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

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

HVAC DESIGNS LTD.

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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.

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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

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#: 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

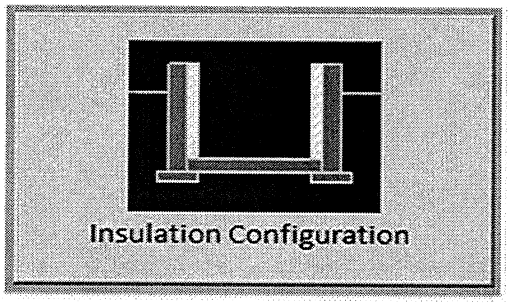
Michael O'Rourke

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# 87513

OPT. IN LAW

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

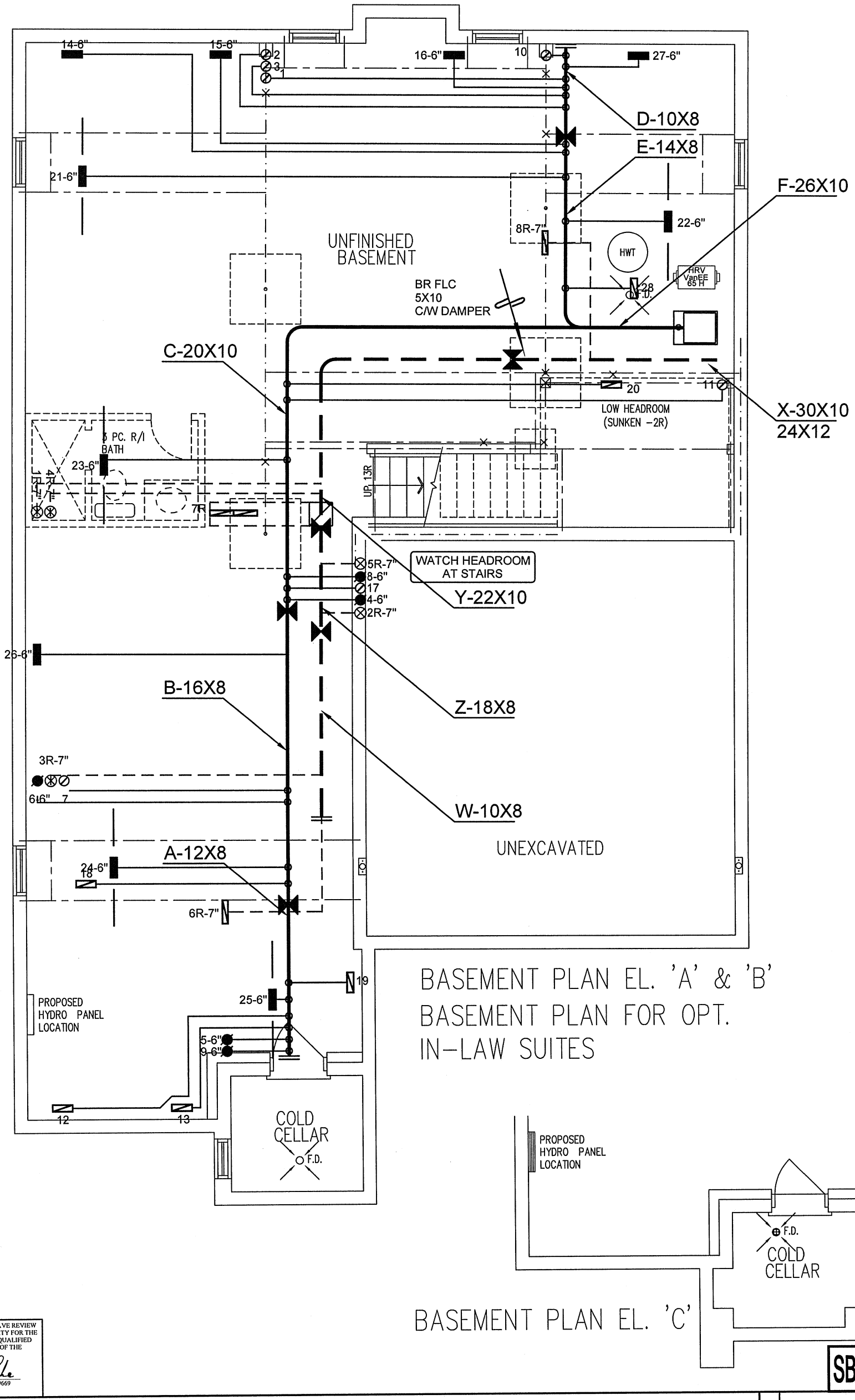
Air Infiltration Residential Load Calculator

