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:** 4502 OPT GROUND - 4 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 4, 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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Web: www.hvacdesigns.ca E-mail: info@hvacdesigns.ca

SITE NAME: CENTREFIELD (WEST GORMLEY) | OPT GROUND - 4 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: 4502 | GFA: 2942 | LO# 91143 | 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			ENS-2			ENS-3			WIC-3			ENS-4				
EXP. WALL			34			11				35			33			35			8			0			7			11				
CLG. HT.			9			8				8			8			8			8			8			8			8				
	FACTORS																															
GRS.WALL AREA	LOSS	GAIN	306			88				280			264			280			64			0			56			88				
GLAZING				LOSS	GAIN		LOSS	GAIN			LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		
NORTH	21.8	15.6	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0	7	152	109	0	0	0	0	0	0	7	152	109		
EAST	21.8	40.3	0	0	0	0	0	0		0	0	0	56	1220	2256	40	871	1611	0	0	0	0	0	0	14	305	564	0	0	0		
SOUTH	21.8	24.2	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		
WEST	21.8	40.3	30	654	1209	17	370	685		26	566	1047	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		
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	276	1161	191	71	299	49		254	1068	176	208	875	144	240	1009	166	57	240	39	0	0	0	42	177	29	81	341	56		
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	389	511	229	173	227	102		255	335	150	228	300	134	216	284	127	75	99	44	54	71	32	49	64	29	133	175	78		
NO ATTIC EXPOSED CLG	2.8	1.3	0	0	0	0	0	0		0	0	0	28	79	35	24	67	30	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	256	668	110	0	0	0	95	248	41	43	112	18	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				2325			896				1970			3141			2232			739			183			546			668			
SUB TOTAL HT GAIN					1628			836				1373			2679			1935			233			50			622			243		
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				423			163				358			571			406			134			33			99			121			
AIR CHANGE HEAT GAIN					69			36				58			114			82			10			2			26			10		
DUCT LOSS				0			0				0			371			0			87			22			0			0			
DUCT GAIN					0			0				0			357			0			24			5			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					539			0				539			539			539			0			0			0			0		
TOTAL HT LOSS BTU/H				2748			1059				2328			4083			2637			960			238			645			789			
TOTAL HT GAIN x 1.3 BTU/H					3532			1133				2874			5109			3635			348			75			843			330		

ROOM USE			DEN			GRT			KT/BR			DIN			LAUN			PWD			FOY			MUD						BAS		
EXP. WALL			30			34			37			17			16			6			18			11						172		
CLG. HT.			10			10			10			10			11			10			10			11						9		
	FACTORS																															
GRS.WALL AREA	LOSS	GAIN	300			340			370			170			176			60			180			121						1032		
GLAZING				LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN		LOSS	GAIN					LOSS	GAIN
NORTH	21.8	15.6	0	0	0	0	0	0	0	0	0	0	0	0	8	174	124	0	0	0	0	0	0	0	0	0	0				0	0	0
EAST	21.8	40.3	34	741	1370	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24	523	967	0	0	0	0				0	0	0
SOUTH	21.8	24.2	0	0	0	0	0	0	0	0	0	20	436	484	0	0	0	7	152	169	0	0	0	0	0	0	0				6	131	145
WEST	21.8	40.3	0	0	0	51	1111	2055	93	2026	3747	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				3	65	121
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
DOORS	25.8	4.3	0	0	0	0	0	0	0	0	0	0	0	0	20	517	85	0	0	0	20	517	85	0	0	0	0				20	517	85
NET EXPOSED WALL	4.2	0.7	266	1119	184	289	1215	200	277	1165	192	150	631	104	148	622	102	53	223	37	136	572	94	121	509	84				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	0				516	1901	313
EXPOSED CLG	1.3	0.6	0	0	0	0	0	0	15	20	9	0	0	0	0	0	0	0	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	0
EXPOSED FLOOR	2.6	0.4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				0	0	0
BASEMENT/CRAWL HEAT LOSS				0			0			0			0			0			0			0			0						5884		
SLAB ON GRADE HEAT LOSS				0			0			0			0			0			0			0			0								
SUBTOTAL HT LOSS				1859			2326			3211			1066			1314			375			1612			509						8498		
SUB TOTAL HT GAIN					1554			2255			3947			588			312			206			1146			84							664
LEVEL FACTOR / MULTIPLIER			0.30	0.28		0.30	0.28		0.30	0.28		0.30	0.28		0.30	0.28		0.30	0.28		0.30	0.28		0.30	0.28					0.50	0.68		
AIR CHANGE HEAT LOSS				524			656			906			301			371			106			455			144						5769		
AIR CHANGE HEAT GAIN					66			96			168			25			13			9			49			4							28
DUCT LOSS				0			0			0			0			0			0			0			0						0		
DUCT GAIN					0			0			0			0			0			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					539			539			539			539			539			0			0			0							539
TOTAL HT LOSS BTU/H				2384			2982			4116			1367			1684			481			2066			652						14267		
TOTAL HT GAIN x 1.3 BTU/H					2807			3757			6051			1498			1124			279			1553			113							1601

