

Schedule 1: Designer Information

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

CITY OF RICHMOND HILL
BUILDING DIVISION

09/15/2021

RECEIVED

Per: jocelyn aguiar

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: 38-8 ASHTON FIN BSMT WUB 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.			
April 19, 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

SITE NAME: CENTREFIELD (WEST GORMLEY)

FIN BSMT WUB

DATE: Apr-21

WINTER NATURAL AIR CHANGE RATE: 0.227

HEAT LOSS AT °F: 78

CSA-F280-12

BUILDER: ROYAL PINE HOMES

TYPE: 38-8

GFA: 2366

LO# 87609

SUMMER NATURAL AIR CHANGE RATE: 0.071

HEAT GAIN AT °F: 13

HIS-12 PERFORMANCE

ROOM USE	EXP. WALL	CLG. HT.	MBR	ENS	WIC	BED-2	BED-3	BED-4	BATH	B-BATH
			36	21	0	34	29	12	6	10
			9	9	9	9	9	9	9	10
FACTORS	LOSS	GAIN	LOSS	GAIN	LOSS	GAIN	LOSS	GAIN	LOSS	GAIN
GRS.WALL AREA	21.8	16.0	0	0	0	0	0	0	0	0
GLAZING	21.8	41.6	26	566	1080	17	370	706	0	0
NORTH	21.8	24.9	11	240	274	0	0	0	0	0
EAST	21.8	41.6	0	0	0	0	0	0	0	0
SOUTH	21.8	41.6	0	0	0	0	0	0	0	0
WEST	35.8	101.2	0	0	0	0	0	0	0	0
SKYLT.	25.8	4.3	0	0	0	0	0	0	0	0
DOORS	4.2	0.7	287	1207	199	164	690	113	0	0
NET EXPOSED WALL	3.7	0.6	0	0	0	0	0	0	0	0
NET EXPOSED BSMT WALL ABOVE GR	1.3	0.6	241	317	142	123	162	72	75	99
EXPOSED CLG	2.8	1.3	0	0	0	0	0	0	0	0
NO ATTIC EXPOSED CLG	2.6	0.4	0	0	0	0	0	0	0	0
EXPOSED FLOOR			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			2330		1396	99	2234	2711	970	684
SUB TOTAL HT GAIN			1694		1020	44	1856	2269	432	238
LEVEL FACTOR / MULTIPLIER	0.20	0.18								
AIR CHANGE HEAT LOSS			427		256	18	410	497	178	125
AIR CHANGE HEAT GAIN			97		58	3	106	129	25	14
DUCT LOSS			0		0	0	0	321	0	81
DUCT GAIN			0		0	0	0	324	0	25
HEAT GAIN PEOPLE	240	2	480	0	0	0	1	240	1	240
HEAT GAIN APPLIANCES/LIGHTS			606		0	0	606	606	606	0
TOTAL HT LOSS BTU/H			2757		1652	117	2643	3529	1148	890
TOTAL HT GAIN x 1.3 BTU/H			3740		1402	61	3650	4639	1693	360

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ROOM USE			FORM		FAM		KT/BR				LAUN		PWD		FOY		MUD						WUB		BAS			
EXP. WALL			31		33		40				12		13		27		8						21		128			
CLG. HT.			10		10		10				9		11		11		11						10		10			
FACTORS		LOSS		GAIN																								
GRS.WALL AREA	21.8		16.0		313		333		404		108		144		300		89						210		896			
GLAZING	21.8		41.6		31		675		772		34		741		1413		12		261		499		7		152		174	
NORTH	21.8	16.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
EAST	21.8	41.6	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	
SOUTH	21.8	24.9	31	675	772	0	0	0	0	0	0	7	152	174	0	0	0	0	0	0	0	0	3	65	125	3	65	125
WEST	21.8	41.6	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	
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	
DOORS	25.8	4.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
NET EXPOSED WALL	4.2	0.7	282	1186	195	299	1259	207	385	1619	266	91	383	63	144	607	100	236	991	163	69	289	48	187	786	129	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	
EXPOSED CLG	1.3	0.6	0	0	0	10	13	6	0	0	0	92	121	54	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	
EXPOSED FLOOR	2.6	0.4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
BASEMENT/CRAWL HEAT LOSS			0				0		0		0		0		0		0		0						4270			
SLAB ON GRADE HEAT LOSS			0				0		0		0		0		0		0		0									
SUBTOTAL HT LOSS			1862				2012		2033		874		607		2548		806						1561		6398			
SUB TOTAL HT GAIN			967				1626		939		540		100		1330		133						339		592			
LEVEL FACTOR / MULTIPLIER	0.30	0.32			0.30		0.32		0.30		0.32		0.30		0.32		0.30		0.32						0.50		0.62	
AIR CHANGE HEAT LOSS			586				634		640		160		191		803		254								4959			
AIR CHANGE HEAT GAIN			55				93		54		31		6		76		8								53			
DUCT LOSS			0				0		0		0		0		0		0								0			
DUCT GAIN			0				0		0		0		0		0		0								0			
HEAT GAIN PEOPLE	240	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
HEAT GAIN APPLIANCES/LIGHTS			606				606		606		606		606		606		606						606		606			
TOTAL HT LOSS BTU/H			2448				2646		2673		1034		798		3351		1060						1561		11356			
TOTAL HT GAIN x 1.3 BTU/H			2117				3022		2078		1530		137		1828		182						441		1626			

TOTAL HEAT GAIN BTU/H:

28803

TONS: 2.40

LOSS DUE TO VENTILATION LOAD BTU/H: 1670

STRUCTURAL HEAT LOSS: 40245

TOTAL COMBINED HEAT LOSS BTU/H: 41915

Michael O'Rourke

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

FIN BSMT WUB
TYPE: 38-8

DATE: Apr-21

GFA: 2366 LO# 87609

HEATING CFM 970 COOLING CFM 970
TOTAL HEAT LOSS 40,245 TOTAL HEAT GAIN 28,528
AIR FLOW RATE CFM 24.1 AIR FLOW RATE CFM 34

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

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

CITY OF RICHMOND HILL
BUILDING DIVISION
RECEIVED
09/15/2021
Mr. Jocelyn Aquila
**CARRIER
59TN6A-060-14V 60 AFUE = 97 %
FAN SPEED 820 INPUT (BTU/H) = 60,000
LOW 0 OUTPUT (BTU/H) = 58,000
MEDLOW 0
MEDIUM 970 DESIGN CFM = 970
MEDIUM HIGH 0 CFM @ .6" E.S.P.
HIGH 1520 TEMPERATURE RISE 55 °F

RUN COUNT	4th	3rd	2nd	1st	Bas
S/A	0	0	12	7	5
R/A	0	0	5	2	1

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

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

RUN #	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	17	18	19	20	21	22	23	24
ROOM NAME	MBR	ENS	WIC	BED-2	BED-3	BED-4	BATH	BED-2	BED-3	MBR	BATH	FORM	FAM	FAM	KT/BR	LAUN	PWD	FOY	MUD	BAS	BAS	B-BATH	BAS
RM LOSS MBH.	1.38	1.65	0.12	1.32	1.76	1.15	0.45	1.32	1.76	1.38	0.45	2.45	1.32	1.32	2.67	1.03	0.80	3.35	1.06	3.23	3.23	0.58	3.23
CFM PER RUN HEAT	33	40	3	32	43	28	11	32	43	33	11	59	32	32	64	25	19	81	26	78	78	14	78
RM GAIN MBH.	1.87	1.40	0.06	1.83	2.32	1.69	0.18	1.83	2.32	1.87	0.18	2.12	1.51	1.51	2.08	1.53	0.14	1.83	0.18	0.52	0.52	0.02	0.52
CFM PER RUN COOLING	64	48	2	62	79	58	6	62	79	64	6	72	51	51	71	52	5	62	6	18	18	1	18
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	0.17	0.17	0.17	0.17	0.17	0.16	0.17	0.17	0.17	0.17	0.17
ACTUAL DUCT LGH.	39	43	27	67	52	34	42	72	56	46	48	43	32	26	31	69	25	47	12	27	32	36	51
EQUIVALENT LENGTH	130	180	180	200	170	0	180	200	190	140	200	190	140	120	140	220	120	160	120	140	150	130	160
TOTAL EFFECTIVE LENGTH	169	223	207	267	222	34	222	272	246	186	248	233	172	146	171	289	145	207	132	167	182	166	211
ADJUSTED PRESSURE	0.1	0.08	0.08	0.06	0.08	0.51	0.08	0.06	0.07	0.09	0.07	0.07	0.1	0.12	0.1	0.06	0.12	0.08	0.13	0.1	0.09	0.1	0.08
ROUND DUCT SIZE	5	5	4	6	6	6	4	6	6	5	4	6	5	4	5	5	4	6	4	5	5	5	6
HEATING VELOCITY (ft/min)	242	294	34	163	219	143	126	163	219	242	126	301	235	367	470	184	218	413	298	573	573	103	398
COOLING VELOCITY (ft/min)	470	352	23	316	403	296	69	316	403	470	69	367	374	585	521	382	57	316	69	132	132	7	92
OUTLET GRILL SIZE	3X10	3X10	3X10	4X10	4X10	4X10	3X10	4X10	4X10	3X10	3X10	4X10	3X10	3X10	3X10	3X10	3X10	4X10	3X10	3X10	3X10	3X10	4X10
TRUNK	A	D	D	B	C	D	C	B	C	A	C	B	A	A	A	B	D	B	D	A	A	C	B

RUN #	25
ROOM NAME	BAS
RM LOSS MBH.	3.23
CFM PER RUN HEAT	78
RM GAIN MBH.	0.52
CFM PER RUN COOLING	18
ADJUSTED PRESSURE	0.17
ACTUAL DUCT LGH.	25
EQUIVALENT LENGTH	110
TOTAL EFFECTIVE LENGTH	135
ADJUSTED PRESSURE	0.13
ROUND DUCT SIZE	5
HEATING VELOCITY (ft/min)	573
COOLING VELOCITY (ft/min)	132
OUTLET GRILL SIZE	3X10
TRUNK	D

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	350	0.09	9.2	10	x	8	630	TRUNK G	0	0.00	0	0	x	8	0	TRUNK O	0	0.05	0	0	x	8	0				0
TRUNK B	307	0.06	9.7	12	x	8	461	TRUNK H	0	0.00	0	0	x	8	0	TRUNK P	0	0.05	0	0	x	8	0				0
TRUNK C	429	0.06	11	16	x	8	483	TRUNK I	0	0.00	0	0	x	8	0	TRUNK Q	0	0.05	0	0	x	8	0				0
TRUNK D	623	0.06	12.6	20	x	8	561	TRUNK J	0	0.00	0	0	x	8	0	TRUNK R	0	0.05	0	0	x	8	0				0
TRUNK E	973	0.06	14.9	26	x	8	674	TRUNK K	0	0.00	0	0	x	8	0	TRUNK S	0	0.05	0	0	x	8	0				0
TRUNK F	0	0.00	0	0	x	8	0	TRUNK L	0	0.00	0	0	x	8	0	TRUNK T	0	0.05	0	0	x	8	0				0

RETURN AIR #	1	2	3	4	5	6	7											BR								
	0	0	0	0		0	0	0	0	0	0	0	0	0	0	0	BR	TRUNK W	0	0.05	0	0	x	8	0	
AIR VOLUME	85	75	75	95	75	320	85	0	0	0	0	0	0	0	0	160	TRUNK X	970	0.05	15.6	28	x	8	624		
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	TRUNK Y	310	0.05	10.2	12	x	8	465		
ACTUAL DUCT LGH.	40	70	61	39	58	20	42	1	1	1	1	1	1	1	1	14	TRUNK Z	0	0.05	0	0	x	8	0		
EQUIVALENT LENGTH	225	250	245	155	225	175	225	0	0	0	0	0	0	0	0	135	DROP	970	0.05	15.6	24	x	10	582		
TOTAL EFFECTIVE LH	265	320	306	194	283	195	267	1	1	1	1	1	1	1	1	149										
ADJUSTED PRESSURE	0.06	0.05	0.05	0.08	0.05	0.08	0.06	14.80	14.80	14.80	14.80	14.80	14.80	14.80	14.80	0.10										
ROUND DUCT SIZE	6	6	6	5.8	6	9.2	6	0	0	0	0	0	0	0	0	6.7										
INLET GRILL SIZE	8	8	8	8	8	6	8	0	0	0	0	0	0	0	0	8										
	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X										
INLET GRILL SIZE	14	14	14	14	14	24	14	0	0	0	0	0	0	0	0	14										

TYPE: 38-8
SITE NAME: CENTREFIELD (WEST GORMLEY)

LO # 87609
FIN BSMT WUB

RESIDENTIAL MECHANICAL VENTILATION DESIGN SUMMARY

CITY OF RICHMOND HILL

BUILDING DIVISION

09/15/2021

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Per: jocelyn.aguilar

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>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>5</u> @ 10.6 cfm <u>53.0</u> cfm	
Table 9.32.3.A.	TOTAL <u>180.2</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>180.2</u> cfm	
Less Principal Ventil. Capacity	<u>79.5</u> cfm	
Required Supplemental Capacity	<u>100.7</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
B-BATH	BY INSTALLING CONTRACTOR	50	☒	3.5
PWD	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 #	001820
Date:	April-21

CITY OF RICHMOND HILL
BUILDING DIVISION

09/15/2021

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jodelyngular

CSA F280-12 Residential Heat Loss and Heat Gain Calculations																																																												
Formula Sheet (For Air Leakage / Ventilation Calculation)																																																												
LO#: 87609	Model: 38-8	Builder: ROYAL PINE HOMES	Date: 4/19/2021																																																									
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																																																									
$HL_{airb} = LR_{airh} \times \frac{V_b}{3.6} \times DTD_h \times 1.2$ 0.227 x 258.47 x 43 °C x 1.2 = 3037 W = 10362 Btu/h			$HG_{salb} = LR_{airc} \times \frac{V_b}{3.6} \times DTD_c \times 1.2$ = 0.071 x 258.47 x 7 °C x 1.2 = 156 W = 532 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>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" style="text-align: center; vertical-align: middle;">10,362</td> <td>8,317</td> <td>0.623</td> </tr> <tr> <td>2</td> <td>0.3</td> <td>9,868</td> <td>0.315</td> </tr> <tr> <td>3</td> <td>0.2</td> <td>11,296</td> <td>0.183</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	10,362	8,317	0.623	2	0.3	9,868	0.315	3	0.2	11,296	0.183	4	0	0	0.000	5	0	0	0.000																														
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HEAT LOSS AND GAIN SUMMARY SHEET

MODEL: 38-8	FIN BSMT WUB	BUILDER: ROYAL PINE HOMES HILL
SFQT: 2366	LO# 87609	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

09/15/2021

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Per: jocelyn.aguiar

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):	32860.2	ASSUMED (Y/N):	Y
INTERNAL SHADING:	BLINDS/CURTAINS	ASSUMED OCCUPANTS:	5
INTERIOR LIGHTING LOAD (Btu/h/ft²):	1.60	DC BRUSHLESS MOTOR (Y/N):	Y
FOUNDATION CONFIGURATION	BCIN_1	DEPTH BELOW GRADE:	7.0 ft
LENGTH: 48.0 ft	WIDTH: 31.0 ft	EXPOSED PERIMETER:	137.0 ft

2012 OBC - COMPLIANCE PACKAGE

Component

Compliance Package SB-12 PERFORMANCE

Nominal Min. Eff.

Ceiling with Attic Space Minimum RSI (R)-Value	60	59.20
Ceiling Without Attic Space Minimum RSI (R)-Value	31	27.70
Exposed Floor Minimum RSI (R)-Value	31	29.80
Walls Above Grade Minimum RSI (R)-Value	22+1.5	18.50
Basement Walls Minimum RSI (R)-Value	20	21.12
Below Grade Slab Entire surface > 600 mm below grade Minimum RSI (R)-Value	-	-
Edge of Below Grade Slab ≤ 600 mm Below Grade Minimum RSI (R)-Value	10	10
Heated Slab or Slab ≤ 600 mm below grade Minimum RSI (R)-Value	10	11.13
Windows and Sliding Glass Doors Maximum U-Value	1.6	-
Skylights Maximum U-Value	2.6	-
Space Heating Equipment Minimum AFUE	0.96	-
HRV Minimum Efficiency	75%	-
Domestic Hot Water Heater Minimum EF	TE=94%	-

INDIVIDUAL BCIN: 19669

MICHAEL O'ROURKE

Michael O'Rourke

CITY OF RICHMOND HILL
BUILDING DIVISION

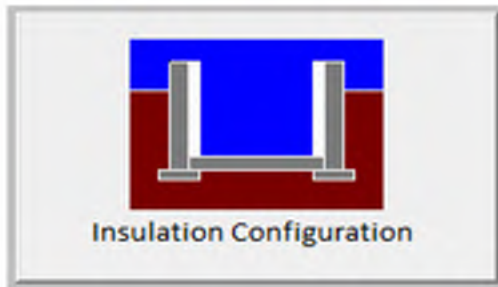
09/16/2021

RECEIVED

Per: jocelyn.aguiar

Residential Foundation Thermal Load Calculator

Supplemental tool for CAN/CSA-F280

Weather Station Description		
Province:	Ontario	
Region:	Richmond Hill	
Site Description		
Soil Conductivity:	Normal conductivity: dry sand, loam, clay	
Water Table:	Normal (7-10 m, 23-33 ft)	
Foundation Dimensions		
Floor Length (m):	14.6	 Insulation Configuration
Floor Width (m):	9.4	
Exposed Perimeter (m):	41.8	
Wall Height (m):	3.0	
Depth Below Grade (m):	2.13	
Window Area (m ²):	1.1	
Door Area (m ²):	3.7	
Radiant Slab		
Heated Fraction of the Slab:	0	
Fluid Temperature (°C):	33	
Design Months		
Heating Month	1	
Foundation Loads		
Heating Load (Watts):		1327

TYPE: 38-8
LO# 87609

FIN BSMT WUB

CITY OF RICHMOND HILL
BUILDING DIVISION

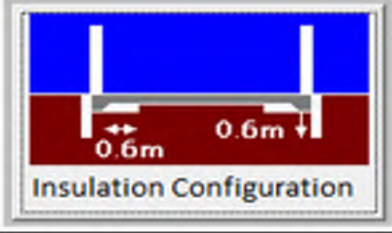
09/15/2021

RECEIVED

Building Department

Residential Slab on Grade 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		
Length (m):	0.6	
Width (m):	5.8	
Exposed Perimeter (m):	6.4	
Radiant Slab		
Heated Fraction of the Slab:	0	
Fluid Temperature (°C):	33	
Design Months		
Heating Month	1	
Results		
Heating Load (Watts):		56

TYPE: 38-8
LO# 87609

FIN BSMT WUB

CITY OF RICHMOND HILL
BUILDING DIVISION

09/15/2021

RECEIVED

Per: jocelyn.aguilar

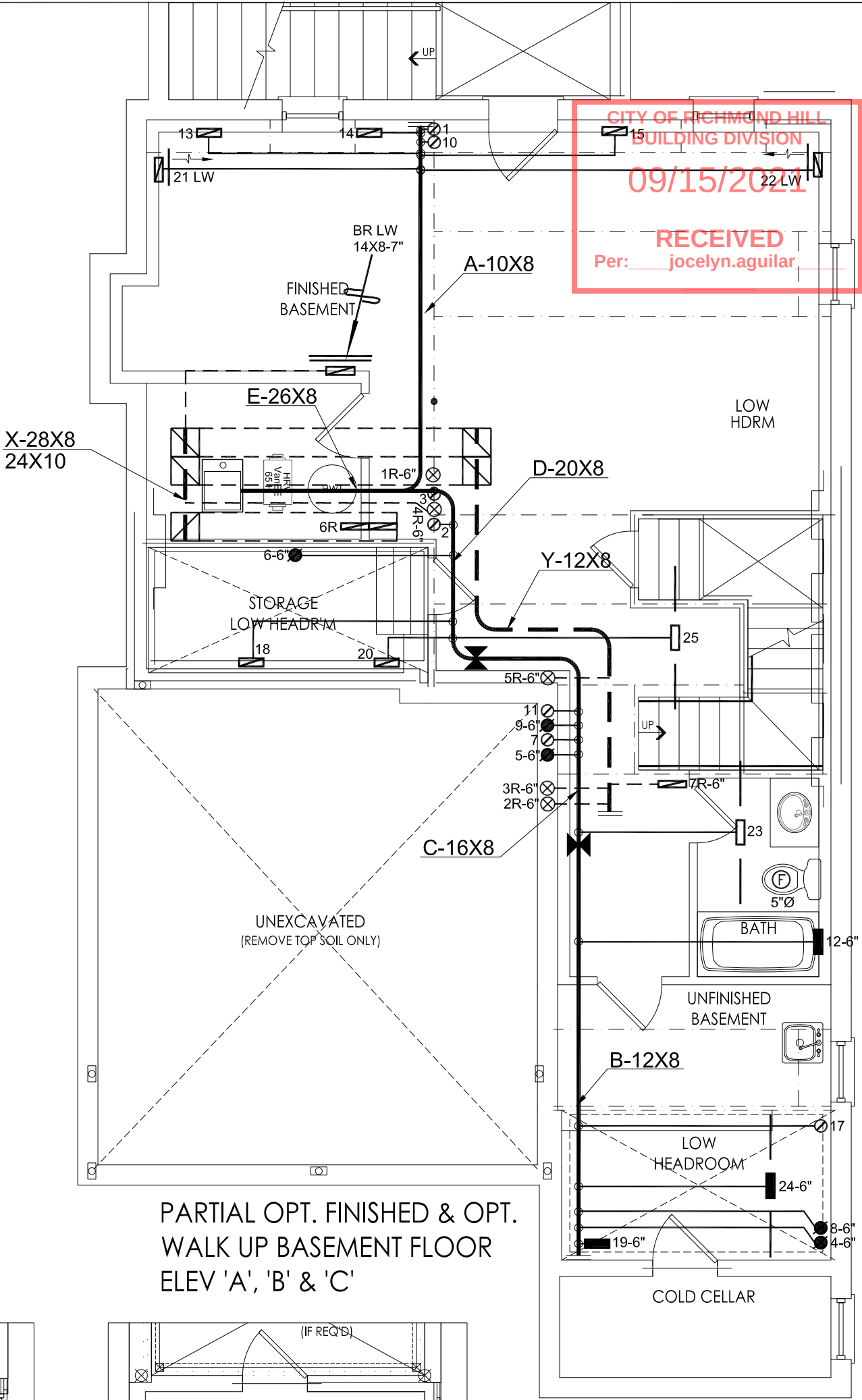
Air Infiltration Residential Load Calculator

Supplemental tool for CAN/CSA-F280

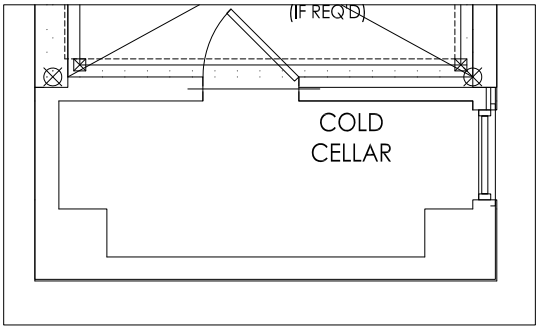
Weather Station Description				
Province:	Ontario			
Region:	Richmond Hill			
Weather Station Location:	Open flat terrain, grass			
Anemometer height (m):	10			
Local Shielding				
Building Site:	Suburban, forest			
Walls:	Heavy			
Flue:	Heavy			
Highest Ceiling Height (m):	6.74			
Building Configuration				
Type:	Detached			
Number of Stories:	Two			
Foundation:	Full			
House Volume (m ³):	930.5			
Air Leakage/Ventilation				
Air Tightness Type:	Energy Star Detached (2.5 ACH)			
Custom BDT Data:	ELA @ 10 Pa.		868.6 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):	0.227			
Cooling Air Leakage Rate (ACH/H):	0.071			

TYPE: 38-8
LO# 87609

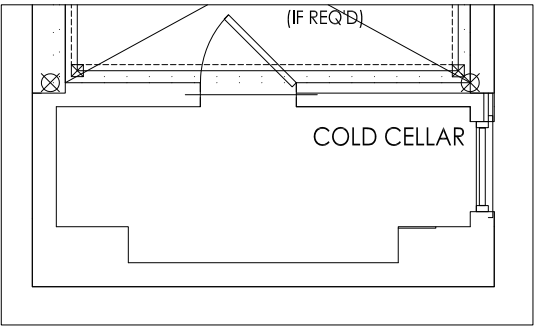
FIN BSMT WUB



PARTIAL OPT. FINISHED & OPT.
WALK UP BASEMENT FLOOR
ELEV 'A', 'B' & 'C'



BASEMENT FLOOR PLAN ELEV. 'B'



BASEMENT FLOOR PLAN ELEV. 'C'

WUB

CSA-F280-12

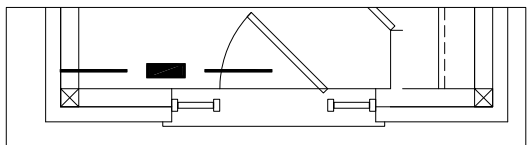
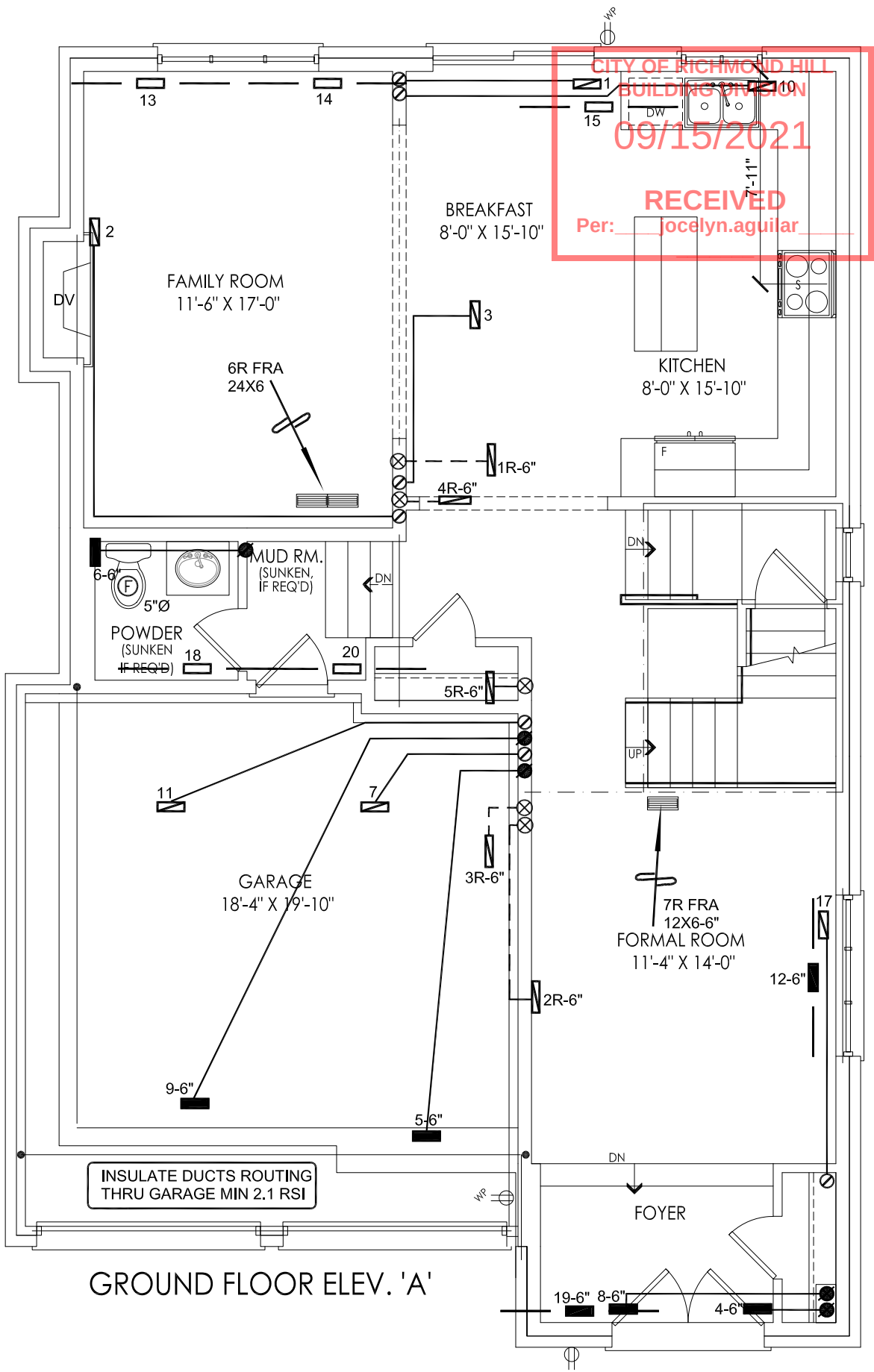
SB-12 PERFORMANCE

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

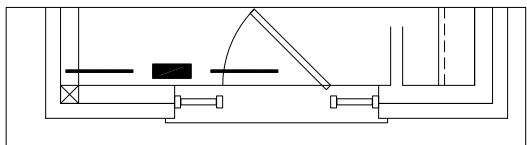
HVAC LEGEND								3.		
SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	2.	REVISED AS PER ARCHITECTURALS	APR/2021
	SUPPLY AIR GRILLE		6" SUPPLY AIR BOOT ABOVE		14"x8" RETURN AIR GRILLE		RETURN AIR STACK ABOVE	1.	REVISED TO PERFORMANCE	SEPT/2020
	SUPPLY AIR GRILLE 6" BOOT		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		

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 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	HEAT LOSS 41915 BTU/H UNIT DATA MAKE CARRIER MODEL 59TN6A-060-14V INPUT 60 MBTU/H OUTPUT 58 MBTU/H COOLING 2.5 TONS FAN SPEED 970 cfm @ 0.6" w.c.	# OF RUNS S/A R/A FANS 3RD FLOOR 2ND FLOOR 12 5 3 1ST FLOOR 7 2 2 BASEMENT 5 1 1	Sheet Title BASEMENT HEATING LAYOUT Date SEPT/2020 Scale 3/16" = 1'-0" BCIN# 19669 LO# 87609
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.	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		
FIN BSMT WUB 38-8	2366 sqft			



GROUND FLOOR PLAN ELEV. 'B'



GROUND FLOOR PLAN ELEV. 'C'

WUB

CSA-F280-12

SB-12 PERFORMANCE

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, BCIN# 19669
HVAC DESIGNS LTD.

HVAC LEGEND								3.		
SYMBOL	DESCRIPTION	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		RETURN AIR STACK ABOVE	1.	REVISED TO PERFORMANCE	SEPT/2020
	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 CENTREFIELD (WEST GORMLEY) RICHMOND HILL, ONTARIO			Date	SEPT/2020
FIN BSMT WUB 38-8			Scale	3/16" = 1'-0"
2366 sqft			BCIN# 19669	
		LO#	87609	

Schedule 1: Designer Information

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

CITY OF RICHMOND HILL
BUILDING DIVISION

09/15/2021

RECEIVED

Per: jocelyn.aguilar

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: 38-8 ASHTON OPT MAIN & OPT 2ND 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.			
April 19, 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.

[illegible]

TOTAL HEAT GAIN BTU/H:	28178	TONS: 2.43	LOSS DUE TO VENTILATION LOAD BTU/H: 1670
------------------------	-------	------------	--

INDIVIDUAL BCIN: 19669
MICHAEL O'HOURKE

SITE NAME: CENTREFIELD (WEST GORMLEY)
BUILDER: ROYAL PINE HOMESOPT MAIN & OPT 2ND
TYPE: 3B-8

DATE: Apr-21

GFA: 2389 LO# 90456

HEATING CFM 970 COOLING CFM 970
TOTAL HEAT LOSS 40,064 TOTAL HEAT GAIN 28,903
AIR FLOW RATE CFM 24.21 AIR FLOW RATE CFM 33.56

50TNSA-060-14V 50

FAN SPEED

AFUE = 97 %

INPUT (BTU/H) = 60,000

OUTPUT (BTU/H) = 58,000

RUN COUNT	4th	3rd	2nd	1st	Bas
S/A	0	0	12	7	4
R/A	0	0	5	2	1

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

All S/A fans 5"Ø unless noted otherwise on layout.

ROOM NAME	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
MBR	1.38	1.66	0.12	1.32	1.77	1.15	0.45	1.32	1.77	1.38	0.45	2.45	1.32	1.32	2.67		1.04	0.99	3.35	1.06	3.27	3.27	3.27	3.27
RM LOSS MBH	33	40	3	32	43	28	11	32	43	33	11	59	32	32	65		25	24	81	26	79	79	79	79
CFM PER RUN HEAT	1.90	1.40	0.06	1.86	2.35	1.75	0.18	1.86	2.35	1.90	0.18	2.18	1.54	1.54	2.14		0.74	1.03	1.83	0.18	0.48	0.48	0.48	0.48
RM GAIN MBH	64	47	2	62	79	59	6	62	79	64	6	73	52	52	72		25	35	61	6	15	16	16	16
CFM PER RUN COOLING	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17		0.17	0.17	0.16	0.17	0.17	0.17	0.17	0.17
ADJUSTED PRESSURE	130	180	180	200	170	0	180	200	190	140	200	190	140	120	140		220	130	160	130	140	150	130	170
EQUIVALENT LENGTH	169	223	207	267	222	34	222	272	246	186	248	233	172	146	171		289	145	207	132	167	182	165	221
TOTAL EFFECTIVE LENGTH	5	5	4	6	6	6	4	6	6	5	5	5	5	5	5		4	4	6	4	5	5	5	6
ADJUSTED PRESSURE	242	294	34	163	219	143	126	163	219	242	301	325	382	382	529		287	275	413	298	580	580	403	403
ROUND DUCT SIZE	470	345	23	316	403	301	69	316	403	470	316	372	382	382	529		287	402	311	69	117	117	117	82
HEATING VELOCITY (ft/min)	3X10	3X10	3X10	3X10	4X10	4X10	3X10	3X10	4X10	3X10	3X10	4X10	4X10	3X10	3X10		3X10	3X10	4X10	3X10	3X10	3X10	3X10	4X10
COOLING VELOCITY (ft/min)																								
OUTLET GRILL SIZE																								
TRUNK	A	D	D	B	C	D	C	B	C	A	C	B	A	A	A		B	D	B	D	A	A	C	B

RUN #

ROOM NAME

RM LOSS MBH

CFM PER RUN HEAT

RM GAIN MBH

CFM PER RUN COOLING

ADJUSTED PRESSURE

EQUIVALENT LENGTH

ADJUSTED PRESSURE

ROUND DUCT SIZE

HEATING VELOCITY (ft/min)

COOLING VELOCITY (ft/min)

OUTLET GRILL SIZE

TRUNK

SUPPLY AIR TRUNK SIZE

CITY OF RICHMOND BUILDING DIVISION																	
09/15/2021																	
RECEIVED																	
Mr. Joseph Ng																	
RETURN AIR TRUNK SIZE	TRUNK	STATIC PRESS.	ROUND DUCT	RECT DUCT	VELOCITY (ft/min)	TRUNK	CFM	STATIC PRESS.	ROUND DUCT	RECT DUCT	VELOCITY (ft/min)	TRUNK	CFM	STATIC PRESS.	ROUND DUCT	RECT DUCT	VELOCITY (ft/min)
TRUNK A	353	0.09	9.2	10	635	8	X	0.00	0	0	X	TRUNK D	0	0.05	0	0	0
TRUNK B	308	0.06	9.7	12	482	8	X	0.00	0	0	X	TRUNK P	0	0.05	0	0	0
TRUNK C	495	0.06	11.6	16	557	8	X	0.00	0	0	X	TRUNK Q	0	0.05	0	0	0
TRUNK D	616	0.06	12.6	20	554	8	X	0.00	0	0	X	TRUNK R	0	0.05	0	0	0
TRUNK E	969	0.06	14.9	26	671	8	X	0.00	0	0	X	TRUNK S	0	0.05	0	0	0
TRUNK F	0	0.00	0	0	0	8	X	0.00	0	0	X	TRUNK T	0	0.05	0	0	0
												TRUNK U	0	0.05	0	0	0
												TRUNK V	0	0.05	0	0	0
												TRUNK W	0	0.05	0	0	0
												TRUNK X	970	0.05	15.6	12	624
												TRUNK Y	310	0.05	10.2	18	465
												TRUNK Z	0	0.05	0	0	0
												DROP	970	0.05	15.6	24	582
RETURN AIR #	1	2	3	4	5	6	7					BR					
AIR VOLUME	85	75	75	100	75	320	85	0	0	0	0	0	0	0	0	0	155
PLENUM PRESSURE	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15
ACTUAL DUCT LGH.	40	70	61	39	58	20	42	1	1	1	1	1	1	1	1	1	14
EQUIVALENT LENGTH	225	250	245	155	225	175	225	0	0	0	0	0	0	0	0	0	136
TOTAL EFFECTIVE LH	285	320	306	194	283	195	267	1	1	1	1	1	1	1	1	1	149
ADJUSTED PRESSURE	0.06	0.05	0.05	0.08	0.05	0.08	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.10
ROUND DUCT SIZE	6	6	6	8	6	9.2	6	0	0	0	0	0	0	0	0	0	6.6
INLET GRILL SIZE	8	8	8	8	8	8	8	0	0	0	0	0	0	0	0	0	8
INLET GRILL SIZE	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
INLET GRILL SIZE	14	14	14	14	14	30	14	0	0	0	0	0	0	0	0	0	14

CITY OF BROMFIELD
BUILDING DIVISION
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Per: [Signature]

TYPE: 38-8
SITE NAME: CENTREFIELD (WEST GORMLEY)

LO # 90456

OPT MAIN & OPT 2ND

RESIDENTIAL MECHANICAL VENTILATION DESIGN SUMMARY
**CITY OF RICHMOND HILL
BUILDING DIVISION**
09/15/2021
RECEIVED

Per: **jocelyn.aguilar**

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	4	@ 10.6 cfm	42.4	cfm
Table 9.32.3.A	TOTAL			169.6 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	169.6 cfm
Less Principal Ventil. Capacity	79.5 cfm
Required Supplemental Capacity	90.1 cfm

PRINCIPAL EXHAUST FAN CAPACITY			
Model:	VANEE 65H		
Location:	BSMT		
79.5 cfm	☒ HVI Approved		
PRINCIPAL EXHAUST HEAT LOSS CALCULATION			
CFM	ΔT °F	FACTOR	% LOSS
79.5 CFM	X 78 F	X 1.08	X 0.25

SUPPLEMENTAL FANS BY INSTALLING CONTRACTOR				
Location	Model	cfm	HVI	Sones
ENS	BY INSTALLING CONTRACTOR	50	☒	3.5
BATH	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:	April-21

CSA F280-12 Residential Heat Loss and Heat Gain Calculations																																																																						
Formula Sheet (For Air Leakage / Ventilation Calculation)																																																																						
LO#: 90456	Model: 38-8	Builder: ROYAL PINE HOMES	Date: 4/19/2021																																																																			
Volume Calculation		Air Change & Delta T Data																																																																				
House Volume <table border="1" style="width:100%; border-collapse: collapse;"> <tr> <th>Level</th> <th>Floor Area (ft²)</th> <th>Floor Height (ft)</th> <th>Volume (ft³)</th> </tr> <tr> <td>Bsmt</td> <td>1065</td> <td>10</td> <td>10650</td> </tr> <tr> <td>First</td> <td>1065</td> <td>10</td> <td>10756.5</td> </tr> <tr> <td>Second</td> <td>1324</td> <td>9</td> <td>11916</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>Total:</td> <td></td> <td></td> <td>33,322.5 ft³</td> </tr> <tr> <td>Total:</td> <td></td> <td></td> <td>943.6 m³</td> </tr> </table>	Level	Floor Area (ft²)	Floor Height (ft)	Volume (ft³)	Bsmt	1065	10	10650	First	1065	10	10756.5	Second	1324	9	11916	Third	0	9	0	Fourth	0	9	0	Total:			33,322.5 ft³	Total:			943.6 m³	<table border="1" style="width:100%; border-collapse: collapse;"> <tr> <th colspan="4">WINTER NATURAL AIR CHANGE RATE</th> </tr> <tr> <td></td> <td></td> <td></td> <td>0.227</td> </tr> <tr> <th colspan="4">SUMMER NATURAL AIR CHANGE RATE</th> </tr> <tr> <td></td> <td></td> <td></td> <td>0.071</td> </tr> </table>	WINTER NATURAL AIR CHANGE RATE							0.227	SUMMER NATURAL AIR CHANGE RATE							0.071	<table border="1" style="width:100%; border-collapse: collapse;"> <tr> <th colspan="4">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 DTDh</td> <td>22</td> <td>-21</td> <td>43</td> <td>78</td> </tr> <tr> <td>Summer DTDc</td> <td>24</td> <td>31</td> <td>7</td> <td>13</td> </tr> </table>	Design Temperature Difference					T _{in} °C	T _{out} °C	ΔT °C	ΔT °F	Winter DTDh	22	-21	43	78	Summer DTDc	24	31	7	13	6.2.6 Sensible Gain due to Air Leakage $HG_{sarb} = LR_{airb} \times \frac{V_b}{3.6} \times DTD_c \times 1.2$ = 0.071 x 262.11 x 7 °C x 1.2 = 158 W 6.2.7 Sensible heat Gain due to Ventilation $HL_{vaib} = PVC \times DTD_h \times 1.08 \times (1 - E)$ 80 CFM x 13 °F x 1.08 x 0.25 = 275 Btu/h
Level	Floor Area (ft²)	Floor Height (ft)	Volume (ft³)																																																																			
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5.2.3.1 Heat Loss due to Air Leakage $HL_{airb} = LR_{airb} \times \frac{V_b}{3.6} \times DTD_h \times 1.2$ 0.227 x 262.11 x 43 °C x 1.2 = 3080 W = 10508 Btu/h		5.2.3.2 Heat Loss due to Mechanical Ventilation $HL_{vaib} = PVC \times DTD_h \times 1.08 \times (1 - E)$ 80 CFM x 78 °F x 1.08 x 0.25 = 1670 Btu/h																																																																				
5.2.3.3 Calculation of Air Change Heat Loss for Each Room (Floor Multiplier Section)																																																																						
$HL_{airr} = Level Factor \times HL_{airbv} \times \{ (HL_{agcr} + HL_{lgr}) \div (HL_{aglevel} + HL_{bglevel}) \}$ <table border="1" style="width:100%; border-collapse: collapse;"> <thead> <tr> <th>Level</th> <th>Level Factor (LF)</th> <th>HL_{airbv} Air Leakage + Ventilation Heat Loss (Btu/h)</th> <th>Level Conductive Heat Loss: (HL_{level})</th> <th>Air Leakage Heat Loss Multiplier (LF x HL_{airbv} / HL_{level})</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>0.5</td> <td rowspan="4">10,508</td> <td>7,840</td> <td>0.670</td> </tr> <tr> <td>2</td> <td>0.3</td> <td>10,016</td> <td>0.315</td> </tr> <tr> <td>3</td> <td>0.2</td> <td>11,296</td> <td>0.186</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></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_{airbv} = 0				Level	Level Factor (LF)	HL _{airbv} Air Leakage + Ventilation Heat Loss (Btu/h)	Level Conductive Heat Loss: (HL _{level})	Air Leakage Heat Loss Multiplier (LF x HL _{airbv} / HL _{level})	1	0.5	10,508	7,840	0.670	2	0.3	10,016	0.315	3	0.2	11,296	0.186	4	0	0	0.000	5	0		0	0.000																																								
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 CITY OF RICHMOND HILL
 BUILDING DIVISION

09/15/2021

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Per: jocelyn.aguilar

HEAT LOSS AND GAIN SUMMARY SHEET

MODEL: 38-8	OPT MAIN & OPT 2ND	BUILDER: ROYAL PINE HOMES HILL
SFQT: 2389	LO# 90456	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

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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):	33322.5	ASSUMED (Y/N):	Y
INTERNAL SHADING:	BLINDS/CURTAINS	ASSUMED OCCUPANTS:	5
INTERIOR LIGHTING LOAD (Btu/h/ft²):	1.70	DC BRUSHLESS MOTOR (Y/N):	Y
FOUNDATION CONFIGURATION	BCIN_1	DEPTH BELOW GRADE:	7.0 ft
LENGTH: 48.0 ft	WIDTH: 31.0 ft	EXPOSED PERIMETER:	158.0 ft

2012 OBC - COMPLIANCE PACKAGE

Component	Compliance Package SB-12 PERFORMANCE	
	Nominal	Min. Eff.
Ceiling with Attic Space Minimum RSI (R)-Value	60	59.20
Ceiling Without Attic Space Minimum RSI (R)-Value	31	27.70
Exposed Floor Minimum RSI (R)-Value	31	29.80
Walls Above Grade Minimum RSI (R)-Value	22+1.5	18.50
Basement Walls Minimum RSI (R)-Value	20	21.12
Below Grade Slab Entire surface > 600 mm below grade Minimum RSI (R)-Value	-	-
Edge of Below Grade Slab ≤ 600 mm Below Grade Minimum RSI (R)-Value	10	10
Heated Slab or Slab ≤ 600 mm below grade Minimum RSI (R)-Value	10	11.13
Windows and Sliding Glass Doors Maximum U-Value	1.6	-
Skylights Maximum U-Value	2.6	-
Space Heating Equipment Minimum AFUE	0.96	-
HRV Minimum Efficiency	75%	-
Domestic Hot Water Heater Minimum EF	TE=94%	-

INDIVIDUAL BCIN: 19669

MICHAEL O'ROURKE



CITY OF RICHMOND HILL
BUILDING DIVISION

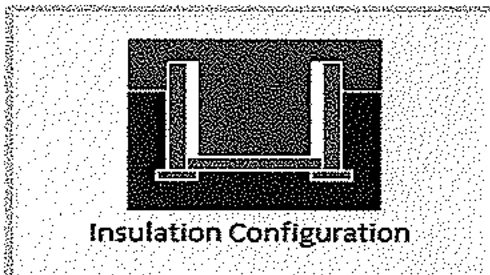
09/15/2021

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Per: _____ jocelyn.aguiar

Residential Foundation Thermal Load Calculator

Supplemental tool for CAN/CSA-F280

Weather Station Description		
Province:	Ontario	
Region:	Richmond Hill	
Site Description		
Soil Conductivity:	Normal conductivity: dry sand, loam, clay	
Water Table:	Normal (7-10 m, 23-33 ft)	
Foundation Dimensions		
Floor Length (m):	14.6	 Insulation Configuration
Floor Width (m):	9.4	
Exposed Perimeter (m):	0.0	
Wall Height (m):	3.0	
Depth Below Grade (m):	2.13	
Window Area (m ²):	1.1	
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):		1558

CITY OF RICHMOND HILL
BUILDING DIVISION

09/15/2021

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Per: jocelyn.aguilar

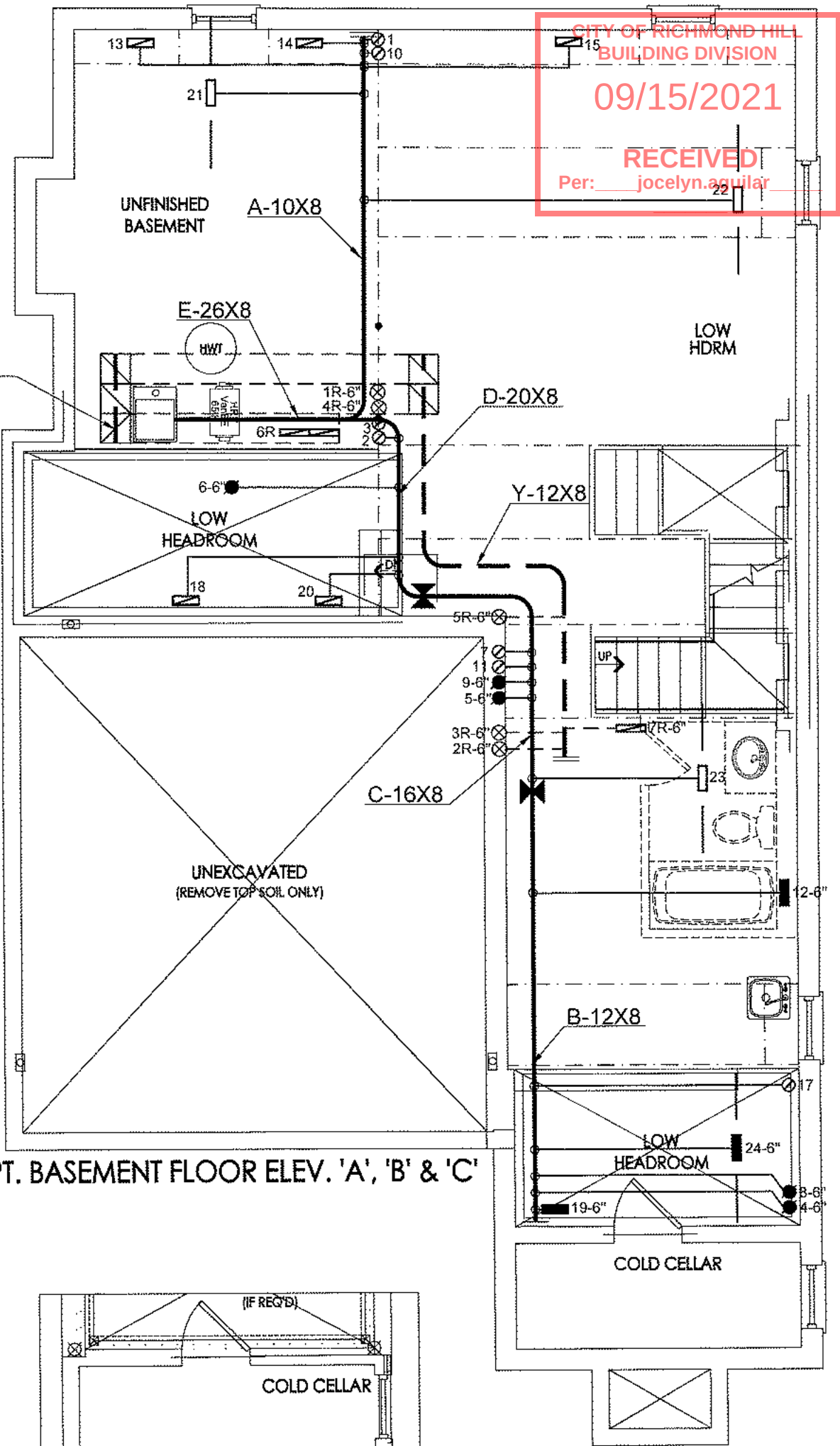
Air Infiltration Residential Load Calculator

Supplemental tool for CAN/CSA-F280

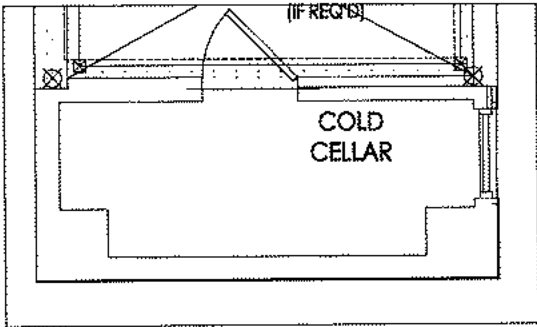
Weather Station Description			
Province:	Ontario		
Region:	Richmond Hill		
Weather Station Location:	Open flat terrain, grass		
Anemometer height (m):	10		
Local Shielding			
Building Site:	Suburban, forest		
Walls:	Heavy		
Flue:	Heavy		
Highest Ceiling Height (m):	6.74		
Building Configuration			
Type:	Detached		
Number of Stories:	Two		
Foundation:	Full		
House Volume (m ³):	943.6		
Air Leakage/Ventilation			
Air Tightness Type:	Energy Star Detached (2.5 ACH)		
Custom BDT Data:	ELA @ 10 Pa.	880.8 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
Diameter (mm):	0	0	0
Natural Infiltration Rates			
Heating Air Leakage Rate (ACH/H):	0.227		
Cooling Air Leakage Rate (ACH/H):	0.071		

TYPE: 38-8
LO# 90456

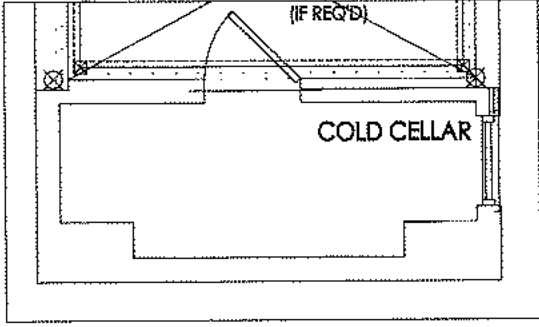
OPT MAIN & OPT 2ND



OPT. BASEMENT FLOOR ELEV. 'A', 'B' & 'C'



BASEMENT FLOOR PLAN ELEV. 'B'



BASEMENT FLOOR PLAN ELEV. 'C'

1 MICHAEL O'Rourke: I HAVE REVIEWED AND TAKE RESPONSIBILITY FOR THE DESIGN WORK AND AM QUALIFIED UNDER DIVISION C, 12.5 OF THE BUILDING CODE.
Michael O'Rourke
Michael O'Rourke, License 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
	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
						REVISIONS	
						No.	Description
						Date	

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Client
ROYAL PINE HOMES

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

**OPT MAIN & OPT 2ND
38-8 2389 sqft**

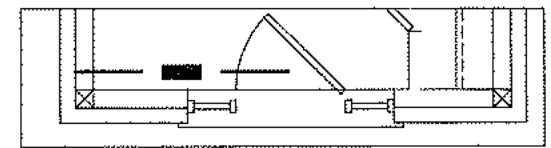
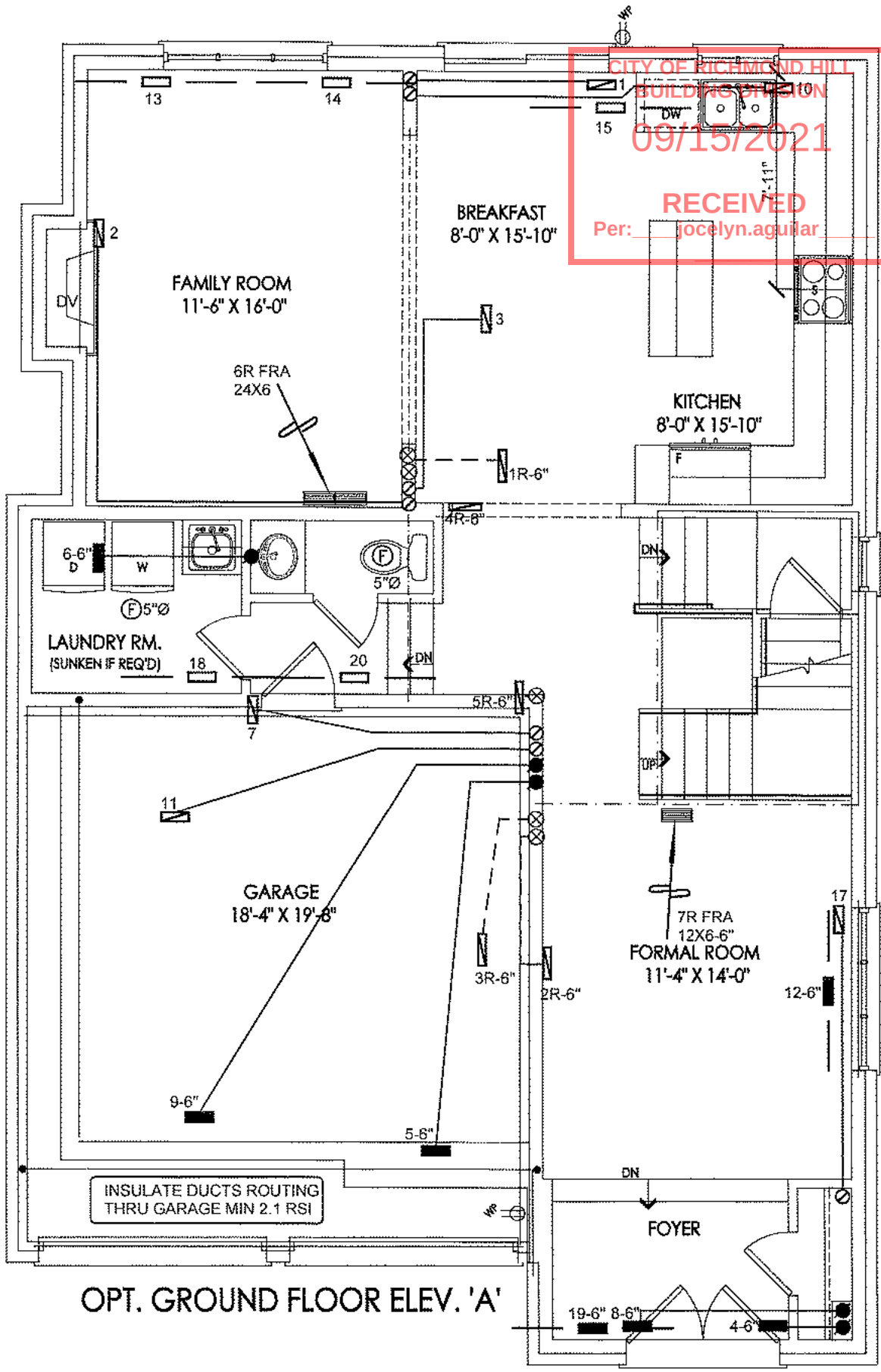
HVACDESIGNS LTD.

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

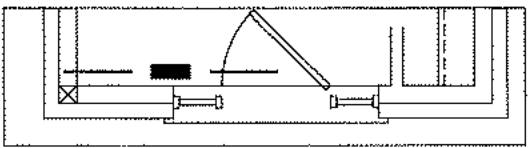
Installation to comply with the latest Ontario Building Code. All supply branch outlets shall be equipped with a manual balancing damper. Ductwork which passes through the garage or unheated spaces shall be adequately insulated and be gas-proofed.

HEAT LOSS 41587 BTU/H UNIT DATA		# OF RUNS S/A R/A FANS			
MAKE	CARRIER	3RD FLOOR			
MODEL	59TN6A-060-14V	2ND FLOOR	12	5	3
INPUT	60 MBTU/H	1ST FLOOR	7	2	3
OUTPUT	58 MBTU/H	BASEMENT	4	1	0
COOLING	2.5 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			
FAN SPEED	970 cfm @ 0.6" w.c.				

