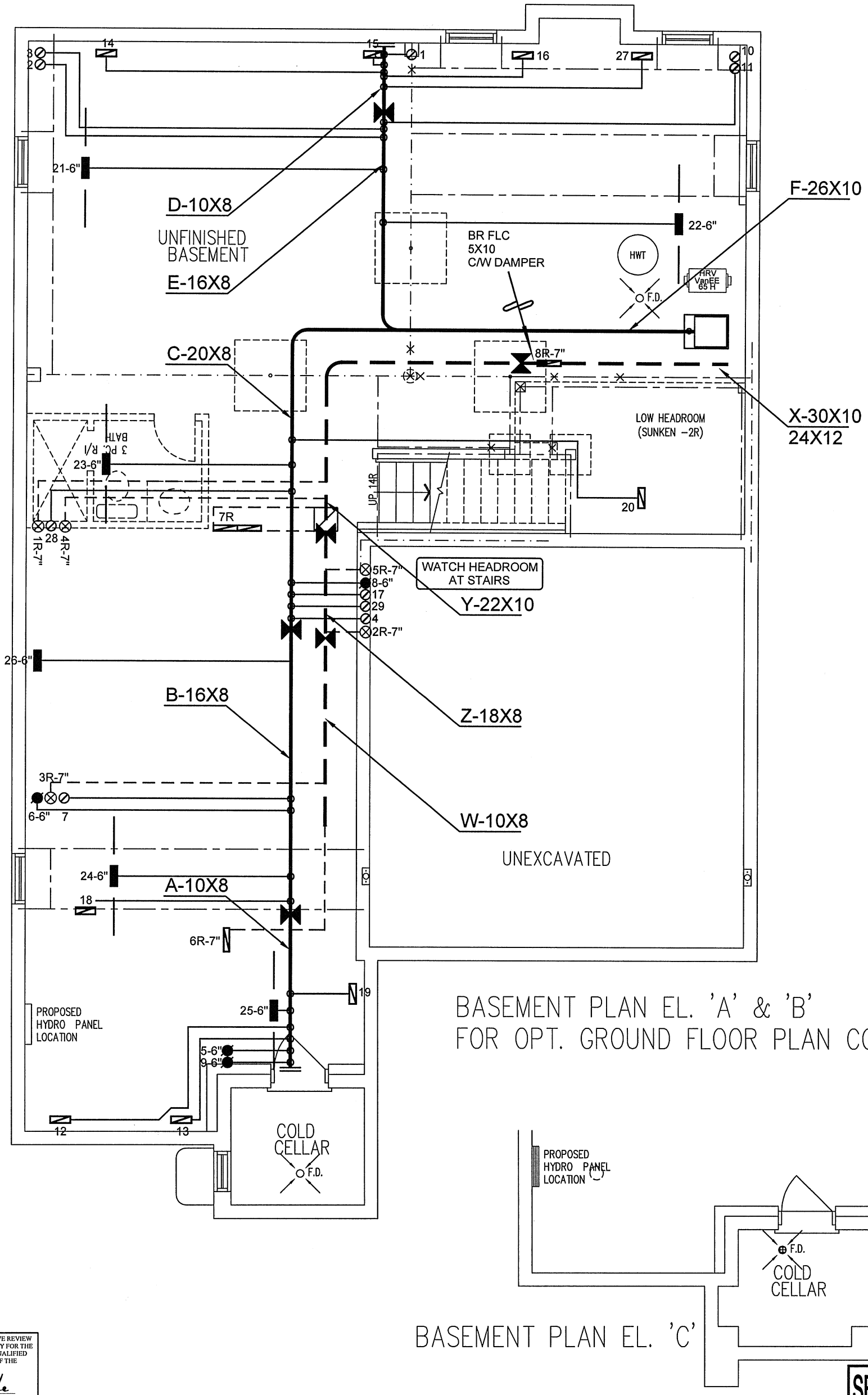
Air Infiltration Residential Load Calculator

Supplemental tool for CAN/CSA-F280

Weather Station Description	
Province:	Ontario
Region:	Richmond Hill
Weather Station Location:	Open flat terrain, grass
Anemometer height (m):	10
Local Shielding	
Building Site:	Suburban, forest
Walls:	Heavy
Flue:	Heavy
Highest Ceiling Height (m):	6.40
Building Configuration	
Type:	Detached
Number of Stories:	Two
Foundation:	Full
House Volume (m^3):	1182.7
Air Leakage/Ventilation	
Air Tightness Type:	Energy Star Detached (2.5 ACH)
Custom BDT Data:	ELA @ 10 Pa. 1104.1 cm^2
	2.50 ACH @ 50 Pa
Mechanical Ventilation (L/s):	Total Supply 45.0 / Total Exhaust 45.0
Flue Size	
Flue #:	#1 #2 #3 #4
Diameter (mm):	0 0 0 0
Natural Infiltration Rates	
Heating Air Leakage Rate (ACH/H):	**0.219**
Cooling Air Leakage Rate (ACH/H):	**0.068**

TYPE: 4504
LO# 90464

OPT. GROUND & OPT 2ND



BASEMENT PLAN EL. 'A' & 'B'
FOR OPT. GROUND FLOOR PLAN COND.

BASEMENT PLAN EL. '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, BCIN# 19669
HVAC DESIGNS LTD.

CSA-F280-12

SB-12 PERFORMANCE

HVAC LEGEND

SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION
—▭—	SUPPLY AIR GRILLE	▬	6" SUPPLY AIR BOOT ABOVE	▭	14"x8" RETURN AIR GRILLE	▭	RETURN AIR STACK ABOVE
—▬—	SUPPLY AIR GRILLE 6" BOOT	⊘	SUPPLY AIR STACK FROM 2nd FLOOR	▭	30"x8" RETURN AIR GRILLE	⊠	RETURN AIR STACK 2nd FLOOR
▭	SUPPLY AIR BOOT ABOVE	●	6" SUPPLY AIR STACK 2nd FLOOR	▬	FRA- FLOOR RETURN AIR GRILLE	⧗	REDUCER

No.	Description	Date
3.		
2.		
1.	REVISED AS PER CAD	JUNE/2021

REVISIONS

Client
ROYAL PINE HOMES

Project Name
CENTREFIELD (WEST GORMLEY)
RICHMOND HILL, ONTARIO

OPT. GROUND & OPT 2ND
4504 3223 sqft

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Email: info@hvacdesigns.ca
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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.

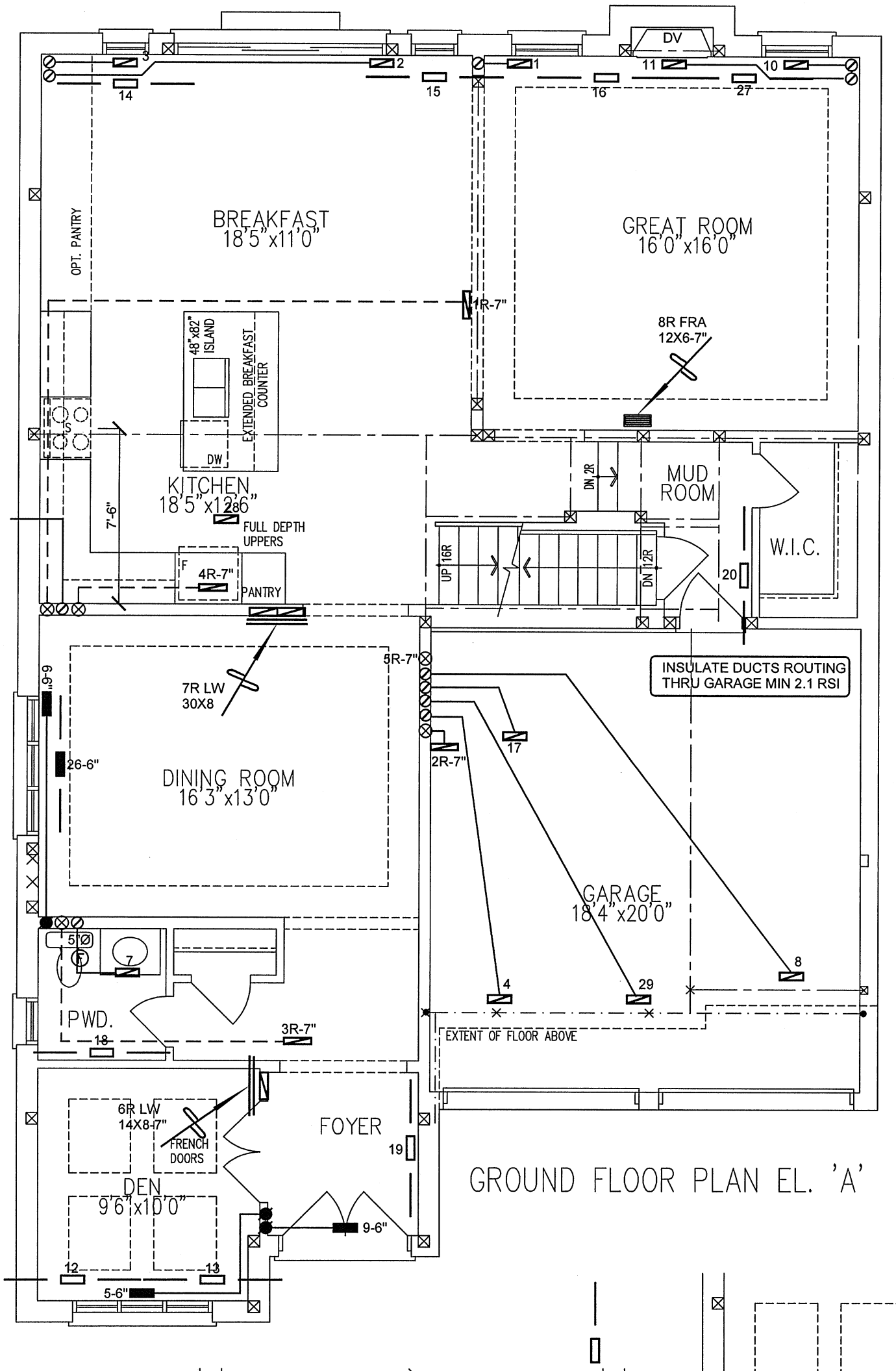
HEAT LOSS 51199 BTU/H	
UNIT DATA	
MAKE	CARRIER
MODEL	59TN6A-060-14V
INPUT	60 MBTU/H
OUTPUT	58 MBTU/H
COOLING	3.5 TONS
FAN SPEED	1370 cfm @ 0.6" w.c.

# OF RUNS	S/A	R/A	FANS
3RD FLOOR			
2ND FLOOR	14	5	4
1ST FLOOR	10	3	2
BASEMENT	5	1	0

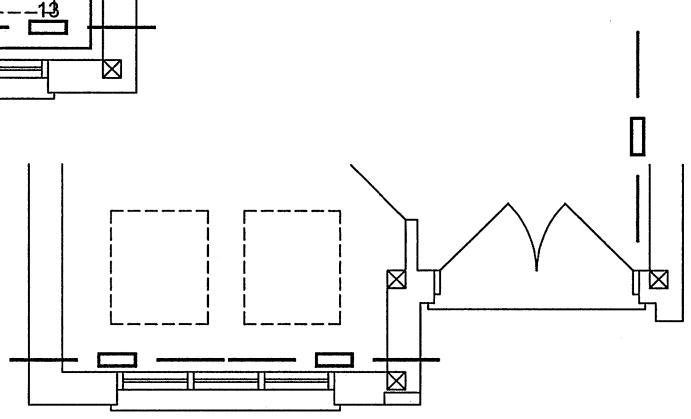
ALL S/A DIFFUSERS 4 "x10" UNLESS NOTED OTHERWISE ON LAYOUT. ALL S/A RUNS 5"Ø UNLESS NOTED OTHERWISE ON LAYOUT. UNDERCUT DOORS 1" min. FOR R/A

Sheet Title
BASEMENT HEATING LAYOUT

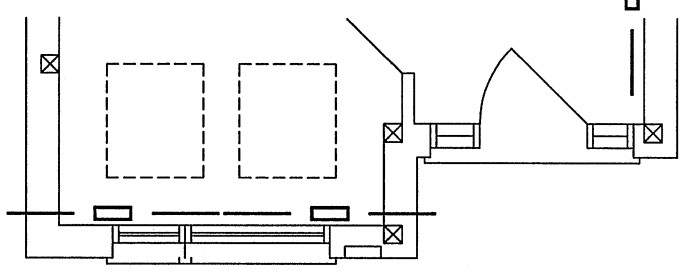
Date APR/2021
Scale 3/16" = 1'-0"
BCIN# 19669
LO# 90464



GROUND FLOOR PLAN EL. 'A'



GROUND FLOOR PLAN EL. 'B'



GROUND FLOOR PLAN EL. '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, BCIN# 19669
HVAC DESIGNS LTD.

CSA-F280-12

SB-12 PERFORMANCE

HVAC LEGEND

SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION
— ▭ —	SUPPLY AIR GRILLE	▬	6" SUPPLY AIR BOOT ABOVE	▭	14"x8" RETURN AIR GRILLE	▭	RETURN AIR STACK ABOVE
— ▬ —	SUPPLY AIR GRILLE 6" BOOT	⊘	SUPPLY AIR STACK FROM 2nd FLOOR	▭	30"x8" RETURN AIR GRILLE	▭	RETURN AIR STACK 2nd FLOOR
▭	SUPPLY AIR BOOT ABOVE	●	6" SUPPLY AIR STACK 2nd FLOOR	▬	FRA- FLOOR RETURN AIR GRILLE	⧗	REDUCER

No.	Description	Date
3.		
2.		
1.	REVISED AS PER CAD	JUNE/2021

REVISIONS

Client
ROYAL PINE HOMES

Project Name
CENTREFIELD (WEST GORMLEY)
RICHMOND HILL, ONTARIO

OPT. GROUND & OPT 2ND
4504 3223 sqft

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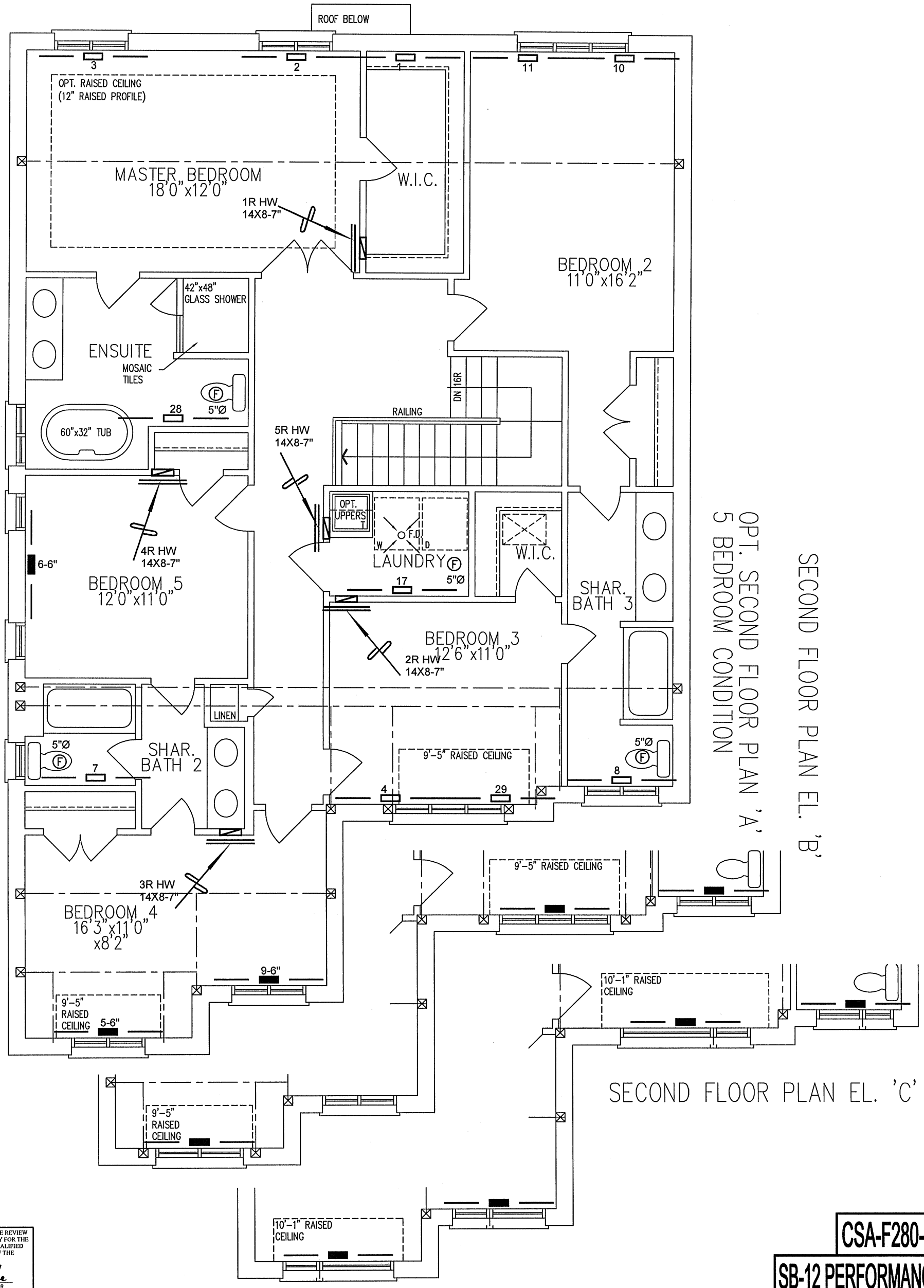
Installation to comply with the latest Ontario Building Code. All supply branch outlets shall be equipped with a manual balancing damper. Ductwork which passes through the garage or unheated spaces shall be adequately insulated and be gas-proofed.

Sheet Title
FIRST FLOOR HEATING LAYOUT

Date APR/2021
Scale 3/16" = 1'-0"
BCIN# 19669
LO# 90464



SECOND FLOOR PLAN EL. 'B'

OPT. SECOND FLOOR PLAN 'A'
5 BEDROOM CONDITION

SECOND FLOOR PLAN EL. '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, BCIN# 19669
HVAC DESIGNS LTD.

CSA-F280-12

SB-12 PERFORMANCE

HVAC LEGEND

SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION
— ▭ —	SUPPLY AIR GRILLE	▬	6" SUPPLY AIR BOOT ABOVE	▭	14"x8" RETURN AIR GRILLE	▭	RETURN AIR STACK ABOVE
— ▬ —	SUPPLY AIR GRILLE 6" BOOT	⊘	SUPPLY AIR STACK FROM 2nd FLOOR	▭	30"x8" RETURN AIR GRILLE	▭	RETURN AIR STACK 2nd FLOOR
▭	SUPPLY AIR BOOT ABOVE	●	6" SUPPLY AIR STACK 2nd FLOOR	▬	FRA- FLOOR RETURN AIR GRILLE	⧗	REDUCER

No.	Description	Date
3.		
2.		
1.	REVISED AS PER CAD	JUNE/2021

REVISIONS

Client

ROYAL PINE HOMES

Project Name

CENTREFIELD (WEST GORMLEY)
RICHMOND HILL, ONTARIO

OPT. GROUND & OPT 2ND
4504 3223 sqft

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Sheet Title

SECOND FLOOR HEATING LAYOUT

Date APR/2021

Scale 3/16" = 1'-0"

BCIN# 19669

LO# 90464

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	**Postal code**	**Plan number/ other description**		
RICHMOND HILL				

B. Individual who reviews and takes responsibility for design activities

Name		Firm		
MICHAEL O'ROURKE		**HVAC DESIGNS LTD.**		
Street address			**Unit no.**	**Lot/con.**
375 FINLEY AVE			**202**	**N/A**
Municipality	**Postal code**	**Province**	**E-mail**	
AJAX	**L1S 2E2**	**ONTARIO**	**info@hvacdesigns.ca**	
Telephone number	**Fax number**		**Cell number**	
(905) 619-2300	**(905) 619-2375**		( )	

C. Design activities undertaken by individual identified in Section B. [Building Code Table 3.5.2.1 OF Division C]

☐ House	☒ HVAC – House	☐ Building Structural
☐ Small Buildings	☐ Building Services	☐ Plumbing – House
☐ Large Buildings	☐ Detection, Lighting and Power	☐ Plumbing – All Buildings
☐ Complex Buildings	☐ Fire Protection	☐ On-site Sewage Systems

Description of designer's work	
HEAT LOSS / GAIN CALCULATIONS **DUCT SIZING** **RESIDENTIAL MECHANICAL VENTILATION DESIGN SUMMARY** **RESIDENTIAL SYSTEM DESIGN per CSA-F280-12**	**Model:** 4504 OPT. GROUND & OPT 2ND **Project:** CENTREFIELD (WEST GORMLEY)

D. Declaration of Designer

I **MICHAEL O'ROURKE** 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 Di vision C, of the Building Code.

Individual BCIN: 19669
Basis for exemption from registration and qualification: O.B.C SENTENCE 3.2.4.1 (4)

☐ 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 23, 2021
Date

Signature of Designer

NOTE:

1. 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.
2. 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.

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SITE NAME: CENTREFIELD (WEST GORMLEY) | OPT. GROUND & OPT 2ND | DATE: Apr-21 | WINTER NATURAL AIR CHANGE RATE 0.233 | HEAT LOSS ΔT °F. 78 | CSA-F280-12

BUILDER: ROYAL PINE HOMES | TYPE: 4504 | GFA: 3223 | LO# 90464 | SUMMER NATURAL AIR CHANGE RATE 0.073 | HEAT GAIN ΔT °F. 13 | SB-12 PERFORMANCE

ROOM USE			MBR			ENS			WIC			BED-2			BED-3			BED-4			ENS-4/5			BED-5				ENS 3				
EXP. WALL			32			10			5			37			13			45			6			12				23				
CLG. HT.			9			9			9			9			9			9			9			9				9				
	FACTORS																															
GRS.WALL AREA	LOSS	GAIN	288			90			45			333			117			405			54			108				207				
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	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	0	0	0	0	0	0	0	0	0	0	0	0	47	1024	1953	64	1394	2659	0	0	0	0	0	0		20	436	831		
SOUTH	21.8	24.9	0	0	0	15	327	373	0	0	0	0	0	0	0	0	0	0	0	0	7	152	174	16	349	398		0	0	0		
WEST	21.8	41.6	36	784	1496	0	0	0	0	0	0	26	566	1080	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	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		0	0	0		
NET EXPOSED WALL	4.2	0.7	252	1060	174	75	315	52	45	189	31	307	1291	212	70	294	48	341	1434	236	47	198	33	92	387	64		187	786	129		
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		0	0	0		
EXPOSED CLG	1.3	0.6	289	380	170	124	163	73	68	89	40	332	436	195	187	246	110	255	335	150	83	109	49	212	279	125		112	147	66		
NO ATTIC EXPOSED CLG	2.8	1.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		0	0	0		
EXPOSED FLOOR	2.6	0.4	0	0	0	0	0	0	0	0	0	0	0	0	187	488	80	0	0	0	0	0	0	0	0	0		112	292	48		
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			2224			805			279			2294			2052			3163			459			1014				1662				
SUB TOTAL HT GAIN				1840			498			71			1488			2192			3045			256			587				1074			
LEVEL FACTOR / MULTIPLIER			0.20	0.21		0.20	0.21		0.20	0.21		0.20	0.21		0.20	0.21		0.20	0.21		0.20	0.21		0.20	0.21			0.20	0.21			
AIR CHANGE HEAT LOSS			472			171			59			487			435			671			97			215				352				
AIR CHANGE HEAT GAIN				89			24			3			72			106			147			12			28				52			
DUCT LOSS			0			0			0			0			249			0			0			0				201				
DUCT GAIN				0			0			0			0			319			0			0			0				113			
HEAT GAIN PEOPLE	240		2		480	0		0	0		0	1		240	1		240	1		240	0		0	1		240		0		0		
HEAT GAIN APPLIANCES/LIGHTS					655			0			0			655			655			655			0			655				0		
TOTAL HT LOSS BTU/H			2696			976			338			2780			2736			3834			557			1229				2216				
TOTAL HT GAIN x 1.3 BTU/H				3983			679			97			3191			4565			5313			348			1963				1611			

ROOM USE			LIV			DIN			KT/GT				LAUN			W/R			FOY			MUD					BAS				
EXP. WALL			25			25			92				0			6			23			16					166				
CLG. HT.			11			11			11				9			11			11			12					10				
	FACTORS																															
GRS.WALL AREA	LOSS	GAIN	275			275			1012				0			66			253			192					1162				
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	0	0	0	0	0	0	0	0		4	87	64		
EAST	21.8	41.6	40	871	1662	0	0	0	0	0	0		0	0	0	0	0	0	25	545	1039	0	0	0				0	0	0		
SOUTH	21.8	24.9	0	0	0	28	610	697	16	349	398		0	0	0	9	196	224	0	0	0	0	0	0				8	174	199		
WEST	21.8	41.6	0	0	0	0	0	0	127	2767	5277		0	0	0	0	0	0	0	0	0	0	0	0				8	174	332		
SKYLT.	35.8	101.2	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0	0	0	0				0	0	0		
DOORS	25.8	4.3	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0	20	517	85	20	517	85				20	517	85		
NET EXPOSED WALL	4.2	0.7	235	988	163	247	1039	171	869	3654	601		0	0	0	57	240	39	208	875	144	172	723	119				0	0	0		
NET EXPOSED BSMT WALL ABOVE GR	3.7	0.6	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0	0	0	0				498	1834	302		
EXPOSED CLG	1.3	0.6	0	0	0	0	0	0	0	0	0		106	139	62	0	0	0	0	0	0	0	0	0				0	0	0		
NO ATTIC EXPOSED CLG	2.8	1.3	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0	0	0	0				0	0	0		
EXPOSED FLOOR	2.6	0.4	0	0	0	0	0	0	0	0	0		38	99	16	0	0	0	0	0	0	0	0	0				0	0	0		
BASEMENT/CRAWL HEAT LOSS			0			0			0				0			0			0			0					5579				
SLAB ON GRADE HEAT LOSS			0			0			0				0			0			0			0									
SUBTOTAL HT LOSS			1860			1649			6770				239			436			1936			1240					8366				
SUB TOTAL HT GAIN				1825			868			6277				79			264			1268			204					982			
LEVEL FACTOR / MULTIPLIER			0.30	0.33		0.30	0.33		0.30	0.33			0.20	0.21		0.30	0.33		0.30	0.33		0.30	0.33				0.50	0.90			
AIR CHANGE HEAT LOSS			604			536			2201				51			142			629			403					7525				
AIR CHANGE HEAT GAIN				88			42			303				4			13			61			10					47			
DUCT LOSS			0			0			0				29			0			0			0					0				
DUCT GAIN				0			0			0				74			0			0			0					0			
HEAT GAIN PEOPLE	240		0		0	0		0	0		0		0		0	0		0	0		0	0		0				0		0		
HEAT GAIN APPLIANCES/LIGHTS					655			655			655				655			0			0			0					655		
TOTAL HT LOSS BTU/H			2464			2185			8970				318			577			2566			1643					15891				
TOTAL HT GAIN x 1.3 BTU/H				3338			2034			9405				1054			359			1728			278					2190			

TOTAL HEAT GAIN BTU/H: 42464 TONS: 3.54 LOSS DUE TO VENTILATION LOAD BTU/H: 2004 STRUCTURAL HEAT LOSS: 51976 TOTAL COMBINED HEAT LOSS BTU/H: 53980

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.