TOTAL HEAT GAIN BTU/H: 36936 TONS: 3.08 LOSS DUE TO VENTILATION LOAD BTU/H: 1670 STRUCTURAL HEAT LOSS: 45489 TOTAL COMBINED HEAT LOSS BTU/H: 47159

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 - 4 BED 4 BATH
BUILDER: ROYAL PINE HOMES — TYPE: 4502 — DATE: Jun-21 — GFA: 2942 — LO# 91143

HEATING CFM	1145	COOLING CFM	1145
TOTAL HEAT LOSS	45,489	TOTAL HEAT GAIN	36,661
AIR FLOW RATE CFM	25.17	AIR FLOW RATE CFM	31.23

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
59TN6B-060-14V 60

FAN SPEED	
LOW	820
MEDLOW	0
MEDIUM	1145
MEDIUM HIGH	0
HIGH	1520

AFUE = 97 %
INPUT (BTU/H) = 60,000
OUTPUT (BTU/H) = **58,000**
DESIGN CFM = **1145**
CFM @ .6 " E.S.P.
TEMPERATURE RISE 47 °F

RUN COUNT	4th	3rd	2nd	1st	Bas
S/A	0	0	12	10	4
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	BED-3	BED-2	BED-3	BED-4	ENS-3	ENS-2	BED-4	MBR	ENS-4	DEN	GRT	KT/BR	KT/BR	DIN	LAUN	PWD	FOY	MUD	BAS	BAS	BAS	BAS
RM LOSS MBH.	1.37	1.06	2.04	2.33	2.04	1.32	0.24	0.96	1.32	1.37	0.79	2.38	1.49	2.06	2.06	1.37	1.68	0.48	2.07	0.65	3.57	3.57	3.57	3.57
CFM PER RUN HEAT	35	27	51	59	51	33	6	24	33	35	20	60	38	52	52	34	42	12	52	16	90	90	90	90
RM GAIN MBH.	1.77	1.13	2.55	2.87	2.55	1.82	0.07	0.35	1.82	1.77	0.33	2.81	1.88	3.03	3.03	1.50	1.12	0.28	1.55	0.11	0.40	0.40	0.40	0.40
CFM PER RUN COOLING	55	35	80	90	80	57	2	11	57	55	10	88	59	94	94	47	35	9	49	4	12	12	12	12
ADJUSTED PRESSURE	0.17	0.17	0.17	0.16	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.16	0.17	0.16	0.16	0.17	0.17	0.17	0.17	0.17	0.16	0.16	0.16	0.16
ACTUAL DUCT LGH.	27	51	56	65	51	45	44	51	38	37	26	30	40	25	35	5	39	16	35	40	19	42	10	30
EQUIVALENT LENGTH	150	130	140	140	130	160	150	150	190	140	110	110	150	130	120	140	140	140	130	150	130	140	130	110
TOTAL EFFECTIVE LENGTH	177	181	196	205	181	205	194	201	228	177	136	140	190	155	155	145	179	156	165	190	149	182	140	140
ADJUSTED PRESSURE	0.1	0.1	0.09	0.08	0.1	0.08	0.09	0.09	0.08	0.1	0.13	0.12	0.09	0.1	0.1	0.12	0.1	0.11	0.1	0.09	0.11	0.09	0.12	0.12
ROUND DUCT SIZE	5	4	**6**	**6**	**6**	5	4	4	5	5	4	**6**	5	**6**	**6**	4	4	4	5	4	**6**	**6**	**6**	**6**
HEATING VELOCITY (ft/min)	257	310	260	301	260	242	69	275	242	257	229	306	279	265	265	390	482	138	382	184	459	459	459	459
COOLING VELOCITY (ft/min)	404	402	408	459	408	419	23	126	419	404	115	449	433	479	479	539	402	103	360	46	61	61	61	61
OUTLET GRILL SIZE	3X10	3X10	4X10	4X10	4X10	3X10	3X10	3X10	3X10	3X10	3X10	4X10	3X10	4X10	4X10	3X10	3X10	3X10	3X10	3X10	4X10	4X10	4X10	4X10
TRUNK	B	B	D	A	D	C	D	D	C	B	D	C	A	B	B	D	A	C	C	A	B	A	D	C