Sheet Title	
BASEMENT HEATING LAYOUT	
Date	APR/2021
Scale	3/16" = 1'-0"
BCIN# 19669	
LO#	90456



GROUND FLOOR PLAN ELEV. 'B'



GROUND FLOOR PLAN ELEV. 'C'

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

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

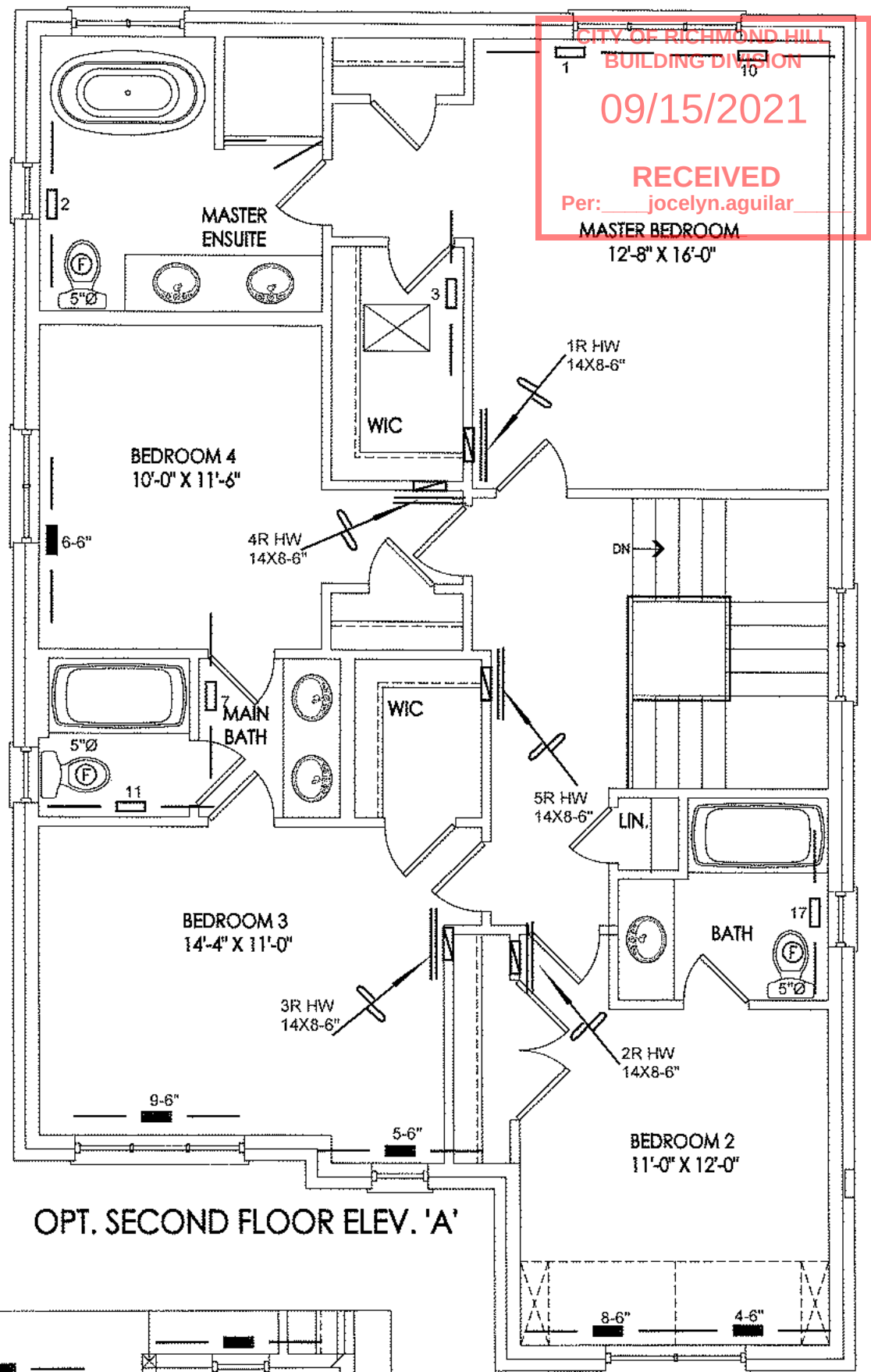
CSA-F280-12

SB-12 PERFORMANCE

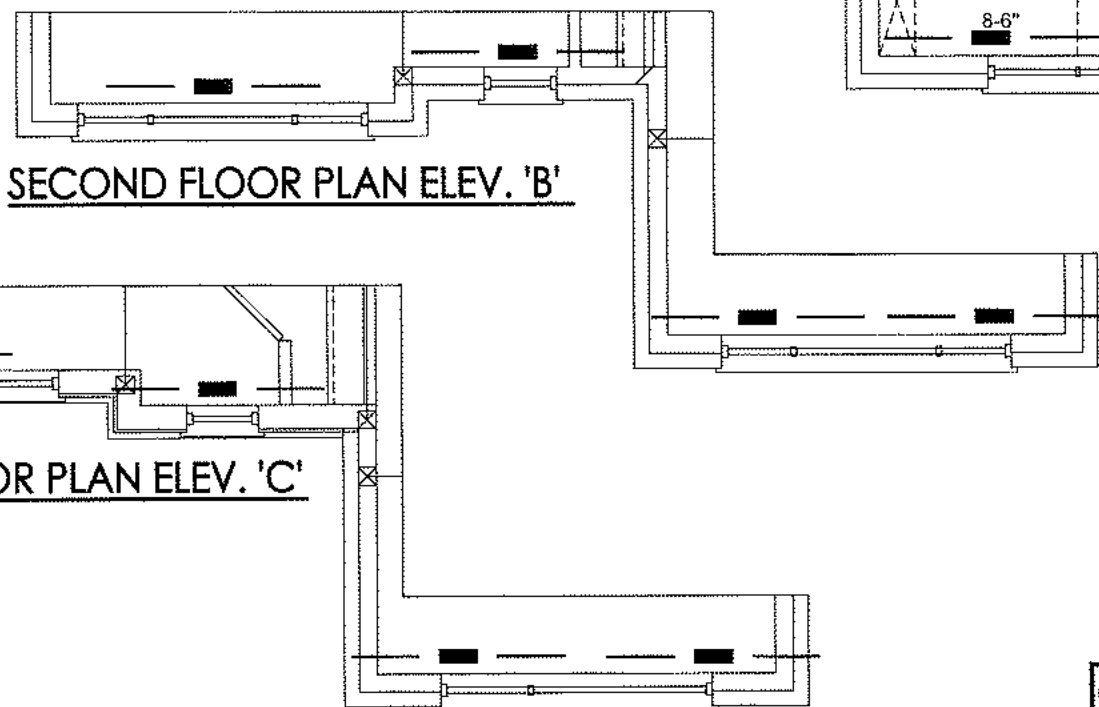
HVAC LEGEND						3.		
SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	
	SUPPLY AIR GRILLE		6" SUPPLY AIR BOOT ABOVE		14"x8" RETURN AIR GRILLE		RETURN AIR STACK ABOVE	2.
	SUPPLY AIR GRILLE 6" BOOT		SUPPLY AIR STACK FROM 2nd FLOOR		30"x8" RETURN AIR GRILLE		RETURN AIR STACK 2nd FLOOR	1.
	SUPPLY AIR BOOT ABOVE		6" SUPPLY AIR STACK 2nd FLOOR		FRA- FLOOR RETURN AIR GRILLE		REDUCER	No.
REVISIONS								Date

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 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	Sheet Title FIRST FLOOR HEATING LAYOUT	
Project Name CENTREFIELD (WEST GORMLEY) RICHMOND HILL, ONTARIO			Date APR/2021	Scale 3/16" = 1'-0"
OPT MAIN & OPT 2ND 38-8 2389 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.	BCIN# 19669	
			LO#	90456



OPT. SECOND FLOOR ELEV. 'A'



SECOND FLOOR PLAN ELEV. 'B'

SECOND FLOOR PLAN ELEV. 'C'

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						REVISIONS	
SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	No.	Date
	SUPPLY AIR GRILLE		6" SUPPLY AIR BOOT ABOVE		14"x8" RETURN AIR GRILLE	3.	
	SUPPLY AIR GRILLE 6" BOOT		SUPPLY AIR STACK FROM 2nd FLOOR		30"x8" RETURN AIR GRILLE	2.	
	SUPPLY AIR BOOT ABOVE		6" SUPPLY AIR STACK 2nd FLOOR		FRA- FLOOR RETURN AIR GRILLE	1.	
					REDUCER	No.	Description

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 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 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 SECOND FLOOR HEATING LAYOUT	
Project Name CENTREFIELD (WEST GORMLEY) RICHMOND HILL, ONTARIO			Date APR/2021	Scale 3/16" = 1'-0"
OPT MAIN & OPT 2ND 38-8 2389 sqft			BCIN# 19669	
			LO#	90456

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: 38-8 Ashton 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.			
April 19, 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

SITE NAME: CENTREFIELD (WEST GORMLEY)

BUILDER: ROYAL PINE HOMES

TYPE: 38-8

GFA: 2366

DATE: Apr-21
LO# 87608

WINTER NATURAL AIR CHANGE RATE 0.227
SUMMER NATURAL AIR CHANGE RATE 0.071

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				
			36	21	0	34	29	12	6				
			9	9	9	9	9	9	9				
FACTORS													
GRS.WALL AREA	LOSS	GAIN	324	189	0	306	261	108	54				
GLAZING	LOSS	GAIN	LOSS	GAIN	LOSS	GAIN	LOSS	GAIN	LOSS	GAIN			
NORTH	21.8	16.0	0	0	0	8	174	128	0	0	0	7	152
EAST	21.8	41.6	26	566	1080	17	370	706	0	0	0	0	0
SOUTH	21.8	24.9	11	240	274	0	0	0	0	0	0	0	0
WEST	21.8	41.6	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
DOORS	25.8	4.3	0	0	0	0	0	0	0	0	0	0	0
NET EXPOSED WALL	4.2	0.7	287	1207	199	164	690	113	0	0	0	47	198
NET EXPOSED BSMT WALL ABOVE GR	3.7	0.6	0	0	0	0	0	0	0	0	0	0	0
EXPOSED CLG	1.3	0.6	241	317	142	123	162	72	75	99	44	105	138
NO ATTIC EXPOSED CLG	2.8	1.3	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	75	196
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			2330		1396	99	2234	2711	970	684			
SUB TOTAL HT GAIN				1694	1020	44	1856	2269	432	238			
LEVEL FACTOR / MULTIPLIER	0.20	0.18			0.20	0.18		0.20	0.18		0.20	0.18	
AIR CHANGE HEAT LOSS			427		256	18	410	497	178	125			
AIR CHANGE HEAT GAIN				98	59	3	107	131	25	14			
DUCT LOSS			0		0		0	321		81			
DUCT GAIN			0		0		0	325		25			
HEAT GAIN PEOPLE	240	2	480	0	0	0	1	240	1	240	0		
HEAT GAIN APPLIANCES/LIGHTS			606		0		606	606		606			
TOTAL HT LOSS BTU/H			2757		1652	117	2643	3529	1148	890			
TOTAL HT GAIN x 1.3 BTU/H				3742	1403	61	3652	4641	1693	360			

CITY OF RICHMOND HILL
BUILDING DIVISION

09/13/2021

RECEIVED

Per: jocelyn aguilar

ROOM USE	EXP. WALL	CLG. HT.	FORM	FAM	KT/BR	LAUN	PWD	FOY	MUD	BAS
			31	33	40	12	13	27	8	158
			10	10	10	9	11	11	11	10
FACTORS										
GRS.WALL AREA	LOSS	GAIN	313	333	404	108	144	300	89	1106
GLAZING	LOSS	GAIN	LOSS	GAIN	LOSS	GAIN	LOSS	GAIN	LOSS	GAIN
NORTH	21.8	16.0	0	0	0	0	0	0	0	0
EAST	21.8	41.6	0	0	0	34	741	1413	12	261
SOUTH	21.8	24.9	31	675	772	0	0	0	7	152
WEST	21.8	41.6	0	0	0	0	0	0	0	0
SKYLT.	35.8	101.2	0	0	0	0	0	0	0	0
DOORS	25.8	4.3	0	0	0	0	0	0	0	0
NET EXPOSED WALL	4.2	0.7	282	1186	195	299	1259	207	385	1619
NET EXPOSED BSMT WALL ABOVE GR	3.7	0.6	0	0	0	0	0	0	0	0
EXPOSED CLG	1.3	0.6	0	0	0	10	13	6	0	0
NO ATTIC EXPOSED CLG	2.8	1.3	0	0	0	0	0	0	0	0
EXPOSED FLOOR	2.6	0.4	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			1862		2012	2033	874	607	2548	806
SUB TOTAL HT GAIN				967	1626	939		540	100	1330
LEVEL FACTOR / MULTIPLIER	0.30	0.32			0.30	0.32		0.30	0.32	
AIR CHANGE HEAT LOSS			586		634	640		191		803
AIR CHANGE HEAT GAIN				56	94	54		31	6	77
DUCT LOSS			0		0	0		0		0
DUCT GAIN			0		0	0		0		0
HEAT GAIN PEOPLE	240	0	0	0	0	0	0	0	0	0
HEAT GAIN APPLIANCES/LIGHTS			606		606	606		0		0
TOTAL HT LOSS BTU/H			2448		2646	2673	1034	798	3351	1060
TOTAL HT GAIN x 1.3 BTU/H				2117	3023	2079	1531	137	1829	182

TOTAL HEAT GAIN BTU/H:

28574

TONS: 2.38

LOSS DUE TO VENTILATION LOAD BTU/H: 1670

STRUCTURAL HEAT LOSS: 39769

TOTAL COMBINED HEAT LOSS BTU/H: 41439

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

TYPE: 38-8

DATE: Apr-21

GFA: 2366

LO# 87608

HEATING CFM 970 COOLING CFM 970
TOTAL HEAT LOSS 39,769 TOTAL HEAT GAIN 28,299
AIR FLOW RATE CFM 24.39 AIR FLOW RATE CFM 34.28

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

****CARRIER**

AFUE = 97 %

59TN6A-060-14V

INPUT (BTU/H) = 60,000

FAN SPEED 60

OUTPUT (BTU/H) = **58,000**

LOW 820

DESIGN CFM = **970**

MEDLOW 0

CFM @ .6" E.S.P.

MEDIUM 970

MEDIUM HIGH 0

TEMPERATURE RISE 55 °F

HIGH 1520

RUN COUNT	4th	3rd	2nd	1st	Bas
S/A	0	0	12	7	4
R/A	0	0	5	2	1

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

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

RUN #	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	17	18	19	20	21	22	23	24
ROOM NAME	MBR	ENS	WIC	BED-2	BED-3	BED-4	BATH	BED-2	BED-3	MBR	BATH	FORM	FAM	FAM	KT/BR	LAUN	PWD	FOY	MUD	BAS	BAS	BAS	BAS
RM LOSS MBH.	1.38	1.65	0.12	1.32	1.76	1.15	0.45	1.32	1.76	1.38	0.45	2.45	1.32	1.32	2.67	1.03	0.80	3.35	1.06	3.26	3.26	3.26	3.26
CFM PER RUN HEAT	34	40	3	32	43	28	11	32	43	34	11	60	32	32	65	25	19	82	26	79	79	79	79
RM GAIN MBH.	1.87	1.40	0.06	1.83	2.32	1.69	0.18	1.83	2.32	1.87	0.18	2.12	1.51	1.51	2.08	1.53	0.14	1.83	0.18	0.46	0.46	0.46	0.46
CFM PER RUN COOLING	64	48	2	63	80	58	6	63	80	64	6	73	52	52	71	52	5	63	6	16	16	16	16
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	0.17	0.17	0.17	0.17	0.17	0.16	0.17	0.17	0.17	0.17	0.17
ACTUAL DUCT LGH.	39	43	27	67	52	34	42	72	56	46	48	43	32	26	31	69	25	47	12	27	32	36	51
EQUIVALENT LENGTH	130	180	180	200	170	0	180	200	190	140	200	190	140	120	140	220	120	160	120	140	150	130	170
TOTAL EFFECTIVE LENGTH	169	223	207	267	222	34	222	272	246	186	248	233	172	146	171	289	145	207	132	167	182	166	221
ADJUSTED PRESSURE	0.1	0.08	0.08	0.06	0.08	0.51	0.08	0.06	0.07	0.09	0.07	0.07	0.1	0.12	0.1	0.06	0.12	0.08	0.13	0.1	0.09	0.1	0.08
ROUND DUCT SIZE	5	5	4	6	6	6	4	6	6	5	4	6	5	4	5	5	4	6	4	5	5	5	6
HEATING VELOCITY (ft/min)	250	294	34	163	219	143	126	163	219	250	126	306	235	367	477	184	218	418	298	580	580	580	403
COOLING VELOCITY (ft/min)	470	352	23	321	408	296	69	321	408	470	69	372	382	597	521	382	57	321	69	117	117	117	82
OUTLET GRILL SIZE	3X10	3X10	3X10	4X10	4X10	4X10	3X10	4X10	4X10	3X10	3X10	4X10	3X10	3X10	3X10	3X10	3X10	4X10	3X10	3X10	3X10	3X10	4X10
TRUNK	A	D	D	B	C	D	C	B	C	A	C	B	A	A	A	B	D	B	D	A	A	C	B

RUN #	
ROOM NAME	
RM LOSS MBH.	
CFM PER RUN HEAT	
RM GAIN MBH.	
CFM PER RUN COOLING	
ADJUSTED PRESSURE	
ACTUAL DUCT LGH.	
EQUIVALENT LENGTH	
TOTAL EFFECTIVE LENGTH	
ADJUSTED PRESSURE	
ROUND DUCT SIZE	
HEATING VELOCITY (ft/min)	
COOLING VELOCITY (ft/min)	
OUTLET GRILL SIZE	
TRUNK	

RECEIVED
Per: jocelyn.aguilar

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	355	0.09	9.2	10	x	8	639	TRUNK G	0	0.00	0	0	x	8	0	TRUNK O	0	0.05	0	0	x	8	0			
TRUNK B	310	0.06	9.7	12	x	8	465	TRUNK H	0	0.00	0	0	x	8	0	TRUNK P	0	0.05	0	0	x	8	0			
TRUNK C	497	0.06	11.6	16	x	8	559	TRUNK I	0	0.00	0	0	x	8	0	TRUNK Q	0	0.05	0	0	x	8	0			
TRUNK D	613	0.06	12.5	20	x	8	552	TRUNK J	0	0.00	0	0	x	8	0	TRUNK R	0	0.05	0	0	x	8	0			
TRUNK E	968	0.06	14.9	26	x	8	670	TRUNK K	0	0.00	0	0	x	8	0	TRUNK S	0	0.05	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	TRUNK T	0	0.05	0	0	x	8	0			

RETURN AIR #	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
AIR VOLUME	85	75	75	100	75	320	85	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
PLENUM PRESSURE	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15
ACTUAL DUCT LGH.	40	70	61	39	58	20	42	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
EQUIVALENT LENGTH	225	250	245	155	225	175	225	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL EFFECTIVE LH	265	320	306	194	283	195	267	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
ADJUSTED PRESSURE	0.06	0.05	0.05	0.08	0.05	0.08	0.06	14.80	14.80	14.80	14.80	14.80	14.80	14.80	14.80	14.80	14.80	14.80	14.80	14.80	14.80	14.80	14.80	14.80
ROUND DUCT SIZE	6	6	6	5.9	6	9.2	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
INLET GRILL SIZE	8	8	8	8	8	8	8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
INLET GRILL SIZE	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
INLET GRILL SIZE	14	14	14	14	14	30	14	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

TYPE: 38-8
SITE NAME: CENTREFIELD (WEST GORMLEY)

LO # 87608

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>3</u> @ 10.6 cfm <u>31.8</u> cfm	
Kitchen & Bathrooms	<u>4</u> @ 10.6 cfm <u>42.4</u> cfm	
Other Rooms	<u>4</u> @ 10.6 cfm <u>42.4</u> cfm	
Table 9.32.3.A.	TOTAL <u>159.0</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>159</u> cfm	
Less Principal Ventil. Capacity	<u>79.5</u> cfm	
Required Supplemental Capacity	<u>79.5</u> cfm	

PRINCIPAL EXHAUST FAN CAPACITY									
Model:	VANEE 65H								
Location:	BSMT								
<u>79.5</u> cfm	☒ HVI Approved								
PRINCIPAL EXHAUST HEAT LOSS CALCULATION <table border="1"> <thead> <tr> <th>CFM</th> <th>AT 1°F</th> <th>FACTOR</th> <th>% LOSS</th> </tr> </thead> <tbody> <tr> <td>79.5 CFM</td> <td>X 78 F</td> <td>X 1.08</td> <td>X 0.25</td> </tr> </tbody> </table>		CFM	AT 1°F	FACTOR	% LOSS	79.5 CFM	X 78 F	X 1.08	X 0.25
CFM	AT 1°F	FACTOR	% LOSS						
79.5 CFM	X 78 F	X 1.08	X 0.25						

SUPPLEMENTAL FANS		BY INSTALLING CONTRACTOR	HVI	Sones
Location	Model	cfm		
ENS	BY INSTALLING CONTRACTOR	50	☒	3.5
BATH	BY INSTALLING CONTRACTOR	50	☒	3.5
PWD	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 #	001820
Date:	April-21

CSA F280-12 Residential Heat Loss and Heat Gain Calculations																																																												
Formula Sheet (For Air Leakage / Ventilation Calculation)																																																												
LO#: 87608	Model: 38-8	Builder: ROYAL PINE HOMES	Date: 4/19/2021																																																									
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																																																									
$HL_{airb} = LR_{airh} \times \frac{V_b}{3.6} \times DTD_h \times 1.2$ 0.227 x 258.47 x 43 °C x 1.2 = 3037 W = 10362 Btu/h			$HG_{salb} = LR_{airc} \times \frac{V_b}{3.6} \times DTD_c \times 1.2$ = 0.071 x 258.47 x 7 °C x 1.2 = 156 W = 532 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>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" style="text-align: center; vertical-align: middle;">10,362</td> <td style="text-align: center;">7,840</td> <td style="text-align: center;">0.661</td> </tr> <tr> <td>2</td> <td>0.3</td> <td style="text-align: center;">9,868</td> <td style="text-align: center;">0.315</td> </tr> <tr> <td>3</td> <td>0.2</td> <td style="text-align: center;">11,296</td> <td style="text-align: center;">0.183</td> </tr> <tr> <td>4</td> <td>0</td> <td style="text-align: center;">0</td> <td style="text-align: center;">0.000</td> </tr> <tr> <td>5</td> <td>0</td> <td style="text-align: center;">0</td> <td style="text-align: center;">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	10,362	7,840	0.661	2	0.3	9,868	0.315	3	0.2	11,296	0.183	4	0	0	0.000	5	0	0	0.000																														
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HEAT LOSS AND GAIN SUMMARY SHEET

MODEL: 38-8	BUILDER: ROYAL PINE HOMES
SFQT: 2366	LO# 87608 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):	32860.2	ASSUMED (Y/N):	Y
INTERNAL SHADING:	BLINDS/CURTAINS	ASSUMED OCCUPANTS:	5
INTERIOR LIGHTING LOAD (Btu/h/ft²):	1.60	DC BRUSHLESS MOTOR (Y/N):	Y
FOUNDATION CONFIGURATION	BCIN_1	DEPTH BELOW GRADE:	7.0 ft
LENGTH: 48.0 ft	WIDTH: 31.0 ft	EXPOSED PERIMETER:	158.0 ft

CITY OF RICHMOND HILL
BUILDING DIVISION

09/13/2021

RECEIVED

Per: jocelyn.aguilar

2012 OBC - COMPLIANCE PACKAGE

Component

Compliance Package SB-12 PERFORMANCE

Nominal	Min. Eff.
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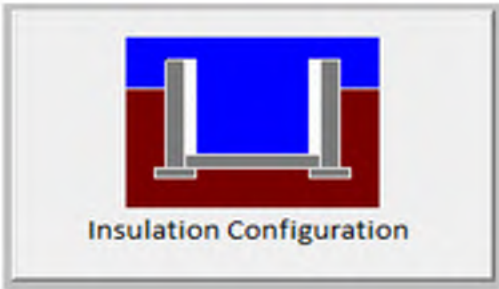
Ceiling with Attic Space Minimum RSI (R)-Value	60	59.20
Ceiling Without Attic Space Minimum RSI (R)-Value	31	27.70
Exposed Floor Minimum RSI (R)-Value	31	29.80
Walls Above Grade Minimum RSI (R)-Value	22+1.5	18.50
Basement Walls Minimum RSI (R)-Value	20	21.12
Below Grade Slab Entire surface > 600 mm below grade Minimum RSI (R)-Value	-	-
Edge of Below Grade Slab ≤ 600 mm Below Grade Minimum RSI (R)-Value	10	10
Heated Slab or Slab ≤ 600 mm below grade Minimum RSI (R)-Value	10	11.13
Windows and Sliding Glass Doors Maximum U-Value	1.6	-
Skylights Maximum U-Value	2.6	-
Space Heating Equipment Minimum AFUE	0.96	-
HRV Minimum Efficiency	75%	-
Domestic Hot Water Heater Minimum EF	TE=94%	-

INDIVIDUAL BCIN: 19669

MICHAEL O'ROURKE

Residential Foundation Thermal Load Calculator

Supplemental tool for CAN/CSA-F280

Weather Station Description		
Province:	Ontario	
Region:	Richmond Hill	
Site Description		
Soil Conductivity:	Normal conductivity: dry sand, loam, clay	
Water Table:	Normal (7-10 m, 23-33 ft)	
Foundation Dimensions		
Floor Length (m):	14.6	 Insulation Configuration
Floor Width (m):	9.4	
Exposed Perimeter (m):	0.0	
Wall Height (m):	3.0	
Depth Below Grade (m):	2.13	
Window Area (m ²):	1.1	
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):		1558

CITY OF RICHMOND HILL
BUILDING DIVISION

09/13/2021

RECEIVED

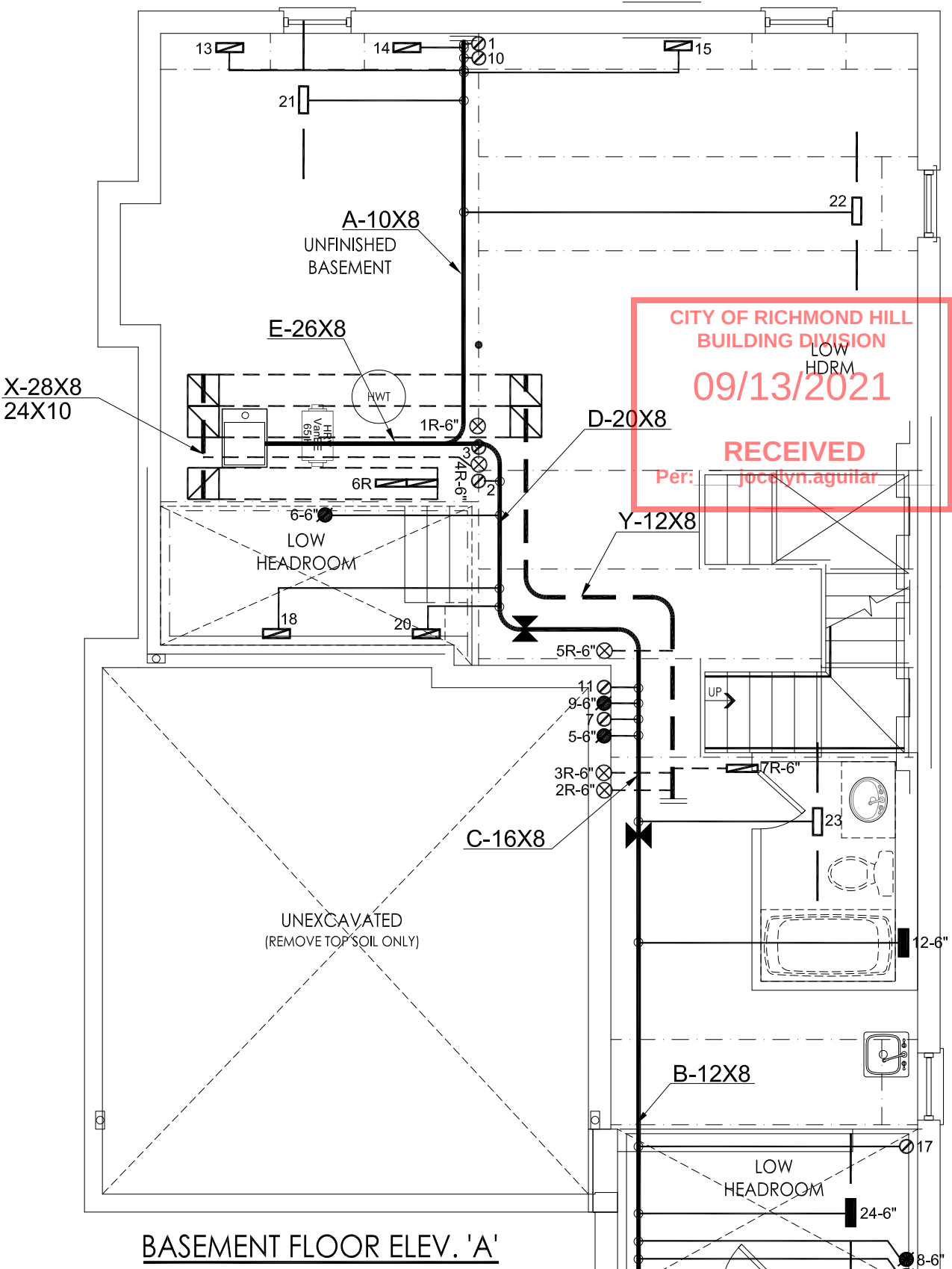
Per: _____jocelyn.aguilar_____

Air Infiltration Residential Load Calculator

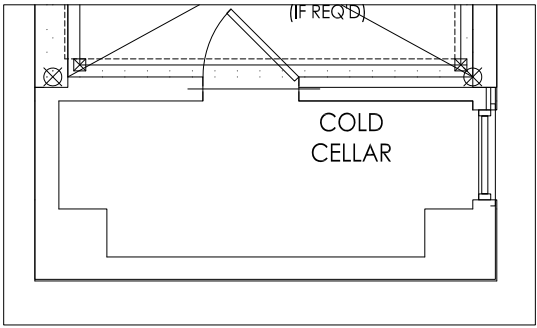
Supplemental tool for CAN/CSA-F280

Weather Station Description				
Province:	Ontario			
Region:	Richmond Hill			
Weather Station Location:	Open flat terrain, grass			
Anemometer height (m):	10			
Local Shielding				
Building Site:	Suburban, forest			
Walls:	Heavy			
Flue:	Heavy			
Highest Ceiling Height (m):	6.74			
Building Configuration				
Type:	Detached			
Number of Stories:	Two			
Foundation:	Full			
House Volume (m ³):	930.5			
Air Leakage/Ventilation				
Air Tightness Type:	Energy Star Detached (2.5 ACH)			
Custom BDT Data:	ELA @ 10 Pa.	868.6 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):	0.227			
Cooling Air Leakage Rate (ACH/H):	0.071			

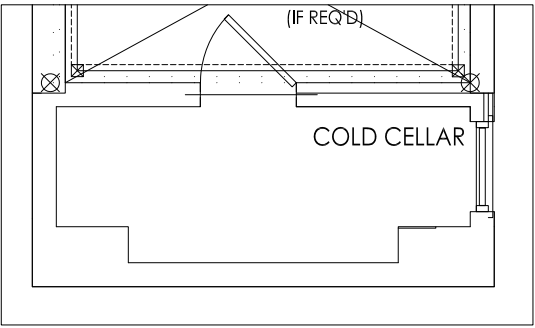
TYPE: 38-8
LO# 87608



BASEMENT FLOOR ELEV. 'A'



BASEMENT FLOOR PLAN ELEV. 'B'



BASEMENT FLOOR PLAN ELEV. 'C'

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

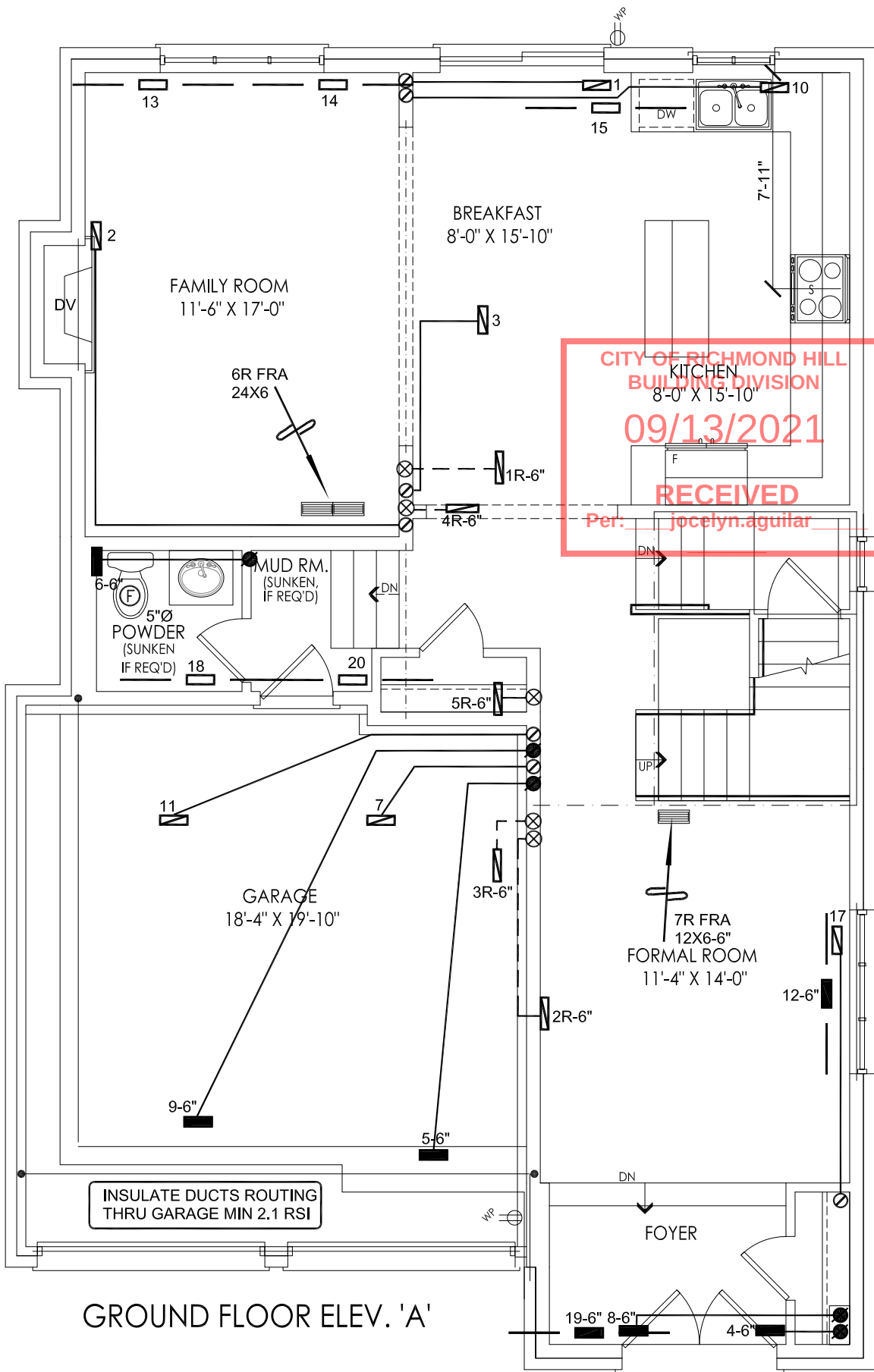
CSA-F280-12

SB-12 PERFORMANCE

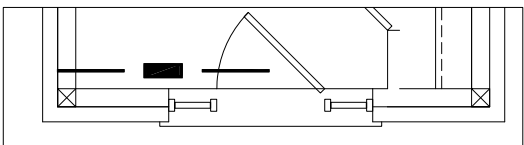
HVAC LEGEND								3.		
SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	2.	REVISED AS PER ARCHITECTURALS	APR/2021
	SUPPLY AIR GRILLE		6" SUPPLY AIR BOOT ABOVE		14"x8" RETURN AIR GRILLE		RETURN AIR STACK ABOVE	1.	REVISED TO PERFORMANCE	SEPT/2020
	SUPPLY AIR GRILLE 6" BOOT		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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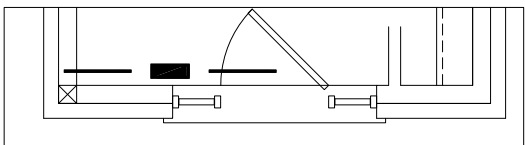
Client		 375 Finley Ave. Suite 202 - Ajax, Ontario L1S 2E2 Tel. 905.619.2300 - 905.420.5300 Fax 905.619.2375 Email: info@hvacdesigns.ca Web: www.hvacdesigns.ca Specializing in Residential Mechanical Design Services	HEAT LOSS 41439 BTU/H UNIT DATA		# OF RUNS S/A R/A FANS			Sheet Title	
ROYAL PINE HOMES			MAKE CARRIER	3RD FLOOR				BASEMENT HEATING LAYOUT	
Project Name			MODEL 59TN6A-060-14V	2ND FLOOR	12	5	3		
CENTREFIELD (WEST GORMLEY) RICHMOND HILL, ONTARIO			INPUT 60 MBTU/H	1ST FLOOR	7	2	2	Date	SEPT/2020
			OUTPUT 58 MBTU/H	BASEMENT	4	1	0	Scale	3/16" = 1'-0"
		COOLING 2.5 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				BCIN# 19669		
38-8		FAN SPEED 970 cfm @ 0.6" w.c.					LO#	87608	
2366 sqft									



GROUND FLOOR ELEV. 'A'



GROUND FLOOR PLAN ELEV. 'B'



GROUND FLOOR PLAN ELEV. 'C'

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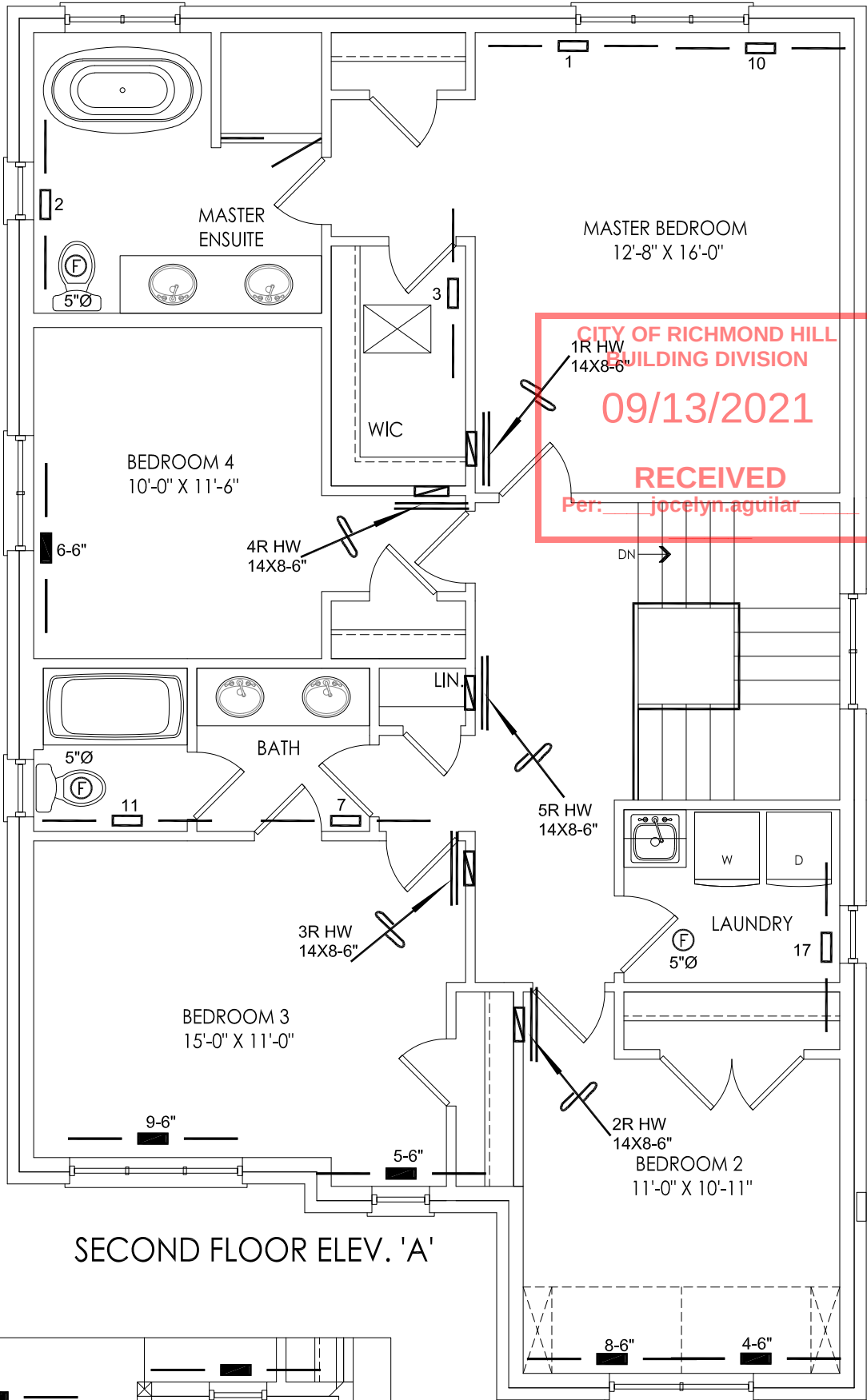
CSA-F280-12

SB-12 PERFORMANCE

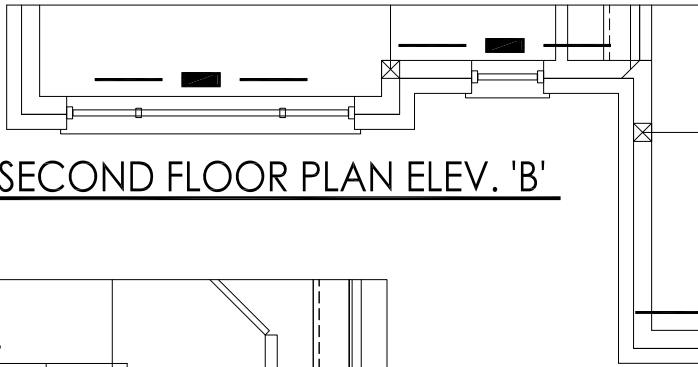
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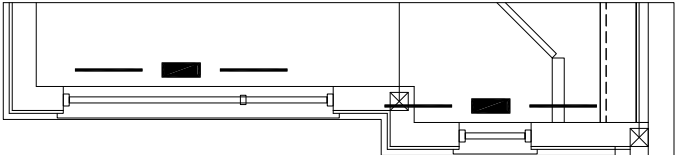
Client		 375 Finley Ave. Suite 202 - Ajax, Ontario L1S 2E2 Tel. 905.619.2300 - 905.420.5300 Fax 905.619.2375 Email: info@hvacdesigns.ca Web: www.hvacdesigns.ca Specializing in Residential Mechanical Design Services	Sheet Title	
ROYAL PINE HOMES			FIRST FLOOR HEATING LAYOUT	
Project Name			Date	SEPT/2020
CENTREFIELD (WEST GORMLEY) RICHMOND HILL, ONTARIO			Scale	3/16" = 1'-0"
		BCIN# 19669		
38-8		LO#		
2366 sqft		87608		



SECOND FLOOR ELEV. 'A'



SECOND FLOOR PLAN ELEV. 'B'



SECOND FLOOR PLAN ELEV. 'C'

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.		
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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			SECOND FLOOR HEATING LAYOUT	
Project Name			Date	SEPT/2020
CENTREFIELD (WEST GORMLEY) RICHMOND HILL, ONTARIO			Scale	3/16" = 1'-0"
		BCIN# 19669		
38-8	2366 sqft	LO# 87608		

Schedule 1: Designer Information

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

A. Project Information					
Building number, street name				Unit no.	Lot/con.
Municipality		Postal code	Plan number/ other description		
RICHMOND HILL					
B. Individual who reviews and takes responsibility for design activities					
Name			Firm		
MICHAEL O'ROURKE			HVAC DESIGNS LTD.		
Street address				Unit no.	Lot/con.
375 FINLEY AVE				202	N/A
Municipality	Postal code	Province	E-mail		
AJAX	L1S 2E2	ONTARIO	info@hvacdesigns.ca		
Telephone number	Fax number	Cell number			
(905) 619-2300	(905) 619-2375	()			
C. Design activities undertaken by individual identified in Section B. [Building Code Table 3.5.2.1 OF Division C]					
☐ House ☐ 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:		
HEAT LOSS / GAIN CALCULATIONS			38-8		
DUCT SIZING			ASHTON		
RESIDENTIAL MECHANICAL VENTILATION DESIGN SUMMARY			OPT MAIN & OPT 2ND		
RESIDENTIAL SYSTEM DESIGN per CSA-F280-12			Project: CENTREFIELD (WEST GORMLEY)		
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.					
April 19, 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.

REVIEW AND TAKE RESPONSIBILITY FOR THE DESIGN WORK AND AM QUALIFIED IN THE APPROPRIATE CATEGORY AS AN "OTHER DESIGNER" UNDER DIVISION C. 3.2.5 OF THE BUILDING CODE.

28178 TOTAL HEAT GAIN BTU/H: 28178 TONS: 2.43 LOSS\$ DUE TO VENTILATION LOAD BTU/H: 1670 STRUCTURAL HEAT LOSS: 40664 TOTAL COMBINED HEAT LOSS BTU/H: 41734

Michael Oppenheimer

MICHAEL OPPENHEIMER
INDIVIDUAL BCRI: 15669

DATE: Apr-21

GFA: 2389 LO# 90456

furnace filler	0.05
a/c coil pressure	0.2
available pressure	

59TN6A-060-14V 50
FAN SPEED

APUE = 97 %
INPUT (BTU/H) = 60,000
OUTPUT (BTU/H) = 58,000

RUN COUNT	4th	3rd	2nd	1st	Bas
S/A	0	0	12	7	4
R/A	0	0	5	2	1

plenum 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

LOW	MEDIUM	HIGH
0	970	0

DESIGN CFM = 970
CFM @ 6" E.S.P.

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

ROOM NAME	1	2	3	4	5
MBR	1.38	1.66	1.32	1.32	1.77
RM LOSS MBH	33	40	33	32	43
CFM PER RUM HEAT	1.90	1.40	0.06	1.86	2.35
RM GAIN MBH	64	47	2	62	79
CFM PER RUN COOLING	0.17	0.17	0.17	0.17	0.17
ADJUSTED PRESSURE	39	43	27	67	52
ACTUAL DUCT LGH	130	180	180	200	170
EQUIVALENT LENGTH	169	223	207	267	222
TOTAL EFFECTIVE LENGTH	0.1	0.08	0.08	0.06	0.08
ADJUSTED PRESSURE	5	4	6	6	6
ROUND DUCT SIZE	242	294	34	163	219
HEATING VELOCITY (fpm)	470	345	23	316	403
COOLING VELOCITY (fpm)	3X10	3X10	3X10	4X10	4X10
OUTLET GRILL SIZE	A	D	D	B	C
TRUNK					

[illegible]

RUN #	ROOM NAME
	RM LOSS MEH
	CWM PER RUN HEAT
	RM GAIN MEH
	CWM PER RUN COOLING
	ADJUSTED PRESSURE
	ACTIONAL DUCT LGH
	EQUIVALENT LENGTH
	TOTAL EFFECTIVE LENGTH
	ADJUSTED PRESSURE
	ROUND DUCT SIZE
	HEATING VELOCITY (ft/min)
	COOLING VELOCITY (ft/min)
	OUTLET GRILL SIZE
	FPS IN/AZ

[illegible]

SUPPLY AIR TRUNK SIZE

VELOCITY (ft/min)	RETURN AIR TRUNK SIZE				VELOCITY (ft/min)
	TRUNK CEM.	STATIC PRESS.	ROUND DUCT	RECT DUCT	
635	TRUNK G	0.00	0	0	0
462	TRUNK H	0	0	0	0
557	TRUNK I	0.00	0	0	0
554	TRUNK J	0	0.00	0	0
671	TRUNK K	0	0.00	0	0
	TRUNK L	0	0.00	0	0

RETURN AIR #

AIR VOLUME

PLENUM PRESSURE

ACTUAL DUCT LGH.

EQUIVALENT LENGTH

TOTAL EFFECTIVE LH

ADJUSTED PRESSURE

ROUND DUCT SIZE

INLET GRILL SIZE

[illegible]

TYPE: 3B-8
SITE NAME: CENTREFIELD (WEST GORMLEY)
LO # 90456
OPT MAIN & 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	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	4	@ 10.6 cfm	42.4	cfm
Table 9.32.3.A	TOTAL		169.6	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	169.6	cfm
Less Principal Ventil. Capacity	79.5	cfm
Required Supplemental Capacity	90.1	cfm

PRINCIPAL EXHAUST FAN CAPACITY
Model: VANE 65H Location: BSMT
79.5 cfm ☒ HVI Approved
PRINCIPAL EXHAUST HEAT LOSS CALCULATION

CFM	ΔT	Factor	% LOSS
79.5 CFM	78 F	1.08	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

HEAT RECOVERY VENTILATOR 9.32.3.11
Model: VANE 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: *Michael O'Rourke*
HRAI # 001820
Date: April-21

CSA F280-12 Residential Heat Loss and Heat Gain Calculations																																																						
Formula Sheet (For Air Leakage / Ventilation Calculation)																																																						
LO#: 90456	Model: 38-8	Builder: ROYAL PINE HOMES	Date: 4/19/2021																																																			
Volume Calculation		Air Change & Delta T Data																																																				
<table border="1" style="width:100%; border-collapse: collapse;"> <tr> <th>House Volume Level</th> <th>Floor Area (ft²)</th> <th>Floor Height (ft)</th> <th>Volume (ft³)</th> </tr> <tr> <td>Bsmt</td> <td>1065</td> <td>10</td> <td>10650</td> </tr> <tr> <td>First</td> <td>1065</td> <td>10</td> <td>10756.5</td> </tr> <tr> <td>Second</td> <td>1324</td> <td>9</td> <td>11916</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>Total:</td> <td></td> <td></td> <td>33,322.5 ft³</td> </tr> <tr> <td>Total:</td> <td></td> <td></td> <td>943.6 m³</td> </tr> </table>		House Volume Level	Floor Area (ft²)	Floor Height (ft)	Volume (ft³)	Bsmt	1065	10	10650	First	1065	10	10756.5	Second	1324	9	11916	Third	0	9	0	Fourth	0	9	0	Total:			33,322.5 ft³	Total:			943.6 m³	<table border="1" style="width:100%; border-collapse: collapse;"> <tr> <th colspan="4">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 DTDh</td> <td>22</td> <td>-21</td> <td>43</td> <td>78</td> </tr> <tr> <td>Summer DTDc</td> <td>24</td> <td>31</td> <td>7</td> <td>13</td> </tr> </table>		Design Temperature Difference					T _{in} °C	T _{out} °C	ΔT °C	ΔT °F	Winter DTDh	22	-21	43	78	Summer DTDc	24	31	7	13
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6.2.6 Sensible Gain due to Air Leakage																																																						
$HG_{sabl} = LR_{airl} \times \frac{V_b}{3.6} \times DTD_c \times 1.2$																																																						
0.227	x	262.11	x	7 °C	x	1.2	=	158 W																																														
$= 0.071 \times 262.11 \times 7 \times 1.2 = 539 \text{ Btu/h}$																																																						
6.2.7 Sensible Heat Gain due to Ventilation																																																						
$HL_{vairb} = PVC \times DTD_h \times 1.08 \times (1 - E)$																																																						
80 CFM	x	13 °F	x	1.08	x	0.25	=	275 Btu/h																																														
5.2.3.3 Calculation of Air Change Heat Loss for Each Room (Floor Multiplier Section)																																																						
$HL_{airrr} = \text{Level Factor} \times HL_{airbv} \times \{ (HL_{agcr} + HL_{lgr}) \div (HL_{aglevel} + HL_{bglevel}) \}$																																																						
<table border="1" style="width:100%; border-collapse: collapse;"> <tr> <th>Level</th> <th>Level Factor (LF)</th> <th>HL_{airbv} = Air Leakage + Ventilation Heat Loss (Btu/h)</th> <th>Level Conductive Heat Loss: (HL_{level})</th> <th>Air Leakage Heat Loss Multiplier (LF x HL_{airbv} / HL_{level})</th> </tr> <tr> <td>1</td> <td>0.5</td> <td rowspan="4">10,508</td> <td>7,840</td> <td>0.670</td> </tr> <tr> <td>2</td> <td>0.3</td> <td>10,016</td> <td>0.315</td> </tr> <tr> <td>3</td> <td>0.2</td> <td>11,296</td> <td>0.186</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></td> <td>0</td> <td>0.000</td> </tr> </table>				Level	Level Factor (LF)	HL _{airbv} = Air Leakage + Ventilation Heat Loss (Btu/h)	Level Conductive Heat Loss: (HL _{level})	Air Leakage Heat Loss Multiplier (LF x HL _{airbv} / HL _{level})	1	0.5	10,508	7,840	0.670	2	0.3	10,016	0.315	3	0.2	11,296	0.186	4	0	0	0.000	5	0		0	0.000																								
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4	0		0	0.000																																																		
5	0		0	0.000																																																		
*HL_{airbv} = Air leakage heat loss + ventilation heat loss *For a balanced or supply only ventilation system HL_{airbv} = 0																																																						

CITY OF RICHMOND HILL
BUILDING DIVISION
09/13/2021
RECEIVED
Per: Joselyn Aguiar

HEAT LOSS AND GAIN SUMMARY SHEET

MODEL: 38-8	OPT MAIN & OPT 2ND	BUILDER: ROYAL PINE HOMES
SFQT: 2389	LO# 90456	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):	33322.5	ASSUMED (Y/N):	Y
INTERNAL SHADING:	BLINDS/CURTAINS	ASSUMED OCCUPANTS:	5
INTERIOR LIGHTING LOAD (Btu/h/ft²):	1.70	DC BRUSHLESS MOTOR (Y/N):	Y
FOUNDATION CONFIGURATION	BCIN_1	DEPTH BELOW GRADE:	7.0 ft
LENGTH: 48.0 ft	WIDTH: 31.0 ft	EXPOSED PERIMETER:	158.0 ft

CITY OF RICHMOND HILL
BUILDING DIVISION

09/13/2021

RECEIVED

Per: jocelyn.aguilar**2012 OBC - COMPLIANCE PACKAGE****Component****Compliance Package
SB-12 PERFORMANCE****Nominal Min. Eff.**

Ceiling with Attic Space Minimum RSI (R)-Value	60	59.20
Ceiling Without Attic Space Minimum RSI (R)-Value	31	27.70
Exposed Floor Minimum RSI (R)-Value	31	29.80
Walls Above Grade Minimum RSI (R)-Value	22+1.5	18.50
Basement Walls Minimum RSI (R)-Value	20	21.12
Below Grade Slab Entire surface > 600 mm below grade Minimum RSI (R)-Value	-	-
Edge of Below Grade Slab ≤ 600 mm Below Grade Minimum RSI (R)-Value	10	10
Heated Slab or Slab ≤ 600 mm below grade Minimum RSI (R)-Value	10	11.13
Windows and Sliding Glass Doors Maximum U-Value	1.6	-
Skylights Maximum U-Value	2.6	-
Space Heating Equipment Minimum AFUE	0.96	-
HRV Minimum Efficiency	75%	-
Domestic Hot Water Heater Minimum EF	TE=94%	-

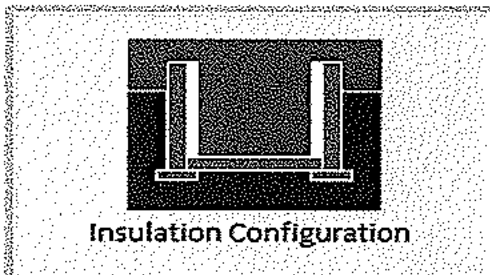
INDIVIDUAL BCIN: 19669

MICHAEL O'ROURKE

Michael O'Rourke

Residential Foundation Thermal Load Calculator

Supplemental tool for CAN/CSA-F280

Weather Station Description		
Province:	Ontario	
Region:	Richmond Hill	
Site Description		
Soil Conductivity:	Normal conductivity: dry sand, loam, clay	
Water Table:	Normal (7-10 m, 23-33 ft)	
Foundation Dimensions		
Floor Length (m):	14.6	 Insulation Configuration
Floor Width (m):	9.4	
Exposed Perimeter (m):	0.0	
Wall Height (m):	3.0	
Depth Below Grade (m):	2.13	
Window Area (m ²):	1.1	
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):		1558

TYPE: 38-8
LO# 90456

OPT MAIN & OPT 2ND

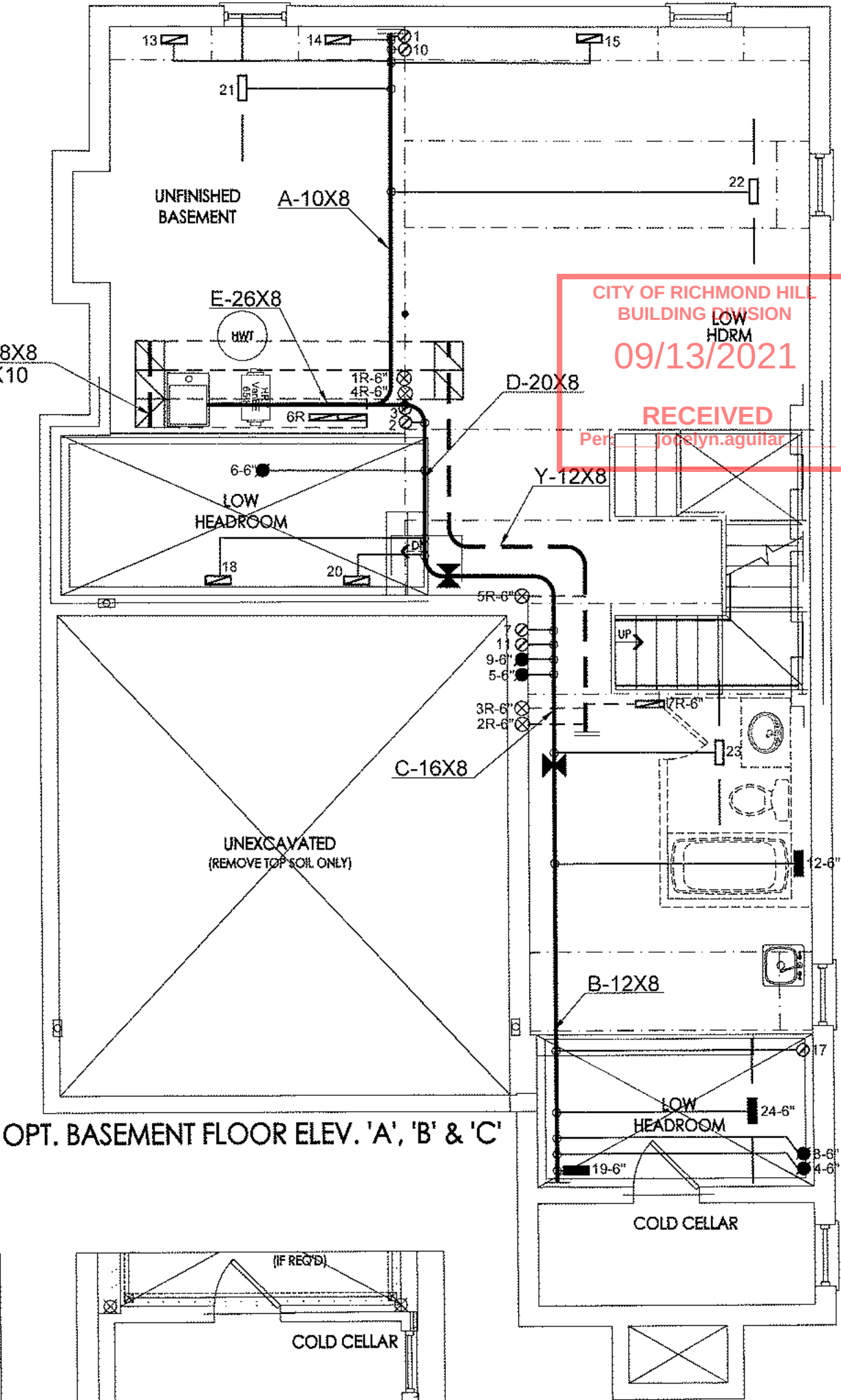
Air Infiltration Residential Load Calculator

Supplemental tool for CAN/CSA-F280

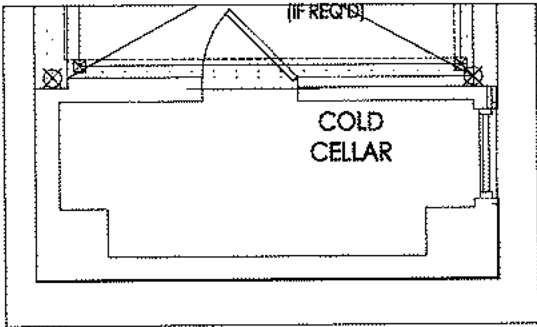
Weather Station Description				
Province:	Ontario	CITY OF RICHMOND HILL BUILDING DIVISION 09/13/2021 RECEIVED Per: <u>jocelyn.aguilar</u>		
Region:	Richmond Hill			
Weather Station Location:	Open flat terrain, grass			
Anemometer height (m):	10			
Local Shielding				
Building Site:	Suburban, forest	RECEIVED Per: <u>jocelyn.aguilar</u>		
Walls:	Heavy			
Flue:	Heavy			
Highest Ceiling Height (m):	6.74			
Building Configuration				
Type:	Detached			
Number of Stories:	Two			
Foundation:	Full			
House Volume (m ³):	943.6			
Air Leakage/Ventilation				
Air Tightness Type:	Energy Star Detached (2.5 ACH)			
Custom BDT Data:	ELA @ 10 Pa.	880.8 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):	0.227			
Cooling Air Leakage Rate (ACH/H):	0.071			

TYPE: 38-8
LO# 90456

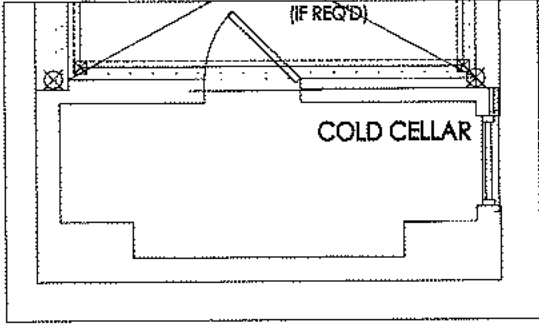
OPT MAIN & OPT 2ND



OPT. BASEMENT FLOOR ELEV. 'A', 'B' & 'C'



BASEMENT FLOOR PLAN ELEV. 'B'



BASEMENT FLOOR PLAN ELEV. 'C'

1 MICHAEL O'BRIEN: I HAVE REVIEWED AND TAKE RESPONSIBILITY FOR THE DESIGN WORK AND AM QUALIFIED UNDER DIVISION C, 12.5 OF THE BUILDING CODE.
Michael O'Brien, License 19669
HVAC DESIGNS LTD.

