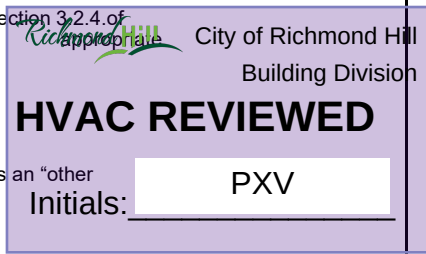


Schedule 1: Designer Information

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 ☐ Small Buildings ☐ Large Buildings ☐ Complex Buildings ☒ HVAC – House ☐ Building Services ☐ Detection, Lighting and Power ☐ Fire Protection ☐ Building Structural ☐ Plumbing – House ☐ Plumbing – All Buildings ☐ 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: 4506 The Fernwood Project: CENTREFIELD (WEST GORMLEY)	
D. Declaration of Designer			
I, <u>MICHAEL O'ROURKE</u> (print name)		declare that (choose one as appropriate):	
☐ 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 classes/categories. Individual BCIN: _____ Firm BCIN: _____		 HVAC REVIEWED Initials: <u>PXV</u>	
☒ 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 Division C, of the Building Code. Individual BCIN: <u>19669</u> Basis for exemption from registration and qualification: <u>O.B.C SENTENCE 3.2.4.1 (4)</u>			
☐ 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		 Signature of Designer	

NOTE:

- 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.
- 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.

Application for a Permit Construct or Demolish – Effective January 1, 2015

Per: danielle.devitt

08/16/2021
RECEIVED

SITE NAME: CENTREFIELD (WEST GORMLEY)

BUILDER: ROYAL PINE HOMES

TYPE: 4506

GFA: 3348

DATE: Jun-21

LO# 87522

WINTER NATURAL AIR CHANGE RATE 0.233

SUMMER NATURAL AIR CHANGE RATE 0.073

HEAT LOSS ΔT °F. 78

HEAT GAIN ΔT °F. 13

CSA-F280-12

SB-12 PERFORMANCE

ROOM USE	EXP. WALL	CLG. HT.	MBR	ENS	WIC	BED-2	BED-3	BED-4	BATH	COMP	LAUN	ENS-2		
			18	29	23	29	47	19	9	8	0	6		
			9	9	9	9	9	9	9	12	9	9		
FACTORS														
GRS.WALL AREA	LOSS	GAIN	162	261	207	261	423	171	81	96	0	54		
GLAZING	LOSS	GAIN	LOSS	GAIN	LOSS	GAIN	LOSS	GAIN	LOSS	GAIN	LOSS	GAIN		
NORTH	21.8	14.9	0	0	0	0	0	0	0	0	0	0	7	152
EAST	21.8	38.4	0	0	0	0	0	0	0	0	0	0	0	0
SOUTH	21.8	23.1	0	0	0	37	806	856	0	0	0	0	0	0
WEST	21.8	38.4	28	610	1075	27	588	1036	0	0	0	0	0	0
SKYL.	35.8	101.2	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
NET EXPOSED WALL	4.2	0.7	134	564	93	197	828	136	207	871	143	216	908	149
NET EXPOSED BSMT WALL ABOVE GR	3.7	0.6	0	0	0	0	0	0	0	0	0	0	0	0
EXPOSED CLG	1.3	0.6	306	402	180	66	87	39	102	134	60	172	226	101
NO ATTIC EXPOSED CLG	2.8	1.3	0	0	0	130	365	163	0	0	0	24	67	30
EXPOSED FLOOR	2.6	0.4	0	0	0	0	0	0	196	512	84	0	0	0
BASEMENT/CRAWL HEAT LOSS			0	0	0	0	0	0	0	0	0	0	0	0
SLAB ON GRADE HEAT LOSS			0	0	0	0	0	0	0	0	0	0	0	0
SUBTOTAL HT LOSS			1576		2675	1005	2694	3594	1966	770	944	165	609	
SUB TOTAL HT GAIN				1347	2230	203	2092	2972	1332	438	385	43	204	
LEVEL FACTOR / MULTIPLIER	0.20	0.18				0.20	0.18		0.20	0.18		0.20	0.18	
AIR CHANGE HEAT LOSS			285		484	182	488	650	356	139	171	30	110	
AIR CHANGE HEAT GAIN				60	99	9	93	132	59	19	17	2	9	
DUCT LOSS			0		0	0	318	0	0	0	19	72		
DUCT GAIN			0	0	0	0	294	0	0	0	56	21		
HEAT GAIN PEOPLE	240	2	480	0	0	0	1	240	1	240	0	0	0	
HEAT GAIN APPLIANCES/LIGHTS			513	0	0	0	513	513	0	513	513	0		
TOTAL HT LOSS BTU/H			1861		3159	1186	3499	4245	2322	910	1115	214	791	
TOTAL HT GAIN x 1.3 BTU/H			3120		3028	276	4201	5013	2786	594	1189	797	305	

ROOM USE	EXP. WALL	CLG. HT.	DIN	FAM	KIT	LIV	WIC-3	W/R	FOY	MUD				BAS
			28	33	61	31	6	18	15	28				188
			11	11	11	11	9	11	11	11				9
FACTORS														
GRS.WALL AREA	LOSS	GAIN	308	363	671	341	54	198	165	308				1128
GLAZING	LOSS	GAIN	LOSS	GAIN	LOSS	GAIN	LOSS	GAIN	LOSS	GAIN	LOSS	GAIN		LOSS
NORTH	21.8	14.9	0	0	0	0	0	0	0	0	0	0	0	0
EAST	21.8	38.4	0	0	0	0	0	0	0	0	0	0	0	0
SOUTH	21.8	23.1	49	1067	1133	0	0	0	8	174	185	0	0	0
WEST	21.8	38.4	0	0	0	37	806	1420	71	1547	2726	0	0	0
SKYL.	35.8	101.2	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
NET EXPOSED WALL	4.2	0.7	259	1089	179	326	1371	226	562	2363	389	255	1072	176
NET EXPOSED BSMT WALL ABOVE GR	3.7	0.6	0	0	0	0	0	0	0	0	0	0	0	0
EXPOSED CLG	1.3	0.6	0	0	0	0	0	0	0	0	0	78	103	46
NO ATTIC EXPOSED CLG	2.8	1.3	0	0	0	0	0	0	0	0	0	0	0	0
EXPOSED FLOOR	2.6	0.4	0	0	0	0	0	0	78	204	34	0	0	0
BASEMENT/CRAWL HEAT LOSS			0	0	0	0	0	0	0	0	0	0	0	0
SLAB ON GRADE HEAT LOSS			0	0	0	0	0	0	0	0	0	0	0	0
SUBTOTAL HT LOSS			2157		2177	4738	2946	691	1679	1728				
SUB TOTAL HT GAIN				1312	1646	3993	2821	456	514	432	284			
LEVEL FACTOR / MULTIPLIER	0.30	0.28				0.30	0.28		0.30	0.28		0.30	0.28	
AIR CHANGE HEAT LOSS			595		600	1306	812	125	278	463	476			
AIR CHANGE HEAT GAIN				58	73	177	125	20	19	13				
DUCT LOSS			0		0	0	0	82	0	0	0			
DUCT GAIN			0	0	0	0	0	48	0	0	0			
HEAT GAIN PEOPLE	240	0	0	0	0	0	0	0	0	0	0			
HEAT GAIN APPLIANCES/LIGHTS			513	513	513	513	513	513	0	513	513			
TOTAL HT LOSS BTU/H			2751		2777	6044	3758	898	1286	2141	2205			
TOTAL HT GAIN x 1.3 BTU/H			2448		2901	6087	4497	681	698	587	1053			

TOTAL HEAT GAIN BTU/H:

42575

TONS: 3.55

LOSS DUE TO VENTILATION LOAD BTU/H: 1670

STRUCTURAL HEAT LOSS: 58223

TOTAL COMBINED HEAT LOSS BTU/H: 59893

CITY OF RICHMOND HILL
BUILDING DIVISION

08/16/2021

RECEIVED
Per: danielle.devitt

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

TYPE: 4506

DATE: Jun-21

GFA: 3348

LO# 87522

HEATING CFM 1370 COOLING CFM 1370
TOTAL HEAT LOSS 58,223 TOTAL HEAT GAIN 42,300
AIR FLOW RATE CFM 23.53 AIR FLOW RATE CFM 32.39

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

****CARRIER**
59TN6A-080-14V
FAN SPEED 80

AFUE = 97 %
INPUT (BTU/H) = 80,000
OUTPUT (BTU/H) = **78,000**

RUN COUNT	4th	3rd	2nd	1st	Bas
S/A	0	0	16	10	5
R/A	0	0	5	3	1

plenium 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

LOW 1030
MEDLOW 0
MEDIUM 1370
MEDIUM HIGH 0
HIGH 1800

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

TEMPERATURE RISE 53 °F

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	WIC	BED-2	BED-3	BED-4	BATH	COMP	LAUN	MBR	ENS-2	DIN	FAM	KIT	KIT	LIV	WIC-3	W/R	FOY	MUD	BAS	BAS	BAS	BAS
RM LOSS MBH.	0.93	1.58	1.19	1.75	2.12	1.16	0.91	1.12	0.21	0.93	0.79	2.75	2.78	2.01	2.01	1.88	0.90	1.29	2.14	2.20	3.41	3.41	3.41	3.41
CFM PER RUN HEAT	22	37	28	41	50	27	21	26	5	22	19	65	65	47	47	44	21	30	50	52	80	80	80	80
RM GAIN MBH.	1.56	1.51	0.28	2.10	2.51	1.39	0.59	1.19	0.80	1.56	0.31	2.45	2.90	2.03	2.03	2.25	0.68	0.70	0.59	1.05	0.41	0.41	0.41	0.41
CFM PER RUN COOLING	51	49	9	68	81	45	19	39	26	51	10	79	94	66	66	73	22	23	19	34	13	13	13	13
ADJUSTED PRESSURE	0.17	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	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17
ACTUAL DUCT LGH.	42	60	54	48	82	52	25	26	38	49	76	49	14	37	32	66	55	58	65	16	43	20	21	39
EQUIVALENT LENGTH	220	160	195	150	150	210	200	150	140	150	170	130	140	150	130	140	150	180	160	110	130	150	130	140
TOTAL EFFECTIVE LENGTH	262	220	249	198	232	262	225	176	178	199	246	179	154	187	162	206	205	238	225	126	173	170	151	179
ADJUSTED PRESSURE	0.07	0.08	0.07	0.09	0.07	0.07	0.08	0.1	0.1	0.09	0.07	0.1	0.11	0.09	0.11	0.08	0.08	0.07	0.08	0.14	0.1	0.1	0.11	0.1
ROUND DUCT SIZE	5	5	4	5	6	5	4	4	4	5	4	5	6	5	5	6	4	4	5	4	5	6	6	6
HEATING VELOCITY (ft/min)	162	272	321	301	255	198	241	298	57	162	218	477	331	345	345	224	241	344	367	597	587	408	408	408
COOLING VELOCITY (ft/min)	374	360	103	499	413	330	218	447	298	374	115	580	479	485	485	372	252	264	140	390	95	66	66	66
OUTLET GRILL SIZE	3X10	3X10	3X10	3X10	4X10	3X10	3X10	3X10	3X10	3X10	3X10	3X10	4X10	3X10	3X10	4X10	3X10	3X10	3X10	3X10	3X10	4X10	4X10	4X10
TRUNK	C	B	C	D	A	B	D	D	D	C	A	B	D	B	C	A	D	A	A	D	B	C	C	B

RUN #	25	26	27	28	29	30	31
ROOM NAME	BAS	ENS	BED-2	BED-3	BED-4	KIT	LIV
RM LOSS MBH.	3.41	1.58	1.75	2.12	1.16	2.01	1.88
CFM PER RUN HEAT	80	37	41	50	27	47	44
RM GAIN MBH.	0.41	1.51	2.10	2.51	1.39	2.03	2.25
CFM PER RUN COOLING	13	49	68	81	45	66	73
ADJUSTED PRESSURE	0.17	0.17	0.17	0.16	0.17	0.17	0.17
ACTUAL DUCT LGH.	68	43	39	79	66	34	67
EQUIVALENT LENGTH	150	200	180	210	240	130	160
TOTAL EFFECTIVE LENGTH	218	243	219	289	306	164	227
ADJUSTED PRESSURE	0.08	0.07	0.08	0.06	0.06	0.1	0.08
ROUND DUCT SIZE	6	5	5	6	5	5	6
HEATING VELOCITY (ft/min)	408	272	301	255	198	345	224
COOLING VELOCITY (ft/min)	66	360	499	413	330	485	372
OUTLET GRILL SIZE	4X10	3X10	3X10	4X10	3X10	3X10	4X10
TRUNK	A	B	D	A	A	B	A

SUPPLY AIR TRUNK SIZE

	TRUNK	STATIC	ROUND	RECT		VELOCITY		TRUNK	STATIC	ROUND	RECT		VELOCITY
	CFM	PRESS.	DUCT	DUCT		(ft/min)		CFM	PRESS.	DUCT	DUCT		(ft/min)
TRUNK A	394	0.06	10.6	14	x	8	507	TRUNK G	0	0.00	0	0	8
TRUNK B	420	0.07	10.5	14	x	8	540	TRUNK H	0	0.00	0	0	8
TRUNK C	1093	0.06	15.6	28	x	8	703	TRUNK I	0	0.00	0	0	8
TRUNK D	1365	0.06	16.9	26	x	10	756	TRUNK J	0	0.00	0	0	8
TRUNK E	0	0.00	0	0	x	8	0	TRUNK K	0	0.00	0	0	8
TRUNK F	0	0.00	0	0	x	8	0	TRUNK L	0	0.00	0	0	8

RETURN AIR TRUNK SIZE

	TRUNK	STATIC	ROUND	RECT		VELOCITY
	CFM	PRESS.	DUCT	DUCT		(ft/min)
TRUNK O	0	0.05	0	0	x	8
TRUNK P	0	0.05	0	0	x	8
TRUNK Q	0	0.05	0	0	x	8
TRUNK R	0	0.05	0	0	x	8
TRUNK S	0	0.05	0	0	x	8
TRUNK T	0	0.05	0	0	x	8
TRUNK U	0	0.05	0	0	x	8
TRUNK V	0	0.05	0	0	x	8
TRUNK W	155	0.05	7.8	8	x	8
TRUNK X	1370	0.05	17.7	30	x	10
TRUNK Y	915	0.05	15.3	28	x	8
TRUNK Z	560	0.05	12.7	18	x	8
DROP	1370	0.05	17.7	24	x	12

RETURN AIR #	1	2	3	4	5	6	7	8								BR
AIR VOLUME	175	75	85	85	95	180	330	155	0	0	0	0	0	0	0	190
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.	42	52	67	60	66	27	40	62	1	1	1	1	1	1	1	14
EQUIVALENT LENGTH	185	235	165	195	155	145	240	170	0	0	0	0	0	0	0	135
TOTAL EFFECTIVE LH	227	287	232	255	221	172	280	232	1	1	1	1	1	1	1	149
ADJUSTED PRESSURE	0.07	0.05	0.06	0.06	0.07	0.09	0.05	0.06	14.80	14.80	14.80	14.80	14.80	14.80	14.80	0.10
ROUND DUCT SIZE	7.5	6	6	6	6	7.2	10.4	7.5	0	0	0	0	0	0	0	7.1
INLET GRILL SIZE	8	8	8	8	8	8	8	8	0	0	0	0	0	0	0	8
	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
INLET GRILL SIZE	14	14	14	14	14	14	30	14	0	0	0	0	0	0	0	14

CITY OF RICHMOND HILL
BUILDING DIVISION

06/16/2021

Per: danielle.devitt

TYPE: 4506
SITE NAME: CENTREFIELD (WEST GORMLEY)

LO # 87522

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	
☒ City of Richmond Hill Building Division	☐ Non Forced Air
☐ Electric Space Heat	

INITIALS: PXV		9.32.1(2)
☐	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	<u>2</u> @ 21.2 cfm <u>42.4</u> cfm	
Other Bedrooms	<u>3</u> @ 10.6 cfm <u>31.8</u> cfm	
Kitchen & Bathrooms	<u>5</u> @ 10.6 cfm <u>53</u> cfm	
Other Rooms	<u>7</u> @ 10.6 cfm <u>74.2</u> cfm	
Table 9.32.3.A.	TOTAL <u>201.4</u> 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	<u>201.4</u> cfm	
Less Principal Ventil. Capacity	<u>79.5</u> cfm	
Required Supplemental Capacity	<u>121.9</u> cfm	

PRINCIPAL EXHAUST FAN CAPACITY	
Model: VANEE 65H	Location: BSMT
<u>79.5</u> cfm	☒ HVI Approved

PRINCIPAL EXHAUST HEAT LOSS CALCULATION			
CFM	ΔT °F	FACTOR	% LOSS
79.5 CFM	X 78 F	X 1.08	X 0.25

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

HEAT RECOVERY VENTILATOR		9.32.3.11.
Model: VANEE 65H		
<u>155</u> cfm high	<u>64</u> cfm low	
<u>75</u> % 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:	<i>Michael O'Rourke</i>
HRAI #	Per: danielle 001820
Date:	June 21

CSA F280-12 Residential Heat Loss and Heat Gain Calculations																																																												
Formula Sheet (For Air Leakage / Ventilation Calculation)																																																												
LO#: 87522		Model: 4506		Builder: ROYAL PINE HOMES																																																								
				Date: 2021-06-04																																																								
Volume Calculation			Air Change & Delta T Data																																																									
House Volume <table border="1" style="width:100%; border-collapse: collapse;"> <thead> <tr> <th>Level</th> <th>Floor Area (ft²)</th> <th>Floor Height (ft)</th> <th>Volume (ft³)</th> </tr> </thead> <tbody> <tr> <td>Bsmt</td> <td>1497</td> <td>9</td> <td>13473</td> </tr> <tr> <td>First</td> <td>1497</td> <td>11</td> <td>16467</td> </tr> <tr> <td>Second</td> <td>1851</td> <td>9</td> <td>16659</td> </tr> <tr> <td>Third</td> <td>0</td> <td>9</td> <td>0</td> </tr> <tr> <td>Fourth</td> <td>0</td> <td>9</td> <td>0</td> </tr> <tr> <td colspan="3" style="text-align: right;">Total:</td> <td>46,599.0 ft³</td> </tr> <tr> <td colspan="3" style="text-align: right;">Total:</td> <td>1319.5 m³</td> </tr> </tbody> </table>			Level	Floor Area (ft²)	Floor Height (ft)	Volume (ft³)	Bsmt	1497	9	13473	First	1497	11	16467	Second	1851	9	16659	Third	0	9	0	Fourth	0	9	0	Total:			46,599.0 ft³	Total:			1319.5 m³	<table border="1" style="width:100%; border-collapse: collapse;"> <tr> <td style="width: 80%;">WINTER NATURAL AIR CHANGE RATE</td> <td style="width: 20%;">0.233</td> </tr> <tr> <td>SUMMER NATURAL AIR CHANGE RATE</td> <td>0.073</td> </tr> </table> <table border="1" style="width:100%; border-collapse: collapse;"> <tr> <th colspan="5" style="text-align: center;">Design Temperature Difference</th> </tr> <tr> <th></th> <th>T_{in} °C</th> <th>T_{out} °C</th> <th>ΔT °C</th> <th>ΔT °F</th> </tr> <tr> <td>Winter DTD_h</td> <td>22</td> <td>-21</td> <td>43</td> <td>78</td> </tr> <tr> <td>Summer DTD_c</td> <td>24</td> <td>31</td> <td>7</td> <td>13</td> </tr> </table>		WINTER NATURAL AIR CHANGE RATE	0.233	SUMMER NATURAL AIR CHANGE RATE	0.073	Design Temperature Difference						T _{in} °C	T _{out} °C	ΔT °C	ΔT °F	Winter DTD _h	22	-21	43	78	Summer DTD _c	24	31	7	13
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5.2.3.1 Heat Loss due to Air Leakage			6.2.6 Sensible Gain due to Air Leakage																																																									
$HL_{airb} = LR_{airh} \times \frac{V_b}{3.6} \times DTD_h \times 1.2$ 0.233 x 366.54 x 43 °C x 1.2 = 4426 W = 15101 Btu/h			$HG_{salb} = LR_{airc} \times \frac{V_b}{3.6} \times DTD_c \times 1.2$ = 0.073 x 366.54 x 7 °C x 1.2 = 227 W = 775 Btu/h																																																									
5.2.3.2 Heat Loss due to Mechanical Ventilation			6.2.7 Sensible heat Gain due to 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			$HL_{vairb} = PVC \times DTD_h \times 1.08 \times (1 - E)$ 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)																																																												
$HL_{airr} = Level\ Factor \times HL_{airbv} \times \{(HL_{agcr} + HL_{bgcr}) \div (HL_{agclevel} + HL_{bgclevel})\}$ <table border="1" style="width:100%; border-collapse: collapse;"> <thead> <tr> <th>Level</th> <th>Level Factor (LF)</th> <th>HL_{airve} Air Leakage + Ventilation Heat Loss (Btu/h)</th> <th>Level Conductive Heat Loss: (HL_{clevel})</th> <th>Air Leakage Heat Loss Multiplier (LF x HL_{airbv} / HL_{clevel})</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>0.5</td> <td rowspan="5" style="text-align: center; vertical-align: middle;">15,101</td> <td>9,509</td> <td>0.794</td> </tr> <tr> <td>2</td> <td>0.3</td> <td>16,432</td> <td>0.276</td> </tr> <tr> <td>3</td> <td>0.2</td> <td>16,689</td> <td>0.181</td> </tr> <tr> <td>4</td> <td>0</td> <td>0</td> <td>0.000</td> </tr> <tr> <td>5</td> <td>0</td> <td>0</td> <td>0.000</td> </tr> </tbody> </table> *HL_{airbv} = Air leakage heat loss + ventilation heat loss *For a balanced or supply only ventilation system HL_{airve} = 0					Level	Level Factor (LF)	HL _{airve} Air Leakage + Ventilation Heat Loss (Btu/h)	Level Conductive Heat Loss: (HL _{clevel})	Air Leakage Heat Loss Multiplier (LF x HL _{airbv} / HL _{clevel})	1	0.5	15,101	9,509	0.794	2	0.3	16,432	0.276	3	0.2	16,689	0.181	4	0	0	0.000	5	0	0	0.000																														
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CITY OF RICHMOND HILL
BUILDING DIVISION

