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**		
BRAMPTON				

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:** 41-00 LOT 30 - WUB **Project:** VALES OF HUMBER

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.

March 22, 2022
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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Web: www.hvacdesigns.ca E-mail: info@hvacdesigns.ca

SITE NAME: VALES OF HUMBER | LOT 30 - WUB | DATE: Mar-22 | WINTER NATURAL AIR CHANGE RATE 0.227 | HEAT LOSS ΔT °F. 74 | CSA-F280-12
BUILDER: ROYAL PINE HOMES | TYPE: 41-00 | GFA: 3462 | LO# 93089 | SUMMER NATURAL AIR CHANGE RATE 0.074 | HEAT GAIN ΔT °F. 11 | SB-12 PERFORMANCE

ROOM USE			MBR			ENS				BED-2			BED-3			BED-4			ENS-2			ENS-3			LOFT			S-BATH				
EXP. WALL			39			17				29			35			20			9			9			13			22				
CLG. HT.			9			9				9			9			9			9			9			9			9				
	FACTORS																															
GRS.WALL AREA	LOSS	GAIN	351			153				261			315			180			81			81			117			198				
GLAZING				LOSS	GAIN		LOSS	GAIN			LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		
NORTH	20.8	15.5	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0	9	187	139	0	0	0	0	0	0	0	0	0		
EAST	20.8	41.0	0	0	0	0	0	0		0	0	0	48	997	1970	37	769	1519	0	0	0	11	229	452	0	0	0	29	603	1190		
SOUTH	20.8	24.4	37	769	903	0	0	0		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	37	769	903	10	208	244		
WEST	20.8	41.0	18	374	739	27	561	1108		19	395	780	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
SKYLT.	34.1	100.3	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		
DOORS	24.7	3.7	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	3.5	0.5	296	1026	152	126	437	65		242	839	124	267	926	137	143	496	74	72	250	37	70	243	36	80	277	41	159	551	82		
NET EXPOSED BSMT WALL ABOVE GR	3.5	0.5	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	357	447	199	223	279	124		208	261	116	241	302	134	187	234	104	90	113	50	100	125	56	208	261	116	117	147	65		
NO ATTIC EXPOSED CLG	2.7	1.2	28	75	33	0	0	0		0	0	0	20	54	24	21	56	25	0	0	0	0	0	0	0	0	0	0	0	0		
EXPOSED FLOOR	2.5	0.4	0	0	0	0	0	0		0	0	0	261	650	96	0	0	0	0	0	0	100	249	37	0	0	0	0	0	0		
BASEMENT/CRAWL HEAT LOSS				0			0				0			0			0			0			0			0			0			
SLAB ON GRADE HEAT LOSS				0			0				0			0			0			0			0			0			0			
SUBTOTAL HT LOSS				2691			1277				1494			2929			1555			549			846			1307			1508			
SUB TOTAL HT GAIN					2026			1297				1020			2362			1722			226			580			1060			1581		
LEVEL FACTOR / MULTIPLIER			0.20	0.20		0.20	0.20			0.20	0.20		0.20	0.20		0.20	0.20		0.20	0.20		0.20	0.20		0.20	0.20		0.20	0.20			
AIR CHANGE HEAT LOSS				547			260				304			596			316			112			172			266			307			
AIR CHANGE HEAT GAIN					84			54				42			97			71			9			24			44			65		
DUCT LOSS				0			0				0			352			0			0			102			0			0			
DUCT GAIN					0			0				0			334			0			0			60			0			0		
HEAT GAIN PEOPLE	240		2		480	0		0		1		240	1		240	1		240	0		0	0		0	0		0	0		0		
HEAT GAIN APPLIANCES/LIGHTS					639			0				639			639			639			0			0			639			0		
TOTAL HT LOSS BTU/H				3239			1537				1798			3877			1871			661			1119			1572			1815			
TOTAL HT GAIN x 1.3 BTU/H					4197			1756				2523			4773			3472			306			864			2265			2140		