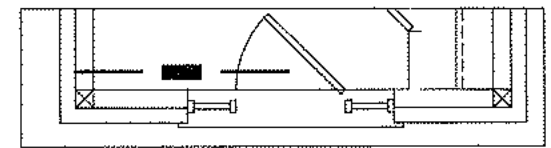
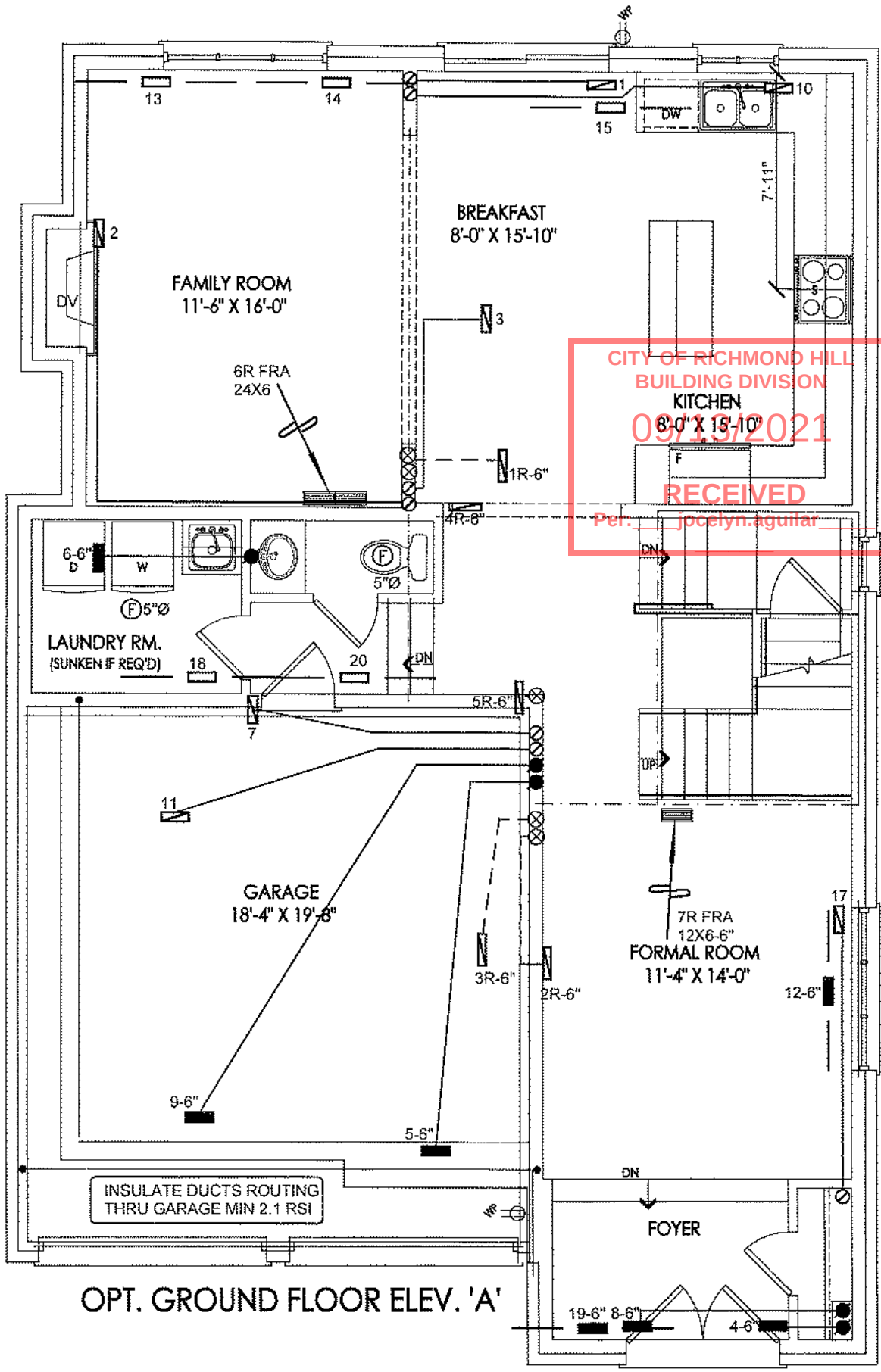
CSA-F280-12

SB-12 PERFORMANCE

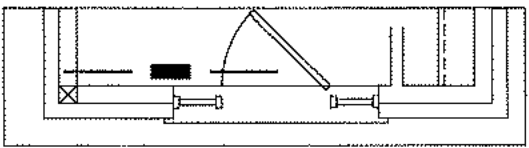
HVAC LEGEND						REVISIONS	
SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	No.	Date
	SUPPLY AIR GRILLE		6" SUPPLY AIR BOOT ABOVE		14"x8" RETURN AIR GRILLE	3.	
	SUPPLY AIR GRILLE 6" BOOT		SUPPLY AIR STACK FROM 2nd FLOOR		30"x8" RETURN AIR GRILLE	2.	
	SUPPLY AIR BOOT ABOVE		6" SUPPLY AIR STACK 2nd FLOOR		FRA- FLOOR RETURN AIR GRILLE	1.	
					REDUCER	No.	Description

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Client		HVAC DESIGNS LTD. 375 Finley Ave. Suite 202 - Ajax, Ontario L1S 2E2 Tel. 905.619.2300 - 905.420.5300 Fax 905.619.2375 Email: info@hvacdesigns.ca Web: www.hvacdesigns.ca Specializing in Residential Mechanical Design Services		HEAT LOSS 41587 BTU/H		# OF RUNS		S/A		R/A		FANS		Sheet Title	
ROYAL PINE HOMES				UNIT DATA		3RD FLOOR								BASEMENT	
Project Name CENTREFIELD (WEST GORMLEY) RICHMOND HILL, ONTARIO		MAKE		CARRIER		2ND FLOOR		12		5		3		Date APR/2021	
		MODEL		59TN6A-060-14V		1ST FLOOR		7		2		3			
		INPUT		60 MBTU/H		BASEMENT		4		1		0			
		OUTPUT		58 MBTU/H		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									
OPT MAIN & OPT 2ND 38-8 2389 sqft		COOLING		2.5 TONS										Scale 3/16" = 1'-0"	
		FAN SPEED		970 cfm @ 0.6" w.c.										BCIN# 19669	
														LO# 90456	



GROUND FLOOR PLAN ELEV. 'B'



GROUND FLOOR PLAN ELEV. 'C'

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

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

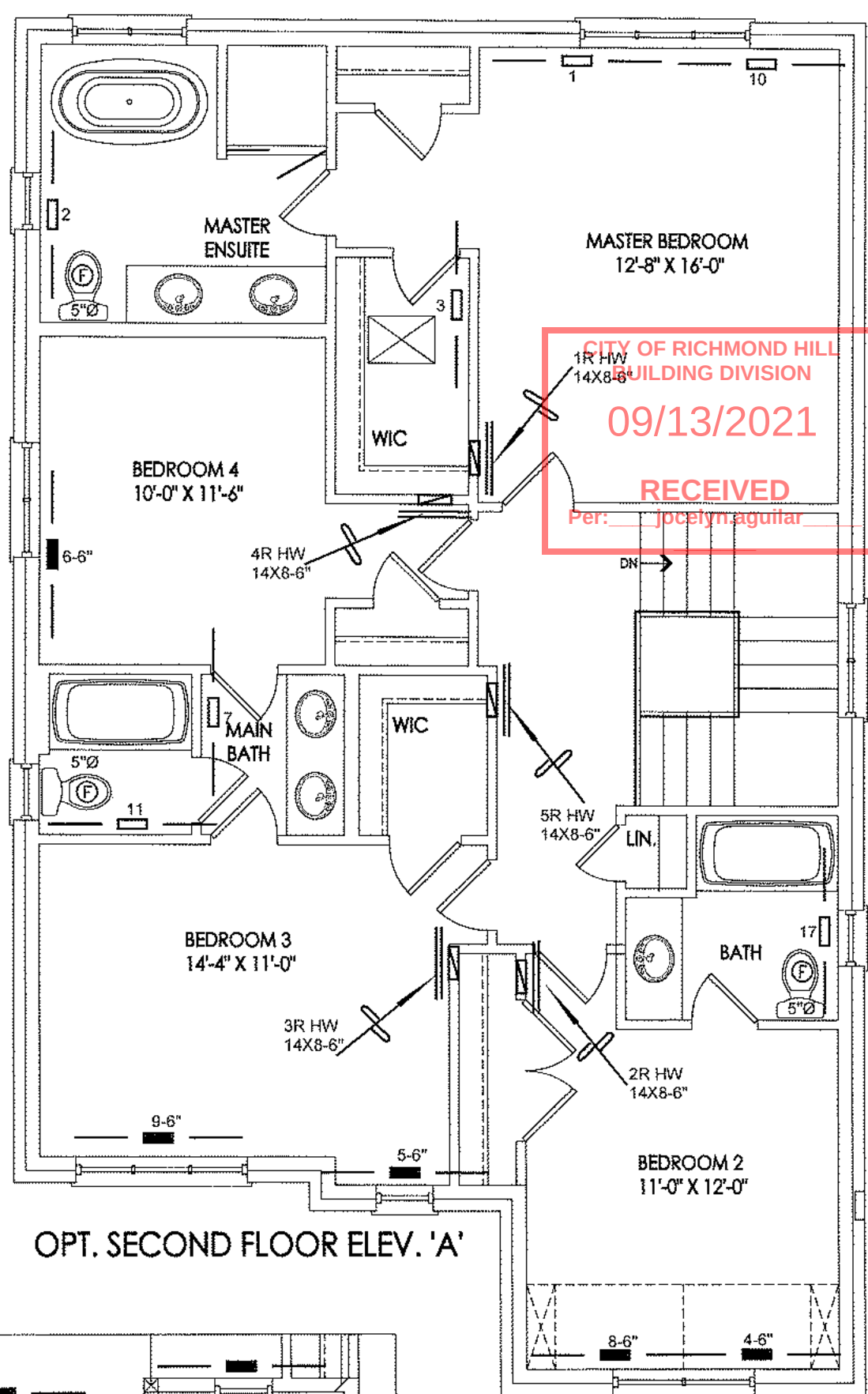
CSA-F280-12

SB-12 PERFORMANCE

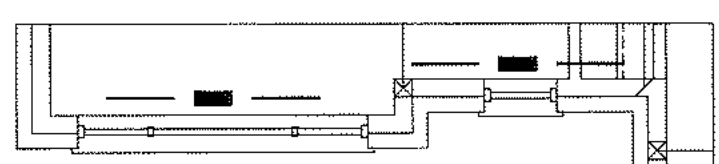
HVAC LEGEND						3.		
SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	
	SUPPLY AIR GRILLE		6" SUPPLY AIR BOOT ABOVE		14"x8" RETURN AIR GRILLE		RETURN AIR STACK ABOVE	2.
	SUPPLY AIR GRILLE 6" BOOT		SUPPLY AIR STACK FROM 2nd FLOOR		30"x8" RETURN AIR GRILLE		RETURN AIR STACK 2nd FLOOR	1.
	SUPPLY AIR BOOT ABOVE		6" SUPPLY AIR STACK 2nd FLOOR		FRA- FLOOR RETURN AIR GRILLE		REDUCER	No. Description Date

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.

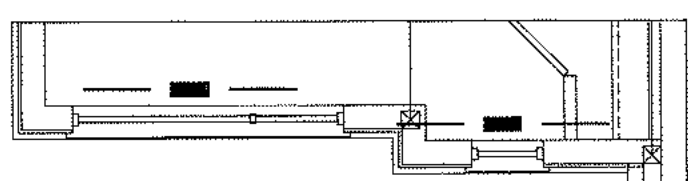
Client ROYAL PINE HOMES		 375 Finley Ave. Suite 202 - Ajax, Ontario L1S 2E2 Tel. 905.619.2300 - 905.420.5300 Fax 905.619.2375 Email: info@hvacdesigns.ca Web: www.hvacdesigns.ca Specializing in Residential Mechanical Design Services	Sheet Title FIRST FLOOR HEATING LAYOUT	
Project Name CENTREFIELD (WEST GORMLEY) RICHMOND HILL, ONTARIO			Date APR/2021	
OPT MAIN & OPT 2ND 38-8 2389 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# 90456	



OPT. SECOND FLOOR ELEV. 'A'



SECOND FLOOR PLAN ELEV. 'B'



SECOND FLOOR PLAN ELEV. 'C'

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						REVISIONS	
SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	No.	Date
	SUPPLY AIR GRILLE		6" SUPPLY AIR BOOT ABOVE		14"x8" RETURN AIR GRILLE	3.	
	SUPPLY AIR GRILLE 6" BOOT		SUPPLY AIR STACK FROM 2nd FLOOR		30"x8" RETURN AIR GRILLE	2.	
	SUPPLY AIR BOOT ABOVE		6" SUPPLY AIR STACK 2nd FLOOR		FRA- FLOOR RETURN AIR GRILLE	1.	
					REDUCER	No.	Description

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 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 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 SECOND FLOOR HEATING LAYOUT	
Project Name CENTREFIELD (WEST GORMLEY) RICHMOND HILL, ONTARIO			Date APR/2021	Scale 3/16" = 1'-0"
OPT MAIN & OPT 2ND 38-8 2389 sqft			BCIN# 19669	
			LO#	90456

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: 38-8 ASHTON FIN BSMT WUB 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.			
April 19, 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

SITE NAME: CENTREFIELD (WEST GORMLEY)

FIN BSMT WUB

DATE: Apr-21

WINTER NATURAL AIR CHANGE RATE 0.227

HEAT LOSS ΔT °F. 78

CSA-F280-12

BUILDER: ROYAL PINE HOMES

TYPE: 38-8

GFA: 2366

LO# 87609

SUMMER NATURAL AIR CHANGE RATE 0.071

HEAT GAIN ΔT °F. 13

SB-12 PERFORMANCE

ROOM USE	EXP. WALL	CLG. HT.	MBR	ENS	WIC	BED-2	BED-3	BED-4	BATH	B-BATH
			36	21	0	34	29	12	6	9
			9	9	9	9	9	9	9	10
FACTORS										
GRS.WALL AREA	LOSS	GAIN	324	189	0	306	261	108	54	63
GLAZING	LOSS	GAIN	LOSS	GAIN	LOSS	GAIN	LOSS	GAIN	LOSS	GAIN
NORTH	21.8	16.0	0	0	0	8	174	128	0	0
EAST	21.8	41.6	26	566	1080	17	370	706	0	0
SOUTH	21.8	24.9	11	240	274	0	0	0	0	0
WEST	21.8	41.6	0	0	0	0	0	0	0	0
SKYLT.	35.8	101.2	0	0	0	0	0	0	0	0
DOORS	25.8	4.3	0	0	0	0	0	0	0	0
NET EXPOSED WALL	4.2	0.7	287	1207	199	164	690	113	0	0
NET EXPOSED BSMT WALL ABOVE GR	3.7	0.6	0	0	0	0	0	0	0	0
EXPOSED CLG	1.3	0.6	241	317	142	123	162	72	75	99
NO ATTIC EXPOSED CLG	2.8	1.3	0	0	0	0	0	0	0	0
EXPOSED FLOOR	2.6	0.4	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			2330		1396	99	2234	2711	970	684
SUB TOTAL HT GAIN				1694	1020	44	1856	2269	432	238
LEVEL FACTOR / MULTIPLIER	0.20	0.18			0.20	0.18		0.20	0.18	
AIR CHANGE HEAT LOSS			427		256	18	410	497	178	125
AIR CHANGE HEAT GAIN				97	58	3	106	129	25	14
DUCT LOSS			0		0		0	321	0	81
DUCT GAIN			0		0		0	324	0	25
HEAT GAIN PEOPLE	240	2	480	0	0	0	1	240	1	240
HEAT GAIN APPLIANCES/LIGHTS			606		0		606	606	606	0
TOTAL HT LOSS BTU/H			2757		1652	117	2643	3529	1148	890
TOTAL HT GAIN x 1.3 BTU/H			3740		1402	61	3650	4639	1693	360

CITY OF RICHMOND HILL
BUILDING DIVISION

09/13/2021

RECEIVED
Per: jocelyn.aguiar

ROOM USE	EXP. WALL	CLG. HT.	FORM	FAM	KT/BR	LAUN	PWD	FOY	MUD	WUB	BAS
			31	33	40	12	13	27	8	21	128
			10	10	10	9	11	11	11	10	10
FACTORS											
GRS.WALL AREA	LOSS	GAIN	313	333	404	108	144	300	89	210	896
GLAZING	LOSS	GAIN	LOSS	GAIN	LOSS	GAIN	LOSS	GAIN	LOSS	GAIN	LOSS
NORTH	21.8	16.0	0	0	0	0	0	0	0	0	0
EAST	21.8	41.6	0	0	0	34	741	1413	12	261	499
SOUTH	21.8	24.9	31	675	772	0	0	0	7	152	174
WEST	21.8	41.6	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	282	1186	195	299	1259	207	385	1619	266
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	10	13	6	0	0	0
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
SLAB ON GRADE HEAT LOSS			0	0	0	0	0	0	0	0	0
SUBTOTAL HT LOSS			1862		2012	2033	874	607	2548	806	193
SUB TOTAL HT GAIN				967	1626	939		100	1330	133	339
LEVEL FACTOR / MULTIPLIER	0.30	0.32			0.30	0.32		0.30	0.32		0.50
AIR CHANGE HEAT LOSS			586		634	640	160	191	803	254	4959
AIR CHANGE HEAT GAIN				55	93	54		31	6	76	8
DUCT LOSS			0		0	0		0	0	0	0
DUCT GAIN			0		0	0		0	0	0	0
HEAT GAIN PEOPLE	240	0	0	0	0	0	0	0	0	0	0
HEAT GAIN APPLIANCES/LIGHTS			606		606	606		606	606	606	0
TOTAL HT LOSS BTU/H			2448		2646	2673	1034	798	3351	1060	1561
TOTAL HT GAIN x 1.3 BTU/H			2117		3022	2078	1530	137	1828	182	441

TOTAL HEAT GAIN BTU/H:

28803

TONS: 2.40

LOSS DUE TO VENTILATION LOAD BTU/H: 1670

STRUCTURAL HEAT LOSS: 40245

TOTAL COMBINED HEAT LOSS BTU/H: 41915

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

FIN BSMT WUB
TYPE: 38-8

DATE: Apr-21

GFA: 2366 LO# 87609

HEATING CFM 970 COOLING CFM 970
TOTAL HEAT LOSS 40,245 TOTAL HEAT GAIN 28,528
AIR FLOW RATE CFM 24.1 AIR FLOW RATE CFM 34

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-060-14V
FAN SPEED 60

AFUE = 97 %
INPUT (BTU/H) = 60,000
OUTPUT (BTU/H) = **58,000**

RUN COUNT	4th	3rd	2nd	1st	Bas
S/A	0	0	12	7	5
R/A	0	0	5	2	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

MEDLOW 0
MEDIUM 970
MEDIUM HIGH 0
HIGH 1520
DESIGN CFM = **970**
CFM @ .6" E.S.P.
TEMPERATURE RISE 55 °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	17	18	19	20	21	22	23	24
ROOM NAME	MBR	ENS	WIC	BED-2	BED-3	BED-4	BATH	BED-2	BED-3	MBR	BATH	FORM	FAM	FAM	KT/BR	LAUN	PWD	FOY	MUD	BAS	BAS	B-BATH	BAS
RM LOSS MBH.	1.38	1.65	0.12	1.32	1.76	1.15	0.45	1.32	1.76	1.38	0.45	2.45	1.32	1.32	2.67	1.03	0.80	3.35	1.06	3.23	3.23	0.58	3.23
CFM PER RUN HEAT	33	40	3	32	43	28	11	32	43	33	11	59	32	32	64	25	19	81	26	78	78	14	78
RM GAIN MBH.	1.87	1.40	0.06	1.83	2.32	1.69	0.18	1.83	2.32	1.87	0.18	2.12	1.51	1.51	2.08	1.53	0.14	1.83	0.18	0.52	0.52	0.02	0.52
CFM PER RUN COOLING	64	48	2	62	79	58	6	62	79	64	6	72	51	51	71	52	5	62	6	18	18	1	18
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	0.17	0.17	0.17	0.17	0.17	0.16	0.17	0.17	0.17	0.17	0.17
ACTUAL DUCT LGH.	39	43	27	67	52	34	42	72	56	46	48	43	32	26	31	69	25	47	12	27	32	36	51
EQUIVALENT LENGTH	130	180	180	200	170	0	180	200	190	140	200	190	140	120	140	220	120	160	120	140	150	130	160
TOTAL EFFECTIVE LENGTH	169	223	207	267	222	34	222	272	246	186	248	233	172	146	171	289	145	207	132	167	182	166	211
ADJUSTED PRESSURE	0.1	0.08	0.08	0.06	0.08	0.51	0.08	0.06	0.07	0.09	0.07	0.07	0.1	0.12	0.1	0.06	0.12	0.08	0.13	0.1	0.09	0.1	0.08
ROUND DUCT SIZE	5	5	4	6	6	6	4	6	6	5	4	6	5	4	5	5	4	6	4	5	5	5	6
HEATING VELOCITY (ft/min)	242	294	34	163	219	143	126	163	219	242	126	301	235	367	470	184	218	413	298	573	573	103	398
COOLING VELOCITY (ft/min)	470	352	23	316	403	296	69	316	403	470	69	367	374	585	521	382	57	316	69	132	132	7	92
OUTLET GRILL SIZE	3X10	3X10	3X10	4X10	4X10	4X10	3X10	4X10	4X10	3X10	3X10	4X10	3X10	3X10	3X10	3X10	3X10	4X10	3X10	3X10	3X10	3X10	4X10
TRUNK	A	D	D	B	C	D	C	B	C	A	C	B	A	A	A	B	D	B	D	A	A	C	B

RUN #	25
ROOM NAME	BAS
RM LOSS MBH.	3.23
CFM PER RUN HEAT	78
RM GAIN MBH.	0.52
CFM PER RUN COOLING	18
ADJUSTED PRESSURE	0.17
ACTUAL DUCT LGH.	25
EQUIVALENT LENGTH	110
TOTAL EFFECTIVE LENGTH	135
ADJUSTED PRESSURE	0.13
ROUND DUCT SIZE	5
HEATING VELOCITY (ft/min)	573
COOLING VELOCITY (ft/min)	132
OUTLET GRILL SIZE	3X10
TRUNK	D

RECEIVED
Per: jocelyn.aguilar

SUPPLY AIR TRUNK SIZE														RETURN AIR TRUNK SIZE													
	TRUNK CFM	STATIC PRESS.	ROUND DUCT	RECT DUCT			VELOCITY (ft/min)		TRUNK CFM	STATIC PRESS.	ROUND DUCT	RECT DUCT			VELOCITY (ft/min)		TRUNK CFM	STATIC PRESS.	ROUND DUCT	RECT DUCT			VELOCITY (ft/min)				
TRUNK A	350	0.09	9.2	10	x	8	630	TRUNK G	0	0.00	0	0	x	8	0	TRUNK O	0	0.05	0	0	x	8	0				
TRUNK B	307	0.06	9.7	12	x	8	461	TRUNK H	0	0.00	0	0	x	8	0	TRUNK P	0	0.05	0	0	x	8	0				
TRUNK C	429	0.06	11	16	x	8	483	TRUNK I	0	0.00	0	0	x	8	0	TRUNK Q	0	0.05	0	0	x	8	0				
TRUNK D	623	0.06	12.6	20	x	8	561	TRUNK J	0	0.00	0	0	x	8	0	TRUNK R	0	0.05	0	0	x	8	0				
TRUNK E	973	0.06	14.9	26	x	8	674	TRUNK K	0	0.00	0	0	x	8	0	TRUNK S	0	0.05	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	TRUNK T	0	0.05	0	0	x	8	0				

RETURN AIR #	1	2	3	4	5	6	7									BR
AIR VOLUME	85	75	75	95	75	320	85	0	0	0	0	0	0	0	0	160
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.	40	70	61	39	58	20	42	1	1	1	1	1	1	1	1	14
EQUIVALENT LENGTH	225	250	245	155	225	175	225	0	0	0	0	0	0	0	0	135
TOTAL EFFECTIVE LH	265	320	306	194	283	195	267	1	1	1	1	1	1	1	1	149
ADJUSTED PRESSURE	0.06	0.05	0.05	0.08	0.05	0.08	0.06	14.80	14.80	14.80	14.80	14.80	14.80	14.80	14.80	0.10
ROUND DUCT SIZE	6	6	6	5.8	6	9.2	6	0	0	0	0	0	0	0	0	6.7
INLET GRILL SIZE	8	8	8	8	8	6	8	0	0	0	0	0	0	0	0	8
	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
INLET GRILL SIZE	14	14	14	14	14	24	14	0	0	0	0	0	0	0	0	14

TYPE: 38-8
SITE NAME: CENTREFIELD (WEST GORMLEY)

LO # 87609
FIN BSMT WUB

RESIDENTIAL MECHANICAL VENTILATION DESIGN SUMMARY

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

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

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

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

TOTAL VENTILATION CAPACITY		9.32.3.3(1)
Basement + Master Bedroom	<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>5</u> @ 10.6 cfm <u>53.0</u> cfm	
Table 9.32.3.A.	TOTAL <u>180.2</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>180.2</u> cfm	
Less Principal Ventil. Capacity	<u>79.5</u> cfm	
Required Supplemental Capacity	<u>100.7</u> cfm	

PRINCIPAL EXHAUST FAN CAPACITY	
Model: VANEE 65H	Location: BSMT
<u>79.5</u> cfm	☒ HVI Approved
HEAT LOSS CALCULATION CFM 79.5 CFM X AT 1°F 78 F X FACTOR 1.08 X % LOSS 0.25	

SUPPLEMENTAL FANS		BY INSTALLING CONTRACTOR	HVI	Sones
Location	Model	cfm		
ENS	BY INSTALLING CONTRACTOR	50	☒	3.5
BATH	BY INSTALLING CONTRACTOR	50	☒	3.5
B-BATH	BY INSTALLING CONTRACTOR	50	☒	3.5
PWD	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 #	001820
Date:	April-21

CSA F280-12 Residential Heat Loss and Heat Gain Calculations
Formula Sheet (For Air Leakage / Ventilation Calculation)

LO#: 87609

Model: 38-8

Builder: ROYAL PINE HOMES

Date: 4/19/2021

Volume Calculation
Air Change & Delta T Data
House Volume

Level	Floor Area (ft²)	Floor Height (ft)	Volume (ft³)
Bsmt	1042	10	10420
First	1042	10	10524.2
Second	1324	9	11916
Third	0	9	0
Fourth	0	9	0
Total:			32,860.2 ft³
Total:			930.5 m³

WINTER NATURAL AIR CHANGE RATE	0.227
SUMMER NATURAL AIR CHANGE RATE	0.071

Design Temperature Difference				
	Tin °C	Tout °C	ΔT °C	ΔT °F
Winter DTDh	22	-21	43	78
Summer DTDc	24	31	7	13

5.2.3.1 Heat Loss due to Air Leakage
6.2.6 Sensible Gain due to Air Leakage

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

0.227 x 258.47 x 43 °C x 1.2 = 3037 W

= 10362 Btu/h

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

0.071 x 258.47 x 7 °C x 1.2 = 156 W

= 532 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)

$$HL_{airr} = Level\ Factor \times HL_{airbv} \times \{(HL_{agcr} + HL_{bgcr}) \div (HL_{agclevel} + HL_{bgclevel})\}$$

Level	Level Factor (LF)	HLairbv Air Leakage + Ventilation Heat Loss (Btu/h)	Level Conductive Heat Loss: (HL _{level})	Air Leakage Heat Loss Multiplier (LF x HLairbv / HLlevel)
1	0.5	10,362	8,317	0.623
2	0.3		9,868	0.315
3	0.2		11,296	0.183
4	0		0	0.000
5	0		0	0.000

*HLairbv = Air leakage heat loss + ventilation heat loss

*For a balanced or supply only ventilation system HLairve = 0

HEAT LOSS AND GAIN SUMMARY SHEET

MODEL: 38-8	FIN BSMT WUB	BUILDER: ROYAL PINE HOMES
SFQT: 2366	LO# 87609	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):	32860.2	ASSUMED (Y/N):	Y
INTERNAL SHADING:	BLINDS/CURTAINS	ASSUMED OCCUPANTS:	5
INTERIOR LIGHTING LOAD (Btu/h/ft ²):	1.60	DC BRUSHLESS MOTOR (Y/N):	Y
FOUNDATION CONFIGURATION	BCIN_1	DEPTH BELOW GRADE:	7.0 ft
LENGTH: 48.0 ft	WIDTH: 31.0 ft	EXPOSED PERIMETER:	137.0 ft

2012 OBC - COMPLIANCE PACKAGE**Component****Compliance Package
SB-12 PERFORMANCE****Nominal Min. Eff.**

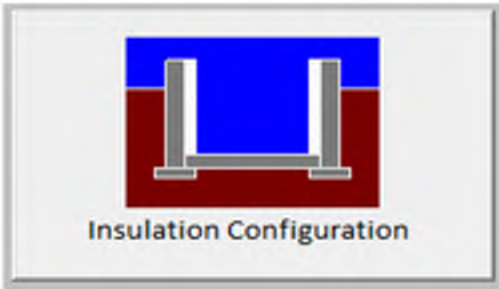
Ceiling with Attic Space Minimum RSI (R)-Value	60	59.20
Ceiling Without Attic Space Minimum RSI (R)-Value	31	27.70
Exposed Floor Minimum RSI (R)-Value	31	29.80
Walls Above Grade Minimum RSI (R)-Value	22+1.5	18.50
Basement Walls Minimum RSI (R)-Value	20	21.12
Below Grade Slab Entire surface > 600 mm below grade Minimum RSI (R)-Value	-	-
Edge of Below Grade Slab ≤ 600 mm Below Grade Minimum RSI (R)-Value	10	10
Heated Slab or Slab ≤ 600 mm below grade Minimum RSI (R)-Value	10	11.13
Windows and Sliding Glass Doors Maximum U-Value	1.6	-
Skylights Maximum U-Value	2.6	-
Space Heating Equipment Minimum AFUE	0.96	-
HRV Minimum Efficiency	75%	-
Domestic Hot Water Heater Minimum EF	TE=94%	-

INDIVIDUAL BCIN: 19669
MICHAEL O'ROURKE



Residential Foundation Thermal Load Calculator

Supplemental tool for CAN/CSA-F280

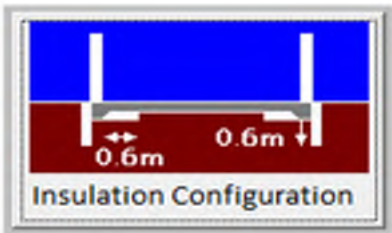
Weather Station Description		
Province:	Ontario	
Region:	Richmond Hill	
Site Description		
Soil Conductivity:	Normal conductivity: dry sand, loam, clay	
Water Table:	Normal (7-10 m, 23-33 ft)	
Foundation Dimensions		
Floor Length (m):	14.6	
Floor Width (m):	9.4	
Exposed Perimeter (m):	41.8	
Wall Height (m):	3.0	
Depth Below Grade (m):	2.13	
Window Area (m ²):	1.1	
Door Area (m ²):	3.7	
Radiant Slab		
Heated Fraction of the Slab:	0	
Fluid Temperature (°C):	33	
Design Months		
Heating Month	1	
Foundation Loads		
Heating Load (Watts):		1327

TYPE: 38-8
LO# 87609

FIN BSMT WUB

Residential Slab on Grade Thermal Load Calculator

Supplemental tool for CAN/CSA-F280

Weather Station Description		
Province:	Ontario	CITY OF RICHMOND HILL BUILDING DIVISION
Region:	Richmond Hill	
Site Description		09/13/2021
Soil Conductivity:	Normal conductivity: dry sand, loam, clay	
Water Table:	Normal (7-10 m, 23-33 ft)	
Foundation Dimensions		
Length (m):	0.6	
Width (m):	5.8	
Exposed Perimeter (m):	6.4	
Radiant Slab		
Heated Fraction of the Slab:	0	
Fluid Temperature (°C):	33	
Design Months		
Heating Month	1	
Results		
Heating Load (Watts):		56

TYPE: 38-8
LO# 87609

FIN BSMT WUB

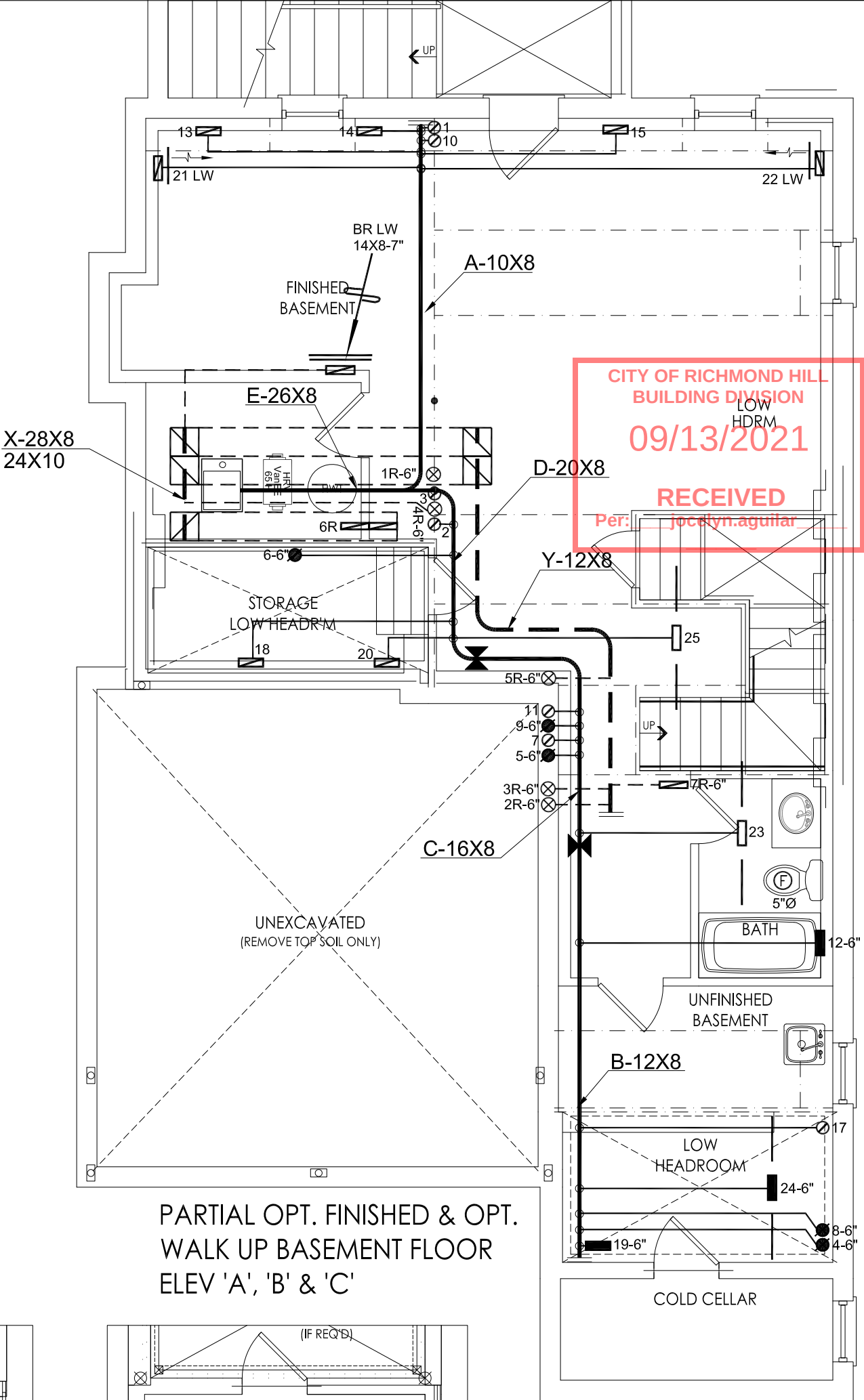
Air Infiltration Residential Load Calculator

Supplemental tool for CAN/CSA-F280

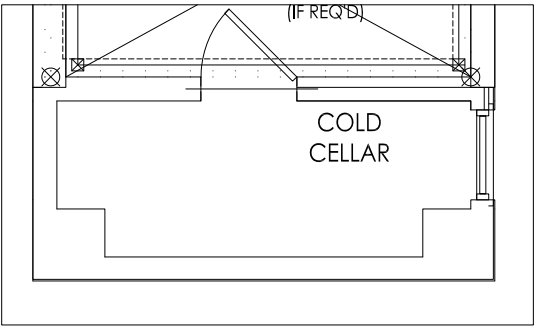
Weather Station Description				
Province:	Ontario			
Region:	Richmond Hill			
Weather Station Location:	Open flat terrain, grass			
Anemometer height (m):	10			
Local Shielding				
Building Site:	Suburban, forest			
Walls:	Heavy			
Flue:	Heavy			
Highest Ceiling Height (m):	6.74			
Building Configuration				
Type:	Detached			
Number of Stories:	Two			
Foundation:	Full			
House Volume (m ³):	930.5			
Air Leakage/Ventilation				
Air Tightness Type:	Energy Star Detached (2.5 ACH)			
Custom BDT Data:	ELA @ 10 Pa.	868.6 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):	0.227			
Cooling Air Leakage Rate (ACH/H):	0.071			

TYPE: 38-8
LO# 87609

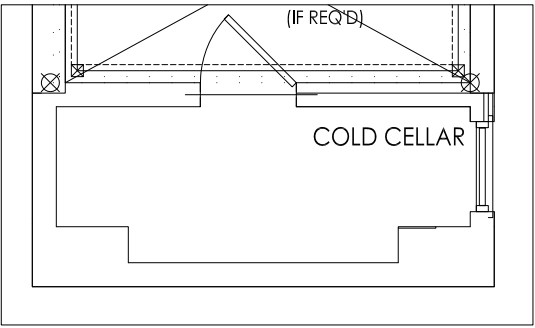
FIN BSMT WUB



PARTIAL OPT. FINISHED & OPT. WALK UP BASEMENT FLOOR ELEV 'A', 'B' & 'C'



BASEMENT FLOOR PLAN ELEV. 'B'



BASEMENT FLOOR PLAN ELEV. 'C'

WUB

CSA-F280-12

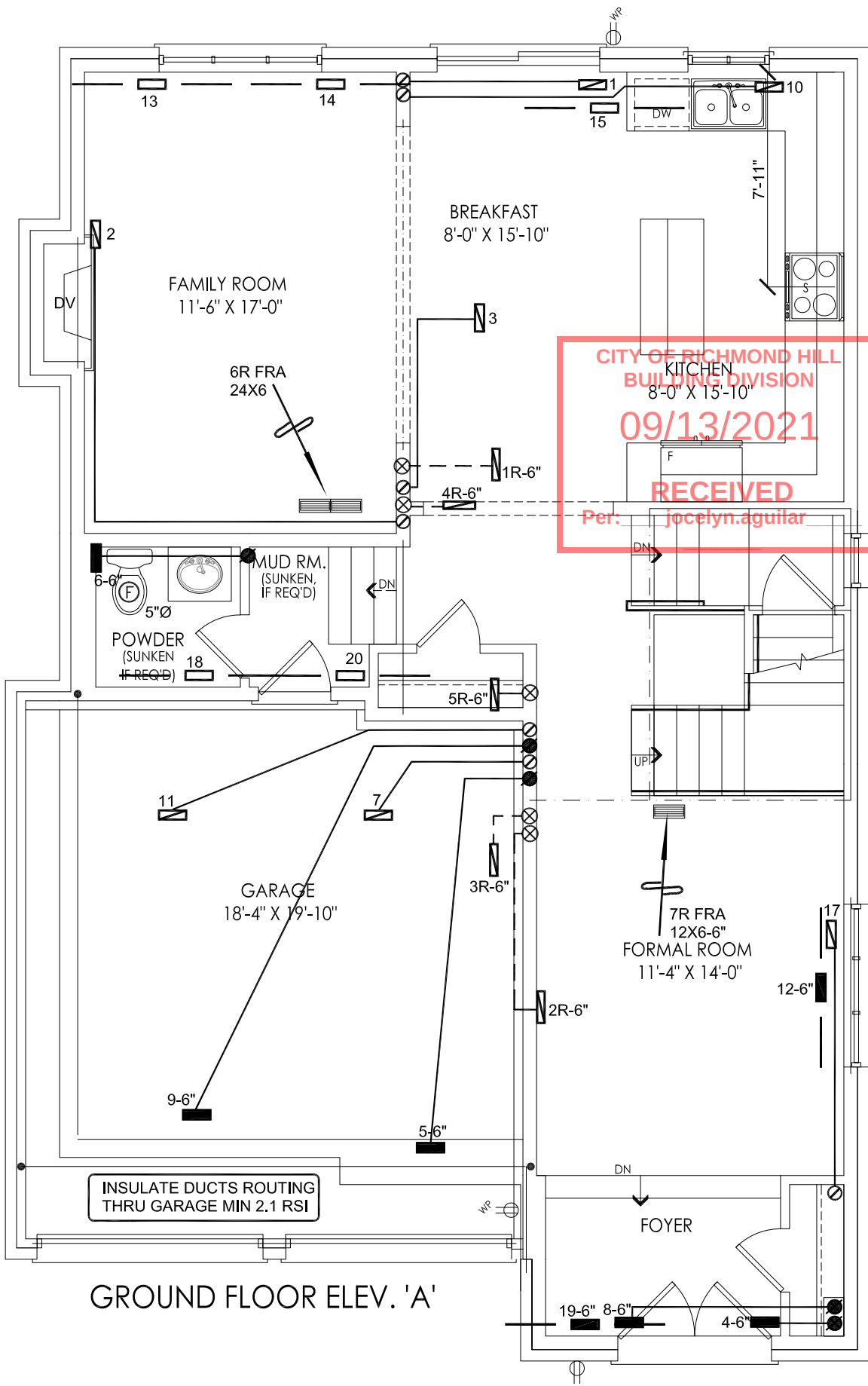
SB-12 PERFORMANCE

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

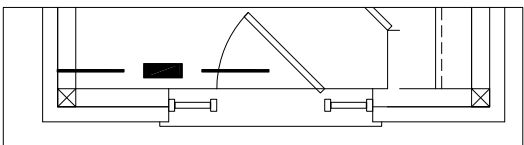
HVAC LEGEND								3.		
SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	2.	REVISED AS PER ARCHITECTURALS	APR/2021
	SUPPLY AIR GRILLE		6" SUPPLY AIR BOOT ABOVE		14"x8" RETURN AIR GRILLE		RETURN AIR STACK ABOVE	1.	REVISED TO PERFORMANCE	SEPT/2020
	SUPPLY AIR GRILLE 6" BOOT		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		

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.

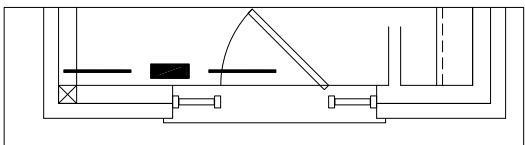
Client	 375 Finley Ave. Suite 202 - Ajax, Ontario L1S 2E2 Tel. 905.619.2300 - 905.420.5300 Fax 905.619.2375 Email: info@hvacdesigns.ca Web: www.hvacdesigns.ca Specializing in Residential Mechanical Design Services Installation to comply with the latest Ontario Building Code. All supply branch outlets 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 41915 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-060-14V		2ND FLOOR	12	5	3			
		INPUT 60 MBTU/H		1ST FLOOR	7	2	2	Date	SEPT/2020	
		OUTPUT 58 MBTU/H		BASEMENT	5	1	1	Scale	3/16" = 1'-0"	
FIN BSMT WUB 38-8	2366 sqft	COOLING 2.5 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			BCIN# 19669				
		FAN SPEED 970 cfm @ 0.6" w.c.				LO#		87609		



GROUND FLOOR ELEV. 'A'



GROUND FLOOR PLAN ELEV. 'B'



GROUND FLOOR PLAN ELEV. 'C'

WUB

CSA-F280-12

SB-12 PERFORMANCE

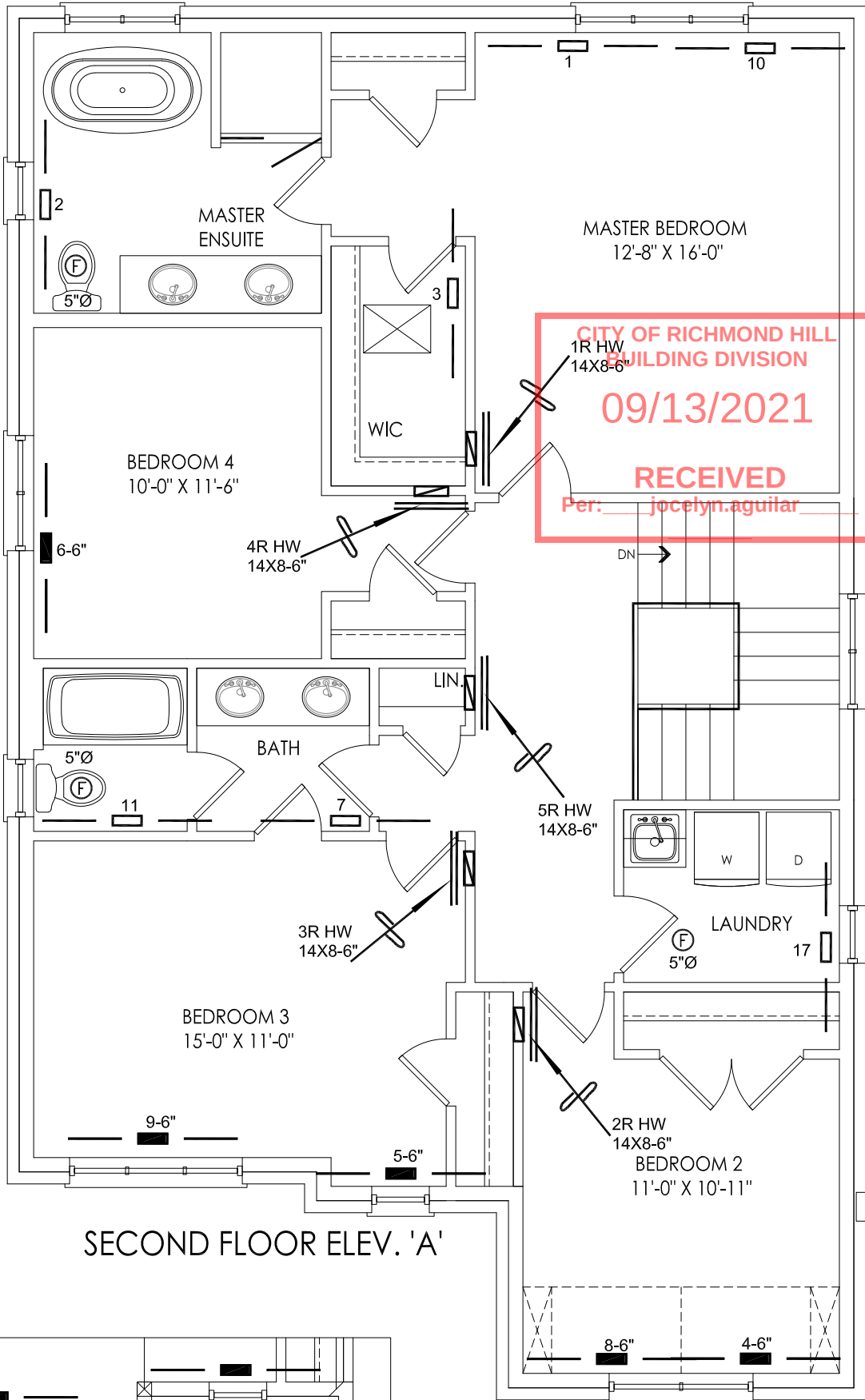
I MICHAEL O'ROURKE HAVE REVIEWED AND TAKE RESPONSIBILITY FOR THE DESIGN WORK AND AM QUALIFIED UNDER DIVISION C, 3.2.5 OF THE BUILDING CODE.

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

HVAC LEGEND								3.		
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		

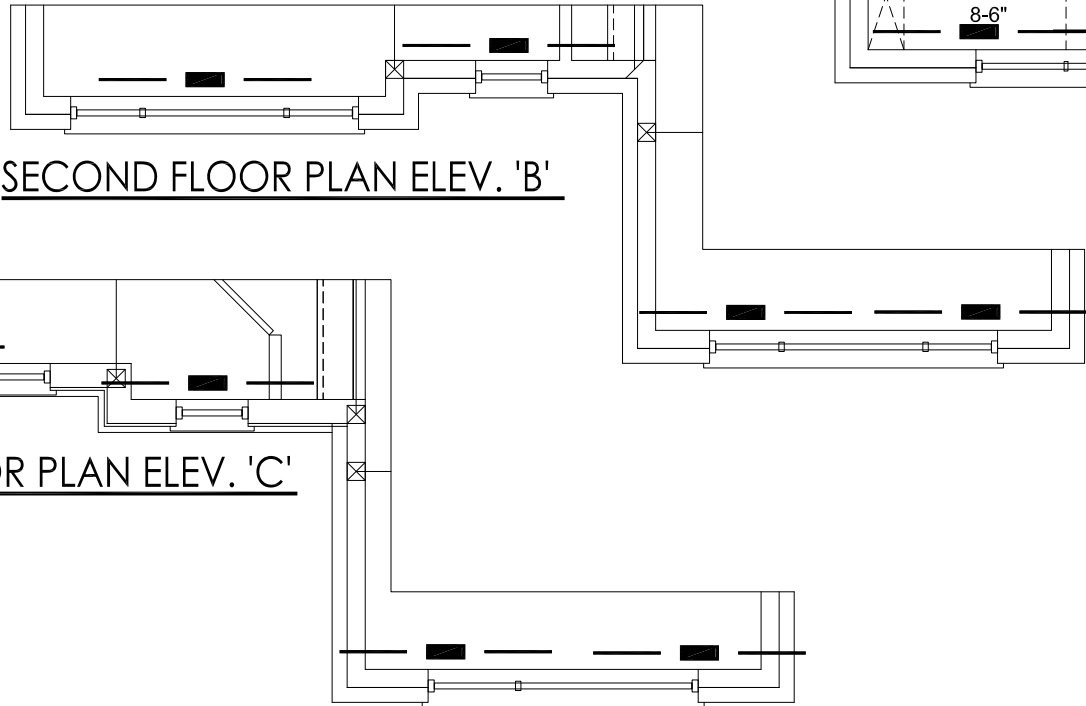
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Client		 375 Finley Ave. Suite 202 - Ajax, Ontario L1S 2E2 Tel. 905.619.2300 - 905.420.5300 Fax 905.619.2375 Email: info@hvacdesigns.ca Web: www.hvacdesigns.ca Specializing in Residential Mechanical Design Services	Sheet Title	
ROYAL PINE HOMES			FIRST 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.	Date	SEPT/2020
CENTREFIELD (WEST GORMLEY) RICHMOND HILL, ONTARIO			Scale	3/16" = 1'-0"
FIN BSMT WUB 38-8			BCIN# 19669	
2366 sqft			LO#	87609

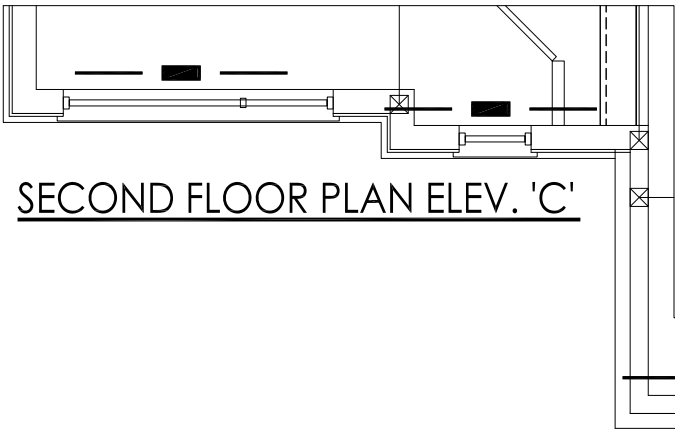


CITY OF RICHMOND HILL
BUILDING DIVISION
09/13/2021
RECEIVED
Per: jocelyn.aguiar

SECOND FLOOR ELEV. 'A'



SECOND FLOOR PLAN ELEV. 'B'



SECOND FLOOR PLAN ELEV. 'C'

WUB

CSA-F280-12

SB-12 PERFORMANCE

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.

HVAC LEGEND								3.		
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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ROYAL PINE HOMES			SECOND FLOOR HEATING LAYOUT	
Project Name			Date	SEPT/2020
CENTREFIELD (WEST GORMLEY) RICHMOND HILL, ONTARIO			Scale	3/16" = 1'-0"
FIN BSMT WUB 38-8			BCIN# 19669	
2366 sqft		LO# 87609		

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: 38-8 Ashton Project: CENTREFIELD (WEST GORMLEY)	
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.			
April 19, 2021		 Signature of Designer	
Date		CITY OF RICHMOND HILL BUILDING DIVISION 08/12/2021 RECEIVED Per: <u>laura.dalbarto</u>	

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

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: 38-8 Ashton 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.			
April 19, 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

SITE NAME: CENTREFIELD (WEST GORMLEY)

BUILDER: ROYAL PINE HOMES

TYPE: 38-8

GFA: 2366

DATE: Apr-21

LO# 87608

WINTER NATURAL AIR CHANGE RATE 0.227

SUMMER NATURAL AIR CHANGE RATE 0.071

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				
			36	21	0	34	29	12	6				
			9	9	9	9	9	9	9				
FACTORS													
GRS.WALL AREA	LOSS	GAIN	324	189	0	306	261	108	54				
GLAZING	LOSS	GAIN	LOSS	GAIN	LOSS	GAIN	LOSS	GAIN	LOSS	GAIN			
NORTH	21.8	16.0	0	0	0	8	174	128	0	0	0	7	152
EAST	21.8	41.6	26	566	1080	17	370	706	0	0	0	0	0
SOUTH	21.8	24.9	11	240	274	0	0	0	0	0	0	0	0
WEST	21.8	41.6	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
DOORS	25.8	4.3	0	0	0	0	0	0	0	0	0	0	0
NET EXPOSED WALL	4.2	0.7	287	1207	199	164	690	113	0	0	0	47	198
NET EXPOSED BSMT WALL ABOVE GR	3.7	0.6	0	0	0	0	0	0	0	0	0	0	0
EXPOSED CLG	1.3	0.6	241	317	142	123	162	72	75	99	44	105	138
NO ATTIC EXPOSED CLG	2.8	1.3	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	75	196
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			2330		1396	99	2234	2711	970	684			
SUB TOTAL HT GAIN				1694	1020	44	1856	2269	432	238			
LEVEL FACTOR / MULTIPLIER	0.20	0.18			0.20	0.18		0.20	0.18		0.20	0.18	
AIR CHANGE HEAT LOSS			427		256	18	410	497	178	125			
AIR CHANGE HEAT GAIN				98	59	3	107	131	25	14			
DUCT LOSS			0		0		0	321		81			
DUCT GAIN			0		0		0	325		25			
HEAT GAIN PEOPLE	240		2	480	0	0	1	240	1	240	0		
HEAT GAIN APPLIANCES/LIGHTS				606	0	0		606		606			
TOTAL HT LOSS BTU/H			2757		1652	117	2643	3529	1148	890			
TOTAL HT GAIN x 1.3 BTU/H				3742	1403	61	3652	4641	1693	360			

CITY OF RICHMOND HILL
BUILDING DIVISION

09/13/2021

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Per: jocelyn aguilar

ROOM USE	EXP. WALL	CLG. HT.	FORM	FAM	KT/BR	LAUN	PWD	FOY	MUD	BAS
			31	33	40	12	13	27	8	158
			10	10	10	9	11	11	11	10
FACTORS										
GRS.WALL AREA	LOSS	GAIN	313	333	404	108	144	300	89	1106
GLAZING	LOSS	GAIN	LOSS	GAIN	LOSS	GAIN	LOSS	GAIN	LOSS	GAIN
NORTH	21.8	16.0	0	0	0	0	0	0	0	0
EAST	21.8	41.6	0	0	0	34	741	1413	12	261
SOUTH	21.8	24.9	31	675	772	0	0	0	7	152
WEST	21.8	41.6	0	0	0	0	0	0	0	0
SKYLT.	35.8	101.2	0	0	0	0	0	0	0	0
DOORS	25.8	4.3	0	0	0	0	0	0	0	0
NET EXPOSED WALL	4.2	0.7	282	1186	195	299	1259	207	385	1619
NET EXPOSED BSMT WALL ABOVE GR	3.7	0.6	0	0	0	0	0	0	0	0
EXPOSED CLG	1.3	0.6	0	0	0	10	13	6	0	0
NO ATTIC EXPOSED CLG	2.8	1.3	0	0	0	0	0	0	0	0
EXPOSED FLOOR	2.6	0.4	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			1862		2012	2033	874	607	2548	806
SUB TOTAL HT GAIN				967	1626	939		540	100	1330
LEVEL FACTOR / MULTIPLIER	0.30	0.32			0.30	0.32		0.30	0.32	
AIR CHANGE HEAT LOSS			586		634	640		191		803
AIR CHANGE HEAT GAIN				56	94	54		31	6	77
DUCT LOSS			0		0	0		0		0
DUCT GAIN			0		0	0		0		0
HEAT GAIN PEOPLE	240		0	0	0	0		0	0	0
HEAT GAIN APPLIANCES/LIGHTS				606	606	606		0		0
TOTAL HT LOSS BTU/H			2448		2646	2673	1034	798	3351	1060
TOTAL HT GAIN x 1.3 BTU/H				2117	3023	2079	1531	137	1829	182

TOTAL HEAT GAIN BTU/H:

28574

TONS: 2.38

LOSS DUE TO VENTILATION LOAD BTU/H: 1670

STRUCTURAL HEAT LOSS: 39769

TOTAL COMBINED HEAT LOSS BTU/H: 41439

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

TYPE: 38-8

DATE: Apr-21

GFA: 2366

LO# 87608

HEATING CFM 970 COOLING CFM 970
TOTAL HEAT LOSS 39,769 TOTAL HEAT GAIN 28,299
AIR FLOW RATE CFM 24.39 AIR FLOW RATE CFM 34.28

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

****CARRIER**

AFUE = 97 %

59TN6A-060-14V

INPUT (BTU/H) = 60,000

FAN SPEED 60

OUTPUT (BTU/H) = **58,000**

LOW 820

MEDLOW 0

MEDIUM 970

MEDIUM HIGH 0

HIGH 1520

DESIGN CFM = **970**

CFM @ .6" E.S.P.