Michael O'Rourke

INDIVIDUAL BCIN: 19669 MICHAEL O'ROURKE

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SITE NAME: CENTREFIELD (WEST GORMLEY) — OPT. GROUND & OPT 2ND
BUILDER: ROYAL PINE HOMES — TYPE: 4504 — DATE: Apr-21 — GFA: 3223 — LO# 90464

HEATING CFM	1370	COOLING CFM	1370
TOTAL HEAT LOSS	51,976	TOTAL HEAT GAIN	42,134
AIR FLOW RATE CFM	26.36	AIR FLOW RATE CFM	32.52

furnace pressure	0.6
furnace filter	0.05
a/c coil pressure	0.2
available pressure for s/a & r/a	0.35
plenum pressure s/a	0.18
max s/a dif press. loss	0.02
min adjusted pressure s/a	0.16
r/a pressure	0.17
r/a grille press. Loss	0.02
adjusted pressure r/a	0.15

**CARRIER
59TN6A-060-14V 60

FAN SPEED	
LOW	820
MEDLOW	0
MEDIUM	0
MEDIUM HIGH	1370
HIGH	1520

AFUE = 97 %
INPUT (BTU/H) = 60,000
OUTPUT (BTU/H) = **58,000**
DESIGN CFM = **1370** CFM @ .6 " E.S.P.
TEMPERATURE RISE 39 °F

RUN COUNT	4th	3rd	2nd	1st	Bas
S/A	0	0	14	10	5
R/A	0	0	5	3	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	WIC	MBR	MBR	BED-3	BED-4	BED-5	ENS-4/5	ENS 3	BED-4	BED-2	BED-2	LIV	LIV	KT/GT	KT/GT	KT/GT	LAUN	W/R	FOY	MUD	BAS	BAS	BAS	BAS
RM LOSS MBH.	0.34	1.35	1.35	1.37	1.92	1.23	0.56	2.22	1.92	1.39	1.39	1.23	1.23	2.24	2.24	2.24	0.32	0.58	2.57	1.64	3.18	3.18	3.18	3.18
CFM PER RUN HEAT	9	36	36	36	51	32	15	58	51	37	37	32	32	59	59	59	8	15	68	43	84	84	84	84
RM GAIN MBH.	0.10	1.99	1.99	2.28	2.66	1.96	0.35	1.61	2.66	1.60	1.60	1.67	1.67	2.35	2.35	2.35	1.05	0.36	1.73	0.28	0.44	0.44	0.44	0.44
CFM PER RUN COOLING	3	65	65	74	86	64	11	52	86	52	52	54	54	76	76	76	34	12	56	9	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	0.17	0.17	0.16	0.16	0.16	0.16
ACTUAL DUCT LGH.	53	45	62	41	61	59	49	46	57	64	61	54	48	44	35	44	31	43	35	41	36	46	21	40
EQUIVALENT LENGTH	170	180	190	180	180	170	170	200	150	220	140	190	170	130	120	160	190	120	160	160	90	100	130	110
TOTAL EFFECTIVE LENGTH	223	225	252	221	241	229	219	246	207	284	201	244	218	174	155	204	221	163	195	201	126	146	151	150
ADJUSTED PRESSURE	0.08	0.08	0.07	0.08	0.07	0.08	0.08	0.07	0.08	0.06	0.09	0.07	0.08	0.1	0.11	0.08	0.08	0.11	0.09	0.09	0.13	0.11	0.11	0.11
ROUND DUCT SIZE	4	**6**	**6**	5	**6**	**6**	4	5	**6**	5	5	5	5	**6**	**6**	**6**	4	4	5	4	**6**	**6**	**6**	**6**
HEATING VELOCITY (ft/min)	103	184	184	264	260	163	172	426	260	272	272	235	235	301	301	301	92	172	499	493	428	428	428	428
COOLING VELOCITY (ft/min)	34	331	331	543	438	326	126	382	438	382	382	396	396	388	388	388	390	138	411	103	71	71	71	71
OUTLET GRILL SIZE	3X10	4X10	4X10	3X10	4X10	4X10	3X10	3X10	4X10	3X10	3X10	3X10	3X10	4X10	4X10	4X10	3X10	3X10	3X10	3X10	4X10	4X10	4X10	4X10
TRUNK	C	C	C	B	A	B	B	E	A	C	D	A	A	C	C	C	B	B	A	D	D	D	D	B

RUN #	25	26	27	28	29
ROOM NAME	BAS	DIN	KT/GT	ENS	BED-3
RM LOSS MBH.	3.18	2.18	2.24	0.98	1.37
CFM PER RUN HEAT	84	58	59	26	36
RM GAIN MBH.	0.44	2.03	2.35	0.68	2.28
CFM PER RUN COOLING	14	66	76	22	74
ADJUSTED PRESSURE	0.16	0.17	0.17	0.17	0.17
ACTUAL DUCT LGH.	39	33	43	43	40
EQUIVALENT LENGTH	150	140	170	180	180
TOTAL EFFECTIVE LENGTH	189	173	213	223	220
ADJUSTED PRESSURE	0.09	0.1	0.08	0.08	0.08
ROUND DUCT SIZE	**6**	**6**	**6**	4	5
HEATING VELOCITY (ft/min)	428	296	301	298	264
COOLING VELOCITY (ft/min)	71	337	388	252	543
OUTLET GRILL SIZE	4X10	4X10	4X10	3X10	3X10
TRUNK	A	B	C	D	B

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	318	0.07	9.4	12	x	8	477	TRUNK G	0	0.00	0	0	x	8	0
TRUNK B	602	0.07	12	18	x	8	602	TRUNK H	0	0.00	0	0	x	8	0
TRUNK C	354	0.06	10.2	14	x	8	455	TRUNK I	0	0.00	0	0	x	8	0
TRUNK D	712	0.06	13.3	20	x	8	641	TRUNK J	0	0.00	0	0	x	8	0
TRUNK E	1372	0.06	17	26	x	10	760	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	1025	0.05	15.9	30	x	8	615
TRUNK Y	0	0.05	0	0	x	8	0
TRUNK Z	0	0.05	0	0	x	8	0
DROP	1370	0.05	17.7	24	x	12	685

RETURN AIR #	1	2	3	4	5	6	7	8								BR
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
AIR VOLUME	115	115	105	105	135	125	370	125	0	0	0	0	0	0	0	175
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.	53	47	73	45	42	48	23	57	1	1	1	1	1	1	1	14
EQUIVALENT LENGTH	215	175	255	255	135	215	260	175	0	0	0	0	0	0	0	260
TOTAL EFFECTIVE LH	268	222	328	300	177	263	283	232	1	1	1	1	1	1	1	274
ADJUSTED PRESSURE	0.06	0.07	0.05	0.05	0.08	0.06	0.05	0.06	14.80	14.80	14.80	14.80	14.80	14.80	14.80	0.05
ROUND DUCT SIZE	6.7	6.5	6.8	6.8	6.6	6.9	10.9	6.9	0	0	0	0	0	0	0	8.2
INLET GRILL SIZE	8	8	8	8	8	8	8	8	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	14	30	14	0	0	0	0	0	0	0	24

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.

Michael O'Rourke — INDIVIDUAL BCIN: 19669 MICHAEL O'ROURKE

HVAC DESIGNS LTD.

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TYPE: 4504 LO # 90464
SITE NAME: CENTREFIELD (WEST GORMLEY) OPT. GROUND & 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	2	@ 21.2 cfm	42.4	cfm
Other Bedrooms	4	@ 10.6 cfm	42.4	cfm
Kitchen & Bathrooms	5	@ 10.6 cfm	53	cfm
Other Rooms	5	@ 10.6 cfm	53.0	cfm
Table 9.32.3.A.		TOTAL	190.8	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	**95.4**	**cfm**

SUPPLEMENTAL VENTILATION CAPACITY 9.32.3.5.

Total Ventilation Capacity	190.8	cfm
Less Principal Ventil. Capacity	95.4	cfm
Required Supplemental Capacity	95.4	cfm

PRINCIPAL EXHAUST FAN CAPACITY

Model: VANEE 65H Location: BSMT

95.4 cfm [✓] HVI Approved

PRINCIPAL EXHAUST HEAT LOSS CALCULATION

CFM		ΔT °F		FACTOR		% LOSS
95.4 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
ENS-4/5	BY INSTALLING CONTRACTOR	50	✓	3.5
ENS 3	BY INSTALLING CONTRACTOR	50	✓	3.5
W/R	BY INSTALLING CONTRACTOR	50	✓	3.5

HEAT RECOVERY VENTILATOR 9.32.3.11.

Model: VANEE 65H

155 cfm high 64 cfm low

75 % 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: Michael O'Rourke.

HRAI # 001820

Date: April-21

I REVIEW AND TAKE RESPONIBILITY 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

HVAC DESIGNS LTD.

375 Finley Ave. Suite 202 Ajax, ON L1S 2E2
Tel: 905.619.2300 Fax: 905.619.2375
Web: www.hvacdesigns.ca E-mail: info@hvacdesigns.ca

CSA F280-12 Residential Heat Loss and Heat Gain Calculations

Formula Sheet (For Air Leakage / Ventiliation Calculation)

LO#: 90464 Model: 4504 Builder: ROYAL PINE HOMES Date: 4/23/2021

Volume Calculation

House Volume

Level	Floor Area (ft²)	Floor Height (ft)	Volume (ft³)
Bsmt	1453	10	14530
First	1453	11	15983
Second	1770	9	15930
Third	0	9	0
Fourth	0	9	0
		Total:	46,443.0 ft³
		Total:	1315.1 m³

Air Change & Delta T Data

WINTER NATURAL AIR CHANGE RATE	0.233
SUMMER NATURAL AIR CHANGE RATE	0.073

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

$$HL_{airb} = LR_{airh} \times \frac{V_b}{3.6} \times DTD_h \times 1.2$$

0.233 x 365.31 x 43 °C x 1.2 = 4411 W

= **15051 Btu/h**

6.2.6 Sensible Gain due to Air Leakage

$$HG_{salb} = LR_{airc} \times \frac{V_b}{3.6} \times DTD_c \times 1.2$$

= 0.073 x 365.31 x 7 °C x 1.2 = 226 W

= **772 Btu/h**

5.2.3.2 Heat Loss due to Mechanical Ventilation

$$HL_{vairb} = PVC \times DTD_h \times 1.08 \times (1 - E)$$

95 CFM x 78 °F x 1.08 x 0.25 = **2004 Btu/h**

6.2.7 Sensible heat Gain due to Ventilation

$$HL_{vairb} = PVC \times DTD_h \times 1.08 \times (1 - E)$$

95 CFM x 13 °F x 1.08 x 0.25 = **330 Btu/h**

5.2.3.3 Calculation of Air Change Heat Loss for Each Room (Floor Multiplier Section)

$$HL_{airr} = Level\ Factor \times HL_{airbv} \times \{(HL_{agcr} + HL_{bgcr}) \div (HL_{agclevel} + HL_{bgclevel})\}$$

Level	Level Factor (LF)	HLairve Air Leakage + Ventilation Heat Loss (Btu/h)	Level Conductive Heat Loss: (HL_{clevel})	Air Leakage Heat Loss Multiplier (LF x HLairbv / HLlevel)
1	0.5	15,051	8,366	0.900
2	0.3		13,890	0.325
3	0.2		14,190	0.212
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

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HEAT LOSS AND GAIN SUMMARY SHEET

MODEL: 4504 OPT. GROUND & OPT 2ND **BUILDER:** ROYAL PINE HOMES
SFQT: 3223 **LO#** 90464 **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):	46443.0	ASSUMED (Y/N):	Y
INTERNAL SHADING:	BLINDS/CURTAINS	ASSUMED OCCUPANTS:	6
INTERIOR LIGHTING LOAD (Btu/h/ft^2):	1.40	DC BRUSHLESS MOTOR (Y/N):	Y
FOUNDATION CONFIGURATION	BCIN_1	DEPTH BELOW GRADE:	7.0 ft
LENGTH: 46.0 ft	WIDTH: 37.0 ft	EXPOSED PERIMETER:	166.0 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

Michael O'Rourke

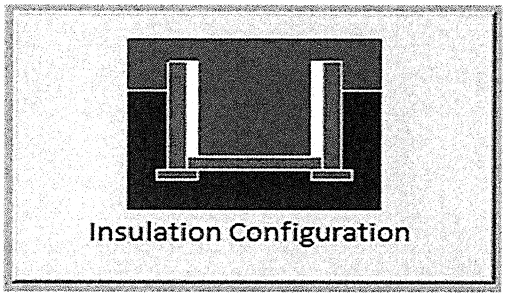
HVAC Designs Ltd.
375 Finley Ave, Suite 202
Ajax ON, L1S 2E2
905-619-2300

Residential Foundation Thermal Load Calculator

Supplemental tool for CAN/CSA-F280

Weather Station Description	
Province:	Ontario
Region:	Richmond Hill
Site Description	
Soil Conductivity:	Normal conductivity: dry sand, loam, clay
Water Table:	Normal (7-10 m, 23-33 ft)

Foundation Dimensions		
Floor Length (m):	**14.0**	
Floor Width (m):	**11.3**	
Exposed Perimeter (m):	**0.0**	
Wall Height (m):	**3.0**	
Depth Below Grade (m):	**2.13**	
Window Area (m^2):	**1.9**	
Door Area (m^2):	**1.9**	


Insulation Configuration

Radiant Slab		
Heated Fraction of the Slab:	**0**	
Fluid Temperature (°C):	**33**	
Design Months		
Heating Month	**1**	
Foundation Loads		
Heating Load (Watts):	**1635**	

TYPE: 4504
LO# 90464

OPT. GROUND & OPT 2ND

HVAC Designs Ltd.
375 Finley Ave, Suite 202
Ajax ON, L1S 2E2
905-619-2300

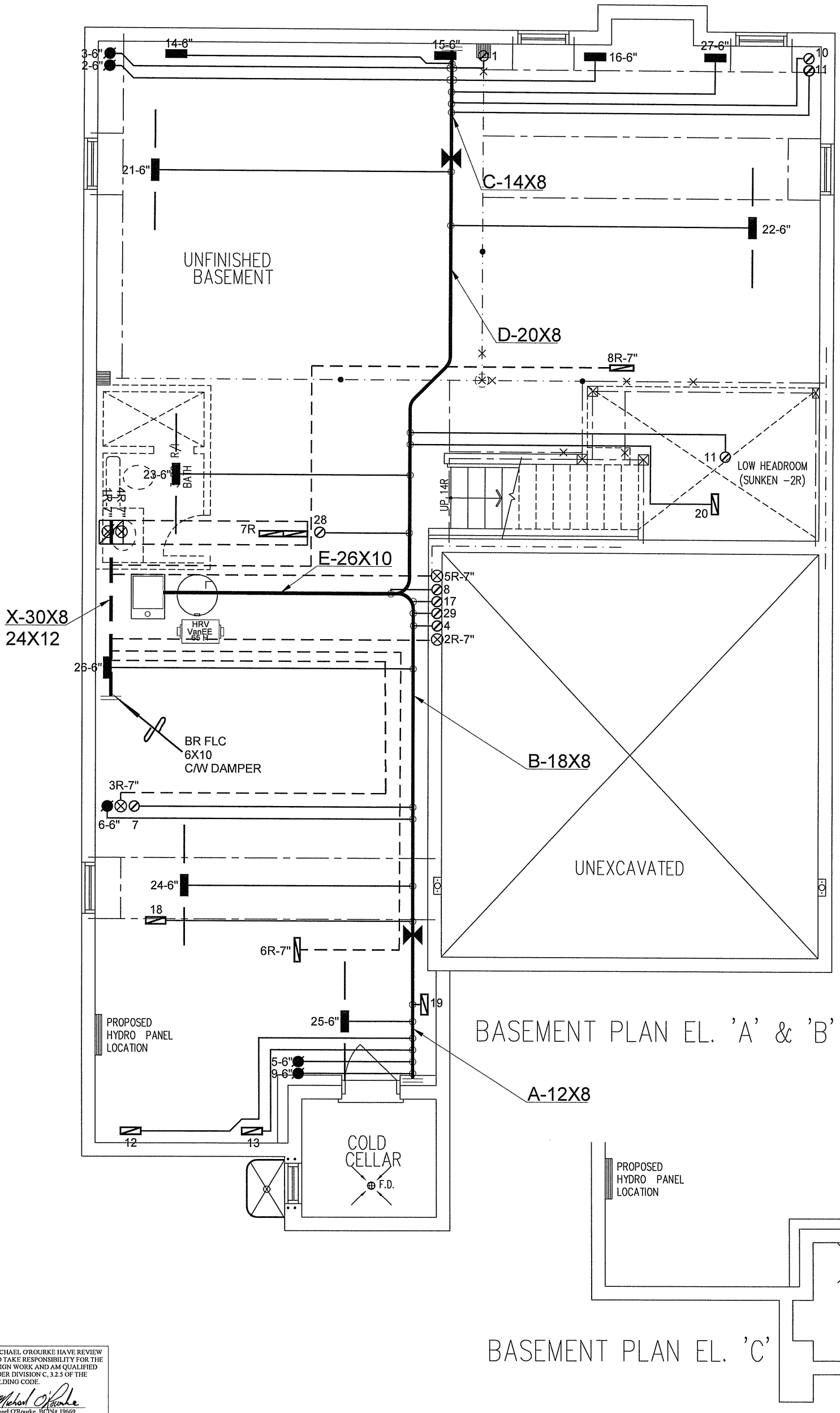
Air Infiltration Residential Load Calculator

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):	7.01
Building Configuration	
Type:	Detached
Number of Stories:	Two
Foundation:	Full
House Volume (m^3):	1315.1
Air Leakage/Ventilation	
Air Tightness Type:	Energy Star Detached (2.5 ACH)
Custom BDT Data:	ELA @ 10 Pa. 1227.7 cm^2
	2.50 ACH @ 50 Pa
Mechanical Ventilation (L/s):	Total Supply 45.0 / Total Exhaust 45.0
Flue Size	
Flue #:	#1 #2 #3 #4
Diameter (mm):	0 0 0 0
Natural Infiltration Rates	
Heating Air Leakage Rate (ACH/H):	**0.233**
Cooling Air Leakage Rate (ACH/H):	**0.073**

TYPE: 4504
LO# 90464

OPT. GROUND & OPT 2ND



BASEMENT PLAN EL. 'A' & 'B'

BASEMENT PLAN EL. '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, BCIN# 19669
HVAC DESIGNS LTD.

CSA-F280-12

SB-12 PERFORMANCE

HVAC LEGEND

SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION
— ▭ —	SUPPLY AIR GRILLE	▬	6" SUPPLY AIR BOOT ABOVE	▭	14"x8" RETURN AIR GRILLE	▭	RETURN AIR STACK ABOVE
— ▬ —	SUPPLY AIR GRILLE 6" BOOT	⊘	SUPPLY AIR STACK FROM 2nd FLOOR	▭	30"x8" RETURN AIR GRILLE	⊠	RETURN AIR STACK 2nd FLOOR
▭	SUPPLY AIR BOOT ABOVE	●	6" SUPPLY AIR STACK 2nd FLOOR	▤	FRA- FLOOR RETURN AIR GRILLE	⧗	REDUCER

No.	Description	Date
3.		
2.		
1.		

REVISIONS

Client

ROYAL PINE HOMES

Project Name

CENTREFIELD (WEST GORMLEY)
RICHMOND HILL, ONTARIO

OPT. GROUND & OPT 2ND
4504 3223 sqft

HVAC DESIGNS LTD.
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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.

HEAT LOSS 53980 BTU/H	
UNIT DATA	
MAKE	CARRIER
MODEL	59TN6A-060-14V
INPUT	60 MBTU/H
OUTPUT	58 MBTU/H
COOLING	3.5 TONS
FAN SPEED	1370 cfm @ 0.6" w.c.

# OF RUNS	S/A	R/A	FANS
3RD FLOOR			
2ND FLOOR	14	5	4
1ST FLOOR	10	3	2
BASEMENT	5	1	0

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

Sheet Title

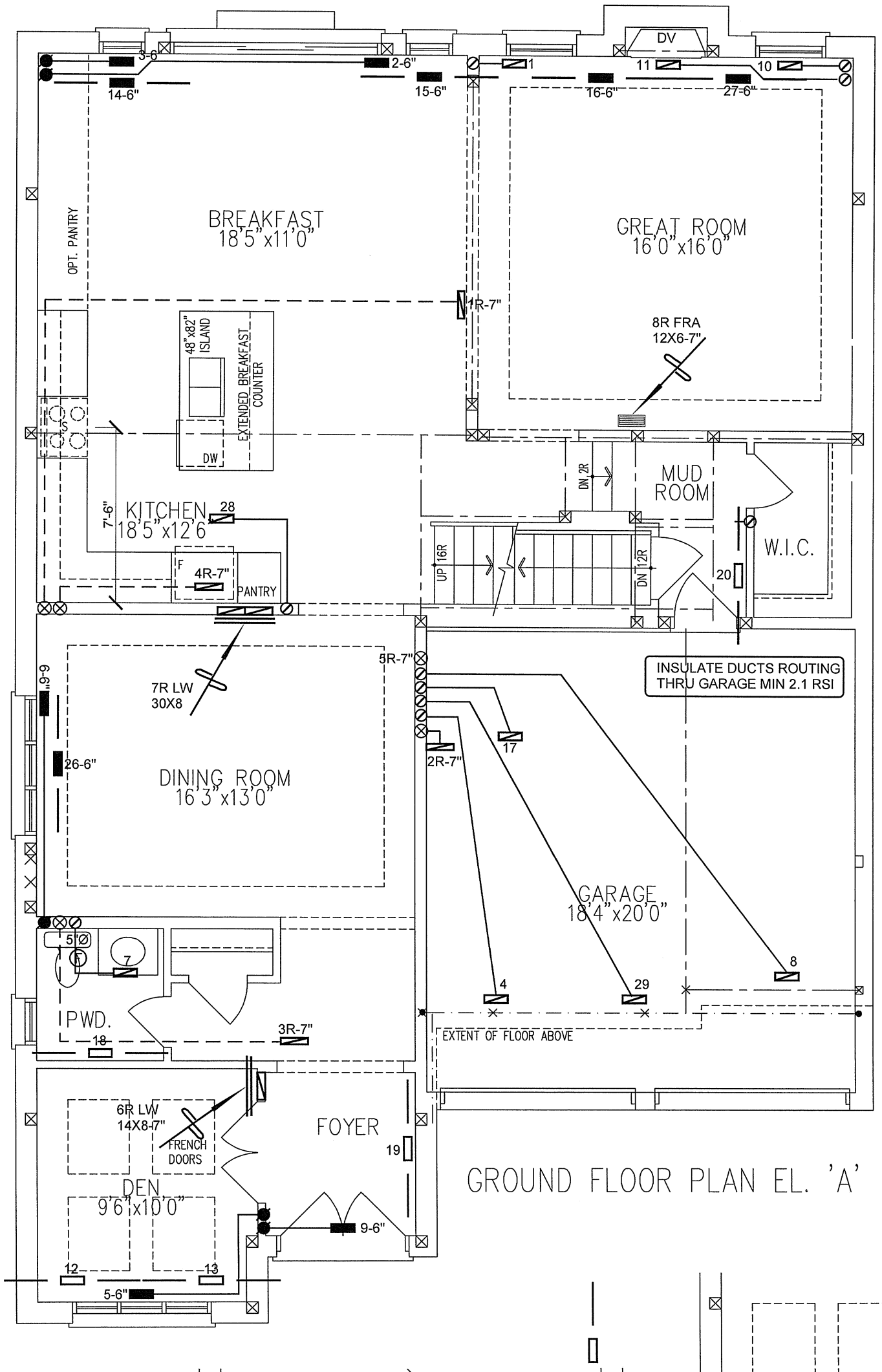
BASEMENT HEATING LAYOUT

Date APR/2021

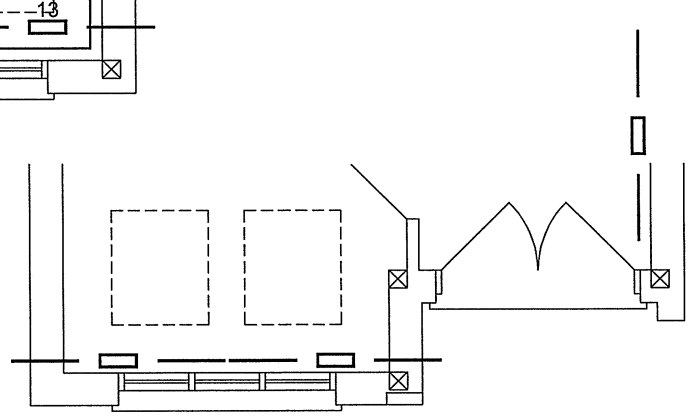
Scale 3/16" = 1'-0"

BCIN# 19669

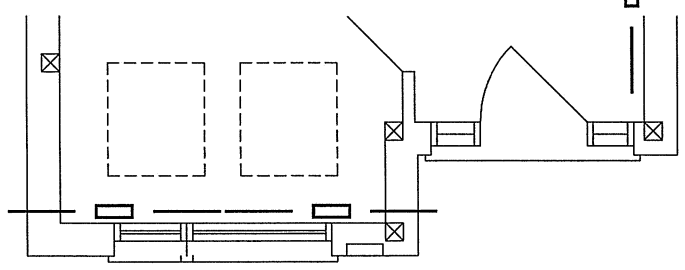
LO# 90464



GROUND FLOOR PLAN EL. 'A'



GROUND FLOOR PLAN EL. 'B'



GROUND FLOOR PLAN EL. '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, BCIN# 19669
HVAC DESIGNS LTD.

CSA-F280-12

SB-12 PERFORMANCE

HVAC LEGEND

SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION
	SUPPLY AIR GRILLE		6" SUPPLY AIR BOOT ABOVE		14"x8" RETURN AIR GRILLE		RETURN AIR STACK ABOVE
	SUPPLY AIR GRILLE 6" BOOT		SUPPLY AIR STACK FROM 2nd FLOOR		30"x8" RETURN AIR GRILLE		RETURN AIR STACK 2nd FLOOR
	SUPPLY AIR BOOT ABOVE		6" SUPPLY AIR STACK 2nd FLOOR		FRA- FLOOR RETURN AIR GRILLE		REDUCER

No.	Description	Date
3.		
2.		
1.		

REVISIONS

Client
ROYAL PINE HOMES

Project Name
CENTREFIELD (WEST GORMLEY)
RICHMOND HILL, ONTARIO

OPT. GROUND & OPT 2ND
4504 3223 sqft

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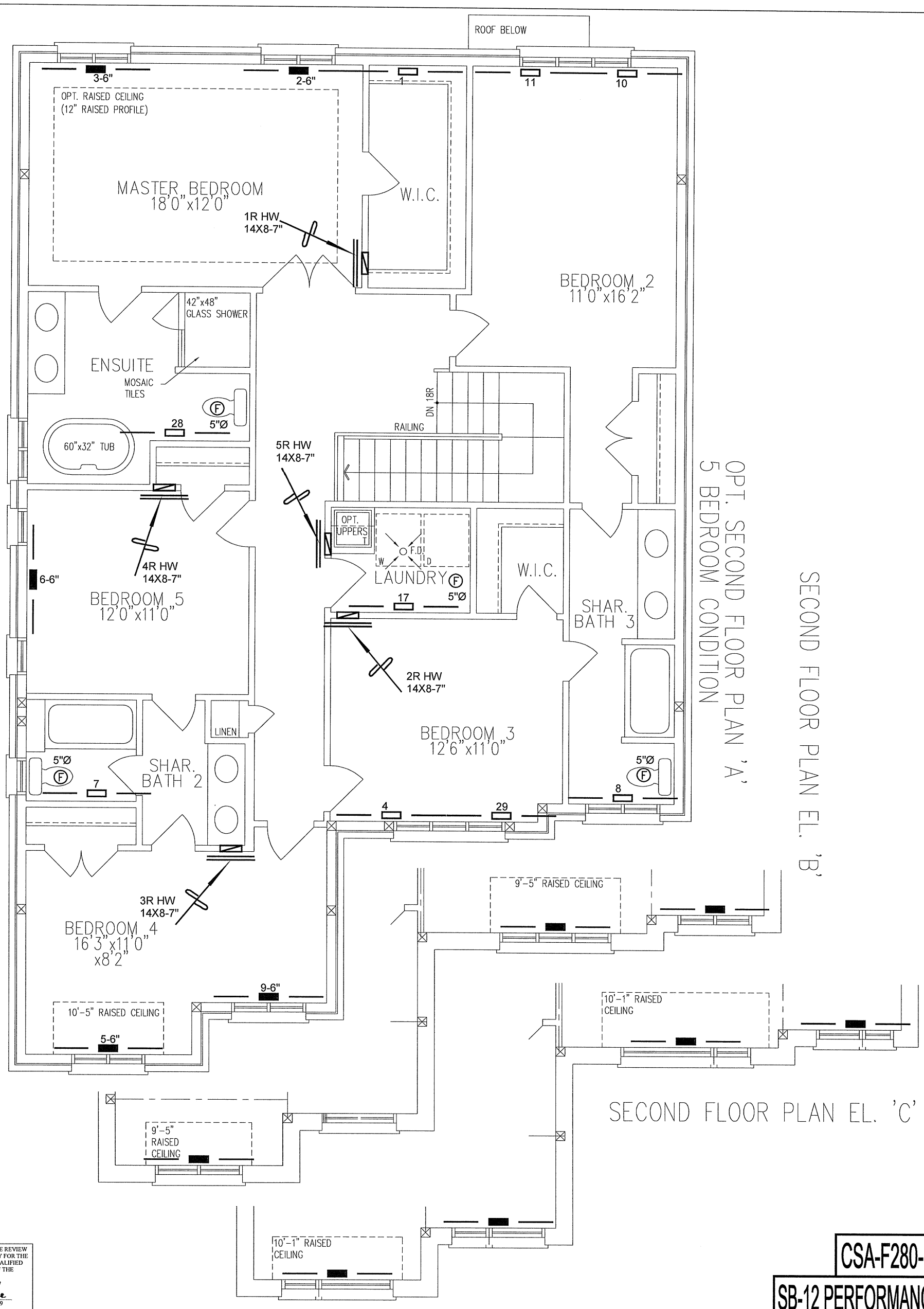
Specializing in Residential Mechanical Design Services

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
FIRST FLOOR HEATING LAYOUT

Date APR/2021
Scale 3/16" = 1'-0"
BCIN# 19669
LO# 90464



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, BCIN# 19669
HVAC DESIGNS LTD.