ROOM USE			GRT			LV/DN			KT/BF				LND			PWD			FOY			MUD					WUB			BAS		
EXP. WALL			42			37			42				0			6			36			25					35			153		
CLG. HT.			10			10			10				9			10			11			11					10			10		
	FACTORS																															
GRS.WALL AREA	LOSS	GAIN	420			370			420				0			60			396			275					350			1071		
GLAZING				LOSS	GAIN		LOSS	GAIN		LOSS	GAIN			LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN				LOSS	GAIN		LOSS	GAIN
NORTH	20.8	15.5	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0	0	0	0			0	0	0	3	62	46
EAST	20.8	41.0	0	0	0	36	748	1478	0	0	0		0	0	0	0	0	0	6	125	246	0	0	0			0	0	0	0	0	0
SOUTH	20.8	24.4	0	0	0	60	1247	1464	0	0	0		0	0	0	0	0	0	0	0	0	0	0	0			0	0	0	6	125	146
WEST	20.8	41.0	48	997	1970	0	0	0	88	1828	3612		0	0	0	0	0	0	0	0	0	0	0	0			3	62	123	3	62	123
SKYLT.	34.1	100.3	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
DOORS	24.7	3.7	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0	40	986	146	40	986	146			20	493	73	0	0	0
NET EXPOSED WALL	3.5	0.5	372	1290	191	274	950	141	332	1151	171		0	0	0	60	208	31	350	1214	180	235	815	121			327	1134	168	0	0	0
NET EXPOSED BSMT WALL ABOVE GR	3.5	0.5	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0	0	0	0			0	0	0	459	1613	239
EXPOSED CLG	1.3	0.6	0	0	0	0	0	0	0	0	0		114	143	64	0	0	0	0	0	0	0	0	0			0	0	0	0	0	0
NO ATTIC EXPOSED CLG	2.7	1.2	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
EXPOSED FLOOR	2.5	0.4	0	0	0	0	0	0	0	0	0		23	57	8	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							5331		
SLAB ON GRADE HEAT LOSS				0			0			0				0			0			0			0					395				
SUBTOTAL HT LOSS				2287			2945			2979				200			208			2324			1801					2084			7193		
SUB TOTAL HT GAIN					2162			3082			3783				72			31			572			267						364			555
LEVEL FACTOR / MULTIPLIER			0.30	0.35		0.30	0.35		0.30	0.35			0.20	0.20		0.30	0.35		0.30	0.35		0.30	0.35							0.50	0.79	
AIR CHANGE HEAT LOSS				798			1028			1040				41			73			811			629							7299		
AIR CHANGE HEAT GAIN					89			127			156				3			1			24			11								38	
DUCT LOSS				0			0			0				24			0			0			0							0		
DUCT GAIN					0			0			0				71			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					639			639			639				639			0			0			0					0			639
TOTAL HT LOSS BTU/H				3086			3973			4020				265			281			3136			2430					2084			14492	
TOTAL HT GAIN x 1.3 BTU/H					3756			5002			5951				1020			42			775			361						474			1601

TOTAL HEAT GAIN BTU/H: 41515 | TONS: 3.46 | LOSS DUE TO VENTILATION LOAD BTU/H: 1593 | STRUCTURAL HEAT LOSS: 51255 | TOTAL COMBINED HEAT LOSS BTU/H: 52848

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: VALES OF HUMBER — LOT 30 - WUB
BUILDER: ROYAL PINE HOMES — TYPE: 41-00 — DATE: Mar-22 — GFA: 3462 — LO# 93089

HEATING CFM	1370		COOLING CFM	1370			furnace pressure	0.6																
TOTAL HEAT LOSS	51,255		TOTAL HEAT GAIN	41,279			furnace filter	0.05																
AIR FLOW RATE CFM	26.73		AIR FLOW RATE CFM	33.19			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	0.03			r/a grille press. Loss	0.02												
							min adjusted pressure s/a	0.15			adjusted pressure r/a	0.15												

#CARRIER
59SP5A-80-16 80
FAN SPEED
LOW 0
MEDLOW 975
MEDIUM 1200
MEDIUM HIGH 1370
HIGH 1540

AFUE = 97 %
INPUT (BTU/H) = 80,000
OUTPUT (BTU/H) = **78,000**
DESIGN CFM = **1370**
CFM @ .6 " E.S.P.
TEMPERATURE RISE 53 °F

