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:** 4505 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 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.

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SITE NAME: CENTREFIELD (WEST GORMLEY) | OPT GROUND | DATE: Jun-21 | WINTER NATURAL AIR CHANGE RATE 0.233 | HEAT LOSS ΔT °F. 78 | CSA-F280-12
BUILDER: ROYAL PINE HOMES | TYPE: 4505 | GFA: 3289 | LO# 87520 | SUMMER NATURAL AIR CHANGE RATE 0.073 | HEAT GAIN ΔT °F. 13 | SB-12 PERFORMANCE

ROOM USE			MBR			ENS			WIC-2			BED-2			BED-3			BED-4			ENS-2				LAUND			BATH					
EXP. WALL			37			34			15			14			44			15			11				0			9					
CLG. HT.			10			9			9			9			10			9			9				9			9					
	FACTORS																																
GRS.WALL AREA	LOSS	GAIN	370			306			135			126			418			135			99				0			81					
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	24	523	375	0	0	0	0	0	0	0	0	0	0	0	0	7	152	109		0	0	0	0	0	0			
EAST	21.8	40.5	0	0	0	0	0	0	13	283	526	45	980	1821	64	1394	2590	0	0	0	0	0	0		0	0	0	0	0	0			
SOUTH	21.8	24.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	17	370	413	0	0	0		0	0	0	7	152	170			
WEST	21.8	40.5	35	762	1416	13	283	526	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			
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	335	1409	232	269	1131	186	122	513	84	81	341	56	354	1489	245	118	496	82	92	387	64		0	0	0	74	311	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			
EXPOSED CLG	1.3	0.6	390	513	229	264	347	155	54	71	32	142	187	83	245	322	144	320	421	188	72	95	42		98	129	58	117	154	69			
NO ATTIC EXPOSED CLG	2.8	1.3	0	0	0	0	0	0	0	0	0	24	67	30	90	253	113	0	0	0	0	0	0		0	0	0	0	0	0			
EXPOSED FLOOR	2.6	0.4	0	0	0	0	0	0	54	141	23	166	433	71	42	110	18	0	0	0	48	125	21		98	256	42	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				2684			2284			1008			2008			3567			1287			759				385			617				
SUB TOTAL HT GAIN					1877			1242			665			2062			3110			683			236				100			290			
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				558			475			210			418			742			268			158				80			128				
AIR CHANGE HEAT GAIN					104			69			37			114			172			38			13				6			16			
DUCT LOSS				0			0			122			243			431			0			92				46			0				
DUCT GAIN					0			0			70			308			419			0			25				77			0			
HEAT GAIN PEOPLE	240		2		480	0		0	0		0	1		240	1		240	1		240	0		0		0		0	0		0			
HEAT GAIN APPLIANCES/LIGHTS					667			0			0			667			667			667			0				667			0			
TOTAL HT LOSS BTU/H				3242			2759			1340			2669			4740			1555			1009				511			746				
TOTAL HT GAIN x 1.3 BTU/H					4067			1705			1004			4410			5991			2116			356				1105			398			