RUN #	25	26
ROOM NAME	GRT	WIC-3
RM LOSS MBH.	1.49	0.65
CFM PER RUN HEAT	38	16
RM GAIN MBH.	1.88	0.84
CFM PER RUN COOLING	59	26
ADJUSTED PRESSURE	0.17	0.17
ACTUAL DUCT LGH.	47	28
EQUIVALENT LENGTH	110	180
TOTAL EFFECTIVE LENGTH	157	208
ADJUSTED PRESSURE	0.11	0.08
ROUND DUCT SIZE	5	4
HEATING VELOCITY (ft/min)	279	184
COOLING VELOCITY (ft/min)	433	298
OUTLET GRILL SIZE	3X10	3X10
TRUNK	A	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	283	0.08	8.7	10	x	8	509	TRUNK G	0	0.00	0	0	x	8	0
TRUNK B	574	0.08	11.4	16	x	8	646	TRUNK H	0	0.00	0	0	x	8	0
TRUNK C	296	0.08	8.9	10	x	8	533	TRUNK I	0	0.00	0	0	x	8	0
TRUNK D	572	0.08	11.4	16	x	8	644	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	1145	0.05	16.6	32	x	8	644
TRUNK Y	315	0.05	10.2	12	x	8	473
TRUNK Z	465	0.05	11.8	16	x	8	523
DROP	1145	0.05	16.6	24	x	10	687

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	95	75	85	75	95	155	150	240	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.	47	79	54	40	47	32	27	38	1	1	1	1	1	1	1	14
EQUIVALENT LENGTH	175	225	215	255	175	230	145	190	0	0	0	0	0	0	0	135
TOTAL EFFECTIVE LH	222	304	269	295	222	262	172	228	1	1	1	1	1	1	1	149
ADJUSTED PRESSURE	0.07	0.05	0.06	0.05	0.07	0.06	0.09	0.06	14.80	14.80	14.80	14.80	14.80	14.80	14.80	0.10
ROUND DUCT SIZE	6	6	6	6	6	7.5	6.7	8.8	0	0	0	0	0	0	0	6.9
INLET GRILL SIZE	8	8	8	8	8	8	8	6	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	14	18	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.