RUN COUNT	4th	3rd	2nd	1st	Bas
S/A	0	0	13	9	4
R/A	0	0	6	2	1

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

RUN #	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
ROOM NAME	MBR	ENS	BED-3	BED-2	BED-3	BED-4	ENS-2	ENS-3	LOFT	MBR	S-BATH	GRT	LV/DN	KT/BF	KT/BF	GRT	LND	PWD	FOY	MUD	BAS	BAS	BAS	BAS
RM LOSS MBH.	1.62	1.54	1.94	1.80	1.94	0.94	0.66	1.12	1.57	1.62	1.81	1.54	1.99	2.01	2.01	1.54	0.26	0.28	3.14	2.43	4.14	4.14	4.14	4.14
CFM PER RUN HEAT	43	41	52	48	52	25	18	30	42	43	49	41	53	54	54	41	7	8	84	65	111	111	111	111
RM GAIN MBH.	2.10	1.76	2.39	2.52	2.39	1.74	0.31	0.86	2.26	2.10	2.14	1.88	2.50	2.98	2.98	1.88	1.02	0.04	0.77	0.36	0.52	0.52	0.52	0.52
CFM PER RUN COOLING	70	58	79	84	79	58	10	29	75	70	71	62	83	99	99	62	34	1	26	12	17	17	17	17
ADJUSTED PRESSURE	0.17	0.17	0.17	0.16	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.16	0.16	0.16	0.17	0.17	0.17	0.16	0.17	0.15	0.15	0.15	0.15
ACTUAL DUCT LGH.	32	48	69	58	77	60	55	61	23	22	47	27	39	32	42	16	45	34	39	41	24	45	26	32
EQUIVALENT LENGTH	100	160	180	150	160	160	170	180	180	180	210	100	150	160	140	150	160	170	120	170	100	100	150	100
TOTAL EFFECTIVE LENGTH	132	208	249	208	237	220	225	241	203	202	257	127	189	192	182	166	205	204	159	211	124	145	176	132
ADJUSTED PRESSURE	0.13	0.08	0.07	0.08	0.07	0.08	0.08	0.07	0.08	0.09	0.07	0.14	0.09	0.08	0.09	0.1	0.08	0.08	0.1	0.08	0.12	0.1	0.09	0.12
ROUND DUCT SIZE	5	5	**6**	**6**	**6**	5	4	4	**6**	5	**6**	5	**6**	**6**	**6**	5	4	4	**6**	5	**6**	**6**	**6**	**6**
HEATING VELOCITY (ft/min)	316	301	265	245	265	184	207	344	214	316	250	301	270	275	275	301	80	92	428	477	566	566	566	566
COOLING VELOCITY (ft/min)	514	426	403	428	403	426	115	333	382	514	362	455	423	505	505	455	390	11	133	88	87	87	87	87
OUTLET GRILL SIZE	3X10	3X10	4X10	4X10	4X10	3X10	3X10	3X10	4X10	3X10	4X10	3X10	4X10	4X10	4X10	3X10	3X10	3X10	4X10	3X10	4X10	4X10	4X10	4X10
TRUNK	D	C	A	C	A	A	C	A	D	D	A	D	B	C	C	D	C	B	A	B	D	C	B	B

RUN #	25	26
ROOM NAME	BED-4	LV/DN
RM LOSS MBH.	0.94	1.99
CFM PER RUN HEAT	25	53
RM GAIN MBH.	1.74	2.50
CFM PER RUN COOLING	58	83
ADJUSTED PRESSURE	0.17	0.16
ACTUAL DUCT LGH.	54	35
EQUIVALENT LENGTH	110	120
TOTAL EFFECTIVE LENGTH	164	155
ADJUSTED PRESSURE	0.1	0.1
ROUND DUCT SIZE	5	**6**
HEATING VELOCITY (ft/min)	184	270
COOLING VELOCITY (ft/min)	426	423
OUTLET GRILL SIZE	3X10	4X10
TRUNK	A	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	317	0.07	9.4	12	x	8	476	TRUNK G	0	0.00	0	0	x	8	0
TRUNK B	718	0.07	12.8	20	x	8	646	TRUNK H	0	0.00	0	0	x	8	0
TRUNK C	333	0.08	9.3	10	x	8	599	TRUNK I	0	0.00	0	0	x	8	0
TRUNK D	1372	0.07	16.3	30	x	8	823	TRUNK J	0	0.00	0	0	x	8	0
TRUNK E	0	0.00	0	0	x	8	0	TRUNK K	0	0.00	0	0	x	8	0
TRUNK F	0	0.00	0	0	x	8	0	TRUNK L	0	0.00	0	0	x	8	0