TEMPERATURE RISE 55 °F

RUN COUNT	4th	3rd	2nd	1st	Bas
S/A	0	0	12	7	4
R/A	0	0	5	2	1

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

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

RUN #	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	17	18	19	20	21	22	23	24
ROOM NAME	MBR	ENS	WIC	BED-2	BED-3	BED-4	BATH	BED-2	BED-3	MBR	BATH	FORM	FAM	FAM	KT/BR	LAUN	PWD	FOY	MUD	BAS	BAS	BAS	BAS
RM LOSS MBH.	1.38	1.65	0.12	1.32	1.76	1.15	0.45	1.32	1.76	1.38	0.45	2.45	1.32	1.32	2.67	1.03	0.80	3.35	1.06	3.26	3.26	3.26	3.26
CFM PER RUN HEAT	34	40	3	32	43	28	11	32	43	34	11	60	32	32	65	25	19	82	26	79	79	79	79
RM GAIN MBH.	1.87	1.40	0.06	1.83	2.32	1.69	0.18	1.83	2.32	1.87	0.18	2.12	1.51	1.51	2.08	1.53	0.14	1.83	0.18	0.46	0.46	0.46	0.46
CFM PER RUN COOLING	64	48	2	63	80	58	6	63	80	64	6	73	52	52	71	52	5	63	6	16	16	16	16
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	0.17	0.17	0.17	0.17	0.17	0.16	0.17	0.17	0.17	0.17	0.17
ACTUAL DUCT LGH.	39	43	27	67	52	34	42	72	56	46	48	43	32	26	31	69	25	47	12	27	32	36	51
EQUIVALENT LENGTH	130	180	180	200	170	0	180	200	190	140	200	190	140	120	140	220	120	160	120	140	150	130	170
TOTAL EFFECTIVE LENGTH	169	223	207	267	222	34	222	272	246	186	248	233	172	146	171	289	145	207	132	167	182	166	221
ADJUSTED PRESSURE	0.1	0.08	0.08	0.06	0.08	0.51	0.08	0.06	0.07	0.09	0.07	0.07	0.1	0.12	0.1	0.06	0.12	0.08	0.13	0.1	0.09	0.1	0.08
ROUND DUCT SIZE	5	5	4	6	6	6	4	6	6	5	4	6	5	4	5	5	4	6	4	5	5	5	6
HEATING VELOCITY (ft/min)	250	294	34	163	219	143	126	163	219	250	126	306	235	367	477	184	218	418	298	580	580	580	403
COOLING VELOCITY (ft/min)	470	352	23	321	408	296	69	321	408	470	69	372	382	597	521	382	57	321	69	117	117	117	82
OUTLET GRILL SIZE	3X10	3X10	3X10	4X10	4X10	4X10	3X10	4X10	4X10	3X10	3X10	4X10	3X10	3X10	3X10	3X10	3X10	4X10	3X10	3X10	3X10	3X10	4X10
TRUNK	A	D	D	B	C	D	C	B	C	A	C	B	A	A	A	B	D	B	D	A	A	C	B

RUN #	ROOM NAME	RM LOSS MBH.	CFM PER RUN HEAT	RM GAIN MBH.	CFM PER RUN COOLING	ADJUSTED PRESSURE	ACTUAL DUCT LGH.	EQUIVALENT LENGTH	TOTAL EFFECTIVE LENGTH	ADJUSTED PRESSURE	ROUND DUCT SIZE	HEATING VELOCITY (ft/min)	COOLING VELOCITY (ft/min)	OUTLET GRILL SIZE	TRUNK
1	MBR	1.38	34	1.87	64	0.17	39	130	169	0.1	5	250	470	3X10	A
2	ENS	1.65	40	1.40	48	0.17	43	180	223	0.08	5	294	352	3X10	D
3	WIC	0.12	3	0.06	2	0.17	27	180	207	0.08	4	34	23	3X10	D
4	BED-2	1.32	32	1.83	63	0.17	67	200	267	0.06	6	163	321	4X10	B
5	BED-3	1.76	43	2.32	80	0.17	52	170	222	0.08	6	219	408	4X10	C
6	BED-4	1.15	28	1.69	58	0.17	34	0	222	0.51	6	143	296	4X10	D
7	BATH	0.45	11	1.83	6	0.17	42	180	272	0.08	4	126	69	3X10	C
8	BED-2	1.32	32	2.32	63	0.17	72	200	246	0.06	6	163	321	4X10	B
9	BED-3	1.76	43	2.32	80	0.17	56	190	246	0.07	6	219	408	4X10	C
10	MBR	1.38	34	1.87	64	0.17	46	140	186	0.09	5	250	470	3X10	A
11	BATH	0.45	11	2.12	6	0.17	48	200	248	0.07	4	126	69	3X10	C
12	FORM	2.45	60	2.12	73	0.17	43	190	233	0.07	6	306	372	4X10	B
13	FAM	1.32	32	1.51	52	0.17	32	140	172	0.1	5	235	382	3X10	A
14	FAM	1.32	32	1.51	52	0.17	26	120	146	0.12	4	367	597	3X10	A
15	KT/BR	2.67	65	2.08	71	0.17	31	140	171	0.1	5	477	521	3X10	A
17	LAUN	1.03	25	1.53	52	0.17	69	220	289	0.06	5	184	382	3X10	B
18	PWD	0.80	19	0.14	5	0.17	25	120	145	0.12	4	218	57	3X10	D
19	FOY	3.35	82	1.83	6	0.16	47	160	207	0.08	6	418	321	4X10	B
20	MUD	1.06	26	0.18	6	0.17	12	120	132	0.13	4	298	69	3X10	D
21	BAS	3.26	79	0.46	16	0.17	27	140	167	0.1	5	580	117	3X10	A
22	BAS	3.26	79	0.46	16	0.17	32	150	182	0.09	5	580	117	3X10	A
23	BAS	3.26	79	0.46	16	0.17	36	130	166	0.1	5	580	117	3X10	C
24	BAS	3.26	79	0.46	16	0.17	51	170	221	0.08	6	403	82	4X10	B

RECEIVED
Per: jocelyn.aguilar

SUPPLY AIR TRUNK SIZE																RETURN AIR TRUNK SIZE							
	TRUNK CFM	STATIC PRESS.	ROUND DUCT	RECT DUCT			VELOCITY (ft/min)		TRUNK CFM	STATIC PRESS.	ROUND DUCT	RECT DUCT			VELOCITY (ft/min)		TRUNK CFM	STATIC PRESS.	ROUND DUCT	RECT DUCT			VELOCITY (ft/min)
TRUNK A	355	0.09	9.2	10	x	8	639	TRUNK G	0	0.00	0	0	x	8	0	TRUNK O	0	0.05	0	0	x	8	0
TRUNK B	310	0.06	9.7	12	x	8	465	TRUNK H	0	0.00	0	0	x	8	0	TRUNK P	0	0.05	0	0	x	8	0
TRUNK C	497	0.06	11.6	16	x	8	559	TRUNK I	0	0.00	0	0	x	8	0	TRUNK Q	0	0.05	0	0	x	8	0
TRUNK D	613	0.06	12.5	20	x	8	552	TRUNK J	0	0.00	0	0	x	8	0	TRUNK R	0	0.05	0	0	x	8	0
TRUNK E	968	0.06	14.9	26	x	8	670	TRUNK K	0	0.00	0	0	x	8	0	TRUNK S	0	0.05	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	TRUNK T	0	0.05	0	0	x	8	0
																TRUNK U	0	0.05	0	0	x	8	0
																TRUNK V	0	0.05	0	0	x	8	0
																TRUNK W	0	0.05	0	0	x	8	0
RETURN AIR #	1	2	3	4	5	6	7								BR	TRUNK X	970	0.05	15.6	28	x	8	624
AIR VOLUME	85	75	75	100	75	320	85	0	0	0	0	0	0	0	155	TRUNK Y	310	0.05	10.2	12	x	8	465
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	TRUNK Z	0	0.05	0	0	x	8	0
ACTUAL DUCT LGH.	40	70	61	39	58	20	42	1	1	1	1	1	1	1	14	DROP	970	0.05	15.6	24	x	10	582
EQUIVALENT LENGTH	225	250	245	155	225	175	225	0	0	0	0	0	0	0	135								
TOTAL EFFECTIVE LH	265	320	306	194	283	195	267	1	1	1	1	1	1	1	149								
ADJUSTED PRESSURE	0.06	0.05	0.05	0.08	0.05	0.08	0.06	14.80	14.80	14.80	14.80	14.80	14.80	14.80	0.10								
ROUND DUCT SIZE	6	6	6	5.9	6	9.2	6	0	0	0	0	0	0	0	6.6								
INLET GRILL SIZE	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								
INLET GRILL SIZE	14	14	14	14	14	30	14	0	0	0	0	0	0	0	14								

TYPE: 38-8
SITE NAME: CENTREFIELD (WEST GORMLEY)

LO # 87608

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>3</u> @ 10.6 cfm <u>31.8</u> cfm	
Kitchen & Bathrooms	<u>4</u> @ 10.6 cfm <u>42.4</u> cfm	
Other Rooms	<u>4</u> @ 10.6 cfm <u>42.4</u> cfm	
Table 9.32.3.A.	TOTAL <u>159.0</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>159</u> cfm	
Less Principal Ventil. Capacity	<u>79.5</u> cfm	
Required Supplemental Capacity	<u>79.5</u> cfm	

PRINCIPAL EXHAUST FAN CAPACITY	
Model: VANEE 65H	Location: BSMT
<u>79.5</u> cfm	☒ HVI Approved
HEAT LOSS CALCULATION CFM <u>79.5</u> X <u>1.08</u> X <u>0.25</u> = <u>21.2</u> BTU/H @ 78 F	

SUPPLEMENTAL FANS		BY INSTALLING CONTRACTOR	HVI	Sones
Location	Model	cfm		
ENS	BY INSTALLING CONTRACTOR	50	☒	3.5
BATH	BY INSTALLING CONTRACTOR	50	☒	3.5
PWD	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 #	001820
Date:	April-21

CSA F280-12 Residential Heat Loss and Heat Gain Calculations																																																												
Formula Sheet (For Air Leakage / Ventilation Calculation)																																																												
LO#: 87608	Model: 38-8	Builder: ROYAL PINE HOMES	Date: 4/19/2021																																																									
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																																																									
$HL_{airb} = LR_{airh} \times \frac{V_b}{3.6} \times DTD_h \times 1.2$ 0.227 x 258.47 x 43 °C x 1.2 = 3037 W = 10362 Btu/h			$HG_{salb} = LR_{airc} \times \frac{V_b}{3.6} \times DTD_c \times 1.2$ = 0.071 x 258.47 x 7 °C x 1.2 = 156 W = 532 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>HLairbv Air Leakage + Ventilation Heat Loss (Btu/h)</th> <th>Level Conductive Heat Loss: (HL_{level})</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" style="text-align: center; vertical-align: middle;">10,362</td> <td style="text-align: center;">7,840</td> <td style="text-align: center;">0.661</td> </tr> <tr> <td>2</td> <td>0.3</td> <td style="text-align: center;">9,868</td> <td style="text-align: center;">0.315</td> </tr> <tr> <td>3</td> <td>0.2</td> <td style="text-align: center;">11,296</td> <td style="text-align: center;">0.183</td> </tr> <tr> <td>4</td> <td>0</td> <td style="text-align: center;">0</td> <td style="text-align: center;">0.000</td> </tr> <tr> <td>5</td> <td>0</td> <td style="text-align: center;">0</td> <td style="text-align: center;">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)	HLairbv Air Leakage + Ventilation Heat Loss (Btu/h)	Level Conductive Heat Loss: (HL _{level})	Air Leakage Heat Loss Multiplier (LF x HLairbv / HLlevel)	1	0.5	10,362	7,840	0.661	2	0.3	9,868	0.315	3	0.2	11,296	0.183	4	0	0	0.000	5	0	0	0.000																														
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HEAT LOSS AND GAIN SUMMARY SHEET

MODEL: 38-8	BUILDER: ROYAL PINE HOMES
SFQT: 2366	SITE: CENTREFIELD (WEST GORMLEY)
LO# 87608	

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):	32860.2	ASSUMED (Y/N):	Y
INTERNAL SHADING:	BLINDS/CURTAINS	ASSUMED OCCUPANTS:	5
INTERIOR LIGHTING LOAD (Btu/h/ft ²):	1.60	DC BRUSHLESS MOTOR (Y/N):	Y
FOUNDATION CONFIGURATION	BCIN_1	DEPTH BELOW GRADE:	7.0 ft
LENGTH: 48.0 ft	WIDTH: 31.0 ft	EXPOSED PERIMETER:	158.0 ft

2012 OBC - COMPLIANCE PACKAGE**Component****Compliance Package
SB-12 PERFORMANCE****Nominal Min. Eff.**

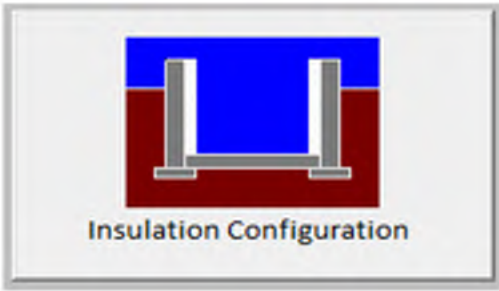
Ceiling with Attic Space Minimum RSI (R)-Value	60	59.20
Ceiling Without Attic Space Minimum RSI (R)-Value	31	27.70
Exposed Floor Minimum RSI (R)-Value	31	29.80
Walls Above Grade Minimum RSI (R)-Value	22+1.5	18.50
Basement Walls Minimum RSI (R)-Value	20	21.12
Below Grade Slab Entire surface > 600 mm below grade Minimum RSI (R)-Value	-	-
Edge of Below Grade Slab ≤ 600 mm Below Grade Minimum RSI (R)-Value	10	10
Heated Slab or Slab ≤ 600 mm below grade Minimum RSI (R)-Value	10	11.13
Windows and Sliding Glass Doors Maximum U-Value	1.6	-
Skylights Maximum U-Value	2.6	-
Space Heating Equipment Minimum AFUE	0.96	-
HRV Minimum Efficiency	75%	-
Domestic Hot Water Heater Minimum EF	TE=94%	-

INDIVIDUAL BCIN: 19669
MICHAEL O'ROURKE



Residential Foundation Thermal Load Calculator

Supplemental tool for CAN/CSA-F280

Weather Station Description		
Province:	Ontario	
Region:	Richmond Hill	
Site Description		
Soil Conductivity:	Normal conductivity: dry sand, loam, clay	
Water Table:	Normal (7-10 m, 23-33 ft)	
Foundation Dimensions		
Floor Length (m):	14.6	 Insulation Configuration
Floor Width (m):	9.4	
Exposed Perimeter (m):	0.0	
Wall Height (m):	3.0	
Depth Below Grade (m):	2.13	
Window Area (m ²):	1.1	
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):		1558

CITY OF RICHMOND HILL
BUILDING DIVISION

09/13/2021

RECEIVED

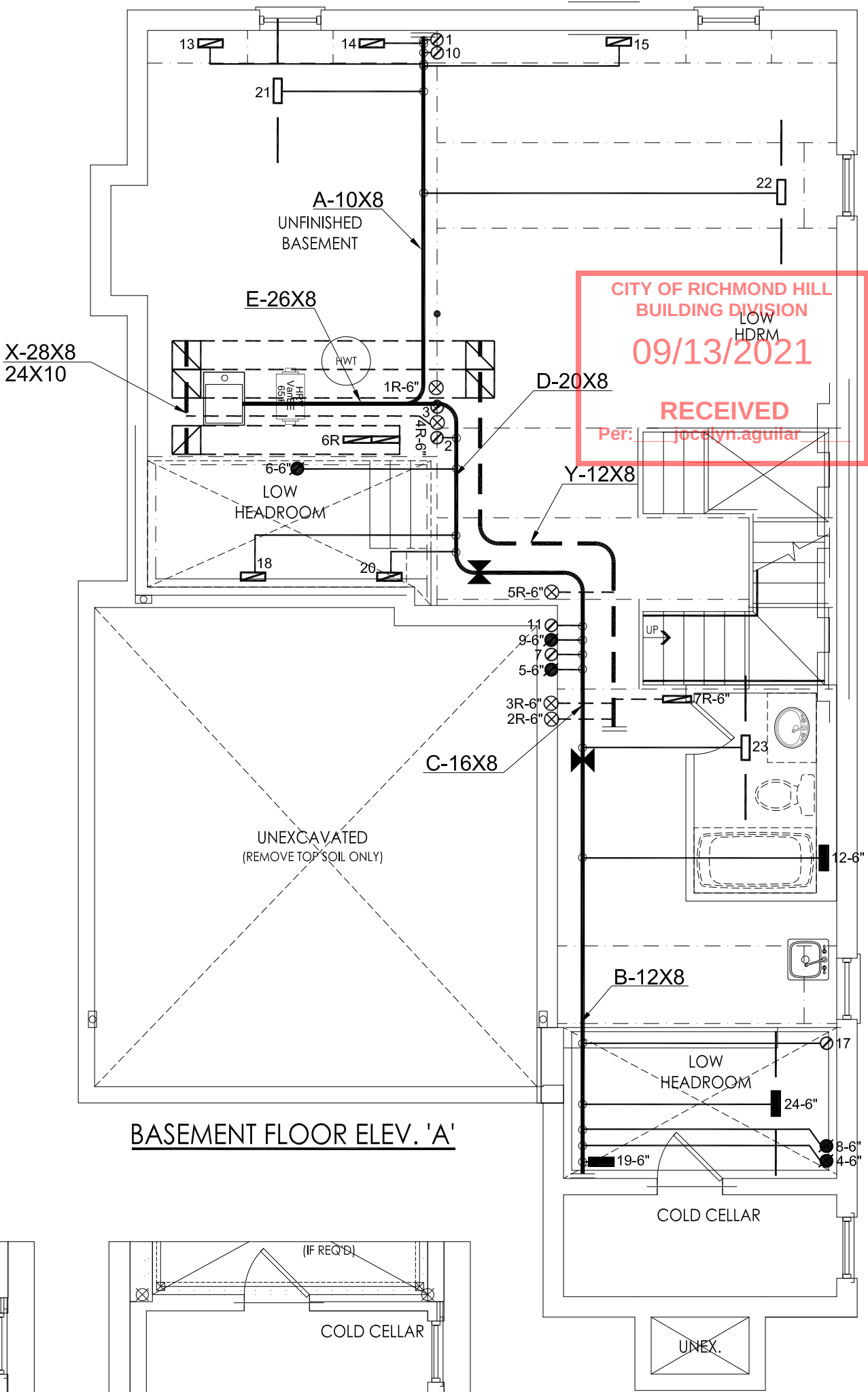
Per: _____jocelyn.aguilar_____

Air Infiltration Residential Load Calculator

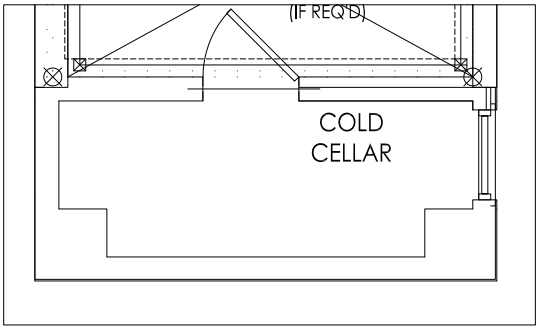
Supplemental tool for CAN/CSA-F280

Weather Station Description				
Province:	Ontario			
Region:	Richmond Hill			
Weather Station Location:	Open flat terrain, grass			
Anemometer height (m):	10			
Local Shielding				
Building Site:	Suburban, forest			
Walls:	Heavy			
Flue:	Heavy			
Highest Ceiling Height (m):	6.74			
Building Configuration				
Type:	Detached			
Number of Stories:	Two			
Foundation:	Full			
House Volume (m ³):	930.5			
Air Leakage/Ventilation				
Air Tightness Type:	Energy Star Detached (2.5 ACH)			
Custom BDT Data:	ELA @ 10 Pa.	868.6 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):	0.227			
Cooling Air Leakage Rate (ACH/H):	0.071			

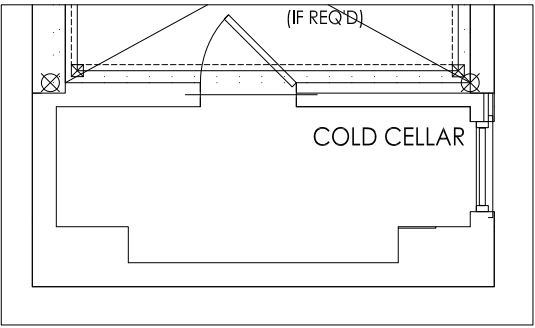
TYPE: 38-8
LO# 87608



BASEMENT FLOOR ELEV. 'A'



BASEMENT FLOOR PLAN ELEV. 'B'



BASEMENT FLOOR PLAN ELEV. 'C'

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

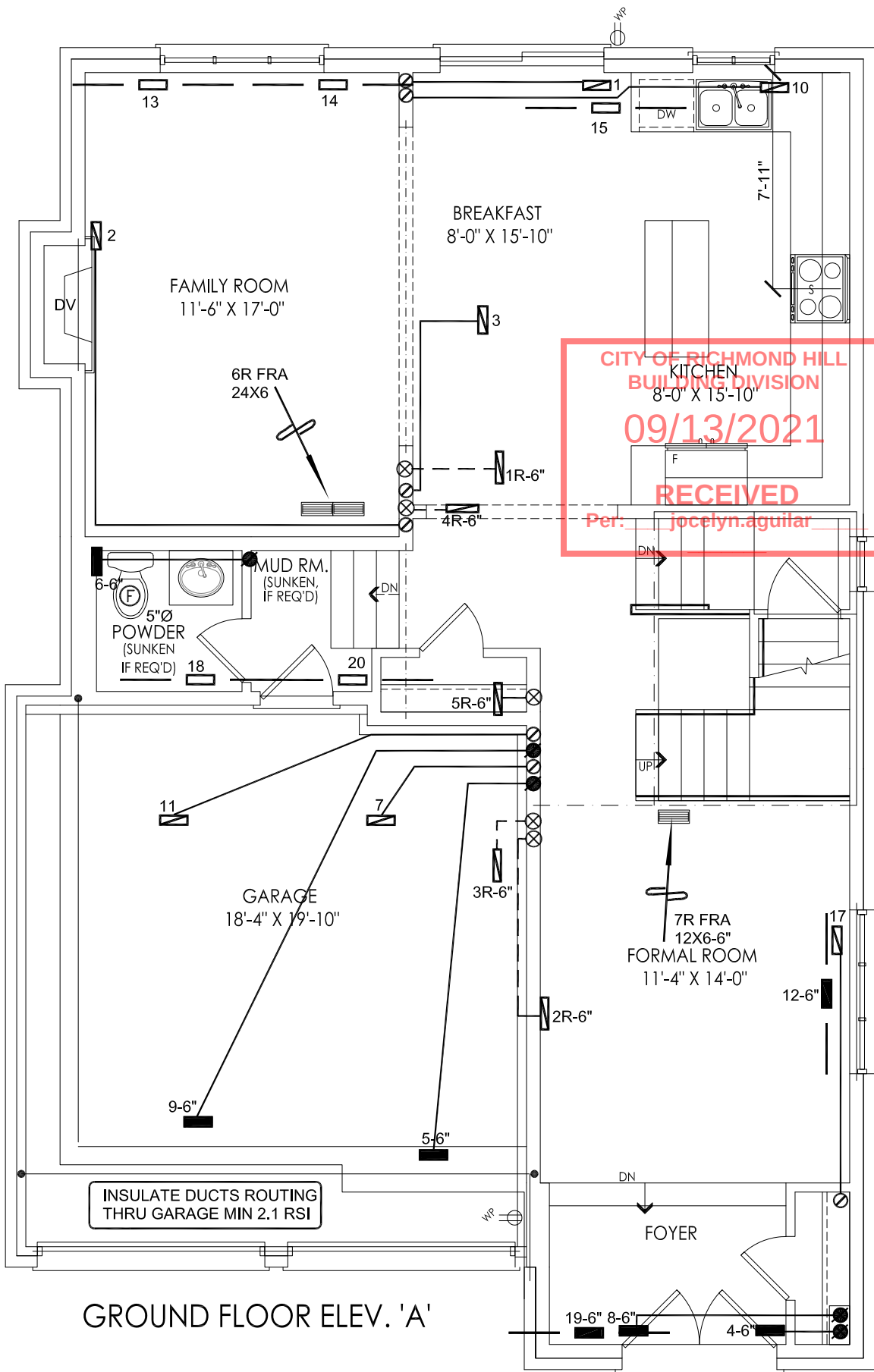
CSA-F280-12

SB-12 PERFORMANCE

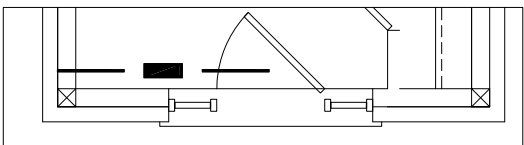
HVAC LEGEND								3.		
SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	2.	REVISED AS PER ARCHITECTURALS	APR/2021
	SUPPLY AIR GRILLE		6" SUPPLY AIR BOOT ABOVE		14"x8" RETURN AIR GRILLE		RETURN AIR STACK ABOVE	1.	REVISED TO PERFORMANCE	SEPT/2020
	SUPPLY AIR GRILLE 6" BOOT		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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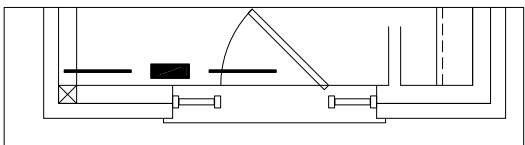
Client		 375 Finley Ave. Suite 202 - Ajax, Ontario L1S 2E2 Tel. 905.619.2300 - 905.420.5300 Fax 905.619.2375 Email: info@hvacdesigns.ca Web: www.hvacdesigns.ca Specializing in Residential Mechanical Design Services	HEAT LOSS 41439 BTU/H UNIT DATA		# OF RUNS S/A R/A FANS			Sheet Title	
ROYAL PINE HOMES			MAKE CARRIER	3RD FLOOR				BASEMENT HEATING LAYOUT	
Project Name CENTREFIELD (WEST GORMLEY) RICHMOND HILL, ONTARIO			MODEL 59TN6A-060-14V	2ND FLOOR	12	5	3	Date SEPT/2020	
38-82366 sqft			INPUT 60MBTU/H	1ST FLOOR	7	2	2	Scale 3/16" = 1'-0"	
			OUTPUT 58MBTU/H	BASEMENT	4	1	0	BCIN# 19669	
		COOLING 2.5TONS			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			LO#87608	
		FAN SPEED 970cfm @ 0.6" w.c.							



GROUND FLOOR ELEV. 'A'



GROUND FLOOR PLAN ELEV. 'B'



GROUND FLOOR PLAN ELEV. 'C'

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.

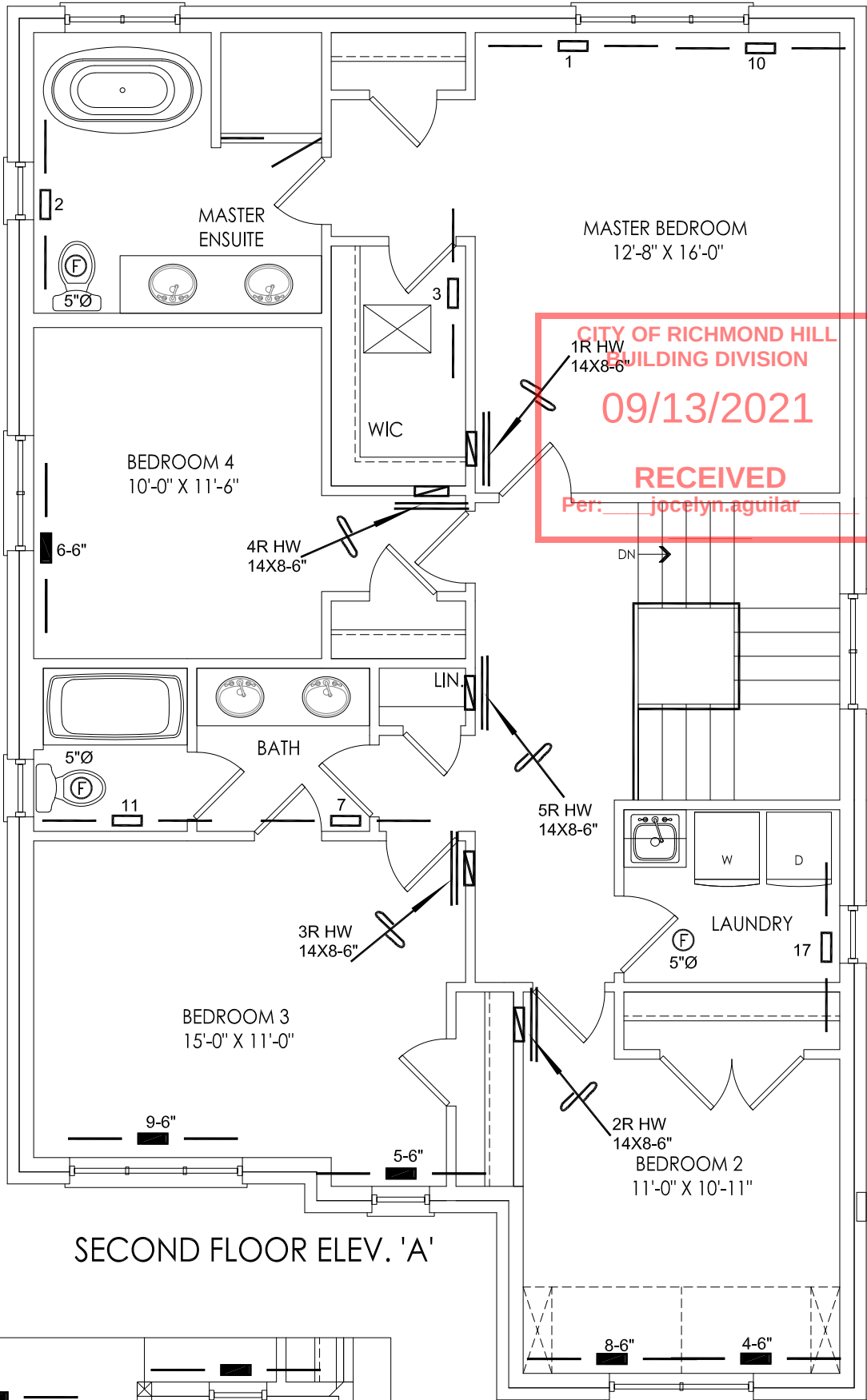
CSA-F280-12

SB-12 PERFORMANCE

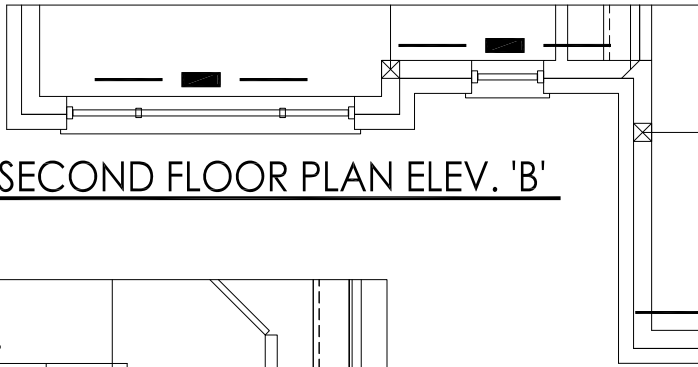
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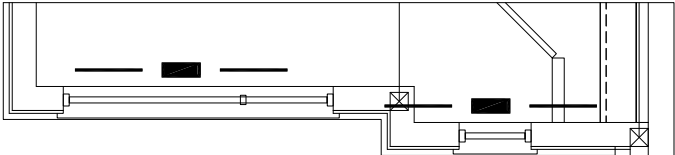
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ROYAL PINE HOMES			FIRST FLOOR HEATING LAYOUT	
Project Name CENTREFIELD (WEST GORMLEY) RICHMOND HILL, ONTARIO			Date	SEPT/2020
		Scale	3/16" = 1'-0"	
		BCIN# 19669		
38-8		LO#		
2366 sqft		87608		



SECOND FLOOR ELEV. 'A'



SECOND FLOOR PLAN ELEV. 'B'



SECOND FLOOR PLAN ELEV. 'C'

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, BCIN# 19669
HVAC DESIGNS LTD.

CSA-F280-12

SB-12 PERFORMANCE

HVAC LEGEND								3.		
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ROYAL PINE HOMES			SECOND FLOOR HEATING LAYOUT	
Project Name			Date	SEPT/2020
CENTREFIELD (WEST GORMLEY) RICHMOND HILL, ONTARIO			Scale	3/16" = 1'-0"
38-8			BCIN# 19669	
2366 sqft			LO#	87608

Schedule 1: Designer Information

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

A. Project Information					
Building number, street name				Unit no.	Lot/con.
Municipality		Postal code	Plan number/ other description		
RICHMOND HILL					
B. Individual who reviews and takes responsibility for design activities					
Name			Firm		
MICHAEL O'ROURKE			HVAC DESIGNS LTD.		
Street address				Unit no.	Lot/con.
375 FINLEY AVE				202	N/A
Municipality	Postal code	Province	E-mail		
AJAX	L1S 2E2	ONTARIO	info@hvacdesigns.ca		
Telephone number		Fax number	Cell number		
(905) 619-2300		(905) 619-2375	()		
C. Design activities undertaken by individual identified in Section B. [Building Code Table 3.5.2.1 OF Division C]					
☐ House ☐ 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:	
HEAT LOSS / GAIN CALCULATIONS				38-8	
DUCT SIZING				ASHTON	
RESIDENTIAL MECHANICAL VENTILATION DESIGN SUMMARY				OPT MAIN & OPT 2ND	
RESIDENTIAL SYSTEM DESIGN per CSA-F280-12				Project: CENTREFIELD (WEST GORMLEY)	
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.					
April 19, 2021				 Signature of Designer	
Date					

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.

TOTAL HEAT GAIN BTU/HN: 28778
TONS: 2.43
LOSS DUE TO VENTILATION LOAD BTU/HN: 1670
TOTAL COMBINED HEAT LOSS BTU/HN: 47734

STRUCTURAL HEAT LOSS: 40964

Michael O'Rourke

MICHAEL O'ROURKE
INDIVIDUAL BCR: 15669

REVIEW AND TAKE RESPONSIBILITY FOR THE DESIGN WORK AND AM QUALIFIED IN THE APPROPRIATE CATEGORY AS AN "OTHER DESIGNER" UNDER DIVISION C, 3.2.5 OF THE BUILDING CODE.

DATE: Apr-21

GFA: 2389 LO# 90456

furnace filler	0.05
a/c coil pressure	0.2
available pressure	

59TN6A-060-14V 50
FAN SPEED

APUE = 97 %
INPUT (BTU/H) = 60,000
OUTPUT (BTU/H) = 58,000

RUN COUNT	4th	3rd	2nd	1st	Bas
S/A	0	0	12	7	4
R/A	0	0	5	2	1

plenum 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

LOW	MEDIUM	HIGH
0	970	0

DESIGN CFM = 970
CFM @ 6" E.S.P.

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

	min adjusted pressure s/a	adjusted pressure r/a
0.15		

HIGH 1520

TEMPERATURE RISE 55

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	BED-2	BED-3	MBR	BATH	FORM	FAM	FAM	KTBR	BATH-2	LAUN	FOY	MUD	BAS	BAS	BAS	BAS
RM LOSS MBH	1.38	1.66	0.12	1.32	1.77	1.15	0.45	1.32	1.77	1.38	0.45	1.32	1.32	1.32	2.67	1.04	0.99	3.35	1.06	3.27	3.27	3.27	3.27
CFM PER RUK HEAT	33	40	3	32	43	28	11	32	43	33	11	59	32	65	65	25	24	81	26	79	79	79	79
RM GAIN MBH	1.90	1.40	0.06	1.86	2.35	1.75	0.18	1.86	2.35	1.90	0.18	2.18	1.54	1.54	2.14	0.74	1.03	1.83	0.18	0.48	0.48	0.48	0.48
CFM PER RUN COOLING	64	47	2	62	78	59	6	62	79	64	6	73	52	52	72	25	35	61	6	16	16	16	16
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	0.17	0.17	0.17	0.17	0.17	0.16	0.17	0.17	0.17	0.17	
ACTUAL DUCT LGH	39	43	27	67	52	34	42	72	56	46	48	43	32	26	31	69	25	47	12	27	32	36	51
EQUIVALENT LENGTH	130	180	180	200	170	0	180	200	190	140	200	190	140	120	140	220	120	160	120	140	150	130	170
TOTAL EFFECTIVE LENGTH	189	223	207	267	222	34	222	272	246	186	248	233	172	146	171	289	145	207	132	167	182	166	221
ADJUSTED PRESSURE	0.1	0.08	0.08	0.06	0.08	0.51	0.08	0.06	0.07	0.09	0.07	0.07	0.1	0.12	0.1	0.06	0.12	0.08	0.13	0.1	0.09	0.1	0.08
ROUND DUCT SIZE	5	5	4	6	6	6	4	6	5	5	4	6	5	5	5	4	6	4	4	5	5	5	6
HEATING VELOCITY (ft/min)	242	294	34	163	219	143	126	163	219	242	126	301	235	235	477	287	275	413	298	580	580	580	403
COOLING VELOCITY (ft/min)	470	345	23	316	403	301	69	316	403	470	69	372	382	529	382	287	402	311	69	117	117	117	82
OUTLET GRILL SIZE	3X10	3X10	3X10	4X10	4X10	4X10	3X10	4X10	3X10	3X10	3X10	4X10	3X10	3X10	3X10	3X10	3X10	4X10	3X10	3X10	3X10	3X10	4X10
TRUNK	A	D	D	B	C	D	C	B	C	A	C	B	A	A	A	B	D	B	B	A	A	C	B

[illegible]

SUPPLY AIR TRUNK SIZE										RETURN AIR TRUNK SIZE									
TRUNK	STATIC PRESS.	ROUND DUCT	RECT DUCT	CFM	VELOCITY (FPM)	RECT TRUNK	STATIC PRESS.	ROUND DUCT	RECT DUCT	VELOCITY (FPM)	TRUNK	STATIC PRESS.	ROUND DUCT	RECT DUCT	VELOCITY (FPM)				
TRUNK A	0.09	9.2	10	X	8	TRUNK G	0.00	0	0	8	TRUNK Q	0.05	0	0	8				
TRUNK B	0.06	9.7	12	X	8	TRUNK H	0.00	0	0	8	TRUNK P	0.05	0	0	8				
TRUNK C	0.06	11.6	18	X	8	TRUNK I	0.00	0	0	8	TRUNK O	0.05	0	0	8				
TRUNK D	0.06	12.6	20	X	8	TRUNK J	0.00	0	0	8	TRUNK S	0.05	0	0	8				
TRUNK E	0.06	14.9	26	X	8	TRUNK K	0.00	0	0	8	TRUNK T	0.05	0	0	8				
TRUNK F	0.00	0	0	X	8	TRUNK L	0.00	0	0	8	TRUNK U	0.05	0	0	8				
RETURN AIR #										BR									
AIR VOLUME	85	75	100	0	7	0	0	0	0	0	TRUNK V	0.05	0	0	8				
PLENUM PRESSURE	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	TRUNK W	0.05	0.05	15.6	8				
ACTUAL DUCT LGH.	40	61	39	58	20	42	1	1	1	1	TRUNK X	0.05	10.2	28	8				
EQUIVALENT LENGTH	225	250	245	155	225	0	0	0	0	0	TRUNK Y	0.05	0	0	8				
TOTAL EFFECTIVE LH	285	320	306	194	283	195	1	1	1	1	TRUNK Z	0.05	0	0	8				
ADJUSTED PRESSURE	0.06	0.05	0.08	0.05	0.06	0.06	1	1	1	1	DROP	0.05	15.6	24	10				
ROUND DUCT SIZE	6	6	5.9	6	9.2	0	14.80	14.80	14.80	14.80									
INLET GRILL SIZE	8	8	8	8	8	0	0	0	0	0									
INLET GRILL SIZE	14	14	14	14	30	0	0	0	0	0									

TYPE: 3B-8
SITE NAME: CENTREFIELD (WEST GORMLEY)
LO # 90456
OPT MAIN & 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	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	4	@ 10.6 cfm	42.4	cfm
Table 9.32.3.A			TOTAL	169.6 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	169.6	cfm
Less Principal Ventil. Capacity	79.5	cfm
Required Supplemental Capacity	90.1	cfm

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

CFM	ΔT	Factor	% LOSS
79.5 CFM	78 F	1.08	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

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: *Michael O'Rourke*
HRAI # 001820
Date: April-21

CITY OF RICHMOND HILL
 BUILDING DIVISION
 0013/2021
 RECEIVED
 Jocelyn.aguiar

HEAT LOSS AND GAIN SUMMARY SHEET

MODEL: 38-8	OPT MAIN & OPT 2ND	BUILDER: ROYAL PINE HOMES
SFQT: 2389	LO# 90456	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):	33322.5	ASSUMED (Y/N):	Y
INTERNAL SHADING:	BLINDS/CURTAINS	ASSUMED OCCUPANTS:	5
INTERIOR LIGHTING LOAD (Btu/h/ft²):	1.70	DC BRUSHLESS MOTOR (Y/N):	Y
FOUNDATION CONFIGURATION	BCIN_1	DEPTH BELOW GRADE:	7.0 ft
LENGTH: 48.0 ft	WIDTH: 31.0 ft	EXPOSED PERIMETER:	158.0 ft

CITY OF RICHMOND HILL
BUILDING DIVISION

09/13/2021

RECEIVED

Per: jocelyn.aguilar**2012 OBC - COMPLIANCE PACKAGE****Component****Compliance Package
SB-12 PERFORMANCE****Nominal Min. Eff.**

Ceiling with Attic Space Minimum RSI (R)-Value	60	59.20
Ceiling Without Attic Space Minimum RSI (R)-Value	31	27.70
Exposed Floor Minimum RSI (R)-Value	31	29.80
Walls Above Grade Minimum RSI (R)-Value	22+1.5	18.50
Basement Walls Minimum RSI (R)-Value	20	21.12
Below Grade Slab Entire surface > 600 mm below grade Minimum RSI (R)-Value	-	-
Edge of Below Grade Slab ≤ 600 mm Below Grade Minimum RSI (R)-Value	10	10
Heated Slab or Slab ≤ 600 mm below grade Minimum RSI (R)-Value	10	11.13
Windows and Sliding Glass Doors Maximum U-Value	1.6	-
Skylights Maximum U-Value	2.6	-
Space Heating Equipment Minimum AFUE	0.96	-
HRV Minimum Efficiency	75%	-
Domestic Hot Water Heater Minimum EF	TE=94%	-

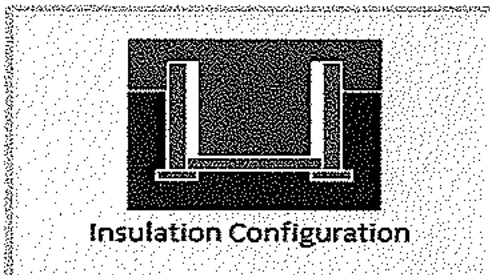
INDIVIDUAL BCIN: 19669

MICHAEL O'ROURKE

Michael O'Rourke

Residential Foundation Thermal Load Calculator

Supplemental tool for CAN/CSA-F280

Weather Station Description		
Province:	Ontario	
Region:	Richmond Hill	
Site Description		
Soil Conductivity:	Normal conductivity: dry sand, loam, clay	
Water Table:	Normal (7-10 m, 23-33 ft)	
Foundation Dimensions		
Floor Length (m):	14.6	 Insulation Configuration
Floor Width (m):	9.4	
Exposed Perimeter (m):	0.0	
Wall Height (m):	3.0	
Depth Below Grade (m):	2.13	
Window Area (m ²):	1.1	
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):		1558

TYPE: 38-8
LO# 90456

OPT MAIN & OPT 2ND

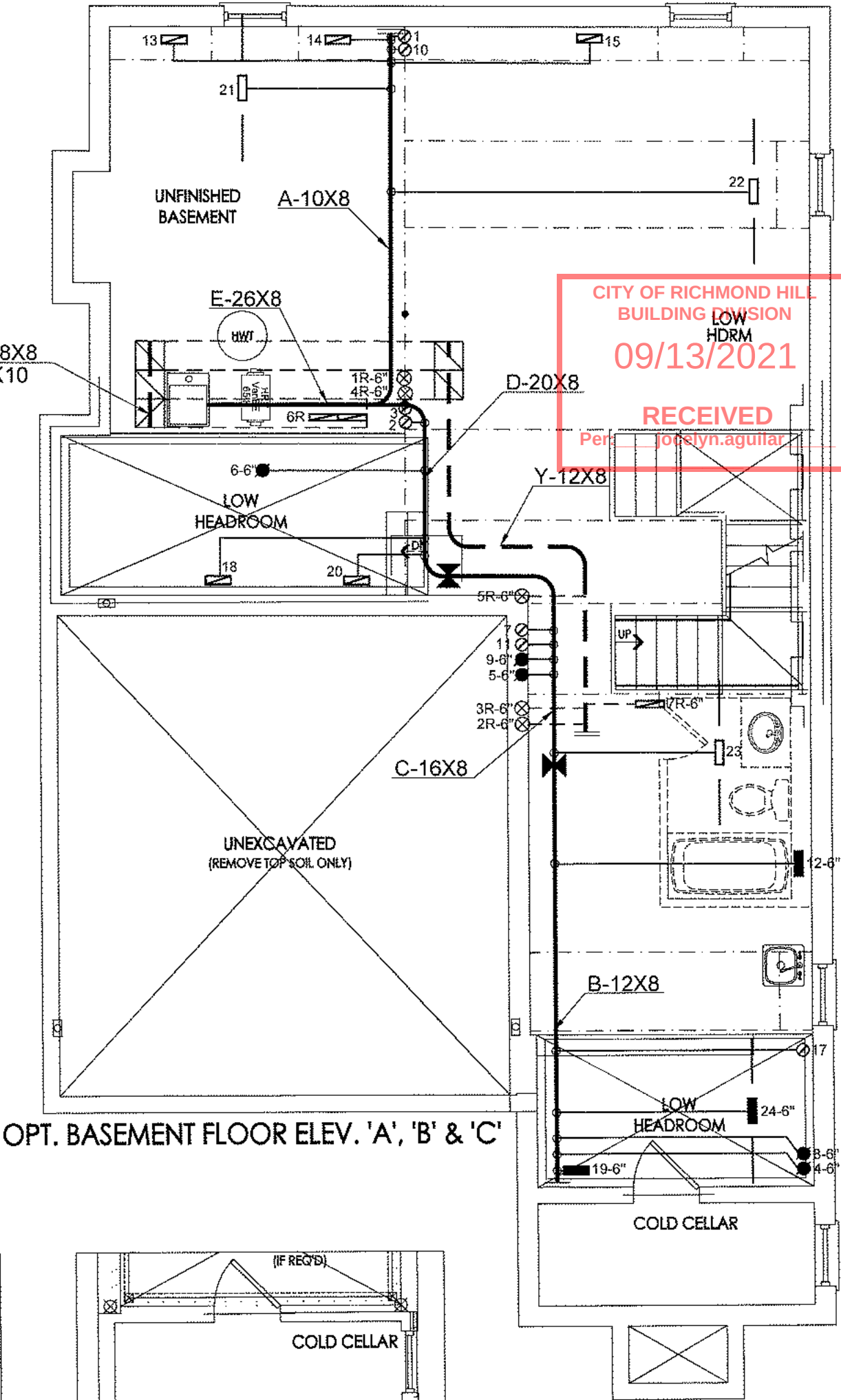
Air Infiltration Residential Load Calculator

Supplemental tool for CAN/CSA-F280

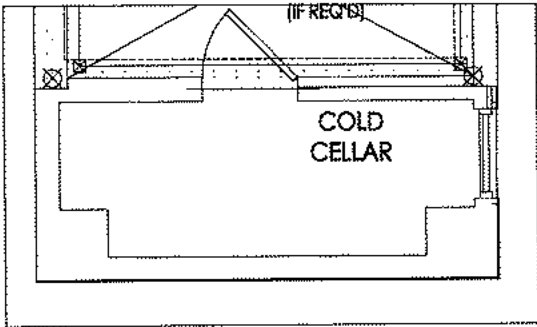
Weather Station Description				
Province:	Ontario	CITY OF RICHMOND HILL BUILDING DIVISION 09/13/2021 RECEIVED Per: <u>jocelyn.aguilar</u>		
Region:	Richmond Hill			
Weather Station Location:	Open flat terrain, grass			
Anemometer height (m):	10			
Local Shielding				
Building Site:	Suburban, forest	RECEIVED Per: <u>jocelyn.aguilar</u>		
Walls:	Heavy			
Flue:	Heavy			
Highest Ceiling Height (m):	6.74			
Building Configuration				
Type:	Detached			
Number of Stories:	Two			
Foundation:	Full			
House Volume (m ³):	943.6			
Air Leakage/Ventilation				
Air Tightness Type:	Energy Star Detached (2.5 ACH)			
Custom BDT Data:	ELA @ 10 Pa.	880.8 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):	0.227			
Cooling Air Leakage Rate (ACH/H):	0.071			

TYPE: 38-8
LO# 90456

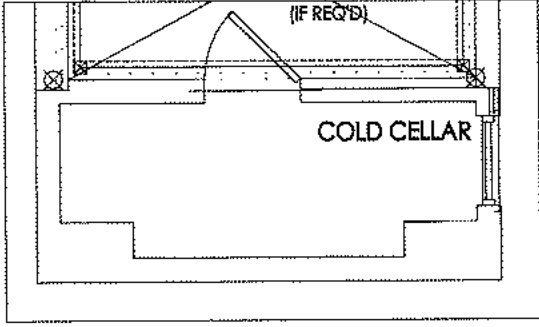
OPT MAIN & OPT 2ND



OPT. BASEMENT FLOOR ELEV. 'A', 'B' & 'C'



BASEMENT FLOOR PLAN ELEV. 'B'



BASEMENT FLOOR PLAN ELEV. 'C'

1 MICHAEL O'BRIEN: I HAVE REVIEWED AND TAKE RESPONSIBILITY FOR THE DESIGN WORK AND AM QUALIFIED UNDER DIVISION C, 12.5 OF THE BUILDING CODE.
Michael O'Brien
Michael O'Brien, License 19669
HVAC DESIGNS LTD.

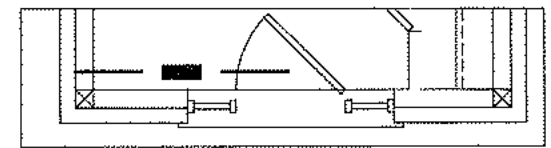
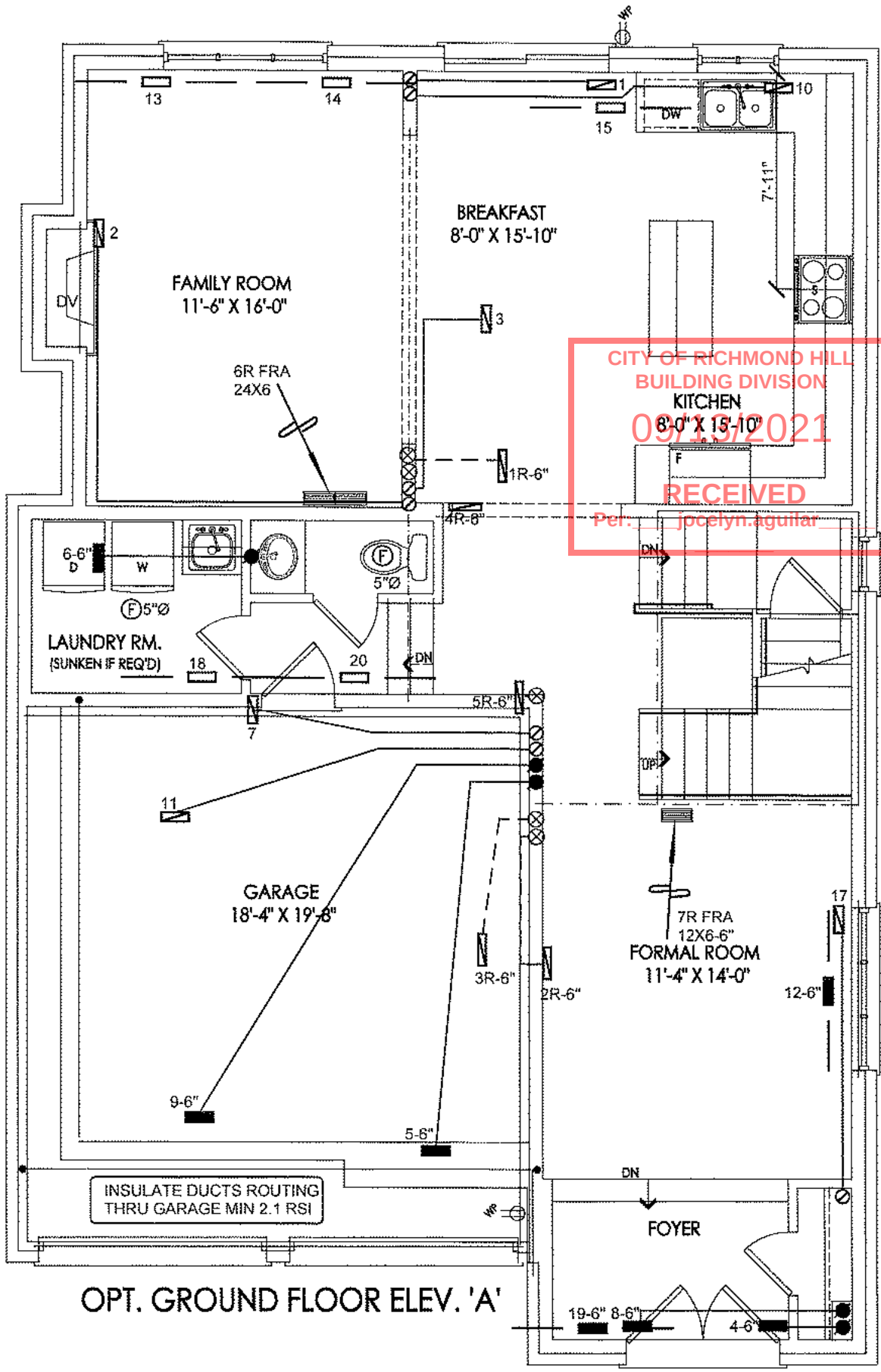
CSA-F280-12

SB-12 PERFORMANCE

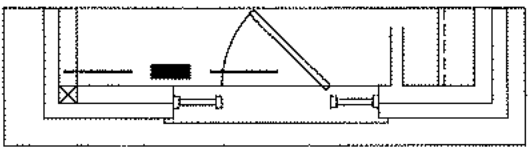
HVAC LEGEND						3.	
SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	2.	
	SUPPLY AIR GRILLE		6" SUPPLY AIR BOOT ABOVE		14"x8" RETURN AIR GRILLE		1.
	SUPPLY AIR GRILLE 6" BOOT		SUPPLY AIR STACK FROM 2nd FLOOR		30"x8" RETURN AIR GRILLE		No.
	SUPPLY AIR BOOT ABOVE		6" SUPPLY AIR STACK 2nd FLOOR		FRA- FLOOR RETURN AIR GRILLE		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	HEAT LOSS 41587 BTU/H		# OF RUNS		S/A		R/A		FANS		Sheet Title		
Project Name CENTREFIELD (WEST GORMLEY) RICHMOND HILL, ONTARIO			UNIT DATA		3RD FLOOR						BASEMENT HEATING LAYOUT				
			MAKE CARRIER		2ND FLOOR		12	5	3						
			MODEL 59TN6A-060-14V		1ST FLOOR		7	2	3						
OPT MAIN & OPT 2ND 38-8 2389 sqft		INPUT 60 MBTU/H		BASEMENT		4	1	0	Date			APR/2021			
		OUTPUT 58 MBTU/H		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"	
		COOLING 2.5 TONS										BCIN# 19669			
		FAN SPEED 970 cfm @ 0.6" w.c.										LO# 90456			



GROUND FLOOR PLAN ELEV. 'B'



GROUND FLOOR PLAN ELEV. 'C'

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

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

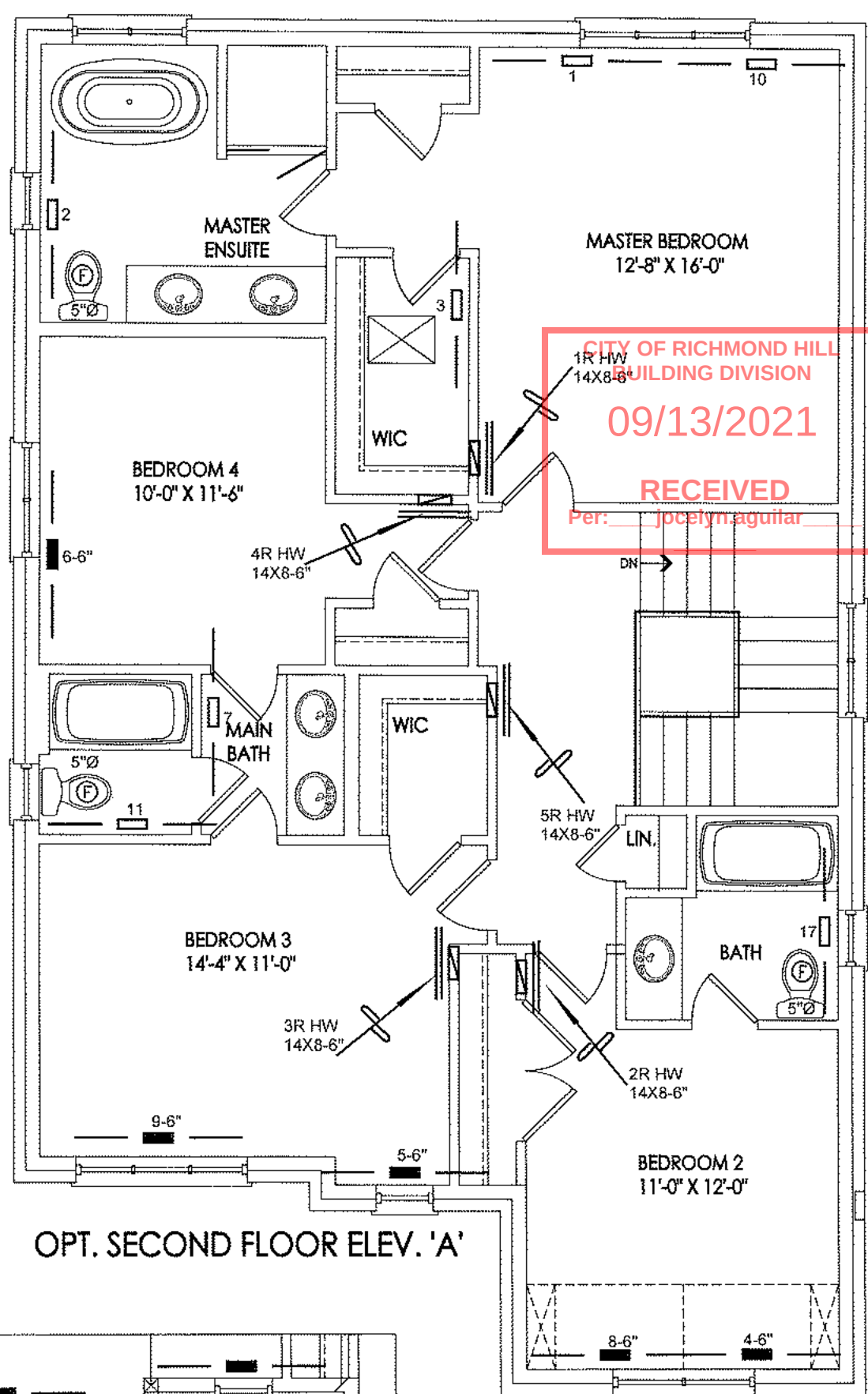
CSA-F280-12

SB-12 PERFORMANCE

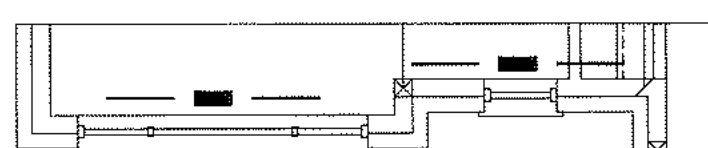
HVAC LEGEND						3.		
SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	
	SUPPLY AIR GRILLE		6" SUPPLY AIR BOOT ABOVE		14"x8" RETURN AIR GRILLE		RETURN AIR STACK ABOVE	2.
	SUPPLY AIR GRILLE 6" BOOT		SUPPLY AIR STACK FROM 2nd FLOOR		30"x8" RETURN AIR GRILLE		RETURN AIR STACK 2nd FLOOR	1.
	SUPPLY AIR BOOT ABOVE		6" SUPPLY AIR STACK 2nd FLOOR		FRA- FLOOR RETURN AIR GRILLE		REDUCER	No. Description Date

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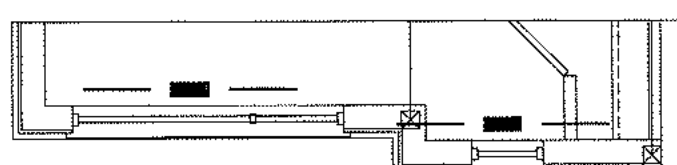
Client ROYAL PINE HOMES		 375 Finley Ave. Suite 202 - Ajax, Ontario L1S 2E2 Tel. 905.619.2300 - 905.420.5300 Fax 905.619.2375 Email: info@hvacdesigns.ca Web: www.hvacdesigns.ca Specializing in Residential Mechanical Design Services	Sheet Title FIRST FLOOR HEATING LAYOUT	
Project Name CENTREFIELD (WEST GORMLEY) RICHMOND HILL, ONTARIO			Date APR/2021	
OPT MAIN & OPT 2ND 38-8 2389 sqft			Scale 3/16" = 1'-0"	
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.			BCIN# 19669	
			LO#	90456



OPT. SECOND FLOOR ELEV. 'A'



SECOND FLOOR PLAN ELEV. 'B'



SECOND FLOOR PLAN ELEV. 'C'

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						REVISIONS	
SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	No.	Date
	SUPPLY AIR GRILLE		6" SUPPLY AIR BOOT ABOVE		14"x8" RETURN AIR GRILLE	3.	
	SUPPLY AIR GRILLE 6" BOOT		SUPPLY AIR STACK FROM 2nd FLOOR		30"x8" RETURN AIR GRILLE	2.	
	SUPPLY AIR BOOT ABOVE		6" SUPPLY AIR STACK 2nd FLOOR		FRA- FLOOR RETURN AIR GRILLE	1.	
					REDUCER	No.	Description

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 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 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 SECOND FLOOR HEATING LAYOUT	
Project Name CENTREFIELD (WEST GORMLEY) RICHMOND HILL, ONTARIO			Date APR/2021	
OPT MAIN & OPT 2ND 38-8 2389 sqft			Scale 3/16" = 1'-0"	
			BCIN# 19669	
		LO#	90456	

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: 38-8 ASHTON FIN BSMT WUB 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.			
April 19, 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

SITE NAME: CENTREFIELD (WEST GORMLEY)

FIN BSMT WUB

DATE: Apr-21

WINTER NATURAL AIR CHANGE RATE 0.227

HEAT LOSS ΔT °F. 78

CSA-F280-12

BUILDER: ROYAL PINE HOMES

TYPE: 38-8

GFA: 2366

LO# 87609

SUMMER NATURAL AIR CHANGE RATE 0.071

HEAT GAIN ΔT °F. 13

SB-12 PERFORMANCE

ROOM USE	EXP. WALL	CLG. HT.	MBR	ENS	WIC	BED-2	BED-3	BED-4	BATH	B-BATH
			36	21	0	34	29	12	6	9
			9	9	9	9	9	9	9	10
FACTORS										
GRS.WALL AREA	LOSS	GAIN	324	189	0	306	261	108	54	63
GLAZING	LOSS	GAIN	LOSS	GAIN	LOSS	GAIN	LOSS	GAIN	LOSS	GAIN
NORTH	21.8	16.0	0	0	0	0	0	0	0	0
EAST	21.8	41.6	26	566	1080	17	370	706	0	0
SOUTH	21.8	24.9	11	240	274	0	0	0	0	0
WEST	21.8	41.6	0	0	0	0	0	0	0	0
SKYLT.	35.8	101.2	0	0	0	0	0	0	0	0
DOORS	25.8	4.3	0	0	0	0	0	0	0	0
NET EXPOSED WALL	4.2	0.7	287	1207	199	164	690	113	0	0
NET EXPOSED BSMT WALL ABOVE GR	3.7	0.6	0	0	0	0	0	0	0	0
EXPOSED CLG	1.3	0.6	241	317	142	123	162	72	75	99
NO ATTIC EXPOSED CLG	2.8	1.3	0	0	0	0	0	0	0	0
EXPOSED FLOOR	2.6	0.4	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			2330		1396	99	2234	2711	970	684
SUB TOTAL HT GAIN				1694	1020	44	1856	2269	432	238
LEVEL FACTOR / MULTIPLIER	0.20	0.18			0.20	0.18		0.20	0.18	
AIR CHANGE HEAT LOSS			427		256	18	410	497	178	125
AIR CHANGE HEAT GAIN				97	58	3	106	129	25	14
DUCT LOSS			0		0		0	321	0	81
DUCT GAIN			0		0		0	324	0	25
HEAT GAIN PEOPLE	240	2	480	0	0	0	1	240	1	240
HEAT GAIN APPLIANCES/LIGHTS			606		0		606	606	606	0
TOTAL HT LOSS BTU/H			2757		1652	117	2643	3529	1148	890
TOTAL HT GAIN x 1.3 BTU/H			3740		1402	61	3650	4639	1693	360

CITY OF RICHMOND HILL
BUILDING DIVISION
09/13/2021
RECEIVED
Per: jocelyn.aguiar

ROOM USE	EXP. WALL	CLG. HT.	FORM	FAM	KT/BR	LAUN	PWD	FOY	MUD	WUB	BAS
			31	33	40	12	13	27	8	21	128
			10	10	10	9	11	11	11	10	10
FACTORS											
GRS.WALL AREA	LOSS	GAIN	313	333	404	108	144	300	89	210	896
GLAZING	LOSS	GAIN	LOSS	GAIN	LOSS	GAIN	LOSS	GAIN	LOSS	GAIN	LOSS
NORTH	21.8	16.0	0	0	0	0	0	0	0	0	0
EAST	21.8	41.6	0	0	0	0	0	0	0	0	0
SOUTH	21.8	24.9	31	675	772	0	0	0	0	0	0
WEST	21.8	41.6	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	282	1186	195	299	1259	207	385	1619	266
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	10	13	6	0	0	0
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
SLAB ON GRADE HEAT LOSS			0	0	0	0	0	0	0	0	0
SUBTOTAL HT LOSS			1862		2012	2033	874	607	2548	806	4270
SUB TOTAL HT GAIN				967	1626	939	540	100	1330	133	592
LEVEL FACTOR / MULTIPLIER	0.30	0.32			0.30	0.32		0.30	0.32		
AIR CHANGE HEAT LOSS			586		634	640	160	191	803	254	4959
AIR CHANGE HEAT GAIN				55	93	54	31	6	76	8	53
DUCT LOSS			0		0	0	0	0	0	0	0
DUCT GAIN			0		0	0	0	0	0	0	0
HEAT GAIN PEOPLE	240	0	0	0	0	0	0	0	0	0	0
HEAT GAIN APPLIANCES/LIGHTS			606		606	606	606	606	606	606	606
TOTAL HT LOSS BTU/H			2448		2646	2673	1034	798	3351	1060	11356
TOTAL HT GAIN x 1.3 BTU/H			2117		3022	2078	1530	137	1828	182	1626

TOTAL HEAT GAIN BTU/H:

28803

TONS: 2.40

LOSS DUE TO VENTILATION LOAD BTU/H: 1670

STRUCTURAL HEAT LOSS: 40245

TOTAL COMBINED HEAT LOSS BTU/H: 41915

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

FIN BSMT WUB
TYPE: 38-8

DATE: Apr-21

GFA: 2366 LO# 87609

HEATING CFM 970 COOLING CFM 970
TOTAL HEAT LOSS 40,245 TOTAL HEAT GAIN 28,528
AIR FLOW RATE CFM 24.1 AIR FLOW RATE CFM 34

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

****CARRIER**

AFUE = 97 %

59TN6A-060-14V

INPUT (BTU/H) = 60,000

FAN SPEED 60

OUTPUT (BTU/H) = **58,000**

LOW 820

MEDLOW 0

MEDIUM 970

MEDIUM HIGH 0

HIGH 1520

DESIGN CFM = **970**

CFM @ .6" E.S.P.