Michael O'Rourke — 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: 4502 LO # 91143
SITE NAME: CENTREFIELD (WEST GORMLEY) OPT GROUND - 4 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	3	@ 10.6 cfm	31.8	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	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
ENS-2	BY INSTALLING CONTRACTOR	50	✓	3.5
ENS-4	BY INSTALLING CONTRACTOR	50	✓	3.5
PWD	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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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#: 91143 Model: 4502 Builder: ROYAL PINE HOMES Date: 2021-06-04

Volume Calculation

House Volume

Level	Floor Area (ft²)	Floor Height (ft)	Volume (ft³)
Bsmt	1305	9	11745
First	1305	10	13050
Second	1637	8	13096
Third	0	9	0
Fourth	0	9	0
		Total:	37,891.0 ft³
		Total:	1073.0 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 298.04 x 43 °C x 1.2 = 3382 W

= **11538 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 298.04 x 7 °C x 1.2 = 173 W

= **592 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	11,538	8,498	0.679
2	0.3		12,272	0.282
3	0.2		12,700	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: 4502 OPT GROUND - 4 BED 4 BATH **BUILDER:** ROYAL PINE HOMES
SFQT: 2942 **LO#** 91143 **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):	37891.0	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:	6.0 ft
LENGTH: 48.0 ft	WIDTH: 38.0 ft	EXPOSED PERIMETER:	172.0 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

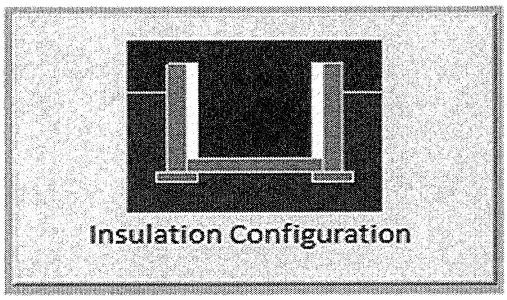
HVAC Designs Ltd.
375 Finley Ave, Suite 202
Ajax ON, L1S 2E2
905-619-2300

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):	**14.6**	
Floor Width (m):	**11.6**	
Exposed Perimeter (m):	**0.0**	
Wall Height (m):	**2.7**	
Depth Below Grade (m):	**1.83**	
Window Area (m^2):	**0.8**	
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):	**1724**	