CSA-F280-12

SB-12 PERFORMANCE

HVAC LEGEND

SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION
— ▭ —	SUPPLY AIR GRILLE	▬	6" SUPPLY AIR BOOT ABOVE	▭	14"x8" RETURN AIR GRILLE	▭	RETURN AIR STACK ABOVE
— ▬ —	SUPPLY AIR GRILLE 6" BOOT	⊘	SUPPLY AIR STACK FROM 2nd FLOOR	▭	30"x8" RETURN AIR GRILLE	⊠	RETURN AIR STACK 2nd FLOOR
▭	SUPPLY AIR BOOT ABOVE	●	6" SUPPLY AIR STACK 2nd FLOOR	▭	FRA- FLOOR RETURN AIR GRILLE	⧗	REDUCER

No.	Description	Date
3.		
2.		
1.		

REVISIONS

Client

ROYAL PINE HOMES

Project Name

CENTREFIELD (WEST GORMLEY)
RICHMOND HILL, ONTARIO

OPT. GROUND & OPT 2ND
4504 3223 sqft

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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

SECOND FLOOR HEATING LAYOUT

Date APR/2021

Scale 3/16" = 1'-0"

BCIN# 19669

LO# 90464

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	**Postal code**	**Plan number/ other description**		
RICHMOND HILL				

B. Individual who reviews and takes responsibility for design activities

Name		Firm		
MICHAEL O'ROURKE		**HVAC DESIGNS LTD.**		
Street address			**Unit no.**	**Lot/con.**
375 FINLEY AVE			**202**	**N/A**
Municipality	**Postal code**	**Province**	**E-mail**	
AJAX	**L1S 2E2**	**ONTARIO**	**info@hvacdesigns.ca**	
Telephone number	**Fax number**		**Cell number**	
(905) 619-2300	**(905) 619-2375**		( )	

C. Design activities undertaken by individual identified in Section B. [Building Code Table 3.5.2.1 OF Division C]

☐ House	☒ HVAC – House	☐ Building Structural
☐ Small Buildings	☐ Building Services	☐ Plumbing – House
☐ Large Buildings	☐ Detection, Lighting and Power	☐ Plumbing – All Buildings
☐ Complex Buildings	☐ Fire Protection	☐ On-site Sewage Systems

Description of designer's work	
HEAT LOSS / GAIN CALCULATIONS **DUCT SIZING** **RESIDENTIAL MECHANICAL VENTILATION DESIGN SUMMARY** **RESIDENTIAL SYSTEM DESIGN per CSA-F280-12**	**Model:** 4504 OPT. GROUND **Project:** CENTREFIELD (WEST GORMLEY)

D. Declaration of Designer

I **MICHAEL O'ROURKE** 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 Di vision C, of the Building Code.

Individual BCIN: 19669
Basis for exemption from registration and qualification: O.B.C SENTENCE 3.2.4.1 (4)

☐ The design work is exempt from the registration and qualification requirements of the Building Code.
Basis for exemption from registration and qualification: _____

I certify that:

1. The information contained in this schedule is true to the best of my knowledge.
2. I have submitted this application with the knowledge and consent of the firm.

June 7, 2021
Date

Michael O'Rourke
Signature of Designer

NOTE:

1. 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.
2. 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.

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Tel: 905.619.2300 Fax: 905.619.2375
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SITE NAME: CENTREFIELD (WEST GORMLEY) OPT. GROUND DATE: Jun-21 WINTER NATURAL AIR CHANGE RATE 0.219 HEAT LOSS ΔT °F. 78 CSA-F280-12

BUILDER: ROYAL PINE HOMES TYPE: 4504 GFA: 3223 LO# 87512 SUMMER NATURAL AIR CHANGE RATE 0.068 HEAT GAIN ΔT °F. 13 SB-12 PERFORMANCE

ROOM USE			MBR			ENS				BED-2			BED-3			BED-4			BATH				ENS-2					
EXP. WALL			42			26				35			48			17			7				9					
CLG. HT.			9			8				8			8			8			8				8					
	FACTORS																											
GRS.WALL AREA	LOSS	GAIN	378			208				280			384			136			56				72					
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		7	152	112			
EAST	21.8	41.6	0	0	0	0	0	0		67	1460	2784	64	1394	2659	0	0	0	0	0	0		0	0	0			
SOUTH	21.8	24.9	0	0	0	8	174	199		0	0	0	0	0	0	16	349	398	7	152	174		0	0	0			
WEST	21.8	41.6	36	784	1496	18	392	748		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	0	0	0	0	0	0		0	0	0			
NET EXPOSED WALL	4.2	0.7	342	1438	237	182	765	126		213	896	147	320	1346	221	120	505	83	49	206	34		65	273	45			
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			
EXPOSED CLG	1.3	0.6	428	562	252	164	216	96		280	368	165	274	360	161	250	329	147	96	126	56		102	134	60			
NO ATTIC EXPOSED CLG	2.8	1.3	0	0	0	0	0	0		0	0	0	30	84	38	40	112	50	0	0	0		0	0	0			
EXPOSED FLOOR	2.6	0.4	0	0	0	0	0	0		280	731	120	0	0	0	0	0	0	0	0	0		5	13	2			
BASEMENT/CRAWL HEAT LOSS				0			0				0			0			0			0				0				
SLAB ON GRADE HEAT LOSS				0			0				0			0			0			0				0				
SUBTOTAL HT LOSS				2785			1547				3454			3184			1294			485				573				
SUB TOTAL HT GAIN					1984			1169				3216			3079			679			265				219			
LEVEL FACTOR / MULTIPLIER			0.20	0.19		0.20	0.19			0.20	0.19		0.20	0.19		0.20	0.19		0.20	0.19			0.20	0.19				
AIR CHANGE HEAT LOSS				522			290				648			597			243			91				107				
AIR CHANGE HEAT GAIN					82			49				134			128			28			11				9			
DUCT LOSS				0			0				410			0			0			0				68				
DUCT GAIN					0			0				432			0			0			0				23			
HEAT GAIN PEOPLE	240		2		480	0		0		1		240	1		240	1		240	0		0		0		0			
HEAT GAIN APPLIANCES/LIGHTS					727			0				727			727			727			0				0			
TOTAL HT LOSS BTU/H				3307			1838				4512			3782			1537			576				748				
TOTAL HT GAIN x 1.3 BTU/H					4256			1583				6173			5427			2176			358				326			

ROOM USE			DEN			DIN			KT/GT				LAUN			W/R			FOY			MUD				BAS		
EXP. WALL			25			25			92				0			6			23			16				166		
CLG. HT.			10			10			10				8			10			10			11				9		
	FACTORS																											
GRS.WALL AREA	LOSS	GAIN	250			250			920				0			60			230			176				996		
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	0	0	0	0	0	0				
EAST	21.8	41.6	40	871	1662	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0	0	0	0		4	87	64
SOUTH	21.8	24.9	0	0	0	28	610	697	16	349	398		0	0	0	9	196	224	0	0	0	0	0	0		0	0	0
WEST	21.8	41.6	0	0	0	0	0	0	127	2767	5277		0	0	0	0	0	0	0	0	0	0	0	0		8	174	199
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		8	174	332
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	210	883	145	222	934	154	777	3268	538		0	0	0	51	214	35	183	770	127	156	656	108		20	517	85
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	0	0	0	0	0	0	0	0	0		106	139	62	0	0	0	0	0	0	0	0	0		498	1834	302
NO ATTIC EXPOSED CLG	2.8	1.3	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0	0	0	0		0	0	0
EXPOSED FLOOR	2.6	0.4	0	0	0	0	0	0	0	0	0		38	99	16	0	0	0	0	0	0	0	0	0		0	0	0
BASEMENT/CRAWL HEAT LOSS				0			0			0				0			0			0			0			5591		
SLAB ON GRADE HEAT LOSS				0			0			0				0			0			0			0					
SUBTOTAL HT LOSS				1754			1544			6383				239			411			1875			1173			8378		
SUB TOTAL HT GAIN					1807			851			6213				79			259			1334			193				982
LEVEL FACTOR / MULTIPLIER			0.30	0.29		0.30	0.29		0.30	0.29			0.20	0.19		0.30	0.29		0.30	0.29		0.30	0.29			0.50	0.76	
AIR CHANGE HEAT LOSS				509			448			1853				45			119			544			341			6359		
AIR CHANGE HEAT GAIN					75			35			258				3			11			55			8				41
DUCT LOSS				0			0			0				28			0			0			0			0		
DUCT GAIN					0			0			0				81			0			0			0				0
HEAT GAIN PEOPLE	240		0		0	0		0	0		0		0		0	0		0	0		0	0		0				0
HEAT GAIN APPLIANCES/LIGHTS					727			727			727				727			0			0			0		0		0
TOTAL HT LOSS BTU/H				2264			1992			8236				312			530			2419			1514			14737		
TOTAL HT GAIN x 1.3 BTU/H					3393			2098			9358				1157			351			1806			261				2276

TOTAL HEAT GAIN BTU/H: 41275 TONS: 3.44 LOSS DUE TO VENTILATION LOAD BTU/H: 1670 STRUCTURAL HEAT LOSS: 48302 TOTAL COMBINED HEAT LOSS BTU/H: 49972

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INDIVIDUAL BCIN: 19669 MICHAEL O'ROURKE

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

OPT. GROUND
TYPE: 4504

DATE: Jun-21

GFA: 3223 LO# 87512

HEATING CFM	1370	COOLING CFM	1370
TOTAL HEAT LOSS	48,302	TOTAL HEAT GAIN	41,000
AIR FLOW RATE CFM	28.36	AIR FLOW RATE CFM	33.41

furnace pressure	0.6
furnace filter	0.05
a/c coil pressure	0.2
available pressure for s/a & r/a	0.35
plenum pressure s/a	0.18
max s/a dif press. loss	0.02
min adjusted pressure s/a	0.16
r/a pressure	0.17
r/a grille press. Loss	0.02
adjusted pressure r/a	0.15

**CARRIER
59TN6A-060-14V 60

FAN SPEED	
LOW	820
MEDLOW	0
MEDIUM	0
MEDIUM HIGH	1370
HIGH	1520

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

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

TEMPERATURE RISE 39 °F

RUN COUNT	4th	3rd	2nd	1st	Bas
S/A	0	0	12	10	5
R/A	0	0	5	3	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	ENS	BED-2	BED-3	BED-4	BATH	BED-2	BED-3	MBR	ENS-2	DEN	DEN	KT/GT	KT/GT	KT/GT	LAUN	W/R	FOY	MUD	BAS	BAS	BAS	BAS
RM LOSS MBH.	1.65	0.92	0.92	2.26	1.89	1.54	0.58	2.26	1.89	1.65	0.75	1.13	1.13	2.06	2.06	2.06	0.31	0.53	2.42	1.51	2.95	2.95	2.95	2.95
CFM PER RUN HEAT	47	26	26	64	54	44	16	64	54	47	21	32	32	58	58	58	9	15	69	43	84	84	84	84
RM GAIN MBH.	2.13	0.79	0.79	3.09	2.71	2.18	0.36	3.09	2.71	2.13	0.33	1.70	1.70	2.34	2.34	2.34	1.16	0.35	1.81	0.26	0.46	0.46	0.46	0.46
CFM PER RUN COOLING	71	26	26	103	91	73	12	103	91	71	11	57	57	78	78	78	39	12	60	9	15	15	15	15
ADJUSTED PRESSURE	0.17	0.17	0.17	0.16	0.16	0.17	0.17	0.16	0.16	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	0.16	0.16
ACTUAL DUCT LGH.	47	69	67	54	81	76	66	72	76	70	66	71	65	43	30	38	55	59	59	51	30	16	27	48
EQUIVALENT LENGTH	140	150	160	120	160	170	170	140	150	140	170	170	170	130	120	140	130	120	160	190	90	120	120	110
TOTAL EFFECTIVE LENGTH	187	219	227	174	241	246	236	212	226	210	236	241	235	173	150	178	185	179	219	241	120	136	147	158
ADJUSTED PRESSURE	0.09	0.08	0.08	0.09	0.07	0.07	0.07	0.08	0.07	0.08	0.07	0.07	0.07	0.1	0.11	0.1	0.09	0.1	0.08	0.07	0.14	0.12	0.11	0.1
ROUND DUCT SIZE	**6**	4	4	**6**	**6**	**6**	4	**6**	**6**	**6**	4	5	5	5	5	5	4	4	**6**	5	**6**	**6**	**6**	**6**
HEATING VELOCITY (ft/min)	240	298	298	326	275	224	184	326	275	240	241	235	235	426	426	426	103	172	352	316	428	428	428	428
COOLING VELOCITY (ft/min)	362	298	298	525	464	372	138	525	464	362	126	419	419	573	573	573	447	138	306	66	76	76	76	76
OUTLET GRILL SIZE	4X10	3X10	3X10	4X10	4X10	4X10	3X10	4X10	4X10	4X10	3X10	3X10	3X10	3X10	3X10	3X10	3X10	3X10	4X10	3X10	4X10	4X10	4X10	4X10
TRUNK	D	E	E	C	A	B	B	C	A	E	C	A	A	D	D	D	C	B	A	C	E	E	C	B

RUN #	25	26	27
ROOM NAME	BAS	DIN	KT/GT
RM LOSS MBH.	2.95	1.99	2.06
CFM PER RUN HEAT	84	56	58
RM GAIN MBH.	0.46	2.10	2.34
CFM PER RUN COOLING	15	70	78
ADJUSTED PRESSURE	0.16	0.17	0.17
ACTUAL DUCT LGH.	57	49	44
EQUIVALENT LENGTH	150	140	150
TOTAL EFFECTIVE LENGTH	207	189	194
ADJUSTED PRESSURE	0.08	0.09	0.09
ROUND DUCT SIZE	**6**	**6**	5
HEATING VELOCITY (ft/min)	428	286	426
COOLING VELOCITY (ft/min)	76	357	573
OUTLET GRILL SIZE	4X10	4X10	3X10
TRUNK	A	B	D

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	325	0.07	9.5	12	x	8	488	TRUNK G	0	0.00	0	0	x	8	0
TRUNK B	540	0.07	11.5	16	x	8	608	TRUNK H	0	0.00	0	0	x	8	0
TRUNK C	825	0.07	13.5	22	x	8	675	TRUNK I	0	0.00	0	0	x	8	0
TRUNK D	279	0.09	8.4	10	x	8	502	TRUNK J	0	0.00	0	0	x	8	0
TRUNK E	546	0.08	11.2	14	x	8	702	TRUNK K	0	0.00	0	0	x	8	0
TRUNK F	1370	0.07	16.3	26	x	10	759	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	245	0.05	9.3	10	x	8	441
TRUNK X	1370	0.05	17.7	30	x	10	658
TRUNK Y	1025	0.05	15.9	22	x	10	671
TRUNK Z	490	0.05	12.1	18	x	8	490
DROP	1370	0.05	17.7	24	x	12	685

RETURN AIR #	1	2	3	4	5	6	7	8									BR
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
AIR VOLUME	115	115	115	115	130	130	305	140	0	0	0	0	0	0	0	0	205
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
ACTUAL DUCT LGH.	95	65	98	88	60	67	47	18	1	1	1	1	1	1	1	1	19
EQUIVALENT LENGTH	195	245	215	235	205	190	245	145	0	0	0	0	0	0	0	0	155
TOTAL EFFECTIVE LH	290	310	313	323	265	257	292	163	1	1	1	1	1	1	1	1	174
ADJUSTED PRESSURE	0.05	0.05	0.05	0.05	0.06	0.06	0.05	0.09	14.80	14.80	14.80	14.80	14.80	14.80	14.80	14.80	0.09
ROUND DUCT SIZE	7	7	7	7	7	7	10.1	6.5	0	0	0	0	0	0	0	0	7.5
INLET GRILL SIZE	8	8	8	8	8	8	8	8	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	X
INLET GRILL SIZE	14	14	14	14	14	14	30	14	0	0	0	0	0	0	0	0	14

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TYPE: 4504 LO # 87512
SITE NAME: CENTREFIELD (WEST GORMLEY) 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	2	@ 21.2 cfm	42.4	cfm
Other Bedrooms	3	@ 10.6 cfm	31.8	cfm
Kitchen & Bathrooms	5	@ 10.6 cfm	53	cfm
Other Rooms	5	@ 10.6 cfm	53.0	cfm
Table 9.32.3.A.		TOTAL	180.2	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	180.2	cfm
Less Principal Ventil. Capacity	79.5	cfm
Required Supplemental Capacity	100.7	cfm

PRINCIPAL EXHAUST FAN CAPACITY

Model: VANEE 65H Location: BSMT

79.5 cfm [✓] HVI Approved

PRINCIPAL EXHAUST HEAT LOSS CALCULATION

CFM		ΔT °F		FACTOR		% LOSS
79.5 CFM	X	78 F	X	1.08	X	0.25

SUPPLEMENTAL FANS BY INSTALLING CONTRACTOR

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

HEAT RECOVERY VENTILATOR 9.32.3.11.

Model: VANEE 65H

155 cfm high 64 cfm low

75 % 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: Michael O'Rourke

HRAI # 001820

Date: June-21

I REVIEW AND TAKE RESPONIBILITY 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.

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CSA F280-12 Residential Heat Loss and Heat Gain Calculations

Formula Sheet (For Air Leakage / Ventiliation Calculation)

LO#: 87512 Model: 4504 Builder: ROYAL PINE HOMES Date: 6/7/2021

Volume Calculation

House Volume

Level	Floor Area (ft²)	Floor Height (ft)	Volume (ft³)
Bsmt	1453	9	13077
First	1453	10	14530
Second	1770	8	14160
Third	0	9	0
Fourth	0	9	0
		Total:	41,767.0 ft³
		Total:	1182.7 m³

Air Change & Delta T Data

WINTER NATURAL AIR CHANGE RATE	0.219
SUMMER NATURAL AIR CHANGE RATE	0.068

Design Temperature Difference

	Tin °C	Tout °C	ΔT °C	ΔT °F
Winter DTDh	22	-21	43	78
Summer DTDc	24	31	7	13

5.2.3.1 Heat Loss due to Air Leakage

$$HL_{airb} = LR_{airh} \times \frac{V_b}{3.6} \times DTD_h \times 1.2$$

0.219 x 328.53 x 43 °C x 1.2 = 3727 W

= 12718 Btu/h

6.2.6 Sensible Gain due to Air Leakage

$$HG_{salb} = LR_{airc} \times \frac{V_b}{3.6} \times DTD_c \times 1.2$$

= 0.068 x 328.53 x 7 °C x 1.2 = 191 W

= 652 Btu/h

5.2.3.2 Heat Loss due to Mechanical 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

6.2.7 Sensible heat Gain due to Ventilation

$$HL_{vairb} = PVC \times DTD_h \times 1.08 \times (1 - E)$$

80 CFM x 13 °F x 1.08 x 0.25 = 275 Btu/h

5.2.3.3 Calculation of Air Change Heat Loss for Each Room (Floor Multiplier Section)

$$HL_{airr} = Level\ Factor \times HL_{airbv} \times \{(HL_{agcr} + HL_{bgcr}) \div (HL_{agclevel} + HL_{bgclevel})\}$$

Level	Level Factor (LF)	HLairve Air Leakage + Ventilation Heat Loss (Btu/h)	Level Conductive Heat Loss: (HL_{clevel})	Air Leakage Heat Loss Multiplier (LF x HLairbv / HLlevel)
1	0.5	12,718	8,378	0.759
2	0.3		13,139	0.290
3	0.2		13,561	0.188
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

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HEAT LOSS AND GAIN SUMMARY SHEET

MODEL: 4504 OPT. GROUND **BUILDER:** ROYAL PINE HOMES
SFQT: 3223 **LO#** 87512 **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):	41767.0	ASSUMED (Y/N):	Y
INTERNAL SHADING:	BLINDS/CURTAINS	ASSUMED OCCUPANTS:	5
INTERIOR LIGHTING LOAD ($Btu/h/ft^2$):	1.40	DC BRUSHLESS MOTOR (Y/N):	Y
FOUNDATION CONFIGURATION	BCIN_1	DEPTH BELOW GRADE:	6.0 ft
LENGTH: 46.0 ft	WIDTH: 37.0 ft	EXPOSED PERIMETER:	166.0 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

Michael O'Rourke

HVAC Designs Ltd.
375 Finley Ave, Suite 202
Ajax ON, L1S 2E2
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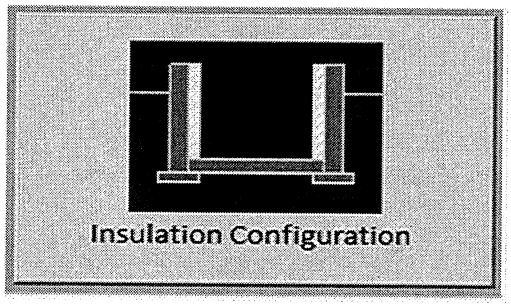
Residential Foundation Thermal Load Calculator

Supplemental tool for CAN/CSA-F280

Weather Station Description	
Province:	Ontario
Region:	Richmond Hill
Site Description	
Soil Conductivity:	Normal conductivity: dry sand, loam, clay
Water Table:	Normal (7-10 m, 23-33 ft)

Foundation Dimensions		
Floor Length (m):	**14.0**	 Insulation Configuration
Floor Width (m):	**11.3**	
Exposed Perimeter (m):	**0.0**	
Wall Height (m):	**2.7**	
Depth Below Grade (m):	**1.83**	
Window Area (m^2):	**1.9**	
Door Area (m^2):	**1.9**	
Radiant Slab		
Heated Fraction of the Slab:	**0**	
Fluid Temperature (°C):	**33**	
Design Months		
Heating Month	**1**	
Foundation Loads		
Heating Load (Watts):	**1638**	

TYPE: 4504
LO# 87512

OPT. GROUND

HVAC Designs Ltd.
375 Finley Ave, Suite 202
Ajax ON, L1S 2E2
905-619-2300

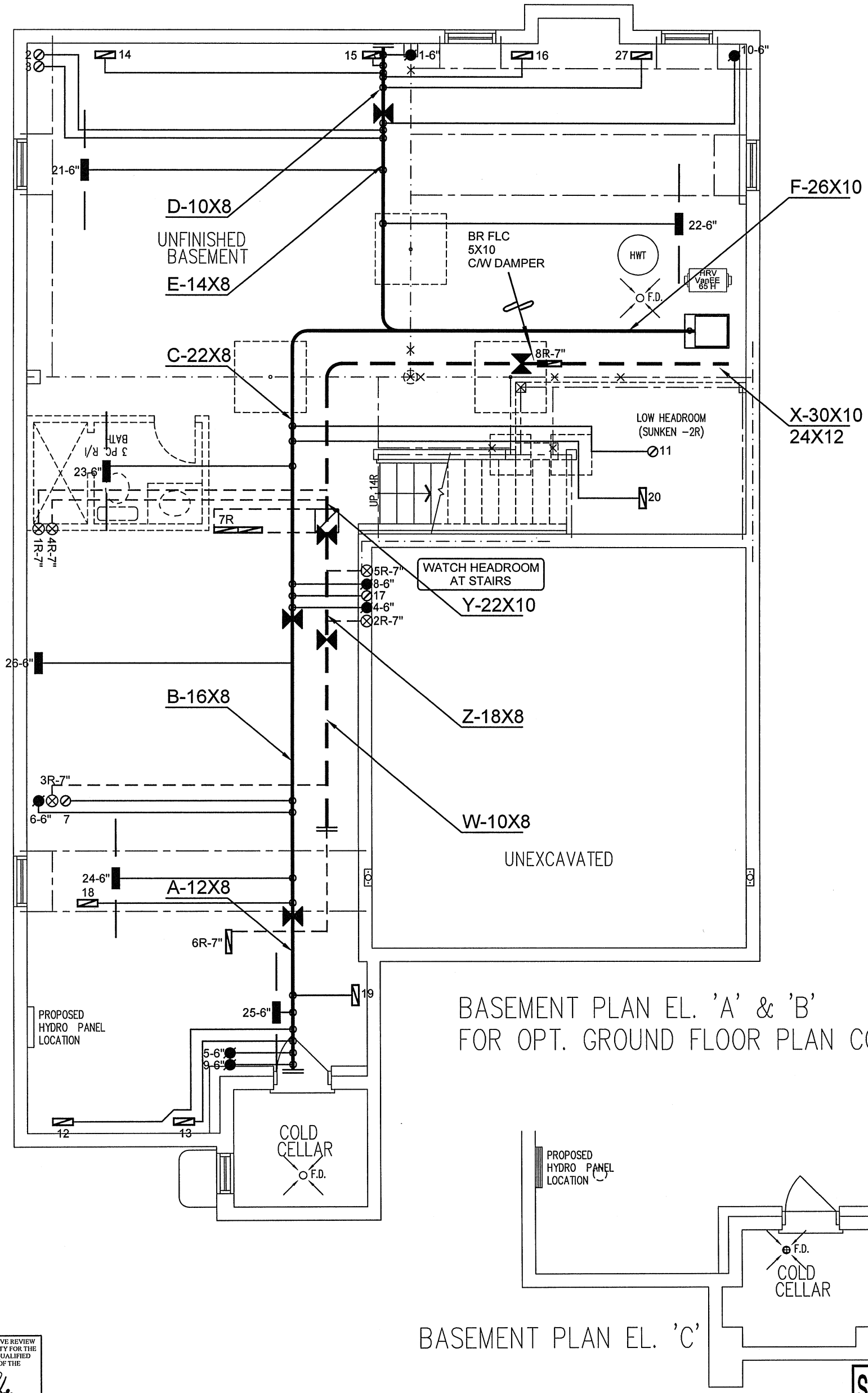
Air Infiltration Residential Load Calculator

Supplemental tool for CAN/CSA-F280

Weather Station Description	
Province:	Ontario
Region:	Richmond Hill
Weather Station Location:	Open flat terrain, grass
Anemometer height (m):	10
Local Shielding	
Building Site:	Suburban, forest
Walls:	Heavy
Flue:	Heavy
Highest Ceiling Height (m):	6.40
Building Configuration	
Type:	Detached
Number of Stories:	Two
Foundation:	Full
House Volume (m^3):	1182.7
Air Leakage/Ventilation	
Air Tightness Type:	Energy Star Detached (2.5 ACH)
Custom BDT Data:	ELA @ 10 Pa. 1104.1 cm^2
	2.50 ACH @ 50 Pa
Mechanical Ventilation (L/s):	Total Supply 37.5 / Total Exhaust 37.5
Flue Size	
Flue #:	#1 #2 #3 #4
Diameter (mm):	0 0 0 0
Natural Infiltration Rates	
Heating Air Leakage Rate (ACH/H):	**0.219**
Cooling Air Leakage Rate (ACH/H):	**0.068**

TYPE: 4504
LO# 87512

OPT. GROUND



BASEMENT PLAN EL. 'A' & 'B'
FOR OPT. GROUND FLOOR PLAN COND.

BASEMENT PLAN EL. '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, BCIN# 19669
HVAC DESIGNS LTD.

HVAC LEGEND

SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION
	SUPPLY AIR GRILLE		6" SUPPLY AIR BOOT ABOVE		14"x8" RETURN AIR GRILLE		RETURN AIR STACK ABOVE
	SUPPLY AIR GRILLE 6" BOOT		SUPPLY AIR STACK FROM 2nd FLOOR		30"x8" RETURN AIR GRILLE		RETURN AIR STACK 2nd FLOOR
	SUPPLY AIR BOOT ABOVE		6" SUPPLY AIR STACK 2nd FLOOR		FRA- FLOOR RETURN AIR GRILLE		REDUCER

No.	Description	Date
3.	REVISED AS PER CAD	JUNE/2021
2.	REVISED AS PER ARCHITECTURALS	APR/2021
1.	REVISED TO PERFORMANCE	SEPT/2020

REVISIONS

Client
ROYAL PINE HOMES

Project Name
CENTREFIELD (WEST GORMLEY)
RICHMOND HILL, ONTARIO

OPT. GROUND
4504 3223 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.