08/16/2021

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Per: danielle.devitt

HEAT LOSS AND GAIN SUMMARY SHEET

MODEL: 4506	BUILDER: ROYAL PINE HOMES
SFQT: 3348	SITE: CENTREFIELD (WEST GORMLEY)
LO# 87522	

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 (ft³):	46599.0	ASSUMED (Y/N):	Y
INTERNAL SHADING:	BLINDS/CURTAINS	ASSUMED OCCUPANTS:	5
INTERIOR LIGHTING LOAD (Btu/h/ft²):	1.27	DC BRUSHLESS MOTOR (Y/N):	Y
FOUNDATION CONFIGURATION	BCIN_1	DEPTH BELOW GRADE:	6.0 ft
LENGTH: 56.0 ft	WIDTH: 38.0 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	94%	-

CITY OF RICHMOND HILL
BUILDING DIVISION

08/16/2021

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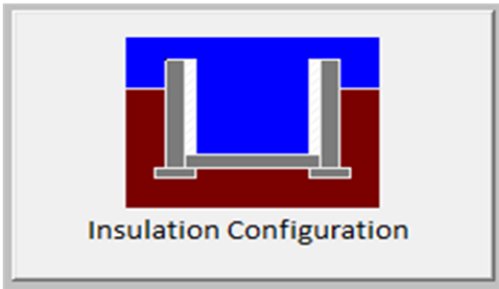
Per: danielle.devitt*Michael O'Rourke*

INDIVIDUAL BCIN: 19669

MICHAEL O'ROURKE

Residential Foundation Thermal Load Calculator

Supplemental tool for CAN/CSA-F280

Weather Station Description		
Province:	Ontario	
Region:	Richmond Hill	
Site Description		
Soil Conductivity:	Normal conductivity: dry sand, loam, clay	
Water Table:	Normal (7-10 m, 23-33 ft)	
Foundation Dimensions		
Floor Length (m):	17.1	 Insulation Configuration
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):	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):	1898	

TYPE: 4506
LO# 87522CITY OF RICHMOND HILL
BUILDING DIVISION

08/16/2021

RECEIVED

Per: danielle.devitt

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):	1319.5			
Air Leakage/Ventilation				
Air Tightness Type:	Energy Star Detached (2.5 ACH)			
Custom BDT Data:	ELA @ 10 Pa.		1231.8 cm ²	
	2.50		ACH @ 50 Pa	
Mechanical Ventilation (L/s):	Total Supply		Total Exhaust	
	37.5		37.5	
Flue Size				
Flue #:	#1	#2	#3	#4
Diameter (mm):	0	0	0	0
Natural Infiltration Rates				
Heating Air Leakage Rate (ACH/H):	0.233			
Cooling Air Leakage Rate (ACH/H):	0.073			

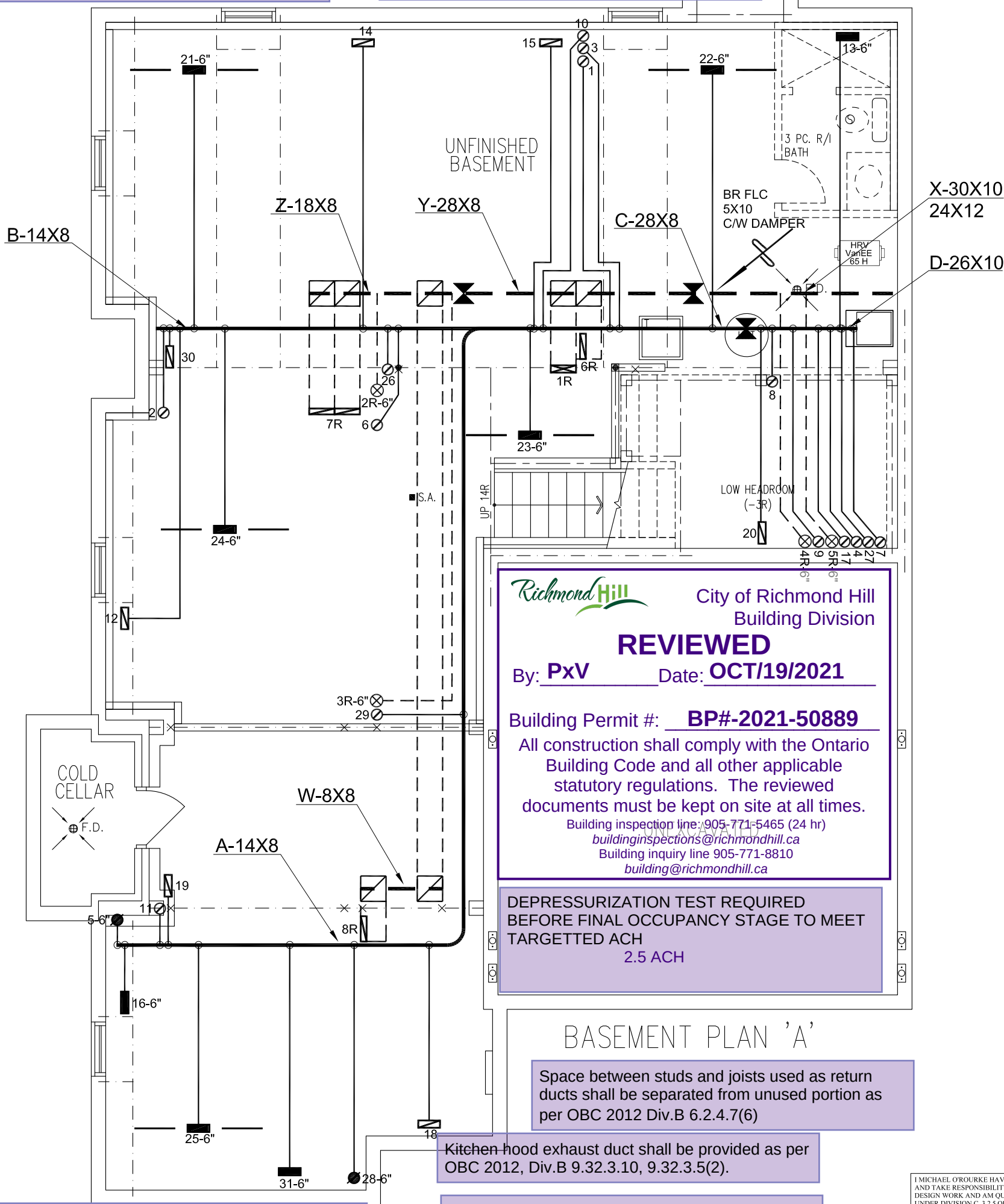
TYPE: 4506
LO# 87522

Minimum R-12 Insulation Value required for ducts installed at unheated or exposed condition (OBC 2012 Div.B 6.2.4.3(10) and seal the ducts as per 6.2.4.3(11) & HRAI Digest 2005, Clause 4.5.

Combustion air supply shall be provided to the furnace and hot water tank.

HRV installation, testing, startup and commissioning shall be in compliance with OBC 2012, Div.B 9.32.3.11, 9.32.3.11(7)&(10)

Ensure that R-Values and U-Values used for heat loss and heat gain calculations are consistent with the values specified by SB-12 Performance Compliance: BETTER THAN CODE/AIR TIGHTNESS TEST and the values used for architectural design.



BASEMENT PLAN 'A'

Space between studs and joists used as return ducts shall be separated from unused portion as per OBC 2012 Div.B 6.2.4.7(6)

Kitchen hood exhaust duct shall be provided as per OBC 2012, Div.B 9.32.3.10, 9.32.3.5(2).

HRV installation, testing, startup and commissioning shall be in compliance with OBC 2012, Div.B 9.32.3.11, 9.32.3.11(7)&(10)

Exterior insulation effective R-Value for wall, roof or exposed floor shall be maintained at the respective location where duct or sanitary pipes are routed inside exterior envelope.

Supply air grill at finished basement shall be at low level. Return air grill for finished or unfinished basement shall be at low level. HRAI digest 2005, clause 7.7(3).

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

CSA-F280-12

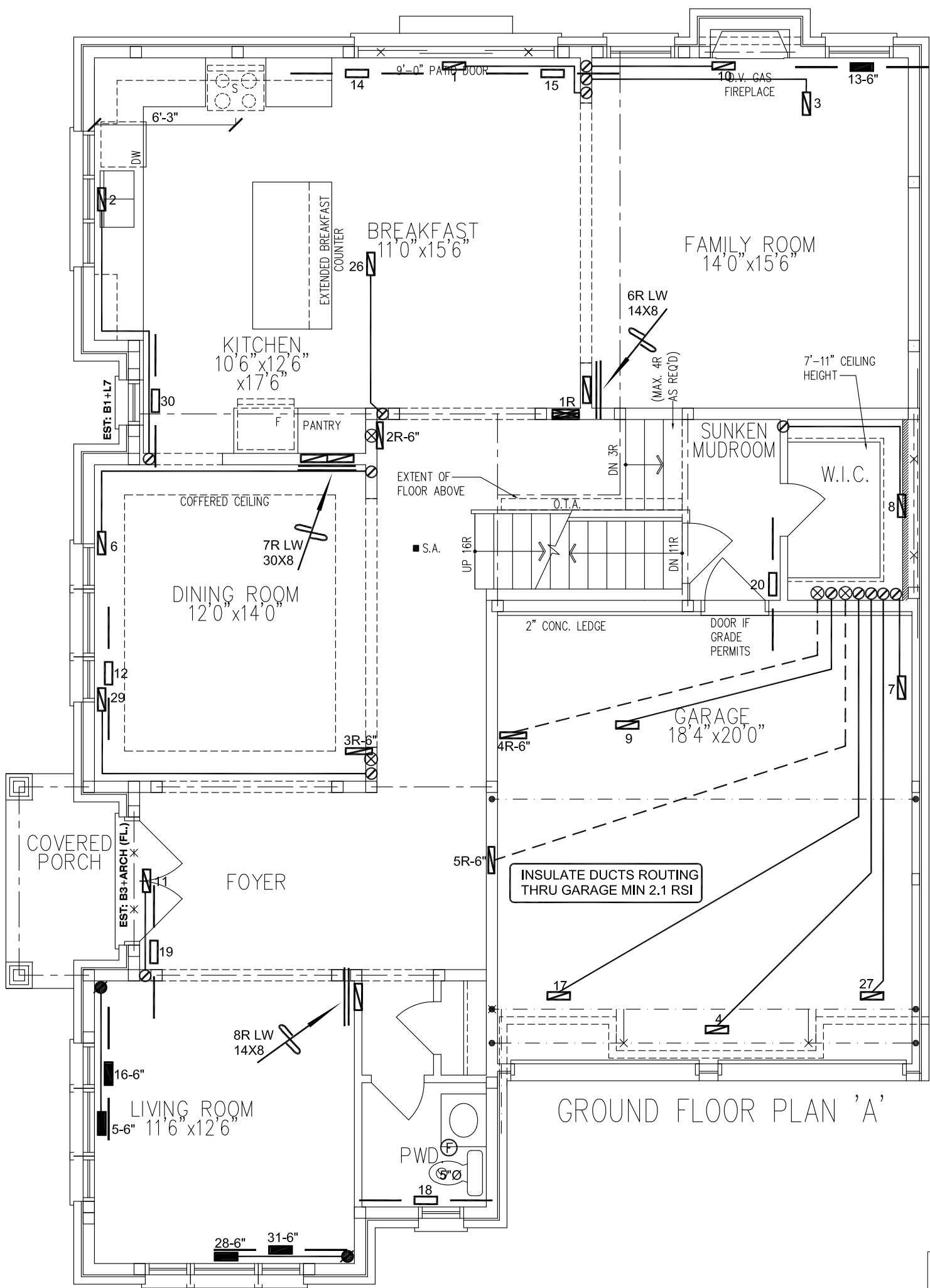
SB-12 PERFORMANCE

HVAC LEGEND						3.	REVISED AS PER CAD	JUNE/2021			
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	2. REVISED AS PER ARCHITECTURALS APR/2021			
	SUPPLY AIR GRILLE 6" BOOT		SUPPLY AIR STACK FROM 2nd FLOOR		30"x8" RETURN AIR GRILLE		RETURN AIR STACK 2nd FLOOR	1. REVISED TO PERFORMANCE SEPT/2020			
	SUPPLY AIR BOOT ABOVE		6" SUPPLY AIR STACK 2nd FLOOR		FRA- FLOOR RETURN AIR GRILLE		REDUCER	No. Description Date			
								REVISIONS			
ALL DRAWINGS, CALCULATIONS AND SPECIFICATIONS ARE THE PROPERTY OF HVAC DESIGNS LTD.© AND MAY NOT BE REPRODUCED, MODIFIED OR ALTERED WITHOUT EXPRESSED WRITTEN CONSENT. THE DRAWINGS ARE DATED AND USE OF THESE DRAWINGS AFTER ONE YEAR FROM THE DATED NOTED IS NOT AUTHORIZED. CONTRACTOR SHALL CHECK ALL CONDITIONS BEFORE PROCEEDING WITH WORK. LATEST MUNICIPAL APPROVED DRAWINGS ONLY TO BE USED DURING INSTALLATION OF HEATING SYSTEM. HVAC DESIGNS LTD. IS NOT LIABLE FOR ANY CLAIMS ARISING FROM UNAUTHORIZED USE OF THE DRAWINGS OR FROM ANY CHANGES TO ACCEPTED STANDARDS AND/OR THE ONTARIO BUILDING CODE.											
Client		 375 Finley Ave. Suite 202 - Ajax, Ontario L1S 2E2 Tel. 905.619.2300 - 905.420.5300 Fax 905.619.2375 Email: info@hvacdesigns.ca Web: www.hvacdesigns.ca Specializing in Residential Mechanical Design Services				HEAT LOSS 59893 BTU/H UNIT DATA		# OF RUNS S/A R/A FANS		Sheet Title	
ROYAL PINE HOMES						MAKE CARRIER		3RD FLOOR		BASEMENT HEATING LAYOUT	
Project Name		CENTREFIELD (WEST GORMLEY) RICHMOND HILL, ONTARIO				MODEL 59TN6A-080-14V		2ND FLOOR		RECEIVED	
4506						INPUT 80 MBTU/H		1ST FLOOR		10/11/2021	
3348 sqft		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.				OUTPUT 78 MBTU/H		BASEMENT		Date	
						COOLING 3.5 TONS		FAN SPEED 1370 cfm @ 0.6" w.c.		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		Scale 3/16" = 1'-0"		BCIN# 19669	
								LO#		87522	

Penetration of Air Barrier System by ducts, wires, conduits or building materials shall be sealed as per OBC 2012, Div.B 9.25.3.3.(9) & (10).

Space between studs and joists used as return ducts shall be separated from unused portion as per OBC 2012 Div.B 6.2.4.7(6)

Exterior insulation effective R-Value for wall, roof or exposed floor shall be maintained at the respective location where duct or sanitary pipes are routed inside exterior envelope.



Minimum R-12 Insulation Value required for ducts installed at unheated or exposed condition (OBC 2012 Div.B 6.2.4.3(10) and seal the ducts as per 6.2.4.3(11) & HRAI Digest 2005, Clause 4.5.

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

CSA-F280-12

SB-12 PERFORMANCE

HVAC LEGEND								3.	REVISED AS PER CAD	JUNE/2021
SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	2.	REVISED AS PER ARCHITECTURALS	APR/2021
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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	No.	Description	Date
	SUPPLY AIR BOOT ABOVE		6" SUPPLY AIR STACK 2nd FLOOR		FRA- FLOOR RETURN AIR GRILLE		REDUCER	REVISIONS		

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Client
ROYAL PINE HOMES
Project Name
**CENTREFIELD (WEST GORMLEY)
RICHMOND HILL, ONTARIO**

HVACDESIGNS LTD.

375 Finley Ave. Suite 202 - Ajax, Ontario
L1S 2E2 Tel. 905.619.2300 - 905.420.5300 Fax 905.619.2375
Email: info@hvacdsgns.ca
Web: www.hvacdsgns.ca
Specializing in Residential Mechanical Design Services

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

4506

3348 sqft

08/16/2021

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Per: danielle.devitt

Sheet Title
**FIRST FLOOR
HEATING
LAYOUT**

Date **SEPT/2020**

Scale **3/16" = 1'-0"**

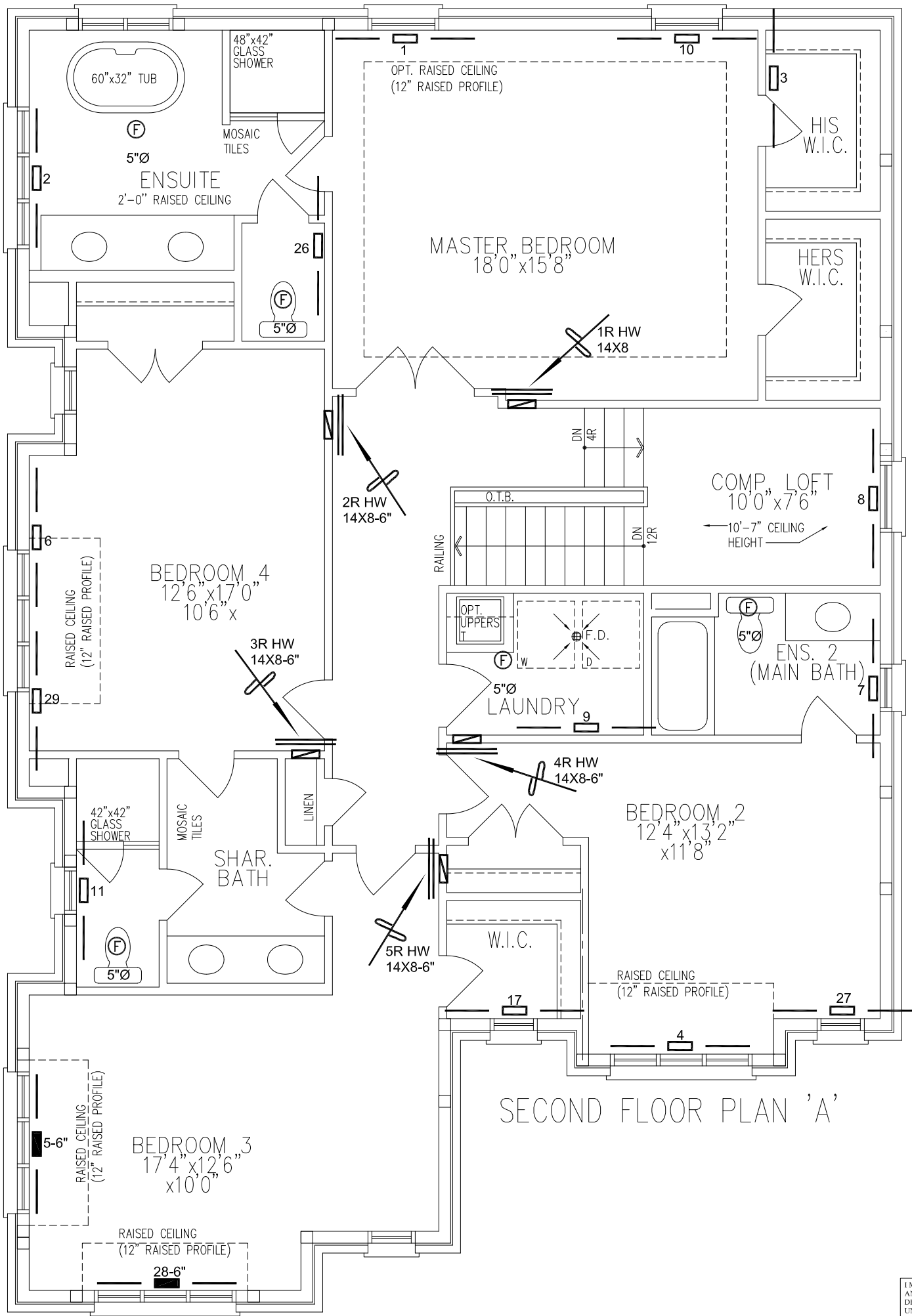
BCIN# 19669

LO# **87522**

Space between studs and joists used as return ducts shall be separated from unused portion as per OBC 2012 Div.B 6.2.4.7(6)

Exterior insulation effective R-Value for wall, roof or exposed floor shall be maintained at the respective location where duct or sanitary pipes are routed inside exterior envelope.

Return air intake shall be provided as recommended in HRAI Digest 2005 Section 4.7
Return air inlet should be positioned so that short circuiting of supply air is avoided. A high and low wall return air combination shall be provided when a combined cooling & heating system is installed.



Laundry dryer exhaust duct shall be provided as per OBC 2012 Div.B 6.2.3.8(7).