ROOM USE			DEN						K/B/G			DIN			MUD			W/R			FOY								BAS		
EXP. WALL			35						72			23			28			7			24								188		
CLG. HT.			11						11			11			12			11			11								10		
	FACTORS																														
GRS.WALL AREA	LOSS	GAIN	385						792			253			336			77			264								1316		
GLAZING				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	8	174	125	0	0	0	0	0	0						3	65	47
EAST	21.8	40.5	37	806	1497				0	0	0	0	0	0	0	0	0	0	0	0	12	261	486						0	0	0
SOUTH	21.8	24.3	0	0	0				8	174	194	34	741	826	0	0	0	9	196	219	0	0	0						7	152	170
WEST	21.8	40.5	0	0	0				75	1634	3035	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
DOORS	25.8	4.3	0	0	0				20	517	85	0	0	0	20	517	85	0	0	0	30	775	128						20	517	85
NET EXPOSED WALL	4.2	0.7	348	1463	241				689	2898	477	219	921	152	308	1295	213	68	286	47	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						564	2078	342
EXPOSED CLG	1.3	0.6	0	0	0				0	0	0	0	0	0	0	0	0	0	0	0	0	0	0						0	0	0
NO ATTIC EXPOSED CLG	2.8	1.3	0	0	0				10	28	13	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
BASEMENT/CRAWL HEAT LOSS				0						0			0			0			0			0							6278		
SLAB ON GRADE HEAT LOSS				0						0			0			0			0			0									
SUBTOTAL HT LOSS				2269						5251			1662			1986			482			1970							9156		
SUB TOTAL HT GAIN					1738						3804			977			423			266			767								765
LEVEL FACTOR / MULTIPLIER			0.30	0.33					0.30	0.33		0.30	0.33		0.30	0.33		0.30	0.33		0.30	0.33							0.50	0.83	
AIR CHANGE HEAT LOSS				759						1756			556			664			161			659							7593		
AIR CHANGE HEAT GAIN					96						211			54			23			15			43								42
DUCT LOSS				0						0			0			0			0			0							0		
DUCT GAIN					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
HEAT GAIN APPLIANCES/LIGHTS					667						667			667			0			0			0								667
TOTAL HT LOSS BTU/H				3029						7007			2217			2651			643			2630							16750		
TOTAL HT GAIN x 1.3 BTU/H					3252						6087			2209			581			365			1052								1917

TOTAL HEAT GAIN BTU/H: 36889 TONS: 3.07 LOSS DUE TO VENTILATION LOAD BTU/H: 1670 STRUCTURAL HEAT LOSS: 53497 TOTAL COMBINED HEAT LOSS BTU/H: 55167

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
BUILDER: ROYAL PINE HOMES TYPE: 4505 DATE: Jun-21 GFA: 3289 LO# 87520

HEATING CFM 1200 COOLING CFM 1200
TOTAL HEAT LOSS 53,497 TOTAL HEAT GAIN 36,614
AIR FLOW RATE CFM 22.43 AIR FLOW RATE CFM 32.77

RUN COUNT	4th	3rd	2nd	1st	Bas
S/A	0	0	13	8	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.

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	0.03
min adjusted pressure s/a	0.15
r/a pressure	0.17
r/a grille press. Loss	0.02
adjusted pressure r/a	0.15