RETURN AIR TRUNK SIZE

	TRUNK CFM	STATIC PRESS.	ROUND DUCT	RECT DUCT			VELOCITY (ft/min)
TRUNK O	0	0.05	0	0	x	8	0
TRUNK P	0	0.05	0	0	x	8	0
TRUNK Q	0	0.05	0	0	x	8	0
TRUNK R	0	0.05	0	0	x	8	0
TRUNK S	0	0.05	0	0	x	8	0
TRUNK T	0	0.05	0	0	x	8	0
TRUNK U	0	0.05	0	0	x	8	0
TRUNK V	0	0.05	0	0	x	8	0
TRUNK W	0	0.05	0	0	x	8	0
TRUNK X	1370	0.05	17.7	28	x	10	**705**
TRUNK Y	645	0.05	13.4	20	x	8	581
TRUNK Z	400	0.05	11.2	14	x	8	514
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	130	130	130	115	115	330	155	0	0	0	0	0	0	0	150
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.	48	58	44	53	68	63	22	27	1	1	1	1	1	1	1	21
EQUIVALENT LENGTH	225	205	185	175	260	255	235	220	0	0	0	0	0	0	0	275
TOTAL EFFECTIVE LH	273	263	229	228	328	318	257	247	1	1	1	1	1	1	1	296
ADJUSTED PRESSURE	0.05	0.06	0.06	0.06	0.05	0.05	0.06	0.06	14.80	14.80	14.80	14.80	14.80	14.80	14.80	0.05
ROUND DUCT SIZE	7	7	7	7	7	7	9.9	7.5	0	0	0	0	0	0	0	7.8
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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Tel: 905.619.2300 Fax: 905.619.2375
Web: www.hvacdesigns.ca E-mail: info@hvacdesigns.ca

TYPE: 41-00 LO # 93089
SITE NAME: VALES OF HUMBER LOT 30 - WUB

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	6	@ 10.6 cfm	63.6	cfm
Other Rooms	4	@ 10.6 cfm	42.4	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 V150H Location: BSMT

79.5 cfm [✓] HVI Approved

PRINCIPAL EXHAUST HEAT LOSS CALCULATION

CFM		ΔT °F		FACTOR		% LOSS
79.5 CFM	X	74 F	X	1.08	X	0.25

SUPPLEMENTAL FANS BY INSTALLING CONTRACTOR

Location	Model	cfm	HVI	Sones
ENS	BY INSTALLING CONTRACTOR	50	✓	3.5
ENS-2	BY INSTALLING CONTRACTOR	50	✓	3.5
S-BATH	BY INSTALLING CONTRACTOR	50	✓	3.5
PWD	BY INSTALLING CONTRACTOR	50	✓	3.5

HEAT RECOVERY VENTILATOR 9.32.3.11.

Model: VANEE V150H

150 cfm high 35 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: March-22

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
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CSA F280-12 Residential Heat Loss and Heat Gain Calculations

Formula Sheet (For Air Leakage / Ventiliation Calculation)

LO#: 93089 Model: 41-00 Builder: ROYAL PINE HOMES Date: 2022-03-22

Volume Calculation

House Volume

Level	Floor Area (ft²)	Floor Height (ft)	Volume (ft³)
Bsmt	1557	10	15570
First	1557	10	15570
Second	1914	9	17226
Third	0	9	0
Fourth	0	9	0
		Total:	48,366.0 ft³
		Total:	1369.6 m³

Air Change & Delta T Data

WINTER NATURAL AIR CHANGE RATE	0.227
SUMMER NATURAL AIR CHANGE RATE	0.074

Design Temperature Difference

	Tin °C	Tout °C	ΔT °C	ΔT °F
Winter DTDh	22	-19	41	74
Summer DTDc	24	30	6	11

5.2.3.1 Heat Loss due to Air Leakage

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

0.227 x 380.44 x 41 °C x 1.2 = 4279 W

= **14599 Btu/h**

6.2.6 Sensible Gain due to Air Leakage

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

= 0.074 x 380.44 x 6 °C x 1.2 = 206 W

= **703 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 74 °F x 1.08 x 0.25 = **1593 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 11 °F x 1.08 x 0.25 = **236 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	14,599	9,277	0.787
2	0.3		12,544	0.349
3	0.2		14,357	0.203
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: 41-00 LOT 30 - WUB **BUILDER:** ROYAL PINE HOMES
SFQT: 3462 **LO#** 93089 **SITE:** VALES OF HUMBER