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

CSA-F280-12

SB-12 PERFORMANCE

HVAC LEGEND								3.	REVISED AS PER CAD	JUNE/2021
SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	2.	REVISED AS PER ARCHITECTURALS	APR/2021
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Client
ROYAL PINE HOMES
Project Name
CENTREFIELD (WEST GORMLEY)
RICHMOND HILL, ONTARIO



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L1S 2E2 Tel. 905.619.2300 - 905.420.5300 Fax 905.619.2375
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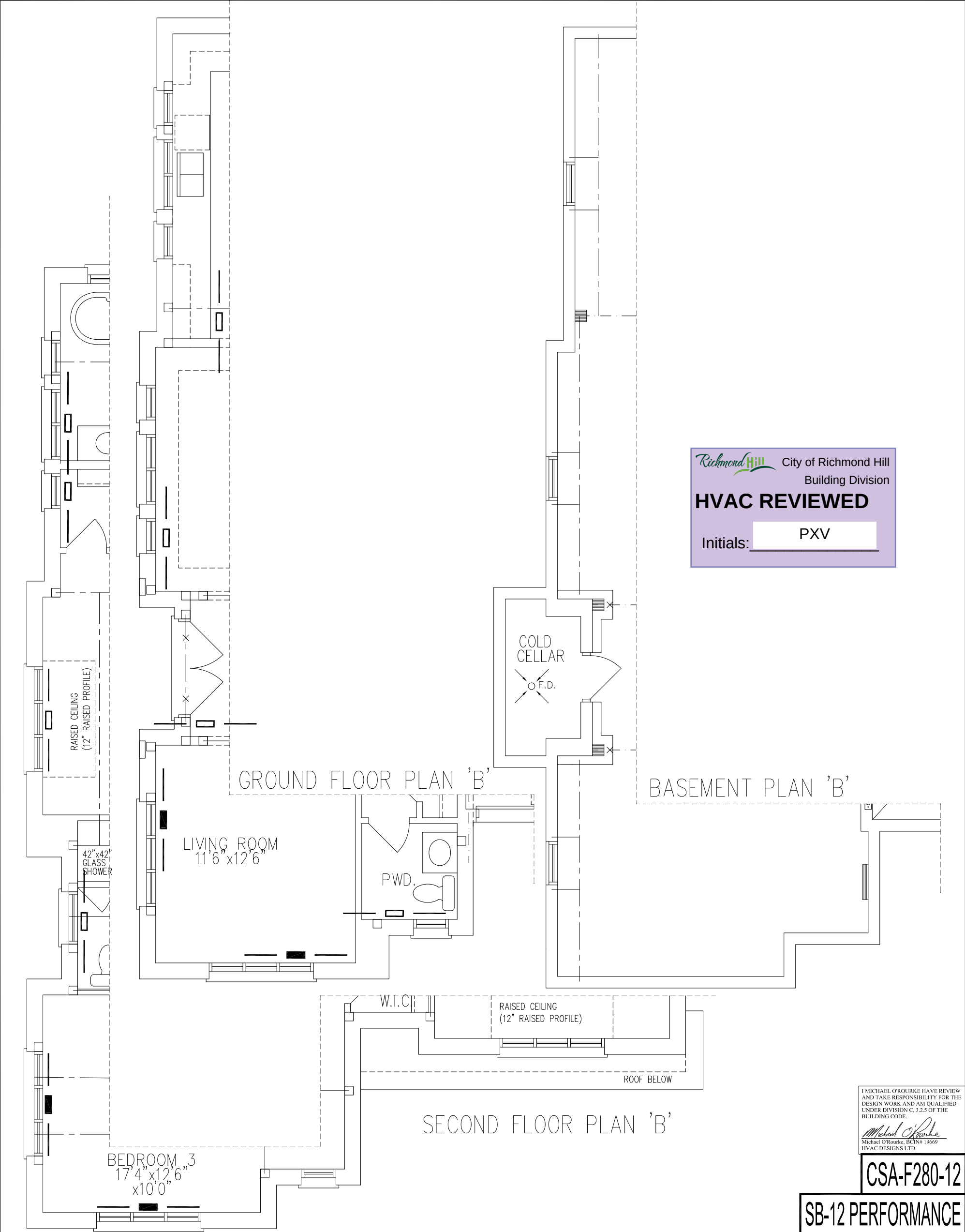
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4506

3348 sqft

08/16/2021
RECEIVED
Per: danielle.devitt

Sheet Title
SECOND FLOOR
HEATING
LAYOUT
Date
SEPT/2020
Scale
3/16" = 1'-0"
BCIN# 19669
LO# 87522



City of Richmond Hill
Building Division

HVAC REVIEWED

Initials:

PXV

I MICHAEL O'ROURKE HAVE REVIEWED AND TAKE RESPONSIBILITY FOR THE DESIGN WORK AND AM QUALIFIED UNDER DIVISION C, 3.2.5 OF THE BUILDING CODE.

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

CSA-F280-12

SB-12 PERFORMANCE

HVAC LEGEND								3.	REVISED AS PER CAD	JUNE/2021
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								REVISIONS		

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Client

ROYAL PINE HOMES

Project Name

CENTREFIELD (WEST GORMLEY)
RICHMOND HILL, ONTARIO

4506

3348 sqft



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Web: www.hvacdsgns.ca
Specializing in Residential Mechanical Design Services

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

08/16/2021

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Per: danielle.devitt

Sheet Title

THIRD FLOOR HEATING LAYOUT

Date

SEPT/2020

Scale

3/16" = 1'-0"

BCIN# 19669

LO# 87522

Schedule 1: Designer Information

Use one form for each individual who reviews and takes responsibility for design activities with respect to the project.

Initials: PXV

A. Project Information			
Building number, street name		Initials: PXV	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@hvacdsgns.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 ☐ Small Buildings ☐ Large Buildings ☐ Complex Buildings ☒ HVAC – House ☐ Building Services ☐ Detection, Lighting and Power ☐ Fire Protection ☐ Building Structural ☐ Plumbing – House ☐ Plumbing – All Buildings ☐ On-site Sewage Systems			
Description of designer's work		Model: 4506 The Fernwood	
HEAT LOSS / GAIN CALCULATIONS		OPT 2ND	
DUCT SIZING		Project: CENTREFIELD (WEST GORMLEY)	
RESIDENTIAL MECHANICAL VENTILATION DESIGN SUMMARY			
RESIDENTIAL SYSTEM DESIGN per CSA-F280-12			
D. Declaration of Designer			
I, <u>MICHAEL O'ROURKE</u>		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 Division C, of the Building Code. Individual BCIN: <u>19669</u> Basis for exemption from registration and qualification: <u>O.B.C SENTENCE 3.2.4.1 (4)</u>			
☐ 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		Signature of Designer	
Date		MICHAEL O'ROURKE	

NOTE:

- 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.
- 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.

Application for a Permit Construct or Demolish – Effective January 1, 2015

Per: danielle.devitt

08/16/2021
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SITE NAME: CENTREFIELD (WEST GORMLEY)				OPT 2ND				DATE: Jun-21				WINTER NATURAL AIR CHANGE RATE 0.233				HEAT LOSS ΔT °F. 78				CSA-F280-12			
BUILDER: ROYAL PINE HOMES				TYPE: 4506				LO# 87523				SUMMER NATURAL AIR CHANGE RATE 0.073				HEAT GAIN ΔT °F. 13				SB-12 PERFORMANCE			
ROOM USE				MBR				BED-2				BED-3				BED-4				BED-5			
EXP. WALL				43				35				29				47				14			
CLG. HT.				11				9				9				9				9			
FACTORS																							
GRS.WALL AREA				473				108				315				261				423			
GLAZING				LOSS GAIN				LOSS GAIN				LOSS GAIN				LOSS GAIN				LOSS GAIN			
NORTH				21.8 14.5				0 0 0				0 0 0				0 0 0				0 0 0			
EAST				21.8 37.1				0 0 0				0 0 0				0 0 0				0 0 0			
SOUTH				21.8 22.4				37 806 829				9 196 202				0 0 0				45 980 1671			
WEST				21.8 37.1				30 654 1114				0 0 0				0 0 0				36 784 807			
SKYLT.				35.8 101.2				0 0 0				0 0 0				0 0 0				45 980 1009			
DOORS				25.8 4.3				0 0 0				0 0 0				0 0 0				13 283 291			
NET EXPOSED WALL				4.2 0.7				406 1707 281				99 416 68				287 1207 199				216 908 149			
NET EXPOSED BSMT WALL ABOVE GR				3.7 0.6				0 0 0				0 0 0				0 0 0				342 1438 237			
EXPOSED CLG				1.3 0.6				364 478 214				130 171 76				276 363 162				172 226 101			
NO ATTIC EXPOSED CLG				2.8 1.3				0 0 0				130 365 163				0 0 0				24 67 30			
EXPOSED FLOOR				2.6 0.4				0 0 0				0 0 0				196 512 84				0 0 0			
BASEMENT/CRAWL HEAT LOSS								0				0				0				0			
SLAB ON GRADE HEAT LOSS								0				0				0				0			
SUBTOTAL HT LOSS				3645				1148				2180				2694				3594			
SUB TOTAL HT GAIN				2438				510				1400				2035				2889			
LEVEL FACTOR / MULTIPLIER				0.20 0.17				0.20 0.17				0.20 0.17				0.20 0.17				0.20 0.17			
AIR CHANGE HEAT LOSS				636				200				380				470				627			
AIR CHANGE HEAT GAIN				115				24				66				96				137			
DUCT LOSS				0				0				0				316				0			
DUCT GAIN				0				0				0				276				0			
HEAT GAIN PEOPLE				240				2				480				1				240			
HEAT GAIN APPLIANCES/LIGHTS				385				385				385				385				385			
TOTAL HT LOSS BTU/H				4282				1349				2560				3480				4222			
TOTAL HT GAIN x 1.3 BTU/H				4443				1194				2718				3941				4745			

ROOM USE			DIN			FAM			KIT			LIV			WIC-3			W/R			FOY			MUD												BAS		
EXP. WALL			28			33			61			31			6			18			15			28												188		
CLG. HT.			11			11			11			11			9			11			11			13												9		
FACTORS																																						
GRS.WALL AREA			LOSS			GAIN																														1128		
GLAZING			LOSS			GAIN			LOSS			GAIN			LOSS			GAIN			LOSS			GAIN			LOSS			GAIN			LOSS			GAIN		
NORTH			21.8	14.5	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	0	0					
EAST			21.8	37.1	0	0	0	0	0	0	0	0	0	43	937	1596	9	196	334	10	218	371	0	0	0	0	0	0	0	0	0	0	0	0				
SOUTH			21.8	22.4	49	1067	1098	0	0	0	38	828	852	43	937	964	0	0	0	0	0	0	8	174	179	0	0	0	0	0	0	0	0	0				
WEST			21.8	37.1	0	0	0	37	806	1374	71	1547	2636	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
SKYLT.			35.8	101.2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
DOORS			25.8	4.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	39	1008	166	20	517	85	0	0	0	0	0	0	0	0			
NET EXPOSED WALL			4.2	0.7	259	1089	179	326	1371	226	562	2363	389	255	1072	176	45	189	31	188	791	130	118	496	82	344	1447	238	0	0	0	0	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	0	0	0	0	0	0			
EXPOSED CLG			1.3	0.6	0	0	0	0	0	0	0	0	0	0	0	0	78	103	46	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	0	0	0			
EXPOSED FLOOR			2.6	0.4	0	0	0	0	0	0	0	0	0	0	0	0	78	204	34	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												
SLAB ON GRADE HEAT LOSS					0			0			0			0			0			0			0			0												
SUBTOTAL HT LOSS					2157			2177			4738			2946			691			1008			1679			1964												
SUB TOTAL HT GAIN						1277			1599			3876			2736			445			501			427			323											
LEVEL FACTOR / MULTIPLIER			0.30	0.27				0.30	0.27		0.30	0.27		0.30	0.27		0.20	0.17		0.30	0.27		0.30	0.27		0.30	0.27						0.50	0.79				
AIR CHANGE HEAT LOSS					586			592			1288			801			121			274			456			534								7551				
AIR CHANGE HEAT GAIN						60			76			183			129			21			24			20			15								47			
DUCT LOSS					0			0			0			0			81			0			0			0												
DUCT GAIN					0			0			0			0			85			0			0			0												
HEAT GAIN PEOPLE			240		0		0	0		0	0		0	0		0	0		0	0		0	0		0	0							0					
HEAT GAIN APPLIANCES/LIGHTS							385			385			385			385			385			0			0			385										
TOTAL HT LOSS BTU/H					2743			2769			6026			3746			893			1283			2135			2497								17060				
TOTAL HT GAIN x 1.3 BTU/H						2239			2677			5777			4225			1216			682			581			940									1852		

CITY OF RICHMOND HILL
BUILDING DIVISION

08/16/2021

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Per: danielle.devitt

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

OPT 2ND
TYPE: 4506

DATE: Jun-21

GFA: 3348 LO# 87523

HEATING CFM 1370 COOLING CFM 1370
TOTAL HEAT LOSS 59,088 TOTAL HEAT GAIN 42,298
AIR FLOW RATE CFM 23.19 AIR FLOW RATE CFM 32.39

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

**CARRIER
59TN6A-080-14V FAN SPEED 80

AFUE = 97 %
INPUT (BTU/H) = 80,000
OUTPUT (BTU/H) = 78,000

RUN COUNT	4th	3rd	2nd	1st	Bas
S/A	0	0	14	10	5
R/A	0	0	6	3	1

plenium pressure s/a 0.18 r/a pressure 0.17
max s/a dif press. loss 0.02 r/a grille press. Loss 0.02
min adjusted pressure s/a 0.16 adjusted pressure r/a 0.15

DESIGN CFM = 1370
CFM @ .6" E.S.P.
TEMPERATURE RISE 53 °F

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	4	5	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
ROOM NAME	MBR	MBR	BED-3	BED-4	M-BATH	M-BATH	LAUN	BED-2	S-BATH	DIN	FAM	KIT	KIT	LIV	WIC-3	W/R	FOY	MUD	BAS	BAS	BAS	BAS
RM LOSS MBH.	2.14	2.14	1.74	2.11	0.45	0.45	0.21	2.56	1.01	2.74	2.77	2.01	2.01	1.87	0.89	1.28	2.13	2.50	3.41	3.41	3.41	3.41
CFM PER RUN HEAT	50	50	40	49	10	10	5	59	23	64	64	47	47	43	21	30	50	58	79	79	79	79
RM GAIN MBH.	2.22	2.22	1.97	2.37	0.54	0.54	0.61	2.72	0.92	2.24	2.68	1.93	1.93	2.11	1.22	0.68	0.58	0.94	0.37	0.37	0.37	0.37
CFM PER RUN COOLING	72	72	64	77	18	18	20	88	30	73	87	62	62	68	39	22	19	30	12	12	12	12
ADJUSTED PRESSURE	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.16	0.17	0.17	0.16	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17
ACTUAL DUCT LGH.	42	60	48	82	25	28	38	49	76	49	14	37	32	66	55	58	65	16	43	20	21	39
EQUIVALENT LENGTH	220	160	150	150	200	150	140	150	170	130	140	150	130	140	150	180	160	110	130	150	130	140
TOTAL EFFECTIVE LENGTH	262	220	198	232	225	178	178	199	246	179	154	187	162	206	205	238	225	126	173	170	151	179
ADJUSTED PRESSURE	0.07	0.08	0.09	0.07	0.08	0.1	0.1	0.08	0.07	0.1	0.11	0.09	0.11	0.08	0.08	0.07	0.08	0.14	0.1	0.1	0.11	0.1
ROUND DUCT SIZE	6	6	5	6	4	4	4	6	4	5	6	5	5	6	5	4	5	5	5	6	6	6
HEATING VELOCITY (ft/min)	255	255	294	250	115	115	57	301	264	470	326	345	345	219	154	344	367	426	580	403	403	403
COOLING VELOCITY (ft/min)	367	367	470	393	207	207	229	449	344	536	444	455	455	347	286	252	140	220	88	61	61	61
OUTLET GRILL SIZE	4X10	4X10	3X10	4X10	3X10	3X10	3X10	4X10	3X10	3X10	4X10	3X10	3X10	4X10	3X10	3X10	3X10	3X10	3X10	4X10	4X10	4X10
TRUNK	C	B	D	A	D	D	D	C	A	B	D	B	C	A	D	A	A	D	B	C	C	B

RUN #	25	26	27	28	29	30	31
ROOM NAME	BAS	ENS	BED-3	BED-4	BED-5	KIT	LIV
RM LOSS MBH.	3.41	1.35	1.74	2.11	1.92	2.01	1.87
CFM PER RUN HEAT	79	31	40	49	45	47	43
RM GAIN MBH.	0.37	1.19	1.97	2.37	2.45	1.93	2.11
CFM PER RUN COOLING	12	39	64	77	79	62	68
ADJUSTED PRESSURE	0.17	0.17	0.17	0.17	0.17	0.17	0.17
ACTUAL DUCT LGH.	68	43	39	79	66	34	67
EQUIVALENT LENGTH	150	200	180	210	240	130	160
TOTAL EFFECTIVE LENGTH	218	243	219	289	306	164	227
ADJUSTED PRESSURE	0.08	0.07	0.08	0.06	0.06	0.1	0.08
ROUND DUCT SIZE	6	5	5	6	6	5	6
HEATING VELOCITY (ft/min)	403	228	294	250	229	345	219
COOLING VELOCITY (ft/min)	61	286	470	393	403	455	347
OUTLET GRILL SIZE	4X10	3X10	3X10	4X10	4X10	3X10	4X10
TRUNK	A	B	D	A	A	B	A

SUPPLY AIR TRUNK SIZE										RETURN AIR TRUNK SIZE									
TRUNK	STATIC	ROUND	RECT		VELOCITY	TRUNK	STATIC	ROUND	RECT	VELOCITY	TRUNK	STATIC	ROUND	RECT	VELOCITY				
CFM	PRESS.	DUCT	DUCT		(ft/min)	CFM	PRESS.	DUCT	DUCT	(ft/min)	CFM	PRESS.	DUCT	DUCT	(ft/min)				
TRUNK A	411	0.06	10.8	14	x	8	528	TRUNK G	0	0.00	0	0	x	8	0				
TRUNK B	397	0.07	10.3	12	x	8	596	TRUNK H	0	0.00	0	0	x	8	0				
TRUNK C	1122	0.06	15.7	28	x	8	721	TRUNK I	0	0.00	0	0	x	8	0				
TRUNK D	1370	0.06	17	26	x	10	759	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				

CITY OF RICHMOND HILL
BUILDING DIVISION

RETURN AIR #	1	2	3	4	5	6	7	8	9	BR
AIR VOLUME	85	75	85	85	95	180	330	155	85	0
PLENUM PRESSURE	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15
ACTUAL DUCT LGH.	42	52	67	60	66	27	40	62	38	1
EQUIVALENT LENGTH	195	235	175	195	155	145	240	170	215	0
TOTAL EFFECTIVE LH	237	287	242	255	221	172	280	232	253	1
ADJUSTED PRESSURE	0.06	0.05	0.06	0.06	0.07	0.09	0.05	0.06	0.06	14.80
ROUND DUCT SIZE	6	6	6	6	6	7.2	10.4	7.5	6	0
INLET GRILL SIZE	8	8	8	8	8	8	8	8	8	0
INLET GRILL SIZE	X	X	X	X	X	X	X	X	X	X
INLET GRILL SIZE	14	14	14	14	14	14	30	14	14	0

RETURN AIR TRUNK SIZE							
	TRUNK	STATIC	ROUND	RECT		VELOCITY	
	CFM	PRESS.	DUCT	DUCT		(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	155	0.05	7.8	8	x	8	349
TRUNK X	1370	0.05	17.7	30	x	10	658
TRUNK Y	910	0.05	15.2	26	x	8	630
TRUNK Z	575	0.05	12.8	20	x	8	518
DROP	1370	0.05	17.7	24	x	12	685

Per: danielle.devitt

TYPE: 4506
SITE NAME: CENTREFIELD (WEST GORMLEY)

LO # 87523
OPT 2ND

RESIDENTIAL MECHANICAL VENTILATION DESIGN SUMMARY

COMBUSTION APPLIANCES		9.32.3.1(1)
a)	☒ Direct vent (sealed combustion) only	
b)	☐ Positive venting induced draft (except fireplaces)	
c)	☐ Natural draft, B-vent or induced draft gas fireplace	
d)	☐ Solid Fuel (including fireplaces)	
e)	☐ No Combustion Appliances	

HEATING SYSTEM	
☒ Forced Air	☐ Non Forced Air
☐ Electric Space Heat	

HOUSE TYPE		9.32.1(2)
☒ I	Type a) or b) appliance only, no solid fuel	
☐ II	Type I except with solid fuel (including fireplaces)	
☐ III	Any Type c) appliance	
☐ IV	Type I, or II with electric space heat	
☐	Other: Type I, II or IV no forced air	

SYSTEM DESIGN OPTIONS		O.N.H.W.P.
☐ 1	Exhaust only/Forced Air System	
☐ 2	HRV with Ducting/Forced Air System	
☒ 3	HRV Simplified/connected to forced air system	
☐ 4	HRV with Ducting/non forced air system	
☐	Part 6 Design	

TOTAL VENTILATION CAPACITY		9.32.3.3(1)
Basement + Master Bedroom	<u>2</u> @ 21.2 cfm	<u>42.4</u> cfm
Other Bedrooms	<u>4</u> @ 10.6 cfm	<u>42.4</u> cfm
Kitchen & Bathrooms	<u>5</u> @ 10.6 cfm	<u>53</u> cfm
Other Rooms	<u>6</u> @ 10.6 cfm	<u>63.6</u> cfm
Table 9.32.3.A.	TOTAL	<u>201.4</u> 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		<u>95.4</u> cfm

SUPPLEMENTAL VENTILATION CAPACITY		9.32.3.5.
Total Ventilation Capacity	<u>201.4</u>	cfm
Less Principal Ventil. Capacity	<u>95.4</u>	cfm
Required Supplemental Capacity	<u>106.0</u>	cfm