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
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
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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.

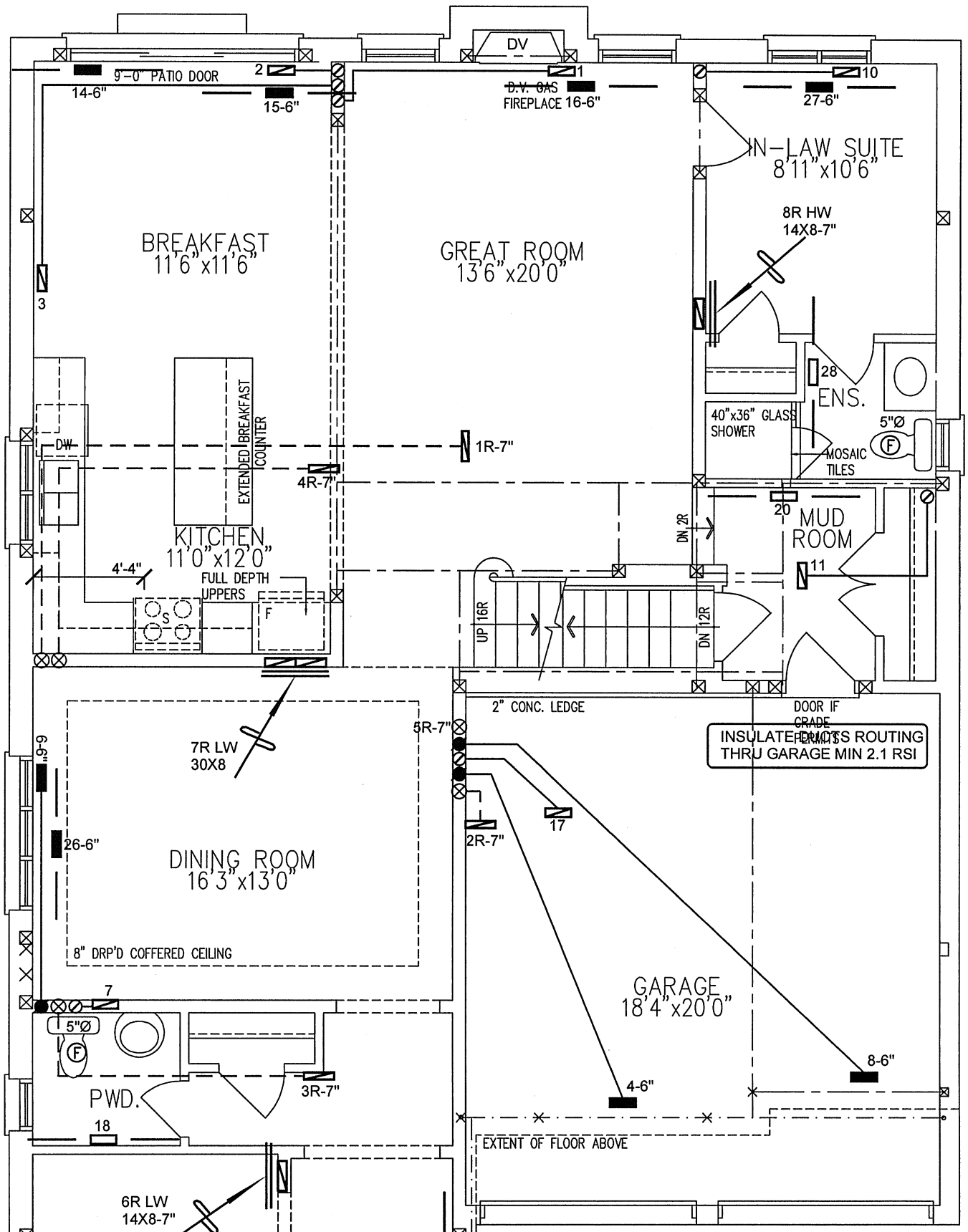
HEAT LOSS 50115 BTU/H	
UNIT DATA	
MAKE	CARRIER
MODEL	59TN6A-060-14V
INPUT	60 MBTU/H
OUTPUT	58 MBTU/H
COOLING	3.5 TONS
FAN SPEED	1370 cfm @ 0.6" w.c.