**CARRIER
59TN6A-060-14V 60
AFUE = 97 %
INPUT (BTU/H) = 60,000
OUTPUT (BTU/H) = **58,000**

FAN SPEED	
LOW	820
MEDLOW	0
MEDIUM	1200
MEDIUM HIGH	0
HIGH	1520

DESIGN CFM = **1200** CFM @ .6 " E.S.P.
TEMPERATURE RISE 45 °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	MBR	ENS	WIC-2	BED-2	BED-3	BED-4	ENS-2	BED-3	LAUND	MBR	BATH	DEN	K/B/G	K/B/G	K/B/G	DIN	MUD	W/R	FOY	ENS	BAS	BAS	BAS	BAS
RM LOSS MBH.	1.62	1.38	1.34	1.33	2.37	1.55	1.01	2.37	0.51	1.62	0.75	3.03	2.34	2.34	2.34	2.22	2.65	0.64	2.63	1.38	4.19	4.19	4.19	4.19
CFM PER RUN HEAT	36	31	30	30	53	35	23	53	11	36	17	68	52	52	52	50	59	14	59	31	94	94	94	94
RM GAIN MBH.	2.03	0.85	1.00	2.20	3.00	2.12	0.36	3.00	1.10	2.03	0.40	3.25	2.03	2.03	2.03	2.21	0.58	0.36	1.05	0.85	0.48	0.48	0.48	0.48
CFM PER RUN COOLING	67	28	33	72	98	69	12	98	36	67	13	107	66	66	66	72	19	12	34	28	16	16	16	16
ADJUSTED PRESSURE	0.17	0.17	0.17	0.17	0.16	0.17	0.17	0.16	0.17	0.17	0.17	0.15	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.	32	58	58	48	49	23	37	47	39	49	27	31	28	39	51	6	43	17	36	46	45	26	8	27
EQUIVALENT LENGTH	150	150	130	120	180	180	140	170	140	150	140	90	130	130	100	140	120	150	100	160	110	120	150	110
TOTAL EFFECTIVE LENGTH	182	208	188	168	229	203	177	217	179	199	167	121	158	169	151	146	163	167	136	206	155	146	158	137
ADJUSTED PRESSURE	0.09	0.08	0.09	0.1	0.07	0.08	0.1	0.07	0.1	0.09	0.1	0.13	0.11	0.1	0.11	0.12	0.11	0.1	0.13	0.08	0.1	0.11	0.1	0.12
ROUND DUCT SIZE	5	5	4	5	**6**	**6**	4	**6**	4	5	4	**6**	5	5	5	**6**	5	4	5	4	**6**	**6**	**6**	**6**
HEATING VELOCITY (ft/min)	264	228	344	220	270	178	264	270	126	264	195	347	382	382	382	255	433	161	433	356	479	479	479	479
COOLING VELOCITY (ft/min)	492	206	379	529	500	352	138	500	413	492	149	546	485	485	485	367	140	138	250	321	82	82	82	82
OUTLET GRILL SIZE	3X10	3X10	3X10	3X10	4X10	4X10	3X10	4X10	3X10	3X10	3X10	4X10	3X10	3X10	3X10	4X10	3X10	3X10	3X10	3X10	4X10	4X10	4X10	4X10
TRUNK	D	D	B	B	A	D	B	A	B	D	A	A	D	C	C	B	C	A	A	C	C	D	B	A

RUN #	25
ROOM NAME	BED-2
RM LOSS MBH.	1.33
CFM PER RUN HEAT	30
RM GAIN MBH.	2.20
CFM PER RUN COOLING	72
ADJUSTED PRESSURE	0.17
ACTUAL DUCT LGH.	55
EQUIVALENT LENGTH	130
TOTAL EFFECTIVE LENGTH	185
ADJUSTED PRESSURE	0.09
ROUND DUCT SIZE	5
HEATING VELOCITY (ft/min)	220
COOLING VELOCITY (ft/min)	529
OUTLET GRILL SIZE	3X10
TRUNK	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	358	0.07	9.9	12	x	8	537	TRUNK G	0	0.00	0	0	x	8	0
TRUNK B	626	0.07	12.2	20	x	8	563	TRUNK H	0	0.00	0	0	x	8	0
TRUNK C	288	0.08	8.8	10	x	8	518	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	920	0.05	15.3	28	x	8	591
TRUNK Y	480	0.05	12	16	x	8	540
TRUNK Z	280	0.05	9.8	12	x	8	420
DROP	1200	0.05	16.9	24	x	12	600

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	125	85	75	95	130	155	175	175	0	0	0	0	0	0	0	185
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.	41	50	58	52	58	35	23	30	1	1	1	1	1	1	1	17
EQUIVALENT LENGTH	215	205	245	165	175	200	185	190	0	0	0	0	0	0	0	145
TOTAL EFFECTIVE LH	256	255	303	217	233	235	208	220	1	1	1	1	1	1	1	162
ADJUSTED PRESSURE	0.06	0.06	0.05	0.07	0.06	0.06	0.07	0.07	14.80	14.80	14.80	14.80	14.80	14.80	14.80	0.09
ROUND DUCT SIZE	6.9	6	6	6	7	7.5	7.5	7.5	0	0	0	0	0	0	0	7.2
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	14	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.