PRINCIPAL EXHAUST FAN CAPACITY	
Model: VANEE 65H	Location: BSMT
<u>95.4</u> 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
M-BATH	BY INSTALLING CONTRACTOR	50	☒	3.5
S-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		
<u>155</u> cfm high	<u>64</u> cfm low	
<u>75</u> % Sensible Efficiency	☒ HVI Approved	
@ 32 deg F (0 deg C)		

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:	<i>Michael O'Rourke</i>
HRAI #	Per: danielle 001820
Date:	June 21

CSA F280-12 Residential Heat Loss and Heat Gain Calculations																																																												
Formula Sheet (For Air Leakage / Ventilation Calculation)																																																												
LO#: 87523		Model: 4506		Builder: ROYAL PINE HOMES																																																								
				Date: 2021-06-04																																																								
Volume Calculation			Air Change & Delta T Data																																																									
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5.2.3.1 Heat Loss due to Air Leakage			6.2.6 Sensible Gain due to Air Leakage																																																									
$HL_{airb} = LR_{airh} \times \frac{V_b}{3.6} \times DTD_h \times 1.2$ 0.233 x 366.54 x 43 °C x 1.2 = 4426 W = 15101 Btu/h			$HG_{salb} = LR_{airc} \times \frac{V_b}{3.6} \times DTD_c \times 1.2$ = 0.073 x 366.54 x 7 °C x 1.2 = 227 W = 775 Btu/h																																																									
5.2.3.2 Heat Loss due to Mechanical Ventilation			6.2.7 Sensible heat Gain due to 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			$HL_{vairb} = PVC \times DTD_h \times 1.08 \times (1 - E)$ 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)																																																												
$HL_{airr} = Level\ Factor \times HL_{airbv} \times \{(HL_{agcr} + HL_{bgcr}) \div (HL_{agclevel} + HL_{bgclevel})\}$ <table border="1" style="width:100%; border-collapse: collapse;"> <thead> <tr> <th>Level</th> <th>Level Factor (LF)</th> <th>HLairve Air Leakage + Ventilation Heat Loss (Btu/h)</th> <th>Level Conductive Heat Loss: (HL_{clevel})</th> <th>Air Leakage Heat Loss Multiplier (LF x HLairbv / HLlevel)</th> </tr> </thead> <tbody> <tr><td>1</td><td>0.5</td><td rowspan="5">15,101</td><td>9,509</td><td>0.794</td></tr> <tr><td>2</td><td>0.3</td><td>16,668</td><td>0.272</td></tr> <tr><td>3</td><td>0.2</td><td>17,302</td><td>0.175</td></tr> <tr><td>4</td><td>0</td><td>0</td><td>0.000</td></tr> <tr><td>5</td><td>0</td><td>0</td><td>0.000</td></tr> </tbody> </table> *HLairbv = Air leakage heat loss + ventilation heat loss *For a balanced or supply only ventilation system HLairve = 0					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	15,101	9,509	0.794	2	0.3	16,668	0.272	3	0.2	17,302	0.175	4	0	0	0.000	5	0	0	0.000																														
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CITY OF RICHMOND HILL
BUILDING DIVISION

08/16/2021

RECEIVED

Per: danielle.devitt

HEAT LOSS AND GAIN SUMMARY SHEET

MODEL: 4506	OPT 2ND	BUILDER: ROYAL PINE HOMES
SFQT: 3348	LO# 87523	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 (ft³):	46599.0	ASSUMED (Y/N):	Y
INTERNAL SHADING:	BLINDS/CURTAINS	ASSUMED OCCUPANTS:	6
INTERIOR LIGHTING LOAD (Btu/h/ft²):	1.27	DC BRUSHLESS MOTOR (Y/N):	Y
FOUNDATION CONFIGURATION	BCIN_1	DEPTH BELOW GRADE:	6.0 ft
LENGTH: 56.0 ft	WIDTH: 38.0 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	94%	-

CITY OF RICHMOND HILL
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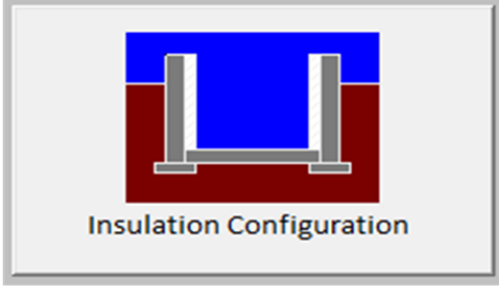
Michael O'Rourke

INDIVIDUAL BCIN: 19669

MICHAEL O'ROURKE

Residential Foundation Thermal Load Calculator

Supplemental tool for CAN/CSA-F280

Weather Station Description		
Province:	Ontario	
Region:	Richmond Hill	
Site Description		
Soil Conductivity:	Normal conductivity: dry sand, loam, clay	
Water Table:	Normal (7-10 m, 23-33 ft)	
Foundation Dimensions		
Floor Length (m):	17.1	 Insulation Configuration
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):	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):	1898	

TYPE: 4506
LO# 87523

OPT 2ND

CITY OF RICHMOND HILL
BUILDING DIVISION
08/16/2021RECEIVED
Per: danielle.devitt

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):	1319.5			
Air Leakage/Ventilation				
Air Tightness Type:	Energy Star Detached (2.5 ACH)			
Custom BDT Data:	ELA @ 10 Pa.		1231.8 cm ²	
	2.50		ACH @ 50 Pa	
Mechanical Ventilation (L/s):	Total Supply		Total Exhaust	
	45.0		45.0	
Flue Size				
Flue #:	#1	#2	#3	#4
Diameter (mm):	0	0	0	0
Natural Infiltration Rates				
Heating Air Leakage Rate (ACH/H):	0.233			
Cooling Air Leakage Rate (ACH/H):	0.073			

TYPE: 4506
LO# 87523

OPT 2ND

CITY OF RICHMOND HILL
BUILDING DIVISION

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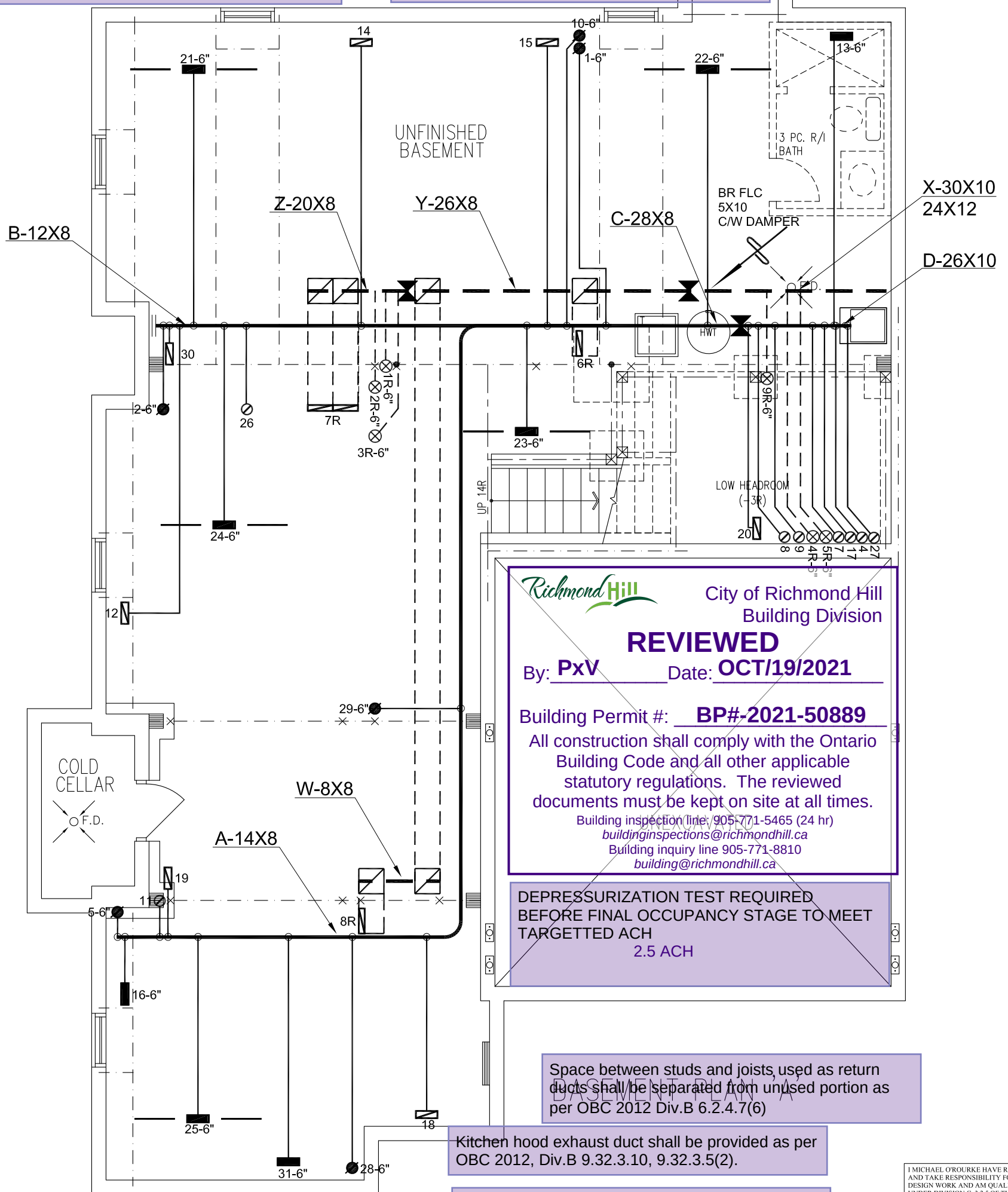
Per: danielle.devitt

Minimum R-12 Insulation Value required for ducts installed at unheated or exposed condition (OBC 2012 Div.B 6.2.4.3(10) and seal the ducts as per 6.2.4.3(11) & HRAI Digest 2005, Clause 4.5.

Combustion air supply shall be provided to the furnace and hot water tank.

HRV installation, testing, startup and commissioning shall be in compliance with OBC 2012, Div.B 9.32.3.11, 9.32.3.11(7)&(10)

Ensure that R-Values and U-Values used for heat loss and heat gain calculations are consistent with the values specified by SB-12 Performance Compliance: BETTER THAN CODE/AIR TIGHTNESS TEST and the values used for architectural design.



Supply air grill at finished basement shall be at low level. Return air grill for finished or unfinished basement shall be at low level. HRAI digest 2005, clause 7.7(3).

HRV installation, testing, startup and commissioning shall be in compliance with OBC 2012, Div.B 9.32.3.11, 9.32.3.11(7)&(10)

Exterior insulation effective R-Value for wall, roof or exposed floor shall be maintained at the respective location where duct or sanitary pipes are routed inside exterior envelope.

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

CSA-F280-12

SB-12 PERFORMANCE

HVAC LEGEND						3.	REVISED AS PER CAD	JUNE/2021
SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	2.	REVISED AS PER ARCHITECTURALS	APR/2021
	SUPPLY AIR GRILLE		6" SUPPLY AIR BOOT ABOVE		14"x8" RETURN AIR GRILLE	1.	REVISED TO PERFORMANCE	SEPT/2020
	SUPPLY AIR GRILLE 6" BOOT		SUPPLY AIR STACK FROM 2nd FLOOR		30"x8" RETURN AIR GRILLE	No.	Description	Date
	SUPPLY AIR BOOT ABOVE		6" SUPPLY AIR STACK 2nd FLOOR		FRA- FLOOR RETURN AIR GRILLE	REVISIONS		

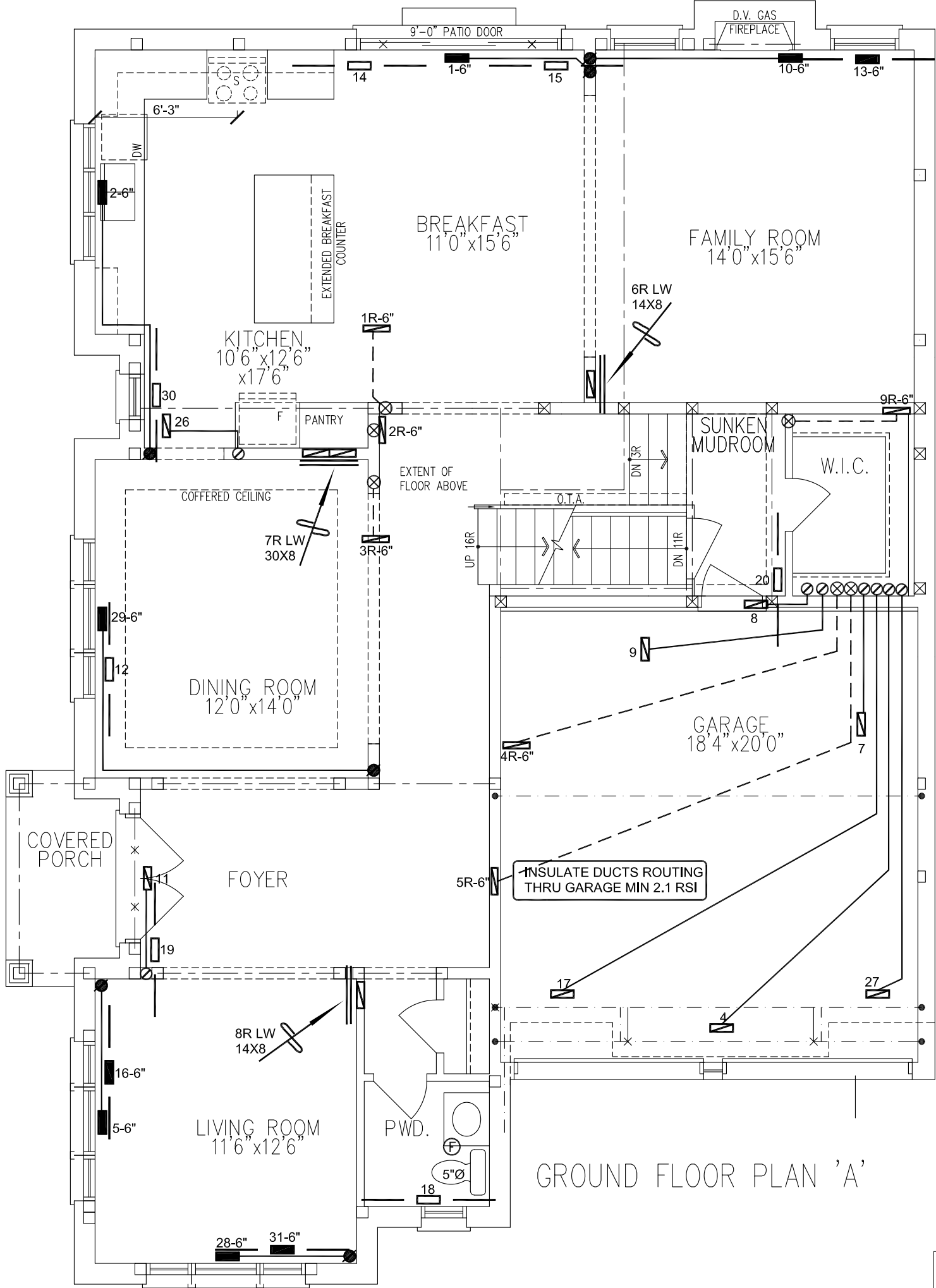
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Client ROYAL PINE HOMES		 375 Finley Ave. Suite 202 - Ajax, Ontario L1S 2E2 Tel. 905.619.2300 - 905.420.5300 Fax 905.619.2375 Email: info@hvacdesigns.ca Web: www.hvacdesigns.ca Specializing in Residential Mechanical Design Services	HEAT LOSS 61092 BTU/H UNIT DATA		# OF RUNS S/A R/A FANS				Sheet Title BASEMENT HEATING LAYOUT		
Project Name CENTREFIELD (WEST GORMLEY) RICHMOND HILL, ONTARIO			MAKE CARRIER		3RD FLOOR				Date SEPT/2020		
			MODEL 59TN6A-080-14V		2ND FLOOR						
			INPUT 80 MBTU/H		1ST FLOOR						
			OUTPUT 78 MBTU/H		BASEMENT						
OPT 2ND 4506		COOLING 3.5 TONS		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				Scale 3/16" = 1'-0"			
		FAN SPEED 1370 cfm @ 0.6" w.c.						BCIN# 19669			
								LO# 87523			
3348 sqft		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.									

Space between studs and joists used as return ducts shall be separated from unused portion as per OBC 2012 Div.B 6.2.4.7(6)

Exterior insulation effective R-Value for wall, roof or exposed floor shall be maintained at the respective location where duct or sanitary pipes are routed inside exterior envelope.

Return air intake shall be provided as recommended in HRAI Digest 2005 Section 4.7 Return air inlet should be positioned so that short circuiting of supply air is avoided. A high and low wall return air combination shall be provided when a combined cooling & heating system is installed.



GROUND FLOOR PLAN 'A'

Laundry dryer exhaust duct shall be provided as per OBC 2012 Div.B 6.2.3.8(7).

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
Michael O'Rourke, BCIN# 19669
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HVAC LEGEND								3.	REVISED AS PER CAD	JUNE/2021
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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	No.	Description	Date
	SUPPLY AIR BOOT ABOVE		6" SUPPLY AIR STACK 2nd FLOOR		FRA- FLOOR RETURN AIR GRILLE		REDUCER	REVISIONS		

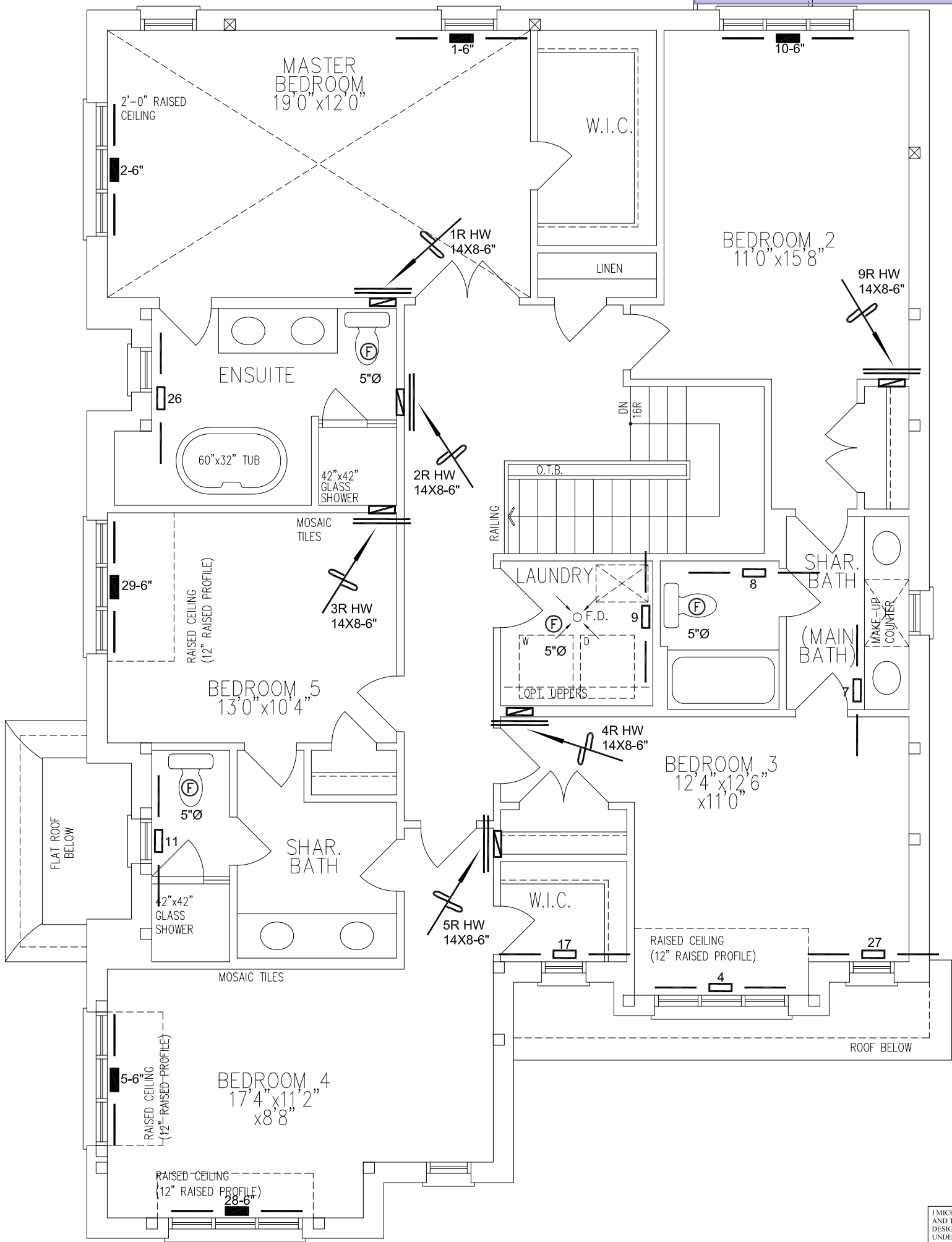
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Client		 375 Finley Ave. Suite 202 - Ajax, Ontario L1S 2E2 Tel. 905.619.2300 - 905.420.5300 Fax 905.619.2375 Email: info@hvacdesigns.ca Web: www.hvacdesigns.ca Specializing in Residential Mechanical Design Services Installation to comply with the latest Ontario Building Code. All supply branch outlets shall be equipped with a manual balancing damper. Ductwork which passes through the garage or unheated spaces shall be adequately insulated and be gas-proofed.	Sheet Title	
ROYAL PINE HOMES			FIRST FLOOR HEATING LAYOUT	
Project Name			Date	
CENTREFIELD (WEST GORMLEY) RICHMOND HILL, ONTARIO			SEPT/2020	
OPT 2ND 4506			Scale	
3348 sqft			3/16" = 1'-0"	
		BCIN# 19669		
		LO#	87523	

Space between studs and joists used as return ducts shall be separated from unused portion as per OBC 2012 Div.B 6.2.4.7(6)

Exterior insulation effective R-Value for wall, roof or exposed floor shall be maintained at the respective location where duct or sanitary pipes are routed inside exterior envelope.