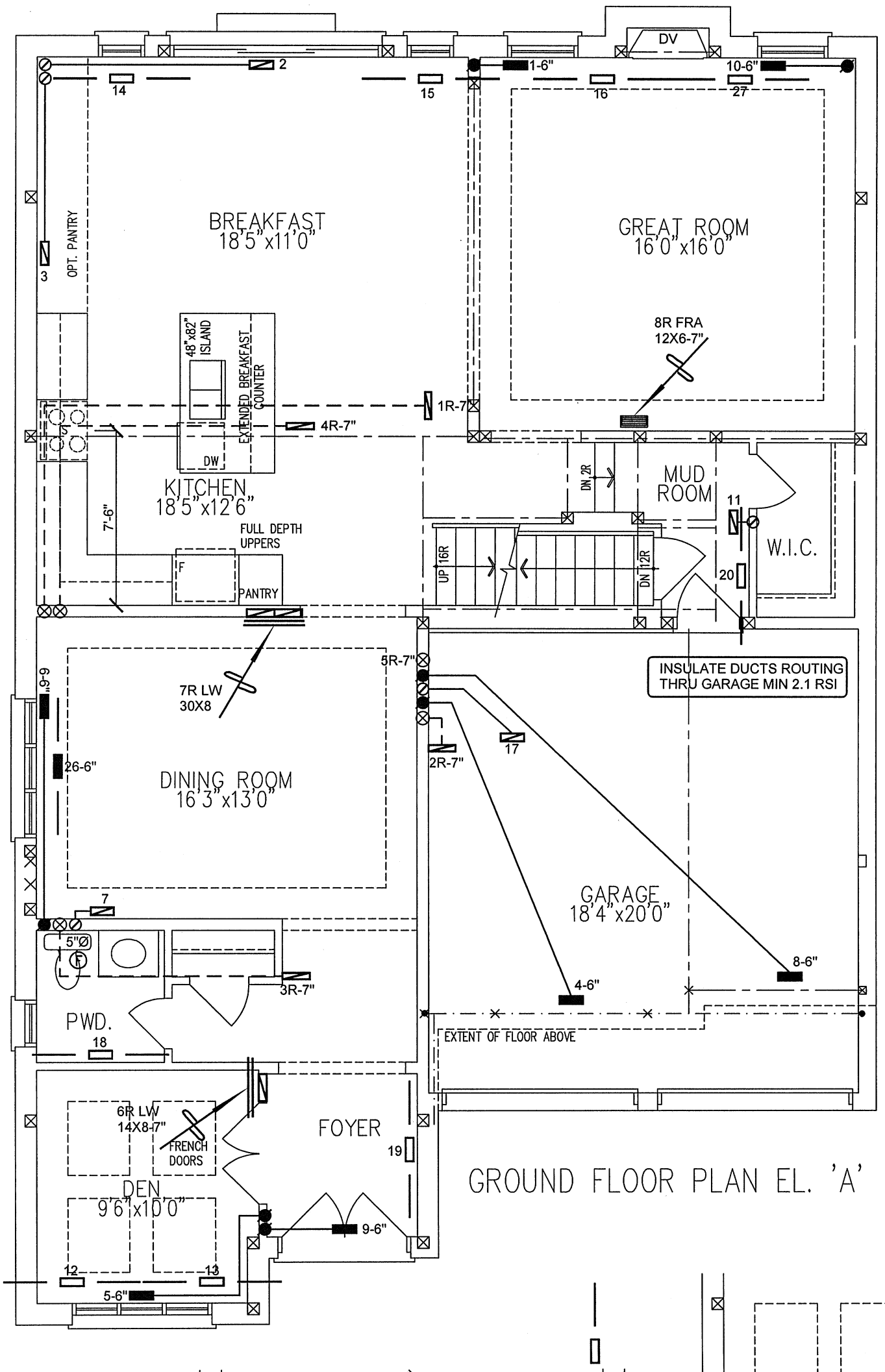
HEAT LOSS 49972 BTU/H	
UNIT DATA	
MAKE	CARRIER
MODEL	59TN6A-060-14V
INPUT	60 MBTU/H
OUTPUT	58 MBTU/H
COOLING	3.5 TONS
FAN SPEED	1370 cfm @ 0.6" w.c.

# OF RUNS	S/A	R/A	FANS
3RD FLOOR			
2ND FLOOR	12	5	5
1ST FLOOR	10	3	2
BASEMENT	5	1	0

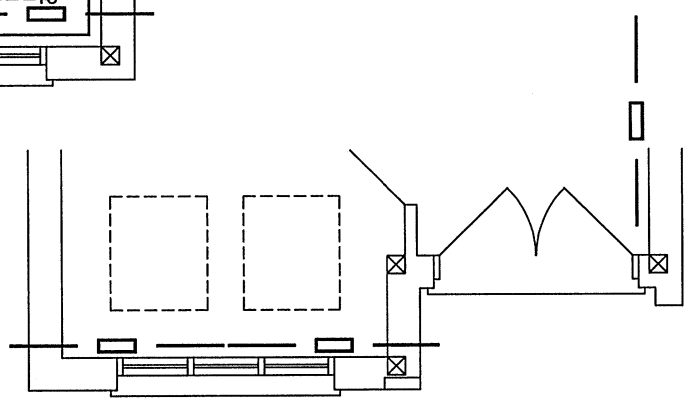
ALL S/A DIFFUSERS 4 "x10" UNLESS NOTED OTHERWISE ON LAYOUT. ALL S/A RUNS 5"Ø UNLESS NOTED OTHERWISE ON LAYOUT. UNDERCUT DOORS 1" min. FOR R/A

Sheet Title
BASEMENT HEATING LAYOUT

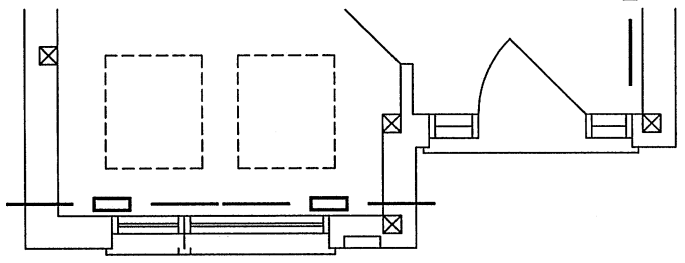
Date SEPT/2020
Scale 3/16" = 1'-0"
BCIN# 19669
LO# 87512



GROUND FLOOR PLAN EL. 'A'



GROUND FLOOR PLAN EL. 'B'



GROUND FLOOR PLAN EL. '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, BCIN# 19669
HVAC DESIGNS LTD.

CSA-F280-12

SB-12 PERFORMANCE

HVAC LEGEND

SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION
— ▭ —	SUPPLY AIR GRILLE	▬	6" SUPPLY AIR BOOT ABOVE	▭	14"x8" RETURN AIR GRILLE	▭	RETURN AIR STACK ABOVE
— ▬ —	SUPPLY AIR GRILLE 6" BOOT	⊘	SUPPLY AIR STACK FROM 2nd FLOOR	▭	30"x8" RETURN AIR GRILLE	▭	RETURN AIR STACK 2nd FLOOR
▭	SUPPLY AIR BOOT ABOVE	●	6" SUPPLY AIR STACK 2nd FLOOR	▬	FRA- FLOOR RETURN AIR GRILLE	⧗	REDUCER

No.	Description	Date
3.	REVISED AS PER CAD	JUNE/2021
2.	REVISED AS PER ARCHITECTURALS	APR/2021
1.	REVISED TO PERFORMANCE	SEPT/2020

REVISIONS

Client
ROYAL PINE HOMES

Project Name
CENTREFIELD (WEST GORMLEY)
RICHMOND HILL, ONTARIO

OPT. GROUND
4504 3223 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
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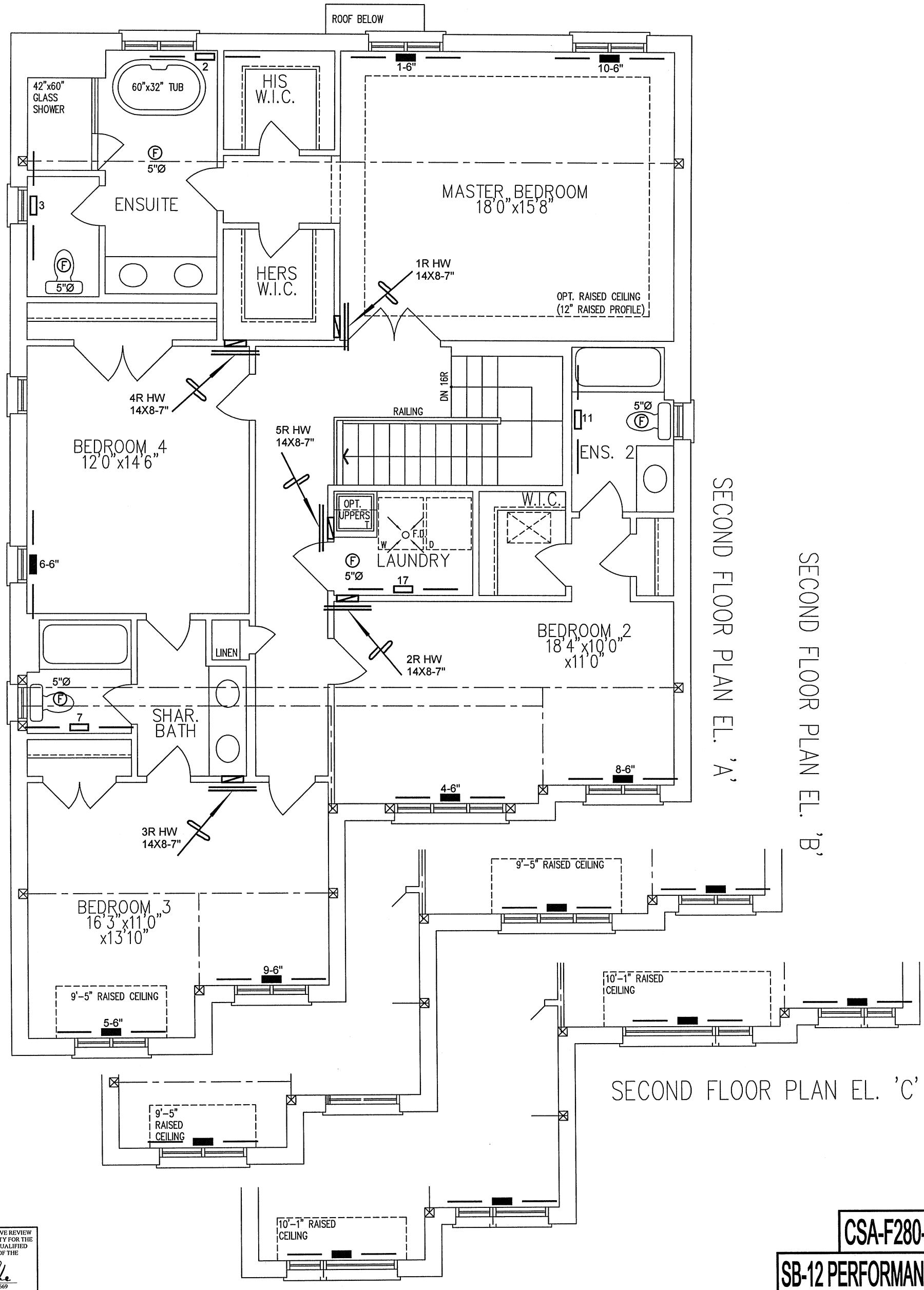
Installation to comply with the latest Ontario Building Code. All supply branch outlets shall be equipped with a manual balancing damper. Ductwork which passes through the garage or unheated spaces shall be adequately insulated and be gas-proofed.

Sheet Title
FIRST FLOOR HEATING LAYOUT

Date SEPT/2020
Scale 3/16" = 1'-0"
BCIN# 19669
LO# 87512



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, BCIN# 19669
HVAC DESIGNS LTD.

CSA-F280-12

SB-12 PERFORMANCE

HVAC LEGEND

SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION
— ▭ —	SUPPLY AIR GRILLE	▬	6" SUPPLY AIR BOOT ABOVE	▭	14"x8" RETURN AIR GRILLE	▭	RETURN AIR STACK ABOVE
— ▬ —	SUPPLY AIR GRILLE 6" BOOT	⊘	SUPPLY AIR STACK FROM 2nd FLOOR	▭	30"x8" RETURN AIR GRILLE	▭	RETURN AIR STACK 2nd FLOOR
▭	SUPPLY AIR BOOT ABOVE	●	6" SUPPLY AIR STACK 2nd FLOOR	▬	FRA- FLOOR RETURN AIR GRILLE	⧗	REDUCER

No.	Description	Date
	REVISIONS	
3.	REVISED AS PER CAD	JUNE/2021
2.	REVISED AS PER ARCHITECTURALS	APR/2021
1.	REVISED TO PERFORMANCE	SEPT/2020

Client
ROYAL PINE HOMES

Project Name
CENTREFIELD (WEST GORMLEY)
RICHMOND HILL, ONTARIO

OPT. GROUND
4504 3223 sqft

HVAC DESIGNS LTD.
375 Finley Ave. Suite 202 - Ajax, Ontario
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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
SECOND FLOOR HEATING LAYOUT

Date SEPT/2020
Scale 3/16" = 1'-0"
BCIN# 19669
LO# 87512

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	**Postal code**	**Plan number/ other description**		
RICHMOND HILL				

B. Individual who reviews and takes responsibility for design activities

Name		Firm		
MICHAEL O'ROURKE		**HVAC DESIGNS LTD.**		
Street address			**Unit no.**	**Lot/con.**
375 FINLEY AVE			**202**	**N/A**
Municipality	**Postal code**	**Province**	**E-mail**	
AJAX	**L1S 2E2**	**ONTARIO**	**info@hvacdesigns.ca**	
Telephone number	**Fax number**		**Cell number**	
(905) 619-2300	**(905) 619-2375**		( )	

C. Design activities undertaken by individual identified in Section B. [Building Code Table 3.5.2.1 OF Division C]

☐ House	☒ HVAC – House	☐ Building Structural
☐ Small Buildings	☐ Building Services	☐ Plumbing – House
☐ Large Buildings	☐ Detection, Lighting and Power	☐ Plumbing – All Buildings
☐ Complex Buildings	☐ Fire Protection	☐ On-site Sewage Systems

Description of designer's work	
HEAT LOSS / GAIN CALCULATIONS **DUCT SIZING** **RESIDENTIAL MECHANICAL VENTILATION DESIGN SUMMARY** **RESIDENTIAL SYSTEM DESIGN per CSA-F280-12**	**Model:** 4504 OPT IN LAW - 5 BED 4 BATH **Project:** CENTREFIELD (WEST GORMLEY)

D. Declaration of Designer

I **MICHAEL O'ROURKE** 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 Di vision C, of the Building Code.

Individual BCIN: 19669
Basis for exemption from registration and qualification: O.B.C SENTENCE 3.2.4.1 (4)

☐ The design work is exempt from the registration and qualification requirements of the Building Code.
Basis for exemption from registration and qualification: _____

I certify that:

1. The information contained in this schedule is true to the best of my knowledge.
2. I have submitted this application with the knowledge and consent of the firm.

June 7, 2021
Date

Michael O'Rourke
Signature of Designer

NOTE:

1. 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.
2. 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.

HVAC DESIGNS LTD.

375 Finley Ave. Suite 202 Ajax, ON L1S 2E2
Tel: 905.619.2300 Fax: 905.619.2375
Web: www.hvacdesigns.ca E-mail: info@hvacdesigns.ca

SITE NAME: CENTREFIELD (WEST GORMLEY) | OPT IN LAW - 5 BED 4 BATH | DATE: Jun-21 | WINTER NATURAL AIR CHANGE RATE 0.219 | HEAT LOSS ΔT °F. 78 | CSA-F280-12

BUILDER: ROYAL PINE HOMES | TYPE: 4504 | GFA: 3223 | LO# 91147 | SUMMER NATURAL AIR CHANGE RATE 0.068 | HEAT GAIN ΔT °F. 13 | SB-12 PERFORMANCE

ROOM USE			MBR			ENS			WIC			BED-2			BED-3			BED-4			ENS-4/5			BED-5			ENS-IL			ENS-3			WIC-3			ENS-2		
EXP. WALL			32			10			5			27			13			45			6			12			6			9			16			10		
CLG. HT.			8			8			8			8			8			8			8			8			10			8			8			8		
	FACTORS																																					
GRS.WALL AREA	LOSS	GAIN	256			80			40			216			104			360			48			96			60			72			128			80		
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	8	174	128	7	152	112	0	0	0	7	152	112
EAST	21.8	41.6	0	0	0	0	0	0	0	0	0	0	0	0	47	1024	1953	64	1394	2659	0	0	0	0	0	0	0	0	0	0	0	0	20	436	831	0	0	0
SOUTH	21.8	24.9	0	0	0	15	327	373	0	0	0	0	0	0	0	0	0	0	0	0	7	152	174	16	349	398	0	0	0	0	0	0	0	0	0	0	0	0
WEST	21.8	41.6	36	784	1496	0	0	0	0	0	0	26	566	1080	0	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	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	0	0	0	0	0	0	0	0	0	0	0	0
NET EXPOSED WALL	4.2	0.7	220	925	152	65	273	45	40	168	28	190	799	131	57	240	39	296	1245	205	41	172	28	80	336	55	52	219	36	65	273	45	108	454	75	73	307	51
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	0	0	0	0	0	0	0	0	0	0	0	0
EXPOSED CLG	1.3	0.6	289	380	170	124	163	73	68	89	40	262	344	154	157	206	92	215	283	126	83	109	49	212	279	125	0	0	0	90	118	53	63	83	37	70	92	41
NO ATTIC EXPOSED CLG	2.8	1.3	0	0	0	0	0	0	0	0	0	0	0	0	30	84	38	40	112	50	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	187	488	80	0	0	0	0	0	0	0	0	0	0	0	0	90	235	39	63	164	27	0	0	0
BASEMENT/CRAWL HEAT LOSS				0			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			0	
SUBTOTAL HT LOSS				2089			763			258			1710			2042			3034			434			964			393			779			1137			551		
SUB TOTAL HT GAIN					1818			491			68			1366			2203			3041			251			578			164			248			970			203
LEVEL FACTOR / MULTIPLIER			0.20	0.18		0.20	0.18		0.20	0.18		0.20	0.18		0.20	0.18		0.20	0.18		0.20	0.18		0.20	0.18		0.30	0.29		0.20	0.18		0.20	0.18		0.20	0.18	
AIR CHANGE HEAT LOSS				380			139			47			311			371			551			79			175			113			142			207			100		
AIR CHANGE HEAT GAIN					92			25			3			69			112			155			13			29			8			13			49			10
DUCT LOSS				0			0			0			0			241			0			0			0			0			92			134			0	
DUCT GAIN					0			0			0			0			309			0			0			0			0			26			102			0
HEAT GAIN PEOPLE	240		2		480	0		0	0		0	1		240	1		240	1		240	0		0	1		240	0		0	0		0	0		0	0		0
HEAT GAIN APPLIANCES/LIGHTS					540			0			0			540			540			540			0			540			0			0			0			0
TOTAL HT LOSS BTU/H				2469			902			304			2020			2655			3585			513			1139			506			1013			1478			652		
TOTAL HT GAIN x 1.3 BTU/H					3809			671			92			2880			4425			5168			344			1804			224			373			1457			278

ROOM USE			LIV			DIN			KT/GT			INLAW			LAUN			W/R			FOY			MUD									BAS		
EXP. WALL			25			25			63			23			0			6			23			16									166		
CLG. HT.			10			10			10			10			8			10			10			11									9		
	FACTORS																																					
GRS.WALL AREA	LOSS	GAIN	250			250			630			230			0			60			230			176									996		
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	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0							4	87	64
EAST	21.8	41.6	40	871	1662	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	25	545	1039	0	0	0							0	0	0
SOUTH	21.8	24.9	0	0	0	28	610	697	16	349	398	0	0	0	0	0	0	9	196	224	0	0	0	0	0	0							8	174	199
WEST	21.8	41.6	0	0	0	0	0	0	103	2244	4280	23	501	956	0	0	0	0	0	0	0	0	0	0	0	0							8	174	332
SKYLT.	35.8	101.2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0							0	0	0
DOORS	25.8	4.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	20	517	85	20	517	85							20	517	85
NET EXPOSED WALL	4.2	0.7	210	883	145	222	934	154	511	2149	354	207	871	143	0	0	0	51	214	35	185	778	128	156	656	108							0	0	0
NET EXPOSED BSMT WALL ABOVE GR	3.7	0.6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0							498	1834	302
EXPOSED CLG	1.3	0.6	0	0	0	0	0	0	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	0	0	0							0	0	0
EXPOSED FLOOR	2.6	0.4	0	0	0	0	0	0	0	0	0	0	0	0	36	94	15	0	0	0	0	0	0	0	0	0							0	0	0
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									5591				
SUBTOTAL HT LOSS				1754			1544			4741			1372			239			411			1840			1173									8378				
SUB TOTAL HT GAIN					1807			851			5032			1099			80			259			1252			193											982	
LEVEL FACTOR / MULTIPLIER			0.30	0.29		0.30	0.29		0.30	0.29		0.30	0.29		0.20	0.18		0.30	0.29		0.30	0.29		0.30	0.29								0.50	0.76				
AIR CHANGE HEAT LOSS				506			445			1368			396			43			118			531			338									6359				
AIR CHANGE HEAT GAIN					92			43			256			56			4			13			64			10											50	
DUCT LOSS				0			0			0			0			28			0			0			0													
DUCT GAIN					0			0			0			0			62			0			0			0													
HEAT GAIN PEOPLE	240		0		0	0		0	0		0	1		240	0		0	0		0	0		0	0		0											0	
HEAT GAIN APPLIANCES/LIGHTS					540			540			540			540			540			0			0			0											540	
TOTAL HT LOSS BTU/H				2261			1989			6109			1767			310			529			2370			1511									14737				
TOTAL HT GAIN x 1.3 BTU/H					3171			1864			7576			2515			892			354			1710			264											2044	

TOTAL HEAT GAIN BTU/H: 42432 | TONS: 3.54 | LOSS DUE TO VENTILATION LOAD BTU/H: 3134 | STRUCTURAL HEAT LOSS: 48818 | TOTAL COMBINED HEAT LOSS BTU/H: 51952

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

HVAC DESIGNS LTD.

375 Finley Ave. Suite 202 Ajax, ON L1S 2E2
Tel: 905.619.2300 Fax: 905.619.2375
Web: www.hvacdesigns.ca E-mail: info@hvacdesigns.ca

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

OPT IN LAW - 5 BED 4 BATH
TYPE: 4504 DATE: Jun-21 GFA: 3223 LO# 91147

HEATING CFM	1370	COOLING CFM	1370
TOTAL HEAT LOSS	48,818	TOTAL HEAT GAIN	41,916
AIR FLOW RATE CFM	28.06	AIR FLOW RATE CFM	32.68

furnace pressure	0.6
furnace filter	0.05
a/c coil pressure	0.2
available pressure for s/a & r/a	0.35
plenum pressure s/a	0.18
max s/a dif press. loss	0.02
min adjusted pressure s/a	0.16
r/a pressure	0.17
r/a grille press. Loss	0.02
adjusted pressure r/a	0.15

**CARRIER
59TN6A-060-14V 60
FAN SPEED
LOW 820
MEDLOW 0
MEDIUM 0
MEDIUM HIGH 1370
HIGH 1520

AFUE = 97 %
INPUT (BTU/H) = 60,000
OUTPUT (BTU/H) = **58,000**
DESIGN CFM = **1370**
CFM @ .6 " E.S.P.
TEMPERATURE RISE 39 °F

RUN COUNT	4th	3rd	2nd	1st	Bas
S/A	0	0	16	11	5
R/A	0	0	5	3	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	WIC	MBR	MBR	BED-3	BED-4	BED-5	ENS-4/5	WIC-3	BED-4	BED-2	BED-2	LIV	LIV	KT/GT	KT/GT	KT/GT	LAUN	W/R	FOY	MUD	BAS	BAS	BAS	BAS
RM LOSS MBH.	0.30	1.23	1.23	1.33	1.79	1.14	0.51	1.48	1.79	1.01	1.01	1.13	1.13	2.04	2.04	2.04	0.31	0.53	2.37	1.51	2.95	2.95	2.95	2.95
CFM PER RUN HEAT	9	35	35	37	50	32	14	41	50	28	28	32	32	57	57	57	9	15	67	42	83	83	83	83
RM GAIN MBH.	0.09	1.90	1.90	2.21	2.58	1.80	0.34	1.46	2.58	1.44	1.44	1.59	1.59	2.53	2.53	2.53	0.89	0.35	1.71	0.26	0.41	0.41	0.41	0.41
CFM PER RUN COOLING	3	62	62	72	84	59	11	48	84	47	47	52	52	83	83	83	29	12	56	9	13	13	13	13
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	0.16	0.16	0.16	0.17	0.17	0.17	0.17	0.16	0.16	0.16	0.16
ACTUAL DUCT LGH.	47	69	67	54	81	76	66	72	76	70	66	71	65	43	30	38	55	59	59	51	30	16	27	48
EQUIVALENT LENGTH	140	150	160	120	160	170	170	140	150	140	170	170	170	130	120	140	130	120	160	190	90	120	120	110
TOTAL EFFECTIVE LENGTH	187	219	227	174	241	246	236	212	226	210	236	241	235	173	150	178	185	179	219	241	120	136	147	158
ADJUSTED PRESSURE	0.09	0.08	0.08	0.1	0.07	0.07	0.07	0.08	0.07	0.08	0.07	0.07	0.07	0.09	0.11	0.09	0.09	0.1	0.08	0.07	0.14	0.12	0.11	0.1
ROUND DUCT SIZE	4	5	5	5	**6**	**6**	4	5	**6**	5	5	5	5	**6**	**6**	**6**	4	4	5	5	**6**	**6**	**6**	**6**
HEATING VELOCITY (ft/min)	103	257	257	272	255	163	161	301	255	206	206	235	235	291	291	291	103	172	492	308	423	423	423	423
COOLING VELOCITY (ft/min)	34	455	455	529	428	301	126	352	428	345	345	382	382	423	423	423	333	138	411	66	66	66	66	66
OUTLET GRILL SIZE	3X10	3X10	3X10	3X10	4X10	4X10	3X10	3X10	4X10	3X10	3X10	3X10	3X10	4X10	4X10	4X10	3X10	3X10	3X10	3X10	4X10	4X10	4X10	4X10
TRUNK	D	D	D	C	A	B	B	C	A	E	E	A	A	E	E	D	C	B	A	C	E	E	C	B

RUN #	25	26	27	28	29	30	31	32
ROOM NAME	BAS	DIN	INLAW	ENS	BED-3	ENS-IL	ENS-2	ENS-3
RM LOSS MBH.	2.95	1.99	1.77	0.90	1.33	0.51	0.65	1.01
CFM PER RUN HEAT	83	56	50	25	37	14	18	28
RM GAIN MBH.	0.41	1.86	2.52	0.67	2.21	0.22	0.28	0.37
CFM PER RUN COOLING	13	61	82	22	72	7	9	12
ADJUSTED PRESSURE	0.16	0.17	0.16	0.17	0.17	0.17	0.17	0.17
ACTUAL DUCT LGH.	57	49	44	26	43	44	60	40
EQUIVALENT LENGTH	150	140	150	180	180	110	150	170
TOTAL EFFECTIVE LENGTH	207	189	194	206	223	154	210	210
ADJUSTED PRESSURE	0.08	0.09	0.08	0.08	0.08	0.11	0.08	0.08
ROUND DUCT SIZE	**6**	**6**	**6**	4	5	4	4	4
HEATING VELOCITY (ft/min)	423	286	255	287	272	161	207	321
COOLING VELOCITY (ft/min)	66	311	418	252	529	80	103	138
OUTLET GRILL SIZE	4X10	4X10	4X10	3X10	3X10	3X10	3X10	3X10
TRUNK	A	B	D	C	C	E	C	E

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	314	0.07	9.4	10	x	8	565	TRUNK G	0	0.00	0	0	x	8	0
TRUNK B	514	0.07	11.3	14	x	8	661	TRUNK H	0	0.00	0	0	x	8	0
TRUNK C	806	0.07	13.4	20	x	8	725	TRUNK I	0	0.00	0	0	x	8	0
TRUNK D	186	0.08	7.5	10	x	8	335	TRUNK J	0	0.00	0	0	x	8	0
TRUNK E	564	0.07	11.7	16	x	8	635	TRUNK K	0	0.00	0	0	x	8	0
TRUNK F	1370	0.07	16.3	26	x	10	759	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	245	0.05	9.3	10	x	8	441
TRUNK X	1370	0.05	17.7	30	x	10	658
TRUNK Y	1025	0.05	15.9	22	x	10	671
TRUNK Z	490	0.05	12.1	18	x	8	490
DROP	1370	0.05	17.7	24	x	12	685

RETURN AIR #	1	2	3	4	5	6	7	8									BR
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
AIR VOLUME	115	115	115	115	130	130	305	140	0	0	0	0	0	0	0	0	205
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
ACTUAL DUCT LGH.	85	55	88	78	50	57	37	15	1	1	1	1	1	1	1	1	19
EQUIVALENT LENGTH	195	245	215	235	205	190	245	145	0	0	0	0	0	0	0	0	155
TOTAL EFFECTIVE LH	280	300	303	313	255	247	282	160	1	1	1	1	1	1	1	1	174
ADJUSTED PRESSURE	0.05	0.05	0.05	0.05	0.06	0.06	0.05	0.09	14.80	14.80	14.80	14.80	14.80	14.80	14.80	14.80	0.09
ROUND DUCT SIZE	7	7	7	7	7	7	10.1	6.5	0	0	0	0	0	0	0	0	7.5
INLET GRILL SIZE	8	8	8	8	8	8	8	8	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	X
INLET GRILL SIZE	14	14	14	14	14	14	30	14	0	0	0	0	0	0	0	0	14

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INDIVIDUAL BCIN: 19669 MICHAEL O'ROURKE

RESIDENTIAL MECHANICAL VENTILATION RECORD

For Certification of Design and Performance of Residential Ventilation Systems

W2

A HEATING SYSTEM/ COMBUSTION APPLIANCES

- [✓] Forced Air [ ] Non Forced air
- [ ] Electric [ ] Gas [ ] Oil [ ] Other
- [ ] No Combustion Appliances — *No Depressurization limit*
- [ ] Solid Fuel (including Fireplaces) — *5 pa Depress limit*
- [✓] Direct Vent (sealed combustion) — *No Dep Limit*
- [ ] Positive Venting Induced Draft [ ] — *Pascals limit*
- [ ] Natural Draft or B-Vent Atmospheric — *5 pa depress limit*

Lowest Depressurization Limit [ ] Pa.