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

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TYPE: 4505 LO # 87520
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
ENS-2	BY INSTALLING CONTRACTOR	50	✓	3.5
BATH	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#: 87520 Model: 4505 Builder: ROYAL PINE HOMES Date: 2021-06-04

Volume Calculation

House Volume

Level	Floor Area (ft²)	Floor Height (ft)	Volume (ft³)
Bsmt	1434	10	14340
First	1434	11	15774
Second	1861	9	16749
Third	0	9	0
Fourth	0	9	0
		Total:	46,863.0 ft³
		Total:	1327.0 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 368.61 x 43 °C x 1.2 = 4451 W

= **15187 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 368.61 x 7 °C x 1.2 = 228 W

= **779 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	15,187	9,156	0.829
2	0.3		13,621	0.334
3	0.2		14,600	0.208
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: 4505 OPT GROUND **BUILDER:** ROYAL PINE HOMES
SFQT: 3289 **LO#** 87520 **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):	46863.0	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: 38.0 ft	WIDTH: 56.0 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

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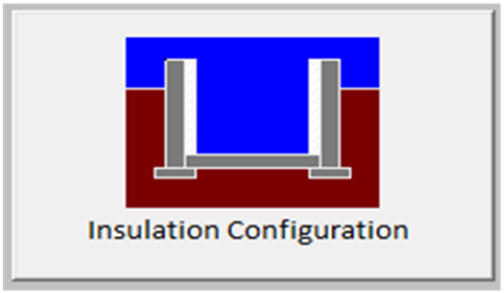
Residential Foundation Thermal Load Calculator

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):	**11.6**	 Insulation Configuration
Floor Width (m):	**17.1**	
Exposed Perimeter (m):	**0.0**	
Wall Height (m):	**3.0**	
Depth Below Grade (m):	**2.13**	
Window Area (m^2):	**1.2**	
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):		**1840**

TYPE: 4505 OPT GROUND
LO# 87520

HVAC Designs Ltd.
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Ajax ON, L1S 2E2
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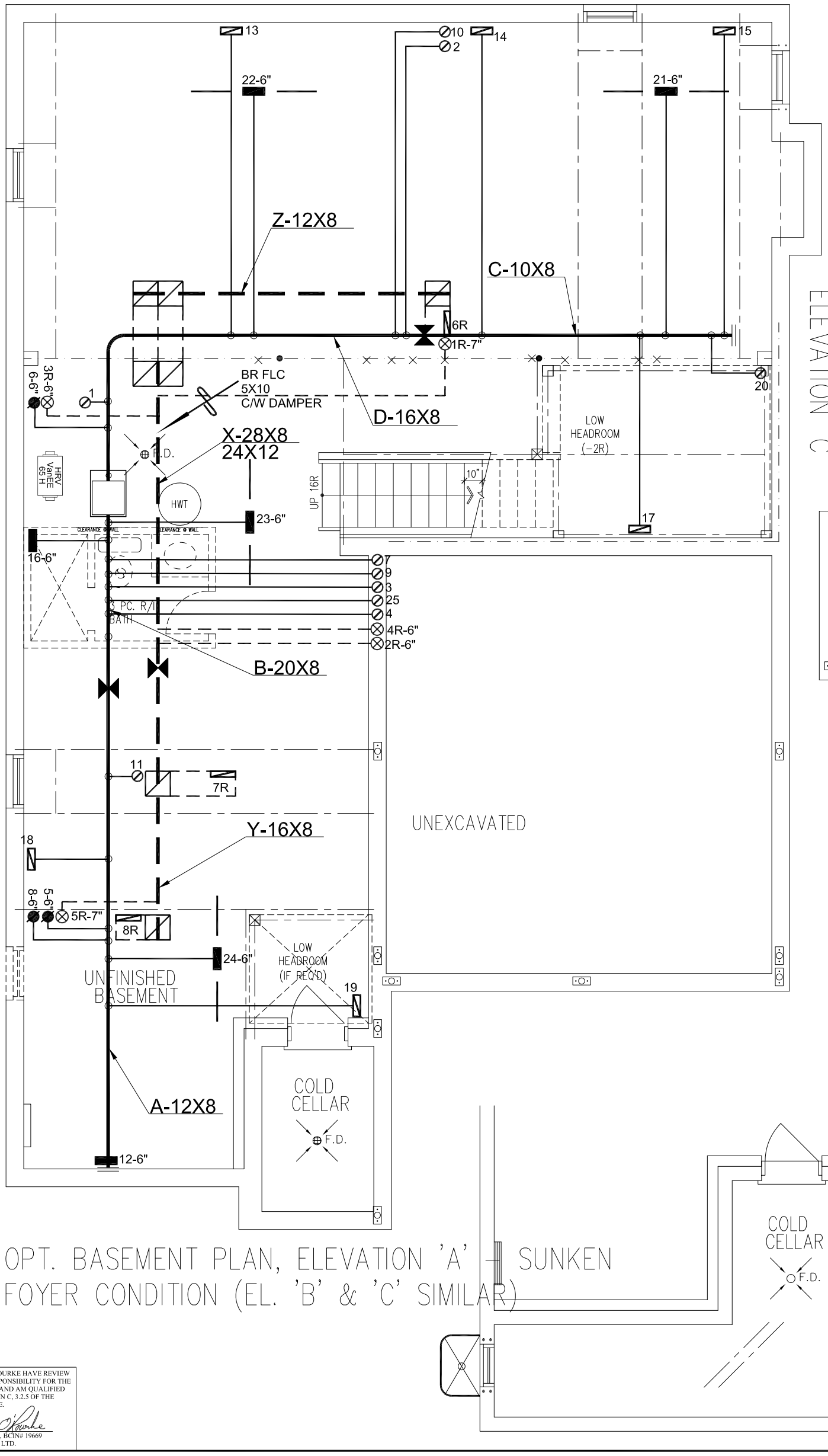
Air Infiltration Residential Load Calculator