TEMPERATURE RISE 55 °F

RUN COUNT	4th	3rd	2nd	1st	Bas
S/A	0	0	12	7	5
R/A	0	0	5	2	1

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

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

RUN #	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	17	18	19	20	21	22	23	24
ROOM NAME	MBR	ENS	WIC	BED-2	BED-3	BED-4	BATH	BED-2	BED-3	MBR	BATH	FORM	FAM	FAM	KT/BR	LAUN	PWD	FOY	MUD	BAS	BAS	B-BATH	BAS
RM LOSS MBH.	1.38	1.65	0.12	1.32	1.76	1.15	0.45	1.32	1.76	1.38	0.45	2.45	1.32	1.32	2.67	1.03	0.80	3.35	1.06	3.23	3.23	0.58	3.23
CFM PER RUN HEAT	33	40	3	32	43	28	11	32	43	33	11	59	32	32	64	25	19	81	26	78	78	14	78
RM GAIN MBH.	1.87	1.40	0.06	1.83	2.32	1.69	0.18	1.83	2.32	1.87	0.18	2.12	1.51	1.51	2.08	1.53	0.14	1.83	0.18	0.52	0.52	0.02	0.52
CFM PER RUN COOLING	64	48	2	62	79	58	6	62	79	64	6	72	51	51	71	52	5	62	6	18	18	1	18
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	0.17	0.17	0.17	0.17	0.17	0.16	0.17	0.17	0.17	0.17	0.17
ACTUAL DUCT LGH.	39	43	27	67	52	34	42	72	56	46	48	43	32	26	31	69	25	47	12	27	32	36	51
EQUIVALENT LENGTH	130	180	180	200	170	0	180	200	190	140	200	190	140	120	140	220	120	160	120	140	150	130	160
TOTAL EFFECTIVE LENGTH	169	223	207	267	222	34	222	272	246	186	248	233	172	146	171	289	145	207	132	167	182	166	211
ADJUSTED PRESSURE	0.1	0.08	0.08	0.06	0.08	0.51	0.08	0.06	0.07	0.09	0.07	0.07	0.1	0.12	0.1	0.06	0.12	0.08	0.13	0.1	0.09	0.1	0.08
ROUND DUCT SIZE	5	5	4	6	6	6	4	6	6	5	4	6	5	4	5	5	4	6	4	5	5	5	6
HEATING VELOCITY (ft/min)	242	294	34	163	219	143	126	163	219	242	126	301	235	367	470	184	218	413	298	573	573	103	398
COOLING VELOCITY (ft/min)	470	352	23	316	403	296	69	316	403	470	69	367	374	585	521	382	57	316	69	132	132	7	92
OUTLET GRILL SIZE	3X10	3X10	3X10	4X10	4X10	4X10	3X10	4X10	4X10	3X10	3X10	4X10	3X10	3X10	3X10	3X10	3X10	4X10	3X10	3X10	3X10	3X10	4X10
TRUNK	A	D	D	B	C	D	C	B	C	A	C	B	A	A	A	B	D	B	D	A	A	C	B

RUN #	25
ROOM NAME	BAS
RM LOSS MBH.	3.23
CFM PER RUN HEAT	78
RM GAIN MBH.	0.52
CFM PER RUN COOLING	18
ADJUSTED PRESSURE	0.17
ACTUAL DUCT LGH.	25
EQUIVALENT LENGTH	110
TOTAL EFFECTIVE LENGTH	135
ADJUSTED PRESSURE	0.13
ROUND DUCT SIZE	5
HEATING VELOCITY (ft/min)	573
COOLING VELOCITY (ft/min)	132
OUTLET GRILL SIZE	3X10
TRUNK	D

RECEIVED
Per: jocelyn.aguilar

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)	CFM	PRESS.	DUCT	DUCT				(ft/min)
TRUNK A	350	0.09	9.2	10	x	8	630	TRUNK G	0	0.00	0	0	x	8	0	TRUNK O	0	0.05	0	0	x	8	0	TRUNK Q	0	0.05	0	0	x	8	0
TRUNK B	307	0.06	9.7	12	x	8	461	TRUNK H	0	0.00	0	0	x	8	0	TRUNK P	0	0.05	0	0	x	8	0	TRUNK R	0	0.05	0	0	x	8	0
TRUNK C	429	0.06	11	16	x	8	483	TRUNK I	0	0.00	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 D	623	0.06	12.6	20	x	8	561	TRUNK J	0	0.00	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 E	973	0.06	14.9	26	x	8	674	TRUNK K	0	0.00	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 F	0	0.00	0	0	x	8	0	TRUNK L	0	0.00	0	0	x	8	0	TRUNK T	0	0.05	0	0	x	8	0								

RETURN AIR #	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
AIR VOLUME	85	75	75	95	75	320	85	0	0	0	0	0	0	0	0	0	160							
PLENUM PRESSURE	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15							
ACTUAL DUCT LGH.	40	70	61	39	58	20	42	1	1	1	1	1	1	1	1	1	14							
EQUIVALENT LENGTH	225	250	245	155	225	175	225	0	0	0	0	0	0	0	0	0	135							
TOTAL EFFECTIVE LH	265	320	306	194	283	195	267	1	1	1	1	1	1	1	1	1	149							
ADJUSTED PRESSURE	0.06	0.05	0.05	0.08	0.05	0.08	0.06	14.80	14.80	14.80	14.80	14.80	14.80	14.80	14.80	14.80	0.10							
ROUND DUCT SIZE	6	6	6	5.8	6	9.2	6	0	0	0	0	0	0	0	0	0	6.7							
INLET GRILL SIZE	8	8	8	8	8	6	8	0	0	0	0	0	0	0	0	0	8							
INLET GRILL SIZE	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X							
INLET GRILL SIZE	14	14	14	14	14	24	14	0	0	0	0	0	0	0	0	0	14							

TYPE: 38-8
SITE NAME: CENTREFIELD (WEST GORMLEY)

LO # 87609
FIN BSMT WUB

RESIDENTIAL MECHANICAL VENTILATION DESIGN SUMMARY

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

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

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

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

TOTAL VENTILATION CAPACITY		9.32.3.3(1)
Basement + Master Bedroom	<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>5</u> @ 10.6 cfm	<u>53.0</u> cfm
Table 9.32.3.A. TOTAL		<u>180.2</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>79.5</u> cfm

SUPPLEMENTAL VENTILATION CAPACITY		9.32.3.5.
Total Ventilation Capacity	<u>180.2</u>	cfm
Less Principal Ventil. Capacity	<u>79.5</u>	cfm
Required Supplemental Capacity	<u>100.7</u>	cfm

PRINCIPAL EXHAUST FAN CAPACITY									
Model:	VANEE 65H								
Location:	BSMT								
<u>79.5</u> cfm	☒ HVI Approved								
PRINCIPAL EXHAUST HEAT LOSS CALCULATION <table border="1"> <thead> <tr> <th>CFM</th> <th>AT °F</th> <th>FACTOR</th> <th>% LOSS</th> </tr> </thead> <tbody> <tr> <td>79.5 CFM</td> <td>78 F</td> <td>1.08</td> <td>0.25</td> </tr> </tbody> </table>		CFM	AT °F	FACTOR	% LOSS	79.5 CFM	78 F	1.08	0.25
CFM	AT °F	FACTOR	% LOSS						
79.5 CFM	78 F	1.08	0.25						

SUPPLEMENTAL FANS		BY INSTALLING CONTRACTOR	HVI	Sones
Location	Model	cfm		
ENS	BY INSTALLING CONTRACTOR	50	☒	3.5
BATH	BY INSTALLING CONTRACTOR	50	☒	3.5
B-BATH	BY INSTALLING CONTRACTOR	50	☒	3.5
PWD	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 #	001820
Date:	April-21

CSA F280-12 Residential Heat Loss and Heat Gain Calculations
Formula Sheet (For Air Leakage / Ventilation Calculation)

LO#: 87609

Model: 38-8

Builder: ROYAL PINE HOMES

Date: 4/19/2021

Volume Calculation
Air Change & Delta T Data
House Volume

Level	Floor Area (ft ²)	Floor Height (ft)	Volume (ft ³)
Bsmt	1042	10	10420
First	1042	10	10524.2
Second	1324	9	11916
Third	0	9	0
Fourth	0	9	0
Total:			32,860.2 ft ³
Total:			930.5 m ³

WINTER NATURAL AIR CHANGE RATE	0.227
SUMMER NATURAL AIR CHANGE RATE	0.071

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

5.2.3.1 Heat Loss due to Air Leakage
6.2.6 Sensible Gain due to Air Leakage

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

0.227 x 258.47 x 43 °C x 1.2 = 3037 W

= 10362 Btu/h

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

= 0.071 x 258.47 x 7 °C x 1.2 = 156 W

= 532 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)

$$HL_{airr} = Level\ Factor \times HL_{airbv} \times \{(HL_{agcr} + HL_{bgcr}) \div (HL_{agclevel} + HL_{bgclevel})\}$$

Level	Level Factor (LF)	HL _{airve} Air Leakage + Ventilation Heat Loss (Btu/h)	Level Conductive Heat Loss: (HL _{cleve})	Air Leakage Heat Loss Multiplier (LF x HL _{airbv} / HL _{level})
1	0.5	10,362	8,317	0.623
2	0.3		9,868	0.315
3	0.2		11,296	0.183
4	0		0	0.000
5	0		0	0.000

*HL_{airbv} = Air leakage heat loss + ventilation heat loss

*For a balanced or supply only ventilation system HL_{airve} = 0

HEAT LOSS AND GAIN SUMMARY SHEET

MODEL: 38-8	FIN BSMT WUB	BUILDER: ROYAL PINE HOMES
SFQT: 2366	LO# 87609	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):	32860.2	ASSUMED (Y/N):	Y
INTERNAL SHADING:	BLINDS/CURTAINS	ASSUMED OCCUPANTS:	5
INTERIOR LIGHTING LOAD (Btu/h/ft²):	1.60	DC BRUSHLESS MOTOR (Y/N):	Y
FOUNDATION CONFIGURATION	BCIN_1	DEPTH BELOW GRADE:	7.0 ft
LENGTH: 48.0 ft	WIDTH: 31.0 ft	EXPOSED PERIMETER:	137.0 ft

2012 OBC - COMPLIANCE PACKAGE**Component****Compliance Package
SB-12 PERFORMANCE****Nominal Min. Eff.**

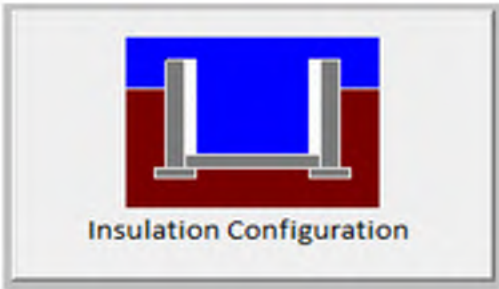
Ceiling with Attic Space Minimum RSI (R)-Value	60	59.20
Ceiling Without Attic Space Minimum RSI (R)-Value	31	27.70
Exposed Floor Minimum RSI (R)-Value	31	29.80
Walls Above Grade Minimum RSI (R)-Value	22+1.5	18.50
Basement Walls Minimum RSI (R)-Value	20	21.12
Below Grade Slab Entire surface > 600 mm below grade Minimum RSI (R)-Value	-	-
Edge of Below Grade Slab ≤ 600 mm Below Grade Minimum RSI (R)-Value	10	10
Heated Slab or Slab ≤ 600 mm below grade Minimum RSI (R)-Value	10	11.13
Windows and Sliding Glass Doors Maximum U-Value	1.6	-
Skylights Maximum U-Value	2.6	-
Space Heating Equipment Minimum AFUE	0.96	-
HRV Minimum Efficiency	75%	-
Domestic Hot Water Heater Minimum EF	TE=94%	-

INDIVIDUAL BCIN: 19669
MICHAEL O'ROURKE



Residential Foundation Thermal Load Calculator

Supplemental tool for CAN/CSA-F280

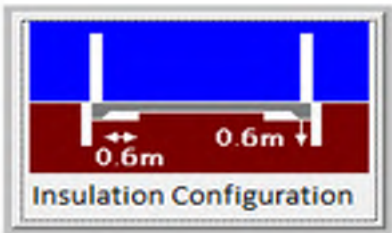
Weather Station Description		
Province:	Ontario	
Region:	Richmond Hill	
Site Description		
Soil Conductivity:	Normal conductivity: dry sand, loam, clay	
Water Table:	Normal (7-10 m, 23-33 ft)	
Foundation Dimensions		
Floor Length (m):	14.6	
Floor Width (m):	9.4	
Exposed Perimeter (m):	41.8	
Wall Height (m):	3.0	
Depth Below Grade (m):	2.13	
Window Area (m ²):	1.1	
Door Area (m ²):	3.7	
Radiant Slab		
Heated Fraction of the Slab:	0	
Fluid Temperature (°C):	33	
Design Months		
Heating Month	1	
Foundation Loads		
Heating Load (Watts):		1327

TYPE: 38-8
LO# 87609

FIN BSMT WUB

Residential Slab on Grade Thermal Load Calculator

Supplemental tool for CAN/CSA-F280

Weather Station Description		
Province:	Ontario	CITY OF RICHMOND HILL BUILDING DIVISION
Region:	Richmond Hill	
Site Description		09/13/2021
Soil Conductivity:	Normal conductivity: dry sand, loam, clay	
Water Table:	Normal (7-10 m, 23-33 ft)	
Foundation Dimensions		
Length (m):	0.6	
Width (m):	5.8	
Exposed Perimeter (m):	6.4	
Radiant Slab		
Heated Fraction of the Slab:	0	
Fluid Temperature (°C):	33	
Design Months		
Heating Month	1	
Results		
Heating Load (Watts):		56

TYPE: 38-8
LO# 87609

FIN BSMT WUB

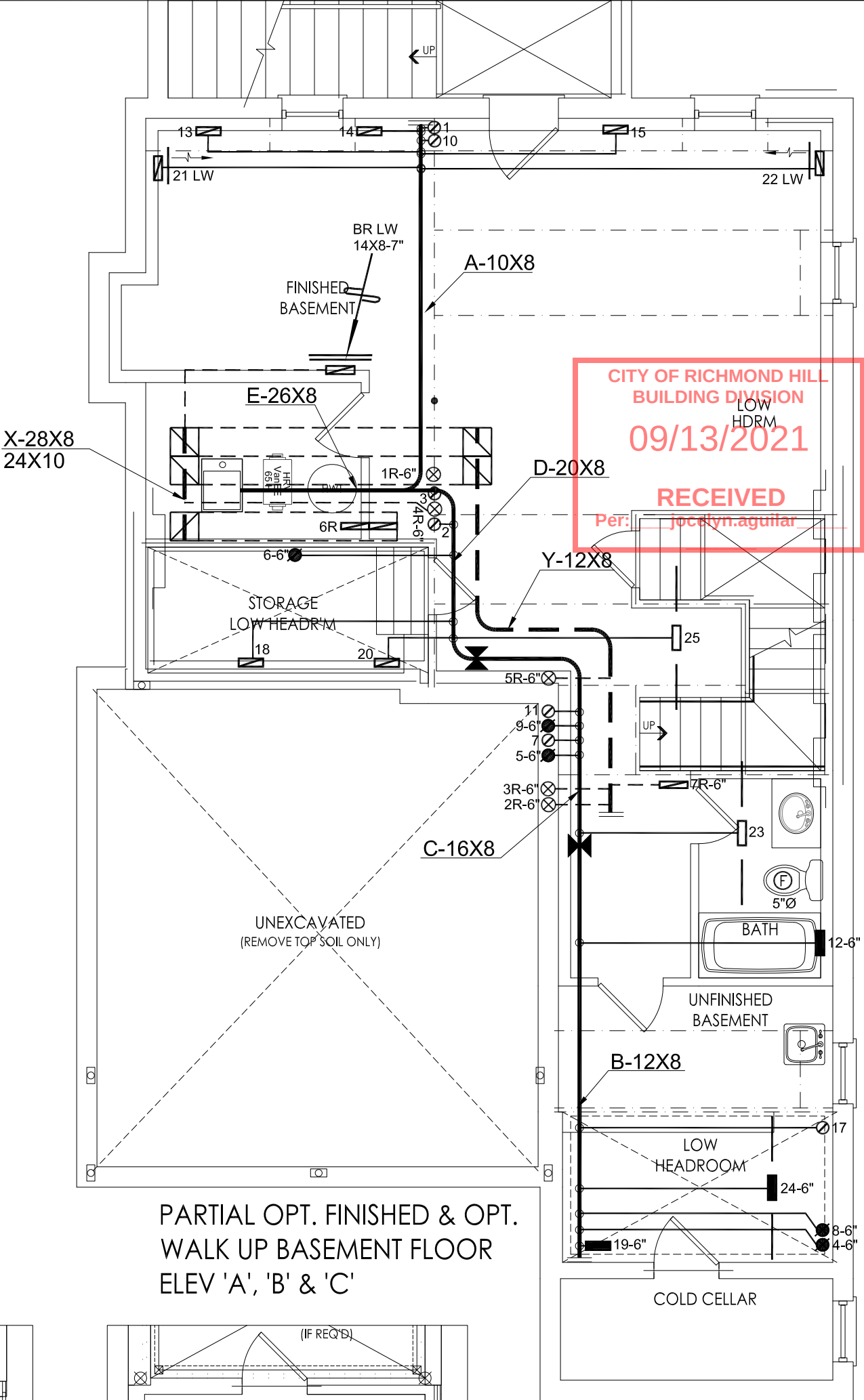
Air Infiltration Residential Load Calculator

Supplemental tool for CAN/CSA-F280

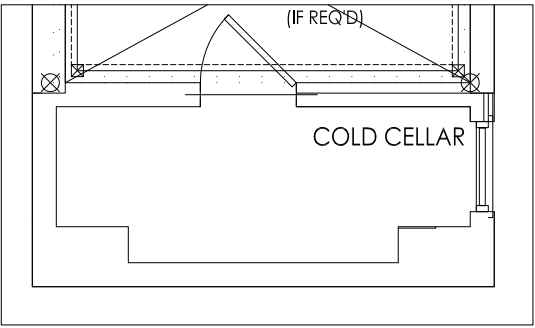
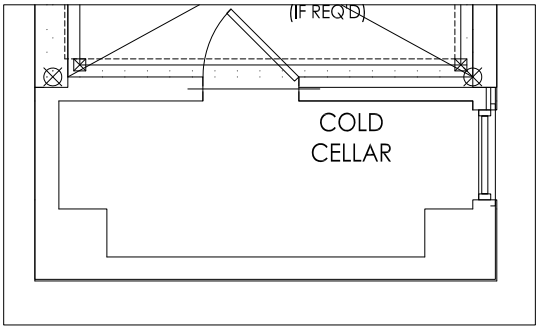
Weather Station Description				
Province:	Ontario			
Region:	Richmond Hill			
Weather Station Location:	Open flat terrain, grass			
Anemometer height (m):	10			
Local Shielding				
Building Site:	Suburban, forest			
Walls:	Heavy			
Flue:	Heavy			
Highest Ceiling Height (m):	6.74			
Building Configuration				
Type:	Detached			
Number of Stories:	Two			
Foundation:	Full			
House Volume (m ³):	930.5			
Air Leakage/Ventilation				
Air Tightness Type:	Energy Star Detached (2.5 ACH)			
Custom BDT Data:	ELA @ 10 Pa.	868.6 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):	0.227			
Cooling Air Leakage Rate (ACH/H):	0.071			

TYPE: 38-8
LO# 87609

FIN BSMT WUB



PARTIAL OPT. FINISHED & OPT.
WALK UP BASEMENT FLOOR
ELEV 'A', 'B' & 'C'



BASEMENT FLOOR PLAN ELEV. 'B'

BASEMENT FLOOR PLAN ELEV. 'C'

WUB

CSA-F280-12

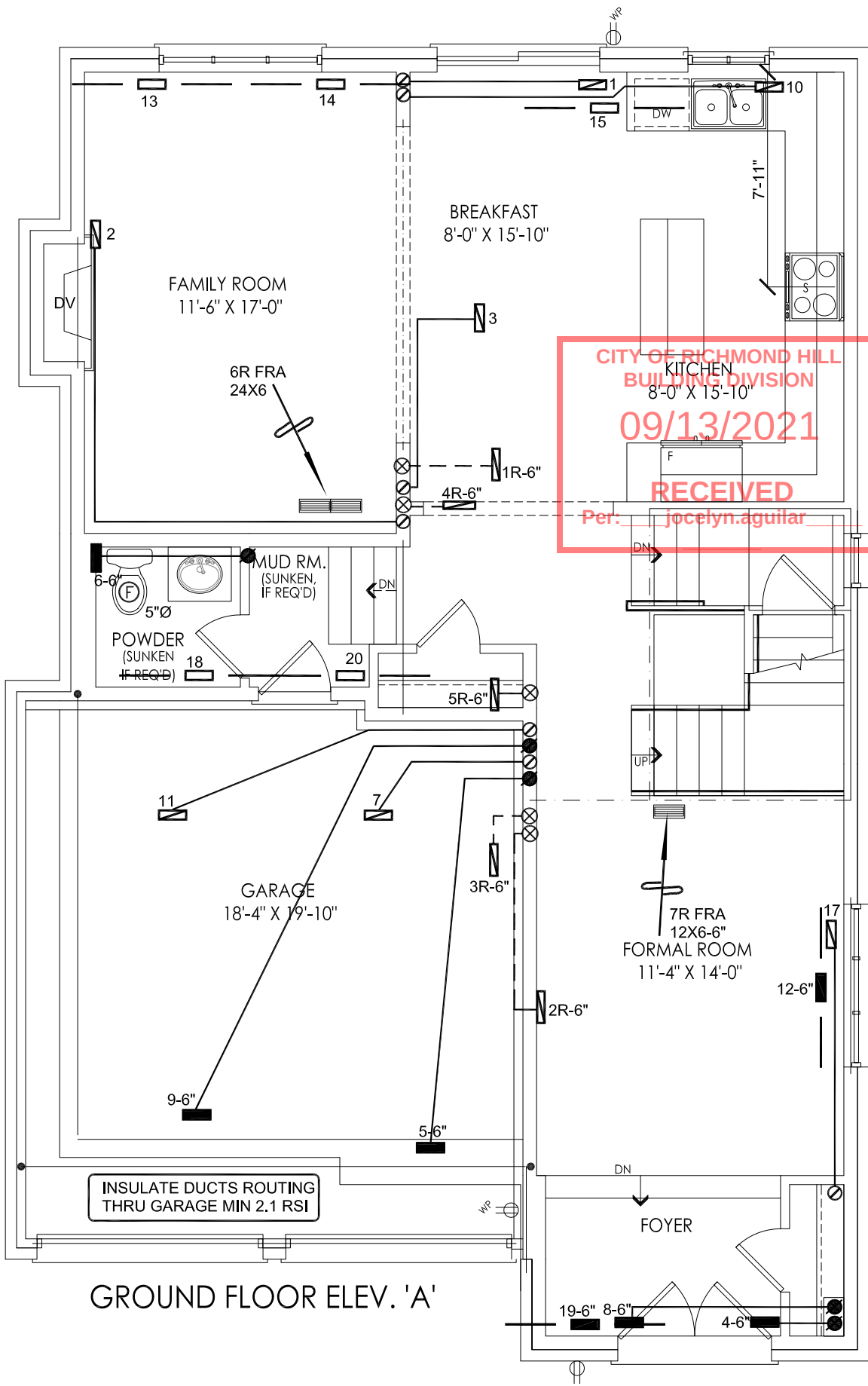
SB-12 PERFORMANCE

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

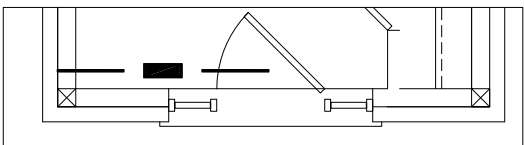
HVAC LEGEND								3.		
SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	2.	REVISED AS PER ARCHITECTURALS	APR/2021
	SUPPLY AIR GRILLE		6" SUPPLY AIR BOOT ABOVE		14"x8" RETURN AIR GRILLE		RETURN AIR STACK ABOVE	1.	REVISED TO PERFORMANCE	SEPT/2020
	SUPPLY AIR GRILLE 6" BOOT		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		

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.

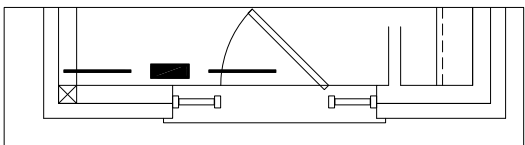
Client		 375 Finley Ave. Suite 202 - Ajax, Ontario L1S 2E2 Tel. 905.619.2300 - 905.420.5300 Fax 905.619.2375 Email: info@hvacdesigns.ca Web: www.hvacdesigns.ca Specializing in Residential Mechanical Design Services	HEAT LOSS 41915 BTU/H UNIT DATA		# OF RUNS S/A R/A FANS			Sheet Title	
ROYAL PINE HOMES			MAKE CARRIER	3RD FLOOR				BASEMENT HEATING LAYOUT	
Project Name			MODEL 59TN6A-060-14V	2ND FLOOR	12	5	3		
CENTREFIELD (WEST GORMLEY) RICHMOND HILL, ONTARIO			INPUT 60 MBTU/H	1ST FLOOR	7	2	2		
FIN BSMT WUB 38-8			OUTPUT 58 MBTU/H	BASEMENT	5	1	1	Date	SEPT/2020
2366 sqft		COOLING 2.5 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 970 cfm @ 0.6" w.c.					BCIN# 19669		
							LO#	87609	



GROUND FLOOR ELEV. 'A'



GROUND FLOOR PLAN ELEV. 'B'



GROUND FLOOR PLAN ELEV. 'C'

WUB

CSA-F280-12

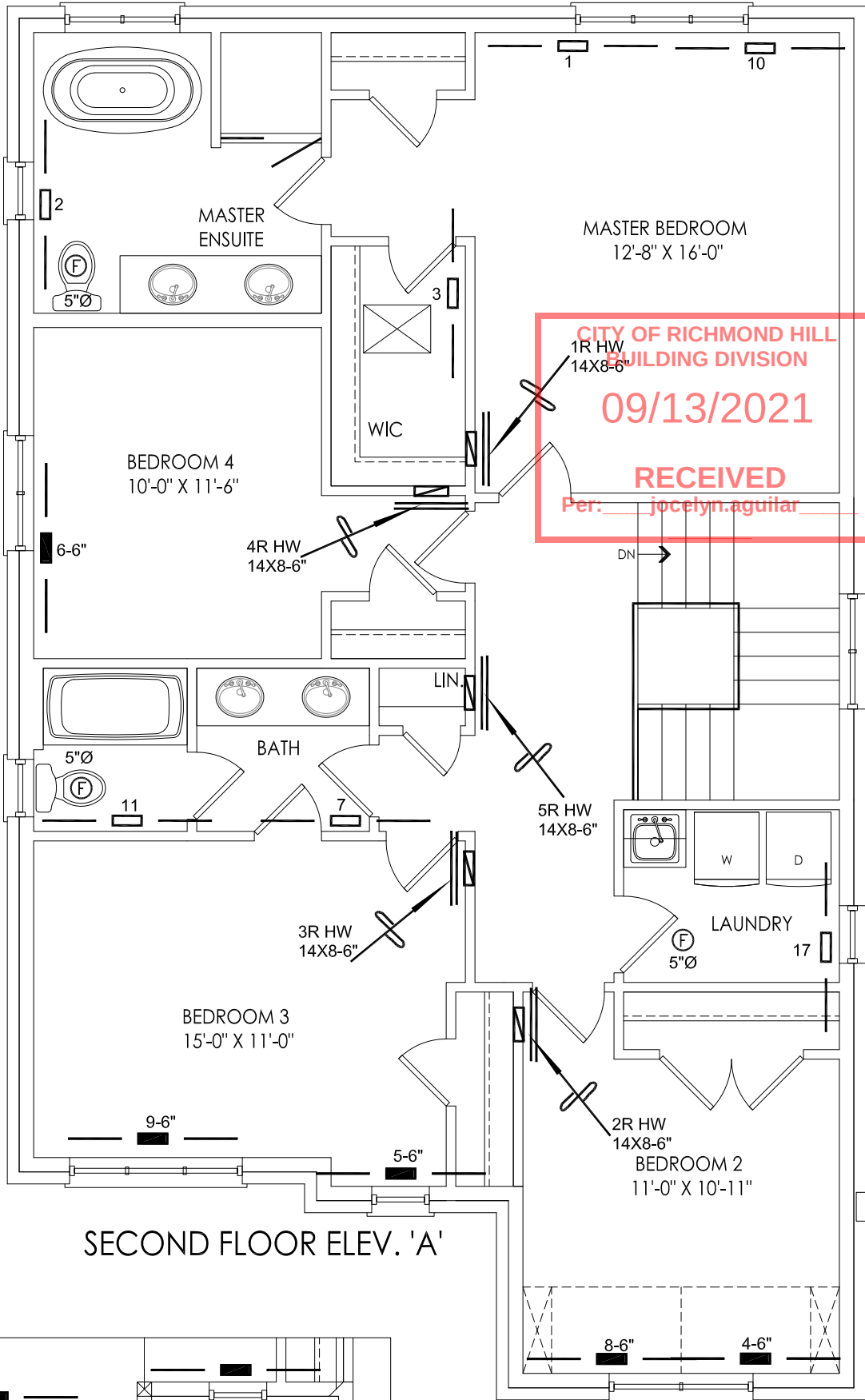
SB-12 PERFORMANCE

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.

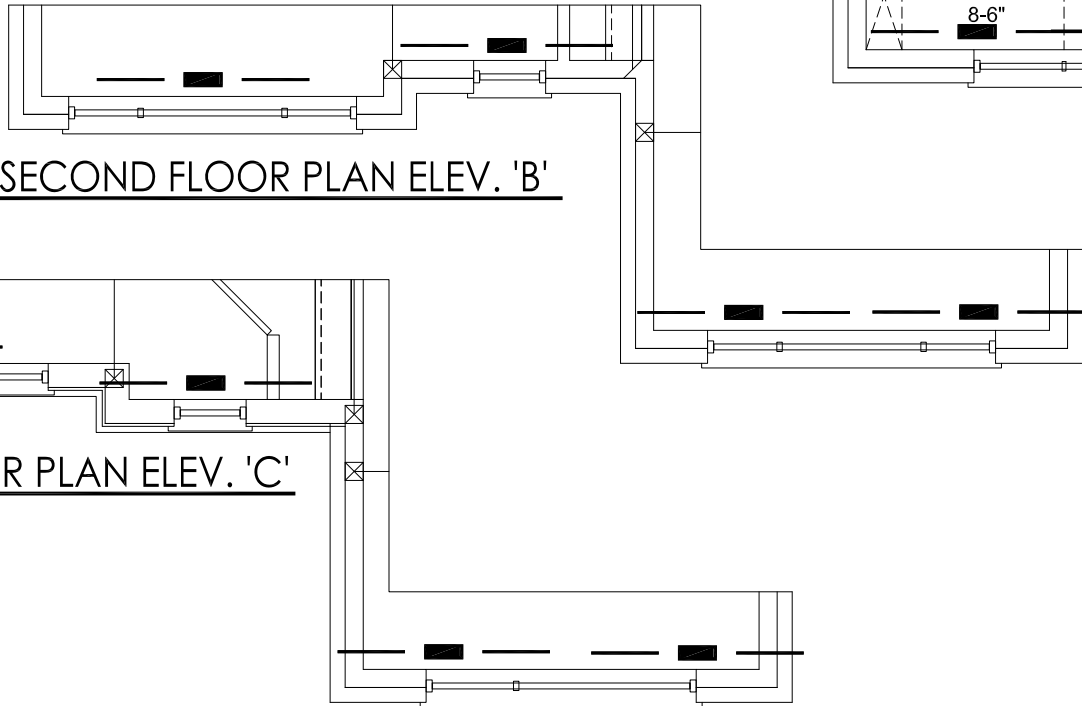
HVAC LEGEND								3.		
SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	2.	REVISED AS PER ARCHITECTURALS	APR/2021
	SUPPLY AIR GRILLE		6" SUPPLY AIR BOOT ABOVE		14"x8" RETURN AIR GRILLE		RETURN AIR STACK ABOVE	1.	REVISED TO PERFORMANCE	SEPT/2020
	SUPPLY AIR GRILLE 6" BOOT		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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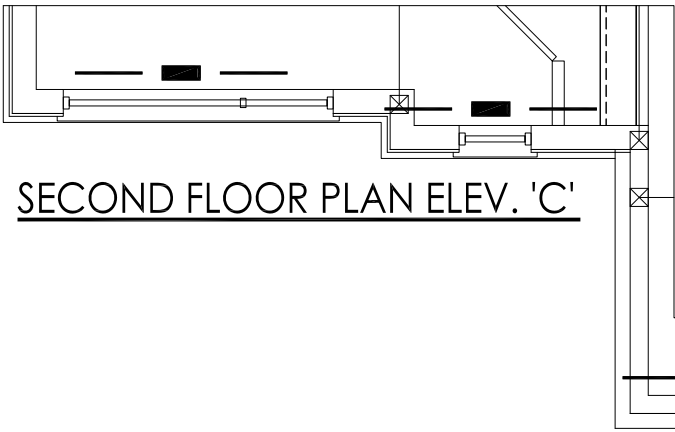
Client		 375 Finley Ave. Suite 202 - Ajax, Ontario L1S 2E2 Tel. 905.619.2300 - 905.420.5300 Fax 905.619.2375 Email: info@hvacdesigns.ca Web: www.hvacdesigns.ca Specializing in Residential Mechanical Design Services	Sheet Title	
ROYAL PINE HOMES			FIRST FLOOR HEATING LAYOUT	
Project Name		Installation 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.	Date	SEPT/2020
CENTREFIELD (WEST GORMLEY) RICHMOND HILL, ONTARIO			Scale	3/16" = 1'-0"
FIN BSMT WUB			BCIN# 19669	
38-8	2366 sqft		LO#	87609



SECOND FLOOR ELEV. 'A'



SECOND FLOOR PLAN ELEV. 'B'



SECOND FLOOR PLAN ELEV. 'C'

WUB

CSA-F280-12

SB-12 PERFORMANCE

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.

HVAC LEGEND								3.		
SYMBOL	DESCRIPTION	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		RETURN AIR STACK ABOVE	1.	REVISED TO PERFORMANCE	SEPT/2020
	SUPPLY AIR GRILLE 6" BOOT		SUPPLY AIR STACK FROM 2nd FLOOR		30"x8" RETURN AIR GRILLE		RETURN AIR STACK 2nd FLOOR	No.	Description	Date
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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	Sheet Title	
ROYAL PINE HOMES			SECOND FLOOR HEATING LAYOUT	
Project Name			Date	SEPT/2020
CENTREFIELD (WEST GORMLEY) RICHMOND HILL, ONTARIO			Scale	3/16" = 1'-0"
FIN BSMT WUB 38-8		BCIN# 19669		
2366 sqft		LO# 87609		

09/03/2021

RECEIVED

Per: jocelyn.aguiar**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: 38-8 Ashtown 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.			
April 19, 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

09/03/2021

SITE NAME: CENTREFIELD (WEST GORMLEY)

BUILDER: ROYAL PINE HOMES

TYPE: 38-8

GFA: 2366

DATE: Apr-21

LO# 87608

WINTER NATURAL AIR CHANGE RATE 0.227

HEAT LOSS AT °F. 78

CSA-F280-12

SUMMER NATURAL AIR CHANGE RATE 0.071

HEAT GAIN AT °F. 13

SB-12 PERFORMANCE

ROOM USE	EXP. WALL	CLG. HT.	MBR	ENS	WIC	BED-2	BED-3	BED-4	BATH								
			36	21	0	34	29	12	6								
			9	9	9	9	9	9	9								
FACTORS																	
GRS.WALL AREA	LOSS	GAIN	324	189	0	306	261	108	54								
GLAZING	LOSS	GAIN	LOSS	GAIN	LOSS	GAIN	LOSS	GAIN	LOSS	GAIN	LOSS	GAIN	LOSS	GAIN	LOSS	GAIN	LOSS
NORTH	21.8	16.0	0	0	0	8	174	128	0	0	0	0	0	0	17	370	272
EAST	21.8	41.6	26	566	1080	17	370	706	0	0	0	0	0	0	0	0	0
SOUTH	21.8	24.9	11	240	274	0	0	0	0	0	0	0	0	0	0	0	0
WEST	21.8	41.6	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
DOORS	25.8	4.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
NET EXPOSED WALL	4.2	0.7	287	1207	199	164	690	113	0	0	0	269	1131	186	91	383	63
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
EXPOSED CLG	1.3	0.6	241	317	142	123	162	72	75	99	44	140	184	82	205	269	121
NO ATTIC EXPOSED CLG	2.8	1.3	0	0	0	0	0	0	0	0	0	40	112	50	0	0	0
EXPOSED FLOOR	2.6	0.4	0	0	0	0	0	0	0	0	0	0	0	0	205	535	88
BASEMENT/CRAWL HEAT LOSS			0	0	0	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	0	0	0
SUBTOTAL HT LOSS			2330		1396	99		2234		2711		970		684			
SUB TOTAL HT GAIN				1694		1020		1856		2269		432		238			
LEVEL FACTOR / MULTIPLIER	0.20	0.18			0.20	0.18		0.20	0.18		0.20	0.18		0.20	0.18		
AIR CHANGE HEAT LOSS			427		256	18		410		497		178		125			
AIR CHANGE HEAT GAIN				98		59		107		131		25		14			
DUCT LOSS			0		0			0		321		0		81			
DUCT GAIN			0		0			0		325		0		25			
HEAT GAIN PEOPLE	240		2	480	0	0	0	1	240	1	240	1	240	0	0		
HEAT GAIN APPLIANCES/LIGHTS				606		0		606		606		606		0			
TOTAL HT LOSS BTU/H			2757		1652	117		2643		3529		1148		890			
TOTAL HT GAIN x 1.3 BTU/H				3742		1403		3652		4641		1693		360			

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Per: jocelyn aguilar

ROOM USE	EXP. WALL	CLG. HT.	FORM	FAM	KT/BR	LAUN	PWD	FOY	MUD								BAS
			31	33	40	12	13	27	8								158
			10	10	10	9	11	11	11								10
FACTORS																	
GRS.WALL AREA	LOSS	GAIN	313	333	404	108	144	300	89								1106
GLAZING	LOSS	GAIN	LOSS	GAIN	LOSS	GAIN	LOSS	GAIN	LOSS	GAIN	LOSS	GAIN	LOSS	GAIN	LOSS	GAIN	LOSS
NORTH	21.8	16.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
EAST	21.8	41.6	0	0	0	34	741	1413	12	261	499	0	0	0	0	0	0
SOUTH	21.8	24.9	31	675	772	0	0	0	7	152	174	17	370	423	0	0	0
WEST	21.8	41.6	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
DOORS	25.8	4.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
NET EXPOSED WALL	4.2	0.7	282	1186	195	299	1259	207	385	1619	266	91	383	63	144	607	100
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
EXPOSED CLG	1.3	0.6	0	0	0	10	13	6	0	0	0	92	121	54	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
EXPOSED FLOOR	2.6	0.4	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	0	0	0	0	0	0	0
SLAB ON GRADE HEAT LOSS			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
SUBTOTAL HT LOSS			1862		2012	2033		874		607		2548		806			
SUB TOTAL HT GAIN				967		1626		540		100		1330		133			
LEVEL FACTOR / MULTIPLIER	0.30	0.32			0.30	0.32		0.30	0.32		0.30	0.32		0.30	0.32		
AIR CHANGE HEAT LOSS			586		634		640		191		803		254				
AIR CHANGE HEAT GAIN				56		94		54		31		6		77		8	
DUCT LOSS			0		0		0		0		0		0		0		
DUCT GAIN			0		0		0		0		0		0		0		
HEAT GAIN PEOPLE	240		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
HEAT GAIN APPLIANCES/LIGHTS				606		606		606		606		606		0			
TOTAL HT LOSS BTU/H			2448		2646	2673		1034		798		3351		1060			
TOTAL HT GAIN x 1.3 BTU/H				2117		3023		2079		1531		137		1829		182	

TOTAL HEAT GAIN BTU/H:

28574

TONS: 2.38

LOSS DUE TO VENTILATION LOAD BTU/H: 1670

STRUCTURAL HEAT LOSS: 39769

TOTAL COMBINED HEAT LOSS BTU/H: 41439

CITY OF RICHMOND HILL
BUILDING DIVISION
09/03/2021

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

TYPE: 38-8

DATE: Apr-21

GFA: 2366 LO# 87608

HEATING CFM 970 COOLING CFM 970
TOTAL HEAT LOSS 39,769 TOTAL HEAT GAIN 28,299
AIR FLOW RATE CFM 24.39 AIR FLOW RATE CFM 34.28

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

****CARRIER** AFUE = 97 %
59TN6A-060-14V INPUT (BTU/H) = 60,000
FAN SPEED **60** OUTPUT (BTU/H) = **58,000**
LOW 820
MEDLOW 0
MEDIUM 970 DESIGN CFM = **970**
MEDIUM HIGH 0 CFM @ 6" E.S.P.
HIGH 1520
TEMPERATURE RISE **55** °F

RUN COUNT	4th	3rd	2nd	1st	Bas
S/A	0	0	12	7	4
R/A	0	0	5	2	1

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

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

RUN #	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	17	18	19	20	21	22	23	24
ROOM NAME	MBR	ENS	WIC	BED-2	BED-3	BED-4	BATH	BED-2	BED-3	MBR	BATH	FORM	FAM	FAM	KT/BR	LAUN	PWD	FOY	MUD	BAS	BAS	BAS	BAS
RM LOSS MBH.	1.38	1.65	0.12	1.32	1.76	1.15	0.45	1.32	1.76	1.38	0.45	2.45	1.32	1.32	2.67	1.03	0.80	3.35	1.06	3.26	3.26	3.26	3.26
CFM PER RUN HEAT	34	40	3	32	43	28	11	32	43	34	11	60	32	32	65	25	19	82	26	79	79	79	79
RM GAIN MBH.	1.87	1.40	0.06	1.83	2.32	1.69	0.18	1.83	2.32	1.87	0.18	2.12	1.51	1.51	2.08	1.53	0.14	1.83	0.18	0.46	0.46	0.46	0.46
CFM PER RUN COOLING	64	48	2	63	80	58	6	63	80	64	6	73	52	52	71	52	5	63	6	16	16	16	16
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	0.17	0.17	0.17	0.17	0.17	0.16	0.17	0.17	0.17	0.17	0.17
ACTUAL DUCT LGH.	39	43	27	67	52	34	42	72	56	46	48	43	32	26	31	69	25	47	12	27	32	36	51
EQUIVALENT LENGTH	130	180	180	200	170	0	180	200	190	140	200	190	140	120	140	220	120	160	120	140	150	130	170
TOTAL EFFECTIVE LENGTH	169	223	207	267	222	34	222	272	246	186	248	233	172	146	171	289	145	207	132	167	182	166	221
ADJUSTED PRESSURE	0.1	0.08	0.08	0.06	0.08	0.51	0.08	0.06	0.07	0.09	0.07	0.07	0.1	0.12	0.1	0.06	0.12	0.08	0.13	0.1	0.09	0.1	0.08
ROUND DUCT SIZE	5	5	4	6	6	6	4	6	6	5	4	6	5	4	5	5	4	6	4	5	5	5	6
HEATING VELOCITY (ft/min)	250	294	34	163	219	143	126	163	219	250	126	306	235	367	477	184	218	418	298	580	580	580	403
COOLING VELOCITY (ft/min)	470	352	23	321	408	296	69	321	408	470	69	372	382	597	521	382	57	321	69	117	117	117	82
OUTLET GRILL SIZE	3X10	3X10	3X10	4X10	4X10	4X10	3X10	4X10	4X10	3X10	3X10	4X10	3X10	3X10	3X10	3X10	3X10	4X10	3X10	3X10	3X10	3X10	4X10
TRUNK	A	D	D	B	C	D	C	B	C	A	C	B	A	A	A	B	D	B	D	A	A	C	B

RUN #	
ROOM NAME	
RM LOSS MBH.	
CFM PER RUN HEAT	
RM GAIN MBH.	
CFM PER RUN COOLING	
ADJUSTED PRESSURE	
ACTUAL DUCT LGH.	
EQUIVALENT LENGTH	
TOTAL EFFECTIVE LENGTH	
ADJUSTED PRESSURE	
ROUND DUCT SIZE	
HEATING VELOCITY (ft/min)	
COOLING VELOCITY (ft/min)	
OUTLET GRILL SIZE	
TRUNK	

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	355	0.09	9.2	10	x	8	639	TRUNK G	0	0.00	0	0	x	8	0	TRUNK O	0	0.05	0	0	x	8	0
TRUNK B	310	0.06	9.7	12	x	8	465	TRUNK H	0	0.00	0	0	x	8	0	TRUNK P	0	0.05	0	0	x	8	0
TRUNK C	497	0.06	11.6	16	x	8	559	TRUNK I	0	0.00	0	0	x	8	0	TRUNK Q	0	0.05	0	0	x	8	0
TRUNK D	613	0.06	12.5	20	x	8	552	TRUNK J	0	0.00	0	0	x	8	0	TRUNK R	0	0.05	0	0	x	8	0
TRUNK E	968	0.06	14.9	26	x	8	670	TRUNK K	0	0.00	0	0	x	8	0	TRUNK S	0	0.05	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	TRUNK T	0	0.05	0	0	x	8	0

RETURN AIR #	1	2	3	4	5	6	7										BR	TRUNK W TRUNK X TRUNK Y TRUNK Z DROP	0	0.05	0	0	x	8	0
AIR VOLUME	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	155		970	0.05	15.6	28	x	8	624
PLENUM PRESSURE	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15		310	0.05	10.2	12	x	8	465
ACTUAL DUCT LGH.	40	70	61	39	58	20	42	1	1	1	1	1	1	1	1	1	14		0	0.05	0	0	x	8	0
EQUIVALENT LENGTH	225	250	245	155	225	175	225	0	0	0	0	0	0	0	0	0	135		970	0.05	15.6	24	x	10	582
TOTAL EFFECTIVE LH	265	320	306	194	283	195	267	1	1	1	1	1	1	1	1	1	149								
ADJUSTED PRESSURE	0.06	0.05	0.05	0.08	0.05	0.08	0.06	14.80	14.80	14.80	14.80	14.80	14.80	14.80	14.80	14.80	0.10								
ROUND DUCT SIZE	6	6	6	5.9	6	9.2	6	0	0	0	0	0	0	0	0	0	6.6								
INLET GRILL SIZE	8	8	8	8	8	8	8	0	0	0	0	0	0	0	0	0	8								
	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X								
INLET GRILL SIZE	14	14	14	14	14	30	14	0	0	0	0	0	0	0	0	0	14								

TYPE: 38-8
SITE NAME: CENTREFIELD (WEST GORMLEY)

LO # 87608

09/03/2021
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>3</u> @ 10.6 cfm	<u>31.8</u> cfm
Kitchen & Bathrooms	<u>4</u> @ 10.6 cfm	<u>42.4</u> cfm
Other Rooms	<u>4</u> @ 10.6 cfm	<u>42.4</u> cfm
Table 9.32.3.A.	TOTAL	<u>159.0</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>79.5</u> cfm

SUPPLEMENTAL VENTILATION CAPACITY		9.32.3.5.
Total Ventilation Capacity	Per: <u>jocelyn.aguiar</u>	159 cfm
Less Principal Ventil. Capacity	<u>79.5</u>	cfm
Required Supplemental Capacity	<u>79.5</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
PWD	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 #	001820
Date:	April-21

09/03/2021

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Per: joeclyn.aguilar

CSA F280-12 Residential Heat Loss and Heat Gain Calculations																																																												
Formula Sheet (For Air Leakage / Ventilation Calculation)																																																												
LO#: 87608	Model: 38-8	Builder: ROYAL PINE HOMES	Date: 4/19/2021																																																									
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>1042</td> <td>10</td> <td>10420</td> </tr> <tr> <td>First</td> <td>1042</td> <td>10</td> <td>10524.2</td> </tr> <tr> <td>Second</td> <td>1324</td> <td>9</td> <td>11916</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>32,860.2 ft³</td> </tr> <tr> <td colspan="3" style="text-align: right;">Total:</td> <td>930.5 m³</td> </tr> </tbody> </table>		Level	Floor Area (ft ²)	Floor Height (ft)	Volume (ft ³)	Bsmt	1042	10	10420	First	1042	10	10524.2	Second	1324	9	11916	Third	0	9	0	Fourth	0	9	0	Total:			32,860.2 ft ³	Total:			930.5 m ³	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 80%;">WINTER NATURAL AIR CHANGE RATE</td> <td style="width: 20%;">0.227</td> </tr> <tr> <td>SUMMER NATURAL AIR CHANGE RATE</td> <td>0.071</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	0.227	SUMMER NATURAL AIR CHANGE RATE	0.071	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																																																										
$HL_{airb} = LR_{airh} \times \frac{V_b}{3.6} \times DTD_h \times 1.2$ 0.227 x 258.47 x 43 °C x 1.2 = 3037 W = 10362 Btu/h		$HG_{salb} = LR_{airc} \times \frac{V_b}{3.6} \times DTD_c \times 1.2$ = 0.071 x 258.47 x 7 °C x 1.2 = 156 W = 532 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_{level})</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>0.5</td> <td rowspan="5" style="text-align: center; vertical-align: middle;">10,362</td> <td>7,840</td> <td>0.661</td> </tr> <tr> <td>2</td> <td>0.3</td> <td>9,868</td> <td>0.315</td> </tr> <tr> <td>3</td> <td>0.2</td> <td>11,296</td> <td>0.183</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>					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 _{level})	1	0.5	10,362	7,840	0.661	2	0.3	9,868	0.315	3	0.2	11,296	0.183	4	0	0	0.000	5	0	0	0.000																														
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*HL_{airbv} = Air leakage heat loss + ventilation heat loss *For a balanced or supply only ventilation system HL_{airve} = 0																																																												

HEAT LOSS AND GAIN SUMMARY SHEET**09/03/2021****MODEL:** 38-8**BUILDER:** ROYAL PINE HOMES**SFQT:** 2366**LO#** 87608**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):	32860.2	ASSUMED (Y/N):	Y
INTERNAL SHADING:	BLINDS/CURTAINS	ASSUMED OCCUPANTS:	5
INTERIOR LIGHTING LOAD (Btu/h/ft ²):	1.60	DC BRUSHLESS MOTOR (Y/N):	Y
FOUNDATION CONFIGURATION	BCIN_1	DEPTH BELOW GRADE:	7.0 ft
LENGTH: 48.0 ft	WIDTH: 31.0 ft	EXPOSED PERIMETER:	158.0 ft

2012 OBC - COMPLIANCE PACKAGE**Component****Compliance Package
SB-12 PERFORMANCE****Nominal Min. Eff.**

Ceiling with Attic Space Minimum RSI (R)-Value	60	59.20
Ceiling Without Attic Space Minimum RSI (R)-Value	31	27.70
Exposed Floor Minimum RSI (R)-Value	31	29.80
Walls Above Grade Minimum RSI (R)-Value	22+1.5	18.50
Basement Walls Minimum RSI (R)-Value	20	21.12
Below Grade Slab Entire surface > 600 mm below grade Minimum RSI (R)-Value	-	-
Edge of Below Grade Slab ≤ 600 mm Below Grade Minimum RSI (R)-Value	10	10
Heated Slab or Slab ≤ 600 mm below grade Minimum RSI (R)-Value	10	11.13
Windows and Sliding Glass Doors Maximum U-Value	1.6	-
Skylights Maximum U-Value	2.6	-
Space Heating Equipment Minimum AFUE	0.96	-
HRV Minimum Efficiency	75%	-
Domestic Hot Water Heater Minimum EF	TE=94%	-

INDIVIDUAL BCIN: 19669

MICHAEL O'ROURKE

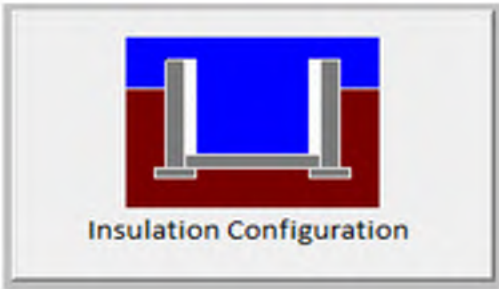
Michael O'Rourke

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Per: [Signature]

Residential Foundation Thermal Load Calculator

Supplemental tool for CAN/CSA-F280

Weather Station Description		
Province:	Ontario	
Region:	Richmond Hill	
Site Description		
Soil Conductivity:	Normal conductivity: dry sand, loam, clay	
Water Table:	Normal (7-10 m, 23-33 ft)	
Foundation Dimensions		
Floor Length (m):	14.6	
Floor Width (m):	9.4	
Exposed Perimeter (m):	0.0	
Wall Height (m):	3.0	
Depth Below Grade (m):	2.13	
Window Area (m ²):	1.1	
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):		1558

TYPE: 38-8

LO# 87608

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Per: jocelyn.aguilar

Air Infiltration Residential Load Calculator

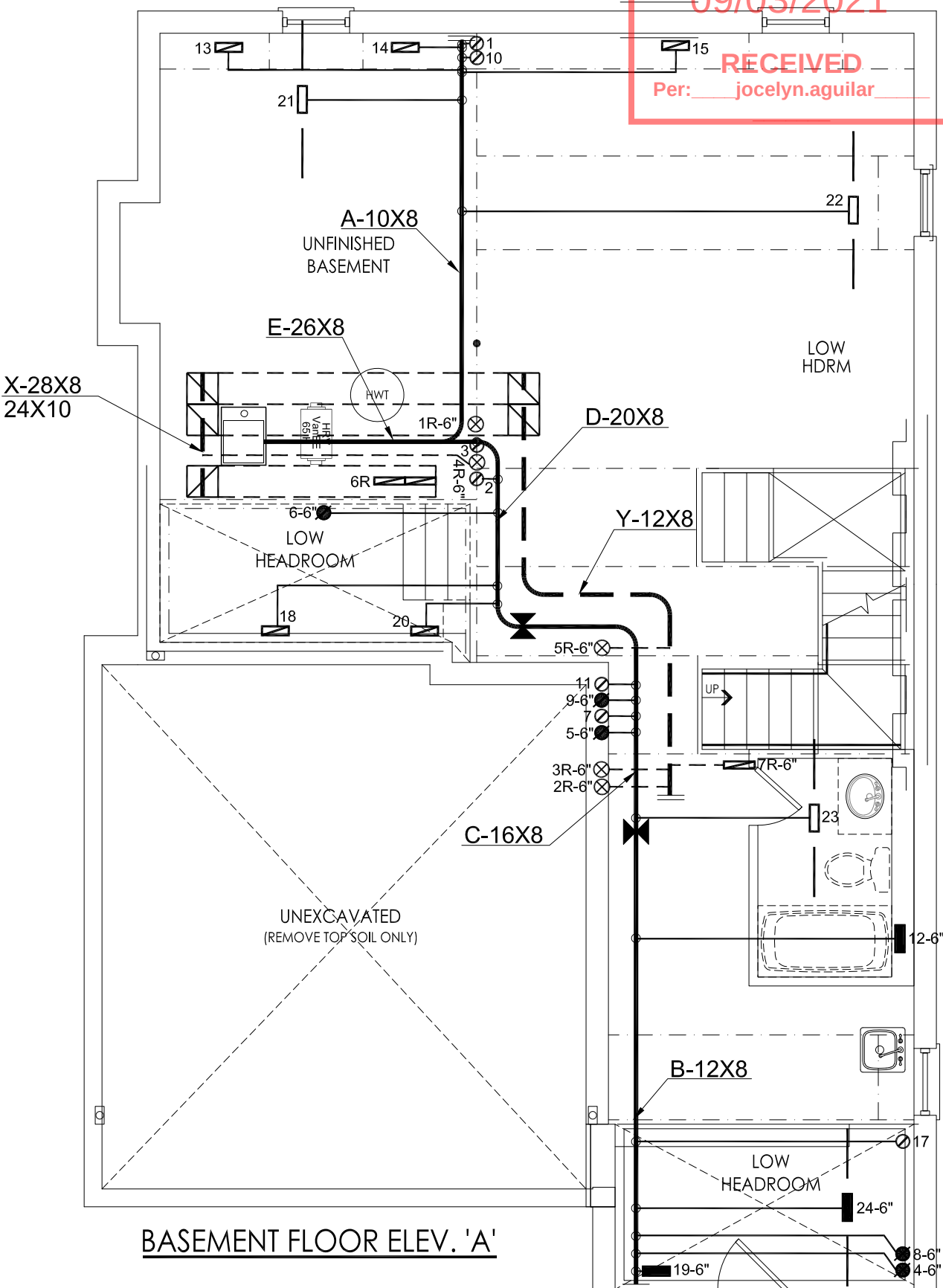
Supplemental tool for CAN/CSA-F280

Weather Station Description				
Province:	Ontario			
Region:	Richmond Hill			
Weather Station Location:	Open flat terrain, grass			
Anemometer height (m):	10			
Local Shielding				
Building Site:	Suburban, forest			
Walls:	Heavy			
Flue:	Heavy			
Highest Ceiling Height (m):	6.74			
Building Configuration				
Type:	Detached			
Number of Stories:	Two			
Foundation:	Full			
House Volume (m ³):	930.5			
Air Leakage/Ventilation				
Air Tightness Type:	Energy Star Detached (2.5 ACH)			
Custom BDT Data:	ELA @ 10 Pa.		868.6 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):	0.227			
Cooling Air Leakage Rate (ACH/H):	0.071			

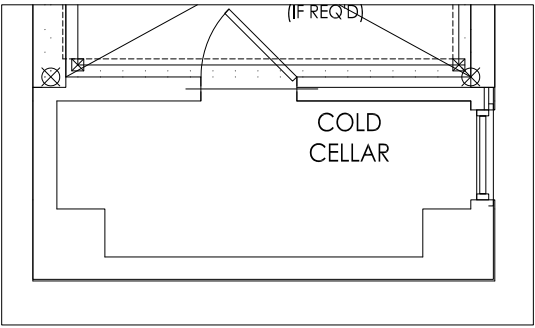
TYPE: 38-8

LO# 87608

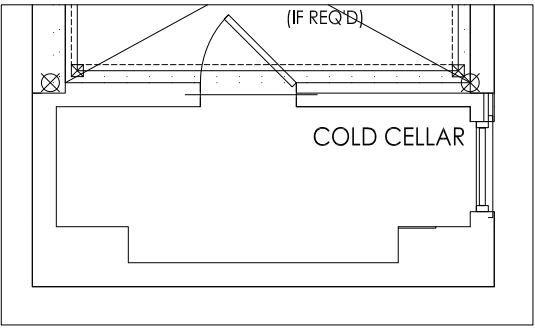
CITY OF RICHMOND HILL
BUILDING DIVISION
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Per: jocelyn.aguilar



BASEMENT FLOOR ELEV. 'A'



BASEMENT FLOOR PLAN ELEV. 'B'



BASEMENT FLOOR PLAN ELEV. 'C'

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

CSA-F280-12

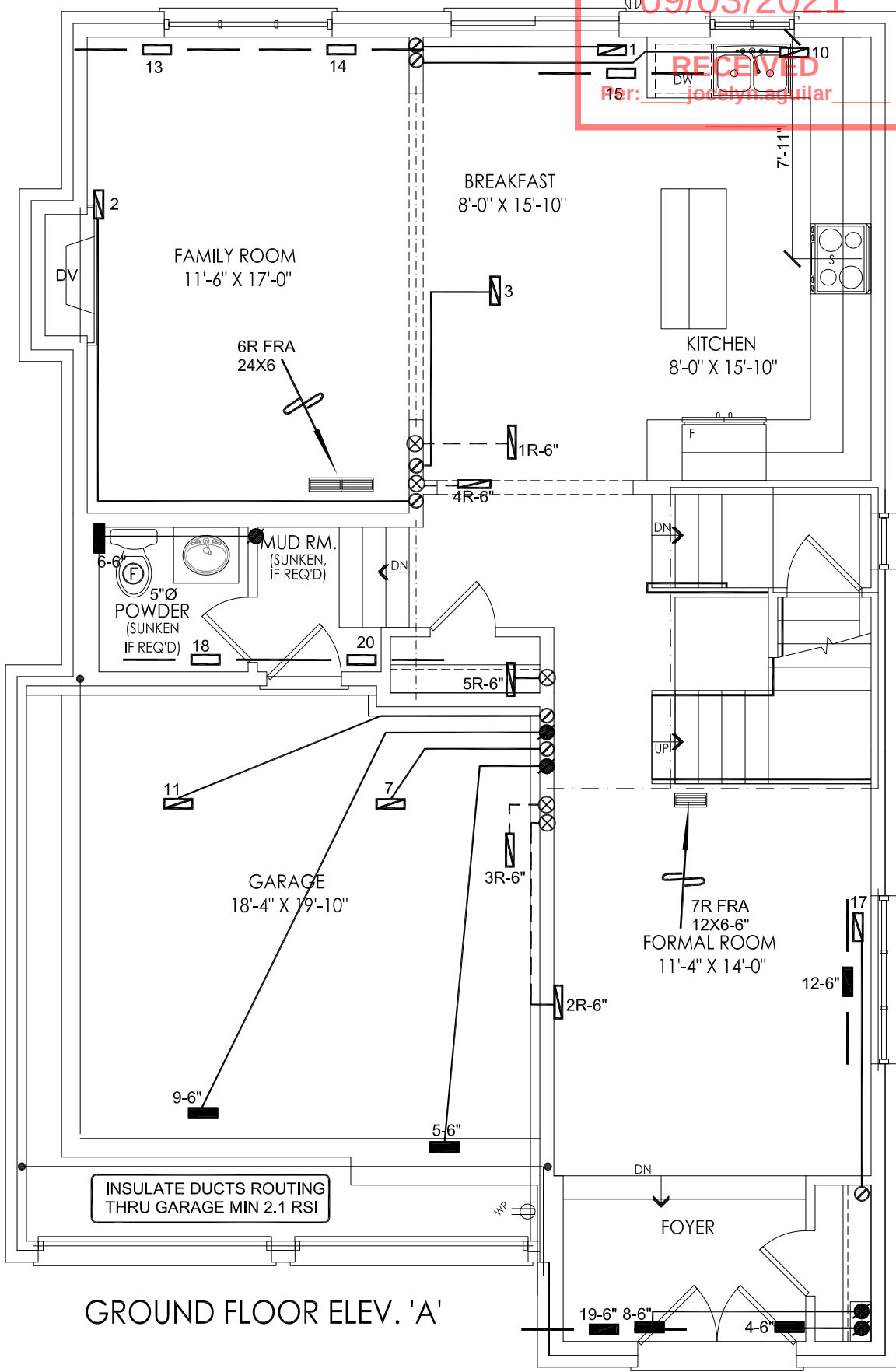
SB-12 PERFORMANCE

HVAC LEGEND								3.		
SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	2.	REVISED AS PER ARCHITECTURALS	APR/2021
	SUPPLY AIR GRILLE		6" SUPPLY AIR BOOT ABOVE		14"x8" RETURN AIR GRILLE		RETURN AIR STACK ABOVE	1.	REVISED TO PERFORMANCE	SEPT/2020
	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		

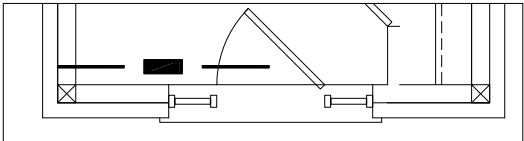
ALL DRAWINGS, CALCULATIONS AND SPECIFICATIONS ARE THE PROPERTY OF HVAC DESIGNS LTD.© AND MAY NOT BE REPRODUCED, MODIFIED OR ALTERED WITHOUT EXPRESSED WRITTEN CONSENT. THE DRAWINGS ARE DATED AND USE OF THESE DRAWINGS AFTER ONE YEAR FROM THE DATED NOTED IS NOT AUTHORIZED. CONTRACTOR SHALL CHECK ALL CONDITIONS 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 41439 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			MODEL 59TN6A-060-14V	2ND FLOOR	12	5	3	Date	
CENTREFIELD (WEST GORMLEY) RICHMOND HILL, ONTARIO			INPUT 60 MBTU/H	1ST FLOOR	7	2	2	SEPT/2020	
			OUTPUT 58 MBTU/H	BASEMENT	4	1	0	Scale	
		COOLING 2.5 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				3/16" = 1'-0"		
		FAN SPEED 970 cfm @ 0.6" w.c.					BCIN# 19669		
38-8								LO#	87608
2366 sqft									

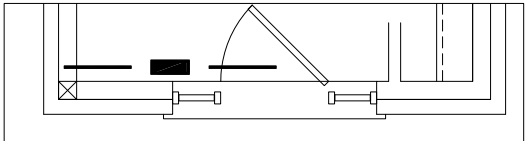
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BUILDING DIVISION
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For: joselyn.aguiar



GROUND FLOOR ELEV. 'A'



GROUND FLOOR PLAN ELEV. 'B'



GROUND FLOOR PLAN ELEV. 'C'

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.		
SYMBOL	DESCRIPTION	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		RETURN AIR STACK ABOVE	1.	REVISED TO PERFORMANCE	SEPT/2020
	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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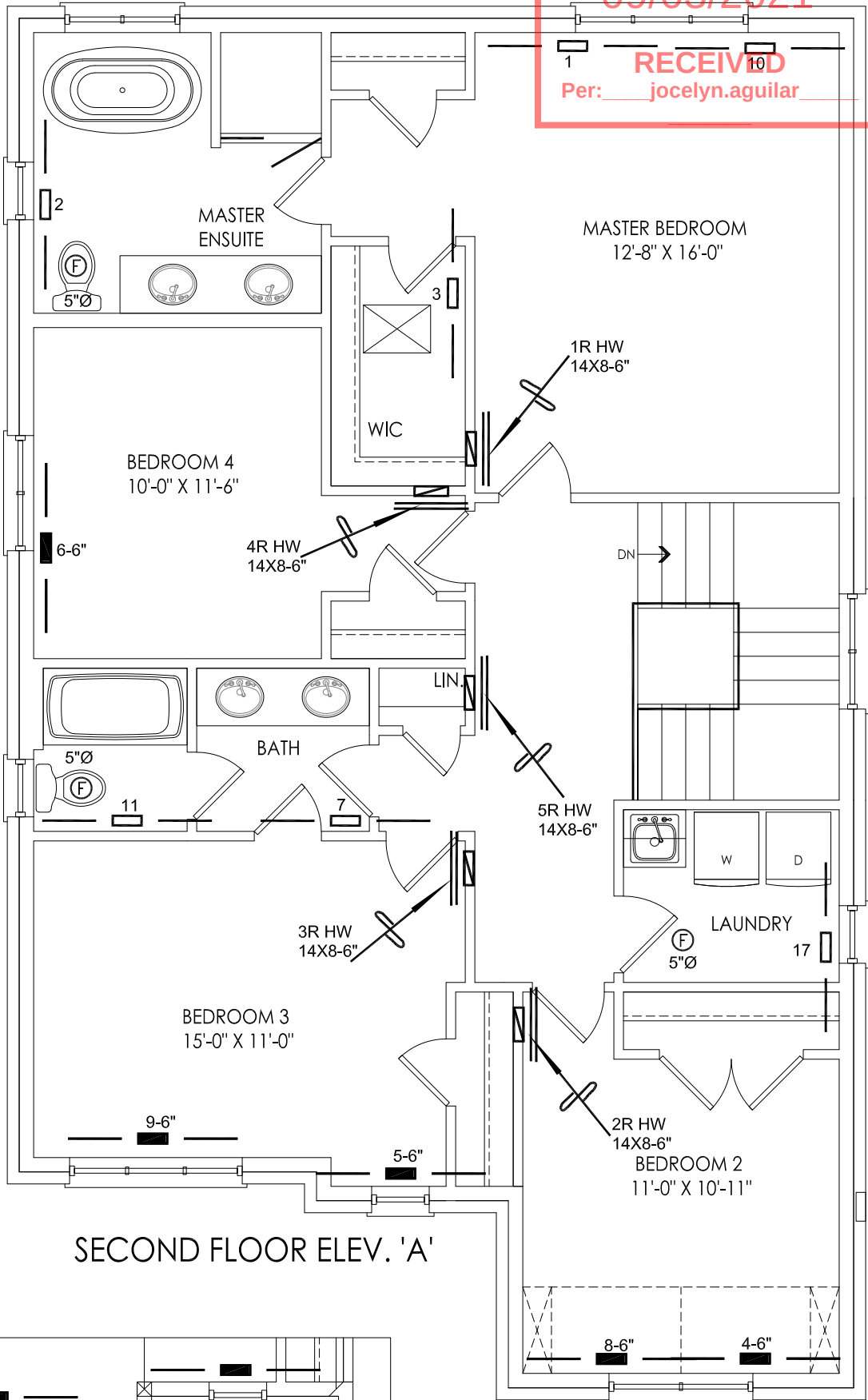
Client ROYAL PINE HOMES		 375 Finley Ave. Suite 202 - Ajax, Ontario L1S 2E2 Tel. 905.619.2300 - 905.420.5300 Fax 905.619.2375 Email: info@hvacdsgns.ca Web: www.hvacdesigns.ca Specializing in Residential Mechanical Design Services	Sheet Title FIRST FLOOR HEATING LAYOUT
Project Name CENTREFIELD (WEST GORMLEY) RICHMOND HILL, ONTARIO			
38-8 2366 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.	Date SEPT/2020
			Scale 3/16" = 1'-0"
			BCIN# 19669
			LO# 87608

CITY OF RICHMOND HILL
BUILDING DIVISION

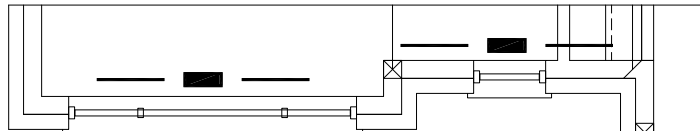
09/03/2021

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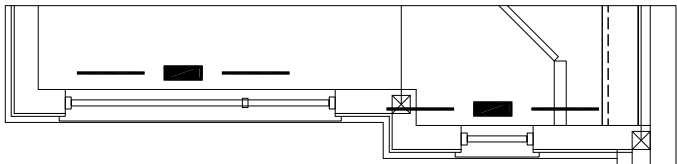
Per: jocelyn.aguilar



SECOND FLOOR ELEV. 'A'



SECOND FLOOR PLAN ELEV. 'B'



SECOND FLOOR PLAN ELEV. 'C'

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.		
SYMBOL	DESCRIPTION	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		RETURN AIR STACK ABOVE	1.	REVISED TO PERFORMANCE	SEPT/2020
	SUPPLY AIR GRILLE 6" BOOT		SUPPLY AIR STACK FROM 2nd FLOOR		30"x8" RETURN AIR GRILLE		RETURN AIR STACK 2nd FLOOR	No.	Description	Date
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Client		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.	Sheet Title	
Project Name			SECOND FLOOR HEATING LAYOUT	
ROYAL PINE HOMES			Date	SEPT/2020
CENTREFIELD (WEST GORMLEY) RICHMOND HILL, ONTARIO			Scale	3/16" = 1'-0"
38-8			BCIN# 19669	
2366 sqft			LO#	87608

Schedule 1: Designer Information

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

CITY OF RICHMOND HILL
BUILDING DIVISION

09/15/2021

RECEIVED

Per: jocelyn.aguilar

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: 38-8 ASHTON OPT MAIN & OPT 2ND 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.			
April 19, 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.