DESIGN ASSUMPTIONS

HEATING	°F	COOLING	°F
OUTDOOR DESIGN TEMP.	-2	OUTDOOR DESIGN TEMP.	86
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):	48366.0	ASSUMED (Y/N):	Y
INTERNAL SHADING:	BLINDS/CURTAINS	ASSUMED OCCUPANTS:	5
INTERIOR LIGHTING LOAD (Btu/h/ft^2):	1.27	DC BRUSHLESS MOTOR (Y/N):	Y
FOUNDATION CONFIGURATION	BCIN_1	DEPTH BELOW GRADE:	7.0 ft
LENGTH: 45.0 ft	WIDTH: 49.0 ft	EXPOSED PERIMETER:	153.0 ft

2012 OBC - COMPLIANCE PACKAGE **Component**	**Compliance Package SB-12 PERFORMANCE**	
	Nominal	**Min. Eff.**
Ceiling with Attic Space Minimum RSI (R)-Value	60	59.22
Ceiling Without Attic Space Minimum RSI (R)-Value	31	27.65
Exposed Floor Minimum RSI (R)-Value	31	29.80
Walls Above Grade Minimum RSI (R)-Value	22+1.5	21.40
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	96%	-
HRV Minimum Efficiency	75%	-
Domestic Hot Water Heater Minimum EF	0.9	-

INDIVIDUAL BCIN: 19669
MICHAEL O'ROURKE

Michael O'Rourke

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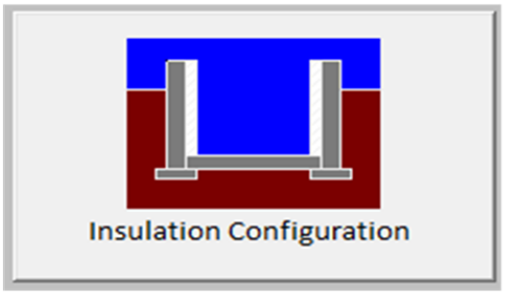
Ajax ON, L1S 2E2
905-619-2300

Residential Foundation Thermal Load Calculator

Supplemental tool for CAN/CSA-F280

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

Foundation Dimensions		
Floor Length (m):	**13.7**	 Insulation Configuration
Floor Width (m):	**14.9**	
Exposed Perimeter (m):	**46.6**	
Wall Height (m):	**3.0**	
Depth Below Grade (m):	**2.13**	
Window Area (m^2):	**1.4**	
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):	**1562**	

TYPE: 41-00
LO# 93089

LOT 30 - WUB

HVAC Designs Ltd.
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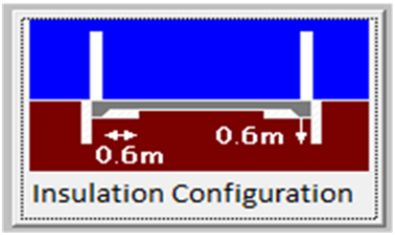
Ajax ON, L1S 2E2
905-619-2300

Residential Slab on Grade Thermal Load Calculator

Supplemental tool for CAN/CSA-F280

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

Foundation Dimensions		
Length (m):	**2.1**	
Width (m):	**6.4**	
Exposed Perimeter (m):	**10.7**	