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):	7.01
Building Configuration	
Type:	Detached
Number of Stories:	Two
Foundation:	Full
House Volume (m^3):	1327.0
Air Leakage/Ventilation	
Air Tightness Type:	Energy Star Detached (2.5 ACH)
Custom BDT Data:	ELA @ 10 Pa. 1238.8 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):	**0.233**
Cooling Air Leakage Rate (ACH/H):	**0.073**

TYPE: 4505 OPT GROUND

LO# 87520



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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
3.		
2.	REVISED AS PER CAD	JUNE/2021
1.	REVISED TO PERFORMANCE	SEPT/2020

REVISIONS

Client
ROYAL PINE HOMES

Project Name
CENTREFIELD (WEST GORMLEY)
RICHMOND HILL, ONTARIO

OPT GROUND
4505 3289 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.

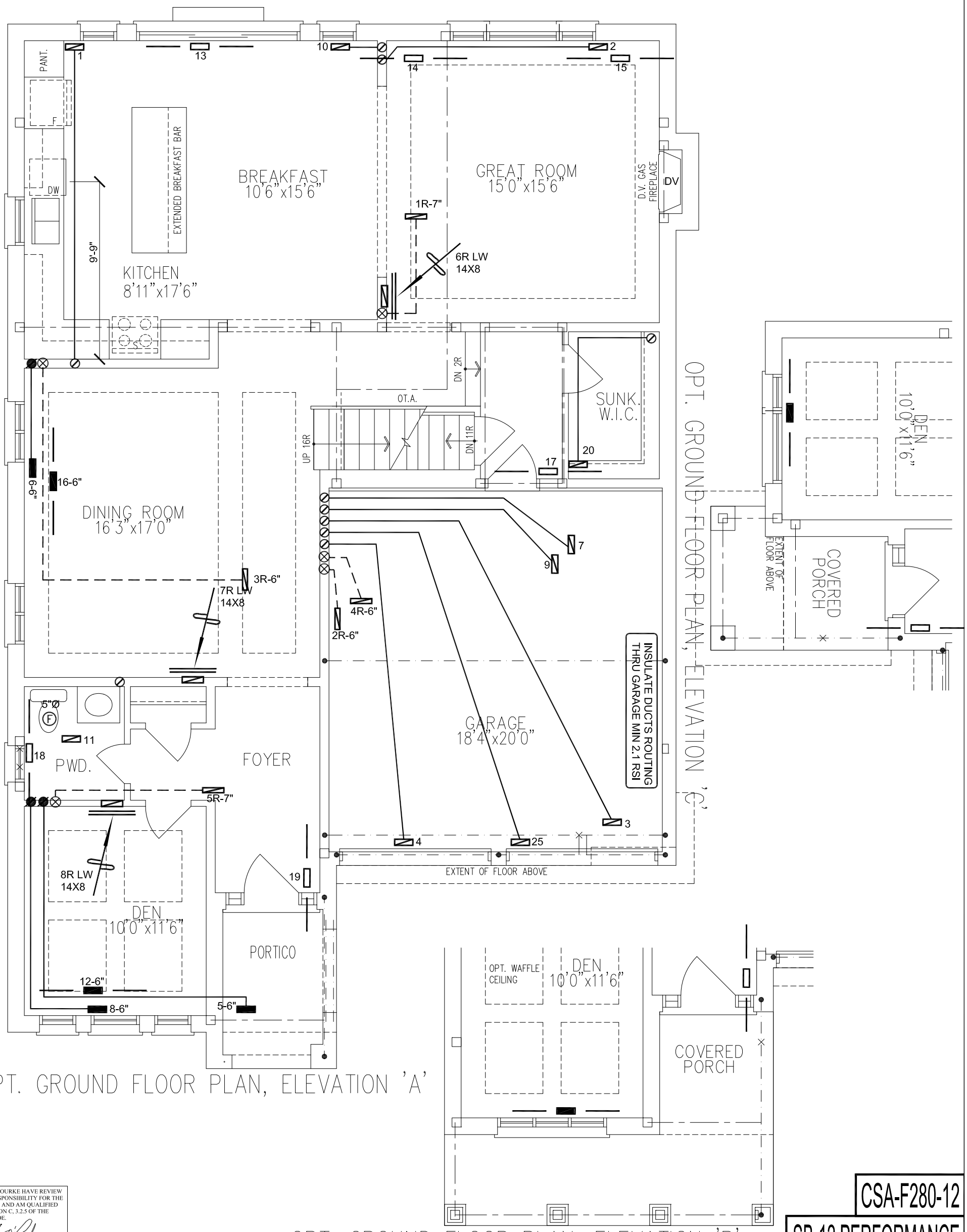
HEAT LOSS 55167 BTU/H	
UNIT DATA	
MAKE	CARRIER
MODEL	59SP5A-80-16
INPUT	80 MBTU/H
OUTPUT	78 MBTU/H
COOLING	3.0 TONS
FAN SPEED	1200 cfm @ 0.6" w.c.

# OF RUNS	S/A	R/A	FANS
3RD FLOOR			
2ND FLOOR	13	5	5
1ST FLOOR	8	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 SEPT/2020
Scale 3/16" = 1'-0"
BCIN# 19669
LO# 87520



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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
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REVISIONS