B EXHAUST EQUIPMENT

- [✓] Clothes Dryer(s) (150 cfm default)
- [ ] Downdraft Cook Top (220 cfm default)
- [ ] Other (exhaust) (over 150 cfm)

Depressurization test/Calc. Required? [ ] Yes [ ] No

C TOTAL VENTILATION CAPACITY (TVC)

Bsmt & Master Bedroom	2	@ 20 cfm	40	cfm
Other Bedrooms	5	@ 10 cfm	50	cfm
Bathrooms & Kitchens	6	@ 10 cfm	60	cfm
Other Hab. Rooms	5	@ 10 cfm	50	cfm
Total Ventilation Capacity (TVC)			200	cfm

D EXHAUST CAPACITY

Continuous

Minimum Continuous Exhaust

Kitchen(s)		@ 60 cfm	=		cfm
Bathroom(s)		@ 20 cfm	=		cfm
		Total			cfm

Intermittent

Minimum Intermittent Exhaust

Kitchen(s)	1	@ 100 cfm	=	100	cfm
Bathroom(s)	5	@ 50 cfm	=	250	cfm
		Total		350	cfm

E

F TVC SYSTEM

Location: BSMT

Manufacturer/Model: VANEE 65H [✓] HVI rated

Design Airflow 155 cfm high 64 cfm low

HRV/ERV 75 % Sensible Efficiency @ 0°C 64 watts

HRV/ERV 64 % Sensible Efficiency @ -25°C 57 watts

G ADDITIONAL (exhaust) EQUIPMENT

1	Location: ENS	50 cfm	3.5 Sones			
	Manufacturer/Model: N/A			[✓] TVC	[✓] HVI	
2	Location: ENS-4/5	50 cfm	3.5 Sones			
	Manufacturer/Model: N/A			[✓] TVC	[✓] HVI	
3	Location: ENS-2/3	50 cfm	3.5 Sones			
	Manufacturer/Model: N/A			[✓] TVC	[✓] HVI	
4	Location: W/R	50 cfm	3.5 Sones			
	Manufacturer/Model: N/A			[✓] TVC	[✓] HVI	

H LOCATION

Roll #: Permit #:

Lot & Plan:

Civic address:

I BUILDER

Name: ROYAL PINE HOMES House ID#:

Address:

City: P.C.

Phone: Fax:

Email Address:

J DESIGNER

Name: HVAC DESIGNS LTD. HRAI #: 001820

Address: 375 FINLEY AVENUE, UNIT 202

City: AJAX P.C. L1S 2E2

Phone: (905) - 619 - 2300 Fax: (905) - 619 - 2375

Email Address: info@hvacdesigns.ca Other #

I certify this ventilation system design to be in accordance with:

- [✓] CSA F326 M-91
- [ ] R-2000

Signature: Date: 6/10/2021

K INSTALLATION CHECKLIST

- [ ] Controls Functioning
- [ ] Filters Clean
- [ ] Dampers Accessible
- [ ] Drain loop and connection
- [ ] Distribution to all habitable rooms (non forced air)
- [ ] Forced air system [ ] Continuous mode [ ] Interlocked
- [ ] Kitchen intake grease filter
- [ ] Exhaust 4" above grade
- [ ] Supply intake 6' from exhaust (*recommended*)
- [ ] Supply intake 3' from other exhaust
- [ ] Fans operating and clean
- [ ] Flow measuring stations
- [ ] Insulated ducts sealed
- [ ] Label supply/exhaust hood
- [ ] Kitchen exh. 40" to range
- [ ] Supply 18" above grade

L MEASURED TVC SYSTEMS

TVC system SUPPLY airflow measured

[ ] cfm High [ ] cfm Low

TVC system EXHAUST airflow measured

[ ] cfm High [ ] cfm Low

M INSTALLER

Name: HRAI #:

Address:

City: P.C.

Phone: Fax:

Email Address:

I certify this ventilation system install to be in accordance with:

- [ ] CSA F326 M-91
- [ ] R-2000

Signature: Date:

Prepared By: HVAC DESIGNS LTD.	HRAI #: 001820	Job Name:	
Signature:	Date: 6/10/2021	Job #: 91147	Official Use:

HVAC DESIGNS LTD.

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Tel: 905.619.2300 Fax: 905.619.2375
Web: www.hvacdesigns.ca E-mail: info@hvacdesigns.ca

CSA F280-12 Residential Heat Loss and Heat Gain Calculations

Formula Sheet (For Air Leakage / Ventiliation Calculation)

LO#: 91147 Model: 4504 Builder: ROYAL PINE HOMES Date: 6/7/2021

Volume Calculation

House Volume

Level	Floor Area (ft²)	Floor Height (ft)	Volume (ft³)
Bsmt	1453	9	13077
First	1453	10	14530
Second	1770	8	14160
Third	0	9	0
Fourth	0	9	0
		Total:	41,767.0 ft³
		Total:	1182.7 m³

Air Change & Delta T Data

WINTER NATURAL AIR CHANGE RATE	0.219
SUMMER NATURAL AIR CHANGE RATE	0.068

Design Temperature Difference

	Tin °C	Tout °C	ΔT °C	ΔT °F
Winter DTDh	22	-21	43	78
Summer DTDc	24	31	7	13

5.2.3.1 Heat Loss due to Air Leakage

$$HL_{airb} = LR_{airh} \times \frac{V_b}{3.6} \times DTD_h \times 1.2$$

0.219 x 328.53 x 43 °C x 1.2 = 3727 W

= **12718 Btu/h**

6.2.6 Sensible Gain due to Air Leakage

$$HG_{salb} = LR_{airc} \times \frac{V_b}{3.6} \times DTD_c \times 1.2$$

= 0.068 x 328.53 x 7 °C x 1.2 = 191 W

= **652 Btu/h**

5.2.3.2 Heat Loss due to Mechanical Ventilation

$$HL_{vairb} = PVC \times DTD_h \times 1.08 \times (1 - E)$$

149 CFM x 78 °F x 1.08 x 0.25 = **3134 Btu/h**

6.2.7 Sensible heat Gain due to Ventilation

$$HL_{vairb} = PVC \times DTD_h \times 1.08 \times (1 - E)$$

149 CFM x 13 °F x 1.08 x 0.25 = **516 Btu/h**

5.2.3.3 Calculation of Air Change Heat Loss for Each Room (Floor Multiplier Section)

$$HL_{airr} = Level\ Factor \times HL_{airbv} \times \{(HL_{agcr} + HL_{bgcr}) \div (HL_{agclevel} + HL_{bgclevel})\}$$

Level	Level Factor (LF)	HLairve Air Leakage + Ventilation Heat Loss (Btu/h)	Level Conductive Heat Loss: (HL_{clevel})	Air Leakage Heat Loss Multiplier (LF x HLairbv / HLlevel)
1	0.5	12,718	8,378	0.759
2	0.3		13,227	0.288
3	0.2		14,000	0.182
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

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HEAT LOSS AND GAIN SUMMARY SHEET

MODEL: 4504 OPT IN LAW - 5 BED 4 BATH **BUILDER:** ROYAL PINE HOMES
SFQT: 3223 **LO#** 91147 **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):	41767.0	ASSUMED (Y/N):	Y
INTERNAL SHADING:	BLINDS/CURTAINS	ASSUMED OCCUPANTS:	7
INTERIOR LIGHTING LOAD ($Btu/h/ft^2$):	1.27	DC BRUSHLESS MOTOR (Y/N):	Y
FOUNDATION CONFIGURATION	BCIN_1	DEPTH BELOW GRADE:	6.0 ft
LENGTH: 46.0 ft	WIDTH: 37.0 ft	EXPOSED PERIMETER:	166.0 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

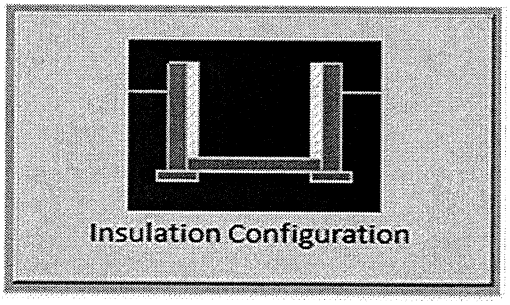
Michael O'Rourke

HVAC Designs Ltd.
375 Finley Ave, Suite 202
Ajax ON, L1S 2E2
905-619-2300

Residential Foundation Thermal Load Calculator

Supplemental tool for CAN/CSA-F280

Weather Station Description	
Province:	Ontario
Region:	Richmond Hill
Site Description	
Soil Conductivity:	Normal conductivity: dry sand, loam, clay
Water Table:	Normal (7-10 m, 23-33 ft)

Foundation Dimensions		
Floor Length (m):	**14.0**	 Insulation Configuration
Floor Width (m):	**11.3**	
Exposed Perimeter (m):	**0.0**	
Wall Height (m):	**2.7**	
Depth Below Grade (m):	**1.83**	
Window Area (m^2):	**1.9**	
Door Area (m^2):	**1.9**	
Radiant Slab		
Heated Fraction of the Slab:	**0**	
Fluid Temperature (°C):	**33**	
Design Months		
Heating Month	**1**	
Foundation Loads		
Heating Load (Watts):	**1638**	

TYPE: 4504
LO# 91147

OPT IN LAW - 5 BED 4 BATH

HVAC Designs Ltd.
375 Finley Ave, Suite 202
Ajax ON, L1S 2E2
905-619-2300

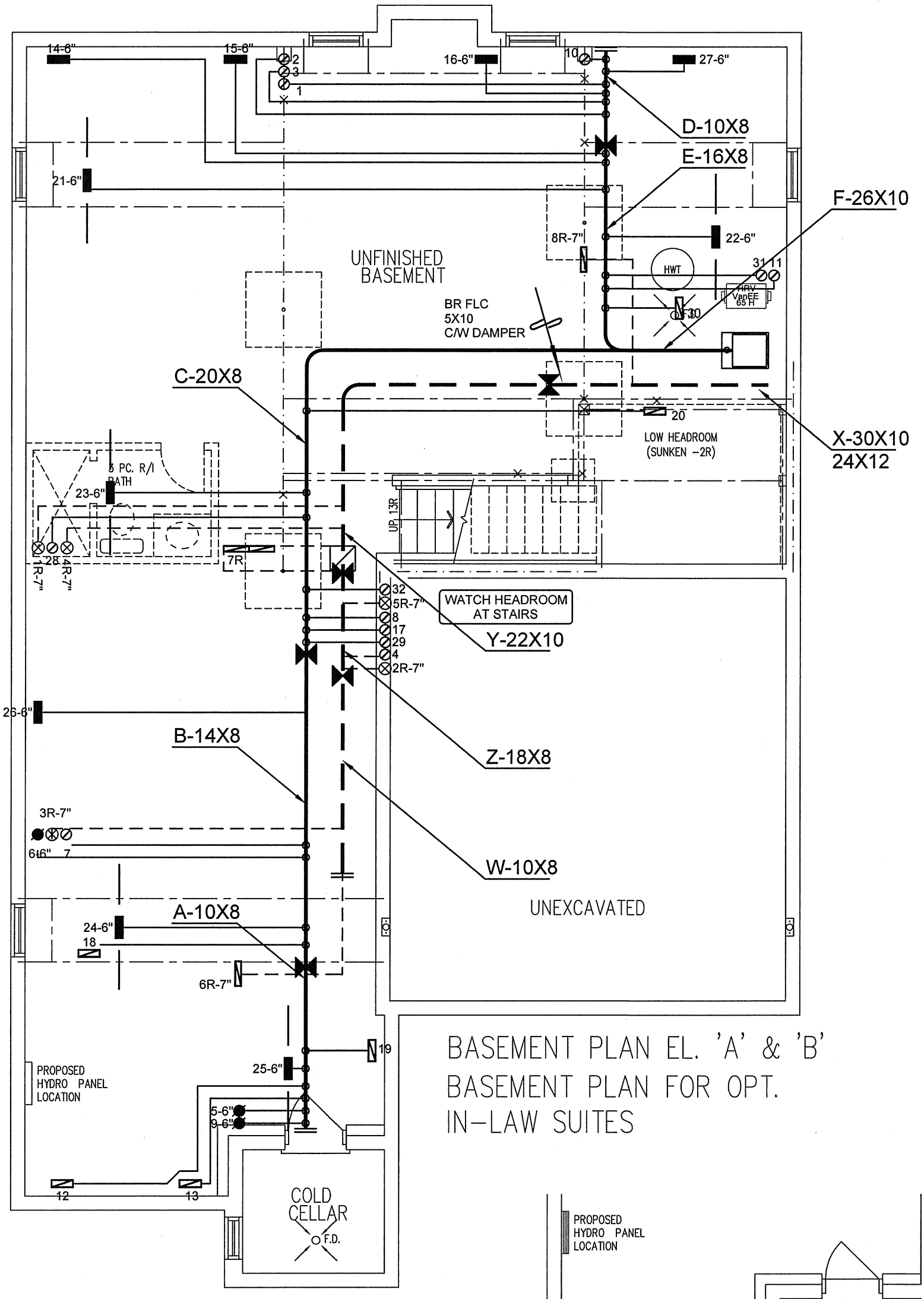
Air Infiltration Residential Load Calculator

Supplemental tool for CAN/CSA-F280

Weather Station Description	
Province:	Ontario
Region:	Richmond Hill
Weather Station Location:	Open flat terrain, grass
Anemometer height (m):	10
Local Shielding	
Building Site:	Suburban, forest
Walls:	Heavy
Flue:	Heavy
Highest Ceiling Height (m):	6.40
Building Configuration	
Type:	Detached
Number of Stories:	Two
Foundation:	Full
House Volume (m^3):	1182.7
Air Leakage/Ventilation	
Air Tightness Type:	Energy Star Detached (2.5 ACH)
Custom BDT Data:	ELA @ 10 Pa. 1104.1 cm^2
	2.50 ACH @ 50 Pa
Mechanical Ventilation (L/s):	Total Supply 70.4 / Total Exhaust 70.4
Flue Size	
Flue #:	#1 #2 #3 #4
Diameter (mm):	0 0 0 0
Natural Infiltration Rates	
Heating Air Leakage Rate (ACH/H):	**0.219**
Cooling Air Leakage Rate (ACH/H):	**0.068**

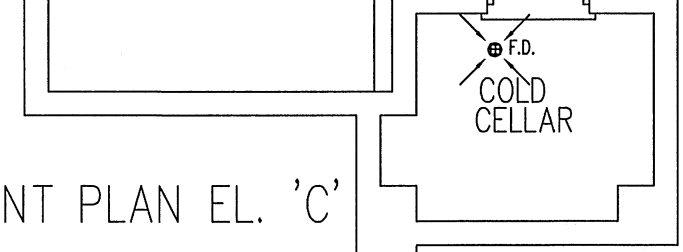
TYPE: 4504
LO# 91147

OPT IN LAW - 5 BED 4 BATH



BASEMENT PLAN EL. 'A' & 'B'

BASEMENT PLAN FOR OPT.
IN-LAW SUITES



BASEMENT PLAN EL. '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, BCIN# 19669
HVAC DESIGNS LTD.

CSA-F280-12

SB-12 PERFORMANCE

HVAC LEGEND

SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION
	SUPPLY AIR GRILLE		6" SUPPLY AIR BOOT ABOVE		14"x8" RETURN AIR GRILLE		RETURN AIR STACK ABOVE
	SUPPLY AIR GRILLE 6" BOOT		SUPPLY AIR STACK FROM 2nd FLOOR		30"x8" RETURN AIR GRILLE		RETURN AIR STACK 2nd FLOOR
	SUPPLY AIR BOOT ABOVE		6" SUPPLY AIR STACK 2nd FLOOR		FRA- FLOOR RETURN AIR GRILLE		REDUCER

No.	Description	Date
3.		
2.		
1.		

REVISIONS

Client

ROYAL PINE HOMES

Project Name

CENTREFIELD (WEST GORMLEY)
RICHMOND HILL, ONTARIO

OPT IN LAW - 5 BED 4 BATH
4504 3223 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.

HEAT LOSS 51952 BTU/H

UNIT DATA

MAKE	CARRIER
MODEL	59TN6A-060-14V
INPUT	60 MBTU/H
OUTPUT	58 MBTU/H
COOLING	3.5 TONS
FAN SPEED	1370 cfm @ 0.6" w.c.

# OF RUNS	S/A	R/A	FANS
3RD FLOOR			
2ND FLOOR	16	5	5
1ST FLOOR	11	3	3
BASEMENT	5	1	0

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

Sheet Title

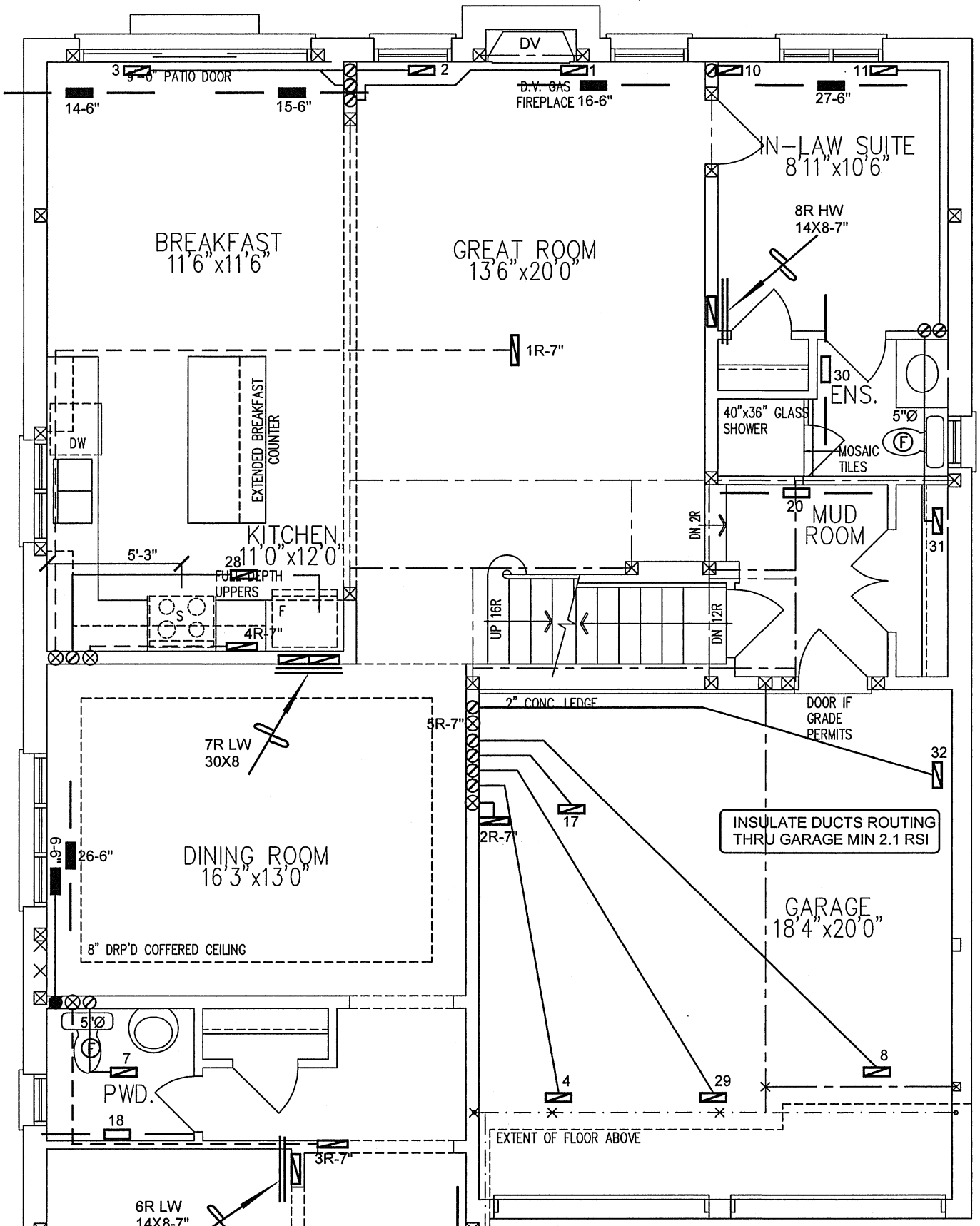
BASEMENT HEATING LAYOUT

Date JUNE/2021

Scale 3/16" = 1'-0"

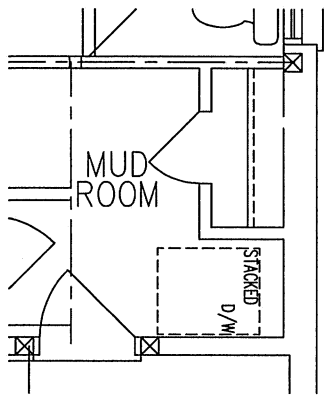
BCIN# 19669

LO# 91147

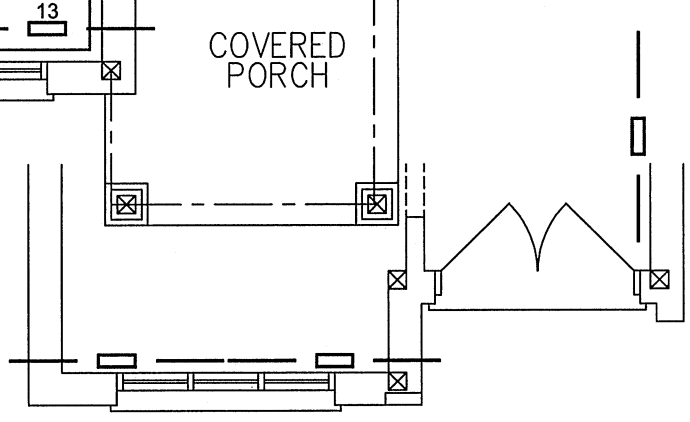


GROUND FLOOR PLAN EL. 'A'

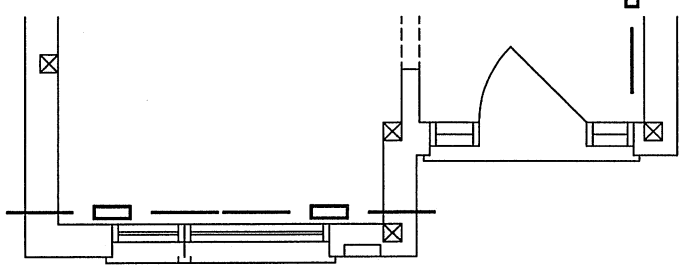
OPT. GROUND FLOOR PLAN W/ IN-LAW SUITE



OPT. IN-LAW SUITE W/ OPT. LAUNDRY



GROUND FLOOR PLAN EL. 'B'



GROUND FLOOR PLAN EL. '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, BCIN# 19669
HVAC DESIGNS LTD.

CSA-F280-12

SB-12 PERFORMANCE

HVAC LEGEND

SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION
— ▭ —	SUPPLY AIR GRILLE	▬	6" SUPPLY AIR BOOT ABOVE	▭	14"x8" RETURN AIR GRILLE	▭	RETURN AIR STACK ABOVE
— ▬ —	SUPPLY AIR GRILLE 6" BOOT	⊘	SUPPLY AIR STACK FROM 2nd FLOOR	▭	30"x8" RETURN AIR GRILLE	▭	RETURN AIR STACK 2nd FLOOR
▭	SUPPLY AIR BOOT ABOVE	●	6" SUPPLY AIR STACK 2nd FLOOR	▬	FRA- FLOOR RETURN AIR GRILLE	⧗	REDUCER

No.	Description	Date
3.		
2.		
1.		

REVISIONS

Client
ROYAL PINE HOMES

Project Name
CENTREFIELD (WEST GORMLEY)
RICHMOND HILL, ONTARIO

OPT IN LAW - 5 BED 4 BATH
4504 3223 sqft

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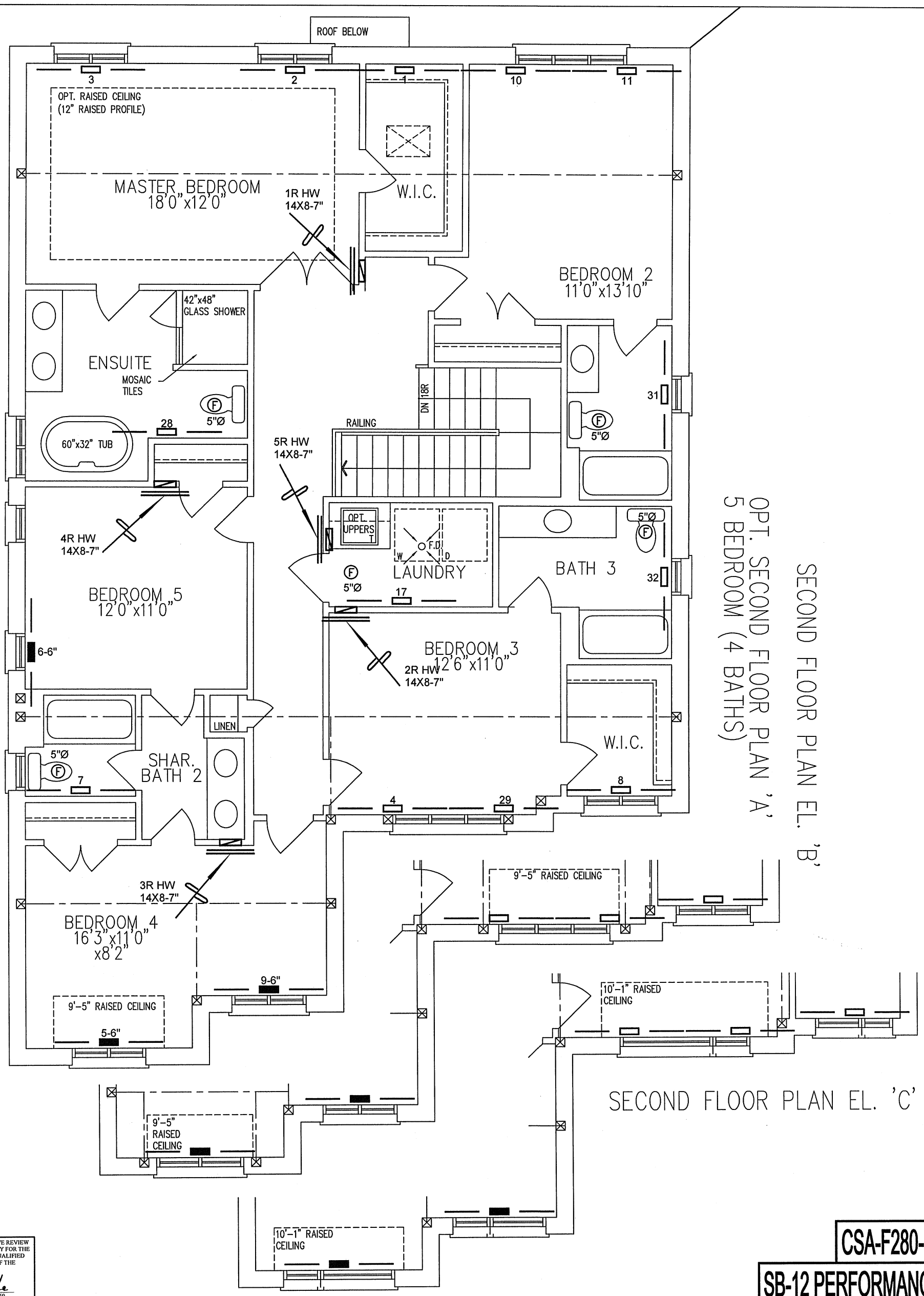
Installation to comply with the latest Ontario Building Code. All supply branch outlets shall be equipped with a manual balancing damper. Ductwork which passes through the garage or unheated spaces shall be adequately insulated and be gas-proofed.