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

Results	
Heating Load (Watts):	**116**

TYPE: 41-00
LO# 93089

LOT 30 - WUB

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

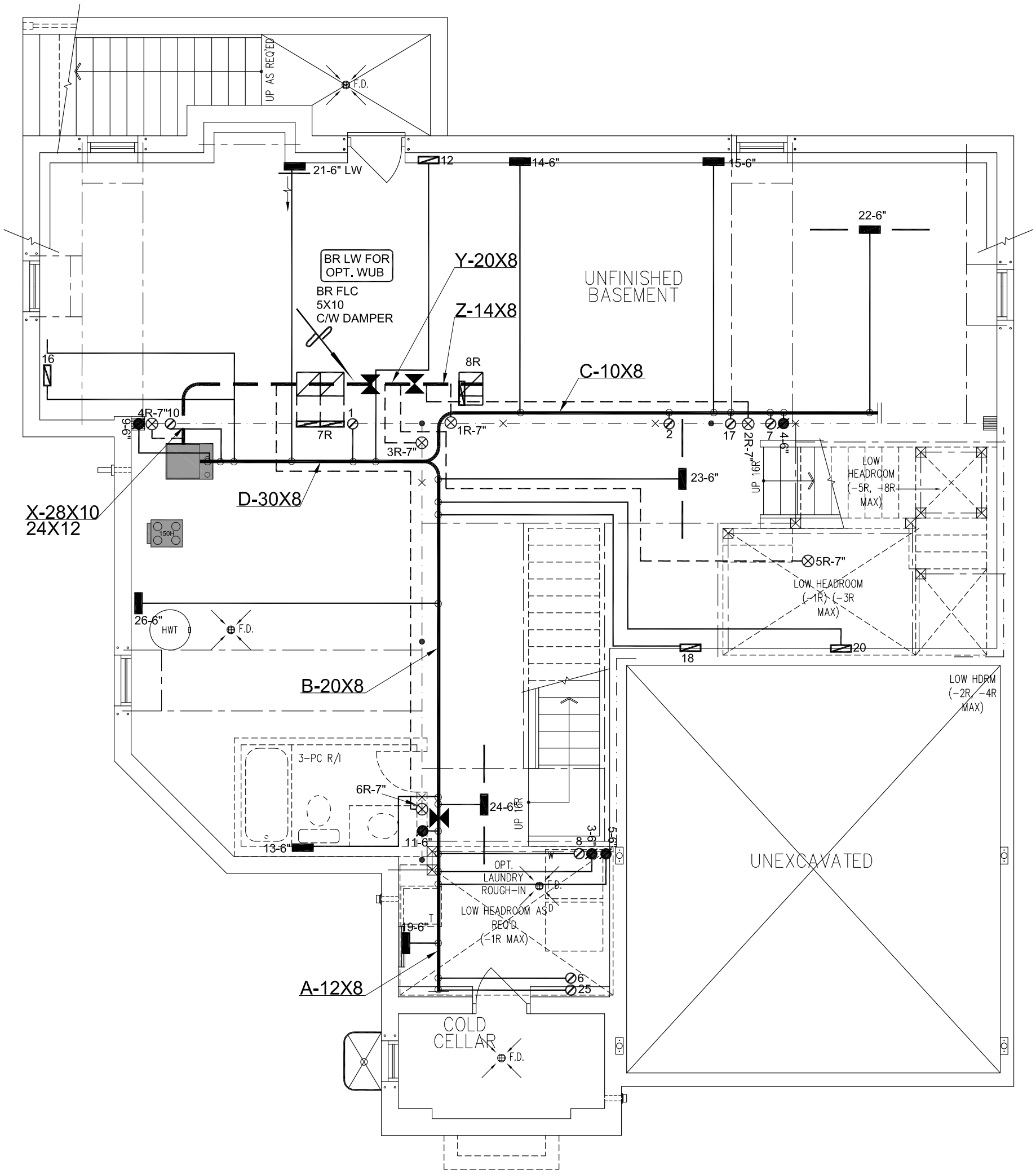
Air Infiltration Residential Load Calculator

Supplemental tool for CAN/CSA-F280

Weather Station Description	
Province:	Ontario
Region:	Brampton
Weather Station Location:	Open flat terrain, grass
Anemometer height (m):	10
Local Shielding	
Building Site:	Suburban, forest
Walls:	Heavy
Flue:	Heavy
Highest Ceiling Height (m):	6.71
Building Configuration	
Type:	Detached
Number of Stories:	Two
Foundation:	Full
House Volume (m^3):	1369.6
Air Leakage/Ventilation	
Air Tightness Type:	Energy Star Detached (2.5 ACH)
Custom BDT Data:	ELA @ 10 Pa. 1278.5 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):	**0.227**
Cooling Air Leakage Rate (ACH/H):	**0.074**

TYPE: 41-00 LOT 30 - WUB

LO# 93089



BASEMENT PLAN, EL. 'A' – W.U.B. CONDITION

LOT 30
WUB
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.	REVISED TO PERFORMANCE PATH	MAR/2022

REVISIONS

Client
ROYAL PINE HOMES

Project Name
VALES OF HUMBER
BRAMPTON, ONTARIO

LOT 30 - WUB
41-00 3462 sqft

HVAC DESIGNS LTD.
375 Finley Ave. Suite 202 - Ajax, Ontario
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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.