TYPE: 4502
LO# 91143

OPT GROUND - 4 BED 4 BATH

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

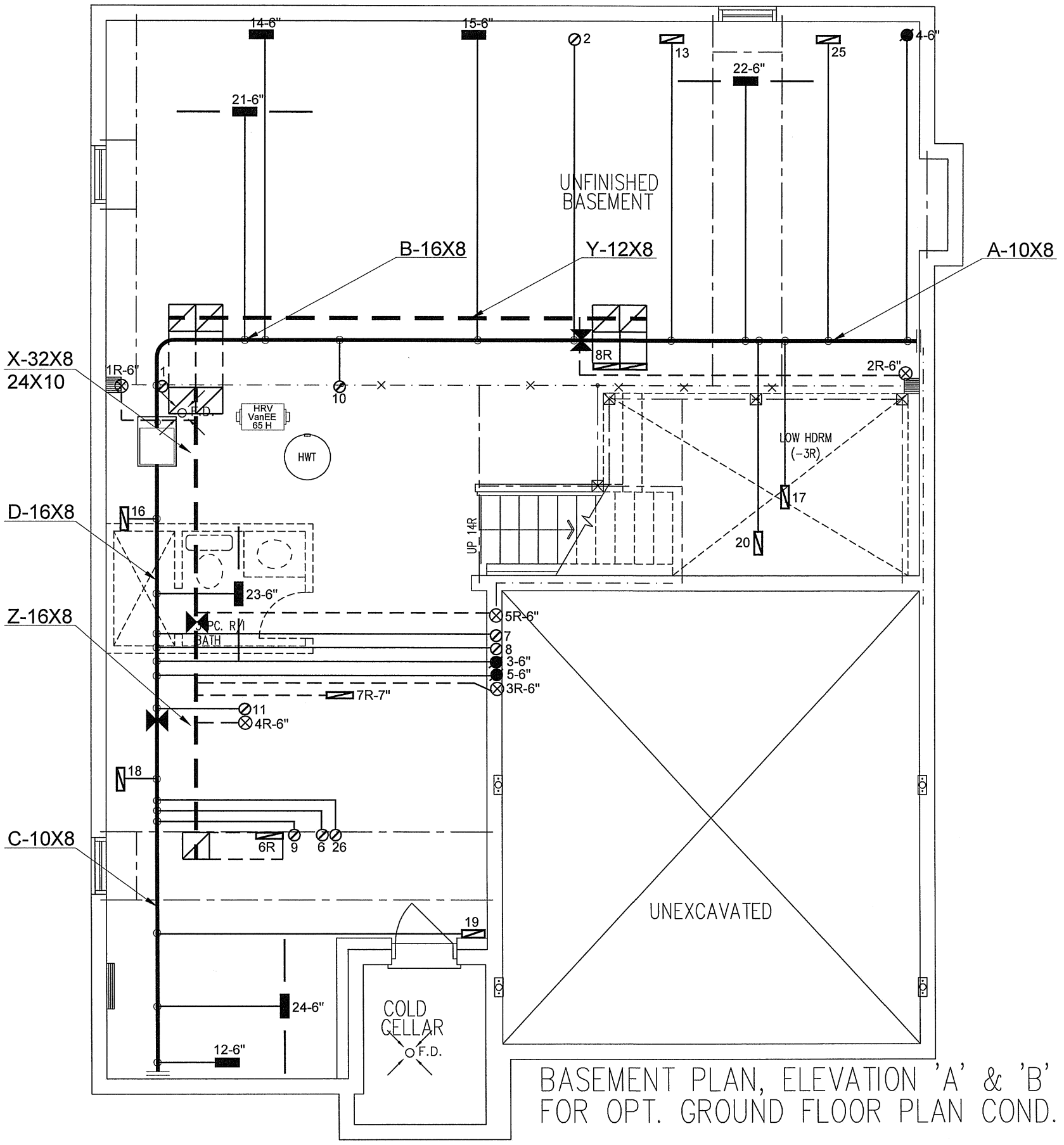
Air Infiltration Residential Load Calculator

Supplemental tool for CAN/CSA-F280

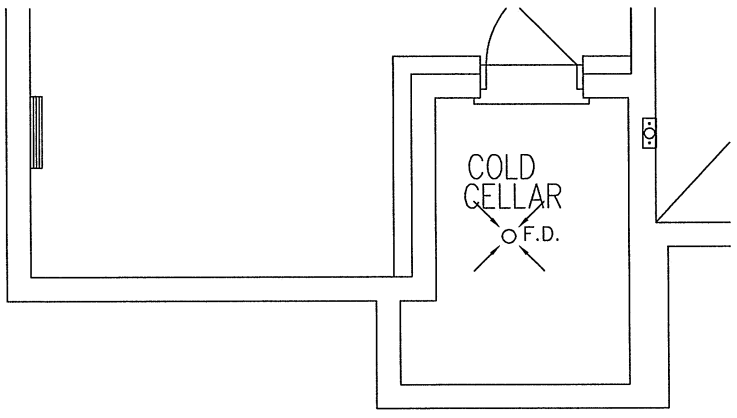
Weather Station Description	
Province:	Ontario
Region:	Richmond Hill
Weather Station Location:	Open flat terrain, grass
Anemometer height (m):	10
Local Shielding	
Building Site:	Suburban, forest
Walls:	Heavy
Flue:	Heavy
Highest Ceiling Height (m):	6.40
Building Configuration	
Type:	Detached
Number of Stories:	Two
Foundation:	Full
House Volume (m^3):	1073.0
Air Leakage/Ventilation	
Air Tightness Type:	Energy Star Detached (2.5 ACH)
Custom BDT Data:	ELA @ 10 Pa. 1001.6 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: 4502
LO# 91143

OPT GROUND - 4 BED 4 BATH



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



BASEMENT PLAN, ELEVATION 'C'
FOR OPT. GROUND FLOOR PLAN COND.

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
4 BED 4 BATH
OPT GROUND
4502 2942 sqft

HVAC DESIGNS LTD.
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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.