Sheet Title
FIRST FLOOR HEATING LAYOUT

Date JUNE/2021
Scale 3/16" = 1'-0"
BCIN# 19669
LO# 91147



SECOND FLOOR PLAN EL. 'B'

OPT. SECOND FLOOR PLAN 'A'
5 BEDROOM (4 BATHS)

SECOND FLOOR PLAN EL. '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, BCIN# 19669
HVAC DESIGNS LTD.

CSA-F280-12

SB-12 PERFORMANCE

HVAC LEGEND

SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION
— ▭ —	SUPPLY AIR GRILLE	▬	6" SUPPLY AIR BOOT ABOVE	▱	14"x8" RETURN AIR GRILLE	▱	RETURN AIR STACK ABOVE
— ▬ —	SUPPLY AIR GRILLE 6" BOOT	⊘	SUPPLY AIR STACK FROM 2nd FLOOR	▱▱	30"x8" RETURN AIR GRILLE	▱	RETURN AIR STACK 2nd FLOOR
▱	SUPPLY AIR BOOT ABOVE	●	6" SUPPLY AIR STACK 2nd FLOOR	▬	FRA- FLOOR RETURN AIR GRILLE	⧗	REDUCER

No.	Description	Date
3.		
2.		
1.		

REVISIONS

Client
ROYAL PINE HOMES

Project Name
CENTREFIELD (WEST GORMLEY)
RICHMOND HILL, ONTARIO

OPT IN LAW - 5 BED 4 BATH
4504 3223 sqft

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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
SECOND FLOOR HEATING LAYOUT

Date JUNE/2021
Scale 3/16" = 1'-0"
BCIN# 19669
LO# 91147

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	☒ HVAC – House	☐ Building Structural
☐ Small Buildings	☐ Building Services	☐ Plumbing – House
☐ Large Buildings	☐ Detection, Lighting and Power	☐ Plumbing – All Buildings
☐ Complex Buildings	☐ Fire Protection	☐ On-site Sewage Systems

Description of designer's work	
HEAT LOSS / GAIN CALCULATIONS **DUCT SIZING** **RESIDENTIAL MECHANICAL VENTILATION DESIGN SUMMARY** **RESIDENTIAL SYSTEM DESIGN per CSA-F280-12**	**Model:** 4504 OPT IN LAW & OPT. 2ND **Project:** CENTREFIELD (WEST GORMLEY)

D. Declaration of Designer

I **MICHAEL O'ROURKE** 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 Di vision C, of the Building Code.

Individual BCIN: 19669
Basis for exemption from registration and qualification: O.B.C SENTENCE 3.2.4.1 (4)

☐ The design work is exempt from the registration and qualification requirements of the Building Code.
Basis for exemption from registration and qualification: _____

I certify that:

1. The information contained in this schedule is true to the best of my knowledge.
2. I have submitted this application with the knowledge and consent of the firm.

June 7, 2021
Date

Michael O'Rourke
Signature of Designer

NOTE:

1. 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.
2. 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.

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Tel: 905.619.2300 Fax: 905.619.2375
Web: www.hvacdesigns.ca E-mail: info@hvacdesigns.ca

SITE NAME: CENTREFIELD (WEST GORMLEY) | OPT IN LAW & OPT. 2ND | DATE: Jun-21 | WINTER NATURAL AIR CHANGE RATE 0.219 | HEAT LOSS ΔT °F. 78 | CSA-F280-12

BUILDER: ROYAL PINE HOMES | TYPE: 4504 | GFA: 3223 | LO# 90463 | SUMMER NATURAL AIR CHANGE RATE 0.068 | HEAT GAIN ΔT °F. 13 | SB-12 PERFORMANCE

ROOM USE			MBR			ENS			WIC			BED-2			BED-3			BED-4			ENS-4/5			BED-5			ENS-IL			ENS-2/3					
EXP. WALL			32			10			5			37			13			45			6			12			6			23					
CLG. HT.			8			8			8			8			8			8			8			8			10			8					
	FACTORS																																		
GRS.WALL AREA	LOSS	GAIN	256			80			40			296			104			360			48			96			60			184					
GLAZING				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	8	174	128	7	152	112			
EAST	21.8	41.6	0	0	0	0	0	0	0	0	0	0	0	0	47	1024	1953	64	1394	2659	0	0	0	0	0	0	0	0	0	20	436	831			
SOUTH	21.8	24.9	0	0	0	15	327	373	0	0	0	0	0	0	0	0	0	0	0	0	7	152	174	16	349	398	0	0	0	0	0	0			
WEST	21.8	41.6	36	784	1496	0	0	0	0	0	0	26	566	1080	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	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	0	0	0	0	0	0			
NET EXPOSED WALL	4.2	0.7	220	925	152	65	273	45	40	168	28	270	1135	187	57	240	39	296	1245	205	41	172	28	80	336	55	52	219	36	157	660	109			
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	0	0	0	0	0	0			
EXPOSED CLG	1.3	0.6	289	380	170	124	163	73	68	89	40	332	436	195	157	206	92	215	283	126	83	109	49	212	279	125	0	0	0	112	147	66			
NO ATTIC EXPOSED CLG	2.8	1.3	0	0	0	0	0	0	0	0	0	0	0	0	30	84	38	40	112	50	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	187	488	80	0	0	0	0	0	0	0	0	0	0	0	0	112	292	48			
BASEMENT/CRAWL HEAT LOSS				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				
SUBTOTAL HT LOSS				2089			763			258			2138			2042			3034			434			964			393			1688				
SUB TOTAL HT GAIN					1818			491			68			1462			2203			3041			251			578			164			1165			
LEVEL FACTOR / MULTIPLIER			0.20	0.19		0.20	0.19		0.20	0.19		0.20	0.19		0.20	0.19		0.20	0.19		0.20	0.19		0.20	0.19		0.30	0.29		0.20	0.19				
AIR CHANGE HEAT LOSS				389			142			48			398			381			565			81			180			113			315					
AIR CHANGE HEAT GAIN					93			25			3			75			113			156			13			30			8			60			
DUCT LOSS				0			0			0			0			242			0			0			0			0			200				
DUCT GAIN					0			0			0			0			310			0			0			0			0			123			
HEAT GAIN PEOPLE	240		2		480	0		0	0		0	1		240	1		240	1		240	0		0	1		240	0		0	0		0			
HEAT GAIN APPLIANCES/LIGHTS					540			0			0			540			540			540			0			540			0			0			
TOTAL HT LOSS BTU/H				2479			905			306			2537			2665			3599			515			1143			506			2203				
TOTAL HT GAIN x 1.3 BTU/H					3810			671			92			3012			4426			5169			344			1804			224			1752			

ROOM USE			LIV			DIN			KT/GT			INLAW			LAUN			W/R			FOY			MUD						BAS		
EXP. WALL			25			25			63			23			0			6			23			16						166		
CLG. HT.			10			10			10			10			8			10			10			11						9		
	FACTORS																															
GRS.WALL AREA	LOSS	GAIN	250			250			630			230			0			60			230			176						996		
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	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				4	87	64
EAST	21.8	41.6	40	871	1662	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	25	545	1039	0	0	0				0	0	0
SOUTH	21.8	24.9	0	0	0	28	610	697	16	349	398	0	0	0	0	0	0	9	196	224	0	0	0	0	0	0				8	174	199
WEST	21.8	41.6	0	0	0	0	0	0	103	2244	4280	23	501	956	0	0	0	0	0	0	0	0	0	0	0	0				8	174	332
SKYLT.	35.8	101.2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				0	0	0
DOORS	25.8	4.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	20	517	85	20	517	85				20	517	85
NET EXPOSED WALL	4.2	0.7	210	883	145	222	934	154	511	2149	354	207	871	143	0	0	0	51	214	35	185	778	128	156	656	108				0	0	0
NET EXPOSED BSMT WALL ABOVE GR	3.7	0.6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				498	1834	302
EXPOSED CLG	1.3	0.6	0	0	0	0	0	0	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	0	0	0				0	0	0
EXPOSED FLOOR	2.6	0.4	0	0	0	0	0	0	0	0	0	0	0	0	36	94	15	0	0	0	0	0	0	0	0	0				0	0	0
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						5591	
SUBTOTAL HT LOSS				1754			1544			4741			1372			239			411			1840			1173						8378	
SUB TOTAL HT GAIN					1807			851			5032			1099			80			259			1252			193						982	
LEVEL FACTOR / MULTIPLIER			0.30	0.29		0.30	0.29		0.30	0.29		0.30	0.29		0.20	0.19		0.30	0.29		0.30	0.29		0.30	0.29					0.50	0.76	
AIR CHANGE HEAT LOSS				506			445			1368			396			44			118			531			338						6359		
AIR CHANGE HEAT GAIN					93			44			258			56			4			13			64			10						50	
DUCT LOSS				0			0			0			0			28			0			0			0						0		
DUCT GAIN					0			0			0			0			62			0			0			0						0	
HEAT GAIN PEOPLE	240		0		0	0		0	0		0	1		240	0		0	0		0	0		0	0		0				0		0	
HEAT GAIN APPLIANCES/LIGHTS					540			540			540			540			540			0			0			0						540	
TOTAL HT LOSS BTU/H				2261			1989			6109			1767			311			529			2370			1511						14737	
TOTAL HT GAIN x 1.3 BTU/H					3172			1864			7578			2516			892			354			1711			264						2044	

TOTAL HEAT GAIN BTU/H: 42217 | TONS: 3.52 | LOSS DUE TO VENTILATION LOAD BTU/H: 3134 | STRUCTURAL HEAT LOSS: 48442 | TOTAL COMBINED HEAT LOSS BTU/H: 51576

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.

Michael O'Rourke

INDIVIDUAL BCIN: 19669 MICHAEL O'ROURKE

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

OPT IN LAW & OPT. 2ND
TYPE: 4504 DATE: Jun-21 GFA: 3223 LO# 90463

HEATING CFM	1370	COOLING CFM	1370
TOTAL HEAT LOSS	48,442	TOTAL HEAT GAIN	41,702
AIR FLOW RATE CFM	28.28	AIR FLOW RATE CFM	32.85

RUN COUNT	4th	3rd	2nd	1st	Bas
S/A	0	0	14	11	5
R/A	0	0	5	3	1

All S/A diffusers 4"x10" unless noted otherwise on layout.
All S/A runs 5"Ø unless noted otherwise on layout.

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

**CARRIER
59TN6A-060-14V 60

FAN SPEED	
LOW	820
MEDLOW	0
MEDIUM	0
MEDIUM HIGH	1370
HIGH	1520

AFUE = 97 %
INPUT (BTU/H) = 60,000
OUTPUT (BTU/H) = **58,000**
DESIGN CFM = **1370**
CFM @ .6 " E.S.P.
TEMPERATURE RISE 39 °F

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	WIC	MBR	MBR	BED-3	BED-4	BED-5	ENS-4/5	ENS-2/3	BED-4	BED-2	BED-2	LIV	LIV	KT/GT	KT/GT	KT/GT	LAUN	W/R	FOY	MUD	BAS	BAS	BAS	BAS
RM LOSS MBH.	0.31	1.24	1.24	1.33	1.80	1.14	0.51	2.20	1.80	1.27	1.27	1.13	1.13	2.04	2.04	2.04	0.31	0.53	2.37	1.51	2.95	2.95	2.95	2.95
CFM PER RUN HEAT	9	35	35	38	51	32	15	62	51	36	36	32	32	58	58	58	9	15	67	43	83	83	83	83
RM GAIN MBH.	0.09	1.91	1.91	2.21	2.58	1.80	0.34	1.75	2.58	1.51	1.51	1.59	1.59	2.53	2.53	2.53	0.89	0.35	1.71	0.26	0.41	0.41	0.41	0.41
CFM PER RUN COOLING	3	63	63	73	85	59	11	58	85	49	49	52	52	83	83	83	29	12	56	9	13	13	13	13
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	0.16	0.16	0.16	0.17	0.17	0.17	0.17	0.16	0.16	0.16	0.16
ACTUAL DUCT LGH.	47	69	67	54	81	76	66	72	76	70	66	71	65	43	30	38	55	59	59	51	30	16	27	48
EQUIVALENT LENGTH	140	150	160	120	160	170	170	140	150	140	170	170	170	130	120	140	130	120	160	190	90	120	120	110
TOTAL EFFECTIVE LENGTH	187	219	227	174	241	246	236	212	226	210	236	241	235	173	150	178	185	179	219	241	120	136	147	158
ADJUSTED PRESSURE	0.09	0.08	0.08	0.1	0.07	0.07	0.07	0.08	0.07	0.08	0.07	0.07	0.07	0.09	0.11	0.09	0.09	0.1	0.08	0.07	0.14	0.12	0.11	0.1
ROUND DUCT SIZE	4	5	5	5	**6**	**6**	4	5	**6**	5	5	5	5	**6**	**6**	**6**	4	4	5	5	**6**	**6**	**6**	**6**
HEATING VELOCITY (ft/min)	103	257	257	279	260	163	172	455	260	264	264	235	235	296	296	296	103	172	492	316	423	423	423	423
COOLING VELOCITY (ft/min)	34	463	463	536	433	301	126	426	433	360	360	382	382	423	423	423	333	138	411	66	66	66	66	66
OUTLET GRILL SIZE	3X10	3X10	3X10	3X10	4X10	4X10	3X10	3X10	4X10	3X10	3X10	3X10	3X10	4X10	4X10	4X10	3X10	3X10	3X10	3X10	4X10	4X10	4X10	4X10
TRUNK	D	D	D	C	A	B	B	C	A	E	E	A	A	E	E	D	C	B	A	C	E	E	C	B

RUN #	25	26	27	28	29	30
ROOM NAME	BAS	DIN	INLAW	ENS	BED-3	ENS-IL
RM LOSS MBH.	2.95	1.99	1.77	0.91	1.33	0.51
CFM PER RUN HEAT	83	56	50	26	38	14
RM GAIN MBH.	0.41	1.86	2.52	0.67	2.21	0.22
CFM PER RUN COOLING	13	61	83	22	73	7
ADJUSTED PRESSURE	0.16	0.17	0.16	0.17	0.17	0.17
ACTUAL DUCT LGH.	57	49	44	26	43	44
EQUIVALENT LENGTH	150	140	150	180	180	110
TOTAL EFFECTIVE LENGTH	207	189	194	206	223	154
ADJUSTED PRESSURE	0.08	0.09	0.08	0.08	0.08	0.11
ROUND DUCT SIZE	**6**	**6**	**6**	4	5	4
HEATING VELOCITY (ft/min)	423	286	255	298	279	161
COOLING VELOCITY (ft/min)	66	311	423	252	536	80
OUTLET GRILL SIZE	4X10	4X10	4X10	3X10	3X10	3X10
TRUNK	A	B	D	C	C	E

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	316	0.07	9.4	10	x	8	569	TRUNK G	0	0.00	0	0	x	8	0
TRUNK B	517	0.07	11.3	14	x	8	665	TRUNK H	0	0.00	0	0	x	8	0
TRUNK C	816	0.07	13.4	20	x	8	734	TRUNK I	0	0.00	0	0	x	8	0
TRUNK D	187	0.08	7.5	10	x	8	337	TRUNK J	0	0.00	0	0	x	8	0
TRUNK E	555	0.07	11.6	16	x	8	624	TRUNK K	0	0.00	0	0	x	8	0
TRUNK F	1370	0.07	16.3	26	x	10	759	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	245	0.05	9.3	10	x	8	441
TRUNK X	1370	0.05	17.7	30	x	10	658
TRUNK Y	1025	0.05	15.9	22	x	10	671
TRUNK Z	490	0.05	12.1	18	x	8	490
DROP	1370	0.05	17.7	24	x	12	685

RETURN AIR #	1	2	3	4	5	6	7	8								BR
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
AIR VOLUME	115	115	115	115	130	130	305	140	0	0	0	0	0	0	0	205
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.	85	55	88	78	50	57	37	15	1	1	1	1	1	1	1	19
EQUIVALENT LENGTH	195	245	215	235	205	190	245	145	0	0	0	0	0	0	0	155
TOTAL EFFECTIVE LH	280	300	303	313	255	247	282	160	1	1	1	1	1	1	1	174
ADJUSTED PRESSURE	0.05	0.05	0.05	0.05	0.06	0.06	0.05	0.09	14.80	14.80	14.80	14.80	14.80	14.80	14.80	0.09
ROUND DUCT SIZE	7	7	7	7	7	7	10.1	6.5	0	0	0	0	0	0	0	7.5
INLET GRILL SIZE	8	8	8	8	8	8	8	8	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	14	30	14	0	0	0	0	0	0	0	14

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

RESIDENTIAL MECHANICAL VENTILATION RECORD

For Certification of Design and Performance of Residential Ventilation Systems

W2

A HEATING SYSTEM/ COMBUSTION APPLIANCES

- [✓] Forced Air [ ] Non Forced air
- [ ] Electric [ ] Gas [ ] Oil [ ] Other
- [ ] No Combustion Appliances — *No Depressurization limit*
- [ ] Solid Fuel (including Fireplaces) — *5 pa Depress limit*
- [✓] Direct Vent (sealed combustion) — *No Dep Limit*
- [ ] Positive Venting Induced Draft [ ] — *Pascals limit*
- [ ] Natural Draft or B-Vent Atmospheric — *5 pa depress limit*

Lowest Depressurization Limit [ ] Pa.

B EXHAUST EQUIPMENT

- [✓] Clothes Dryer(s) (150 cfm default)
- [ ] Downdraft Cook Top (220 cfm default)
- [ ] Other (exhaust) (over 150 cfm)

Depressurization test/Calc. Required? [ ] Yes [ ] No

C TOTAL VENTILATION CAPACITY (TVC)

Bsmt & Master Bedroom	2	@ 20 cfm	40	cfm
Other Bedrooms	5	@ 10 cfm	50	cfm
Bathrooms & Kitchens	6	@ 10 cfm	60	cfm
Other Hab. Rooms	5	@ 10 cfm	50	cfm
Total Ventilation Capacity (TVC)			200	cfm

D EXHAUST CAPACITY

Continuous

Minimum Continuous Exhaust

Kitchen(s)		@ 60 cfm	=		cfm
Bathroom(s)		@ 20 cfm	=		cfm
		Total			cfm

Intermittent

Minimum Intermittent Exhaust

Kitchen(s)	1	@ 100 cfm	=	100	cfm
Bathroom(s)	5	@ 50 cfm	=	250	cfm
		Total		350	cfm

E F TVC SYSTEM

Location: BSMT

Manufacturer/Model: VANEE 65H [✓] HVI rated

Design Airflow 155 cfm high 64 cfm low

HRV/ERV 75 % Sensible Efficiency @ 0°C 64 watts

HRV/ERV 64 % Sensible Efficiency @ -25°C 57 watts

G ADDITIONAL (exhaust)EQUIPMENT

1	Location: ENS	50 cfm	3.5 Sones			
	Manufacturer/Model: N/A			[✓] TVC	[✓] HVI	
2	Location: ENS-4/5	50 cfm	3.5 Sones			
	Manufacturer/Model: N/A			[✓] TVC	[✓] HVI	
3	Location: ENS-2/3	50 cfm	3.5 Sones			
	Manufacturer/Model: N/A			[✓] TVC	[✓] HVI	
4	Location: W/R	50 cfm	3.5 Sones			
	Manufacturer/Model: N/A			[✓] TVC	[✓] HVI	

H LOCATION

Roll #: Permit #:

Lot & Plan:

Civic address:

I BUILDER

Name: ROYAL PINE HOMES House ID#:

Address:

City: P.C.

Phone: Fax:

Email Address:

J DESIGNER

Name: HVAC DESIGNS LTD. HRAI #: 001820

Address: 375 FINLEY AVENUE, UNIT 202

City: AJAX P.C. L1S 2E2

Phone: (905) - 619 - 2300 Fax: (905) - 619 - 2375

Email Address: info@hvacdesigns.ca Other #

I certify this ventilation system design to be in accordance with:

- [✓] CSA F326 M-91
- [ ] R-2000

Signature: Date: 6/10/2021

K INSTALLATION CHECKLIST

- [ ] Controls Functioning
- [ ] Filters Clean
- [ ] Dampers Accessible
- [ ] Drain loop and connection
- [ ] Distribution to all habitable rooms (non forced air)
- [ ] Forced air system [ ] Continuous mode [ ] Interlocked
- [ ] Kitchen intake grease filter
- [ ] Exhaust 4" above grade
- [ ] Supply intake 6' from exhaust (*recommended*)
- [ ] Supply intake 3' from other exhaust
- [ ] Fans operating and clean
- [ ] Flow measuring stations
- [ ] Insulated ducts sealed
- [ ] Label supply/exhaust hood
- [ ] Kitchen exh. 40" to range
- [ ] Supply 18" above grade

L MEASURED TVC SYSTEMS

TVC system SUPPLY airflow measured

_____ cfm High _____ cfm Low

TVC system EXHAUST airflow measured

_____ cfm High _____ cfm Low

M INSTALLER

Name: HRAI #:

Address:

City: P.C.

Phone: Fax:

Email Address:

I certify this ventilation system install to be in accordance with:

- [ ] CSA F326 M-91
- [ ] R-2000

Signature: Date:

Prepared By: HVAC DESIGNS LTD.	HRAI #: 001820	Job Name:	
Signature:	Date: 6/10/2021	Job #: 90463	Official Use:

HVAC DESIGNS LTD.

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CSA F280-12 Residential Heat Loss and Heat Gain Calculations

Formula Sheet (For Air Leakage / Ventiliation Calculation)

LO#: 90463 Model: 4504 Builder: ROYAL PINE HOMES Date: 6/7/2021

Volume Calculation

House Volume

Level	Floor Area (ft²)	Floor Height (ft)	Volume (ft³)
Bsmt	1453	9	13077
First	1453	10	14530
Second	1770	8	14160
Third	0	9	0
Fourth	0	9	0
		Total:	41,767.0 ft³
		Total:	1182.7 m³

Air Change & Delta T Data

WINTER NATURAL AIR CHANGE RATE	0.219
SUMMER NATURAL AIR CHANGE RATE	0.068

Design Temperature Difference

	Tin °C	Tout °C	ΔT °C	ΔT °F
Winter DTDh	22	-21	43	78
Summer DTDc	24	31	7	13

5.2.3.1 Heat Loss due to Air Leakage

$$HL_{airb} = LR_{airh} \times \frac{V_b}{3.6} \times DTD_h \times 1.2$$

0.219 x 328.53 x 43 °C x 1.2 = 3727 W

= **12718 Btu/h**

6.2.6 Sensible Gain due to Air Leakage

$$HG_{salb} = LR_{airc} \times \frac{V_b}{3.6} \times DTD_c \times 1.2$$

= 0.068 x 328.53 x 7 °C x 1.2 = 191 W

= **652 Btu/h**

5.2.3.2 Heat Loss due to Mechanical Ventilation

$$HL_{vairb} = PVC \times DTD_h \times 1.08 \times (1 - E)$$

149 CFM x 78 °F x 1.08 x 0.25 = **3134 Btu/h**

6.2.7 Sensible heat Gain due to Ventilation

$$HL_{vairb} = PVC \times DTD_h \times 1.08 \times (1 - E)$$

149 CFM x 13 °F x 1.08 x 0.25 = **516 Btu/h**

5.2.3.3 Calculation of Air Change Heat Loss for Each Room (Floor Multiplier Section)

$$HL_{airr} = Level\ Factor \times HL_{airbv} \times \{(HL_{agcr} + HL_{bgcr}) \div (HL_{agclevel} + HL_{bgclevel})\}$$

Level	Level Factor (LF)	HLairve Air Leakage + Ventilation Heat Loss (Btu/h)	Level Conductive Heat Loss: (HL_{clevel})	Air Leakage Heat Loss Multiplier (LF x HLairbv / HLlevel)
1	0.5	12,718	8,378	0.759
2	0.3		13,227	0.288
3	0.2		13,648	0.186
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

HVAC DESIGNS LTD.