Return air intake shall be provided as recommended in HRAI Digest 2005 Section 4.7 Return air inlet should be positioned so that short circuiting of supply air is avoided. A high and low wall return air combination shall be provided when a combined cooling & heating system is installed.



SECOND FLOOR PLAN 'A' W/ OPT. 5 BEDROOM
Laundry dryer exhaust duct shall be provided as per OBC 2012 Div.B 6.2.3.8(7).

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

CSA-F280-12

SB-12 PERFORMANCE

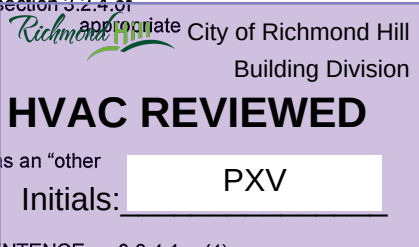
HVAC LEGEND						3.	REVISED AS PER CAD	JUNE/2021
SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	
	SUPPLY AIR GRILLE		6" SUPPLY AIR BOOT ABOVE		14"x8" RETURN AIR GRILLE		2.	REVISED AS PER ARCHITECTURALS
	SUPPLY AIR GRILLE 6" BOOT		SUPPLY AIR STACK FROM 2nd FLOOR		30"x8" RETURN AIR GRILLE		1.	REVISED TO PERFORMANCE
	SUPPLY AIR BOOT ABOVE		6" SUPPLY AIR STACK 2nd FLOOR		FRA- FLOOR RETURN AIR GRILLE		No.	Description
								Date
							REVISIONS	

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Project Name CENTREFIELD (WEST GORMLEY) RICHMOND HILL, ONTARIO				Date SEPT/2020	
OPT 2ND 4506 3348 sqft		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.	Scale 3/16" = 1'-0"		
			BCIN# 19669		
			LO#	87523	

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@hvacdsgns.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 ☐ Small Buildings ☐ Large Buildings ☐ Complex Buildings ☒ HVAC – House ☐ Building Services ☐ Detection, Lighting and Power ☐ Fire Protection ☐ Building Structural ☐ Plumbing – House ☐ Plumbing – All Buildings ☐ 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: 4506 The Fernwood OPT 5 BED 4 BATH Project: CENTREFIELD (WEST GORMLEY)	
D. Declaration of Designer			
I, <u>MICHAEL O'ROURKE</u> (print name)		declare that (choose one as appropriate):	
☐ 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 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 Division C, of the Building Code. Individual BCIN: <u>19669</u> Basis for exemption from registration and qualification: <u>O.B.C. SENTENCE 3.2.4.1 (4)</u>			
☐ 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 10, 2021 Date		 Signature of Designer	

NOTE:

- 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.
- 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.

Application for a Permit Construct or Demolish – Effective January 1, 2015

CITY OF RICHMOND HILL
BUILDING DIVISION

08/16/2021

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Per: danielle.devitt

SITE NAME: CENTREFIELD (WEST GORMLEY) BUILDER: ROYAL PINE HOMES OPT 5 BED 4 BATH TYPE: 4506 DATE: Jun-21 LOW# 91163 GFA: 3348 WINTER NATURAL AIR CHANGE RATE 0.233 SUMMER NATURAL AIR CHANGE RATE 0.073 HEAT LOSS AT °F. 78 HEAT GAIN AT °F. 13 CSA-F280-12 SB-12 PERFORMANCE

ROOM USE	EXP. WALL	CLG. HT.	MBR	ENS	WIC	BED-3	BED-4	BED-5	BATH	BED-2	BTH-4
GRS.WALL AREA	21.8	14.9	324	261	54	261	423	171	81	315	54
GLAZING	0	0	0	0	0	0	0	0	0	0	0
NORTH	21.8	14.9	0	0	0	0	0	0	0	0	0
EAST	21.8	38.4	0	0	0	45	980	1727	8	174	120
SOUTH	21.8	23.1	36	196	208	0	0	0	0	0	0
WEST	21.8	38.4	28	610	1075	0	36	784	832	0	0
SKYLT.	35.8	101.2	0	0	0	0	0	0	0	28	610
DOORS	25.8	4.3	0	0	0	0	0	0	0	0	0
NET EXPOSED WALL	4.2	0.7	260	1093	180	54	227	37	216	908	149
NET EXPOSED BSMT WALL ABOVE GR	3.7	0.6	0	0	0	0	0	0	0	0	0
EXPOSED CLG	1.3	0.6	276	363	162	-5	-7	-3	75	99	44
NO ATTIC EXPOSED CLG	2.8	1.3	0	130	365	163	0	0	24	67	30
EXPOSED FLOOR	2.6	0.4	0	0	0	0	0	0	196	512	84
BASEMENT/CRAWL HEAT LOSS	0	0	0	0	0	0	0	0	0	0	0
SLAB ON GRADE HEAT LOSS	0	0	0	0	0	0	0	0	0	0	0
SUBTOTAL HT LOSS	2850	0	2850	1614	326	2694	2092	1653	682	2147	609
SUB TOTAL HT GAIN	0.20	0.18	2249	543	81	0.20	0.18	0.20	0.18	0.20	0.18
LEVEL FACTOR / MULTIPLIER	527	0	527	298	60	498	664	306	126	397	113
AIR CHANGE HEAT LOSS	109	0	109	26	4	319	101	51	0	69	10
AIR CHANGE HEAT GAIN	0	0	0	0	0	0	0	0	0	0	0
DUCT LOSS	0	0	0	0	0	0	0	0	0	0	0
DUCT GAIN	0	0	0	0	0	0	0	0	0	0	0
HEAT GAIN PEOPLE	240	0	2	480	0	1	240	1	0	0	21
HEAT GAIN APPLIANCES/LIGHTS	559	0	559	0	0	559	559	559	0	559	0
TOTAL HT LOSS BTU/H	3377	0	3377	1913	386	3511	4259	1958	808	2544	794
TOTAL HT GAIN x 1.3 BTU/H	4417	0	4417	740	111	4280	5089	2484	354	2976	306

ROOM USE	EXP. WALL	CLG. HT.	DIN	FAM	KIT	LIV	BTH-3	WIR	FOY	MUD	BAS
GRS.WALL AREA	21.8	14.9	308	363	671	341	54	198	165	308	1316
GLAZING	0	0	0	0	0	0	0	0	0	0	0
NORTH	21.8	14.9	0	0	0	0	0	0	0	0	0
EAST	21.8	38.4	0	0	0	43	937	1651	0	0	0
SOUTH	21.8	23.1	49	1067	1133	0	0	0	8	174	185
WEST	21.8	38.4	0	0	0	0	0	0	0	0	0
SKYLT.	35.8	101.2	0	0	0	0	0	0	0	0	0
DOORS	25.8	4.3	0	0	0	0	0	0	0	0	0
NET EXPOSED WALL	4.2	0.7	259	1089	179	326	1371	226	562	2363	389
NET EXPOSED BSMT WALL ABOVE GR	3.7	0.6	0	0	0	0	0	0	0	0	0
EXPOSED CLG	1.3	0.6	0	0	0	0	0	0	78	103	46
NO ATTIC EXPOSED CLG	2.8	1.3	0	0	0	0	0	0	0	0	0
EXPOSED FLOOR	2.6	0.4	0	0	0	0	0	0	0	0	0
BASEMENT/CRAWL HEAT LOSS	0	0	0	0	0	0	0	0	0	0	0
SLAB ON GRADE HEAT LOSS	0	0	0	0	0	0	0	0	0	0	0
SUBTOTAL HT LOSS	2157	0	2157	2177	4738	2946	591	1008	1679	1728	9502
SUB TOTAL HT GAIN	0.30	0.28	1312	1646	3993	2821	0.20	0.30	0.28	0.30	0.28
LEVEL FACTOR / MULTIPLIER	514	0	514	619	1348	838	128	287	478	492	564
AIR CHANGE HEAT LOSS	63	0	63	80	193	136	22	25	21	14	49
AIR CHANGE HEAT GAIN	0	0	0	0	0	0	0	0	0	0	0
DUCT LOSS	0	0	0	0	0	0	0	0	0	0	0
DUCT GAIN	0	0	0	0	0	0	0	0	0	0	0
HEAT GAIN PEOPLE	240	0	2	480	0	1	240	1	0	0	21
HEAT GAIN APPLIANCES/LIGHTS	559	0	559	0	0	559	559	559	0	559	0
TOTAL HT LOSS BTU/H	2770	0	2770	2796	6086	3784	901	1295	2156	2220	17295
TOTAL HT GAIN x 1.3 BTU/H	2516	0	2516	2970	6169	4572	684	700	589	1115	2106

TOTAL HEAT GAIN BTU/H: 42909 TONS: 3.54 LOSS DUE TO VENTILATION LOAD BTU/H: 2004 STRUCTURAL HEAT LOSS: 5885 TOTAL COMBINED HEAT LOSS BTU/H: 60859

Michael O'Rourke

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

OPT 5 BED 4 BATH

TYPE: 4508

DATE: Jun-21

GFA: 3348 LO# 91153

HEATING CFM 1370 COOLING CFM 1370
TOTAL HEAT LOSS 58,855 TOTAL HEAT GAIN 42,179
AIR FLOW RATE CFM 23.28 AIR FLOW RATE CFM 32.48**CARRIER
59TN6A-080-14V 80
FAN SPEED LOW 1030
MEDIUM 1370
HIGH 1800
AFUE = 97 %
INPUT (BTU/H) = 80,000
OUTPUT (BTU/H) = 78,000
DESIGN CFM = 1370
CFM @ .5" E.S.P.

RUN COUNT	4th	3rd	2nd	1st	Bas
S/A	0	0	14	10	5
R/A	0	0	5	3	1

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

All S/A runs 5'Ø unless noted otherwise on layout.

RUN #	1	2	3	4	5	6	7	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
ROOM NAME	MBR	MBR	WIC	BED-3	BED-4	ENS	BATH	BATH	BED-2	BTH-2	DIN	FAM	KIT	KIT	LIV	BTH-3	W/R	FOY	MUD	BAS	BAS	BAS	BAS
RM LOSS MBH	1.69	1.69	1.76	1.76	2.13	1.91	0.40	0.40	2.54	0.79	2.77	2.80	2.03	2.03	1.89	0.90	1.30	2.16	2.22	3.46	3.46	3.46	3.46
CFM PER RUN HEAT	39	39	9	41	50	45	9	9	59	18	64	65	47	47	44	21	30	50	52	81	81	81	81
RM GAIN MBH	2.21	2.21	2.14	2.14	2.54	0.74	0.18	0.18	2.98	0.31	2.52	2.97	2.06	2.06	2.29	0.68	0.70	0.59	1.11	0.42	0.42	0.42	0.42
CFM PER RUN COOLING	72	72	4	70	83	24	6	6	97	10	82	96	67	67	74	22	23	19	36	14	14	14	14
ADJUSTED PRESSURE	0.17	0.17	0.17	0.17	0.16	0.17	0.17	0.17	0.16	0.17	0.16	0.16	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	42	60	54	48	82	52	25	38	49	76	49	14	37	32	66	55	58	65	16	43	20	21	39
EQUIVALENT LENGTH	220	160	195	150	150	210	200	140	150	170	130	140	150	130	140	150	180	160	110	130	150	130	140
TOTAL EFFECTIVE LENGTH	262	220	249	198	232	262	225	178	199	246	179	154	187	182	206	205	238	225	126	173	170	151	179
ADJUSTED PRESSURE	0.07	0.08	0.07	0.09	0.07	0.07	0.08	0.1	0.08	0.07	0.09	0.11	0.09	0.11	0.11	0.08	0.07	0.08	0.14	0.09	0.1	0.11	0.09
ROUND DUCT SIZE	6	6	4	5	6	5	4	4	6	4	6	6	5	5	6	4	4	5	4	6	6	6	6
HEATING VELOCITY (ft/min)	199	199	103	301	255	330	103	103	301	207	326	331	345	345	224	241	344	367	597	413	413	413	413
COOLING VELOCITY (ft/min)	367	367	46	514	423	176	69	69	495	115	418	489	492	492	377	252	264	140	413	71	71	71	71
OUTLET GRILL SIZE	4X10	4X10	3X10	3X10	4X10	3X10	3X10	3X10	4X10	3X10	4X10	4X10	3X10	3X10	3X10	3X10	3X10	3X10	3X10	4X10	4X10	4X10	4X10
TRUNK	C	B	C	D	A	B	D	D	C	A	B	D	B	C	A	D	A	A	D	B	C	C	B

RUN #	25	27	28	29	30	31
ROOM NAME	BAS	BED-3	BED-4	BED-5	KIT	LIV
RM LOSS MBH	3.46	1.76	2.13	1.96	2.03	1.89
CFM PER RUN HEAT	81	41	50	46	47	44
RM GAIN MBH	0.42	2.14	2.54	2.48	2.06	2.29
CFM PER RUN COOLING	14	70	83	81	67	74
ADJUSTED PRESSURE	0.16	0.17	0.16	0.16	0.17	0.17
ACTUAL DUCT LGH	68	39	79	66	34	67
EQUIVALENT LENGTH	150	180	210	220	130	160
TOTAL EFFECTIVE LENGTH	218	219	289	286	164	227
ADJUSTED PRESSURE	0.07	0.08	0.06	0.06	0.1	0.08
ROUND DUCT SIZE	6	5	6	6	5	6
HEATING VELOCITY (ft/min)	413	301	255	235	345	224
COOLING VELOCITY (ft/min)	71	514	423	413	492	377
OUTLET GRILL SIZE	4X10	3X10	4X10	4X10	3X10	3X10
TRUNK	A	D	A	A	B	A

SUPPLY AIR TRUNK SIZE				RETURN AIR TRUNK SIZE			
TRUNK	STATIC PRESS.	ROUND DUCT	RECT DUCT	TRUNK	STATIC PRESS.	ROUND DUCT	RECT DUCT
TRUNK A	413	0.06	10.8	14	0	0	0
TRUNK B	404	0.07	10.3	12	0	0	0
TRUNK C	1133	0.06	15.8	28	0	0	0
TRUNK D	1371	0.06	17	26	0	0	0
TRUNK E	0	0.00	0	0	0	0	0
TRUNK F	0	0.00	0	0	0	0	0
TRUNK G	0	0.00	0	0	0	0	0
TRUNK H	0	0.00	0	0	0	0	0
TRUNK I	0	0.00	0	0	0	0	0
TRUNK J	0	0.00	0	0	0	0	0
TRUNK K	0	0.00	0	0	0	0	0
TRUNK L	0	0.00	0	0	0	0	0
TRUNK M	0	0.00	0	0	0	0	0
TRUNK N	0	0.00	0	0	0	0	0
TRUNK O	0	0.00	0	0	0	0	0
TRUNK P	0	0.00	0	0	0	0	0
TRUNK Q	0	0.00	0	0	0	0	0
TRUNK R	0	0.00	0	0	0	0	0
TRUNK S	0	0.00	0	0	0	0	0
TRUNK T	0	0.00	0	0	0	0	0
TRUNK U	0	0.00	0	0	0	0	0
TRUNK V	0	0.00	0	0	0	0	0
TRUNK W	155	0.05	7.8	8	0.05	7.8	8
TRUNK X	1370	0.05	17.7	30	0.05	17.7	30
TRUNK Y	915	0.05	15.3	28	0.05	15.3	28
TRUNK Z	560	0.05	12.7	18	0.05	12.7	18
DROP	1370	0.05	17.7	24	0.05	17.7	24
VELOCITY (ft/min)							
TRUNK A	8	8	8	8	8	8	8
TRUNK B	8	8	8	8	8	8	8
TRUNK C	8	8	8	8	8	8	8
TRUNK D	8	8	8	8	8	8	8
TRUNK E	8	8	8	8	8	8	8
TRUNK F	8	8	8	8	8	8	8
TRUNK G	8	8	8	8	8	8	8
TRUNK H	8	8	8	8	8	8	8
TRUNK I	8	8	8	8	8	8	8
TRUNK J	8	8	8	8	8	8	8
TRUNK K	8	8	8	8	8	8	8
TRUNK L	8	8	8	8	8	8	8
TRUNK M	8	8	8	8	8	8	8
TRUNK N	8	8	8	8	8	8	8
TRUNK O	8	8	8	8	8	8	8
TRUNK P	8	8	8	8	8	8	8
TRUNK Q	8	8	8	8	8	8	8
TRUNK R	8	8	8	8	8	8	8
TRUNK S	8	8	8	8	8	8	8
TRUNK T	8	8	8	8	8	8	8
TRUNK U	8	8	8	8	8	8	8
TRUNK V	8	8	8	8	8	8	8
TRUNK W	155	0.05	7.8	8	0.05	7.8	8
TRUNK X	1370	0.05	17.7	30	0.05	17.7	30
TRUNK Y	915	0.05	15.3	28	0.05	15.3	28
TRUNK Z	560	0.05	12.7	18	0.05	12.7	18
DROP	1370	0.05	17.7	24	0.05	17.7	24
VELOCITY (ft/min)							
TRUNK A	8	8	8	8	8	8	8
TRUNK B	8	8	8	8	8	8	8
TRUNK C	8	8	8	8	8	8	8
TRUNK D	8	8	8	8	8	8	8
TRUNK E	8	8	8	8	8	8	8
TRUNK F	8	8	8	8	8	8	8
TRUNK G	8	8	8	8	8	8	8
TRUNK H	8	8	8	8	8	8	8
TRUNK I	8	8	8	8	8	8	8
TRUNK J	8	8	8	8	8	8	8
TRUNK K	8	8	8	8	8	8	8
TRUNK L	8	8	8	8	8	8	8
TRUNK M	8	8	8	8	8	8	8
TRUNK N	8	8	8	8	8	8	8
TRUNK O	8	8	8	8	8	8	8
TRUNK P	8	8	8	8	8	8	8
TRUNK Q	8	8	8	8	8	8	8
TRUNK R	8	8	8	8	8	8	8
TRUNK S	8	8	8	8	8	8	8
TRUNK T	8	8	8	8	8	8	8
TRUNK U	8	8	8	8	8	8	8
TRUNK V	8	8	8	8	8	8	8
TRUNK W	155	0.05	7.8	8	0.05	7.8	8
TRUNK X	1370	0.05	17.7	30	0.05	17.7	30
TRUNK Y	915	0.05	15.3	28	0.05	15.3	28
TRUNK Z	560	0.05	12.7	18	0.05	12.7	18
DROP	1370	0.05	17.7	24	0.05	17.7	24
VELOCITY (ft/min)							
TRUNK A	8	8	8	8	8	8	8
TRUNK B	8	8	8	8	8	8	8
TRUNK C	8	8	8	8	8	8	8
TRUNK D	8	8	8	8	8	8	8
TRUNK E	8	8	8	8	8	8	8
TRUNK F	8	8	8	8	8	8	8
TRUNK G	8	8	8	8	8	8	8
TRUNK H	8	8	8	8	8	8	8
TRUNK I	8	8	8	8	8	8	8
TRUNK J	8	8	8	8	8	8	8
TRUNK K	8	8	8	8	8	8	8
TRUNK L	8	8	8	8	8	8	8
TRUNK M	8	8	8	8	8	8	8
TRUNK N	8	8	8	8	8	8	8
TRUNK O	8	8	8	8	8	8	8
TRUNK P	8	8	8	8	8	8	8
TRUNK Q	8	8	8	8	8	8	8
TRUNK R	8	8	8	8	8	8	8
TRUNK S	8	8	8	8	8	8	8
TRUNK T	8	8	8	8	8	8	8
TRUNK U	8	8	8	8	8	8	8
TRUNK V	8	8	8	8	8	8	8
TRUNK W	155	0.05	7.8	8	0.05	7.8	8
TRUNK X	1370	0.05	17.7	30	0.05	17.7	30
TRUNK Y	915	0.05	15.3	28	0.05	15.3	28
TRUNK Z	560	0.05	12.7	18	0.05	12.7	18
DROP	1370	0.05	17.7	24	0.05	17.7	24
VELOCITY (ft/min)							
TRUNK A	8	8	8	8	8	8	8
TRUNK B	8	8	8	8	8	8	8
TRUNK C	8	8	8	8	8	8	8
TRUNK D	8	8	8	8	8	8	8
TRUNK E	8	8	8	8	8	8	8
TRUNK F	8	8	8	8	8	8	8
TRUNK G	8	8	8	8	8	8	8
TRUNK H	8	8	8	8	8	8	8
TRUNK I	8	8	8	8	8	8	8
TRUNK J	8	8	8	8	8	8	8
TRUNK K	8	8	8	8	8	8	8
TRUNK L	8	8	8	8	8	8	8

TYPE: 4506
SITE NAME: CENTREFIELD (WEST GORMLEY)

LO # 91153
OPT 5 BED 4 BATH

RESIDENTIAL MECHANICAL VENTILATION DESIGN SUMMARY

COMBUSTION APPLIANCES		9.32.3.1(1)
a)	☒ Direct vent (sealed combustion) only	
b)	☐ Positive venting induced draft (except fireplaces)	
c)	☐ Natural draft, B-vent or induced draft gas fireplace	
d)	☐ Solid Fuel (including fireplaces)	
e)	☐ No Combustion Appliances	