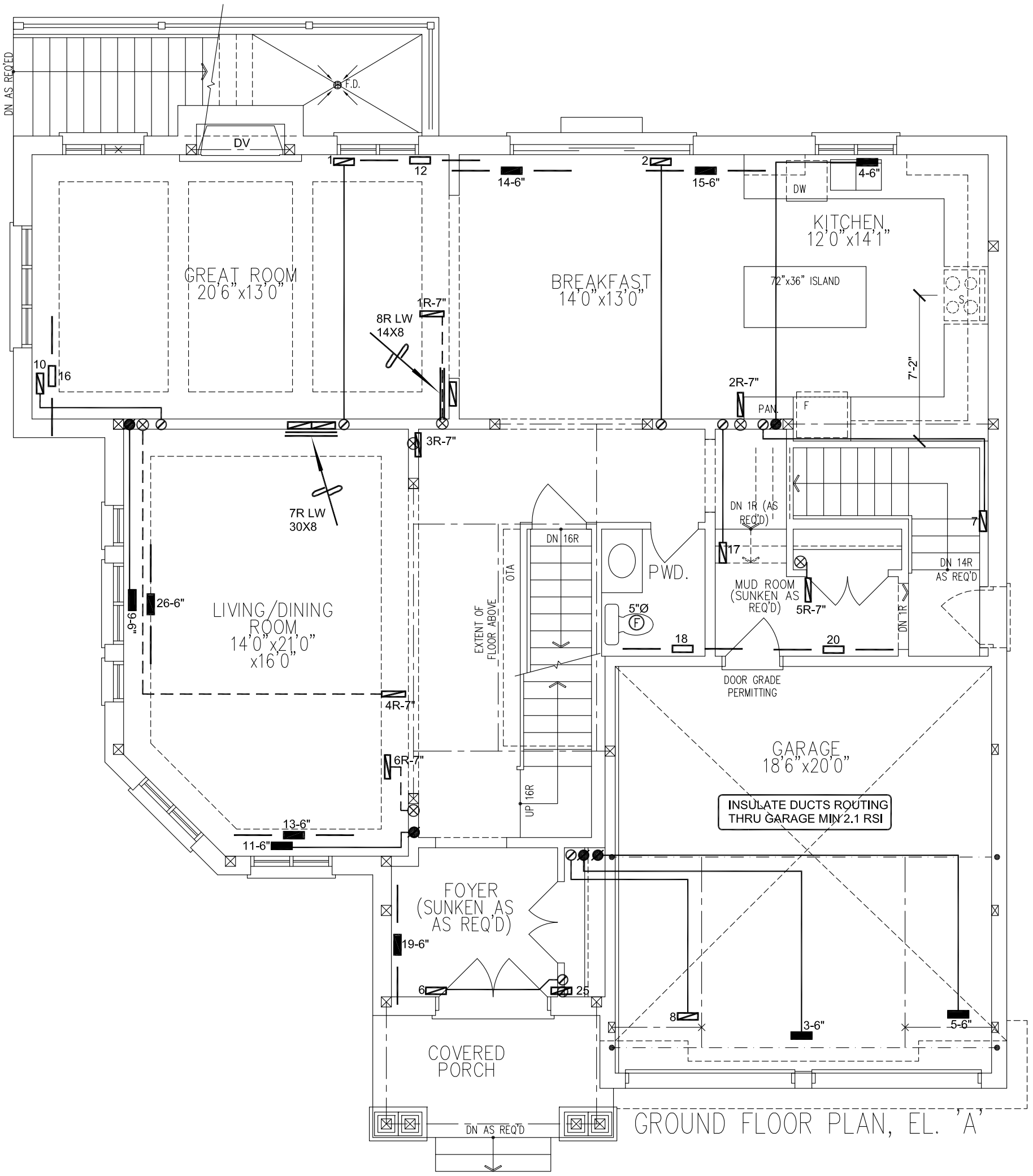
HEAT LOSS 52848 BTU/H	
UNIT DATA	
MAKE	CARRIER
MODEL	59SP5A-80-16
INPUT	80 MBTU/H
OUTPUT	78 MBTU/H
COOLING	3.5 TONS
FAN SPEED	1370 cfm @ 0.6" w.c.

# OF RUNS	S/A	R/A	FANS
3RD FLOOR			
2ND FLOOR	13	6	5
1ST FLOOR	9	2	2
BASEMENT	4	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 OCT/2021
Scale 3/16" = 1'-0"
BCIN# 19669
LO# 93089



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HVAC DESIGNS LTD.