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Web: www.hvacdesigns.ca E-mail: info@hvacdesigns.ca

HEAT LOSS AND GAIN SUMMARY SHEET

MODEL: 4504 OPT IN LAW & OPT. 2ND **BUILDER:** ROYAL PINE HOMES
SFQT: 3223 **LO#** 90463 **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):	41767.0	ASSUMED (Y/N):	Y
INTERNAL SHADING:	BLINDS/CURTAINS	ASSUMED OCCUPANTS:	7
INTERIOR LIGHTING LOAD ($Btu/h/ft^2$):	1.27	DC BRUSHLESS MOTOR (Y/N):	Y
FOUNDATION CONFIGURATION	BCIN_1	DEPTH BELOW GRADE:	6.0 ft
LENGTH: 46.0 ft	WIDTH: 37.0 ft	EXPOSED PERIMETER:	166.0 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

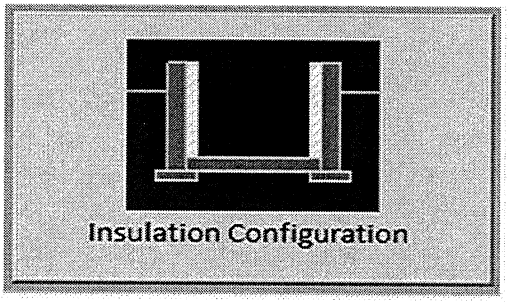
Michael O'Rourke

HVAC Designs Ltd.
375 Finley Ave, Suite 202
Ajax ON, L1S 2E2
905-619-2300

Residential Foundation Thermal Load Calculator

Supplemental tool for CAN/CSA-F280

Weather Station Description	
Province:	Ontario
Region:	Richmond Hill
Site Description	
Soil Conductivity:	Normal conductivity: dry sand, loam, clay
Water Table:	Normal (7-10 m, 23-33 ft)

Foundation Dimensions		
Floor Length (m):	**14.0**	 Insulation Configuration
Floor Width (m):	**11.3**	
Exposed Perimeter (m):	**0.0**	
Wall Height (m):	**2.7**	
Depth Below Grade (m):	**1.83**	
Window Area (m^2):	**1.9**	
Door Area (m^2):	**1.9**	
Radiant Slab		
Heated Fraction of the Slab:	**0**	
Fluid Temperature (°C):	**33**	
Design Months		
Heating Month	**1**	
Foundation Loads		
Heating Load (Watts):	**1638**	

TYPE: 4504
LO# 90463

OPT IN LAW & OPT. 2ND

HVAC Designs Ltd.
375 Finley Ave, Suite 202
Ajax ON, L1S 2E2
905-619-2300

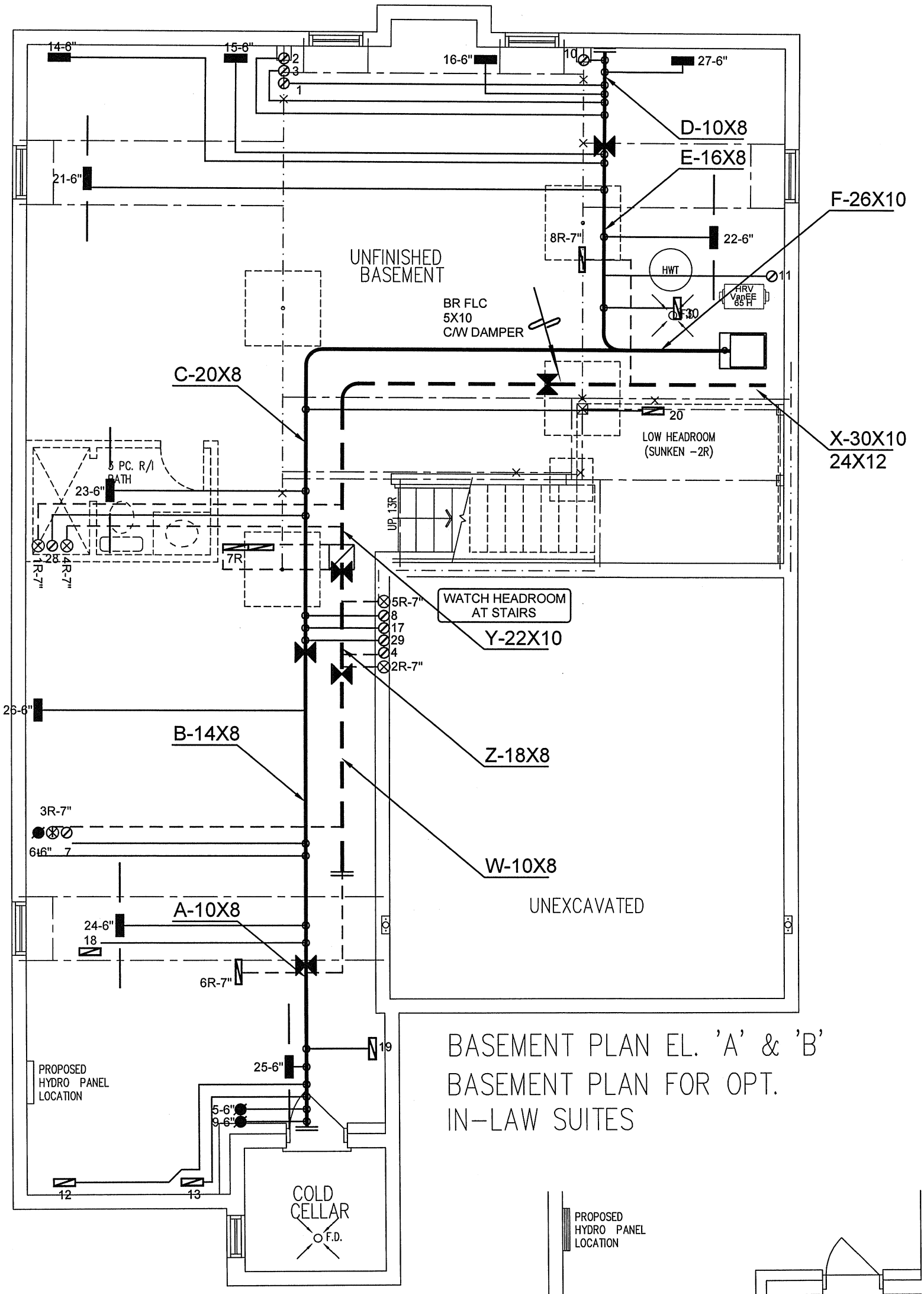
Air Infiltration Residential Load Calculator

Supplemental tool for CAN/CSA-F280

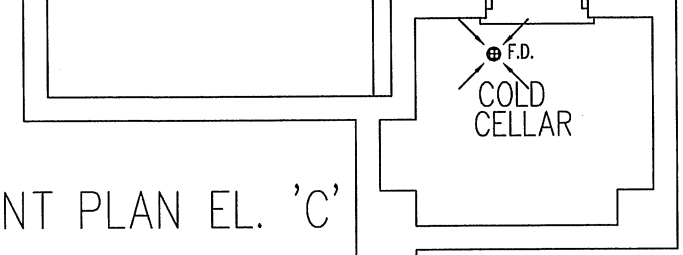
Weather Station Description		
Province:	Ontario	
Region:	Richmond Hill	
Weather Station Location:	Open flat terrain, grass	
Anemometer height (m):	10	
Local Shielding		
Building Site:	Suburban, forest	
Walls:	Heavy	
Flue:	Heavy	
Highest Ceiling Height (m):	6.40	
Building Configuration		
Type:	Detached	
Number of Stories:	Two	
Foundation:	Full	
House Volume (m^3):	1182.7	
Air Leakage/Ventilation		
Air Tightness Type:	Energy Star Detached (2.5 ACH)	
Custom BDT Data:	ELA @ 10 Pa.	1104.1 cm^2
	2.50	ACH @ 50 Pa
Mechanical Ventilation (L/s):	Total Supply	Total Exhaust
	70.4	70.4
Flue Size		
Flue #:	#1 #2 #3 #4	
Diameter (mm):	0 0 0 0	
Natural Infiltration Rates		
Heating Air Leakage Rate (ACH/H):	**0.219**	
Cooling Air Leakage Rate (ACH/H):	**0.068**	

TYPE: 4504
LO# 90463

OPT IN LAW & OPT. 2ND



BASEMENT PLAN EL. 'A' & 'B'
BASEMENT PLAN FOR OPT.
IN-LAW SUITES



BASEMENT PLAN EL. '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, BCIN# 19669
HVAC DESIGNS LTD.

CSA-F280-12

SB-12 PERFORMANCE

HVAC LEGEND

SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION
	SUPPLY AIR GRILLE		6" SUPPLY AIR BOOT ABOVE		14"x8" RETURN AIR GRILLE		RETURN AIR STACK ABOVE
	SUPPLY AIR GRILLE 6" BOOT		SUPPLY AIR STACK FROM 2nd FLOOR		30"x8" RETURN AIR GRILLE		RETURN AIR STACK 2nd FLOOR
	SUPPLY AIR BOOT ABOVE		6" SUPPLY AIR STACK 2nd FLOOR		FRA- FLOOR RETURN AIR GRILLE		REDUCER

No.	Description	Date
3.		
2.		
1.	REVISED AS PER CAD	JUNE/2021

REVISIONS

Client
ROYAL PINE HOMES

Project Name
CENTREFIELD (WEST GORMLEY)
RICHMOND HILL, ONTARIO

OPT IN LAW & OPT. 2ND
4504 3223 sqft

HVAC DESIGNS LTD.
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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.

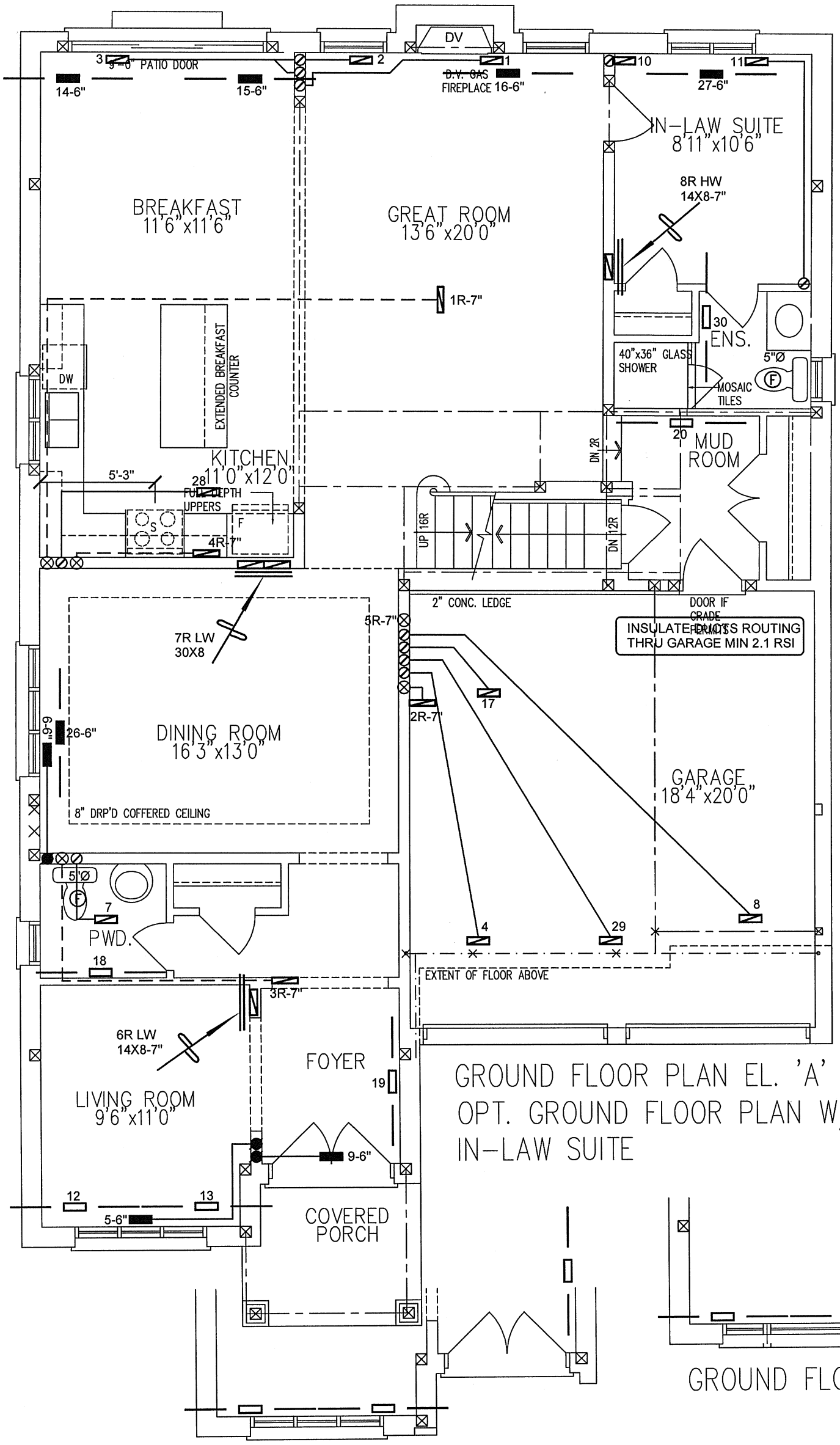
HEAT LOSS 51576 BTU/H	
UNIT DATA	
MAKE	CARRIER
MODEL	59TN6A-060-14V
INPUT	60 MBTU/H
OUTPUT	58 MBTU/H
COOLING	3.5 TONS
FAN SPEED	1370 cfm @ 0.6" w.c.

# OF RUNS	S/A	R/A	FANS
3RD FLOOR			
2ND FLOOR	14	5	4
1ST FLOOR	11	3	3
BASEMENT	5	1	0

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

Sheet Title
BASEMENT HEATING LAYOUT

Date APR/2021
Scale 3/16" = 1'-0"
BCIN# 19669
LO# 90463



GROUND FLOOR PLAN EL. 'A'
OPT. GROUND FLOOR PLAN W/
IN-LAW SUITE

GROUND FLOOR PLAN EL. 'B'

GROUND FLOOR PLAN EL. '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, BCIN# 19669
HVAC DESIGNS LTD.

CSA-F280-12

SB-12 PERFORMANCE

HVAC LEGEND

SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION
— ▭ —	SUPPLY AIR GRILLE	▬	6" SUPPLY AIR BOOT ABOVE	▭	14"x8" RETURN AIR GRILLE	▭	RETURN AIR STACK ABOVE
— ▬ —	SUPPLY AIR GRILLE 6" BOOT	⊘	SUPPLY AIR STACK FROM 2nd FLOOR	▭	30"x8" RETURN AIR GRILLE	⊠	RETURN AIR STACK 2nd FLOOR
▭	SUPPLY AIR BOOT ABOVE	●	6" SUPPLY AIR STACK 2nd FLOOR	▬	FRA- FLOOR RETURN AIR GRILLE	⧗	REDUCER

No.	Description	Date
3.		
2.		
1.	REVISED AS PER CAD	JUNE/2021

REVISIONS

Client
ROYAL PINE HOMES

Project Name
CENTREFIELD (WEST GORMLEY)
RICHMOND HILL, ONTARIO

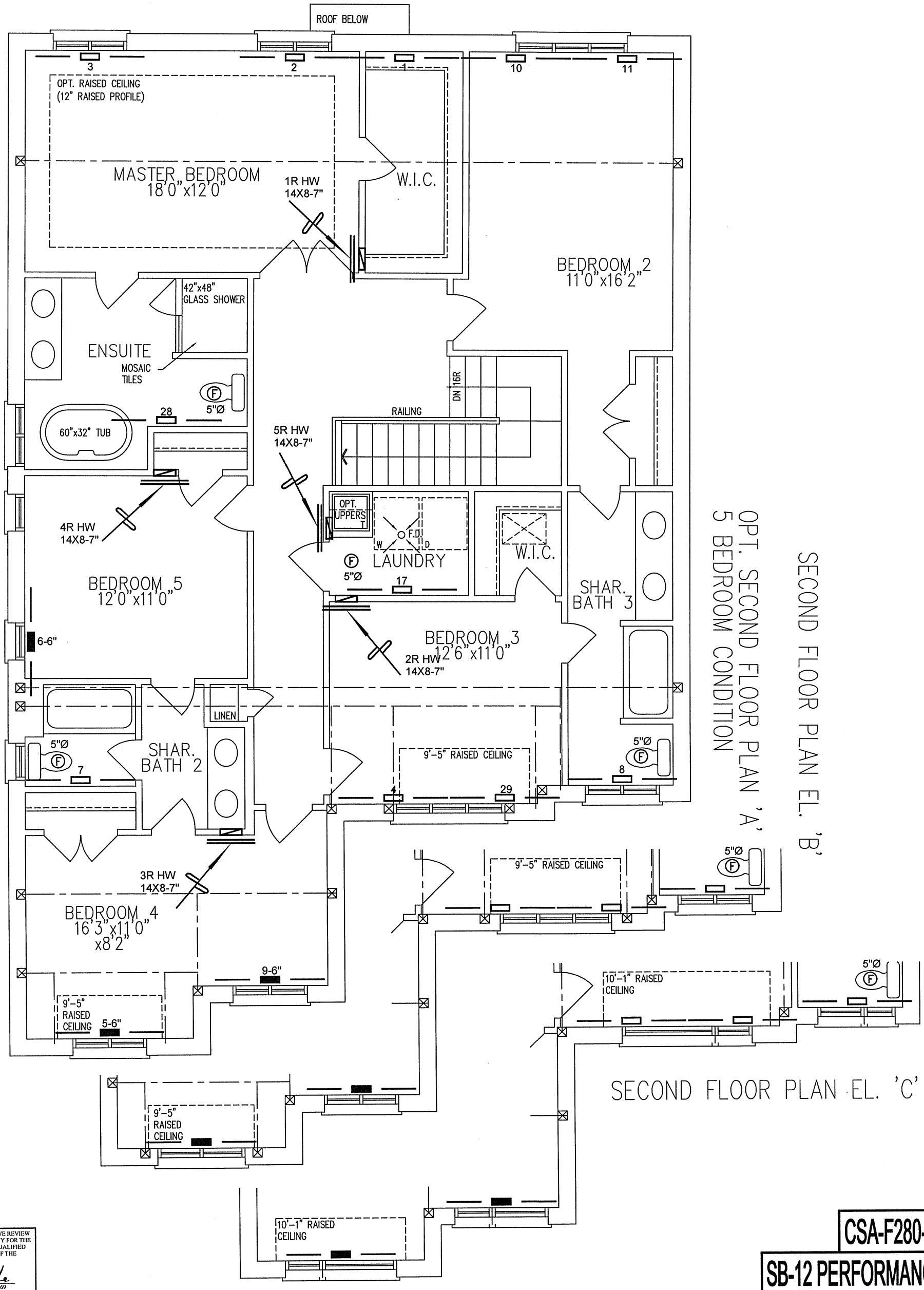
OPT IN LAW & OPT. 2ND
4504 3223 sqft

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.

Sheet Title
FIRST FLOOR HEATING LAYOUT

Date APR/2021
Scale 3/16" = 1'-0"
BCIN# 19669
LO# 90463



SECOND FLOOR PLAN EL. 'B'

OPT. SECOND FLOOR PLAN 'A'
5 BEDROOM CONDITION

SECOND FLOOR PLAN EL. '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, BCIN# 19669
HVAC DESIGNS LTD.

CSA-F280-12

SB-12 PERFORMANCE

HVAC LEGEND

SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION
— ▭ —	SUPPLY AIR GRILLE	▬	6" SUPPLY AIR BOOT ABOVE	▭	14"x8" RETURN AIR GRILLE	▭	RETURN AIR STACK ABOVE
— ▬ —	SUPPLY AIR GRILLE 6" BOOT	⊘	SUPPLY AIR STACK FROM 2nd FLOOR	▭	30"x8" RETURN AIR GRILLE	▭	RETURN AIR STACK 2nd FLOOR
▭	SUPPLY AIR BOOT ABOVE	●	6" SUPPLY AIR STACK 2nd FLOOR	▬	FRA- FLOOR RETURN AIR GRILLE	⧗	REDUCER

No.	Description	Date
3.		
2.		
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Sheet Title
SECOND FLOOR HEATING LAYOUT

Date APR/2021
Scale 3/16" = 1'-0"
BCIN# 19669
LO# 90463

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	**Postal code**	**Plan number/ other description**		
RICHMOND HILL				

B. Individual who reviews and takes responsibility for design activities

Name		Firm		
MICHAEL O'ROURKE		**HVAC DESIGNS LTD.**		
Street address			**Unit no.**	**Lot/con.**
375 FINLEY AVE			**202**	**N/A**
Municipality	**Postal code**	**Province**	**E-mail**	
AJAX	**L1S 2E2**	**ONTARIO**	**info@hvacdesigns.ca**	
Telephone number	**Fax number**		**Cell number**	
(905) 619-2300	**(905) 619-2375**		( )	

C. Design activities undertaken by individual identified in Section B. [Building Code Table 3.5.2.1 OF Division C]

☐ House	☒ HVAC – House	☐ Building Structural
☐ Small Buildings	☐ Building Services	☐ Plumbing – House
☐ Large Buildings	☐ Detection, Lighting and Power	☐ Plumbing – All Buildings
☐ Complex Buildings	☐ Fire Protection	☐ On-site Sewage Systems

Description of designer's work	
HEAT LOSS / GAIN CALCULATIONS **DUCT SIZING** **RESIDENTIAL MECHANICAL VENTILATION DESIGN SUMMARY** **RESIDENTIAL SYSTEM DESIGN per CSA-F280-12**	**Model:** 4504 OPT. IN LAW **Project:** CENTREFIELD (WEST GORMLEY)

D. Declaration of Designer

I **MICHAEL O'ROURKE** 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 Di vision C, of the Building Code.

Individual BCIN: 19669
Basis for exemption from registration and qualification: O.B.C SENTENCE 3.2.4.1 (4)

☐ The design work is exempt from the registration and qualification requirements of the Building Code.
Basis for exemption from registration and qualification: _____

I certify that:

1. The information contained in this schedule is true to the best of my knowledge.
2. I have submitted this application with the knowledge and consent of the firm.

June 7, 2021
Date

Michael O'Rourke
Signature of Designer

NOTE:

1. 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.
2. 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.

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SITE NAME: CENTREFIELD (WEST GORMLEY) OPT. IN LAW DATE: Jun-21 WINTER NATURAL AIR CHANGE RATE 0.219 HEAT LOSS ΔT °F. 78 CSA-F280-12

BUILDER: ROYAL PINE HOMES TYPE: 4504 GFA: 3223 LO# 87513 SUMMER NATURAL AIR CHANGE RATE 0.068 HEAT GAIN ΔT °F. 13 SB-12 PERFORMANCE

ROOM USE			MBR			ENS				BED-2			BED-3			BED-4			BATH					ENS-2			IL-ENS			
EXP. WALL			42			26				35			48			17			7					9			6			
CLG. HT.			8			8				8			8			8			8					8			10			
	FACTORS																													
GRS.WALL AREA	LOSS	GAIN	336			208				280			384			136			56					72			60			
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	0	0	0			7	152	112	8	174	128	
EAST	21.8	41.6	0	0	0	0	0	0		67	1460	2784	64	1394	2659	0	0	0	0	0	0			0	0	0	0	0	0	
SOUTH	21.8	24.9	0	0	0	8	174	199		0	0	0	0	0	0	16	349	398	7	152	174			0	0	0	0	0	0	
WEST	21.8	41.6	36	784	1496	18	392	748		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	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	300	1262	208	182	765	126		213	896	147	320	1346	221	120	505	83	49	206	34			65	273	45	52	219	36	
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	428	562	252	164	216	96		280	368	165	304	400	179	290	381	170	96	126	56			102	134	60	0	0	0	
NO ATTIC EXPOSED CLG	2.8	1.3	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0	0	0	0			0	0	0	0	0	0	
EXPOSED FLOOR	2.6	0.4	0	0	0	0	0	0		280	731	120	0	0	0	0	0	0	0	0	0			5	13	2	0	0	0	
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				2608			1547				3454			3139			1234			485					573			393		
SUB TOTAL HT GAIN					1955			1169				3216			3059			652			265					219			164	
LEVEL FACTOR / MULTIPLIER			0.20	0.19		0.20	0.19			0.20	0.19		0.20	0.19		0.20	0.19		0.20	0.19				0.20	0.19		0.30	0.29		
AIR CHANGE HEAT LOSS				500			296				662			601			236			93					110			113		
AIR CHANGE HEAT GAIN					86			52				142			135			29			12					10			7	
DUCT LOSS				0			0				412			0			0			0					68			0		
DUCT GAIN					0			0				419			0			0			0					23			0	
HEAT GAIN PEOPLE	240		2		480	0		0		1		240	1		240	1		240	0		0			0		0	0		0	
HEAT GAIN APPLIANCES/LIGHTS					595			0				595			595			595			0					0			0	
TOTAL HT LOSS BTU/H				3108			1844				4527			3741			1471			578					751			506		
TOTAL HT GAIN x 1.3 BTU/H					4051			1587				5996			5238			1971			359					327			222	

ROOM USE			LIV			DIN			KT/GT			IN LAW			LAUN			W/R			FOY			MUD			BAS		
EXP. WALL			25			25			63			23			0			6			23			16			166		
CLG. HT.			10			10			10			10			8			10			10			11			9		
	FACTORS																												
GRS.WALL AREA	LOSS	GAIN	250			250			630			230			0			60			230			176			996		
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	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	87	64
EAST	21.8	41.6	40	871	1662	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	25	545	1039	0	0	0	0	0	0
SOUTH	21.8	24.9	0	0	0	28	610	697	16	349	398	0	0	0	0	0	0	9	196	224	0	0	0	0	0	0	8	174	199
WEST	21.8	41.6	0	0	0	0	0	0	103	2244	4280	23	501	956	0	0	0	0	0	0	0	0	0	0	0	0	8	174	332
SKYLT.	35.8	101.2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
DOORS	25.8	4.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	20	517	85	20	517	85	20	517	85
NET EXPOSED WALL	4.2	0.7	210	883	145	222	934	154	511	2149	354	207	871	143	0	0	0	51	214	35	185	778	128	156	656	108	0	0	0
NET EXPOSED BSMT WALL ABOVE GR	3.7	0.6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	498	1834	302
EXPOSED CLG	1.3	0.6	0	0	0	0	0	0	0	0	0	0	0	0	106	139	62	0	0	0	0	0	0	0	0	0	0	0	0
NO ATTIC EXPOSED CLG	2.8	1.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
EXPOSED FLOOR	2.6	0.4	0	0	0	0	0	0	0	0	0	0	0	0	38	99	16	0	0	0	0	0	0	0	0	0	0	0	0
BASEMENT/CRAWL HEAT LOSS				0			0			0			0			0			0			0			0			5591	
SLAB ON GRADE HEAT LOSS				0			0			0			0			0			0			0			0				
SUBTOTAL HT LOSS				1754			1544			4741			1372			239			411			1840			1173			8378	
SUB TOTAL HT GAIN					1807			851			5032			1099			79			259			1252			193			982
LEVEL FACTOR / MULTIPLIER			0.30	0.29		0.30	0.29		0.30	0.29		0.30	0.29		0.20	0.19		0.30	0.29		0.30	0.29		0.30	0.29		0.50	0.76	
AIR CHANGE HEAT LOSS				506			445			1368			396			46			118			531			338			6359	
AIR CHANGE HEAT GAIN					80			38			222			48			3			11			55			9			43
DUCT LOSS				0			0			0			0			28			0			0			0			0	
DUCT GAIN					0			0			0			0			68			0			0			0			0
HEAT GAIN PEOPLE	240		0		0	0		0	0		0	1		240	0		0	0		0	0		0	0		0	0		0	
HEAT GAIN APPLIANCES/LIGHTS					595			595			595			595			595			0			0			595			595
TOTAL HT LOSS BTU/H				2261			1989			6109			1767			313			529			2370			1511			14737	
TOTAL HT GAIN x 1.3 BTU/H					3227			1928			7604			2577			968			352			1699			1036			2107

TOTAL HEAT GAIN BTU/H: 41581 TONS: 3.47 LOSS DUE TO VENTILATION LOAD BTU/H: 2004 STRUCTURAL HEAT LOSS: 48111 TOTAL COMBINED HEAT LOSS BTU/H: 50115

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

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

OPT. IN LAW
TYPE: 4504

DATE: Jun-21

GFA: 3223 LO# 87513

HEATING CFM	1370	COOLING CFM	1370
TOTAL HEAT LOSS	48,111	TOTAL HEAT GAIN	41,251
AIR FLOW RATE CFM	28.48	AIR FLOW RATE CFM	33.21

furnace pressure	0.6
furnace filter	0.05
a/c coil pressure	0.2
available pressure for s/a & r/a	0.35
plenum pressure s/a	0.18
max s/a dif press. loss	0.02
min adjusted pressure s/a	0.16
r/a pressure	0.17
r/a grille press. Loss	0.02
adjusted pressure r/a	0.15

**CARRIER
59TN6A-060-14V 60

FAN SPEED	
LOW	820
MEDLOW	0
MEDIUM	0
MEDIUM HIGH	1370
HIGH	1520

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

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

TEMPERATURE RISE 39 °F

RUN COUNT	4th	3rd	2nd	1st	Bas
S/A	0	0	12	11	5
R/A	0	0	5	3	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	ENS	BED-2	BED-3	BED-4	BATH	BED-2	BED-3	MBR	ENS-2	LIV	LIV	KT/GT	KT/GT	KT/GT	LAUN	W/R	FOY	MUD	BAS	BAS	BAS	BAS
RM LOSS MBH.	1.55	0.92	0.92	2.26	1.87	1.47	0.58	2.26	1.87	1.55	0.75	1.13	1.13	2.04	2.04	2.04	0.31	0.53	2.37	1.51	2.95	2.95	2.95	2.95
CFM PER RUN HEAT	44	26	26	64	53	42	16	64	53	44	21	32	32	58	58	58	9	15	68	43	84	84	84	84
RM GAIN MBH.	2.03	0.79	0.79	3.00	2.62	1.97	0.36	3.00	2.62	2.03	0.33	1.61	1.61	2.53	2.53	2.53	0.97	0.35	1.70	1.04	0.42	0.42	0.42	0.42
CFM PER RUN COOLING	67	26	26	100	87	65	12	100	87	67	11	54	54	84	84	84	32	12	56	34	14	14	14	14
ADJUSTED PRESSURE	0.17	0.17	0.17	0.16	0.16	0.17	0.17	0.16	0.16	0.17	0.17	0.17	0.17	0.16	0.16	0.16	0.17	0.17	0.17	0.17	0.16	0.16	0.16	0.16
ACTUAL DUCT LGH.	47	69	67	54	81	76	66	72	76	70	66	71	65	43	30	38	55	59	59	51	30	16	27	48
EQUIVALENT LENGTH	140	150	160	120	160	170	170	140	150	140	170	170	170	130	120	140	130	120	160	190	90	120	120	110
TOTAL EFFECTIVE LENGTH	187	219	227	174	241	246	236	212	226	210	236	241	235	173	150	178	185	179	219	241	120	136	147	158
ADJUSTED PRESSURE	0.09	0.08	0.08	0.09	0.07	0.07	0.07	0.08	0.07	0.08	0.07	0.07	0.07	0.09	0.11	0.09	0.09	0.1	0.08	0.07	0.14	0.12	0.11	0.1
ROUND DUCT SIZE	5	4	4	**6**	**6**	**6**	4	**6**	**6**	5	4	5	5	**6**	**6**	**6**	4	4	**6**	5	**6**	**6**	**6**	**6**
HEATING VELOCITY (ft/min)	323	298	298	326	270	214	184	326	270	323	241	235	235	296	296	296	103	172	347	316	428	428	428	428
COOLING VELOCITY (ft/min)	492	298	298	510	444	331	138	510	444	492	126	396	396	428	428	428	367	138	286	250	71	71	71	71
OUTLET GRILL SIZE	3X10	3X10	3X10	4X10	4X10	4X10	3X10	4X10	4X10	3X10	3X10	3X10	3X10	4X10	4X10	4X10	3X10	3X10	4X10	3X10	4X10	4X10	4X10	4X10
TRUNK	D	D	D	C	A	B	B	C	A	E	C	A	A	E	E	D	C	B	A	C	E	E	C	B

RUN #	25	26	27	28
ROOM NAME	BAS	DIN	IN LAW	IL-ENS
RM LOSS MBH.	2.95	1.99	1.77	0.51
CFM PER RUN HEAT	84	57	50	14
RM GAIN MBH.	0.42	1.93	2.58	0.22
CFM PER RUN COOLING	14	64	86	7
ADJUSTED PRESSURE	0.16	0.17	0.16	0.17
ACTUAL DUCT LGH.	57	49	44	44
EQUIVALENT LENGTH	150	140	150	110
TOTAL EFFECTIVE LENGTH	207	189	194	154
ADJUSTED PRESSURE	0.08	0.09	0.08	0.11
ROUND DUCT SIZE	**6**	**6**	**6**	4
HEATING VELOCITY (ft/min)	428	291	255	161
COOLING VELOCITY (ft/min)	71	326	438	80
OUTLET GRILL SIZE	4X10	4X10	4X10	3X10
TRUNK	A	B	D	E

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	322	0.07	9.5	12	x	8	483	TRUNK G	0	0.00	0	0	x	8	0
TRUNK B	536	0.07	11.5	16	x	8	603	TRUNK H	0	0.00	0	0	x	8	0
TRUNK C	821	0.07	13.5	20	x	10	591	TRUNK I	0	0.00	0	0	x	8	0
TRUNK D	204	0.08	7.7	10	x	8	367	TRUNK J	0	0.00	0	0	x	8	0
TRUNK E	546	0.08	11.2	14	x	8	702	TRUNK K	0	0.00	0	0	x	8	0
TRUNK F	1370	0.07	16.3	26	x	10	759	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	245	0.05	9.3	10	x	8	441
TRUNK X	1370	0.05	17.7	30	x	10	658
TRUNK Y	1025	0.05	15.9	22	x	10	671
TRUNK Z	490	0.05	12.1	18	x	8	490
DROP	1370	0.05	17.7	24	x	12	685

RETURN AIR #	1	2	3	4	5	6	7	8									BR
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
AIR VOLUME	115	115	115	115	130	130	305	140	0	0	0	0	0	0	0	0	205
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
ACTUAL DUCT LGH.	95	65	98	88	60	67	47	18	1	1	1	1	1	1	1	1	19
EQUIVALENT LENGTH	195	245	215	235	205	190	245	145	0	0	0	0	0	0	0	0	155
TOTAL EFFECTIVE LH	290	310	313	323	265	257	292	163	1	1	1	1	1	1	1	1	174
ADJUSTED PRESSURE	0.05	0.05	0.05	0.05	0.06	0.06	0.05	0.09	14.80	14.80	14.80	14.80	14.80	14.80	14.80	14.80	0.09
ROUND DUCT SIZE	7	7	7	7	7	7	10.1	6.5	0	0	0	0	0	0	0	0	7.5
INLET GRILL SIZE	8	8	8	8	8	8	8	8	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	X
INLET GRILL SIZE	14	14	14	14	14	14	30	14	0	0	0	0	0	0	0	0	14

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

HVAC DESIGNS LTD.