[illegible]

TOTAL HEAT GAIN BTU/H:	28178	TONS: 2.43	LOSS DUE TO VENTILATION LOAD BTU/H: 1670
------------------------	-------	------------	--

INDIVIDUAL BCIN: 19669
MICHAEL O'HOURKE

SITE NAME: CENTREFIELD (WEST GORMLEY)
BUILDER: ROYAL PINE HOMESOPT MAIN & OPT 2ND
TYPE: 3B-8

DATE: Apr-21

GFA: 2389 LO# 90456

HEATING CFM 970 COOLING CFM 970
TOTAL HEAT LOSS 40,064 TOTAL HEAT GAIN 28,903
AIR FLOW RATE CFM 24.21 AIR FLOW RATE CFM 33.5650TNSA-060-14V 50
FAN SPEED LOW 820
MEDIUM 970
HIGH 1520

**CARRIER

AFUE = 97 %

INPUT (BTU/H) = 60,000

OUTPUT (BTU/H) = 58,000

RUN COUNT	4th	3rd	2nd	1st	Bas
S/A	0	0	12	7	4
R/A	0	0	5	2	1

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

All S/A fans 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	BED-2	BED-3	MBR	BATH	FORM	FAM	FAM	KT/BR		BATH-2	LAUN	FOY	MUD	BAS	BAS	BAS	BAS
RM LOSS MBH	1.38	1.66	0.12	1.32	1.77	0.45	0.45	1.32	1.77	1.38	0.45	2.45	1.32	1.32	2.67		1.04	0.99	3.35	1.06	3.27	3.27	3.27	3.27
CFM PER RUN HEAT	33	40	3	32	43	28	11	32	43	33	11	59	32	32	65		25	24	81	26	79	79	79	79
RM GAIN MBH	1.90	1.40	0.06	1.86	2.35	1.75	0.18	1.86	2.35	1.90	0.18	2.18	1.54	1.54	2.14		0.74	1.03	1.83	0.18	0.48	0.48	0.48	0.48
CFM PER RUN COOLING	64	47	2	62	79	59	6	62	79	64	6	73	52	52	72		25	35	61	6	16	16	16	16
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	0.17	0.17	0.17		0.17	0.17	0.16	0.17	0.17	0.17	0.17	0.17
ACTUAL DUCT LGH	39	43	27	67	52	34	42	72	56	46	48	43	32	26	31		69	25	47	12	27	32	36	51
EQUIVALENT LENGTH	130	180	180	200	170	0	180	200	190	140	200	190	140	120	140		220	130	160	130	140	150	130	170
TOTAL EFFECTIVE LENGTH	169	223	207	267	222	34	222	272	246	186	248	233	172	146	171		289	145	207	132	167	182	166	221
ADJUSTED PRESSURE	0.1	0.08	0.08	0.06	0.08	0.51	0.08	0.06	0.07	0.09	0.07	0.07	0.1	0.12	0.1		0.06	0.12	0.08	0.13	0.1	0.09	0.1	0.08
ROUND DUCT SIZE	5	5	4	6	6	6	4	6	6	5	4	6	5	5	5		4	4	6	4	5	5	5	6
HEATING VELOCITY (ft/min)	242	294	34	163	219	143	126	163	219	242	126	301	235	235	477		287	275	413	298	580	580	580	403
COOLING VELOCITY (ft/min)	470	345	23	316	403	301	69	316	403	470	69	372	382	382	529		287	402	311	69	117	117	117	82
OUTLET GRILL SIZE	3X10	3X10	3X10	4X10	4X10	4X10	3X10	4X10	4X10	3X10	3X10	4X10	3X10	3X10	3X10		3X10	3X10	4X10	3X10	3X10	3X10	3X10	4X10
TRUNK	A	D	D	B	C	D	C	B	C	A	C	B	A	A	A		B	D	B	D	A	A	C	B

RUN #

ROOM NAME

RM LOSS MBH

CFM PER RUN HEAT

RM GAIN MBH

CFM PER RUN COOLING

ADJUSTED PRESSURE

ACTUAL DUCT LGH

EQUIVALENT LENGTH

TOTAL EFFECTIVE LENGTH

ADJUSTED PRESSURE

ROUND DUCT SIZE

HEATING VELOCITY (ft/min)

COOLING VELOCITY (ft/min)

OUTLET GRILL SIZE

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SUPPLY AIR TRUNK SIZE

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CITY OF BROMFIELD

BUILDING DIVISION

09/15/2021

RECEIVED

Per: Jonathan G. G.

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TYPE: 38-8
SITE NAME: CENTREFIELD (WEST GORMLEY)

LO # 90456

OPT MAIN & OPT 2ND

RESIDENTIAL MECHANICAL VENTILATION DESIGN SUMMARY
**CITY OF RICHMOND HILL
BUILDING DIVISION**
09/15/2021
RECEIVED

Per: **jocelyn.aguilar**

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	4	@ 10.6 cfm	42.4	cfm
Table 9.32.3.A	TOTAL		169.6	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	169.6 cfm
Less Principal Ventil. Capacity	79.5 cfm
Required Supplemental Capacity	90.1 cfm

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

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

SUPPLEMENTAL FANS BY INSTALLING CONTRACTOR				
Location	Model	cfm	HVI	Sones
ENS	BY INSTALLING CONTRACTOR	50	☒	3.5
BATH	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:	April-21

CSA F280-12 Residential Heat Loss and Heat Gain Calculations																																																															
Formula Sheet (For Air Leakage / Ventilation Calculation)																																																															
LO#: 90456	Model: 38-8	Date: 4/19/2021																																																													
Volume Calculation		Air Change & Delta T Data																																																													
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6.2.6 Sensible Gain due to Air Leakage																																																															
$HG_{sarb} = LR_{airb} \times \frac{V_b}{3.6} \times DTD_c \times 1.2$																																																															
0.227	x	262.11	x																																																												
		7 °C	x																																																												
		1.2	=																																																												
			158 W																																																												
6.2.7 Sensible heat gain due to Ventilation																																																															
$HL_{vairb} = PVC \times DTD_h \times 1.08 \times (1 - E)$																																																															
80 CFM	x	13 °F	x																																																												
		1.08	x																																																												
		0.25	=																																																												
			275 Btu/h																																																												
5.2.3.3 Calculation of Air Change Heat Loss for Each Room (Floor Multiplier Section)																																																															
$HL_{airr} = Level Factor \times HL_{airbv} \times \{(HL_{agcr} + HL_{lgr}) \div (HL_{aglevel} + HL_{bglevel})\}$																																																															
<table border="1" style="width:100%; border-collapse: collapse;"> <tr> <th>Level</th> <th>Level Factor (LF)</th> <th>HL_{airbv} Air Leakage + Ventilation Heat Loss (Btu/h)</th> <th>Level Conductive Heat Loss: (HL_{level})</th> <th>Air Leakage Heat Loss Multiplier (LF x HL_{airbv} / HL_{level})</th> </tr> <tr> <td>1</td> <td>0.5</td> <td rowspan="4">10,508</td> <td>7,840</td> <td>0.670</td> </tr> <tr> <td>2</td> <td>0.3</td> <td>10,016</td> <td>0.315</td> </tr> <tr> <td>3</td> <td>0.2</td> <td>11,296</td> <td>0.186</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></td> <td>0</td> <td>0.000</td> </tr> </table>				Level	Level Factor (LF)	HL _{airbv} Air Leakage + Ventilation Heat Loss (Btu/h)	Level Conductive Heat Loss: (HL _{level})	Air Leakage Heat Loss Multiplier (LF x HL _{airbv} / HL _{level})	1	0.5	10,508	7,840	0.670	2	0.3	10,016	0.315	3	0.2	11,296	0.186	4	0	0	0.000	5	0		0	0.000																																	
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*HL_{airbv} = Air leakage heat loss + ventilation heat loss *For a balanced or supply only ventilation system HL_{airbv} = 0																																																															

CITY OF RICHMOND HILL
BUILDING DIVISION

09/15/2021

RECEIVED

Per: jocelyn.aguilar

HEAT LOSS AND GAIN SUMMARY SHEET

MODEL: 38-8	OPT MAIN & OPT 2ND	BUILDER: ROYAL PINE HOMES HILL
SFQT: 2389	LO# 90456	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

09/15/2021

RECEIVED

Per: jocelyn.aguilar

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):	33322.5	ASSUMED (Y/N):	Y
INTERNAL SHADING:	BLINDS/CURTAINS	ASSUMED OCCUPANTS:	5
INTERIOR LIGHTING LOAD (Btu/h/ft²):	1.70	DC BRUSHLESS MOTOR (Y/N):	Y
FOUNDATION CONFIGURATION	BCIN_1	DEPTH BELOW GRADE:	7.0 ft
LENGTH: 48.0 ft	WIDTH: 31.0 ft	EXPOSED PERIMETER:	158.0 ft

2012 OBC - COMPLIANCE PACKAGE

Component

Compliance Package SB-12 PERFORMANCE

Nominal Min. Eff.

Ceiling with Attic Space Minimum RSI (R)-Value	60	59.20
Ceiling Without Attic Space Minimum RSI (R)-Value	31	27.70
Exposed Floor Minimum RSI (R)-Value	31	29.80
Walls Above Grade Minimum RSI (R)-Value	22+1.5	18.50
Basement Walls Minimum RSI (R)-Value	20	21.12
Below Grade Slab Entire surface > 600 mm below grade Minimum RSI (R)-Value	-	-
Edge of Below Grade Slab ≤ 600 mm Below Grade Minimum RSI (R)-Value	10	10
Heated Slab or Slab ≤ 600 mm below grade Minimum RSI (R)-Value	10	11.13
Windows and Sliding Glass Doors Maximum U-Value	1.6	-
Skylights Maximum U-Value	2.6	-
Space Heating Equipment Minimum AFUE	0.96	-
HRV Minimum Efficiency	75%	-
Domestic Hot Water Heater Minimum EF	TE=94%	-

INDIVIDUAL BCIN: 19669

MICHAEL O'ROURKE

Michael O'Rourke

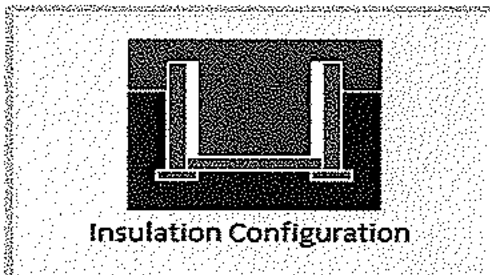
CITY OF RICHMOND HILL
BUILDING DIVISION

09/15/2021

RECEIVED

Per: _____
jocelyn.aguiar**Residential Foundation Thermal Load Calculator**

Supplemental tool for CAN/CSA-F280

Weather Station Description		
Province:	Ontario	
Region:	Richmond Hill	
Site Description		
Soil Conductivity:	Normal conductivity: dry sand, loam, clay	
Water Table:	Normal (7-10 m, 23-33 ft)	
Foundation Dimensions		
Floor Length (m):	14.6	 Insulation Configuration
Floor Width (m):	9.4	
Exposed Perimeter (m):	0.0	
Wall Height (m):	3.0	
Depth Below Grade (m):	2.13	
Window Area (m ²):	1.1	
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):	1558	

TYPE: 38-8
LO# 90456

OPT MAIN & OPT 2ND

CITY OF RICHMOND HILL
BUILDING DIVISION

09/15/2021

RECEIVED

Per: jocelyn.aguilar

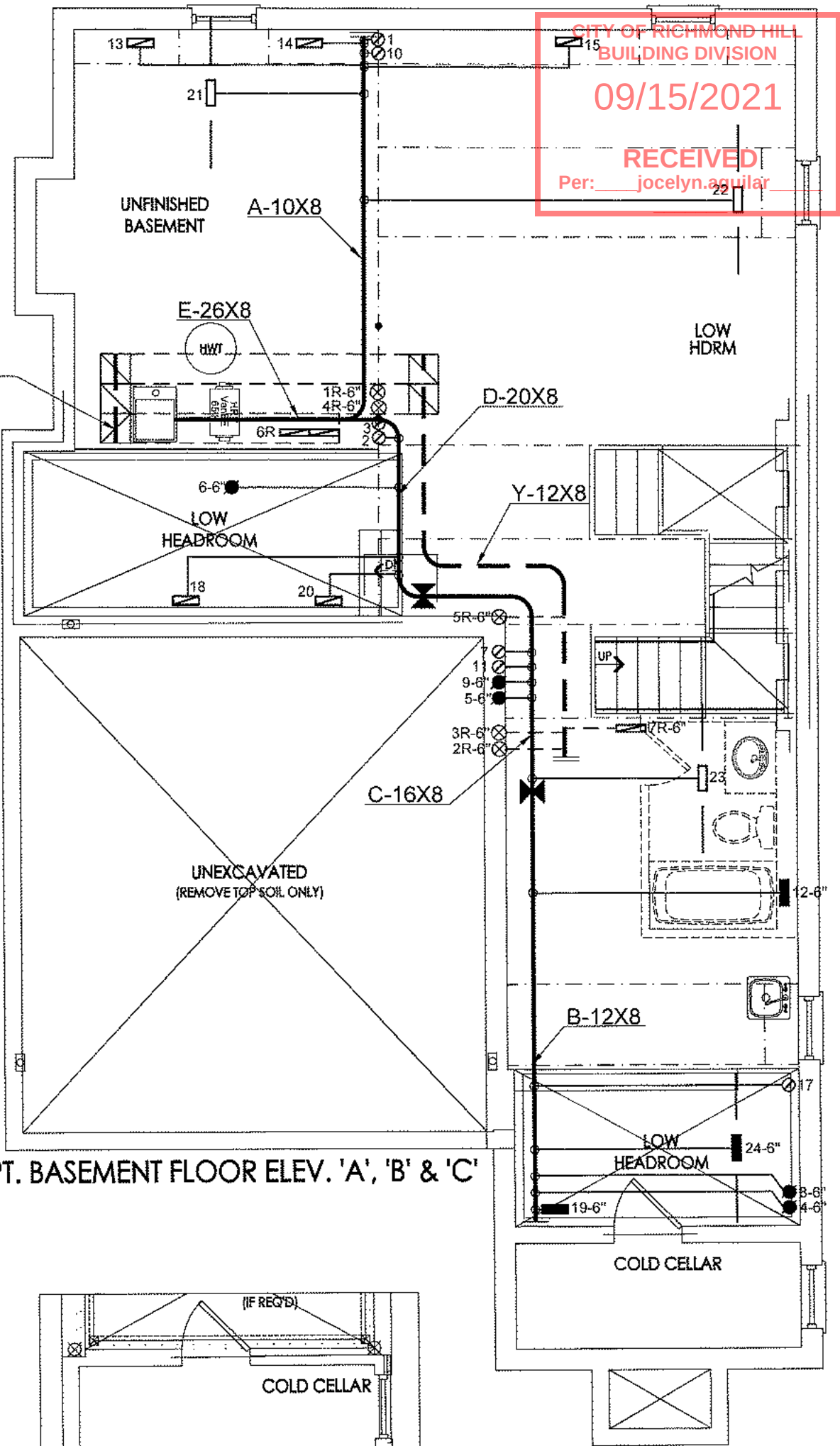
Air Infiltration Residential Load Calculator

Supplemental tool for CAN/CSA-F280

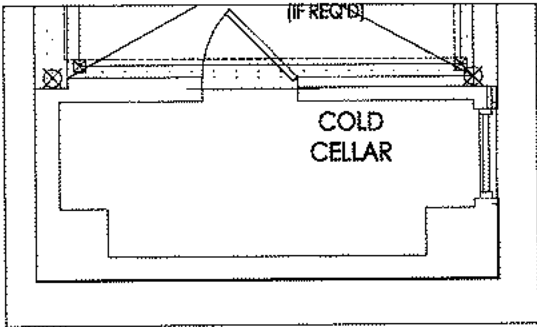
Weather Station Description			
Province:	Ontario		
Region:	Richmond Hill		
Weather Station Location:	Open flat terrain, grass		
Anemometer height (m):	10		
Local Shielding			
Building Site:	Suburban, forest		
Walls:	Heavy		
Flue:	Heavy		
Highest Ceiling Height (m):	6.74		
Building Configuration			
Type:	Detached		
Number of Stories:	Two		
Foundation:	Full		
House Volume (m ³):	943.6		
Air Leakage/Ventilation			
Air Tightness Type:	Energy Star Detached (2.5 ACH)		
Custom BDT Data:	ELA @ 10 Pa.	880.8 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
Diameter (mm):	0	0	0
Natural Infiltration Rates			
Heating Air Leakage Rate (ACH/H):	0.227		
Cooling Air Leakage Rate (ACH/H):	0.071		

TYPE: 38-8
LO# 90456

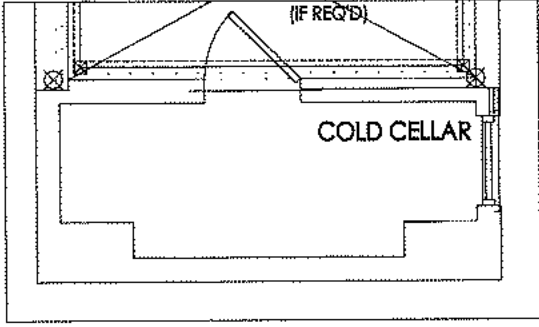
OPT MAIN & OPT 2ND



OPT. BASEMENT FLOOR ELEV. 'A', 'B' & 'C'



BASEMENT FLOOR PLAN ELEV. 'B'



BASEMENT FLOOR PLAN ELEV. 'C'

1 MICHAEL O'Rourke: I HAVE REVIEWED AND TAKE RESPONSIBILITY FOR THE DESIGN WORK AND AM QUALIFIED UNDER DIVISION C, 12.5 OF THE BUILDING CODE.
Michael O'Rourke
Michael O'Rourke, License 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
	SUPPLY AIR GRILLE 6" BOOT		SUPPLY AIR STACK FROM 2nd FLOOR		30"x8" RETURN AIR GRILLE		RETURN AIR STACK 2nd FLOOR
	SUPPLY AIR BOOT ABOVE		6" SUPPLY AIR STACK 2nd FLOOR		FRA- FLOOR RETURN AIR GRILLE		REDUCER
						No.	Description
						Date	

REVISIONS

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Client
ROYAL PINE HOMES

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

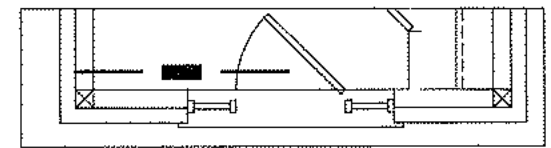
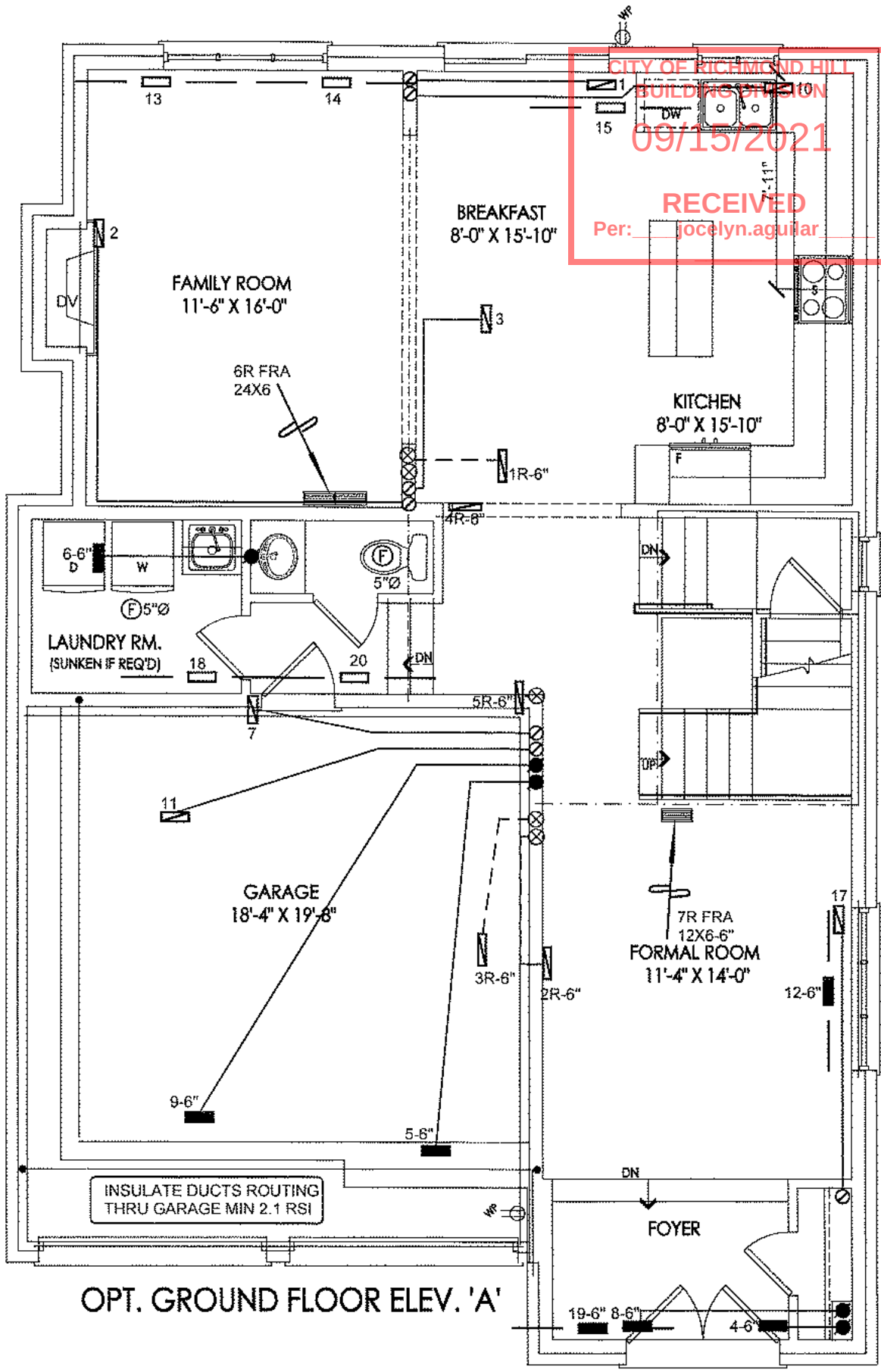
**OPT MAIN & OPT 2ND
38-8 2389 sqft**

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

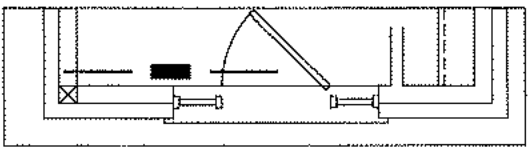
Installation to comply with the latest Ontario Building Code. All supply branch outlets shall be equipped with a manual balancing damper. Ductwork which passes through the garage or unheated spaces shall be adequately insulated and be gas-proofed.

HEAT LOSS 41587 BTU/H UNIT DATA		# OF RUNS S/A R/A FANS			
MAKE	CARRIER	3RD FLOOR			
MODEL	59TN6A-060-14V	2ND FLOOR	12	5	3
INPUT	60 MBTU/H	1ST FLOOR	7	2	3
OUTPUT	58 MBTU/H	BASEMENT	4	1	0
COOLING	2.5 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			
FAN SPEED	970 cfm @ 0.6" w.c.				

Sheet Title	
BASEMENT HEATING LAYOUT	
Date	APR/2021
Scale	3/16" = 1'-0"
BCIN# 19669	
LO#	90456



GROUND FLOOR PLAN ELEV. 'B'



GROUND FLOOR PLAN ELEV. 'C'

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

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

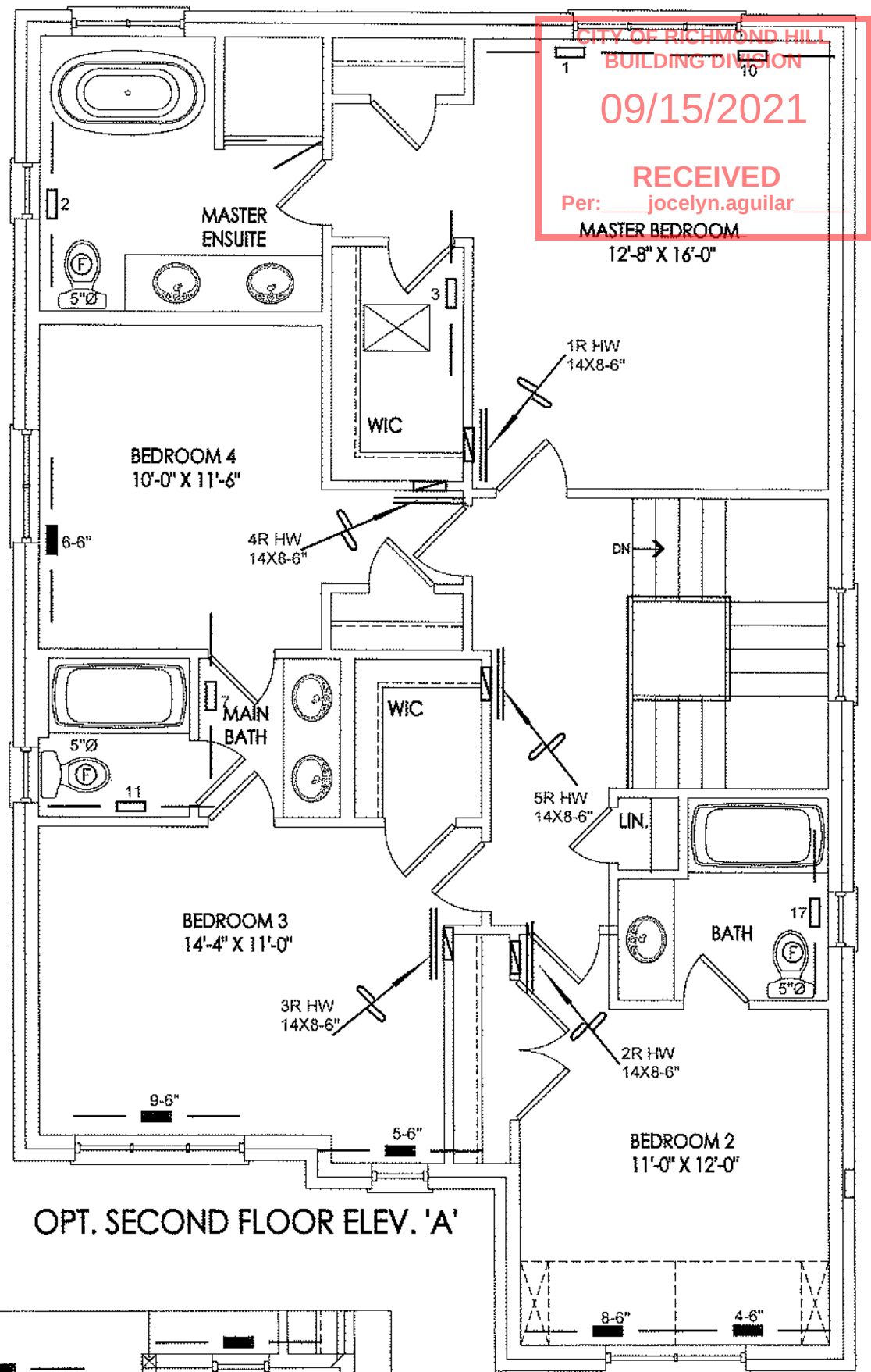
CSA-F280-12

SB-12 PERFORMANCE

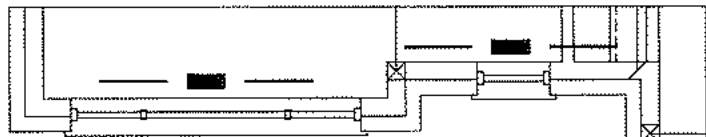
HVAC LEGEND						3.		
SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	
	SUPPLY AIR GRILLE		6" SUPPLY AIR BOOT ABOVE		14"x8" RETURN AIR GRILLE		RETURN AIR STACK ABOVE	2.
	SUPPLY AIR GRILLE 6" BOOT		SUPPLY AIR STACK FROM 2nd FLOOR		30"x8" RETURN AIR GRILLE		RETURN AIR STACK 2nd FLOOR	1.
	SUPPLY AIR BOOT ABOVE		6" SUPPLY AIR STACK 2nd FLOOR		FRA- FLOOR RETURN AIR GRILLE		REDUCER	No.
REVISIONS								Date

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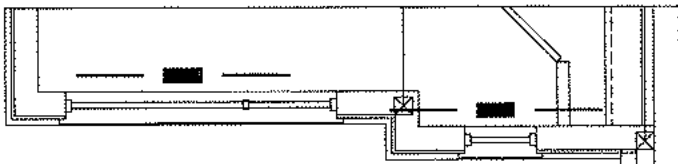
Client ROYAL PINE HOMES		 375 Finley Ave. Suite 202 - Ajax, Ontario L1S 2E2 Tel. 905.619.2300 - 905.420.5300 Fax 905.619.2375 Email: info@hvacdesigns.ca Web: www.hvacdesigns.ca Specializing in Residential Mechanical Design Services	Sheet Title FIRST FLOOR HEATING LAYOUT	
Project Name CENTREFIELD (WEST GORMLEY) RICHMOND HILL, ONTARIO			Date APR/2021	
OPT MAIN & OPT 2ND 38-8 2389 sqft			Scale 3/16" = 1'-0"	
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.			BCIN# 19669	
			LO#	90456



OPT. SECOND FLOOR ELEV. 'A'



SECOND FLOOR PLAN ELEV. 'B'



SECOND FLOOR PLAN ELEV. 'C'

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						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
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						REVISIONS	
						No.	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 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 SECOND FLOOR HEATING LAYOUT	
Project Name CENTREFIELD (WEST GORMLEY) RICHMOND HILL, ONTARIO			Date APR/2021	
OPT MAIN & OPT 2ND 38-8 2389 sqft			Scale 3/16" = 1'-0"	
			BCIN# 19669	
			LO#	90456

Schedule 1: Designer Information

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

CITY OF RICHMOND HILL
BUILDING DIVISION

09/15/2021

RECEIVED

Per: jocelyn aguiar

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: 38-8 ASHTON FIN BSMT WUB 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.			
April 19, 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

SITE NAME: CENTREFIELD (WEST GORMLEY)

FIN BSMT WUB

DATE: Apr-21

WINTER NATURAL AIR CHANGE RATE: 0.227 HEAT LOSS AT °F: 78

CSA-F280-12

BUILDER: ROYAL PINE HOMES

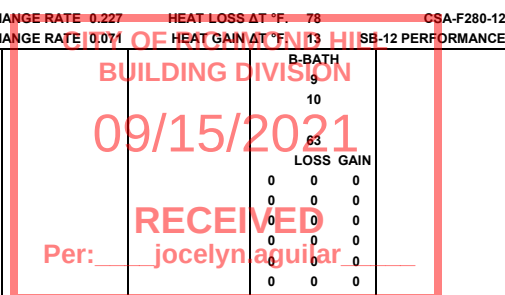
TYPE: 38-8

GFA: 2366

LO# 87609

SUMMER NATURAL AIR CHANGE RATE: 0.071 HEAT GAIN AT °F: 13

ROOM USE	EXP. WALL	CLG. HT.	FACTORS	MBR	ENS	WIC	BED-2	BED-3	BED-4	BATH	B-BATH
				36	21	0	34	29	12	6	10
				9	9	9	9	9	9	9	10
GRS.WALL AREA	LOSS	GAIN		324	189	0	306	261	108	54	63
GLAZING	LOSS	GAIN		LOSS	GAIN	LOSS	LOSS	LOSS	LOSS	LOSS	LOSS
NORTH	21.8	16.0	0	0	8	0	0	0	17	7	0
EAST	21.8	41.6	26	566	17	0	0	0	0	0	0
SOUTH	21.8	24.9	11	240	0	0	0	0	0	0	0
WEST	21.8	41.6	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	287	1207	164	0	269	1131	91	47	0
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	241	317	123	75	140	205	165	105	0
NO ATTIC EXPOSED CLG	2.8	1.3	0	0	0	0	40	0	0	0	0
EXPOSED FLOOR	2.6	0.4	0	0	0	0	0	205	0	75	0
BASEMENT/CRAWL HEAT LOSS			0	0	0	0	0	0	0	0	258
SLAB ON GRADE HEAT LOSS			0	0	0	0	0	0	0	0	0
SUBTOTAL HT LOSS			2330		1396	99	2234	2711	970	684	357
SUB TOTAL HT GAIN				1694	1020	44	1856	2269	432	238	16
LEVEL FACTOR / MULTIPLIER	0.20	0.18			0.20	0.18	0.20	0.18	0.20	0.18	0.50
AIR CHANGE HEAT LOSS			427		256	18	410	497	178	125	223
AIR CHANGE HEAT GAIN				97	58	3	106	129	25	14	1
DUCT LOSS			0		0	0	0	321	0	81	0
DUCT GAIN			0		0	0	0	324	0	25	0
HEAT GAIN PEOPLE	240		2	480	0	0	1	240	1	240	0
HEAT GAIN APPLIANCES/LIGHTS				606	0	0		606		606	0
TOTAL HT LOSS BTU/H			2757		1652	117	2643	3529	1148	890	580
TOTAL HT GAIN x 1.3 BTU/H				3740	1402	61	3650	4639	1693	360	22



ROOM USE	EXP. WALL	CLG. HT.	FORM	FAM	KT/BR	LAUN	PWD	FOY	MUD	WUB	BAS
			31	33	40	12	13	27	8	21	128
			10	10	10	9	11	11	11	10	10
GRS.WALL AREA	LOSS	GAIN	313	333	404	108	144	300	89	210	896
GLAZING	LOSS	GAIN	LOSS	LOSS	LOSS	LOSS	LOSS	LOSS	LOSS	LOSS	LOSS
NORTH	21.8	16.0	0	0	0	0	0	0	0	0	0
EAST	21.8	41.6	0	0	34	0	0	0	0	3	65
SOUTH	21.8	24.9	31	675	772	17	370	423	0	0	6
WEST	21.8	41.6	0	0	0	0	0	0	24	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	40	20	517
NET EXPOSED WALL	4.2	0.7	282	1186	195	91	383	63	236	69	289
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	10	92	121	54	0	0	384
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	4270
SLAB ON GRADE HEAT LOSS			0	0	0	0	0	0	0	0	0
SUBTOTAL HT LOSS			1862		2012	874	607	2548	806	1561	6398
SUB TOTAL HT GAIN				967	1626		540	100	1330	339	592
LEVEL FACTOR / MULTIPLIER	0.30	0.32		0.30	0.32	0.20	0.18	0.30	0.32	0.30	0.62
AIR CHANGE HEAT LOSS			586		634	160	191	803	254		4959
AIR CHANGE HEAT GAIN				55	93		31	6	76	8	53
DUCT LOSS			0		0	0	0	0	0	0	0
DUCT GAIN			0		0	0	0	0	0	0	0
HEAT GAIN PEOPLE	240		0	0	0	0	0	0	0	0	0
HEAT GAIN APPLIANCES/LIGHTS				606	606		606	0	0	0	606
TOTAL HT LOSS BTU/H			2448		2646	1034	798	3351	1060	1561	11356
TOTAL HT GAIN x 1.3 BTU/H				2117	3022		1530	137	1828	441	1626

TOTAL HEAT GAIN BTU/H:

28803

TONS: 2.40

LOSS DUE TO VENTILATION LOAD BTU/H: 1670

STRUCTURAL HEAT LOSS: 40245

TOTAL COMBINED HEAT LOSS BTU/H: 41915

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

FIN BSMT WUB
TYPE: 38-8

DATE: Apr-21

GFA: 2366 LO# 87609

HEATING CFM 970 COOLING CFM 970
TOTAL HEAT LOSS 40,245 TOTAL HEAT GAIN 28,528
AIR FLOW RATE CFM 24.1 AIR FLOW RATE CFM 34

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

plenum pressure s/a 0.18 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

CITY OF RICHMOND HILL
BUILDING DIVISION
****CARRIER** AFUE = 97 %
59TN6A-060-14V INPUT (BTU/H) = 60,000
FAN SPEED 60 OUTPUT (BTU/H) = **58,000**
LOW 820
MEDLOW 0
MEDIUM 970 DESIGN CFM = **970**
MEDIUM HIGH 0 CFM @ .6" E.S.P.
HIGH 1520
TEMPERATURE RISE **55** °F

RUN COUNT	4th	3rd	2nd	1st	Bas
S/A	0	0	12	7	5
R/A	0	0	5	2	1

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

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

RUN #	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	17	18	19	20	21	22	23	24
ROOM NAME	MBR	ENS	WIC	BED-2	BED-3	BED-4	BATH	BED-2	BED-3	MBR	BATH	FORM	FAM	FAM	KT/BR	LAUN	PWD	FOY	MUD	BAS	BAS	B-BATH	BAS
RM LOSS MBH.	1.38	1.65	0.12	1.32	1.76	1.15	0.45	1.32	1.76	1.38	0.45	2.45	1.32	1.32	2.67	1.03	0.80	3.35	1.06	3.23	3.23	0.58	3.23
CFM PER RUN HEAT	33	40	3	32	43	28	11	32	43	33	11	59	32	32	64	25	19	81	26	78	78	14	78
RM GAIN MBH.	1.87	1.40	0.06	1.83	2.32	1.69	0.18	1.83	2.32	1.87	0.18	2.12	1.51	1.51	2.08	1.53	0.14	1.83	0.18	0.52	0.52	0.02	0.52
CFM PER RUN COOLING	64	48	2	62	79	58	6	62	79	64	6	72	51	51	71	52	5	62	6	18	18	1	18
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	0.17	0.17	0.17	0.17	0.17	0.16	0.17	0.17	0.17	0.17	0.17
ACTUAL DUCT LGH.	39	43	27	67	52	34	42	72	56	46	48	43	32	26	31	69	25	47	12	27	32	36	51
EQUIVALENT LENGTH	130	180	180	200	170	0	180	200	190	140	200	190	140	120	140	220	120	160	120	140	150	130	160
TOTAL EFFECTIVE LENGTH	169	223	207	267	222	34	222	272	246	186	248	233	172	146	171	289	145	207	132	167	182	166	211
ADJUSTED PRESSURE	0.1	0.08	0.08	0.06	0.08	0.51	0.08	0.06	0.07	0.09	0.07	0.07	0.1	0.12	0.1	0.06	0.12	0.08	0.13	0.1	0.09	0.1	0.08
ROUND DUCT SIZE	5	5	4	6	6	6	4	6	6	5	4	6	5	4	5	5	4	6	4	5	5	5	6
HEATING VELOCITY (ft/min)	242	294	34	163	219	143	126	163	219	242	126	301	235	367	470	184	218	413	298	573	573	103	398
COOLING VELOCITY (ft/min)	470	352	23	316	403	296	69	316	403	470	69	367	374	585	521	382	57	316	69	132	132	7	92
OUTLET GRILL SIZE	3X10	3X10	3X10	4X10	4X10	4X10	3X10	4X10	4X10	3X10	3X10	4X10	3X10	3X10	3X10	3X10	3X10	4X10	3X10	3X10	3X10	3X10	4X10
TRUNK	A	D	D	B	C	D	C	B	C	A	C	B	A	A	A	B	D	B	D	A	A	C	B

RUN #	25
ROOM NAME	BAS
RM LOSS MBH.	3.23
CFM PER RUN HEAT	78
RM GAIN MBH.	0.52
CFM PER RUN COOLING	18
ADJUSTED PRESSURE	0.17
ACTUAL DUCT LGH.	25
EQUIVALENT LENGTH	110
TOTAL EFFECTIVE LENGTH	135
ADJUSTED PRESSURE	0.13
ROUND DUCT SIZE	5
HEATING VELOCITY (ft/min)	573
COOLING VELOCITY (ft/min)	132
OUTLET GRILL SIZE	3X10
TRUNK	D

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	350	0.09	9.2	10	x	8	630	TRUNK G	0	0.00	0	0	x	8	0	TRUNK O	0	0.05	0	0	x	8	0			
TRUNK B	307	0.06	9.7	12	x	8	461	TRUNK H	0	0.00	0	0	x	8	0	TRUNK P	0	0.05	0	0	x	8	0			
TRUNK C	429	0.06	11	16	x	8	483	TRUNK I	0	0.00	0	0	x	8	0	TRUNK Q	0	0.05	0	0	x	8	0			
TRUNK D	623	0.06	12.6	20	x	8	561	TRUNK J	0	0.00	0	0	x	8	0	TRUNK R	0	0.05	0	0	x	8	0			
TRUNK E	973	0.06	14.9	26	x	8	674	TRUNK K	0	0.00	0	0	x	8	0	TRUNK S	0	0.05	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	TRUNK T	0	0.05	0	0	x	8	0			

RETURN AIR #	1	2	3	4	5	6	7											BR								
	0	0	0	0		0	0	0	0	0	0	0	0	0	0	0	BR	TRUNK W	0	0.05	0	0	x	8	0	
AIR VOLUME	85	75	75	95	75	320	85	0	0	0	0	0	0	0	0	160	TRUNK X	970	0.05	15.6	28	x	8	624		
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	TRUNK Y	310	0.05	10.2	12	x	8	465		
ACTUAL DUCT LGH.	40	70	61	39	58	20	42	1	1	1	1	1	1	1	1	14	TRUNK Z	0	0.05	0	0	x	8	0		
EQUIVALENT LENGTH	225	250	245	155	225	175	225	0	0	0	0	0	0	0	0	135	DROP	970	0.05	15.6	24	x	10	582		
TOTAL EFFECTIVE LH	265	320	306	194	283	195	267	1	1	1	1	1	1	1	1	149										
ADJUSTED PRESSURE	0.06	0.05	0.05	0.08	0.05	0.08	0.06	14.80	14.80	14.80	14.80	14.80	14.80	14.80	14.80	0.10										
ROUND DUCT SIZE	6	6	6	5.8	6	9.2	6	0	0	0	0	0	0	0	0	6.7										
INLET GRILL SIZE	8	8	8	8	8	6	8	0	0	0	0	0	0	0	0	8										
	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X										
INLET GRILL SIZE	14	14	14	14	14	24	14	0	0	0	0	0	0	0	0	14										

TYPE: 38-8
SITE NAME: CENTREFIELD (WEST GORMLEY)

LO # 87609
FIN BSMT WUB

RESIDENTIAL MECHANICAL VENTILATION DESIGN SUMMARY

CITY OF RICHMOND HILL
BUILDING DIVISION

09/15/2021

RECEIVED
Per: jocelyn.aguilar

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>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>5</u> @ 10.6 cfm	<u>53.0</u> cfm
Table 9.32.3.A.	TOTAL	<u>180.2</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>79.5</u> cfm

SUPPLEMENTAL VENTILATION CAPACITY		9.32.3.5.
Total Ventilation Capacity	<u>180.2</u>	cfm
Less Principal Ventil. Capacity	<u>79.5</u>	cfm
Required Supplemental Capacity	<u>100.7</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
B-BATH	BY INSTALLING CONTRACTOR	50	☒	3.5
PWD	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 #	001820
Date:	April-21

CITY OF RICHMOND HILL
BUILDING DIVISION

09/15/2021

RECEIVED
jodelyngular

CSA F280-12 Residential Heat Loss and Heat Gain Calculations																																																												
Formula Sheet (For Air Leakage / Ventilation Calculation)																																																												
LO#: 87609	Model: 38-8	Builder: ROYAL PINE HOMES	Date: 4/19/2021																																																									
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>1042</td> <td>10</td> <td>10420</td> </tr> <tr> <td>First</td> <td>1042</td> <td>10</td> <td>10524.2</td> </tr> <tr> <td>Second</td> <td>1324</td> <td>9</td> <td>11916</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>32,860.2 ft³</td> </tr> <tr> <td colspan="3" style="text-align: right;">Total:</td> <td>930.5 m³</td> </tr> </tbody> </table>			Level	Floor Area (ft²)	Floor Height (ft)	Volume (ft³)	Bsmt	1042	10	10420	First	1042	10	10524.2	Second	1324	9	11916	Third	0	9	0	Fourth	0	9	0	Total:			32,860.2 ft³	Total:			930.5 m³	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 60%;">WINTER NATURAL AIR CHANGE RATE</td> <td style="width: 40%;">0.227</td> </tr> <tr> <td>SUMMER NATURAL AIR CHANGE RATE</td> <td>0.071</td> </tr> </table> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th colspan="5" style="text-align: center;">Design Temperature Difference</th> </tr> <tr> <th></th> <th>Tin °C</th> <th>Tout °C</th> <th>ΔT °C</th> <th>ΔT °F</th> </tr> </thead> <tbody> <tr> <td>Winter DTDh</td> <td>22</td> <td>-21</td> <td>43</td> <td>78</td> </tr> <tr> <td>Summer DTDc</td> <td>24</td> <td>31</td> <td>7</td> <td>13</td> </tr> </tbody> </table>		WINTER NATURAL AIR CHANGE RATE	0.227	SUMMER NATURAL AIR CHANGE RATE	0.071	Design Temperature Difference						Tin °C	Tout °C	ΔT °C	ΔT °F	Winter DTDh	22	-21	43	78	Summer DTDc	24	31	7	13
Level	Floor Area (ft²)	Floor Height (ft)	Volume (ft³)																																																									
Bsmt	1042	10	10420																																																									
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5.2.3.1 Heat Loss due to Air Leakage			6.2.6 Sensible Gain due to Air Leakage																																																									
$HL_{airb} = LR_{airh} \times \frac{V_b}{3.6} \times DTD_h \times 1.2$ 0.227 x 258.47 x 43 °C x 1.2 = 3037 W = 10362 Btu/h			$HG_{salb} = LR_{airc} \times \frac{V_b}{3.6} \times DTD_c \times 1.2$ = 0.071 x 258.47 x 7 °C x 1.2 = 156 W = 532 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>HLairve Air Leakage + Ventilation Heat Loss (Btu/h)</th> <th>Level Conductive Heat Loss: (HL_{level})</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" style="text-align: center; vertical-align: middle;">10,362</td> <td>8,317</td> <td>0.623</td> </tr> <tr> <td>2</td> <td>0.3</td> <td>9,868</td> <td>0.315</td> </tr> <tr> <td>3</td> <td>0.2</td> <td>11,296</td> <td>0.183</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 _{level})	Air Leakage Heat Loss Multiplier (LF x HLairbv / HLlevel)	1	0.5	10,362	8,317	0.623	2	0.3	9,868	0.315	3	0.2	11,296	0.183	4	0	0	0.000	5	0	0	0.000																														
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4	0		0	0.000																																																								
5	0		0	0.000																																																								

HEAT LOSS AND GAIN SUMMARY SHEET

MODEL: 38-8	FIN BSMT WUB	BUILDER: TRIO RINE HOMES HILL
SFQT: 2366	LO# 87609	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

09/15/2021

RECEIVED

Per: jocelyn.aguilar

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):	32860.2	ASSUMED (Y/N):	Y
INTERNAL SHADING:	BLINDS/CURTAINS	ASSUMED OCCUPANTS:	5
INTERIOR LIGHTING LOAD (Btu/h/ft ²):	1.60	DC BRUSHLESS MOTOR (Y/N):	Y
FOUNDATION CONFIGURATION	BCIN_1	DEPTH BELOW GRADE:	7.0 ft
LENGTH: 48.0 ft	WIDTH: 31.0 ft	EXPOSED PERIMETER:	137.0 ft

2012 OBC - COMPLIANCE PACKAGE

Component

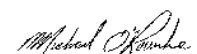
Compliance Package SB-12 PERFORMANCE

Nominal	Min. Eff.
---------	-----------

Ceiling with Attic Space Minimum RSI (R)-Value	60	59.20
Ceiling Without Attic Space Minimum RSI (R)-Value	31	27.70
Exposed Floor Minimum RSI (R)-Value	31	29.80
Walls Above Grade Minimum RSI (R)-Value	22+1.5	18.50
Basement Walls Minimum RSI (R)-Value	20	21.12
Below Grade Slab Entire surface > 600 mm below grade Minimum RSI (R)-Value	-	-
Edge of Below Grade Slab ≤ 600 mm Below Grade Minimum RSI (R)-Value	10	10
Heated Slab or Slab ≤ 600 mm below grade Minimum RSI (R)-Value	10	11.13
Windows and Sliding Glass Doors Maximum U-Value	1.6	-
Skylights Maximum U-Value	2.6	-
Space Heating Equipment Minimum AFUE	0.96	-
HRV Minimum Efficiency	75%	-
Domestic Hot Water Heater Minimum EF	TE=94%	-

INDIVIDUAL BCIN: 19669

MICHAEL O'ROURKE



CITY OF RICHMOND HILL
BUILDING DIVISION

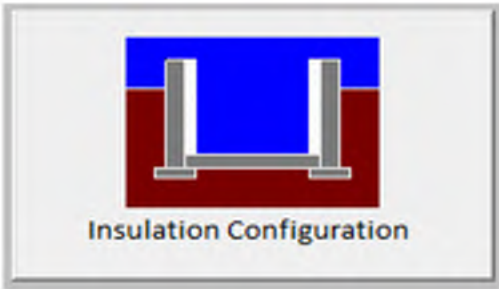
09/16/2021

RECEIVED

Per: jocelyn.aguiar

Residential Foundation Thermal Load Calculator

Supplemental tool for CAN/CSA-F280

Weather Station Description		
Province:	Ontario	
Region:	Richmond Hill	
Site Description		
Soil Conductivity:	Normal conductivity: dry sand, loam, clay	
Water Table:	Normal (7-10 m, 23-33 ft)	
Foundation Dimensions		
Floor Length (m):	14.6	 Insulation Configuration
Floor Width (m):	9.4	
Exposed Perimeter (m):	41.8	
Wall Height (m):	3.0	
Depth Below Grade (m):	2.13	
Window Area (m ²):	1.1	
Door Area (m ²):	3.7	
Radiant Slab		
Heated Fraction of the Slab:	0	
Fluid Temperature (°C):	33	
Design Months		
Heating Month	1	
Foundation Loads		
Heating Load (Watts):		1327

TYPE: 38-8
LO# 87609

FIN BSMT WUB

CITY OF RICHMOND HILL
BUILDING DIVISION

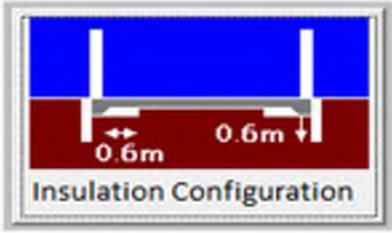
09/15/2021

RECEIVED

Building Department

Residential Slab on Grade 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		
Length (m):	0.6	
Width (m):	5.8	
Exposed Perimeter (m):	6.4	
Radiant Slab		
Heated Fraction of the Slab:	0	
Fluid Temperature (°C):	33	
Design Months		
Heating Month	1	
Results		
Heating Load (Watts):		56

TYPE: 38-8
LO# 87609

FIN BSMT WUB

CITY OF RICHMOND HILL
BUILDING DIVISION

09/15/2021

RECEIVED

Per: jocelyn.aguilar

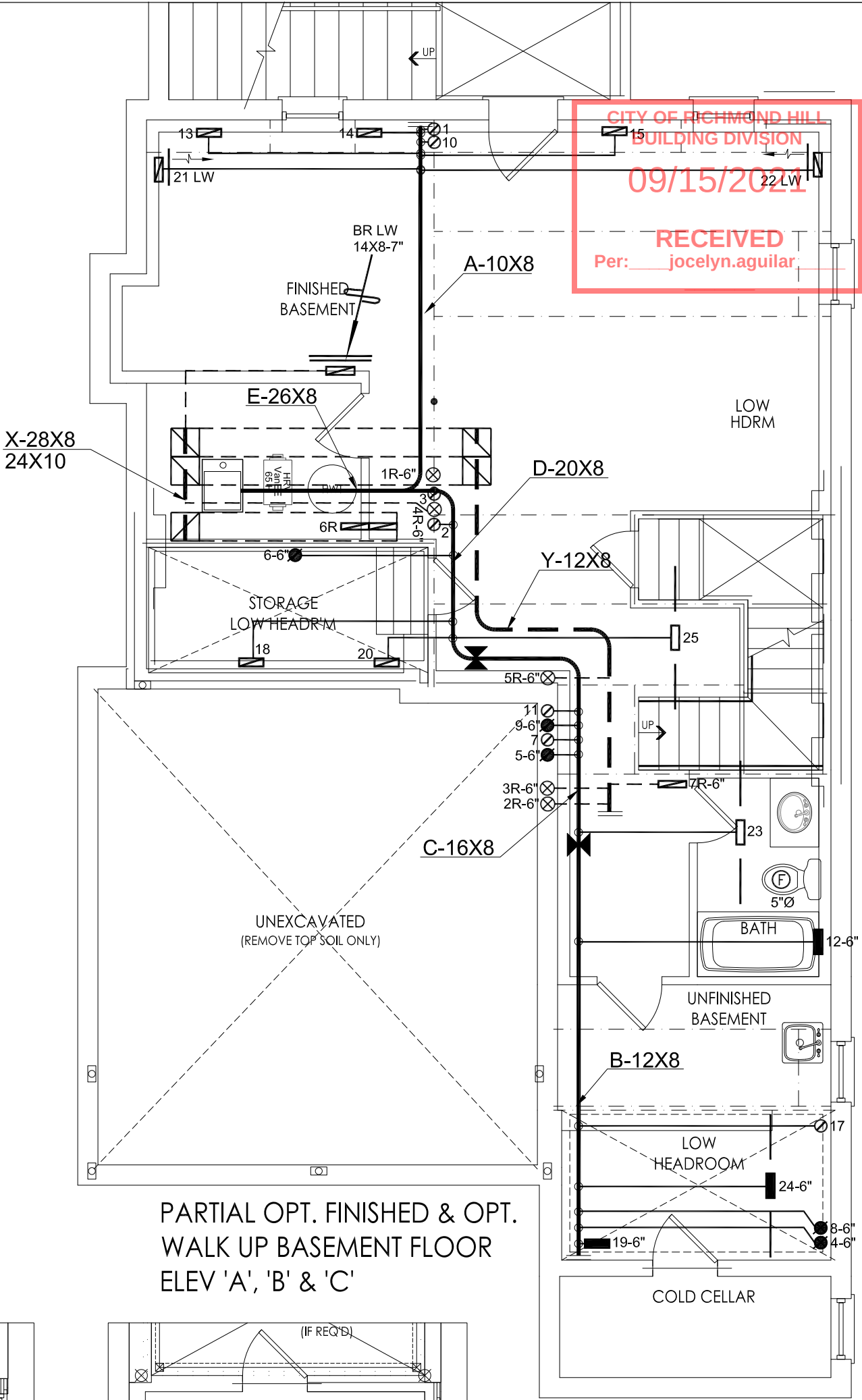
Air Infiltration Residential Load Calculator

Supplemental tool for CAN/CSA-F280

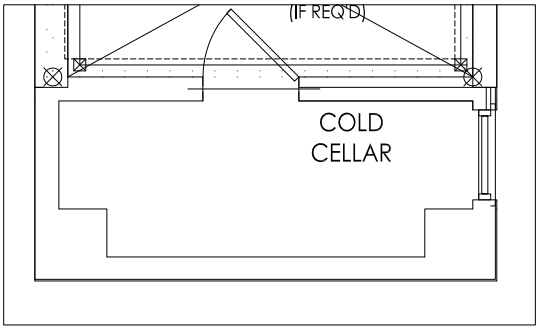
Weather Station Description				
Province:	Ontario			
Region:	Richmond Hill			
Weather Station Location:	Open flat terrain, grass			
Anemometer height (m):	10			
Local Shielding				
Building Site:	Suburban, forest			
Walls:	Heavy			
Flue:	Heavy			
Highest Ceiling Height (m):	6.74			
Building Configuration				
Type:	Detached			
Number of Stories:	Two			
Foundation:	Full			
House Volume (m ³):	930.5			
Air Leakage/Ventilation				
Air Tightness Type:	Energy Star Detached (2.5 ACH)			
Custom BDT Data:	ELA @ 10 Pa.		868.6 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):	0.227			
Cooling Air Leakage Rate (ACH/H):	0.071			

TYPE: 38-8
LO# 87609

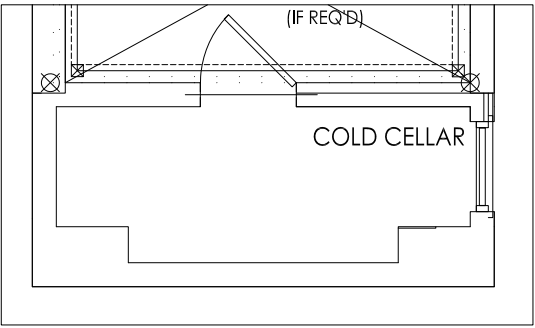
FIN BSMT WUB



PARTIAL OPT. FINISHED & OPT.
WALK UP BASEMENT FLOOR
ELEV 'A', 'B' & 'C'



BASEMENT FLOOR PLAN ELEV. 'B'



BASEMENT FLOOR PLAN ELEV. 'C'

WUB

CSA-F280-12

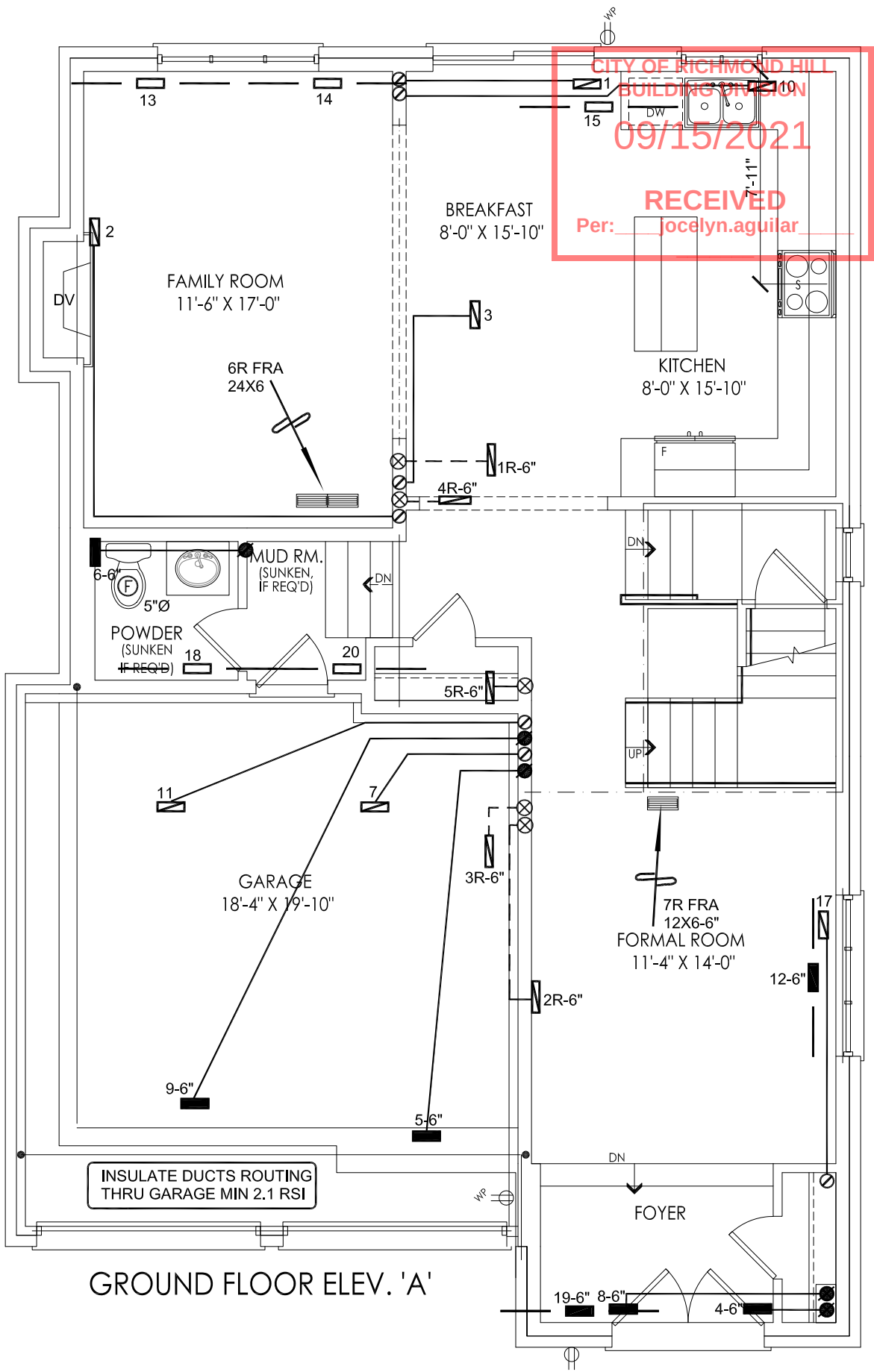
SB-12 PERFORMANCE

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

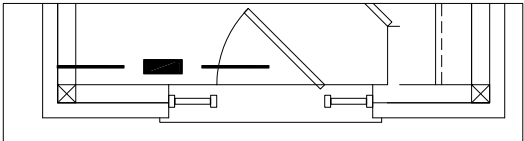
HVAC LEGEND								3.		
SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	2.	REVISED AS PER ARCHITECTURALS	APR/2021
	SUPPLY AIR GRILLE		6" SUPPLY AIR BOOT ABOVE		14"x8" RETURN AIR GRILLE		RETURN AIR STACK ABOVE	1.	REVISED TO PERFORMANCE	SEPT/2020
	SUPPLY AIR GRILLE 6" BOOT		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		

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.