HEATING SYSTEM	
☒ Forced Air	☐ Non Forced Air
☐ Electric Space Heat	

HOUSE TYPE		9.32.1(2)
☒ I	Type a) or b) appliance only, no solid fuel	
☐ II	Type I except with solid fuel (including fireplaces)	
☐ III	Any Type c) appliance	
☐ IV	Type I, or II with electric space heat	
☐	Other: Type I, II or IV no forced air	

SYSTEM DESIGN OPTIONS		O.N.H.W.P.
☐ 1	Exhaust only/Forced Air System	
☐ 2	HRV with Ducting/Forced Air System	
☒ 3	HRV Simplified/connected to forced air system	
☐ 4	HRV with Ducting/non forced air system	
☐	Part 6 Design	

TOTAL VENTILATION CAPACITY		9.32.3.3(1)
Basement + Master Bedroom	2 @ 21.2 cfm	42.4 cfm
Other Bedrooms	4 @ 10.6 cfm	42.4 cfm
Kitchen & Bathrooms	6 @ 10.6 cfm	63.6 cfm
Other Rooms	5 @ 10.6 cfm	53.0 cfm
Table 9.32.3.A. TOTAL		201.4 cfm

PRINCIPAL VENTILATION CAPACITY REQUIRED		9.32.3.4.(1)
1 Bedroom	31.8	cfm
2 Bedroom	47.7	cfm
3 Bedroom	63.6	cfm
4 Bedroom	79.5	cfm
5 Bedroom	95.4	cfm
TOTAL		95.4 cfm

SUPPLEMENTAL VENTILATION CAPACITY		9.32.3.5.
Total Ventilation Capacity	201.4	cfm
Less Principal Ventil. Capacity	95.4	cfm
Required Supplemental Capacity	106.0	cfm

PRINCIPAL EXHAUST FAN CAPACITY	
Model: VANEE 65H	Location: BSMT
95.4 cfm	☒ HVI Approved

PRINCIPAL EXHAUST HEAT LOSS CALCULATION			
CFM	ΔT °F	FACTOR	% LOSS
95.4 CFM	X 78 F	X 1.08	X 0.25

SUPPLEMENTAL FANS		BY INSTALLING CONTRACTOR		
Location	Model	cfm	HVI	Sones
ENS	BY INSTALLING CONTRACTOR	50	☒	3.5
BATH	BY INSTALLING CONTRACTOR	50	☒	3.5
BTH-4	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	☒ HVI Approved	
@ 32 deg F (0 deg C)		

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:	<i>Michael O'Rourke</i>
HRAI #	001820
Date:	June-21

CITY OF RICHMOND HILL
BUILDING DIVISION

08/16/2021

RECEIVED
Per: daniele devitt

CSA F280-12 Residential Heat Loss and Heat Gain Calculations																																																																															
Formula Sheet (For Air Leakage / Ventilation Calculation)																																																																															
LO#: 91153	Model: 4506	Builder: ROYAL PINE HOMES	Date: 2021-06-10																																																																												
Volume Calculation		Air Change & Delta T Data																																																																													
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0.233	x	378.31	x																																																																												
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			234 W																																																																												
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			800 Btu/h																																																																												
6.2.7 Sensible heat Gain due to Ventilation																																																																															
$HL_{vaib} = PVC \times DTD_h \times 1.08 \times (1 - E)$																																																																															
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)																																																																															
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*HLairbv = Air leakage heat loss + ventilation heat loss *For a balanced or supply only ventilation system HLairve = 0																																																																															

CITY OF RICHMOND HILL
BUILDING DIVISION

08/16/2021

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Per: danielle.devitt

HEAT LOSS AND GAIN SUMMARY SHEET

MODEL: 4506	OPT 5 BED 4 BATH	BUILDER: ROYAL PINE HOMES
SFQT: 3348	LO# 91153	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 (ft³):	48096.0	ASSUMED (Y/N):	Y
INTERNAL SHADING:	BLINDS/CURTAINS	ASSUMED OCCUPANTS:	6
INTERIOR LIGHTING LOAD (Btu/h/ft²):	1.27	DC BRUSHLESS MOTOR (Y/N):	Y
FOUNDATION CONFIGURATION	BCIN_1	DEPTH BELOW GRADE:	7.0 ft
LENGTH: 56.0 ft	WIDTH: 38.0 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%	-

CITY OF RICHMOND HILL
BUILDING DIVISION

08/16/2021

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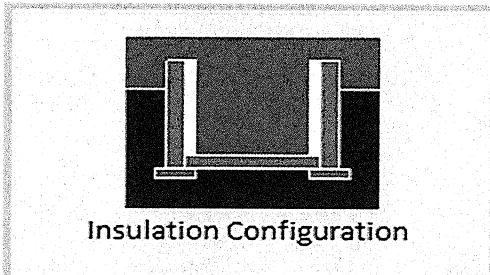
INDIVIDUAL BCIN: 19669

MICHAEL O'ROURKE

Michael O'Rourke

Residential Foundation Thermal Load Calculator

Supplemental tool for CAN/CSA-F280

Weather Station Description		
Province:	Ontario	
Region:	Richmond Hill	
Site Description		
Soil Conductivity:	Normal conductivity: dry sand, loam, clay	
Water Table:	Normal (7-10 m, 23-33 ft)	
Foundation Dimensions		
Floor Length (m):	17.1	 Insulation Configuration
Floor Width (m):	11.6	
Exposed Perimeter (m):	0.0	
Wall Height (m):	3.0	
Depth Below Grade (m):	2.13	
Window Area (m ²):	1.9	
Door Area (m ²):	1.9	
Radiant Slab		
Heated Fraction of the Slab:	0	
Fluid Temperature (°C):	33	
Design Months		
Heating Month	1	
Foundation Loads		
Heating Load (Watts):	1896	

TYPE: 4506
LO# 91153

OPT 5 BED 4 BATH

CITY OF RICHMOND HILL
BUILDING DIVISION

08/16/2021

RECEIVED
Per: danielle.devitt

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):	1361.9			
Air Leakage/Ventilation				
Air Tightness Type:	Energy Star Detached (2.5 ACH)			
Custom BDT Data:	ELA @ 10 Pa.	1271.4 cm ²		
	2.50	ACH @ 50 Pa		
Mechanical Ventilation (L/s):	Total Supply	Total Exhaust		
	45.0	45.0		
Flue Size				
Flue #:	#1	#2	#3	#4
Diameter (mm):	0	0	0	0
Natural Infiltration Rates				
Heating Air Leakage Rate (ACH/H):	0.233			
Cooling Air Leakage Rate (ACH/H):	0.073			

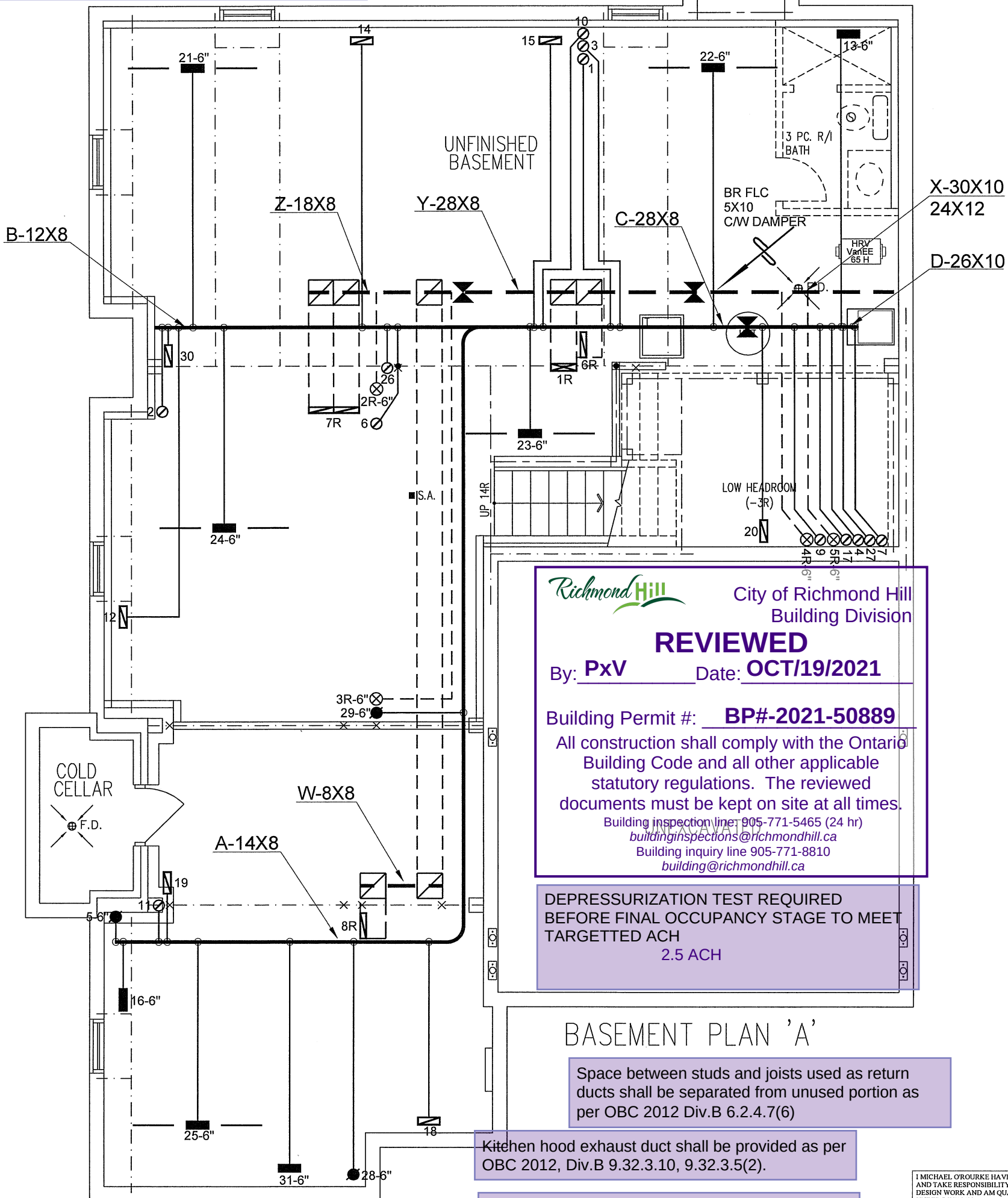
TYPE: 4506
LO# 9115308/16/2021
OPT 5 BED 4 BATHRECEIVED
Per: danielle.devitt

Minimum R-12 Insulation Value required for ducts installed at unheated or exposed condition (OBC 2012 Div.B 6.2.4.3(10) and seal the ducts as per 6.2.4.3(11) & HRAI Digest 2005, Clause 4.5.

Combustion air supply shall be provided to the furnace and hot water tank.

HRV installation, testing, startup and commissioning shall be in compliance with OBC 2012, Div.B 9.32.3.11, 9.32.3.11(7)&(10)

Ensure that R-Values and U-Values used for heat loss and heat gain calculations are consistent with the values specified by SB-12 Performance Compliance: BETTER THAN CODE/AIR TIGHTNESS TEST and the values used for architectural design.



BASEMENT PLAN 'A'

Space between studs and joists used as return ducts shall be separated from unused portion as per OBC 2012 Div.B 6.2.4.7(6)

Kitchen hood exhaust duct shall be provided as per OBC 2012, Div.B 9.32.3.10, 9.32.3.5(2).

HRV installation, testing, startup and commissioning shall be in compliance with OBC 2012, Div.B 9.32.3.11, 9.32.3.11(7)&(10)

Exterior insulation effective R-Value for wall, roof or exposed floor shall be maintained at the respective location where duct or sanitary pipes are routed inside exterior envelope.

Supply air grill at finished basement shall be at low level. Return air grill for finished or unfinished basement shall be at low level. HRAI digest 2005, clause 7.7(3).

I MICHAEL O'ROURKE HAVE REVIEWED AND TAKE RESPONSIBILITY FOR THE DESIGN WORK AND AM QUALIFIED UNDER DIVISION C, 3.2.3 OF THE BUILDING CODE.
Michael O'Rourke
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.		
No.	Description	Date

REVISIONS

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Client
ROYAL PINE HOMES

Project Name
**CENTREFIELD (WEST GORMLEY)
RICHMOND HILL, ONTARIO**

HVACDESIGNS LTD.
375 Finley Ave. Suite 202 - Ajax, Ontario
L1S 2E2 Tel. 905.619.2300 - 905.420.5300 Fax 905.619.2375
Email: info@hvacdesigns.ca
Web: www.hvacdesigns.ca

Specializing in Residential Mechanical Design Services

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

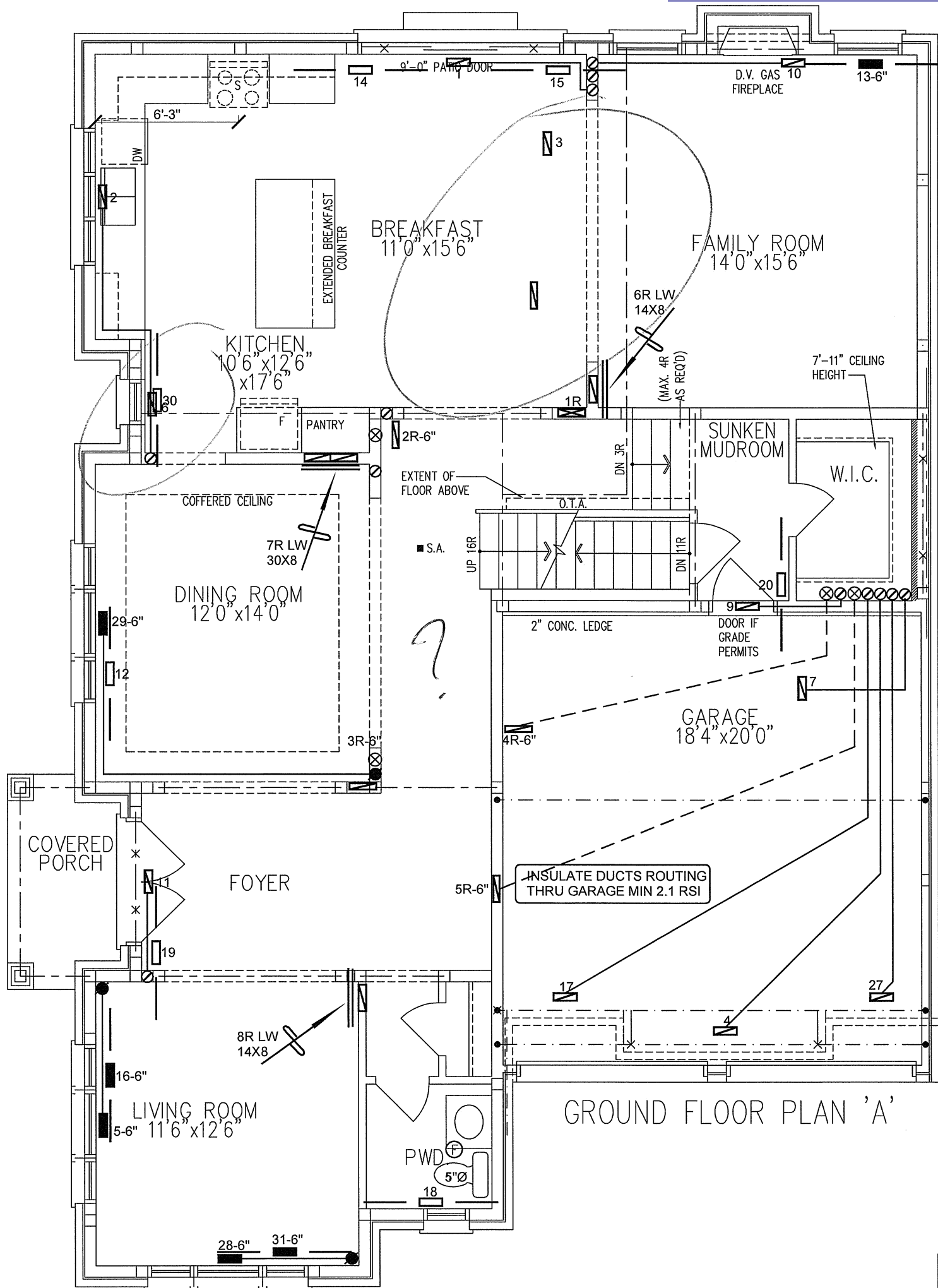
HEAT LOSS	60859 BTU/H
UNIT DATA	
MAKE	CARRIER
MODEL	59TN6A-080-14V
INPUT	80 MBTU/H
OUTPUT	78 MBTU/H
COOLING	3.5 TONS
FAN SPEED	1370 cfm @ 0.6" w.c.

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

Sheet Title	BASEMENT HEATING LAYOUT
Date	JUNE 2021
Scale	3/16" = 1'-0"
BCIN#	19669
LO#	91153

OPT 5 BED 4 BATH
4506 3348 sqft

Return air intake shall be provided as recommended in HRAI Digest 2005 Section 4.7 Return air inlet should be positioned so that short circuiting of supply air is avoided. A high and low wall return air combination shall be provided when a combined cooling & heating system is installed.



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								3.		
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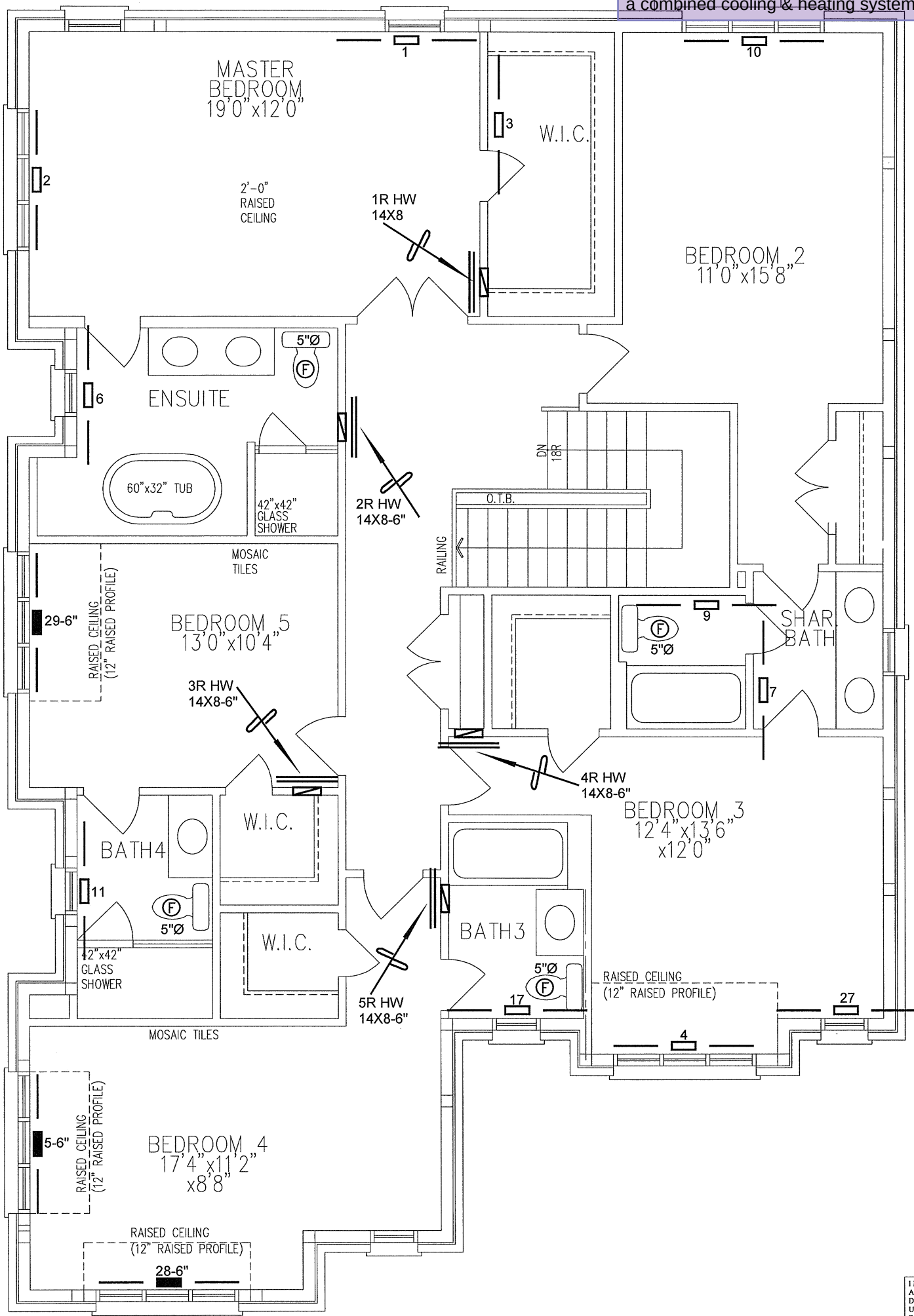
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Client				Sheet Title 08/16/2021	
ROYAL PINE HOMES		375 Finley Ave. Suite 202 - Ajax, Ontario L1S 2E2 Tel. 905.619.2300 - 905.420.5300 Fax 905.619.2375 Email: info@hvacdsgns.ca Web: www.hvacdsgns.ca Specializing in Residential Mechanical Design Services		FIRST FLOOR HEATING LAYOUT	
Project Name CENTREFIELD (WEST GORMLEY) RICHMOND HILL, ONTARIO		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.		RECEIVED Per: <u>danielle.devitt</u> Date JUNE/2021	
OPT 5 BED 4 BATH 4506 3348 sqft				Scale 3/16" = 1'-0" BCIN# 19669	
				LO# 91153	

Space between studs and joists used as return ducts shall be separated from unused portion as per OBC 2012 Div.B 6.2.4.7(6)

Exterior insulation effective R-Value for wall, roof or exposed floor shall be maintained at the respective location where duct or sanitary pipes are routed inside exterior envelope.