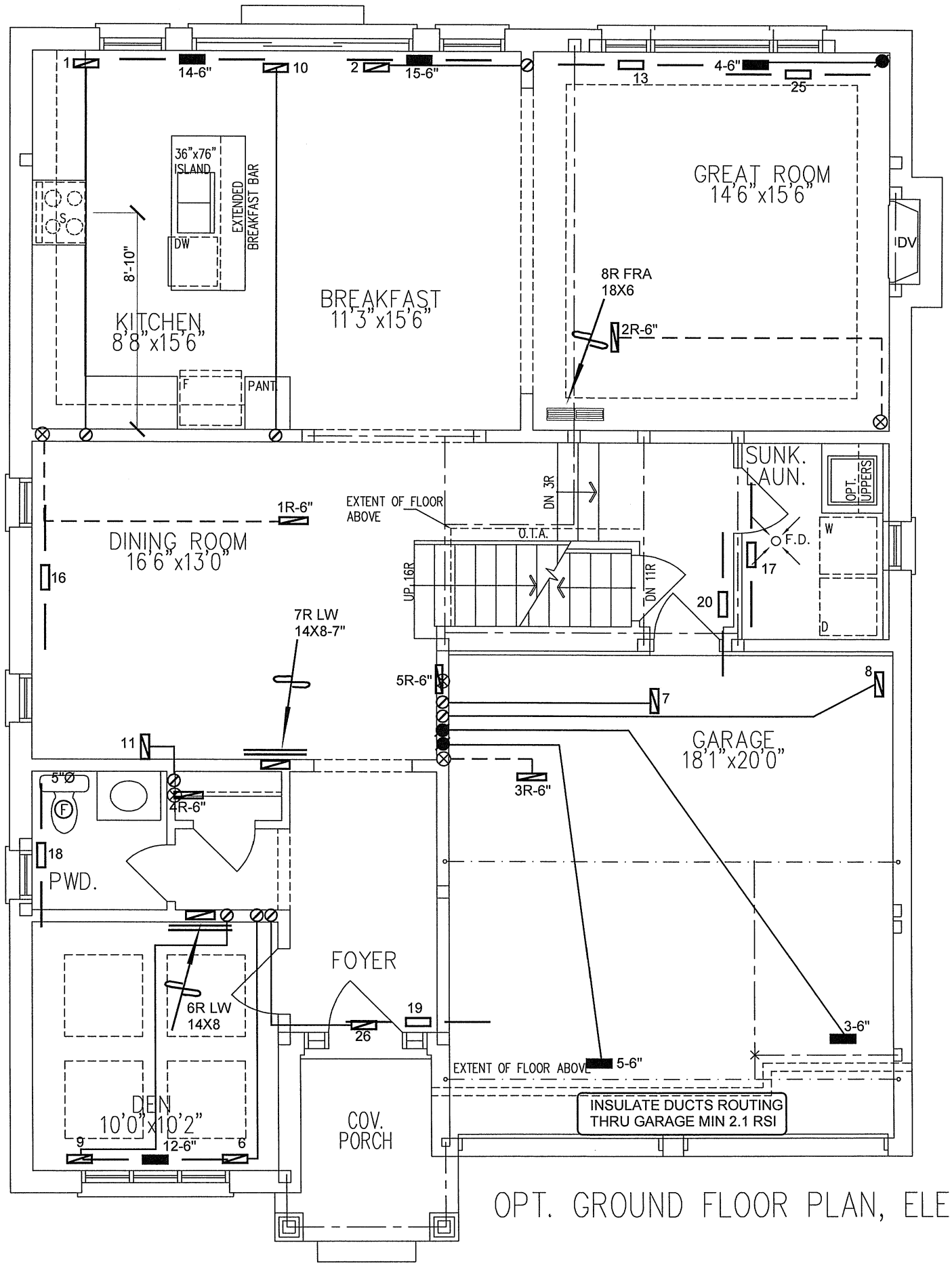
HEAT LOSS 47159 BTU/H		
UNIT DATA		
MAKE	CARRIER	
MODEL	59TN6B-060-14V	
INPUT	60	MBTU/H
OUTPUT	58	MBTU/H
COOLING	3.0	TONS
FAN SPEED	1145	cfm @ 0.6" w.c.