Client

ROYAL PINE HOMES

Project Name

CENTREFIELD (WEST GORMLEY)
RICHMOND HILL, ONTARIO

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Sheet Title

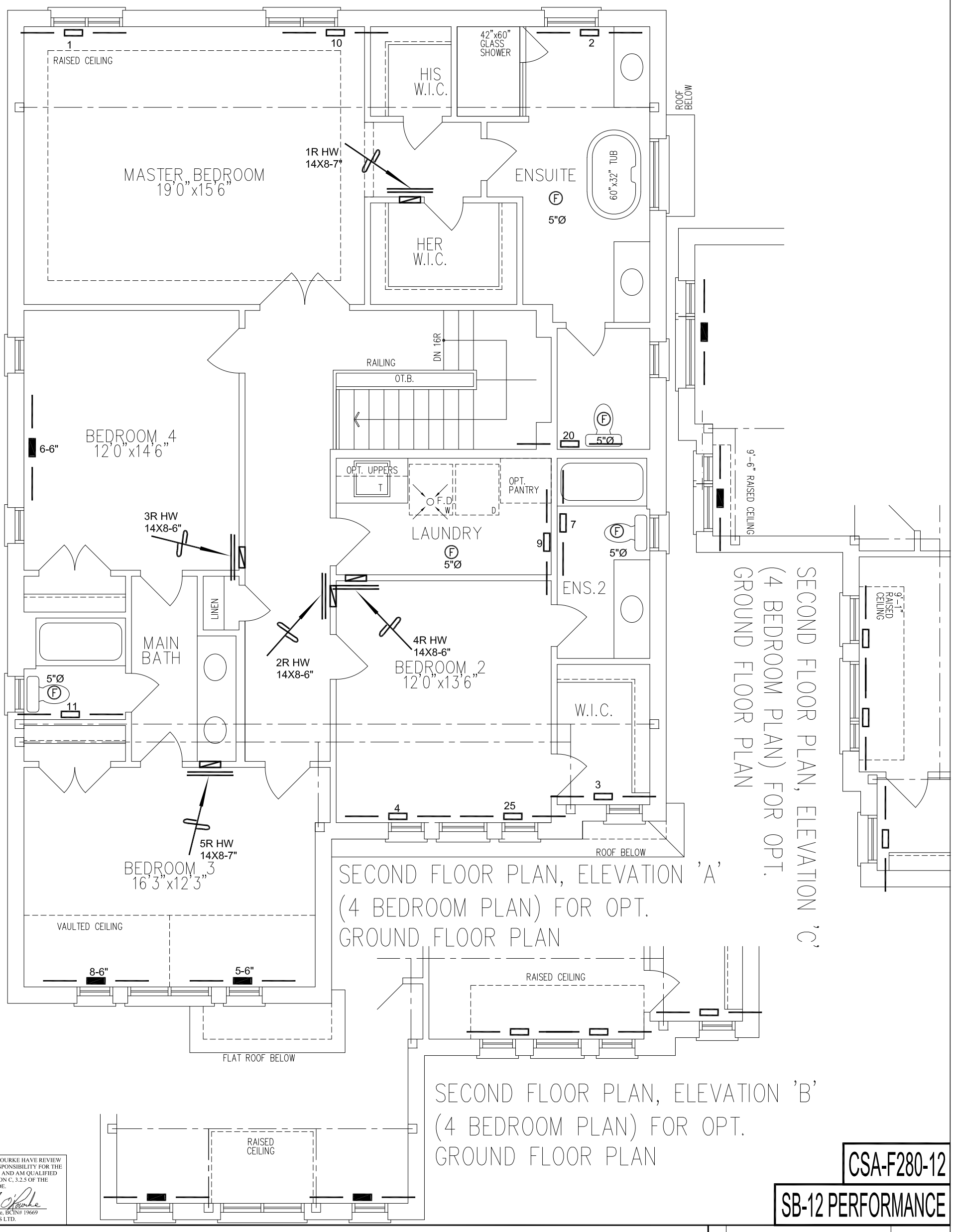
FIRST FLOOR HEATING LAYOUT

Date SEPT/2020

Scale 3/16" = 1'-0"

BCIN# 19669

LO# 87520



SECOND FLOOR PLAN, ELEVATION 'A'
(4 BEDROOM PLAN) FOR OPT.
GROUND FLOOR PLAN

SECOND FLOOR PLAN, ELEVATION 'C'
(4 BEDROOM PLAN) FOR OPT.
GROUND FLOOR PLAN

SECOND FLOOR PLAN, ELEVATION 'B'
(4 BEDROOM PLAN) FOR OPT.
GROUND FLOOR PLAN

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CSA-F280-12

SB-12 PERFORMANCE

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Sheet Title

SECOND FLOOR HEATING LAYOUT

Date SEPT/2020

Scale 3/16" = 1'-0"

BCIN# 19669

LO# 87520