Return air intake shall be provided as recommended in HRAI Digest 2005 Section 4.7 Return air inlet should be positioned so that short circuiting of supply air is avoided. A high and low wall return air combination shall be provided when a combined cooling & heating system is installed.



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

CSA-F280-12

Laundry dryer exhaust duct shall be provided as per OBC 2012 Div.B 6.2.3.8(7).

SB-12 PERFORMANCE

HVAC LEGEND							3.		
SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	2.	
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Client
ROYAL PINE HOMES

Project Name
CENTREFIELD (WEST GORMLEY)
RICHMOND HILL, ONTARIO

OPT 5 BED 4 BATH
4506 3348 sqft

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

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Per: danielle.devitt

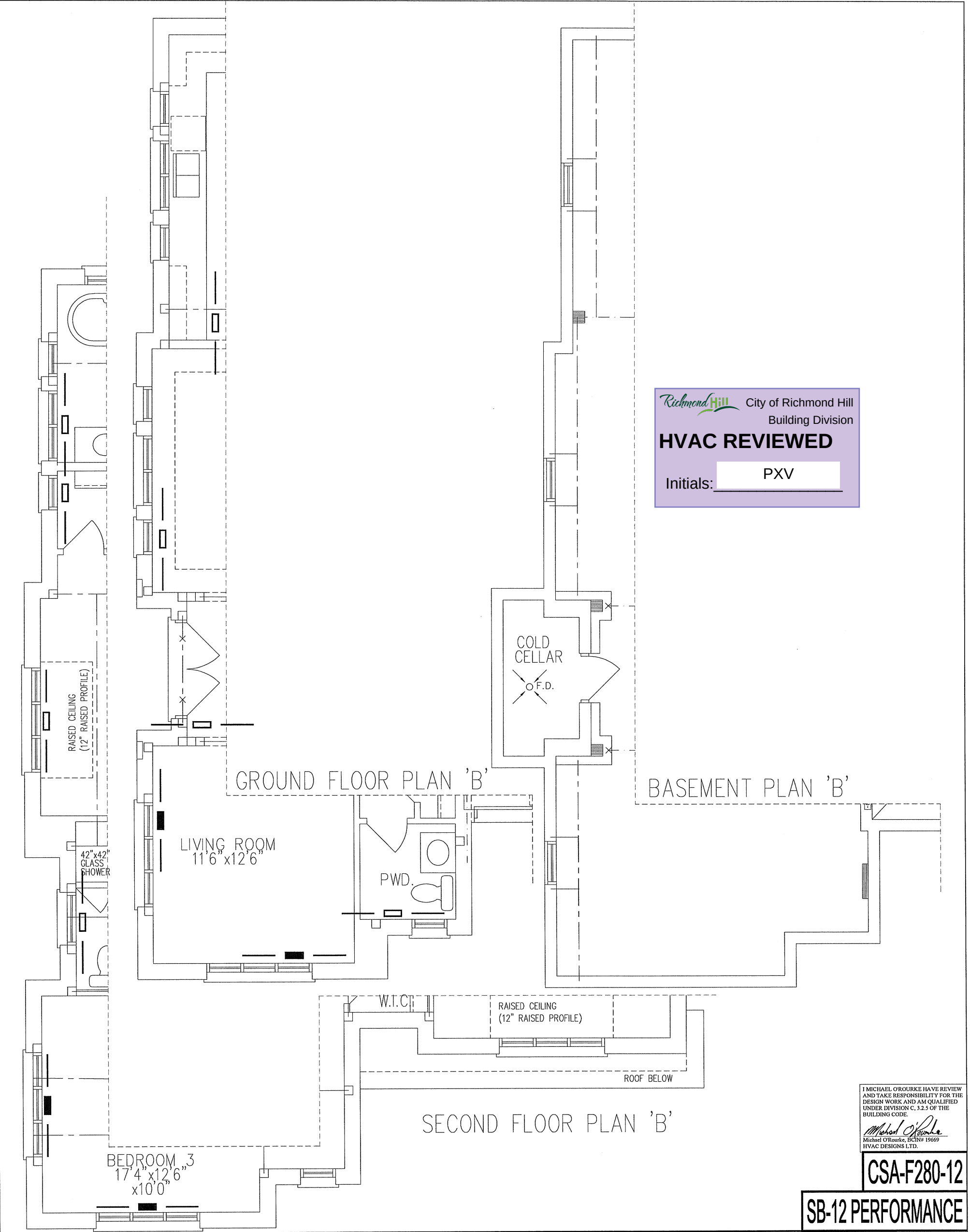
Sheet Title
SECOND FLOOR
HEATING
LAYOUT

Date
JUNE/2021

Scale
3/16" = 1'-0"

BCIN# 19669

LO# 91153



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

CSA-F280-12

SB-12 PERFORMANCE

HVAC LEGEND						3.		
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REVISIONS								Description
								Date

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Client ROYAL PINE HOMES		 375 Finley Ave. Suite 202 - Ajax, Ontario L1S 2E2 Tel. 905.619.2300 - 905.420.5300 Fax 905.619.2375 Email: info@hvacdesigns.ca Web: www.hvacdesigns.ca Specializing in Residential Mechanical Design Services	08/16/2021 RECEIVED Per: <u>danielle.devitt</u>	Sheet Title THIRD FLOOR HEATING LAYOUT	
Project Name CENTREFIELD (WEST GORMLEY) RICHMOND HILL, ONTARIO				Date JUNE/2021	
OPT 5 BED 4 BATH 4506		Scale 3/16" = 1'-0"			
3348 sqft		BCIN# 19669			
		LO#		91153	

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@hvacdsgns.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 ☐ Small Buildings ☐ Large Buildings ☐ Complex Buildings ☒ HVAC – House ☐ Building Services ☐ Detection, Lighting and Power ☐ Fire Protection ☐ Building Structural ☐ Plumbing – House ☐ Plumbing – All Buildings ☐ 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: 4506 The Fernwood OPT GROUND Project: CENTREFIELD (WEST GORMLEY)	
D. Declaration of Designer			
I, <u>MICHAEL O'ROURKE</u> (print name)		declare that (choose one as appropriate):	
☐ 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 Division C, of the Building Code. Individual BCIN: <u>19669</u> Basis for exemption from registration and qualification: <u>O.B.C SENTENCE 3.2.4.1 (4)</u>			
☐ 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		 Signature of Designer	
Date		CITY OF RICHMOND HILL BUILDING DIVISION 08/16/2021 RECEIVED Per: danielle.devitt	

NOTE:

- 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.
- 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.

Application for a Permit Construct or Demolish – Effective January 1, 2015

SITE NAME: CENTREFIELD (WEST GORMLEY) BUILDER: ROYAL PINE HOMES										TYPE: 4506		OPT GROUND		GFA: 3348		DATE: Jun-21 LO# 91152		BATH		SUMMER NATURAL AIR CHANGE RATE		WINTER NATURAL AIR CHANGE RATE		0.233		HEAT LOSS AT °F.		78		CSA-F280-12 SB-12 PERFORMANCE																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																				
ROOM USE		MBR		ENS		WIC		BED-2		BED-3		BED-4		COMP		LAUN		ENS-2		LAUN-2		HEAT GAIN AT °F.		13		78		CSA-F280-12 SB-12 PERFORMANCE																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																						
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CLG. HT.		9		9		9		9		9		9		12		9		9		11		HEAT LOSS AT °F.		13		78		CSA-F280-12 SB-12 PERFORMANCE																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																						
FACTORS		162		261		207		261		423		171		81		0		54		176		HEAT LOSS AT °F.		13		78		CSA-F280-12 SB-12 PERFORMANCE																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																						
GRS.WALL AREA		LOSS		GAIN		LOSS		GAIN		LOSS		GAIN		LOSS		GAIN		LOSS		GAIN		HEAT LOSS AT °F.		13		78		CSA-F280-12 SB-12 PERFORMANCE																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																						
GLAZING		NORTH		EAST		SOUTH		WEST		SKYL.T.		DOORS		NET EXPOSED WALL		NET EXPOSED BSMT WALL ABOVE GR		NO ATTIC EXPOSED CLG		EXPOSED FLOOR		BASEMENT/CRAWL HEAT LOSS		SLAB ON GRADE HEAT LOSS		SUBTOTAL HT LOSS		SUB TOTAL HT GAIN		LEVEL FACTOR / MULTIPLIER		AIR CHANGE HEAT LOSS		AIR CHANGE HEAT GAIN		DUCT LOSS		HEAT GAIN PEOPLE		HEAT GAIN APPLIANCES/LIGHTS		TOTAL HT LOSS BTU/H		TOTAL HT GAIN x 1.3 BTU/H		781																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																				
21.8		14.9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

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

OPT GROUND
TYPE: 4506

DATE: Jun-21

GFA: 3348 LO# 91152

HEATING CFM 1370 COOLING CFM 1370
TOTAL HEAT LOSS 58,176 TOTAL HEAT GAIN 42,280
AIR FLOW RATE CFM 23.55 AIR FLOW RATE CFM 32.4

AFUE = 97 %
INPUT (BTU/H) = 80,000
OUTPUT (BTU/H) = 78,000

**CARRIER
59TN6A-080-14V 80
FAN SPEED LOW 1030
MEDIUM 0
HIGH 1370

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

RUN COUNT	4th	3rd	2nd	1st	Bas
S/A	0	0	16	11	5
R/A	0	0	5	3	1

furnace pressure 0.6
furnace filter 0.05
a/c coil pressure 0.2
available pressure 0.35
plenum pressure s/a 0.18
max s/a diff 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

TEMPERATURE RISE 53 °F

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	WIC	BED-2	BED-3	BED-4	BATH	COMP	LAUN	MBR	ENS-2	DIN	FAM	KIT	KIT	LIV	WIC-3	W/R	FOY	MUD	BAS	BAS	BAS	BAS
RM LOSS MBH	0.93	1.58	1.19	1.75	2.12	1.16	1.16	0.91	0.21	0.93	0.79	2.75	2.78	2.02	2.02	1.88	0.90	1.29	1.24	1.20	3.41	3.41	3.41	3.41
CFM PER RUN HEAT	22	37	28	41	50	27	21	26	5	22	19	65	65	47	47	44	21	30	50	28	80	80	80	80
RM GAIN MBH	1.53	1.51	0.28	2.07	2.48	1.37	0.59	1.14	0.74	1.53	0.31	2.40	2.85	2.01	2.01	2.22	0.68	0.70	0.59	0.83	0.40	0.40	0.40	0.40
CFM PER RUN COOLING	50	49	9	67	80	44	19	37	24	50	10	78	92	65	65	72	22	23	19	27	13	13	13	13
ADJUSTED PRESSURE	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.16	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17
ACTUAL DUCT LGH	42	60	54	48	82	52	25	26	38	49	76	49	14	37	32	66	55	58	65	16	43	20	21	39
EQUIVALENT LENGTH	220	160	195	150	150	210	200	150	140	150	170	130	140	150	130	140	150	160	160	110	130	150	130	140
TOTAL EFFECTIVE LENGTH	262	220	249	198	232	262	262	225	176	178	199	246	179	154	187	206	205	238	225	126	173	170	151	179
ADJUSTED PRESSURE	0.07	0.08	0.07	0.09	0.07	0.07	0.08	0.1	0.1	0.09	0.07	0.1	0.11	0.09	0.11	0.08	0.08	0.07	0.08	0.14	0.1	0.1	0.11	0.1
ROUND DUCT SIZE	5	5	4	5	6	5	4	4	4	5	4	5	5	5	5	6	4	4	5	4	5	6	6	6
HEATING VELOCITY (ft/min)	162	272	321	301	255	198	241	298	57	162	218	477	477	345	345	345	224	241	344	367	321	587	408	408
COOLING VELOCITY (ft/min)	367	360	103	492	408	323	218	424	275	367	115	573	675	477	477	367	252	264	140	310	95	66	66	66
OUTLET GRILL SIZE	3X10	3X10	3X10	3X10	4X10	3X10	3X10	3X10	3X10	3X10	3X10	3X10	3X10	3X10	3X10	4X10	3X10	3X10	3X10	3X10	3X10	4X10	4X10	4X10
TRUNK	C	B	C	D	A	B	D	D	D	C	A	B	D	B	C	A	C	A	A	D	B	C	C	B

RUN #	25	26	27	28	29	30	31	32
ROOM NAME	BAS	ENS	BED-2	BED-3	BED-4	KIT	LIV	LAUN-2
RM LOSS MBH	3.41	1.58	1.75	2.12	1.16	2.02	1.88	0.94
CFM PER RUN HEAT	80	37	41	50	27	44	44	22
RM GAIN MBH	0.40	1.51	2.07	2.48	1.37	2.01	2.22	0.78
CFM PER RUN COOLING	13	49	67	80	44	65	72	25
ADJUSTED PRESSURE	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17
ACTUAL DUCT LGH	68	43	39	79	66	34	67	14
EQUIVALENT LENGTH	150	200	180	210	240	130	160	120
TOTAL EFFECTIVE LENGTH	218	243	219	289	306	164	227	134
ADJUSTED PRESSURE	0.08	0.07	0.08	0.06	0.06	0.1	0.08	0.13
ROUND DUCT SIZE	6	5	5	6	5	5	6	4
HEATING VELOCITY (ft/min)	408	272	301	255	198	345	224	252
COOLING VELOCITY (ft/min)	66	360	492	408	323	477	367	287
OUTLET GRILL SIZE	4X10	3X10	3X10	4X10	3X10	3X10	4X10	3X10
TRUNK	A	B	D	A	A	B	A	D

SUPPLY AIR TRUNK SIZE										RETURN AIR TRUNK SIZE													
TRUNK	STATIC	ROUND	RECT	VELOCITY	TRUNK	STATIC	ROUND	RECT	VELOCITY	TRUNK	STATIC	ROUND	RECT	VELOCITY	TRUNK	STATIC	ROUND	RECT	VELOCITY				
CFM	PRESS.	DUCT	DUCT	(ft/min)	CFM	PRESS.	DUCT	DUCT	(ft/min)	CFM	PRESS.	DUCT	DUCT	(ft/min)	CFM	PRESS.	DUCT	DUCT	(ft/min)				
TRUNK A	394	0.06	14	8	507	0	0	0	8	0	0.00	0	0	0	TRUNK O	0	0.05	0	0	8	0	0	0
TRUNK B	420	0.07	14	8	540	0	0	0	8	0	0.00	0	0	0	TRUNK P	0	0.05	0	0	8	0	0	0
TRUNK C	1093	0.06	28	8	703	0	0	0	8	0	0.00	0	0	0	TRUNK Q	0	0.05	0	0	8	0	0	0
TRUNK D	1363	0.06	26	10	755	0	0	0	8	0	0.00	0	0	0	TRUNK R	0	0.05	0	0	8	0	0	0
TRUNK E	0	0.00	0	8	0	0.00	0	0	8	0	0.00	0	0	0	TRUNK S	0	0.05	0	0	8	0	0	0
TRUNK F	0	0.00	0	8	0	0.00	0	0	8	0	0.00	0	0	0	TRUNK T	0	0.05	0	0	8	0	0	0
RETURN AIR #	1	2	3	4	5	6	7	8	BR														
AIR VOLUME	175	75	85	85	95	180	330	155	0	0	0	0	0	0	TRUNK W	155	0.05	7.8	8	349	8	349	8
PLENUM PRESSURE	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0	0	0	0	0	0	TRUNK X	1370	0.05	17.7	30	658	10	658	10
ACTUAL DUCT LGH.	42	52	67	60	66	27	40	62	1	1	1	1	1	1	TRUNK Y	915	0.05	15.3	28	588	8	588	8
EQUIVALENT LENGTH	185	235	165	195	155	145	240	170	0	0	0	0	0	0	TRUNK Z	560	0.05	12.7	18	560	8	560	8
TOTAL EFFECTIVE LH	227	287	232	255	221	172	280	232	1	1	1	1	1	1	DROP	1370	0.05	17.7	24	685	12	685	12
ADJUSTED PRESSURE	0.07	0.05	0.06	0.06	0.07	0.09	0.05	0.06	0.06	0.06	0.06	0.06	0.06	0.06									
ROUND DUCT SIZE	7.5	6	6	6	6	7.2	10.4	7.5	0	0	0	0	0	0									
INLET GRILL SIZE	8	8	8	8	8	8	8	8	8	8	8	8	8	8									
INLET GRILL SIZE	14	14	14	14	14	14	14	14	14	14	14	14	14	14									

TYPE: 4506
SITE NAME: CENTREFIELD (WEST GORMLEY)

LO # 91152
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	8 @ 10.6 cfm 84.8 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	79.5 cfm

SUPPLEMENTAL VENTILATION CAPACITY 9.32.3.5.	
Total Ventilation Capacity	212 cfm
Less Principal Ventil. Capacity	79.5 cfm
Required Supplemental Capacity	132.5 cfm

PRINCIPAL EXHAUST FAN CAPACITY	
Model: VANEE 65H	Location: BSMT
79.5 cfm	☒ HVI Approved

PRINCIPAL EXHAUST HEAT LOSS CALCULATION	
CFM	ΔT °F
79.5 CFM	78 F
X	X
FACTOR	% LOSS
1.08	0.25

SUPPLEMENTAL FANS BY INSTALLING CONTRACTOR	
Location	Model
ENS	BY INSTALLING CONTRACTOR
BATH	BY INSTALLING CONTRACTOR
ENS-2	BY INSTALLING CONTRACTOR
W/R	BY INSTALLING CONTRACTOR

HEAT RECOVERY VENTILATOR 9.32.3.11.	
Model: VANEE 65H	
155 cfm high	64 cfm low
75 % Sensible Efficiency	☒ HVI Approved
@ 32 deg F (0 deg C)	

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:	<i>Michael O'Rourke</i>
HRAI #	Per: daniel devitt
Date:	June-21

CSA F280-12 Residential Heat Loss and Heat Gain Calculations																																																															
Formula Sheet (For Air Leakage / Ventilation Calculation)																																																															
LO#: 91152	Model: 4506	Builder: ROYAL PINE HOMES	Date: 2021-06-04																																																												
Volume Calculation		Air Change & Delta T Data																																																													
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5.2.3.1 Heat Loss due to Air Leakage		6.2.6 Sensible Gain due to Air Leakage																																																													
$HL_{airb} = LR_{airb} \times \frac{V_b}{3.6} \times DTD_h \times 1.2$		$HG_{salb} = LR_{airc} \times \frac{V_b}{3.6} \times DTD_c \times 1.2$																																																													
0.233	x 366.54 x 43 °C x 1.2 = 4426 W	0.073	x 366.54 x 7 °C x 1.2 = 227 W																																																												
	= 15101 Btu/h		= 775 Btu/h																																																												
5.2.3.2 Heat Loss due to Mechanical Ventilation		6.2.7 Sensible heat Gain due to Ventilation																																																													
$HL_{vairb} = PVC \times DTD_h \times 1.08 \times (1 - E)$		$HL_{vairb} = PVC \times DTD_h \times 1.08 \times (1 - E)$																																																													
80 CFM	x 78 °F x 1.08 x 0.25 = 1670 Btu/h	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)																																																															
$HL_{airr} = Level Factor \times HL_{airbv} \times \{(HL_{agcr} + HL_{bgcr}) \div (HL_{agclvl} + HL_{bgclvl})\}$																																																															
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CITY OF RICHMOND HILL
BUILDING DIVISION

08/16/2021

RECEIVED

Per: danielle.devitt

HEAT LOSS AND GAIN SUMMARY SHEET

MODEL: 4506	OPT GROUND	BUILDER: ROYAL PINE HOMES
SFQT: 3348	LO# 91152	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):	46599.0	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: 56.0 ft	WIDTH: 38.0 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%	-

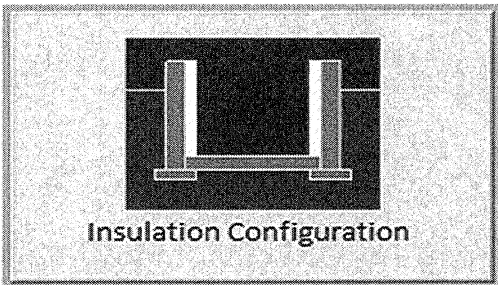
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BUILDING DIVISION
08/16/2021
RECEIVED
Per: danielle devitt

INDIVIDUAL BCIN: 19669
MICHAEL O'ROURKE

Michael O'Rourke

Residential Foundation Thermal Load Calculator

Supplemental tool for CAN/CSA-F280

Weather Station Description		
Province:	Ontario	
Region:	Richmond Hill	
Site Description		
Soil Conductivity:	Normal conductivity: dry sand, loam, clay	
Water Table:	Normal (7-10 m, 23-33 ft)	
Foundation Dimensions		
Floor Length (m):	17.1	 Insulation Configuration
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):	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):	1898	

TYPE: 4506
LO# 91152

OPT GROUND

CITY OF RICHMOND HILL
BUILDING DIVISION

08/16/2021

RECEIVED

Per: danielle.devitt

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):	1319.5			
Air Leakage/Ventilation				
Air Tightness Type:	Energy Star Detached (2.5 ACH)			
Custom BDT Data:	ELA @ 10 Pa.	1231.8 cm ²		
	2.50	ACH @ 50 Pa		
Mechanical Ventilation (L/s):	Total Supply	Total Exhaust		
	37.5	37.5		
Flue Size				
Flue #:	#1	#2	#3	#4
Diameter (mm):	0	0	0	0
Natural Infiltration Rates				
Heating Air Leakage Rate (ACH/H):	0.233			
Cooling Air Leakage Rate (ACH/H):	0.073			