# 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

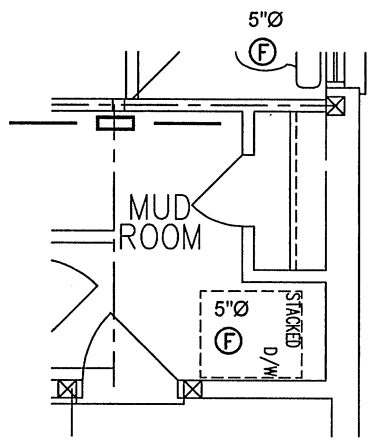
Sheet Title
BASEMENT HEATING LAYOUT

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

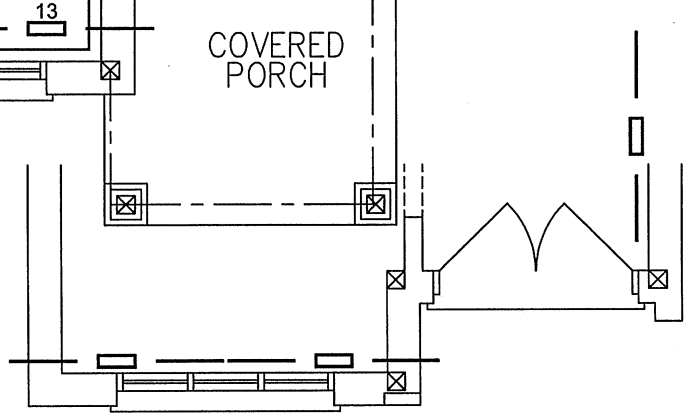


GROUND FLOOR PLAN EL. 'A'

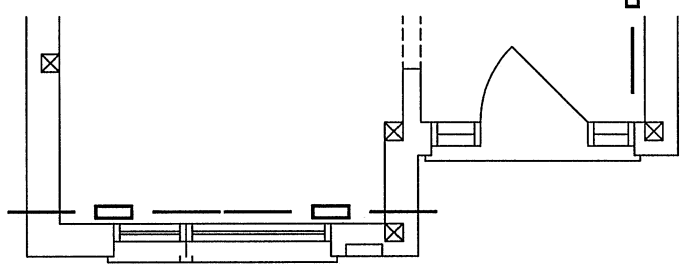
OPT. GROUND FLOOR PLAN W/ IN-LAW SUITE



OPT. IN-LAW SUITE W/ OPT. LAUNDRY



GROUND FLOOR PLAN EL. 'B'



GROUND FLOOR PLAN EL. 'C'