375 Finley Ave. Suite 202 Ajax, ON L1S 2E2
Tel: 905.619.2300 Fax: 905.619.2375
Web: www.hvacdesigns.ca E-mail: info@hvacdesigns.ca

TYPE: 4504 LO # 87513
SITE NAME: CENTREFIELD (WEST GORMLEY) OPT. IN LAW

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	2	@ 21.2 cfm	42.4	cfm
Other Bedrooms	4	@ 10.6 cfm	42.4	cfm
Kitchen & Bathrooms	6	@ 10.6 cfm	63.6	cfm
Other Rooms	6	@ 10.6 cfm	63.6	cfm
Table 9.32.3.A.		TOTAL	212.0	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	95.4	cfm

SUPPLEMENTAL VENTILATION CAPACITY 9.32.3.5.

Total Ventilation Capacity	212	cfm
Less Principal Ventil. Capacity	95.4	cfm
Required Supplemental Capacity	116.6	cfm

PRINCIPAL EXHAUST FAN CAPACITY

Model: VANEE 65H Location: BSMT

95.4 cfm [✓] HVI Approved

PRINCIPAL EXHAUST HEAT LOSS CALCULATION

CFM		ΔT °F		FACTOR		% LOSS
95.4 CFM	X	78 F	X	1.08	X	0.25

SUPPLEMENTAL FANS BY INSTALLING CONTRACTOR

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

HEAT RECOVERY VENTILATOR 9.32.3.11.

Model: VANEE 65H

155 cfm high 64 cfm low

75 % 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: Michael O'Rourke

HRAI # 001820

Date: June-21

I REVIEW AND TAKE RESPONIBILITY 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

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CSA F280-12 Residential Heat Loss and Heat Gain Calculations

Formula Sheet (For Air Leakage / Ventiliation Calculation)

LO#: 87513 Model: 4504 Builder: ROYAL PINE HOMES Date: 6/7/2021

Volume Calculation

House Volume

Level	Floor Area (ft²)	Floor Height (ft)	Volume (ft³)
Bsmt	1453	9	13077
First	1453	10	14530
Second	1770	8	14160
Third	0	9	0
Fourth	0	9	0
		Total:	41,767.0 ft³
		Total:	1182.7 m³

Air Change & Delta T Data

WINTER NATURAL AIR CHANGE RATE	0.219
SUMMER NATURAL AIR CHANGE RATE	0.068

Design Temperature Difference

	Tin °C	Tout °C	ΔT °C	ΔT °F
Winter DTDh	22	-21	43	78
Summer DTDc	24	31	7	13

5.2.3.1 Heat Loss due to Air Leakage

$$HL_{airb} = LR_{airh} \times \frac{V_b}{3.6} \times DTD_h \times 1.2$$

0.219 x 328.53 x 43 °C x 1.2 = 3727 W

= **12718 Btu/h**

6.2.6 Sensible Gain due to Air Leakage

$$HG_{salb} = LR_{airc} \times \frac{V_b}{3.6} \times DTD_c \times 1.2$$

= 0.068 x 328.53 x 7 °C x 1.2 = 191 W

= **652 Btu/h**

5.2.3.2 Heat Loss due to Mechanical Ventilation

$$HL_{vairb} = PVC \times DTD_h \times 1.08 \times (1 - E)$$

95 CFM x 78 °F x 1.08 x 0.25 = **2004 Btu/h**

6.2.7 Sensible heat Gain due to Ventilation

$$HL_{vairb} = PVC \times DTD_h \times 1.08 \times (1 - E)$$

95 CFM x 13 °F x 1.08 x 0.25 = **330 Btu/h**

5.2.3.3 Calculation of Air Change Heat Loss for Each Room (Floor Multiplier Section)

$$HL_{airr} = Level\ Factor \times HL_{airbv} \times \{(HL_{agcr} + HL_{bgcr}) \div (HL_{agclevel} + HL_{bgclevel})\}$$

Level	Level Factor (LF)	HLairve Air Leakage + Ventilation Heat Loss (Btu/h)	Level Conductive Heat Loss: (HL_{clevel})	Air Leakage Heat Loss Multiplier (LF x HLairbv / HLlevel)
1	0.5	12,718	8,378	0.759
2	0.3		13,227	0.288
3	0.2		13,280	0.192
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

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HEAT LOSS AND GAIN SUMMARY SHEET

MODEL: 4504 OPT. IN LAW **BUILDER:** ROYAL PINE HOMES
SFQT: 3223 **LO#** 87513 **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):	41767.0	ASSUMED (Y/N):	Y
INTERNAL SHADING:	BLINDS/CURTAINS	ASSUMED OCCUPANTS:	6
INTERIOR LIGHTING LOAD ($Btu/h/ft^2$):	1.40	DC BRUSHLESS MOTOR (Y/N):	Y
FOUNDATION CONFIGURATION	BCIN_1	DEPTH BELOW GRADE:	6.0 ft
LENGTH: 46.0 ft	WIDTH: 37.0 ft	EXPOSED PERIMETER:	166.0 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

Michael O'Rourke

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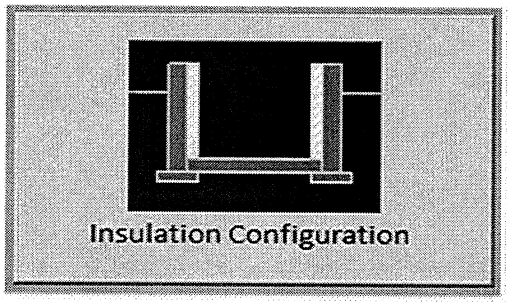
Ajax ON, L1S 2E2
905-619-2300

Residential Foundation Thermal Load Calculator

Supplemental tool for CAN/CSA-F280

Weather Station Description	
Province:	Ontario
Region:	Richmond Hill
Site Description	
Soil Conductivity:	Normal conductivity: dry sand, loam, clay
Water Table:	Normal (7-10 m, 23-33 ft)

Foundation Dimensions		
Floor Length (m):	**14.0**	 Insulation Configuration
Floor Width (m):	**11.3**	
Exposed Perimeter (m):	**0.0**	
Wall Height (m):	**2.7**	
Depth Below Grade (m):	**1.83**	
Window Area (m^2):	**1.9**	
Door Area (m^2):	**1.9**	
Radiant Slab		
Heated Fraction of the Slab:	**0**	
Fluid Temperature (°C):	**33**	
Design Months		
Heating Month	**1**	
Foundation Loads		
Heating Load (Watts):	**1638**	

TYPE: 4504
LO# 87513

OPT. IN LAW

HVAC Designs Ltd.
375 Finley Ave, Suite 202
Ajax ON, L1S 2E2
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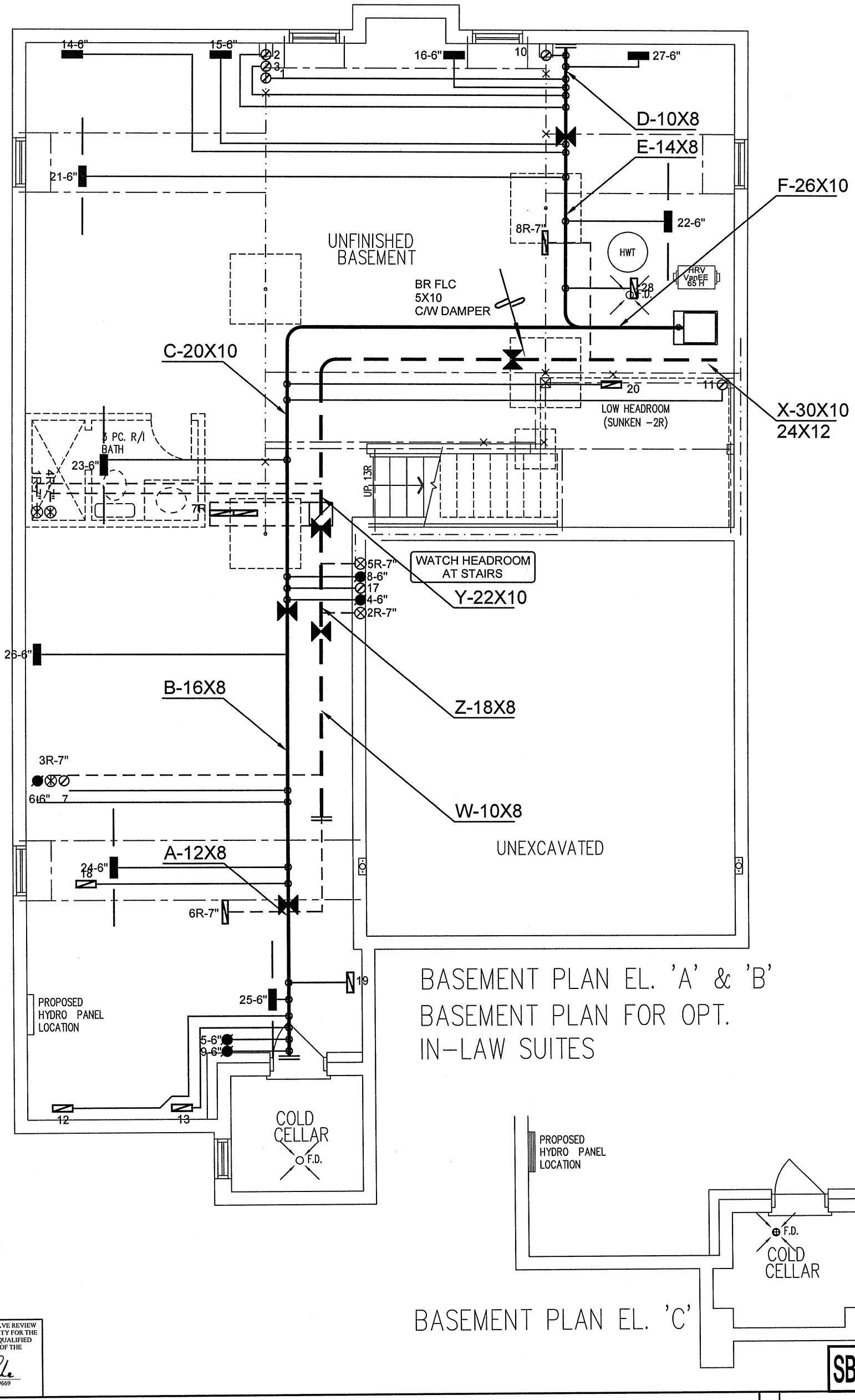
Air Infiltration Residential Load Calculator

Supplemental tool for CAN/CSA-F280

Weather Station Description	
Province:	Ontario
Region:	Richmond Hill
Weather Station Location:	Open flat terrain, grass
Anemometer height (m):	10
Local Shielding	
Building Site:	Suburban, forest
Walls:	Heavy
Flue:	Heavy
Highest Ceiling Height (m):	6.40
Building Configuration	
Type:	Detached
Number of Stories:	Two
Foundation:	Full
House Volume (m^3):	1182.7
Air Leakage/Ventilation	
Air Tightness Type:	Energy Star Detached (2.5 ACH)
Custom BDT Data:	ELA @ 10 Pa. 1104.1 cm^2
	2.50 ACH @ 50 Pa
Mechanical Ventilation (L/s):	Total Supply 45.0 / Total Exhaust 45.0
Flue Size	
Flue #:	#1 #2 #3 #4
Diameter (mm):	0 0 0 0
Natural Infiltration Rates	
Heating Air Leakage Rate (ACH/H):	**0.219**
Cooling Air Leakage Rate (ACH/H):	**0.068**

TYPE: 4504
LO# 87513

OPT. IN LAW



BASEMENT PLAN EL. 'A' & 'B'
BASEMENT PLAN FOR OPT. IN-LAW SUITES

BASEMENT PLAN EL. '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, BCIN# 19669
HVAC DESIGNS LTD.

HVAC LEGEND

SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION
	SUPPLY AIR GRILLE		6" SUPPLY AIR BOOT ABOVE		14"x8" RETURN AIR GRILLE		RETURN AIR STACK ABOVE
	SUPPLY AIR GRILLE 6" BOOT		SUPPLY AIR STACK FROM 2nd FLOOR		30"x8" RETURN AIR GRILLE		RETURN AIR STACK 2nd FLOOR
	SUPPLY AIR BOOT ABOVE		6" SUPPLY AIR STACK 2nd FLOOR		FRA- FLOOR RETURN AIR GRILLE		REDUCER

No.	Description	Date
	REVISIONS	
3.	REVISED AS PER CAD	JUNE/2021
2.	REVISED AS PER ARCHITECTURALS	APR/2021
1.	REVISED TO PERFORMANCE	SEPT/2020

Client
ROYAL PINE HOMES

Project Name
CENTREFIELD (WEST GORMLEY)
RICHMOND HILL, ONTARIO

OPT. IN LAW
4504 3223 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.

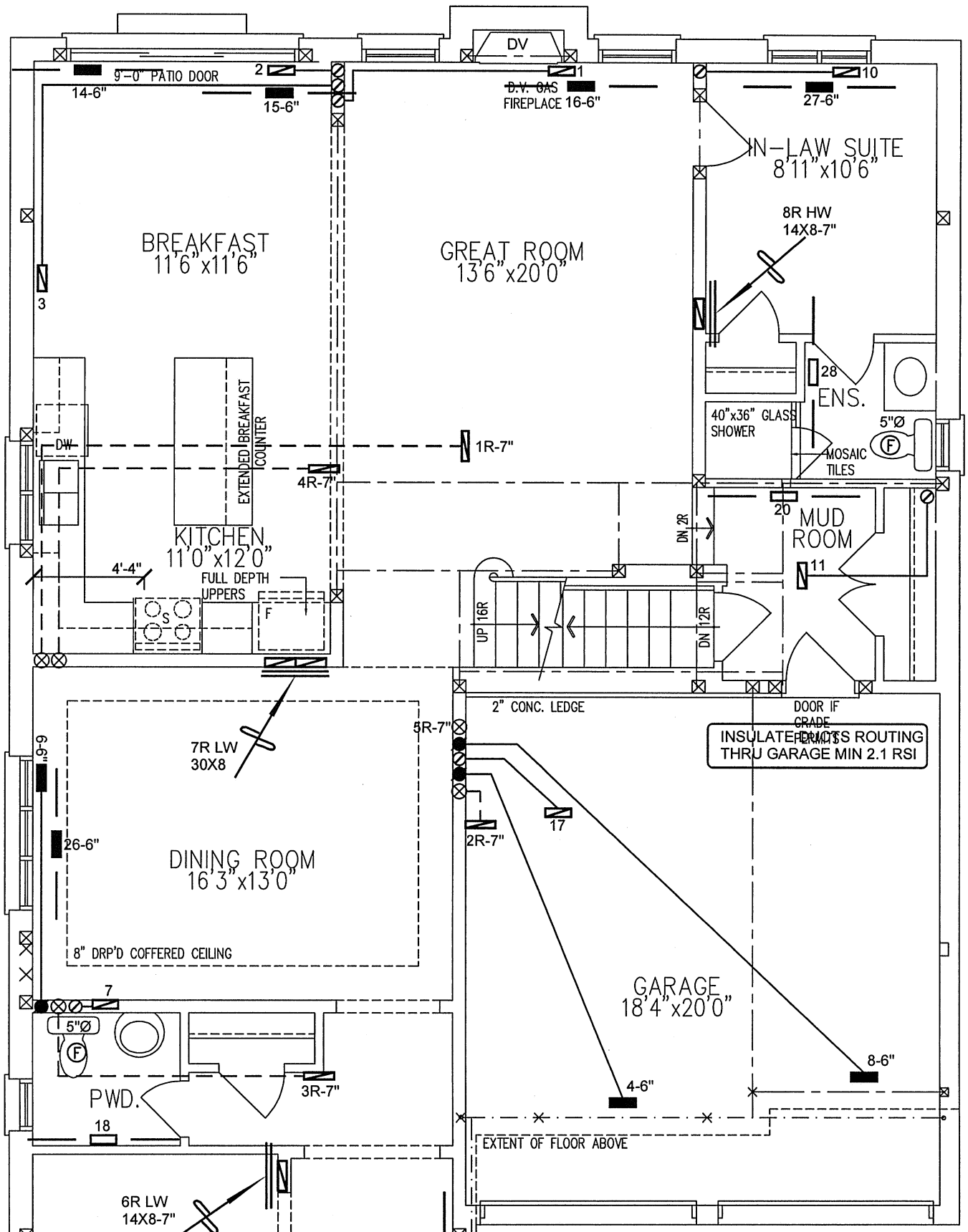
HEAT LOSS 50115 BTU/H	
UNIT DATA	
MAKE	CARRIER
MODEL	59TN6A-060-14V
INPUT	60 MBTU/H
OUTPUT	58 MBTU/H
COOLING	3.5 TONS
FAN SPEED	1370 cfm @ 0.6" w.c.

# OF RUNS	S/A	R/A	FANS
3RD FLOOR			
2ND FLOOR	12	5	5
1ST FLOOR	11	3	3(4)
BASEMENT	5	1	0

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

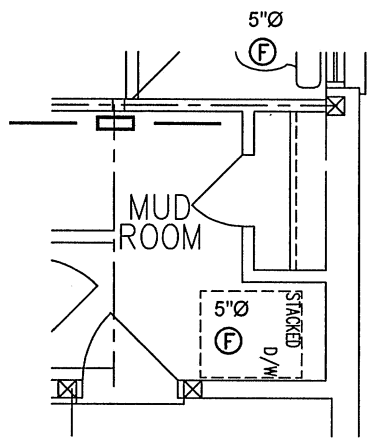
Sheet Title
BASEMENT HEATING LAYOUT

Date SEPT/2020
Scale 3/16" = 1'-0"
BCIN# 19669
LO# 87513

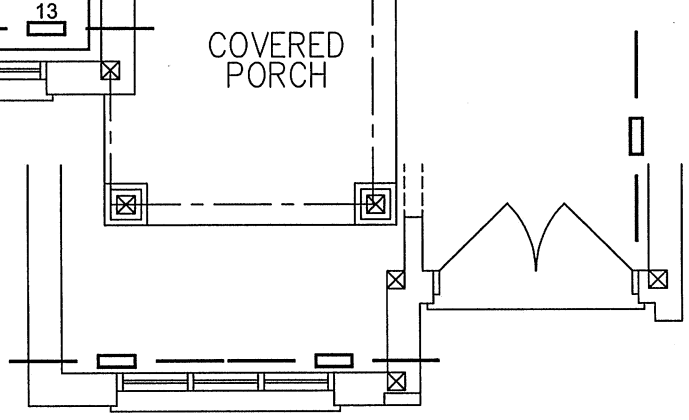


GROUND FLOOR PLAN EL. 'A'

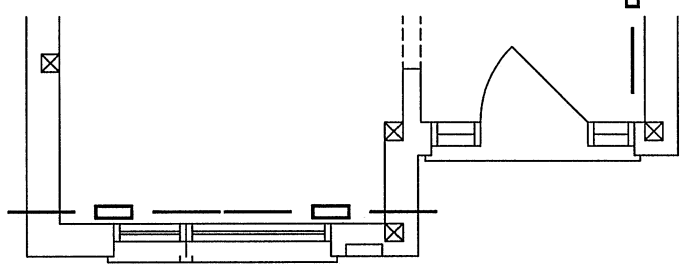
OPT. GROUND FLOOR PLAN W/ IN-LAW SUITE



OPT. IN-LAW SUITE W/ OPT. LAUNDRY



GROUND FLOOR PLAN EL. 'B'



GROUND FLOOR PLAN EL. 'C'

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

CSA-F280-12

SB-12 PERFORMANCE

HVAC LEGEND

SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION
— ▭ —	SUPPLY AIR GRILLE	▬	6" SUPPLY AIR BOOT ABOVE	▱	14"x8" RETURN AIR GRILLE	▱	RETURN AIR STACK ABOVE
— ▬ —	SUPPLY AIR GRILLE 6" BOOT	⊘	SUPPLY AIR STACK FROM 2nd FLOOR	▱	30"x8" RETURN AIR GRILLE	⊠	RETURN AIR STACK 2nd FLOOR
▱	SUPPLY AIR BOOT ABOVE	●	6" SUPPLY AIR STACK 2nd FLOOR	▬	FRA- FLOOR RETURN AIR GRILLE	⧗	REDUCER

No.	Description	Date
	REVISIONS	
3.	REVISED AS PER CAD	JUNE/2021
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1.	REVISED TO PERFORMANCE	SEPT/2020

Client
ROYAL PINE HOMES

Project Name
CENTREFIELD (WEST GORMLEY)
RICHMOND HILL, ONTARIO

OPT. IN LAW
4504 3223 sqft

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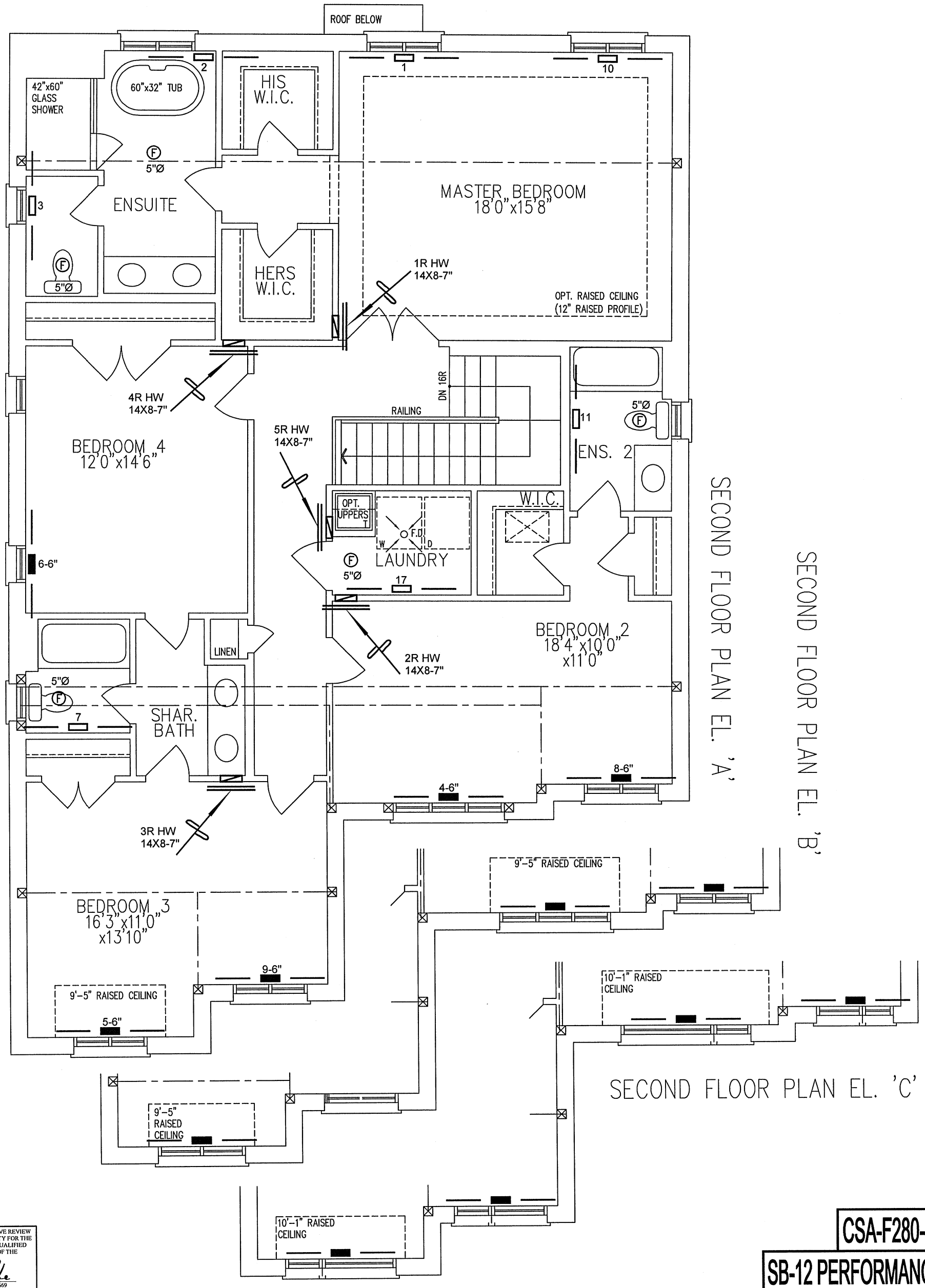
Installation to comply with the latest Ontario Building Code. All supply branch outlets shall be equipped with a manual balancing damper. Ductwork which passes through the garage or unheated spaces shall be adequately insulated and be gas-proofed.

Sheet Title
FIRST FLOOR HEATING LAYOUT

Date SEPT/2020
Scale 3/16" = 1'-0"
BCIN# 19669
LO# 87513



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CSA-F280-12

SB-12 PERFORMANCE

HVAC LEGEND

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	SUPPLY AIR BOOT ABOVE		6" SUPPLY AIR STACK 2nd FLOOR		FRA- FLOOR RETURN AIR GRILLE		REDUCER

No.	Description	Date
3.	REVISED AS PER CAD	JUNE/2021
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1.	REVISED TO PERFORMANCE	SEPT/2020

REVISIONS

Client
ROYAL PINE HOMES

Project Name
CENTREFIELD (WEST GORMLEY)
RICHMOND HILL, ONTARIO

OPT. IN LAW
4504 3223 sqft

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Sheet Title
SECOND FLOOR HEATING LAYOUT

Date SEPT/2020
Scale 3/16" = 1'-0"
BCIN# 19669
LO# 87513