TYPE: 4506
LO# 91152

OPT GROUND

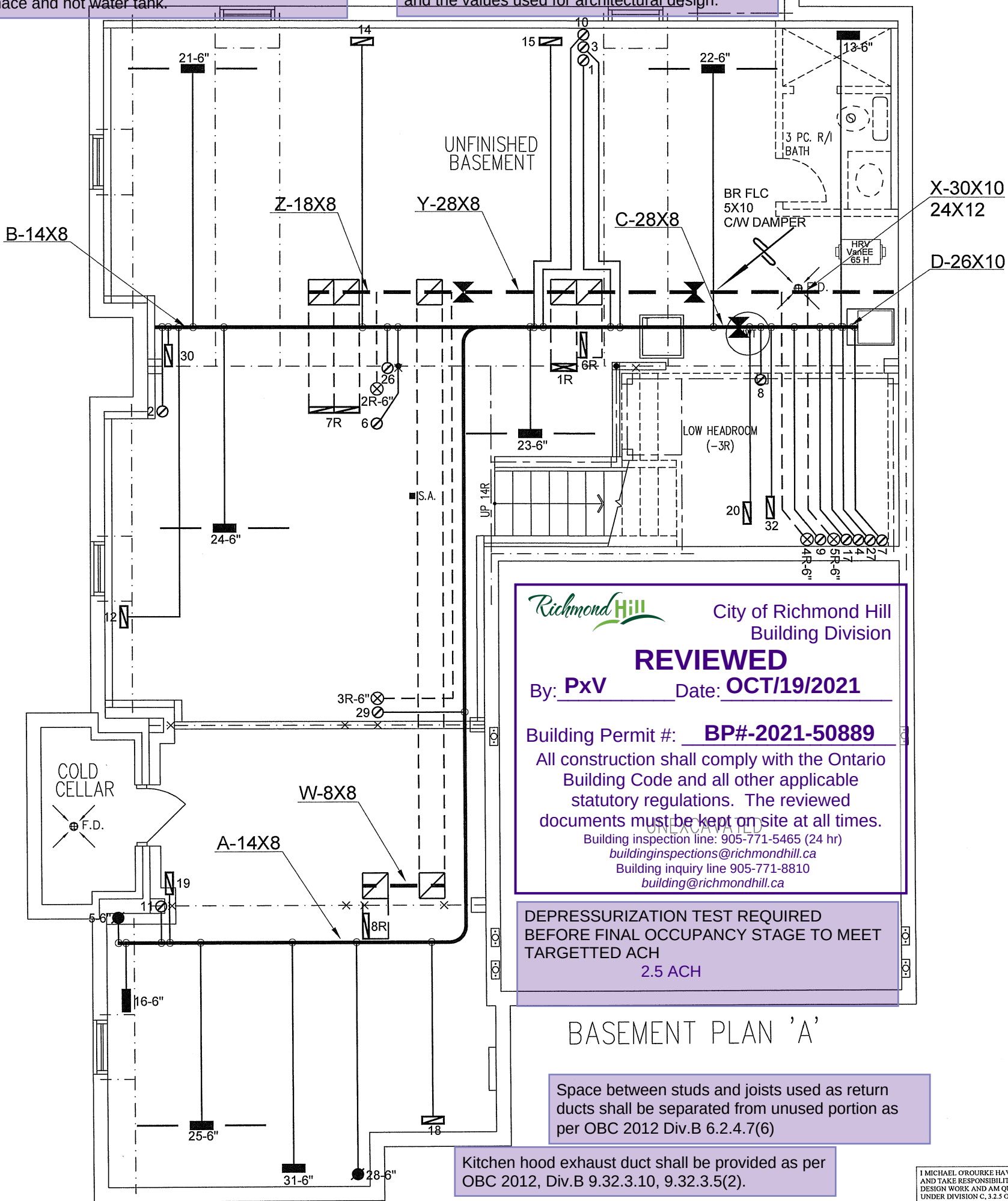
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Minimum R-12 Insulation Value required for ducts installed at unheated or exposed condition (OBC 2012 Div.B 6.2.4.3(10) and seal the ducts as per 6.2.4.3(11) & HRAI Digest 2005, Clause 4.5.

Combustion air supply shall be provided to the furnace and hot water tank.

HRV installation, testing, startup and commissioning shall be in compliance with OBC 2012, Div.B 9.32.3.11, 9.32.3.11(7)&(10)

Ensure that R-Values and U-Values used for heat loss and heat gain calculations are consistent with the values specified by SB-12 Performance Compliance: **BETTER THAN CODE/AIR TIGHTNESS TEST** and the values used for architectural design.



BASEMENT PLAN 'A'

Space between studs and joists used as return ducts shall be separated from unused portion as per OBC 2012 Div.B 6.2.4.7(6)

Kitchen hood exhaust duct shall be provided as per OBC 2012, Div.B 9.32.3.10, 9.32.3.5(2).

HRV installation, testing, startup and commissioning shall be in compliance with OBC 2012, Div.B 9.32.3.11, 9.32.3.11(7)&(10)

Exterior insulation effective R-Value for wall, roof or exposed floor shall be maintained at the respective location where duct or sanitary pipes are routed inside exterior envelope.

I MICHAEL O'ROURKE HAVE REVIEWED AND TAKE RESPONSIBILITY FOR THE DESIGN WORK AND AM QUALIFIED UNDER DIVISION C, 3.2.5 OF THE BUILDING CODE.
Michael O'Rourke
Michael O'Rourke, BCIN# 19669
HVAC DESIGNS LTD.

CSA-F280-12

SB-12 PERFORMANCE

HVAC LEGEND							REVISIONS	
SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	Description	Date
	SUPPLY AIR GRILLE		6" SUPPLY AIR BOOT ABOVE		14"x8" RETURN AIR GRILLE		RETURN AIR STACK ABOVE	1.
	SUPPLY AIR GRILLE 6" BOOT		SUPPLY AIR STACK FROM 2nd FLOOR		30"x8" RETURN AIR GRILLE		RETURN AIR STACK 2nd FLOOR	No.
	SUPPLY AIR BOOT ABOVE		6" SUPPLY AIR STACK 2nd FLOOR		FRA- FLOOR RETURN AIR GRILLE		REDUCER	

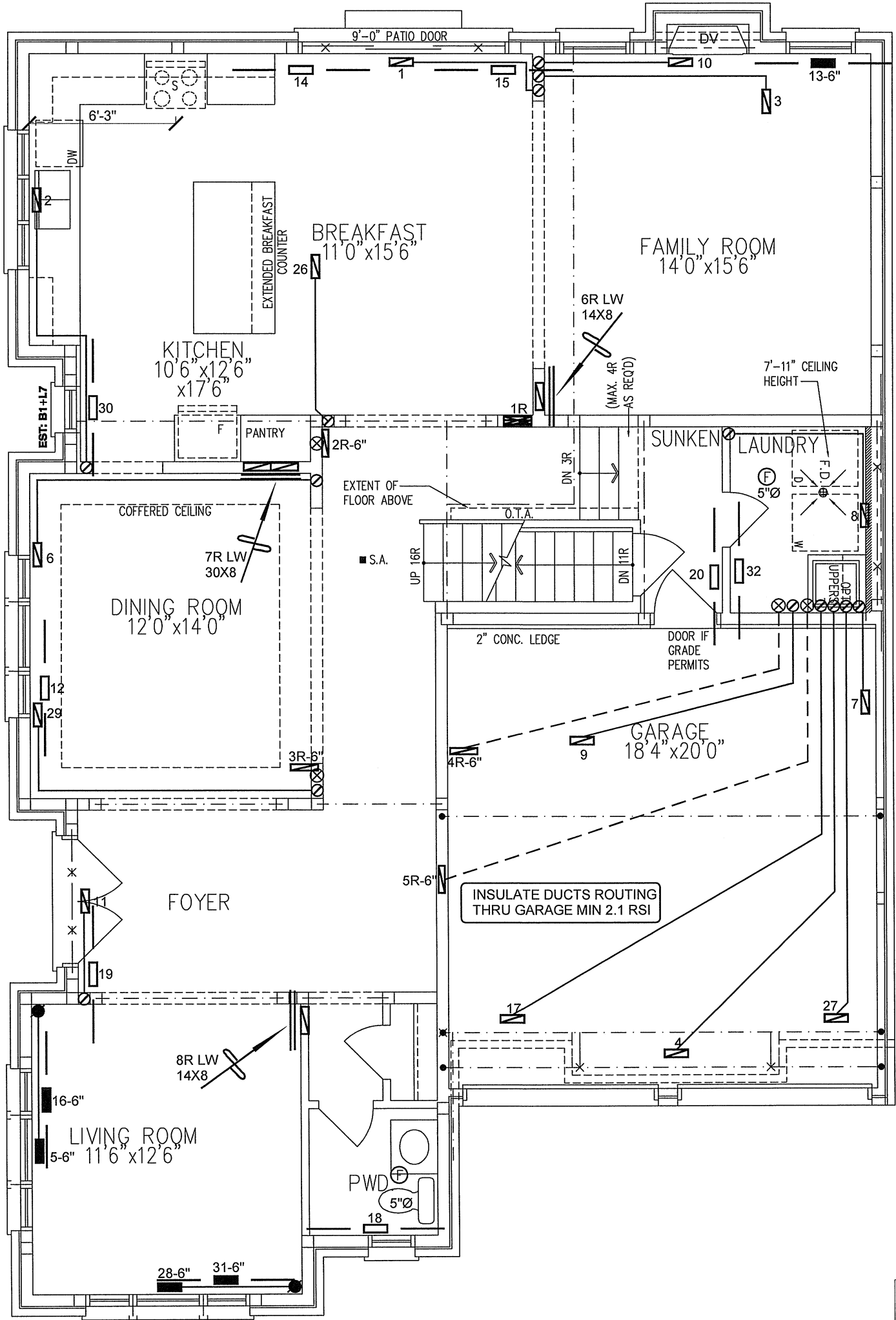
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Client ROYAL PINE HOMES		 375 Finley Ave. Suite 202 - Ajax, Ontario L1S 2E2 Tel. 905.619.2300 - 905.420.5300 Fax 905.619.2375 Email: info@hvacdesigns.ca Web: www.hvacdesigns.ca Specializing in Residential Mechanical Design Services	HEAT LOSS 59846 BTU/H UNIT DATA		# OF RUNS S/A R/A FANS		Sheet Title BASEMENT HEATING LAYOUT	
Project Name CENTREFIELD (WEST GORMLEY) RICHMOND HILL, ONTARIO			MAKE CARRIER		3RD FLOOR		Date JUNE/2021	
OPT GROUND 4506 3348 sqft		MODEL 59TN6A-080-14V		2ND FLOOR		Scale 3/16" = 1'-0"		
		INPUT 80 MBTU/H		1ST FLOOR		BCIN# 19669		
		OUTPUT 78 MBTU/H		BASEMENT		LO#		
		COOLING 3.5 TONS		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		91152		
		FAN SPEED 1370 cfm @ 0.6" w.c.						

Space between studs and joists used as return ducts shall be separated from unused portion as per OBC 2012 Div.B 6.2.4.7(6)

Exterior insulation effective R-Value for wall, roof or exposed floor shall be maintained at the respective location where duct or sanitary pipes are routed inside exterior envelope.

Return air intake shall be provided as recommended in HRAI Digest 2005 Section 4.7
Return air inlet should be positioned so that short circuiting of supply air is avoided. A high and low wall return air combination shall be provided when a combined cooling & heating system is installed.



Laundry dryer exhaust duct shall be provided as per OBC 2012 Div.B 6.2.3.8(7).

I MICHAEL O'ROURKE HAVE REVIEWED AND TAKE RESPONSIBILITY FOR THE DESIGN WORK AND AM QUALIFIED UNDER DIVISION C.32.5 OF THE BUILDING CODE.
Michael O'Rourke
Michael O'Rourke, BCIN# 19669
HVAC DESIGNS LTD.

CSA-F280-12

SB-12 PERFORMANCE

HVAC LEGEND						3.		
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	2.
	SUPPLY AIR GRILLE 6" BOOT		SUPPLY AIR STACK FROM 2nd FLOOR		30"x8" RETURN AIR GRILLE		RETURN AIR STACK 2nd FLOOR	1.
	SUPPLY AIR BOOT ABOVE		6" SUPPLY AIR STACK 2nd FLOOR		FRA- FLOOR RETURN AIR GRILLE		REDUCER	No.
							Description	Date
REVISIONS								

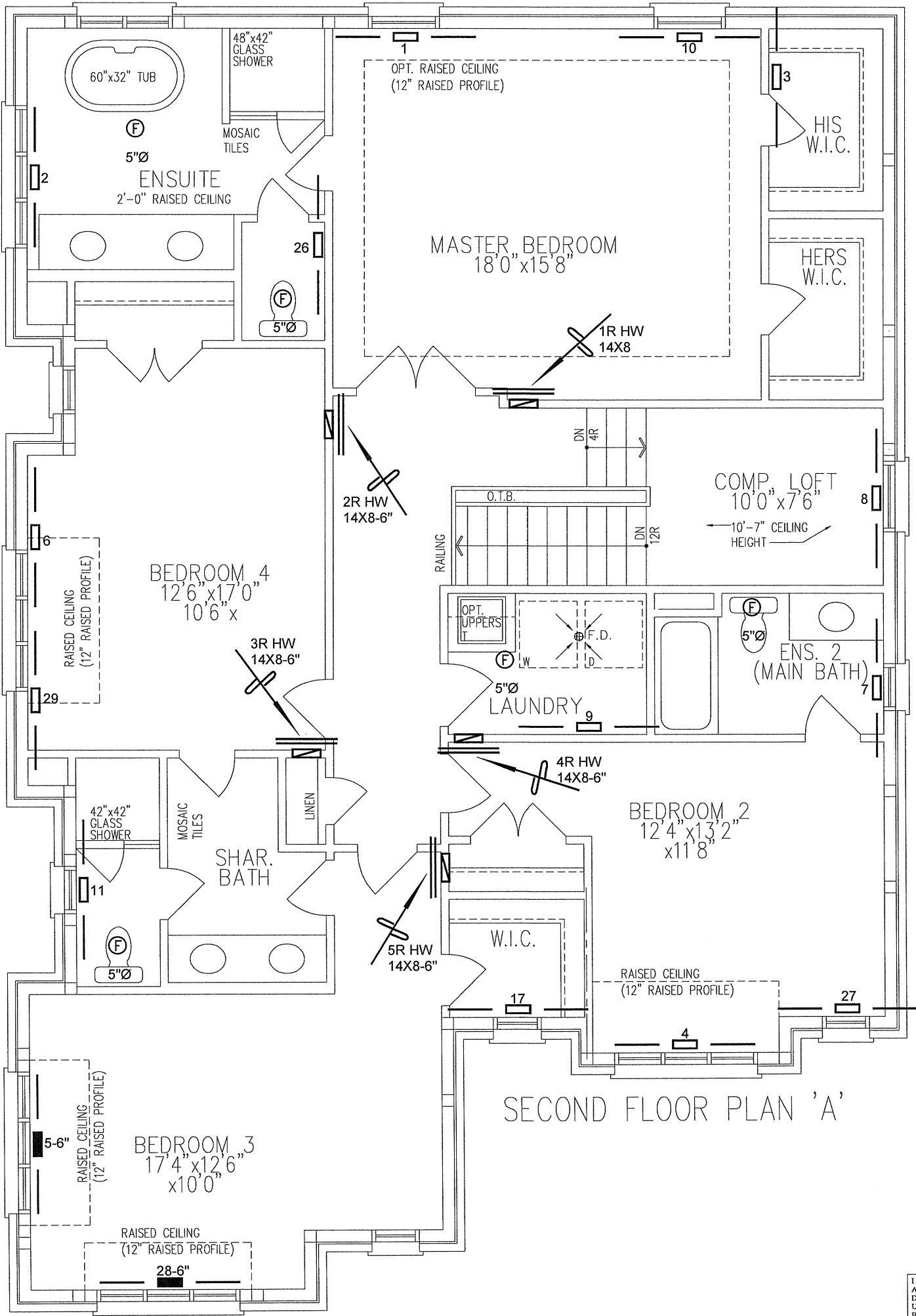
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Client ROYAL PINE HOMES		HVACDESIGNS LTD. 375 Finley Ave. Suite 202 - Ajax, Ontario L1S 2E2 Tel. 905.619.2300 - 905.420.5300 Fax 905.619.2375 Email: info@hvacdesigns.ca Web: www.hvacdesigns.ca Specializing in Residential Mechanical Design Services	08/16/2021 RECEIVED Per: <u>danielle.devitt</u>	Sheet Title FIRST FLOOR HEATING LAYOUT	
Project Name CENTREFIELD (WEST GORMLEY) RICHMOND HILL, ONTARIO				Date JUNE/2021	
OPT GROUND 4506		Scale 3/16" = 1'-0"		BCIN# 19669	
3348 sqft		LO# 91152			
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.					

Space between studs and joists used as return ducts shall be separated from unused portion as per OBC 2012 Div.B 6.2.4.7(6)

Exterior insulation effective R-Value for wall, roof or exposed floor shall be maintained at the respective location where duct or sanitary pipes are routed inside exterior envelope.

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Laundry dryer exhaust duct shall be provided as per OBC 2012 Div.B 6.2.3.8(7).

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.

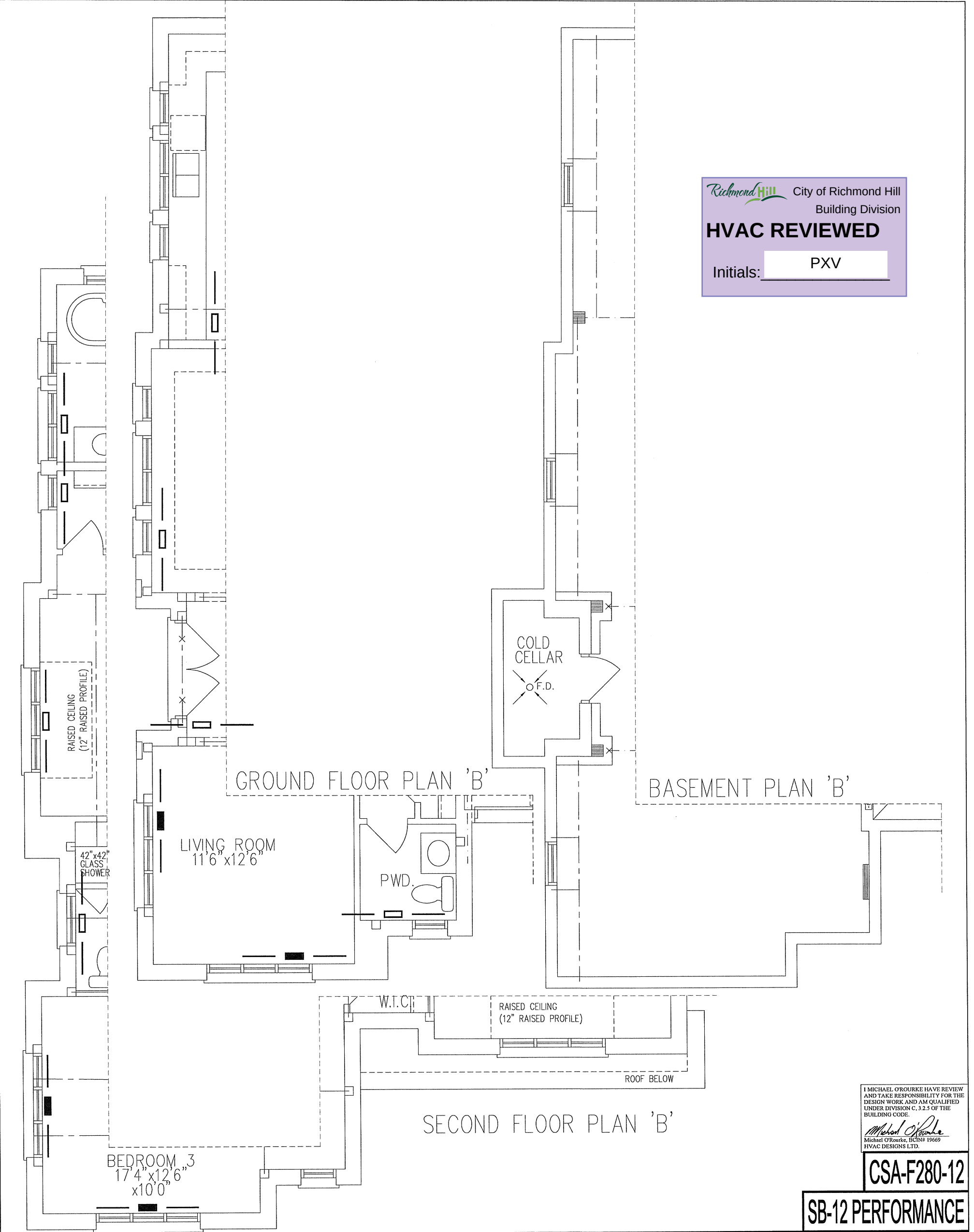
CSA-F280-12

SB-12 PERFORMANCE

HVAC LEGEND						3.		
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REVISIONS								
Description								Date

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Project Name CENTREFIELD (WEST GORMLEY) RICHMOND HILL, ONTARIO				Date JUNE/2021	
OPT GROUND 4506		Scale 3/16" = 1'-0"		BCIN# 19669	
3348 sqft		LO# 91152			



HVAC LEGEND							3.		
SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	2.	
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ROYAL PINE HOMES			08/16/2021 THIRD FLOOR HEATING LAYOUT	
Project Name		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.	RECEIVED Per: <u>danielle.devitt</u>	
CENTREFIELD (WEST GORMLEY) RICHMOND HILL, ONTARIO			Date JUNE/2021	
OPT GROUND 4506			Scale 3/16" = 1'-0"	
3348 sqft			BCIN# 19669	
			LO# 91152	