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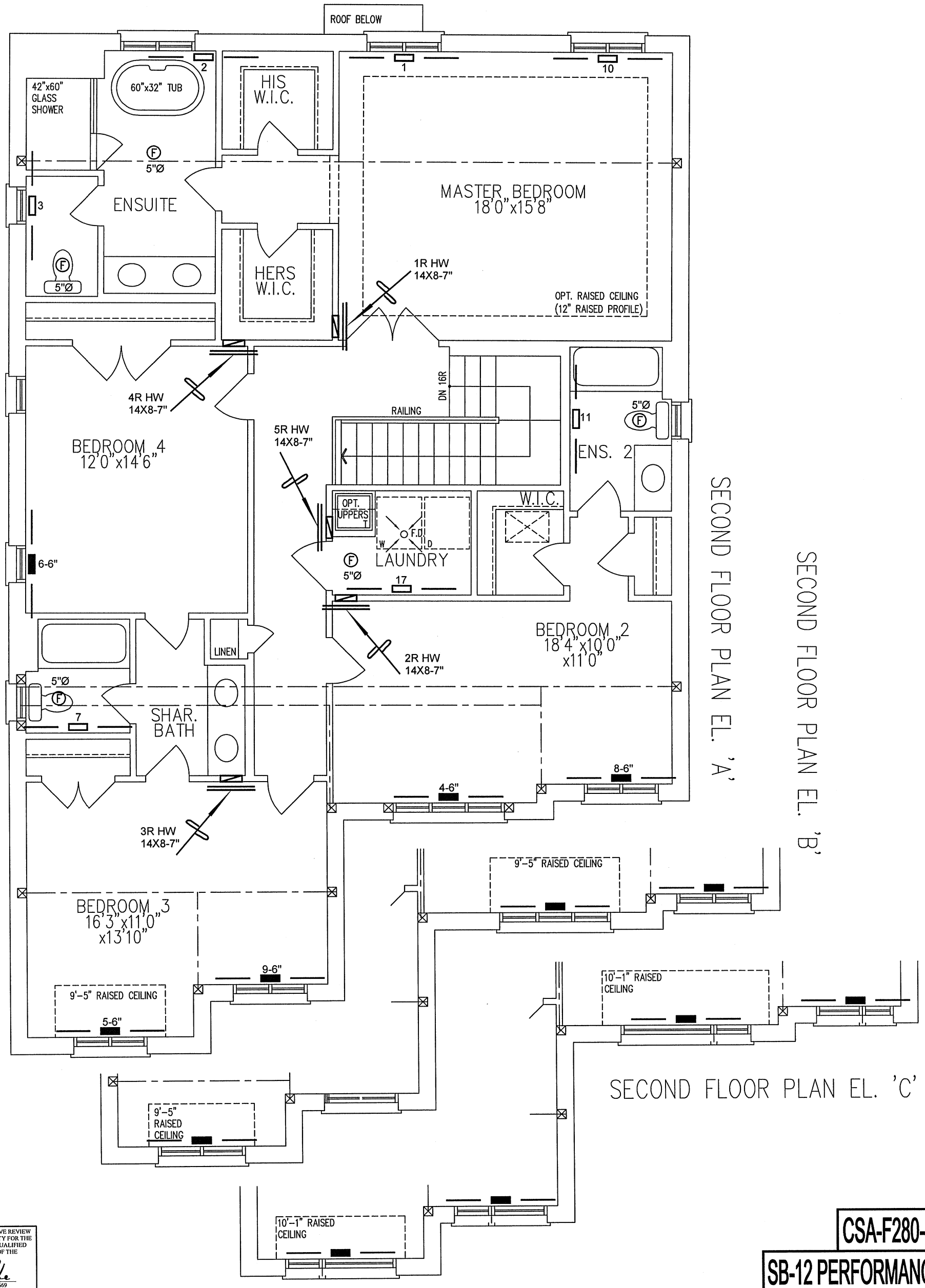
Installation to comply with the latest Ontario Building Code. All supply branch outlets shall be equipped with a manual balancing damper. Ductwork which passes through the garage or unheated spaces shall be adequately insulated and be gas-proofed.

Sheet Title
FIRST FLOOR HEATING LAYOUT

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



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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.	REVISED AS PER CAD	JUNE/2021
2.	REVISED AS PER ARCHITECTURALS	APR/2021
1.	REVISED TO PERFORMANCE	SEPT/2020

REVISIONS

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Sheet Title
SECOND FLOOR HEATING LAYOUT

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