LOT 30
WUB
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
3.		
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REVISIONS

Client
ROYAL PINE HOMES

Project Name
VALES OF HUMBER
BRAMPTON, ONTARIO

LOT 30 - WUB
41-00 3462 sqft

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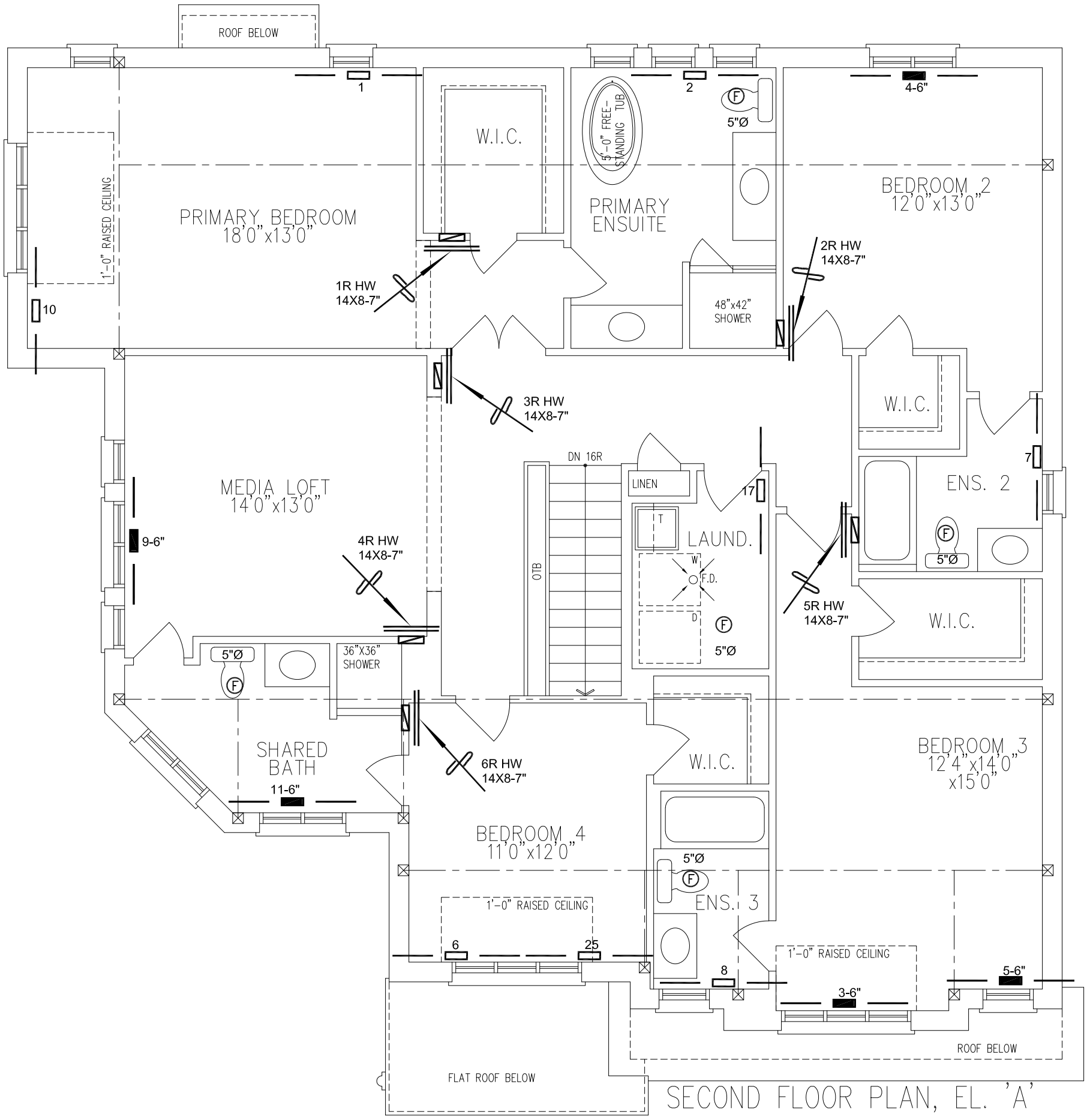
Installation to comply with the latest Ontario Building Code. All supply branch outlets shall be equipped with a manual balancing damper. Ductwork which passes through the garage or unheated spaces shall be adequately insulated and be gas-proofed.

Sheet Title
FIRST FLOOR HEATING LAYOUT

Date OCT/2021
Scale 3/16" = 1'-0"
BCIN# 19669
LO# 93089



SECOND FLOOR PLAN, EL. 'A'

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.

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LOT 30
WUB
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

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ROYAL PINE HOMES

Project Name
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BRAMPTON, ONTARIO

LOT 30 - WUB
41-00 3462 sqft

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Sheet Title
SECOND FLOOR HEATING LAYOUT

Date OCT/2021
Scale 3/16" = 1'-0"
BCIN# 19669
LO# 93089