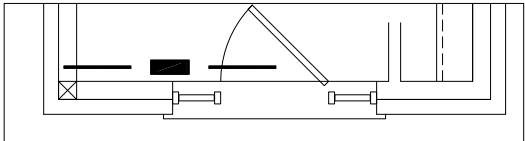
Client		 375 Finley Ave. Suite 202 - Ajax, Ontario L1S 2E2 Tel. 905.619.2300 - 905.420.5300 Fax 905.619.2375 Email: info@hvacdesigns.ca Web: www.hvacdesigns.ca Specializing in Residential Mechanical Design Services Installation to comply with the latest Ontario Building Code. All supply branch outlets 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 41915 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-060-14V	2ND FLOOR	12	5	3	Date SEPT/2020	
			INPUT 60 MBTU/H	1ST FLOOR	7	2	2	Scale 3/16" = 1'-0"	
			OUTPUT 58 MBTU/H	BASEMENT	5	1	1	BCIN# 19669	
FIN BSMT WUB 38-8			COOLING 2.5 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				LO# 87609	
2366 sqft			FAN SPEED 970 cfm @ 0.6" w.c.						



GROUND FLOOR ELEV. 'A'



GROUND FLOOR PLAN ELEV. 'B'



GROUND FLOOR PLAN ELEV. 'C'

WUB

CSA-F280-12

SB-12 PERFORMANCE

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.

HVAC LEGEND								3.		
SYMBOL	DESCRIPTION	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		RETURN AIR STACK ABOVE	1.	REVISED TO PERFORMANCE	SEPT/2020
	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		

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	Sheet Title	
ROYAL PINE HOMES			FIRST 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.	Date	SEPT/2020
CENTREFIELD (WEST GORMLEY) RICHMOND HILL, ONTARIO			Scale	3/16" = 1'-0"
FIN BSMT WUB 38-8			BCIN# 19669	
2366 sqft			LO#	87609

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: 38-8 OPT MAIN & OPT 2ND 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.			
April 19, 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.

REVIEW AND TAKE RESPONSIBILITY FOR THE DESIGN WORK AND AM QUALIFIED IN THE APPROPRIATE CATEGORY AS AN "OTHER DESIGNER" UNDER DIVISION C, 3.2.5 OF THE BUILDING CODE.

TONS: 2.43

TOTAL HEAT GAIN BTU/H: 28178

LOSS DUE TO VENTILATION LOAD BTU/H: 1670

STRUCTURAL HEAT LOSS: 40664

TOTAL COMBINED HEAT LOSS BTU/H: 41734

Michael Oppenheimer

INDIVIDUAL BCR: 15659

MICHAEL OPPENHEIMER

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

OPT MAIN & OPT 2ND

TYPE: 3B-8

DATE: Apr-21

GFA: 2389 LO# 90456

HEATING CFM 970 COOLING CFM 970
TOTAL HEAT LOSS 40,064 TOTAL HEAT GAIN 28,903
AIR FLOW RATE CFM 24.21 AIR FLOW RATE CFM 33.56

**CARRIER

50TNSA-060-14V 50
FAN SPEED LOW 820
MEDLOW 0
MEDIUM 970
HIGH 1520AFUE = 97 %
INPUT (BTU/H) = 60,000
OUTPUT (BTU/H) = 58,000

RUN COUNT	4th	3rd	2nd	1st	Bas
S/A	0	0	12	7	4
R/A	0	0	5	2	1

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

All S/A fans 5"Ø unless noted otherwise on layout.

ROOM NAME	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	BED-2	BED-3	MBR	BATH	FORM	FAM	FAM	KT/BR		BATH-2	LAUN	FOY	MUD	BAS	BAS	BAS	BAS
RM LOSS MBH	1.38	1.66	0.12	1.32	1.77	1.15	0.45	1.32	1.77	1.38	0.45	2.45	1.32	1.32	2.67		1.04	0.99	3.35	1.06	3.27	3.27	3.27	3.27
CFM PER RUN HEAT	33	40	3	32	43	28	11	32	43	33	11	59	32	32	65		25	24	81	26	79	79	79	79
RM GAIN MBH	1.90	1.40	0.06	1.86	2.35	1.75	0.18	1.86	2.35	1.90	0.18	2.18	1.54	1.54	2.14		0.74	1.03	1.83	0.18	0.48	0.48	0.48	0.48
CFM PER RUN COOLING	64	47	2	62	79	59	6	62	79	64	6	73	52	52	72		25	35	61	6	15	16	16	16
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	0.17	0.17	0.17		0.17	0.17	0.16	0.17	0.17	0.17	0.17	0.17
ACTUAL DUCT LGH	39	43	27	67	52	34	42	72	56	46	48	43	32	26	31		69	25	47	12	27	32	36	51
EQUIVALENT LENGTH	130	180	180	200	170	0	180	200	190	140	200	190	140	120	140		220	130	160	120	140	150	130	170
TOTAL EFFECTIVE LENGTH	169	223	207	267	222	34	222	272	246	186	248	233	172	146	171		289	145	207	132	167	182	165	221
ADJUSTED PRESSURE	0.1	0.08	0.08	0.06	0.08	0.51	0.08	0.06	0.07	0.09	0.07	0.07	0.1	0.12	0.1		0.06	0.12	0.08	0.13	0.1	0.09	0.1	0.08
ROUND DUCT SIZE	5	5	4	6	6	6	4	6	6	5	4	6	5	5	5		4	4	6	4	5	5	5	6
HEATING VELOCITY (ft/min)	242	294	34	163	219	143	126	163	219	242	126	301	235	235	477		287	275	413	298	580	580	580	403
COOLING VELOCITY (ft/min)	470	345	23	316	403	301	69	316	403	470	69	372	382	382	529		287	402	311	69	117	117	117	82
OUTLET GRILL SIZE	3X10	3X10	3X10	4X10	4X10	4X10	3X10	4X10	4X10	3X10	3X10	4X10	3X10	3X10	3X10		3X10	3X10	4X10	3X10	3X10	3X10	3X10	4X10
TRUNK	A	D	D	B	C	D	C	B	C	A	C	B	A	A	A		B	D	B	D	A	A	C	B

RUN #	ROOM NAME	RM LOSS MBH	CFM PER RUN HEAT	RM GAIN MBH	CFM PER RUN COOLING	ADJUSTED PRESSURE	ACTUAL DUCT LGH	EQUIVALENT LENGTH	TOTAL EFFECTIVE LENGTH	ADJUSTED PRESSURE	ROUND DUCT SIZE	HEATING VELOCITY (ft/min)	COOLING VELOCITY (ft/min)	OUTLET GRILL SIZE	TRUNK
1	TRUNK A	353	0.09	9.2	10	0.15	10	10	10	0.15	10	635	0	0	TRUNK A
2	TRUNK B	308	0.06	9.7	12	0.15	12	12	12	0.15	12	482	0	0	TRUNK B
3	TRUNK C	495	0.06	11.6	16	0.15	16	16	16	0.15	16	557	0	0	TRUNK C
4	TRUNK D	616	0.06	12.6	20	0.15	20	20	20	0.15	20	554	0	0	TRUNK D
5	TRUNK E	969	0.06	14.9	26	0.15	26	26	26	0.15	26	671	0	0	TRUNK E
6	TRUNK F	0	0.00	0	0	0.00	0	0	0	0.00	0	0	0	0	TRUNK F

SUPPLY AIR TRUNK SIZE	TRUNK	STATIC PRESS.	ROUND DUCT	RECT DUCT	VELOCITY (ft/min)	TRUNK	STATIC PRESS.	ROUND DUCT	RECT DUCT	VELOCITY (ft/min)	TRUNK	STATIC PRESS.	ROUND DUCT	RECT DUCT	VELOCITY (ft/min)
TRUNK A	353	0.09	9.2	10	0.15	10	0.00	0	0	0	TRUNK D	0	0.05	0	0
TRUNK B	308	0.06	9.7	12	0.15	12	0.00	0	0	0	TRUNK P	0	0.05	0	0
TRUNK C	495	0.06	11.6	16	0.15	16	0.00	0	0	0	TRUNK Q	0	0.05	0	0
TRUNK D	616	0.06	12.6	20	0.15	20	0.00	0	0	0	TRUNK R	0	0.05	0	0
TRUNK E	969	0.06	14.9	26	0.15	26	0.00	0	0	0	TRUNK S	0	0.05	0	0
TRUNK F	0	0.00	0	0	0.00	0	0.00	0	0	0	TRUNK T	0	0.05	0	0
RETURN AIR #	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
AIR VOLUME	85	75	75	100	100	75	320	85	0	0	0	0	0	0	0
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
ACTUAL DUCT LGH	40	70	61	39	58	20	42	1	1	1	1	1	1	1	1
EQUIVALENT LENGTH	225	250	245	155	155	225	175	225	0	0	0	0	0	0	0
TOTAL EFFECTIVE LH	285	320	306	194	263	195	267	1	1	1	1	1	1	1	1
ADJUSTED PRESSURE	0.06	0.05	0.05	0.08	0.08	0.08	0.08	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06
ROUND DUCT SIZE	6	6	6	8	8	6	9.2	6	6	6	6	6	6	6	6
INLET GRILL SIZE	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
INLET GRILL SIZE	14	14	14	14	14	14	30	14	0	0	0	0	0	0	0

Michael O'Rourke

TYPE: 3B-8
SITE NAME: CENTREFIELD (WEST GORMLEY)
LO # 90456
OPT MAIN & 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	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	4 @ 10.6 cfm	42.4 cfm
Table 9.32.3.A	TOTAL	169.6 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	169.6 cfm	
Less Principal Ventil. Capacity	79.5 cfm	
Required Supplemental Capacity	90.1 cfm	

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

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

SUPPLEMENTAL FANS		BY INSTALLING CONTRACTOR	
Location	Model	cfm	HVI
ENS	BY INSTALLING CONTRACTOR	50	☒
BATH	BY INSTALLING CONTRACTOR	50	☒

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:	April-21

Specializing in Residential Mechanical Design Services

HEAT LOSS AND GAIN SUMMARY SHEET

MODEL: 38-8	OPT MAIN & OPT 2ND	BUILDER: ROYAL PINE HOMES
SFQT: 2389	LO# 90456	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):	33322.5	ASSUMED (Y/N):	Y
INTERNAL SHADING:	BLINDS/CURTAINS	ASSUMED OCCUPANTS:	5
INTERIOR LIGHTING LOAD (Btu/h/ft²):	1.70	DC BRUSHLESS MOTOR (Y/N):	Y
FOUNDATION CONFIGURATION	BCIN_1	DEPTH BELOW GRADE:	7.0 ft
LENGTH: 48.0 ft	WIDTH: 31.0 ft	EXPOSED PERIMETER:	158.0 ft

2012 OBC - COMPLIANCE PACKAGE		Compliance Package SB-12 PERFORMANCE	
Component		Nominal	Min. Eff.
Ceiling with Attic Space Minimum RSI (R)-Value		60	59.20
Ceiling Without Attic Space Minimum RSI (R)-Value		31	27.70
Exposed Floor Minimum RSI (R)-Value		31	29.80
Walls Above Grade Minimum RSI (R)-Value		22+1.5	18.50
Basement Walls Minimum RSI (R)-Value		20	21.12
Below Grade Slab Entire surface > 600 mm below grade Minimum RSI (R)-Value		-	-
Edge of Below Grade Slab ≤ 600 mm Below Grade Minimum RSI (R)-Value		10	10
Heated Slab or Slab ≤ 600 mm below grade Minimum RSI (R)-Value		10	11.13
Windows and Sliding Glass Doors Maximum U-Value		1.6	-
Skylights Maximum U-Value		2.6	-
Space Heating Equipment Minimum AFUE		0.96	-
HRV Minimum Efficiency		75%	-
Domestic Hot Water Heater Minimum EF		TE=94%	-

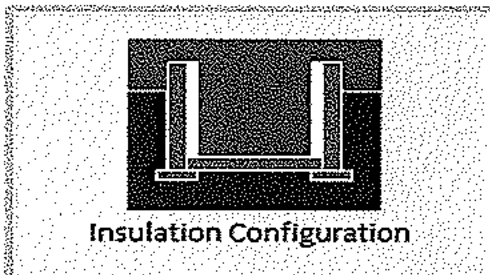
INDIVIDUAL BCIN: 19669

MICHAEL O'ROURKE



Residential Foundation Thermal Load Calculator

Supplemental tool for CAN/CSA-F280

Weather Station Description		
Province:	Ontario	
Region:	Richmond Hill	
Site Description		
Soil Conductivity:	Normal conductivity: dry sand, loam, clay	
Water Table:	Normal (7-10 m, 23-33 ft)	
Foundation Dimensions		
Floor Length (m):	14.6	 Insulation Configuration
Floor Width (m):	9.4	
Exposed Perimeter (m):	0.0	
Wall Height (m):	3.0	
Depth Below Grade (m):	2.13	
Window Area (m ²):	1.1	
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):		1558

TYPE: 38-8
LO# 90456

OPT MAIN & OPT 2ND

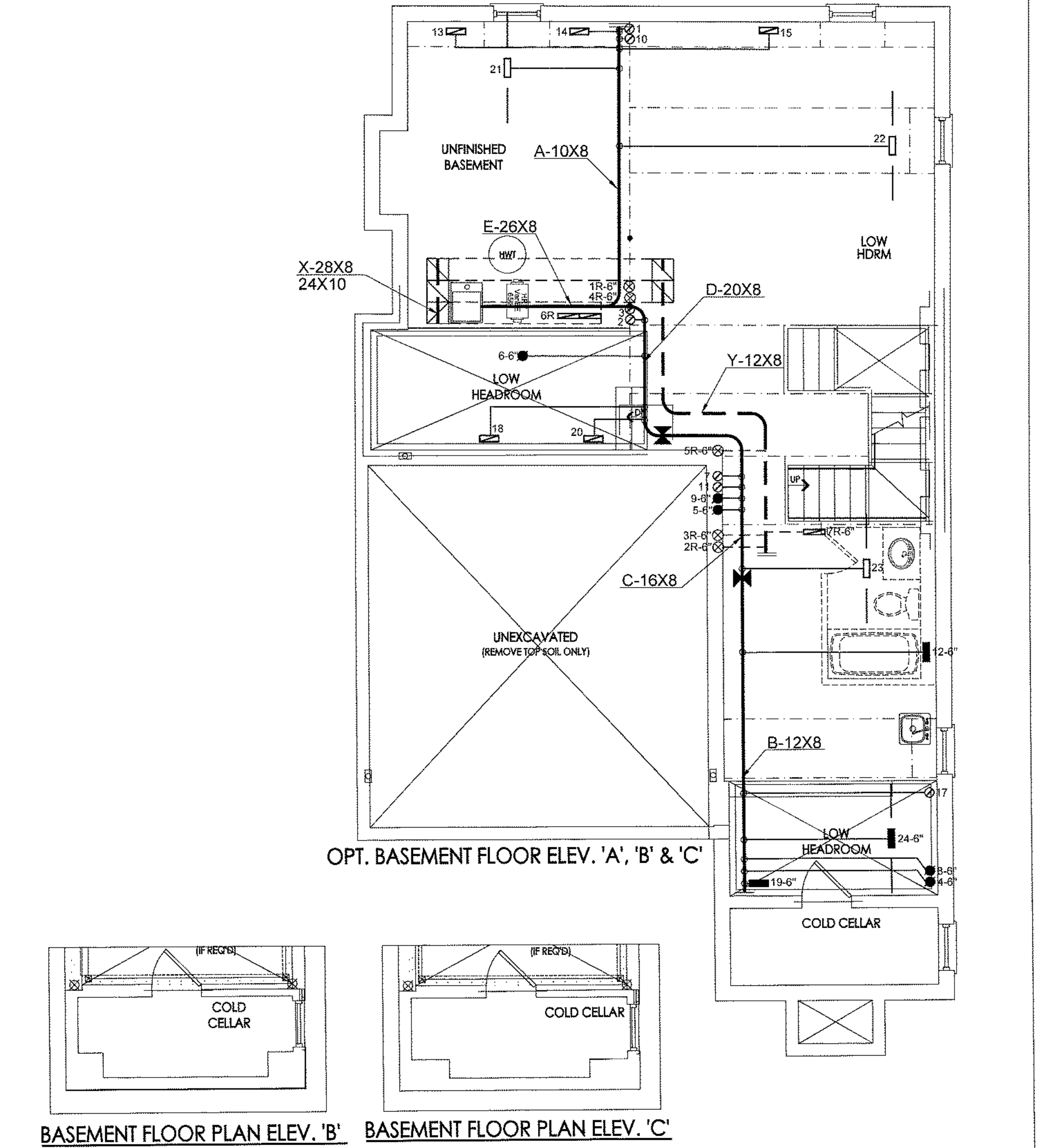
Air Infiltration Residential Load Calculator

Supplemental tool for CAN/CSA-F280

Weather Station Description				
Province:	Ontario			
Region:	Richmond Hill			
Weather Station Location:	Open flat terrain, grass			
Anemometer height (m):	10			
Local Shielding				
Building Site:	Suburban, forest			
Walls:	Heavy			
Flue:	Heavy			
Highest Ceiling Height (m):	6.74			
Building Configuration				
Type:	Detached			
Number of Stories:	Two			
Foundation:	Full			
House Volume (m ³):	943.6			
Air Leakage/Ventilation				
Air Tightness Type:	Energy Star Detached (2.5 ACH)			
Custom BDT Data:	ELA @ 10 Pa.	880.8 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):	0.227			
Cooling Air Leakage Rate (ACH/H):	0.071			

TYPE: 38-8
LO# 90456

OPT MAIN & OPT 2ND



1 MICHAEL O'BRIEN: 10% REVIEW AND TAKE RESPONSIBILITY FOR THE DESIGN WORK AND AM QUALIFIED UNDER DIVISION C, 12.5 OF THE BUILDING CODE.

Michael O'Brien

Michael O'Brien, License 19669
HVAC DESIGNS LTD.

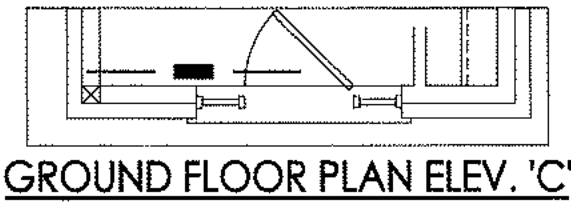
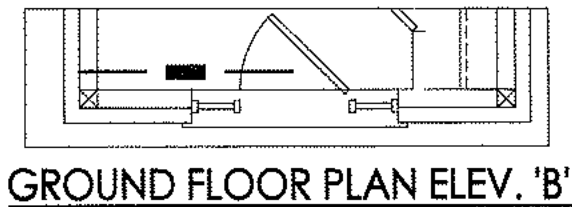
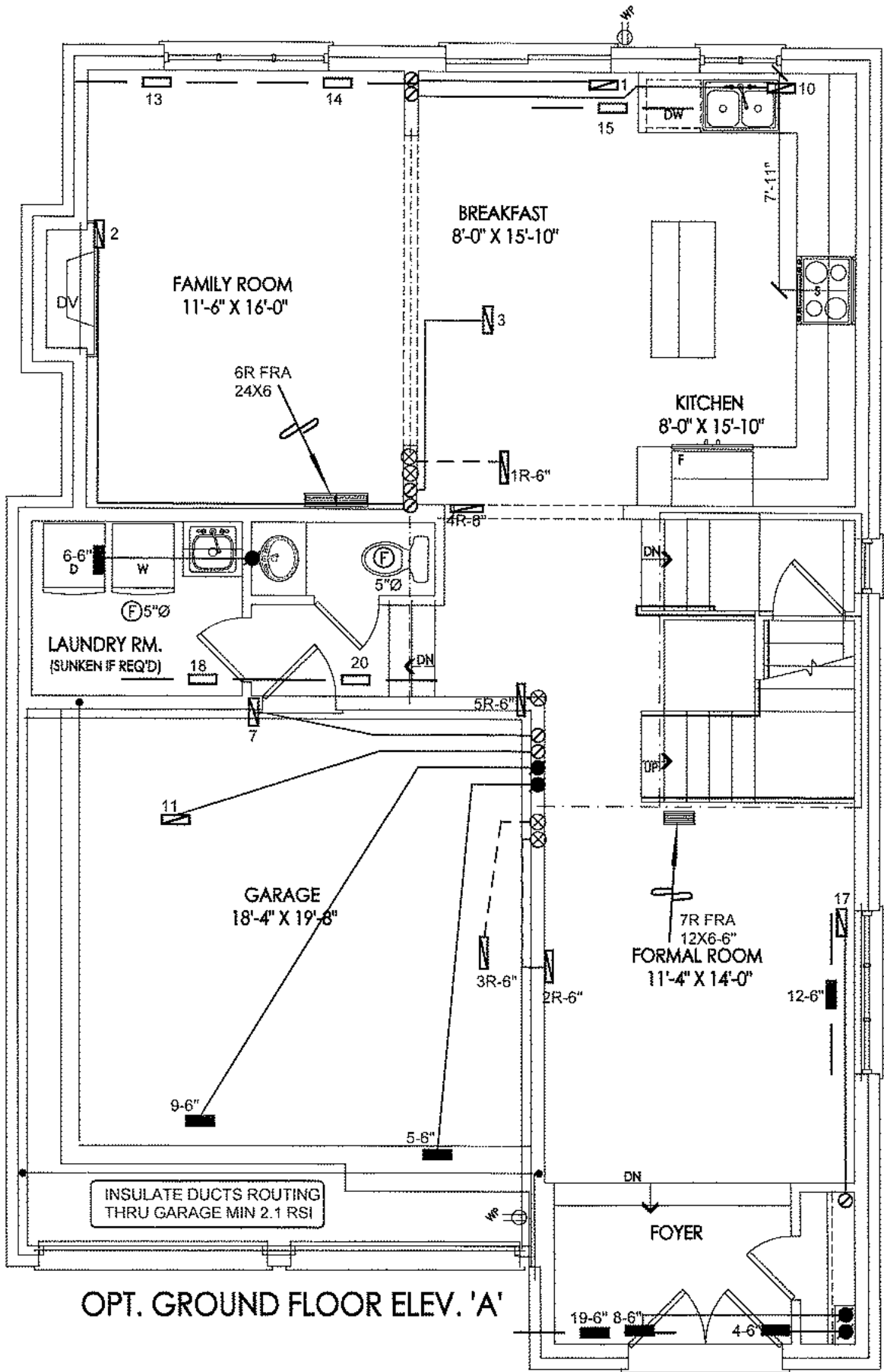
CSA-F280-12

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
	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
						REVISIONS	
						No.	Description
						Date	

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Client		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		HEAT LOSS 41587 BTU/H		# OF RUNS		S/A		R/A		FANS		Sheet Title	
ROYAL PINE HOMES				UNIT DATA		3RD FLOOR								BASEMENT	
Project Name CENTREFIELD (WEST GORMLEY) RICHMOND HILL, ONTARIO		MAKE		CARRIER		2ND FLOOR		12		5		3		Date APR/2021	
		MODEL		59TN6A-060-14V		1ST FLOOR		7		2		3			
		INPUT		60 MBTU/H		BASEMENT		4		1		0			
		OUTPUT		58 MBTU/H		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									
OPT MAIN & OPT 2ND 38-8 2389 sqft		COOLING		2.5 TONS										Scale 3/16" = 1'-0"	
		FAN SPEED		970 cfm @ 0.6" w.g.										BCIN# 19669	
														LO# 90456	



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

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

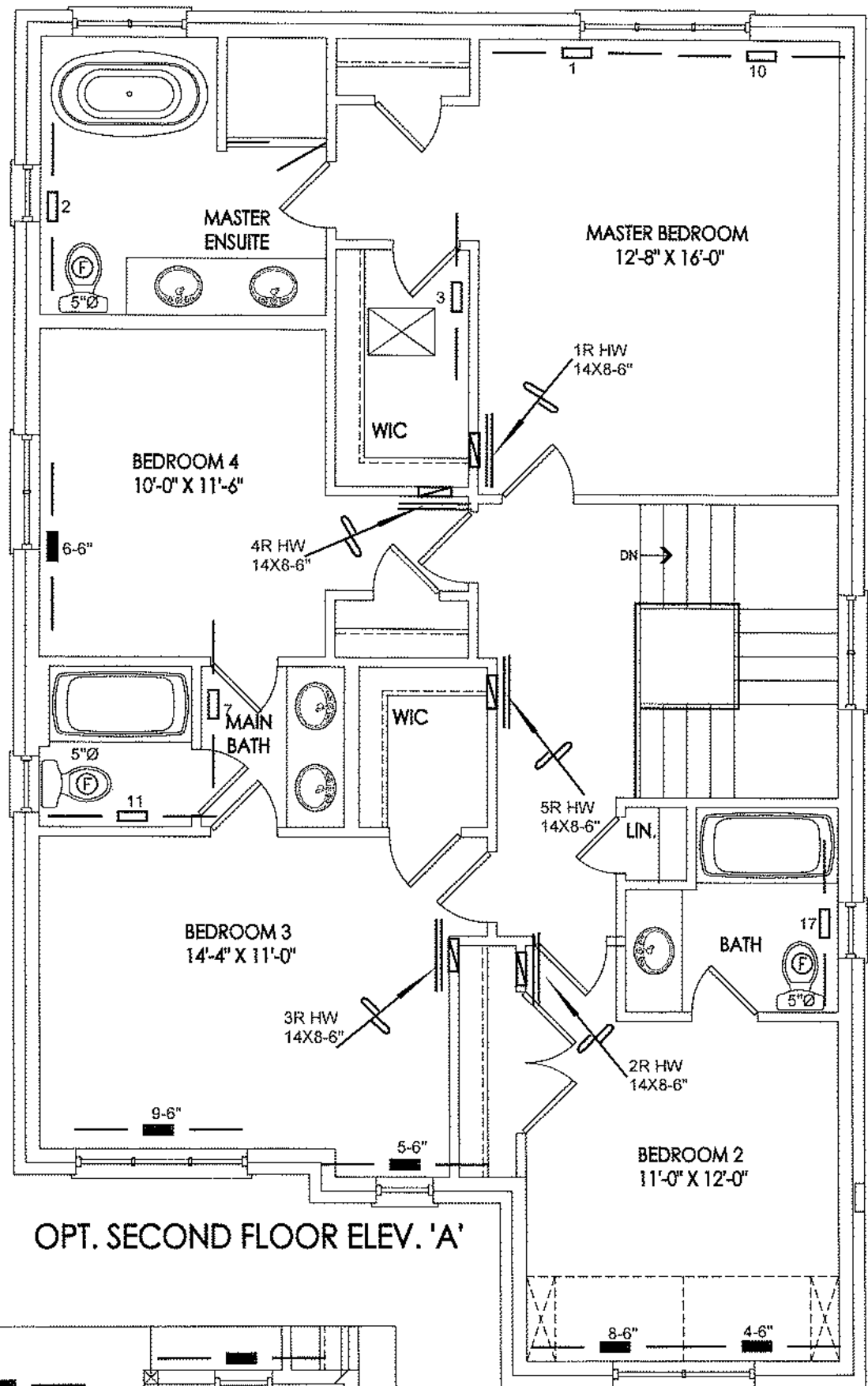
CSA-F280-12

SB-12 PERFORMANCE

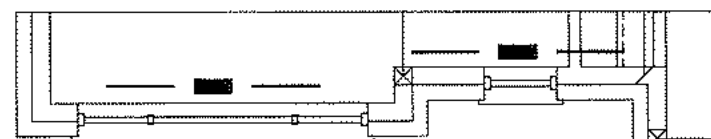
HVAC LEGEND						3.	
	SUPPLY AIR GRILLE		6" SUPPLY AIR BOOT ABOVE		14"x8" RETURN AIR GRILLE		2.
	SUPPLY AIR GRILLE 6" BOOT		SUPPLY AIR STACK FROM 2nd FLOOR		30"x8" RETURN AIR GRILLE		1.
	SUPPLY AIR BOOT ABOVE		6" SUPPLY AIR STACK 2nd FLOOR		FRA- FLOOR RETURN AIR GRILLE		No. Description Date
						REVISIONS	

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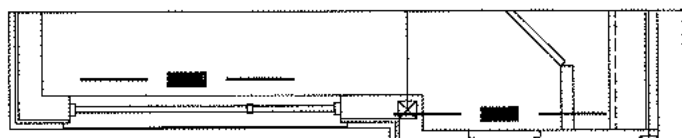
Client ROYAL PINE HOMES		 375 Finley Ave. Suite 202 - Ajax, Ontario L1S 2E2 Tel. 905.619.2300 - 905.420.5300 Fax 905.619.2375 Email: info@hvacdesigns.ca Web: www.hvacdesigns.ca Specializing in Residential Mechanical Design Services	Sheet Title FIRST FLOOR HEATING LAYOUT	
Project Name CENTREFIELD (WEST GORMLEY) RICHMOND HILL, ONTARIO			Date APR/2021	Scale 3/16" = 1'-0"
OPT MAIN & OPT 2ND 38-8 2389 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.	BCIN# 19669	
			LO# 90456	



OPT. SECOND FLOOR ELEV. 'A'



SECOND FLOOR PLAN ELEV. 'B'



SECOND FLOOR PLAN ELEV. 'C'

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						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	
	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	
REVISIONS								
No.	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	Sheet Title SECOND FLOOR HEATING LAYOUT	
Project Name CENTREFIELD (WEST GORMLEY) RICHMOND HILL, ONTARIO			Date APR/2021	
OPT MAIN & OPT 2ND 38-8 2389 sqft		Scale 3/16" = 1'-0"		
		BCIN# 19669		
		LO#	90456	

Energy Efficiency Design Summary: Performance & Other Acceptable Compliance Methods

(Building Code Part 9, Residential)

This form is used by a designer to demonstrate that the energy efficiency design of a house complies with the building code using the Performance or Other Acceptable Compliance Methods described in Subsections 3.1.2. and 3.1.3. of SB-12,

This form must accurately reflect the information contained on the drawings and specifications being submitted. Refer to Supplementary Standard SB-12 for details about building code compliance requirements. Further information about energy efficiency requirements for new buildings is available from the provincial building code website or the municipal building department.

For use by Principal Authority	
Application No:	Model/Certification Number

A. Project Information

Building number, street name Model Type 38-08 Ashtown		Unit number	Lot/Con
Municipality Richmond Hill	Postal code	Reg. Plan number / other description	

B. Compliance Option [indicate the building code compliance option being employed in this house design]

☒ SB-12 Performance* [SB-12 - 3.1.2.]	* Attach energy performance results using an approved software (see guide)
☐ ENERGY STAR®* [SB-12 - 3.1.3.]	* Attach Builder Option Package [BOP] form
☐ R-2000®* [SB-12 - 3.1.3.]	* Attach R-2000 HOT2000 Report

C. Project Building Design Conditions

Climatic Zone (SB-1):	Heating Equipment Efficiency	Space Heating Fuel Source
☒ Zone 1 (< 5000 degree days)	☒ ≥ 92% AFUE	☒ Gas ☐ Propane ☐ Solid Fuel
☐ Zone 2 (≥ 5000 degree days)	☐ ≥ 84% < 92% AFUE	☐ Oil ☐ Electric ☐ Earth Energy
Ratio of Windows, Skylights & Glass (W, S & G) to Wall Area		Other Building Characteristics
Area of walls = 300.23 m ² or _____ ft ²		☐ Log/Post&Beam ☐ ICF Above Grade ☐ ICF Basement ☐ Slab-on-ground ☐ Walkout Basement ☐ Air Conditioning ☐ Combo Unit ☐ Air Source Heat Pump (ASHP) ☐ Ground Source Heat Pump (GSHP)
Area of W, S & G = 34.93 m ² or _____ ft ²		
W, S & G % = 11.63		
SB-12 Performance Reference Building Design Package indicating the prescriptive package to be compared for compliance		
SB-12 Referenced Building Package (input design package): Package: <u>A1</u> Table: <u>3.1.1.2.A</u>		

D. Building Specifications [provide values and ratings of the energy efficiency components proposed, or attach ENERGY STAR BOP form]

Building Component	Minimum RSI / R values or Maximum U-Value ⁽¹⁾	Building Component	Efficiency Ratings
Thermal Insulation	Nominal Effective	Windows & Doors Provide U-Value ⁽¹⁾ or ER rating	
Ceiling with Attic Space	R60	Windows/Sliding Glass Doors	U=1.6
Ceiling without Attic Space	R31	Skylights/Glazed Roofs	N/A
Exposed Floor	R31	Mechanicals	
Walls Above Grade	R22+R1.5ci	Heating Equip.(AFUE)	96% AFUE
Basement Walls	R20ci	HRV Efficiency (SRE% at 0°C)	75%
Slab (all >600mm below grade)	N/A	DHW Heater (EF)	0.90 EF
Slab (edge only ≤600mm below grade)	N/A	DWHR (CSA B55.1 (min. 42% efficiency))	42 # Showers <u>2</u>
Slab (all ≤600mm below grade, or heated)	N/A	Combined Space / Dom. Water Heating	N/A

(1) U value to be provided in either W/(m²•K) or Btu/(h•ft²•F) but not both.

E. Performance Design Verification [Subsection 3.1.2. Performance Compliance]

The annual energy consumption using Subsection 3.1.1. SB-12 Reference Building Package is 141.33 GJ (1 GJ =1000MJ)

The annual energy consumption of this house as designed is 111.15 GJ

The software used to simulate the annual energy use of the building is: REM RATE 16.0.2 Canada

The building is being designed using an air tightness baseline of:

- ☐ OBC reference ACH, NLA or NLR default values (no depressurization test required)
- ☒ Targeted ACH, NLA or NLR. Depressurization test to meet 2.5 ACH50 or NLR or NLA

- ☒ Reduction of overall thermal performance of the proposed building envelope is not more than 25% of the envelope of the compliance package it is compared against (3.1.2.1.(6)).
- ☐ Standard Operating Conditions Applied (A-3.1.2.1 - 4.6.2)
- ☐ Reduced Operating Conditions for Zero-rated homes Applied (A-3.1.2.1 - 4.6.2.5)

- ☐ On Site Renewable(s): Solar: _____
- Other Types: _____

F. ENERGY STAR or R-2000 Performance Design Verification [Subsection 3.1.3. Other Acceptable Compliance Methods]

- ☐ The NRCan "ENERGY STAR for New Homes Standard Version 12.6" technical requirements, applied to this building design result in the building performance meeting or exceeding the prescriptive performance requirements of the Supplementary Standard SB12 (A-3.1.3.1).
- ☐ The NRCan, "2012 R-2000 Standard" technical requirements, applied to this building design result in the building performance meeting or exceeding the prescriptive performance requirements of the Supplementary Standard SB12 (A-3.1.3.1).

Performance Energy Modeling Professional

Energy Evaluator/Advisor/Rater/CEM Name and company:

Accreditation or Evaluator/Advisor/Rater License #

John B Godden/Clearsphere Consulting

08

ENERGY STAR or R-2000

Energy Evaluator/Advisor/Rater/ Name and company:

Evaluator/Advisor/Rater License #

G. Designer(s) [name(s) & BCIN(s), if applicable, of person(s) providing information herein to substantiate that design meets the building code]

Qualified Designer: Declaration of designer to have reviewed and take responsibility for the design work.

Name	BCIN	Signature
MARTHA SANDOVAL	103017	

CITY OF RICHMOND HILL
BUILDING DIVISION

08/12/2021

RECEIVED

Per: laura.dalberto

Guide to the Energy Efficiency Design Summary Form for Performance & Other Acceptable Compliance Methods

COMPLETING THE FORM

B. Compliance Options

Indicate the compliance option being used.

- SB-12 Performance refers to the method of compliance in Subsection 3.1.2. of SB-12. Using this approach the designer must use recognized energy simulation software (such as HOT2000 V10.51 or newer), and submit documents which show that the annual energy use of the proposed building is equal to or less than a prescriptive (referenced) building package.
- ENERGY STAR houses must be designed to ENERGY STAR requirements and verified on completion by a licensed energy evaluator and/or service organization. The ENERGY STAR BOP form must be submitted with the permit documents.
- R-2000 houses must be designed to the R-2000 Standard and verified on completion by a licensed energy evaluator and/or service organization. The HOT2000 report must be submitted with the permit documents.

C. Project Design Conditions

Climatic Zone: The number of degree days for Ontario cities is contained in Supplementary Standard SB-1
Windows, Skylights and Glass Doors: If the ratio of the total gross area of windows, sidelights, skylights, glazing in doors and sliding glass doors to the total gross area of walls is more than 17%, higher efficiency glazing is required. The total area is the sum of all the structural rough openings. Some exceptions apply. Refer to 3.1.1.1. of SB-12 for further details.

Fuel Source and Heating Equipment Efficiency: The fuel source and efficiency of the proposed heating equipment must be specified in order to determine which SB-12 Prescriptive compliance package table applies.

Other Building Conditions: These construction conditions affect SB-12 Prescriptive compliance requirements.

D. Building Specifications

Thermal Insulation: Indicate the RSI or R-value being proposed where they apply to the house design. Refer to SB-12 for further details.

E. Performance Design Summary

A summary of the performance design applicable only to the SB-12 Performance option.

F. ENERGY STAR or R-2000 Performance Method

Design to ENERGY STAR or R-2000 Standards.

G. House Designer

The building code requires designers providing information about whether a building complies with the building code to have a BCIN. Exemptions apply to architects, engineers and owners designing their own house.

BUILDING CODE REQUIREMENTS FOR AIRTIGHTNESS IN NEW HOUSES

All houses must comply with increased air barrier requirements in the building code. Notice of air barrier completion must be provided and an inspection conducted prior to it being covered.

The air leakage rates in Table 3.1.2.1. are not requirements. The Table is not intended to require or suggest that the building meet those airtightness targets. They are provided only as default or reference values for the purpose of annual energy simulations, should the builder/owner decide to perform such simulations. They are given in three different metrics; ACH, NLA, NLR. Any one of them can be used. They can be used as a default values for both a reference and proposed building or, where an air leakage test is conducted and credit for airtightness is claimed, the airtightness values in Table 3.1.2.1. can be used for the reference building and the actual leakage rates obtained from the air leakage test can be used as inputs for the proposed building.

OBC Reference Default Air Leakage Rates (Table 3.1.2.1.)

Detached dwelling	3.0 ACH50	NLA 2.12 cm ² /m ²	NLR 1.32 L/s/m ²
Attached dwelling	3.5 ACH50	NLA 2.27 cm ² /m ²	NLR 1.44 L/s/m ²

The building code requires that a blower door test be conducted to verify the air tightness of the house during construction if the SB-12 Performance option is used and an air tightness of less than 3.0 ACH @ 50 Pa (or NLA or NLR equivalent) in the case of detached houses, or 3.5 ACH @ 50 Pa (or NLA or NLR equivalent) in the case of attached houses is necessary to meet the required energy efficiency standard.

ENERGY EFFICIENCY LABELING FOR NEW HOUSES

ENERGY STAR and R-2000 may issue labels for new homes constructed under their energy efficiency programs. The building code does not currently regulate or require new home labeling.

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Mr. Anna Dalberto

Code Compliance Certificate

Project Title: Model 38-08 - Proposed

Report Date June 22, 2021
Data Filename Model 38-08 - Proposed.blg

Energy Code OBC SB-12 Performance Compliance Ontario 2017
Location Toronto, ON_CAN
Construction Type Single-family detached
Heating Type Natural Gas
Heating Degree Days <5000 HDD-Zone 1
Conditioned Area (sq ft) 3440
Conditioned Volume (cubic ft) 32819
Insulated Shell Area (sq ft) 7414

Construction Site	Owner	Builder	HERS Rater
Model 38-08 - Proposed	Royal Pine Homes	Royal Pine Homes	Clearsphere Consulting
Richmond Hill,	Model 38-08 - Proposed	3550 Langstaff Road, Suite 200	John Godden
	Richmond Hill,	Woodbridge, Ontario L4L 9G3	416-481-4218

Annual Energy Consumption	KWH	GJ
Reference Home Package A1	39259.46	141.33
Proposed House	30875.34	111.15
Better Than Code	21.4%	

SB-12 Performance Compliance: PASS

The Design Home total annual consumption is less than or equal to the Reference Home.

Building Summary

Assembly	Gross Area or Perimeter	Cavity R-Value	Continuous R-Value
Ceilings			
Roof 1: Std-R60, Attic G2*****	1328	20.0	40.0
Above-Grade Walls			
AG Wall 1: Std R22 G2 + 1.5 @16*****	2848	22.0	1.5
Joist 1: Cond -> ambient	318	22.0	1.5
Window 1: U=0.282, SHGC 0.45*****	359		3.5
Door 1: R6*****	9		6.0
Door 2: Code	18		4.0
Floors Over Garage			
Floor 1: Std-R31 G2*****	295	31.0	0.0
Basement Walls			

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Code Compliance Certificate

Building Summary

Assembly

Wall 1: Std-R-20 Blanket G2*****
 Window 2: U=0.282, SHGC 0.45*****
 Door 3

Gross Area or Perimeter

1535
 17
 17

Cavity R-Value

0.0

Continuous R-Value

20.0
 3.5
 4.0

Mechanical Equipment

Heating: Fuel-fired air distribution

Name/Type

96 AFUE Gas ECM
 64k*****

Size/Input

64.0 kBtuh

Efficiency

96.0 AFUE

Water Heating: Conventional, Gas

50 gal. 0.90 EF
 Gas*****

50 gal

0.90 EF

HRV/ERV

66.0 CFM

75.0% sen/ 0.0% tot

Drain Water Heat Recovery

2 of 2 Showers connected and 42.0% unit efficiency

Air Exchange

2.50 ACH50 or: 0.18 CFM50/sf

Efficient Lighting

90.0% Interior, 90.0% Exterior, 0.0% Garage

Renewables

N/A

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Building Summary

Property

Royal Pine Homes
Model 38-08 - Proposed
Richmond Hill,

Weather: Toronto, ON_CAN
Model 38-08 - Proposed
Model 38-08 - Proposed.blg

Organization

Clearsphere Consulting
416-481-4218
John Godden

Builder

Royal Pine Homes

HERS

Projected Rating
June 22, 2021
Rating No: N/A
Rater ID: 0001

Property/Builder Information

Building Name	Model 38-08 - Proposed
Owner's Name	Royal Pine Homes
Property Address	Model 38-08 - Proposed
City, St, Zip	Richmond Hill,
Phone Number	
Builder's Name	Royal Pine Homes
Phone Number	
Email Address	
Plan/Model Name	Model
Community/Development	Centerfiled
Identifier/Other	

Organization Information

Organization Name	Clearsphere Consulting
Address	1632 O'Connor Dr.
City, St, Zip	Toronto, ON_CAN M4B 3P4
Phone Number	416-481-4218
Website	www.clearsphere.ca

Rating/RESNET Information

Provider ID	2006-001
Sample Set ID	00000000
Registry ID	
Registry Date Registered	
Rater's Name	John Godden
Rater's ID	0001
Rater's Email	howard@clearsphere.ca
Last Field Insp	June 22, 2021
Rating Type	Projected Rating
Reason for Rating	New Home
Rating Number	N/A
Rating Permit Date	11/22/2019

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Projected Rating
June 22, 2021
Rating No:N/A
Rater ID:0001

Weather:Toronto, ON_CAN
Model 38-08 - Proposed
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Builder

Royal Pine Homes

General Building Information

Area of Conditioned. Space(sq ft)	3440
Volume of Conditioned. Space	32819
Year Built	2021
Housing Type	Single-family detached
Level Type(Apartments Only)	None
Floors on or Above-Grade	2
Number of Bedrooms	4
Foundation Type	Conditioned basement
Foundation is w/in Infiltration Volume:	N/A
Enclosed Crawl Space Type	N/A
Number of Stories Including Conditioned Basement	3
Thermal Boundary Location	N/A

Foundation Wall Information

Name	Library Entry	Location	Length(ft)	Total Height(ft)	Depth Below Grade(ft)	Height Above Grade(ft)	Uo Value Combo*	Uo Value (wall only)
Foundation Wall	Std-R-20 Blanket G2*****	Cond->ambient/grr	159.60	9.83	8.83	1.00	0.035	0.048

* Uo Value Combo combines wall, airfilm, and soil path

Foundation Wall Library List

Foundation Wall: Std-R-20 Blanket

G2*****

Type	Solid concrete or stone
Thickness(in)	8.0
Studs	None
Interior Insulation	
Continuous R-Value	20.0
Frame Cavity R-Value	0.0
Cavity Insulation Grade	2
Ins top	0.00 ft from top of wall
Ins Bottom	0.00 ft from bottom of wall

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Foundation Wall Library List

Exterior Insulation

R-Value	0.0
Ins top	0.00 ft from top of wall
Ins bottom	0.00 ft below grade

Note

Slab Floor Information

Name	Library Entry	Area(sq ft)	Depth Below Grade(ft)	Full Perimeter(ft)	Exposed Perimeter(ft)	On-Grade Perimeter(ft)
Slab	Uninsulated*****	1056	8.83	160	160	0

Slab Floor Library List

Slab Floor: Uninsulated*****

Slab Covering	Carpet
Perimeter Insulation (R-Value)	0.0
Perimeter Insulation Depth (ft)	0.0
Under-Slab Insulation (R-Value)	0.0
Under-Slab Insulation Width (ft)	0.0
Slab Insulation Grade	3
Radiant Slab	No
Note	

Frame Floor Information

Name	Library Entry	Location	Area(sq ft)	Uo Value
Exposed Floor	Std-R31 G2*****	Btwn cond & garage	295	0.039

Frame Floor Library List

Floor: Std-R31 G2*****

Information From Quick Fill Screen

Continuous Insulation R-Value	0.0
Cavity Insulation R-Value	31.0
Cavity Insulation Thickness (in.)	9.5
Cavity Insulation Grade	2
Joist Size (w x h, in)	1.5 x 9.5

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Frame Floor Library List

Joist Spacing (in oc) 16.0
Framing Factor - (default) 0.1300
Floor Covering CARPET
Note

Rim and Band Joist Information

Name	Location	Area(sq ft)	Continuous Ins	Framed Cavity Ins	Cavity Ins Thk(in)	Joist Spacing	Insulation Grade	Uo Value
Rim Band Joist	Cond -> ambient	318.10	1.5	22.0	5.5	16.0	2	0.049

Above-Grade Wall

Name	Library Entry	Location	Exterior Color	Area(sq ft)	Uo Value
AGW	Std R22 G2 + 1.5 @16*****	Cond -> ambient	Medium	2848.30	0.053

Above-Grade Wall Library List

Above-Grade Wall: Std R22 G2 + 1.5

@16*****

Information From Quick Fill Screen

Wall Construction Type Std Frame w/Brick Veneer
Continuous Insulation (R-Value) 1.5
Frame Cavity Insulation (R-Value) 22.0
Frame Cavity Insulation Thickness (in) 5.5
Frame Cavity Insulation Grade 2
Stud Size (w x d, in) 1.5 x 5.5
Stud Spacing (in o.c.) 16.0
Framing Factor - (default) 0.2300
Gypsum Thickness (in) 0.5
Note

Window Information

Name	Wall	Orient	U-Value	SHGC	Area	Depth	Overhang To Top	To Btm	Interior Winter	Summer	Adjacent Winter	Summer
------	------	--------	---------	------	------	-------	-----------------	--------	-----------------	--------	-----------------	--------

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June 22, 2021
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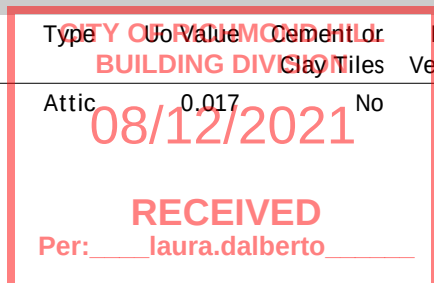
	Assignment				(sqft)	(ft)	(ft)	(ft)	Shading	Shading	Shading	Shading
front	AGWall 1	South	0.282	0.450	5.00	5.0	0.8	1.8	0.85	0.70	None	None
front	AGWall 1	South	0.282	0.450	5.00	5.0	1.8	8.8	0.85	0.70	None	None
front door	AGWall 1	South	0.282	0.450	12.00	5.0	1.8	8.6	0.85	0.70	None	None
front	AGWall 1	South	0.282	0.450	45.30	1.3	1.5	7.2	0.85	0.70	None	None
front	AGWall 1	South	0.282	0.450	11.30	1.3	1.5	7.2	0.85	0.70	None	None
front	AGWall 1	South	0.282	0.450	30.00	1.3	1.5	6.8	0.85	0.70	None	None
left	AGWall 1	West	0.282	0.450	9.30	1.3	1.8	6.4	0.85	0.70	None	None
left	AGWall 1	West	0.282	0.450	17.30	1.3	1.8	6.1	0.85	0.70	None	None
left	AGWall 1	West	0.282	0.450	8.00	1.3	1.8	5.8	0.85	0.70	None	None
back	FndWall 1	North	0.282	0.450	6.70	0.0	0.0	0.0	0.85	0.70	None	None
back	AGWall 1	North	0.282	0.450	13.00	0.0	0.0	0.0	0.85	0.70	None	None
back Sliding	AGWall 1	North	0.282	0.450	47.00	0.0	0.0	0.0	0.85	0.70	None	None
back	AGWall 1	North	0.282	0.450	36.00	0.0	0.0	0.0	0.85	0.70	None	None
back	AGWall 1	North	0.282	0.450	46.70	1.3	1.8	6.4	0.85	0.70	None	None
Right	FndWall 1	East	0.282	0.450	10.00	0.0	0.0	0.0	0.85	0.70	None	None
Right	AGWall 1	East	0.282	0.450	34.00	0.0	0.0	0.0	0.85	0.70	None	None
Right	AGWall 1	East	0.282	0.450	8.70	0.0	0.0	0.0	0.85	0.70	None	None
Right	AGWall 1	East	0.282	0.450	8.00	1.3	1.8	5.8	0.85	0.70	None	None
Right	AGWall 1	East	0.282	0.450	22.70	1.3	1.8	7.4	0.85	0.70	None	None

Door Information

Name	Library Entry	Wall Assignment	Opaque Area(sq ft)	Uo Value	R-Value of Opaque Area	Storm Door
Front	R6*****	AGWall 1	8.5	0.144	6.0	No
garage	Code*	AGWall 1	18.2	0.203	4.0	No
Cold Cellar	Code*	FndWall 1	17.1	0.203	4.0	No

Roof Information

Name	Library Entry	Ceiling Area(sq ft)	Roof Area(sq ft)	Exterior Color	Radiant Barrier	Type	Uo Value	Cement or Clay Tiles	Roof Tile Ventilation
Ceiling-with attic	Std-R60, Attic G2*****	1328.00	1660.00	Medium	No	Attic	0.017	No	No



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Building Summary

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Richmond Hill,

Organization

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416-481-4218
John Godden

HERS

Projected Rating
June 22, 2021
Rating No:N/A
Rater ID:0001

Weather:Toronto, ON_CAN
Model 38-08 - Proposed
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Builder

Royal Pine Homes

Roof Library List

Ceiling: Std-R60, Attic G2*****

Information From Quick Fill Screen

Continuous Insulation (R-Value)	40.0
Cavity Insulation (R-Value)	20.0
Cavity Insulation Thickness (in)	9.5
Cavity Insulation Grade	2
Gypsum Thickness (in)	0.500
Insulated Framing Size(w x h, in)	1.5 x 3.5
Insulated Framing Spacing (in o.c.)	24.0
Framing Factor - (default)	0.1100
Ceiling Type	Attic
Note	

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Mechanical Equipment

Number of Mechanical Systems	2
Heating SetPoint(F)	72.0
Heating Setback Thermostat	Present
Cooling SetPoint(F)	75.0
Cooling Setup Thermostat	Present
DHW SetPoint(F)	125.0

Heat: 96 AFUE Gas ECM 64k*****

SystemType	Fuel-fired air distribution
Fuel Type	Natural gas
Rated Output Capacity (kBtuh)	64.0
Seasonal Equipment Efficiency	96.0 AFUE
Auxiliary Electric	200 Watts
Note	
Number Of Units	1
Location	Conditioned area
Performance Adjustment	100
Percent Load Served	100

DHW: 50 gal. 0.90 EF Gas*****

Water Heater Type	Conventional
Fuel Type	Natural gas
Energy Factor	0.90
Recovery Efficiency	0.90
Water Tank Size (gallons)	50
Extra Tank Insulation (R-Value)	0.0
Note	
Number Of Units	1
Location	Conditioned area
Performance Adjustment	100
Percent Load Served	100

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DHW Efficiencies

All bath faucets & showers <= 2gpm	false
All DHW pipes fully insulated >= R-3	false
Recirculation type	None (standard system)
Farthest fixture to DHW heater	68
TOTAL Pipelength for longest DHW run	98
DWHR unit present?	true
DWHR unit efficiency per CSA 55.1	42.00
DWHR preheats cold supply for shower	false
DWHR preheats hot supply for shower	true
Number showerheads in home	2
Number showers connected to DWHR	2

DHW Diagnostics

dhwGpd	58.83
peRatio	1.00
dishwasherGpd	5.10
clothesWasherHotWaterGPD	4.48
EDef	1.00
ewaste	32.00
tmains	54.00
dwhrWhInletTempAdj	8.44
pumpConsKwh	0.00
pumpConsMmbtu	0.00

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Richmond Hill,

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Weather:Toronto, ON_CAN
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Builder

Royal Pine Homes

Duct Systems

Name

Conditioned Floor Area(sq ft) 3440.0
of Returns 6
Heating System 96 AFUE Gas ECM
64k*****
Cooling System N/A
Supply Duct Surface Area(sq ft) 696.6
Return Duct Surface Area(sq ft) 645.0
No bldg cavities used as ducts FALSE

Type	Location	Percent Location	R-Value
Supply	Conditioned space	100.0	0.0
Return	Conditioned space	100.0	0.0

Test Exemptions

IECC TRUE
RESNET 2019 TRUE
ENERGY STAR LtO TRUE

Duct Leakage

Input Type Measured
Test Type Total Duct Leakage
Duct Test Stage Postconstruction Test

	LtO (based on Total DL)	Total Duct Leakage
Supply & Return	Not Applicable	0.00 CFM @ 25 Pascals
Supply Only	0.00 CFM @ 25 Pascals	
Return Only	0.00 CFM @ 25 Pascals	

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Builder

Royal Pine Homes

Infiltration and Mechanical Ventilation

Whole Dwelling Infiltration

Input Type	Blower door
Heating Season Infiltration Value	2.50 ACH @ 50 Pascals
Cooling Season Infiltration Value	2.50 ACH @ 50 Pascals
Shelter Class	4
Code Verification	Tested

Mechanical Ventilation for IAQ

Type	Balanced
Unable to Measure Mechanical Ventilation	FALSE
Rate(cfm)	66
Adjusted Sensible Recovery Efficiency(%)	75.00
Adjusted Total Recovery Efficiency(%)	0.00
Hours per Day	24.0
Fan Power (watts)	64.00
ECM Fan Motor	false

Ventilation Strategy for Cooling

Cooling Season Ventilation	Natural Ventilation
----------------------------	---------------------

Good Air Exchange for Multi-Family	NA
------------------------------------	----

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Lights and Appliances

Rating/RESNET audit

Ceiling Fan CFM / Watt	0.00
Refrigerator kWh/yr	691
Refrigerator Location	Conditioned
Range/Oven Fuel Type	Electric
Induction Range	No
Convection Oven	No

Dishwasher

Energy Factor	0.46
Dishwasher kWh/yr	0
Place Setting Capacity	12

Clothes Dryer

Fuel Type	Electric
Location	Conditioned
Moisture Sensing	No
CEF	2.62

Clothes Washer

Location	Conditioned
LER (kWh/yr)	704
IMEF	0.331
Capacity (CU.Ft)	2.874
Electricity Rate	0.08
Gas Rate	0.58
Annual Gas Cost	23.00

Qualifying Light Fixtures

Interior Lights %	0.0
Exterior Lights %	0.0
Garage Lights %	0.0
Interior LEDs %	90.0
Exterior LEDs %	90.0
Garage LEDs %	0.0

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Building Summary

Canada Package A1 Reference

Property

Royal Pine Homes
Model 38-08 - Proposed
Richmond Hill,

Organization

Clearsphere Consulting
416-481-4218
John Godden

HERS

Projected Rating
June 22, 2021
Rating No:N/A
Rater ID:0001

Weather:Toronto, ON_CAN
Model 38-08 - Proposed
Model 38-08 - Proposed.blg

Builder

Royal Pine Homes

Property/Builder Information

Building Name	Model 38-08 - Proposed
Owner's Name	Royal Pine Homes
Property Address	Model 38-08 - Proposed
City, St, Zip	Richmond Hill,
Phone Number	
Builder's Name	Royal Pine Homes
Phone Number	
Email Address	
Plan/Model Name	Model
Community/Development	Centerfiled
Identifier/Other	

Organization Information

Organization Name	Clearsphere Consulting
Address	1632 O'Connor Dr.
City, St, Zip	Toronto, ON_CAN M4B 3P4
Phone Number	416-481-4218
Website	www.clearsphere.ca

Rating/RESNET Information

Provider ID	2006-001
Sample Set ID	00000000
Registry ID	
Registry Date Registered	
Rater's Name	John Godden
Rater's ID	0001
Rater's Email	howard@clearsphere.ca
Last Field Insp	June 22, 2021
Rating Type	Projected Rating
Reason for Rating	New Home
Rating Number	N/A
Rating Permit Date	11/22/2019

REM/Rate - Residential Energy Analysis and Rating Software v16.0.2 Canada

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Richmond Hill,

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June 22, 2021
Rating No:N/A
Rater ID:0001

Weather:Toronto, ON_CAN
Model 38-08 - Proposed
Model 38-08 - Proposed.blg

Builder

Royal Pine Homes

General Building Information

Area of Conditioned. Space(sq ft)	3440
Volume of Conditioned. Space	32819
Year Built	2021
Housing Type	Single-family detached
Level Type(Apartments Only)	None
Floors on or Above-Grade	2
Number of Bedrooms	4
Foundation Type	Conditioned basement
Foundation is w/in Infiltration Volume:	N/A
Enclosed Crawl Space Type	N/A
Number of Stories Including Conditioned Basement	3
Thermal Boundary Location	N/A

Foundation Wall Information

Name	Library Entry	Location	Length(ft)	Total Height(ft)	Depth Below Grade(ft)	Height Above Grade(ft)	Uo Value Combo*	Uo Value (wall only)
Foundation Wall	N/A	Cond->ambient/grr	159.60	9.83	8.83	1.00	0.047	N/A

* Uo Value Combo combines wall, airfilm, and soil path

Slab Floor Information

Name	Library Entry	Area(sq ft)	Depth Below Grade(ft)	Full Perimeter(ft)	Exposed Perimeter(ft)	On-Grade Perimeter(ft)
Slab	(Under R-0.0; Per R-0.0; Per depth-0.00)	1056	8.83	160	160	0

Frame Floor Information

Name	Library Entry	Location	Area(sq ft)	Uo Value
Exposed Floor	N/A	Btwn cond & garage	295	0.047

Rim and Band Joist Information

Name	Location	Area(sq ft)	Continuous Ins	Framed Cavity Ins	Cavity Ins Thk(in)	Joist Spacing	Insulation Grade	Uo Value
Rim Band Joist	Cond -> ambient	318.10	N/A	N/A	N/A	N/A	1	0.065