# OF RUNS	S/A	R/A	FANS
3RD FLOOR			
2ND FLOOR	12	5	4
1ST FLOOR	10	3	2
BASEMENT	4	1	0

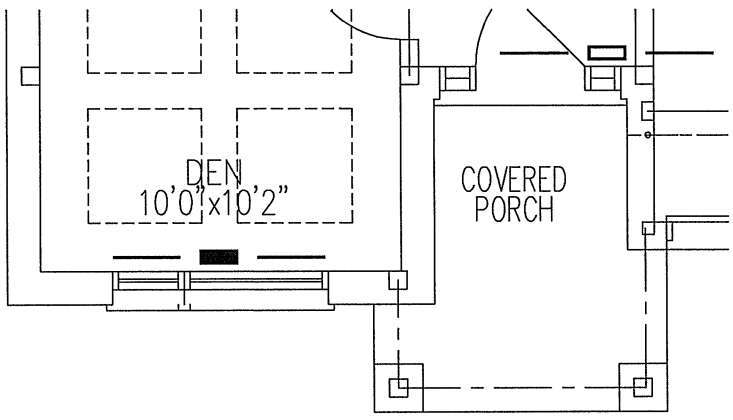
ALL S/A DIFFUSERS 4 "x10" UNLESS NOTED OTHERWISE ON LAYOUT. ALL S/A RUNS 5"Ø UNLESS NOTED OTHERWISE ON LAYOUT. UNDERCUT DOORS 1" min. FOR R/A

Sheet Title
BASEMENT HEATING LAYOUT

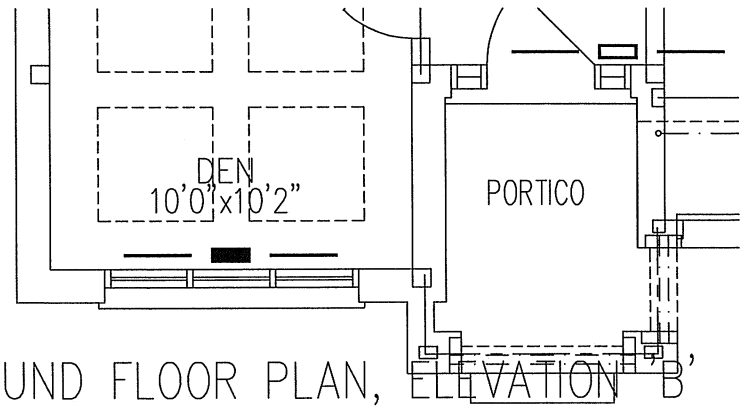
Date JUNE/2021
Scale 3/16" = 1'-0"
BCIN# 19669
LO# 91143



OPT. GROUND FLOOR PLAN, ELEVATION 'A'



OPT. GROUND FLOOR PLAN, ELEVATION 'C'



OPT. GROUND FLOOR PLAN, ELEVATION 'B'

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
3.		
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REVISIONS

Client
ROYAL PINE HOMES

Project Name
CENTREFIELD (WEST GORMLEY)
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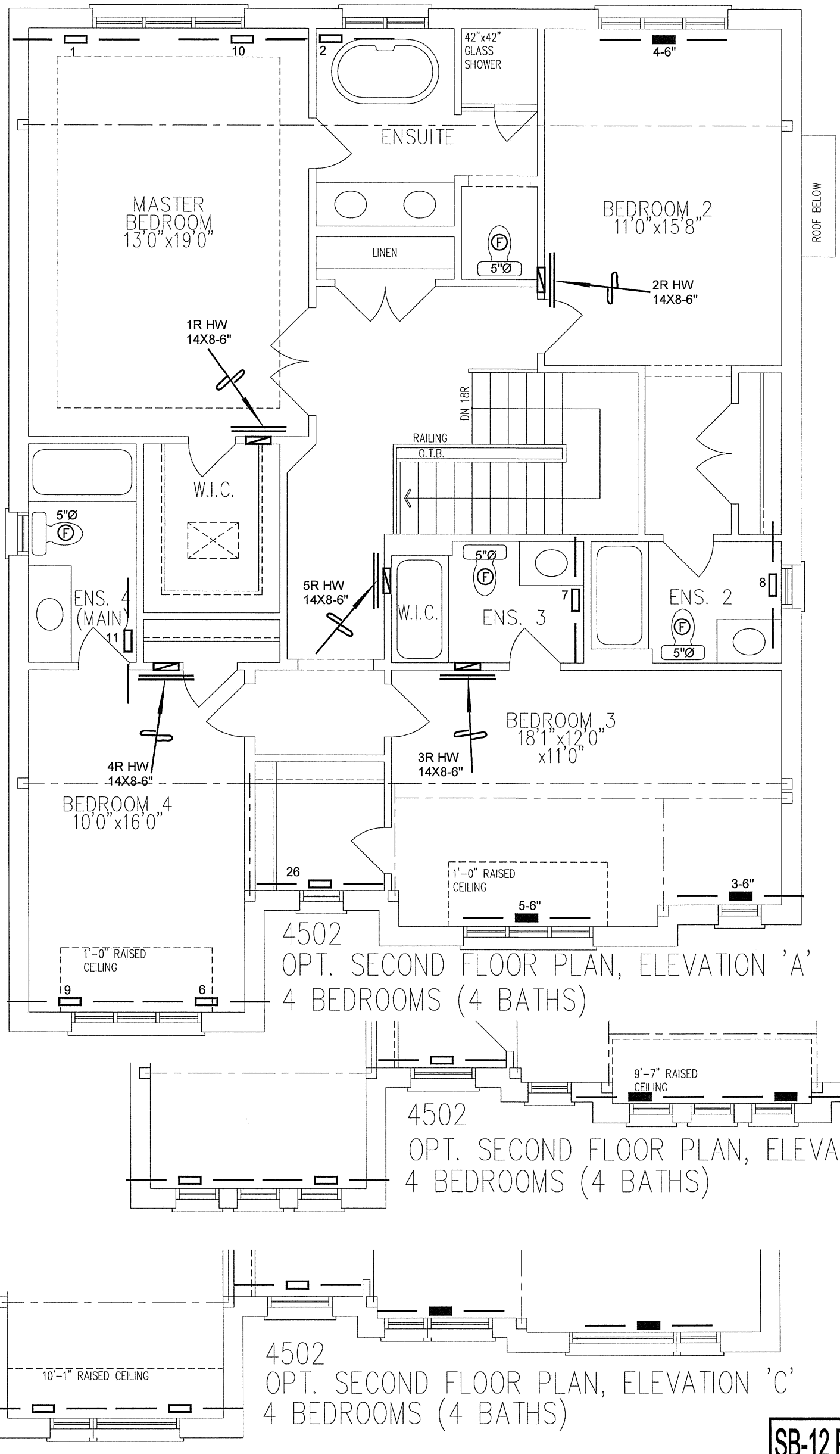
Sheet Title
FIRST FLOOR HEATING LAYOUT

Date JUNE/2021
Scale 3/16" = 1'-0"
BCIN# 19669
LO# 91143



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SB-12 PERFORMANCE

HVAC LEGEND

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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.		
2.		
1.		

REVISIONS

Client

ROYAL PINE HOMES

Project Name

CENTREFIELD (WEST GORMLEY)
RICHMOND HILL, ONTARIO
4 BED 4 BATH
OPT GROUND
4502 2942 sqft

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Sheet Title

SECOND FLOOR HEATING LAYOUT

Date JUNE/2021

Scale 3/16" = 1'-0"

BCIN# 19669

LO# 91143