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Building Summary

Canada Package A1 Reference

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Model 38-08 - Proposed
Richmond Hill,

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John Godden

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Projected Rating
June 22, 2021
Rating No:N/A
Rater ID:0001

Weather:Toronto, ON_CAN

Model 38-08 - Proposed
Model 38-08 - Proposed.blg

Builder

Royal Pine Homes

Above-Grade Wall

Name	Library Entry	Location	Exterior Color	Area(sq ft)	Uo Value
AGW	[frame wall]	Cond -> ambient	Medium	2848.30	0.065

Window Information

Name	Wall Assignment	Orient	U-Value	SHGC	Area (sqft)	Overhang			Interior		Adjacent	
						Depth (ft)	To Top (ft)	To Btm (ft)	Winter Shading	Summer Shading	Winter Shading	Summer Shading
front	AGWall 1	South	0.280	0.450	5.00	0.0	0.0	0.0	0.83	0.83	None	None
front	AGWall 1	South	0.280	0.450	5.00	0.0	0.0	0.0	0.83	0.83	None	None
front door	AGWall 1	South	0.280	0.450	12.00	0.0	0.0	0.0	0.83	0.83	None	None
front	AGWall 1	South	0.280	0.450	45.30	0.0	0.0	0.0	0.83	0.83	None	None
front	AGWall 1	South	0.280	0.450	11.30	0.0	0.0	0.0	0.83	0.83	None	None
front	AGWall 1	South	0.280	0.450	30.00	0.0	0.0	0.0	0.83	0.83	None	None
left	AGWall 1	West	0.280	0.450	9.30	0.0	0.0	0.0	0.83	0.83	None	None
left	AGWall 1	West	0.280	0.450	17.30	0.0	0.0	0.0	0.83	0.83	None	None
left	AGWall 1	West	0.280	0.450	8.00	0.0	0.0	0.0	0.83	0.83	None	None
back	FndWall 1	North	0.280	0.450	6.70	0.0	0.0	0.0	0.83	0.83	None	None
back	AGWall 1	North	0.280	0.450	13.00	0.0	0.0	0.0	0.83	0.83	None	None
back Sliding	AGWall 1	North	0.280	0.450	47.00	0.0	0.0	0.0	0.83	0.83	None	None
back	AGWall 1	North	0.280	0.450	36.00	0.0	0.0	0.0	0.83	0.83	None	None
back	AGWall 1	North	0.280	0.450	46.70	0.0	0.0	0.0	0.83	0.83	None	None
Right	FndWall 1	East	0.280	0.450	10.00	0.0	0.0	0.0	0.83	0.83	None	None
Right	AGWall 1	East	0.280	0.450	34.00	0.0	0.0	0.0	0.83	0.83	None	None
Right	AGWall 1	East	0.280	0.450	8.70	0.0	0.0	0.0	0.83	0.83	None	None
Right	AGWall 1	East	0.280	0.450	8.00	0.0	0.0	0.0	0.83	0.83	None	None
Right	AGWall 1	East	0.280	0.450	22.70	0.0	0.0	0.0	0.83	0.83	None	None

Door Information

Name	Library Entry	Wall Assignment	Opaque Area(sq ft)	Uo Value	R-Value of Opaque Area	Storm Door
Front	N/A	AGWall 1	8.5	0.250	N/A	N/A
garage	N/A	AGWall 1	18.2	0.250	N/A	N/A
Cold Cellar	N/A	FndWall 1	17.1	0.250	N/A	N/A

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Page 3 of 10

Building Summary

Canada Package A1 Reference

Property

Royal Pine Homes
Model 38-08 - Proposed
Richmond Hill,

Organization

Clearsphere Consulting
416-481-4218
John Godden

HERS

Projected Rating
June 22, 2021
Rating No:N/A
Rater ID:0001

Weather:Toronto, ON_CAN
Model 38-08 - Proposed
Model 38-08 - Proposed.blg

Builder

Royal Pine Homes

Roof Information

Name	Library Entry	Ceiling Area(sq ft)	Roof Area(sq ft)	Exterior Color	Radiant Barrier	Type	Uo Value	Cement or Clay Tiles	Roof Tile Ventilation
Ceiling-with attic	N/A	1328.00	1660.00	Medium	No	Attic	0.017	No	No

Building Summary

Canada Package A1 Reference

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Richmond Hill,

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Rating No:N/A
Rater ID:0001

Weather:Toronto, ON_CAN
Model 38-08 - Proposed
Model 38-08 - Proposed.blg

Builder

Royal Pine Homes

Mechanical Equipment

Number of Mechanical Systems	3
Heating SetPoint(F)	72.0
Heating Setback Thermostat	Not Present
Cooling SetPoint(F)	75.0
Cooling Setup Thermostat	Not Present
DHW SetPoint(F)	125.0

Heat: 96 AFUE Gas ECM 64k*****

SystemType	Fuel-fired air distribution
Fuel Type	Natural gas
Rated Output Capacity (kBtuh)	37.5
Seasonal Equipment Efficiency	96.0 AFUE
Auxiliary Electric	371 Watts
Note	
Number Of Units	1
Location	Conditioned area
Performance Adjustment	100
Percent Load Served	100

DHW: Reference DHW

Water Heater Type	Conventional
Fuel Type	Natural gas
Energy Factor	0.80
Recovery Efficiency	0.80
Water Tank Size (gallons)	50
Extra Tank Insulation (R-Value)	0.0
Note	
Number Of Units	1
Location	Conditioned area
Performance Adjustment	100
Percent Load Served	100

Cool: ***Code Generated Cooling***

Building Summary

Canada Package A1 Reference

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Royal Pine Homes
Model 38-08 - Proposed
Richmond Hill,

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Model 38-08 - Proposed
Model 38-08 - Proposed.blg

Builder

Royal Pine Homes

Mechanical Equipment

System Type	Air conditioner
Fuel Type	Electric
Rated Output Capacity (kBtuh)	19.2
Seasonal Equipment Efficiency	13.0 SEER
Sensible Heat Fraction (SHF)	0.70
Note	
Number Of Units	1
Location	Conditioned area
Performance Adjustment	100
Percent Load Served	100

DHW Efficiencies

All bath faucets & showers <= 2gpm	false
All DHW pipes fully insulated >= R-3	false
Recirculation type	None (standard system)
TOTAL Pipelength for longest DHW run	98
refPipeL	98
refLoopL	175
DWHR unit present?	true
DWHR unit efficiency per CSA 55.1	42.00
DWHR preheats cold supply for shower	false
DWHR preheats hot supply for shower	true
Number showerheads in home	2
Number showers connected to DWHR	2
DHW Diagnostics	Canada Package A1 Reference
dhwGpd	58.83
peRatio	1.00
EDef	1.00
ewaste	32.00
tmains	54.00

Building Summary

Canada Package A1 Reference

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Model 38-08 - Proposed
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Builder

Royal Pine Homes

Infiltration and Mechanical Ventilation

Whole Dwelling Infiltration

Input Type	Blower door
Heating Season Infiltration Value	0.26 CFM50/sf shell
Cooling Season Infiltration Value	0.26 CFM50/sf shell
Shelter Class	4
Code Verification	Tested

Mechanical Ventilation for IAQ

Type	Balanced
Unable to Measure Mechanical Ventilation	FALSE
Rate(cfm)	66
Adjusted Sensible Recovery Efficiency(%)	75.00
Adjusted Total Recovery Efficiency(%)	0.00
Hours per Day	24.0
Fan Power (watts)	70.40
ECM Fan Motor	false

Ventilation Strategy for Cooling

Cooling Season Ventilation	Natural Ventilation
----------------------------	---------------------

Good Air Exchange for Multi-Family	NA
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Canada Package A1 Reference

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Model 38-08 - Proposed
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Builder

Royal Pine Homes

Lights and Appliances

Rating/RESNET audit

Ceiling Fan CFM / Watt	0.00
Refrigerator kWh/yr	691
Refrigerator Location	Conditioned
Range/Oven Fuel Type	Electric
Induction Range	No
Convection Oven	No

Dishwasher

Energy Factor	0.46
Dishwasher kWh/yr	0
Place Setting Capacity	12

Clothes Dryer

Fuel Type	Electric
Location	Conditioned
Moisture Sensing	No
CEF	2.62

Clothes Washer

Location	Conditioned
LER (kWh/yr)	704
IMEF	0.331
Capacity (CU.Ft)	2.874
Electricity Rate	0.08
Gas Rate	0.58
Annual Gas Cost	23.00

Qualifying Light Fixtures

Interior Lights %	0.0
Exterior Lights %	0.0
Garage Lights %	0.0
Interior LEDs %	0.0
Exterior LEDs %	0.0
Garage LEDs %	0.0

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Building Summary

Canada Package A1 Reference

Property

Royal Pine Homes
Model 38-08 WUB - Proposed
Richmond Hill,

Organization

Clearsphere Consulting
416-481-4218
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Projected Rating
June 22, 2021
Rating No: N/A
Rater ID: 0001

CITY OF RICHMOND HILL
BUILDING DIVISION

09/01/2021

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By: jocelyn.aguilar

Weather: Toronto, ON_CAN
Model 38-08 WUB - Proposed
Model 38-08 WUB - Proposed.blg

Builder

Royal Pine Homes

Property/Builder Information

Building Name	Model 38-08 WUB - Proposed
Owner's Name	Royal Pine Homes
Property Address	Model 38-08 WUB - Proposed
City, St, Zip	Richmond Hill,
Phone Number	
Builder's Name	Royal Pine Homes
Phone Number	
Email Address	
Plan/Model Name	Model
Community/Development	Centerfiled
Identifier/Other	

Organization Information

Organization Name	Clearsphere Consulting
Address	1632 O'Connor Dr.
City, St, Zip	Toronto, ON_CAN M4B 3P4
Phone Number	416-481-4218
Website	www.clearsphere.ca

Rating/RESNET Information

Provider ID	2006-001
Sample Set ID	00000000
Registry ID	
Registry Date Registered	
Rater's Name	John Godden
Rater's ID	0001
Rater's Email	howard@clearsphere.ca
Last Field Insp	June 22, 2021
Rating Type	Projected Rating
Reason for Rating	New Home
Rating Number	N/A
Rating Permit Date	11/22/2019

REM/Rate - Residential Energy Analysis and Rating Software v16.0.2 Canada

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Building Summary

Canada Package A1 Reference

CITY OF RICHMOND HILL
BUILDING DIVISION

09/01/2021

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By: jocelyn.aguilar

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Projected Rating:

June 22, 2021

Rating No: N/A

Rater ID: 0001

Property

Royal Pine Homes
Model 38-08 WUB - Proposed
Richmond Hill,

Organization

Clearsphere Consulting
416-481-4218
John Godden

Weather: Toronto, ON_CAN

Model 38-08 WUB - Proposed

Model 38-08 WUB - Proposed.blg

Builder

Royal Pine Homes

General Building Information

Area of Conditioned. Space(sq ft)	3440
Volume of Conditioned. Space	32819
Year Built	2021
Housing Type	Single-family detached
Level Type(Apartments Only)	None
Floors on or Above-Grade	2
Number of Bedrooms	4
Foundation Type	Conditioned basement
Foundation is w/in Infiltration Volume:	N/A
Enclosed Crawl Space Type	N/A
Number of Stories Including Conditioned Basement	3
Thermal Boundary Location	N/A

Foundation Wall Information

Name	Library Entry	Location	Length(ft)	Total Height(ft)	Depth Below Grade(ft)	Height Above Grade(ft)	Uo Value Combo*	Uo Value (wall only)
Foundation Wall	N/A	Cond->ambient/grr	159.60	9.83	8.83	1.00	0.047	N/A

* Uo Value Combo combines wall, airfilm, and soil path

Slab Floor Information

Name	Library Entry	Area(sq ft)	Depth Below Grade(ft)	Full Perimeter(ft)	Exposed Perimeter(ft)	On-Grade Perimeter(ft)
Slab	(Under R-0.0; Per R-0.0; Per depth-0.00)	966	8.83	154	124	0
WUB Slab	(Under R-10.0; Per R-0.0; Per depth-0.00)	88	0.00	66	36	36

Frame Floor Information

Name	Library Entry	Location	Area(sq ft)	Uo Value
Exposed Floor	N/A	Btwn cond & garage	295	0.047

Rim and Band Joist Information

Name	Location	Area(sq ft)	Continuous Ins	Framed Cavity Ins	Cavity Ins Thk(in)	Joist Spacing	Insulation Grade	Uo Value
------	----------	-------------	----------------	-------------------	--------------------	---------------	------------------	----------

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Richmond Hill,

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416-481-4218
John Godden

Weather: Toronto, ON_CAN

Model 38-08 WUB - Proposed
Model 38-08 WUB - Proposed.blg

Builder

Royal Pine Homes

Rim and Band Joist Information

Name	Location	Area(sq ft)	Continuous Ins	Framed Cavity Ins	Cavity Ins Thk(in)	Joist Spacing	Insulation Grade	Uo Value
Rim Band Joist	Cond -> ambient	318.10	N/A	N/A	N/A	N/A	1	0.065

Above-Grade Wall

Name	Library Entry	Location	Exterior Color	Area(sq ft)	Uo Value
AGW	[frame wall]	Cond -> ambient	Medium	2848.30	0.065
AGW WUB	[frame wall]	Cond -> ambient	Medium	315.70	0.065

Window Information

Name	Wall Assignment	Orient	U-Value	SHGC	Area (sqft)	Overhang			Interior		Adjacent	
						Depth (ft)	To Top (ft)	To Btm (ft)	Winter Shading	Summer Shading	Winter Shading	Summer Shading
front	AGWall 1	South	0.280	0.450	5.00	0.0	0.0	0.0	0.83	0.83	None	None
front	AGWall 1	South	0.280	0.450	5.00	0.0	0.0	0.0	0.83	0.83	None	None
front door	AGWall 1	South	0.280	0.450	12.00	0.0	0.0	0.0	0.83	0.83	None	None
front	AGWall 1	South	0.280	0.450	45.30	0.0	0.0	0.0	0.83	0.83	None	None
front	AGWall 1	South	0.280	0.450	11.30	0.0	0.0	0.0	0.83	0.83	None	None
front	AGWall 1	South	0.280	0.450	30.00	0.0	0.0	0.0	0.83	0.83	None	None
left	AGWall 1	West	0.280	0.450	9.30	0.0	0.0	0.0	0.83	0.83	None	None
left	AGWall 1	West	0.280	0.450	17.30	0.0	0.0	0.0	0.83	0.83	None	None
left	AGWall 1	West	0.280	0.450	8.00	0.0	0.0	0.0	0.83	0.83	None	None
WUB Door	AGWall 2	North	0.280	0.450	9.60	0.0	0.0	0.0	0.83	0.83	None	None
back	FndWall 1	North	0.280	0.450	6.70	0.0	0.0	0.0	0.83	0.83	None	None
back	AGWall 1	North	0.280	0.450	13.00	0.0	0.0	0.0	0.83	0.83	None	None
back Sliding	AGWall 1	North	0.280	0.450	47.00	0.0	0.0	0.0	0.83	0.83	None	None
back	AGWall 1	North	0.280	0.450	36.00	0.0	0.0	0.0	0.83	0.83	None	None
back	AGWall 1	North	0.280	0.450	46.70	0.0	0.0	0.0	0.83	0.83	None	None
Right	AGWall 2	East	0.280	0.450	10.00	0.0	0.0	0.0	0.83	0.83	None	None
Right	AGWall 1	East	0.280	0.450	34.00	0.0	0.0	0.0	0.83	0.83	None	None
Right	AGWall 1	East	0.280	0.450	8.70	0.0	0.0	0.0	0.83	0.83	None	None
Right	AGWall 1	East	0.280	0.450	8.00	0.0	0.0	0.0	0.83	0.83	None	None
Right	AGWall 1	East	0.280	0.450	22.70	0.0	0.0	0.0	0.83	0.83	None	None

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Building Summary

Canada Package A1 Reference

Property

Royal Pine Homes
Model 38-08 WUB - Proposed
Richmond Hill,

Organization

Clearsphere Consulting
416-481-4218
John Godden

HERS

Projected Rating
June 22, 2021
Rating No: N/A
Rater ID: 0001

CITY OF RICHMOND HILL
BUILDING DIVISION

09/01/2021

RECEIVED

By: jocelyn.aguilar

Weather: Toronto, ON_CAN

Model 38-08 WUB - Proposed
Model 38-08 WUB - Proposed.blg

Builder

Royal Pine Homes

Door Information

Name	Library Entry	Wall Assignment	Opaque Area(sq ft)	Uo Value	R-Value of Opaque Area	Storm Door
Front	N/A	AGWall 1	8.5	0.250	N/A	N/A
garage	N/A	AGWall 1	18.2	0.250	N/A	N/A
Cold Cellar	N/A	FndWall 1	17.1	0.250	N/A	N/A
WUB Door	N/A	AGWall 2	8.6	0.250	N/A	N/A

Roof Information

Name	Library Entry	Ceiling Area(sq ft)	Roof Area(sq ft)	Exterior Color	Radiant Barrier	Type	Uo Value	Cement or Clay Tiles	Roof Tile Ventilation
Ceiling-with attic	N/A	1328.00	1660.00	Medium	No	Attic	0.017	No	No

Building Summary

Canada Package A1 Reference

Property

Royal Pine Homes
Model 38-08 WUB - Proposed
Richmond Hill,

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By: jocelyn.aguilar

Weather:Toronto, ON_CAN
Model 38-08 WUB - Proposed
Model 38-08 WUB - Proposed.blg

Builder

Royal Pine Homes

Mechanical Equipment

Number of Mechanical Systems	3
Heating SetPoint(F)	72.0
Heating Setback Thermostat	Not Present
Cooling SetPoint(F)	75.0
Cooling Setup Thermostat	Not Present
DHW SetPoint(F)	125.0

Heat: 96 AFUE Gas ECM 64k*****

SystemType	Fuel-fired air distribution
Fuel Type	Natural gas
Rated Output Capacity (kBtuh)	40.2
Seasonal Equipment Efficiency	96.0 AFUE
Auxiliary Electric	371 Watts
Note	
Number Of Units	1
Location	Conditioned area
Performance Adjustment	100
Percent Load Served	100

DHW: Reference DHW

Water Heater Type	Conventional
Fuel Type	Natural gas
Energy Factor	0.80
Recovery Efficiency	0.80
Water Tank Size (gallons)	50
Extra Tank Insulation (R-Value)	0.0
Note	
Number Of Units	1
Location	Conditioned area
Performance Adjustment	100
Percent Load Served	100

Cool: ***Code Generated Cooling***

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Model 38-08 WUB - Proposed
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Builder

Royal Pine Homes

Mechanical Equipment

System Type	Air conditioner
Fuel Type	Electric
Rated Output Capacity (kBtuh)	19.9
Seasonal Equipment Efficiency	13.0 SEER
Sensible Heat Fraction (SHF)	0.70
Note	
Number Of Units	1
Location	Conditioned area
Performance Adjustment	100
Percent Load Served	100

DHW Efficiencies

All bath faucets & showers <= 2gpm	false
All DHW pipes fully insulated >= R-3	false
Recirculation type	None (standard system)
TOTAL Pipelength for longest DHW run	98
refPipeL	98
refLoopL	175
DWHR unit present?	true
DWHR unit efficiency per CSA 55.1	42.00
DWHR preheats cold supply for shower	false
DWHR preheats hot supply for shower	true
Number showerheads in home	2
Number showers connected to DWHR	2
DHW Diagnostics	Canada Package A1 Reference
dhwGpd	58.83
peRatio	1.00
EDeff	1.00
ewaste	32.00
tmains	54.00

Building Summary

Canada Package A1 Reference

Property

Royal Pine Homes
Model 38-08 WUB - Proposed
Richmond Hill,

Organization

Clearsphere Consulting
416-481-4218
John Godden

HERS

Projected Rating
June 22, 2021
Rating No:N/A
Rater ID:0001

CITY OF RICHMOND HILL
BUILDING DIVISION

09/01/2021

RECEIVED

By: jocelyn.aguilar

Weather:Toronto, ON_CAN

Model 38-08 WUB - Proposed
Model 38-08 WUB - Proposed.blg

Builder

Royal Pine Homes

Infiltration and Mechanical Ventilation

Whole Dwelling Infiltration

Input Type	Blower door
Heating Season Infiltration Value	0.26 CFM50/sf shell
Cooling Season Infiltration Value	0.26 CFM50/sf shell
Shelter Class	4
Code Verification	Tested

Mechanical Ventilation for IAQ

Type	Balanced
Unable to Measure Mechanical Ventilation	FALSE
Rate(cfm)	66
Adjusted Sensible Recovery Efficiency(%)	75.00
Adjusted Total Recovery Efficiency(%)	0.00
Hours per Day	24.0
Fan Power (watts)	70.40
ECM Fan Motor	false

Ventilation Strategy for Cooling

Cooling Season Ventilation	Natural Ventilation
----------------------------	---------------------

Good Air Exchange for Multi-Family	NA
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Building Summary

Canada Package A1 Reference

Property

Royal Pine Homes
Model 38-08 WUB - Proposed
Richmond Hill,

Organization

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BUILDING DIVISION

09/01/2021

RECEIVED

By: jocelyn.aguilar

Weather:Toronto, ON_CAN

Model 38-08 WUB - Proposed
Model 38-08 WUB - Proposed.blg

Builder

Royal Pine Homes

Lights and Appliances

Rating/RESNET audit

Ceiling Fan CFM / Watt	0.00
Refrigerator kWh/yr	691
Refrigerator Location	Conditioned
Range/Oven Fuel Type	Electric
Induction Range	No
Convection Oven	No

Dishwasher

Energy Factor	0.46
Dishwasher kWh/yr	0
Place Setting Capacity	12

Clothes Dryer

Fuel Type	Electric
Location	Conditioned
Moisture Sensing	No
CEF	2.62

Clothes Washer

Location	Conditioned
LER (kWh/yr)	704
IMEF	0.331
Capacity (CU.Ft)	2.874
Electricity Rate	0.08
Gas Rate	0.58
Annual Gas Cost	23.00

Qualifying Light Fixtures

Interior Lights %	0.0
Exterior Lights %	0.0
Garage Lights %	0.0
Interior LEDs %	0.0
Exterior LEDs %	0.0
Garage LEDs %	0.0

REM/Rate - Residential Energy Analysis and Rating Software v16.0.2 Canada

This information does not constitute any warranty of energy costs or savings.

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Schedule 1: Designer Information

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

A. Project Information			
Building number, street name		Unit no.	Lot/con.
Municipality	Postal code	Plan number/ other description	
RICHMOND HILL			
B. Individual who reviews and takes responsibility for design activities			
Name		Firm	
MICHAEL O'ROURKE		HVAC DESIGNS LTD.	
Street address		Unit no.	Lot/con.
375 FINLEY AVE		202	N/A
Municipality	Postal code	Province	E-mail
AJAX	L1S 2E2	ONTARIO	info@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: 38-8	
HEAT LOSS / GAIN CALCULATIONS		OPT MAIN & 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.			
April 19, 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.

REVIEW AND TAKE RESPONSIBILITY FOR THE DESIGN WORK AND AM QUALIFIED IN THE APPROPRIATE CATEGORY AS AN "OTHER DESIGNER" UNDER DIVISION C, 3.2.5 OF THE BUILDING CODE.

TONS: 2.43

TOTAL HEAT GAIN BTU/H: 28178

LOSS DUE TO VENTILATION LOAD BTU/H: 1670

STRUCTURAL HEAT LOSS: 40664

TOTAL COMBINED HEAT LOSS BTU/H: 41734

Michael Oppenheimer

INDIVIDUAL BCR: 15659

MICHAEL OPPENHEIMER

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

OPT MAIN & OPT 2ND

TYPE: 3B-8

DATE: Apr-21

GFA: 2389 LO# 90456

HEATING CFM 970 COOLING CFM 970
TOTAL HEAT LOSS 40,064 TOTAL HEAT GAIN 28,903
AIR FLOW RATE CFM 24.21 AIR FLOW RATE CFM 33.56

**CARRIER

50TNSA-060-14V 50
FAN SPEED LOW 820
MEDLOW 0
MEDIUM 970
HIGH 1520AFUE = 97 %
INPUT (BTU/H) = 60,000
OUTPUT (BTU/H) = 58,000

RUN COUNT	4th	3rd	2nd	1st	Bas
S/A	0	0	12	7	4
R/A	0	0	5	2	1

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

All S/A fans 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	BED-2	BED-3	MBR	BATH	FORM	FAM	FAM	KT/BR		BATH-2	LAUN	FOY	MUD	BAS	BAS	BAS	BAS
RM LOSS MBH	1.38	1.66	0.12	1.32	1.77	1.15	0.45	1.32	1.77	1.38	0.45	2.45	1.32	1.32	2.67		1.04	0.99	3.35	1.06	3.27	3.27	3.27	3.27
CFM PER RUN HEAT	33	40	3	32	43	28	11	32	43	33	11	59	32	32	65		25	24	81	26	79	79	79	79
RM GAIN MBH	1.90	1.40	0.06	1.86	2.35	1.75	0.18	1.86	2.35	1.90	0.18	2.18	1.54	1.54	2.14		0.74	1.03	1.83	0.18	0.48	0.48	0.48	0.48
CFM PER RUN COOLING	64	47	2	62	79	59	6	62	79	64	6	73	52	52	72		25	35	61	6	15	16	16	16
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	0.17	0.17	0.17		0.17	0.17	0.16	0.17	0.17	0.17	0.17	0.17
ACTUAL DUCT LGH	39	43	27	67	52	34	42	72	56	46	48	43	32	26	31		69	25	47	12	27	32	36	51
EQUIVALENT LENGTH	130	180	180	200	170	0	180	200	190	140	200	190	140	120	140		220	130	160	120	140	150	130	170
TOTAL EFFECTIVE LENGTH	169	223	207	267	222	34	222	272	246	186	248	233	172	146	171		289	145	207	132	167	182	165	221
ADJUSTED PRESSURE	0.1	0.08	0.08	0.06	0.08	0.51	0.08	0.06	0.07	0.09	0.07	0.07	0.1	0.12	0.1		0.06	0.12	0.08	0.13	0.1	0.09	0.1	0.08
ROUND DUCT SIZE	5	5	4	6	6	6	4	6	6	5	4	6	5	5	5		4	4	6	4	5	5	5	6
HEATING VELOCITY (ft/min)	242	294	34	163	219	143	126	163	219	242	126	301	235	235	477		287	275	413	298	580	580	580	403
COOLING VELOCITY (ft/min)	470	345	23	316	403	301	69	316	403	470	69	372	382	382	529		287	402	311	69	117	117	117	82
OUTLET GRILL SIZE	3X10	3X10	3X10	4X10	4X10	4X10	3X10	4X10	4X10	3X10	3X10	4X10	3X10	3X10	3X10		3X10	3X10	4X10	3X10	3X10	3X10	3X10	4X10
TRUNK	A	D	D	B	C	D	C	B	C	A	C	B	A	A	A		B	D	B	D	A	A	C	B

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	BED-2	BED-3	MBR	BATH	FORM	FAM	FAM	KT/BR		BATH-2	LAUN	FOY	MUD	BAS	BAS	BAS	BAS
RM LOSS MBH	1.38	1.66	0.12	1.32	1.77	1.15	0.45	1.32	1.77	1.38	0.45	2.45	1.32	1.32	2.67		1.04	0.99	3.35	1.06	3.27	3.27	3.27	3.27
CFM PER RUN HEAT	33	40	3	32	43	28	11	32	43	33	11	59	32	32	65		25	24	81	26	79	79	79	79
RM GAIN MBH	1.90	1.40	0.06	1.86	2.35	1.75	0.18	1.86	2.35	1.90	0.18	2.18	1.54	1.54	2.14		0.74	1.03	1.83	0.18	0.48	0.48	0.48	0.48
CFM PER RUN COOLING	64	47	2	62	79	59	6	62	79	64	6	73	52	52	72		25	35	61	6	15	16	16	16
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	0.17	0.17	0.17		0.17	0.17	0.16	0.17	0.17	0.17	0.17	0.17
ACTUAL DUCT LGH	39	43	27	67	52	34	42	72	56	46	48	43	32	26	31		69	25	47	12	27	32	36	51
EQUIVALENT LENGTH	130	180	180	200	170	0	180	200	190	140	200	190	140	120	140		220	130	160	120	140	150	130	170
TOTAL EFFECTIVE LENGTH	169	223	207	267	222	34	222	272	246	186	248	233	172	146	171		289	145	207	132	167	182	165	221
ADJUSTED PRESSURE	0.1	0.08	0.08	0.06	0.08	0.51	0.08	0.06	0.07	0.09	0.07	0.07	0.1	0.12	0.1		0.06	0.12	0.08	0.13	0.1	0.09	0.1	0.08
ROUND DUCT SIZE	5	5	4	6	6	6	4	6	6	5	4	6	5	5	5		4	4	6	4	5	5	5	6
HEATING VELOCITY (ft/min)	242	294	34	163	219	143	126	163	219	242	126	301	235	235	477		287	275	413	298	580	580	580	403
COOLING VELOCITY (ft/min)	470	345	23	316	403	301	69	316	403	470	69	372	382	382	529		287	402	311	69	117	117	117	82
OUTLET GRILL SIZE	3X10	3X10	3X10	4X10	4X10	4X10	3X10	4X10	4X10	3X10	3X10	4X10	3X10	3X10	3X10		3X10	3X10	4X10	3X10	3X10	3X10	3X10	4X10
TRUNK	A	D	D	B	C	D	C	B	C	A	C	B	A	A	A		B	D	B	D	A	A	C	B

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	BED-2	BED-3	MBR	BATH	FORM	FAM	FAM	KT/BR		BATH-2	LAUN	FOY	MUD	BAS	BAS	BAS	BAS
RM LOSS MBH	1.38	1.66	0.12	1.32	1.77	1.15	0.45	1.32	1.77	1.38	0.45	2.45	1.32	1.32	2.67		1.04	0.99	3.35	1.06	3.27	3.27	3.27	3.27
CFM PER RUN HEAT	33	40	3	32	43	28	11	32	43	33	11	59	32	32	65		25	24	81	26	79	79	79	79
RM GAIN MBH	1.90	1.40	0.06	1.86	2.35	1.75	0.18	1.86	2.35	1.90	0.18	2.18	1.54	1.54	2.14		0.74	1.03	1.83	0.18	0.48	0.48	0.48	0.48
CFM PER RUN COOLING	64	47	2	62	79	59	6	62	79	64	6	73	52	52	72		25	35	61	6	15	16	16	16
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	0.17	0.17	0.17		0.17	0.17	0.16	0.17	0.17	0.17	0.17	0.17
ACTUAL DUCT LGH	39	43	27	67	52	34	42	72	56	46	48	43	32	26	31		69	25	47	12	27	32	36	51
EQUIVALENT LENGTH	130	180	180	200	170	0	180	200	190	140	200	190	140	120	140		220	130	160	120	140	150	130	170
TOTAL EFFECTIVE LENGTH	169	223	207	267	222	34	222	272	246	186	248	233	172	146	171		289	145	207	132	167	182	165	221
ADJUSTED PRESSURE	0.1	0.08	0.08	0.06	0.08	0.51	0.08	0.06	0.07	0.09	0.07	0.07	0.1	0.12	0.1		0.06	0.12	0.08	0.13	0.1	0.09	0.1	0.08
ROUND DUCT SIZE	5	5	4	6	6	6	4	6	6	5	4	6	5	5	5		4	4	6	4	5	5	5	6
HEATING VELOCITY (ft/min)	242	294	34	163	219	143	126	163	219	242	126	301	235	235	477		287	275	413	298	580	580	580	403
COOLING VELOCITY (ft/min)	470	345	23	316	403	301	69	316	403	470	69	372	382	382	529		287	402	311	69	117	117	117	82
OUTLET GRILL SIZE	3X10	3X10	3X10	4X10	4X10	4X10	3X10	4X10	4X10	3X10	3X10	4X10	3X10	3X10	3X10		3X10	3X10	4X10	3X10	3X10	3X10	3X10	4X10
TRUNK	A	D	D	B	C	D	C	B	C	A	C	B	A	A	A		B	D	B	D	A	A	C	B

TYPE: 3B-8
SITE NAME: CENTREFIELD (WEST GORMLEY)
LO # 90456
OPT MAIN & 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	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	4	@ 10.6 cfm	42.4	cfm
Table 9.32.3.A			TOTAL	169.6 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	169.6	cfm
Less Principal Ventil. Capacity	79.5	cfm
Required Supplemental Capacity	90.1	cfm

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

PRINCIPAL EXHAUST HEAT LOSS CALCULATION

CFM	ΔT °F	FACTOR	% LOSS
79.5 CFM	X 78 F	X 1.08	X 0.25

SUPPLEMENTAL FANS BY INSTALLING CONTRACTOR

Location	Model	cfm	HVI	Sones
ENS	BY INSTALLING CONTRACTOR	50	☒	3.5
BATH	BY INSTALLING CONTRACTOR	50	☒	3.5

HEAT RECOVERY VENTILATOR 9.32.3.11
Model: VANE 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: *Michael O'Rourke*
HRAI # 001820
Date: April-21

Specializing in Residential Mechanical Design Services

HEAT LOSS AND GAIN SUMMARY SHEET

MODEL: 38-8	OPT MAIN & OPT 2ND	BUILDER: ROYAL PINE HOMES
SFQT: 2389	LO# 90456	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

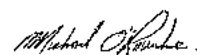
BUILDING DATA

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):	33322.5	ASSUMED (Y/N):	Y
INTERNAL SHADING:	BLINDS/CURTAINS	ASSUMED OCCUPANTS:	5
INTERIOR LIGHTING LOAD (Btu/h/ft²):	1.70	DC BRUSHLESS MOTOR (Y/N):	Y
FOUNDATION CONFIGURATION	BCIN_1	DEPTH BELOW GRADE:	7.0 ft
LENGTH: 48.0 ft	WIDTH: 31.0 ft	EXPOSED PERIMETER:	158.0 ft

2012 OBC - COMPLIANCE PACKAGE		
Component	Compliance Package SB-12 PERFORMANCE	
	Nominal	Min. Eff.
Ceiling with Attic Space Minimum RSI (R)-Value	60	59.20
Ceiling Without Attic Space Minimum RSI (R)-Value	31	27.70
Exposed Floor Minimum RSI (R)-Value	31	29.80
Walls Above Grade Minimum RSI (R)-Value	22+1.5	18.50
Basement Walls Minimum RSI (R)-Value	20	21.12
Below Grade Slab Entire surface > 600 mm below grade Minimum RSI (R)-Value	-	-
Edge of Below Grade Slab ≤ 600 mm Below Grade Minimum RSI (R)-Value	10	10
Heated Slab or Slab ≤ 600 mm below grade Minimum RSI (R)-Value	10	11.13
Windows and Sliding Glass Doors Maximum U-Value	1.6	-
Skylights Maximum U-Value	2.6	-
Space Heating Equipment Minimum AFUE	0.96	-
HRV Minimum Efficiency	75%	-
Domestic Hot Water Heater Minimum EF	TE=94%	-

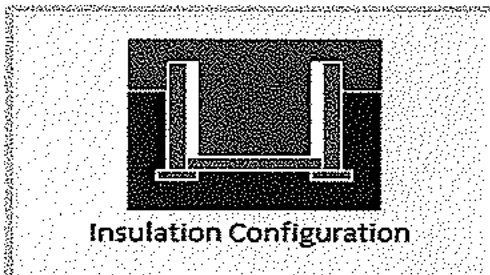
INDIVIDUAL BCIN: 19669

MICHAEL O'ROURKE



Residential Foundation Thermal Load Calculator

Supplemental tool for CAN/CSA-F280

Weather Station Description		
Province:	Ontario	
Region:	Richmond Hill	
Site Description		
Soil Conductivity:	Normal conductivity: dry sand, loam, clay	
Water Table:	Normal (7-10 m, 23-33 ft)	
Foundation Dimensions		
Floor Length (m):	14.6	 Insulation Configuration
Floor Width (m):	9.4	
Exposed Perimeter (m):	0.0	
Wall Height (m):	3.0	
Depth Below Grade (m):	2.13	
Window Area (m ²):	1.1	
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):		1558

TYPE: 38-8
LO# 90456

OPT MAIN & OPT 2ND

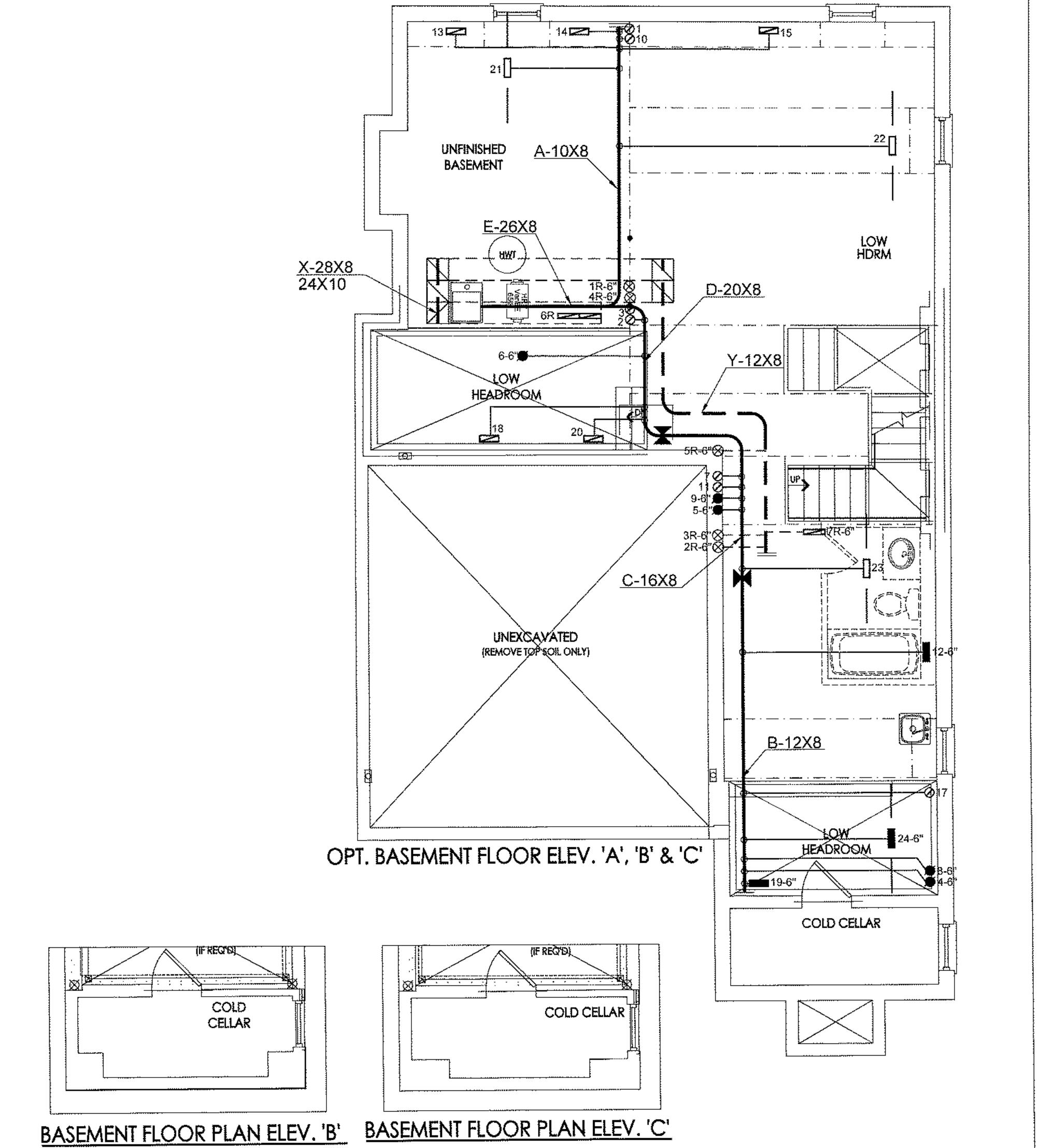
Air Infiltration Residential Load Calculator

Supplemental tool for CAN/CSA-F280

Weather Station Description				
Province:	Ontario			
Region:	Richmond Hill			
Weather Station Location:	Open flat terrain, grass			
Anemometer height (m):	10			
Local Shielding				
Building Site:	Suburban, forest			
Walls:	Heavy			
Flue:	Heavy			
Highest Ceiling Height (m):	6.74			
Building Configuration				
Type:	Detached			
Number of Stories:	Two			
Foundation:	Full			
House Volume (m ³):	943.6			
Air Leakage/Ventilation				
Air Tightness Type:	Energy Star Detached (2.5 ACH)			
Custom BDT Data:	ELA @ 10 Pa.	880.8 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):	0.227			
Cooling Air Leakage Rate (ACH/H):	0.071			

TYPE: 38-8
LO# 90456

OPT MAIN & OPT 2ND



1 MICHAEL O'BRIEN: 10% REVIEW AND TAKE RESPONSIBILITY FOR THE DESIGN WORK AND AM QUALIFIED UNDER DIVISION C, 12.5 OF THE BUILDING CODE.

Michael O'Brien, License 19669
HVAC DESIGNS LTD.

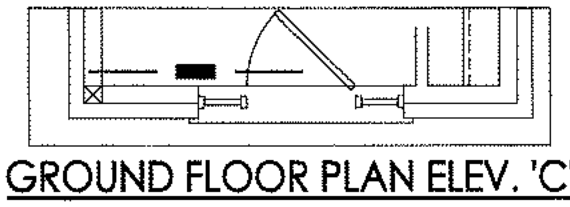
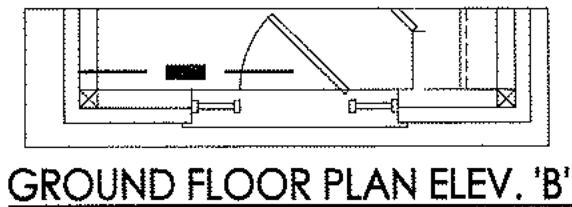
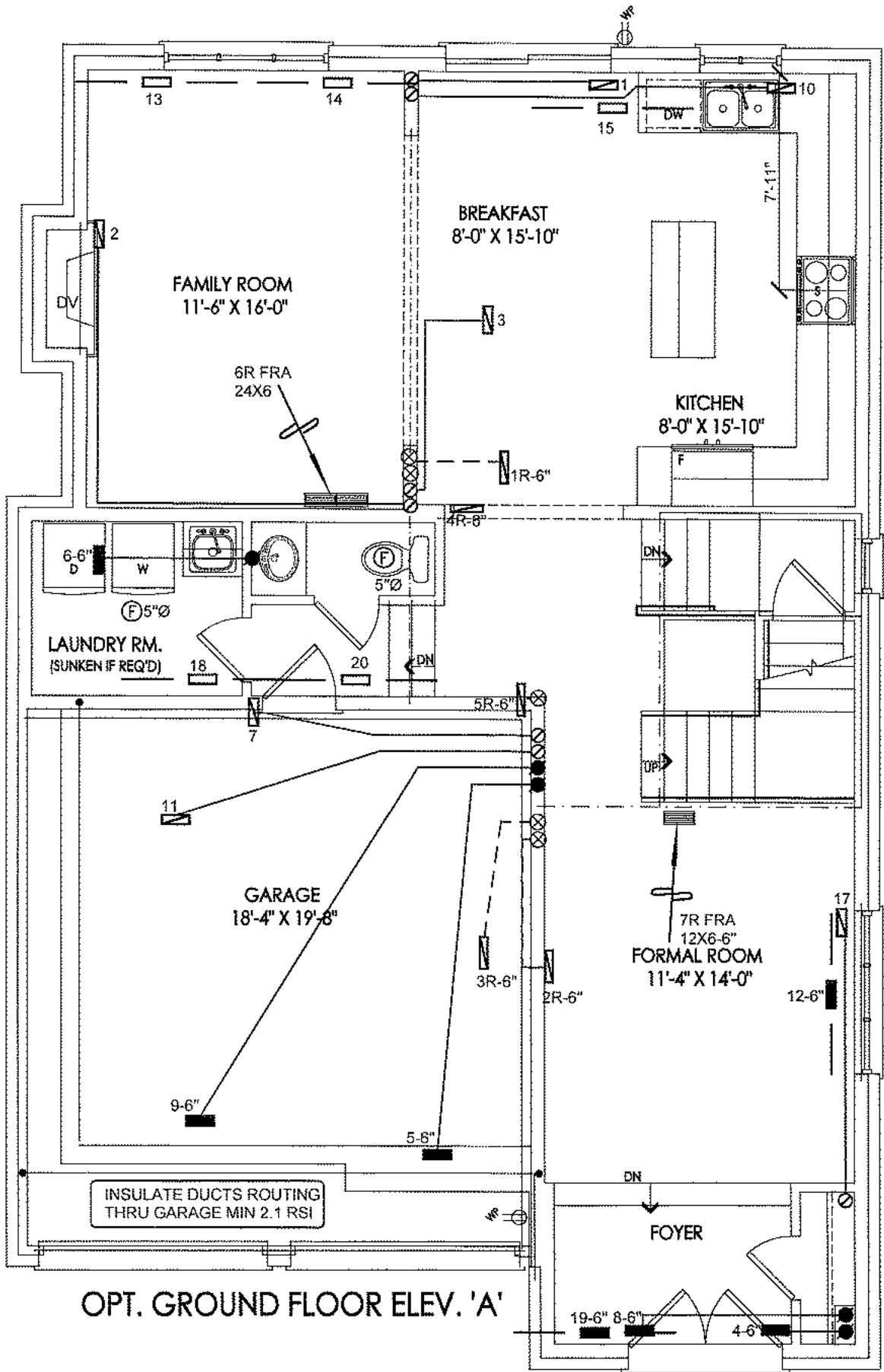
CSA-F280-12

SB-12 PERFORMANCE

HVAC LEGEND						3.	
SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	2.	
	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
						REVISIONS	
						No.	Description Date

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		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		HEAT LOSS 41587 BTU/H		# OF RUNS		S/A		R/A		FANS		Sheet Title	
ROYAL PINE HOMES				UNIT DATA		3RD FLOOR								BASEMENT	
Project Name CENTREFIELD (WEST GORMLEY) RICHMOND HILL, ONTARIO		MAKE		CARRIER		2ND FLOOR		12		5		3		Date	
		MODEL		59TN6A-060-14V		1ST FLOOR		7		2		3		APR/2021	
OPT MAIN & OPT 2ND 38-8 2389 sqft		INPUT		60 MBTU/H		BASEMENT		4		1		0		Scale	
		OUTPUT		58 MBTU/H		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									
		COOLING		2.5 TONS		BCIN# 19669									
		FAN SPEED		970 cfm @ 0.6" w.g.		LO# 90456									



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

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

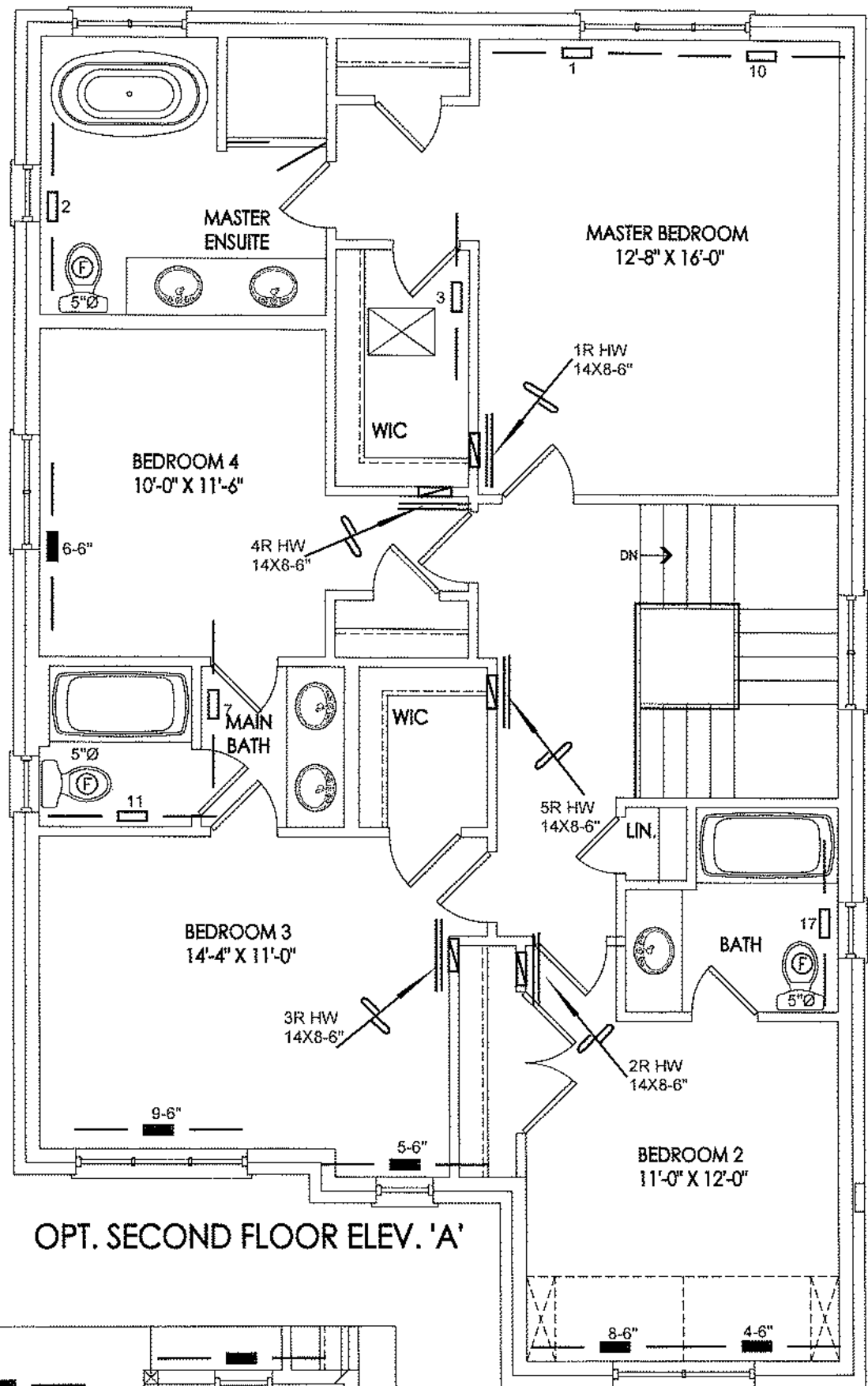
CSA-F280-12

SB-12 PERFORMANCE

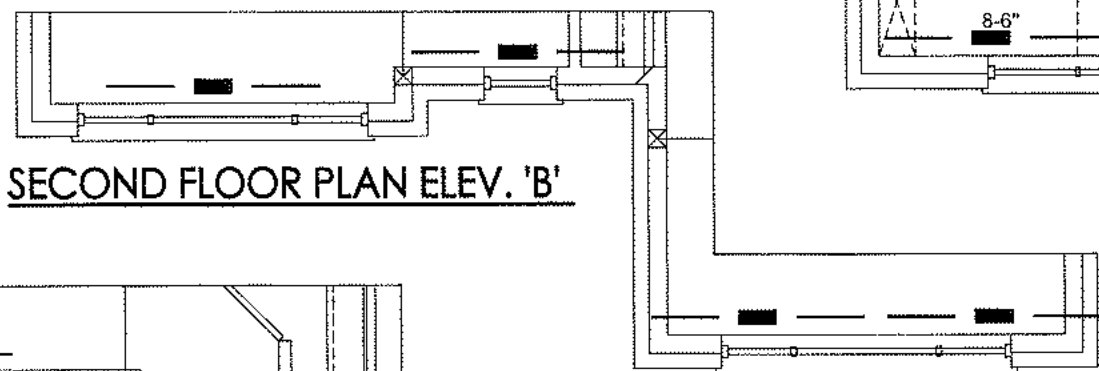
HVAC LEGEND						3.	
	SUPPLY AIR GRILLE		6" SUPPLY AIR BOOT ABOVE		14"x8" RETURN AIR GRILLE		2.
	SUPPLY AIR GRILLE 6" BOOT		SUPPLY AIR STACK FROM 2nd FLOOR		30"x8" RETURN AIR GRILLE		1.
	SUPPLY AIR BOOT ABOVE		6" SUPPLY AIR STACK 2nd FLOOR		FRA- FLOOR RETURN AIR GRILLE		No. Description Date

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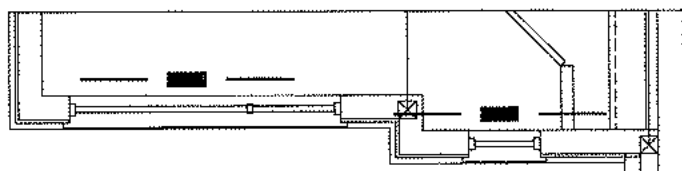
Client	 375 Finley Ave. Suite 202 - Ajax, Ontario L1S 2E2 Tel. 905.619.2300 - 905.420.5300 Fax 905.619.2375 Email: info@hvacdesigns.ca Web: www.hvacdesigns.ca Specializing in Residential Mechanical Design Services	Sheet Title	
ROYAL PINE HOMES		FIRST FLOOR HEATING LAYOUT	
Project Name CENTREFIELD (WEST GORMLEY) RICHMOND HILL, ONTARIO		Date	APR/2021
OPT MAIN & OPT 2ND 38-8 2389 sqft	Scale	3/16" = 1'-0"	
	BCIN# 19669		
	LO#	90456	



OPT. SECOND FLOOR ELEV. 'A'



SECOND FLOOR PLAN ELEV. 'B'



SECOND FLOOR PLAN ELEV. 'C'

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								3.		
SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	2.		
	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.	Description	Date
	SUPPLY AIR BOOT ABOVE		6" SUPPLY AIR STACK 2nd FLOOR		FRA- FLOOR RETURN AIR GRILLE		REDUCER	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 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 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 SECOND FLOOR HEATING LAYOUT	
Project Name CENTREFIELD (WEST GORMLEY) RICHMOND HILL, ONTARIO			Date APR/2021	
OPT MAIN & OPT 2ND 38-8 2389 sqft			Scale 3/16" = 1'-0"	
			BCIN# 19669	
			LO#	90456

09/03/2021

RECEIVED

Per: jocelyn.aguiar**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: 38-8 Ashtown 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.			
April 19, 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

09/03/2021

SITE NAME: CENTREFIELD (WEST GORMLEY)

BUILDER: ROYAL PINE HOMES

TYPE: 38-8

GFA: 2366

DATE: Apr-21

LO# 87608

WINTER NATURAL AIR CHANGE RATE 0.227

HEAT LOSS AT °F. 78

CSA-F280-12

SUMMER NATURAL AIR CHANGE RATE 0.071

HEAT GAIN AT °F. 13

SB-12 PERFORMANCE

ROOM USE	EXP. WALL	CLG. HT.	MBR	ENS	WIC	BED-2	BED-3	BED-4	BATH								
			36	21	0	34	29	12	6								
			9	9	9	9	9	9	9								
FACTORS																	
GRS.WALL AREA	LOSS	GAIN	324	189	0	306	261	108	54								
GLAZING	LOSS	GAIN	LOSS	GAIN	LOSS	GAIN	LOSS	GAIN	LOSS	GAIN	LOSS	GAIN	LOSS	GAIN	LOSS	GAIN	LOSS
NORTH	21.8	16.0	0	0	0	8	174	128	0	0	0	0	0	0	17	370	272
EAST	21.8	41.6	26	566	1080	17	370	706	0	0	0	0	0	0	0	0	0
SOUTH	21.8	24.9	11	240	274	0	0	0	0	0	0	0	0	0	0	0	0
WEST	21.8	41.6	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
DOORS	25.8	4.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
NET EXPOSED WALL	4.2	0.7	287	1207	199	164	690	113	0	0	0	269	1131	186	91	383	63
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
EXPOSED CLG	1.3	0.6	241	317	142	123	162	72	75	99	44	140	184	82	205	269	121
NO ATTIC EXPOSED CLG	2.8	1.3	0	0	0	0	0	0	0	0	0	40	112	50	0	0	0
EXPOSED FLOOR	2.6	0.4	0	0	0	0	0	0	0	0	0	0	0	0	205	535	88
BASEMENT/CRAWL HEAT LOSS			0	0	0	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	0	0	0
SUBTOTAL HT LOSS			2330		1396	99		2234		2711		970		684			
SUB TOTAL HT GAIN				1694		1020		1856		2269		432		238			
LEVEL FACTOR / MULTIPLIER	0.20	0.18			0.20	0.18		0.20	0.18			0.20	0.18		0.20	0.18	
AIR CHANGE HEAT LOSS			427		256	18		410		497		178		125			
AIR CHANGE HEAT GAIN				98		59		107		131		25		14			
DUCT LOSS			0		0			0		321		0		81			
DUCT GAIN			0		0			0		325		0		25			
HEAT GAIN PEOPLE	240		2	480	0	0	0	1	240	1	240	1	240	0	0		
HEAT GAIN APPLIANCES/LIGHTS				606		0		606		606		606		0			
TOTAL HT LOSS BTU/H			2757		1652	117		2643		3529		1148		890			
TOTAL HT GAIN x 1.3 BTU/H				3742		1403		3652		4641		1693		360			

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Per: jocelyn aguilar

ROOM USE	EXP. WALL	CLG. HT.	FORM	FAM	KT/BR	LAUN	PWD	FOY	MUD								BAS
			31	33	40	12	13	27	8								158
			10	10	10	9	11	11	11								10
FACTORS																	
GRS.WALL AREA	LOSS	GAIN	313	333	404	108	144	300	89								1106
GLAZING	LOSS	GAIN	LOSS	GAIN	LOSS	GAIN	LOSS	GAIN	LOSS	GAIN	LOSS	GAIN	LOSS	GAIN	LOSS	GAIN	LOSS
NORTH	21.8	16.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
EAST	21.8	41.6	0	0	0	34	741	1413	12	261	499	0	0	0	0	0	0
SOUTH	21.8	24.9	31	675	772	0	0	0	7	152	174	17	370	423	0	0	0
WEST	21.8	41.6	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
DOORS	25.8	4.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
NET EXPOSED WALL	4.2	0.7	282	1186	195	299	1259	207	385	1619	266	91	383	63	144	607	100
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
EXPOSED CLG	1.3	0.6	0	0	0	10	13	6	0	0	0	92	121	54	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
EXPOSED FLOOR	2.6	0.4	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	0	0	0	0	0	0	0
SLAB ON GRADE HEAT LOSS			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
SUBTOTAL HT LOSS			1862		2012	2033		874		607		2548		806			
SUB TOTAL HT GAIN				967		1626		540		100		1330		133			
LEVEL FACTOR / MULTIPLIER	0.30	0.32			0.30	0.32		0.30	0.32			0.30	0.32		0.30	0.32	
AIR CHANGE HEAT LOSS			586		634		640		191		6		803		254		
AIR CHANGE HEAT GAIN				56		94		54		31		6		77		8	
DUCT LOSS			0		0		0		0		0		0		0		
DUCT GAIN			0		0		0		0		0		0		0		
HEAT GAIN PEOPLE	240		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
HEAT GAIN APPLIANCES/LIGHTS				606		606		606		606		0		0		0	
TOTAL HT LOSS BTU/H			2448		2646	2673		1034		798		3351		1060			
TOTAL HT GAIN x 1.3 BTU/H				2117		3023		2079		1531		137		1829		182	

TOTAL HEAT GAIN BTU/H:

28574

TONS: 2.38

LOSS DUE TO VENTILATION LOAD BTU/H: 1670

STRUCTURAL HEAT LOSS: 39769

TOTAL COMBINED HEAT LOSS BTU/H: 41439

CITY OF RICHMOND HILL
BUILDING DIVISION
09/03/2021

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

TYPE: 38-8

DATE: Apr-21

GFA: 2366 LO# 87608

HEATING CFM 970 COOLING CFM 970
TOTAL HEAT LOSS 39,769 TOTAL HEAT GAIN 28,299
AIR FLOW RATE CFM 24.39 AIR FLOW RATE CFM 34.28

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

****CARRIER** AFUE = 97 %
59TN6A-060-14V INPUT (BTU/H) = 60,000
FAN SPEED **60** OUTPUT (BTU/H) = **58,000**
LOW 820
MEDLOW 0
MEDIUM 970 DESIGN CFM = **970**
MEDIUM HIGH 0 CFM @ 6" E.S.P.
HIGH 1520
TEMPERATURE RISE **55** °F

RUN COUNT	4th	3rd	2nd	1st	Bas
S/A	0	0	12	7	4
R/A	0	0	5	2	1

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

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

RUN #	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	17	18	19	20	21	22	23	24
ROOM NAME	MBR	ENS	WIC	BED-2	BED-3	BED-4	BATH	BED-2	BED-3	MBR	BATH	FORM	FAM	FAM	KT/BR	LAUN	PWD	FOY	MUD	BAS	BAS	BAS	BAS
RM LOSS MBH.	1.38	1.65	0.12	1.32	1.76	1.15	0.45	1.32	1.76	1.38	0.45	2.45	1.32	1.32	2.67	1.03	0.80	3.35	1.06	3.26	3.26	3.26	3.26
CFM PER RUN HEAT	34	40	3	32	43	28	11	32	43	34	11	60	32	32	65	25	19	82	26	79	79	79	79
RM GAIN MBH.	1.87	1.40	0.06	1.83	2.32	1.69	0.18	1.83	2.32	1.87	0.18	2.12	1.51	1.51	2.08	1.53	0.14	1.83	0.18	0.46	0.46	0.46	0.46
CFM PER RUN COOLING	64	48	2	63	80	58	6	63	80	64	6	73	52	52	71	52	5	63	6	16	16	16	16
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	0.17	0.17	0.17	0.17	0.17	0.16	0.17	0.17	0.17	0.17	0.17
ACTUAL DUCT LGH.	39	43	27	67	52	34	42	72	56	46	48	43	32	26	31	69	25	47	12	27	32	36	51
EQUIVALENT LENGTH	130	180	180	200	170	0	180	200	190	140	200	190	140	120	140	220	120	160	120	140	150	130	170
TOTAL EFFECTIVE LENGTH	169	223	207	267	222	34	222	272	246	186	248	233	172	146	171	289	145	207	132	167	182	166	221
ADJUSTED PRESSURE	0.1	0.08	0.08	0.06	0.08	0.51	0.08	0.06	0.07	0.09	0.07	0.07	0.1	0.12	0.1	0.06	0.12	0.08	0.13	0.1	0.09	0.1	0.08
ROUND DUCT SIZE	5	5	4	6	6	6	4	6	6	5	4	6	5	4	5	5	4	6	4	5	5	5	6
HEATING VELOCITY (ft/min)	250	294	34	163	219	143	126	163	219	250	126	306	235	367	477	184	218	418	298	580	580	580	403
COOLING VELOCITY (ft/min)	470	352	23	321	408	296	69	321	408	470	69	372	382	597	521	382	57	321	69	117	117	117	82
OUTLET GRILL SIZE	3X10	3X10	3X10	4X10	4X10	4X10	3X10	4X10	4X10	3X10	3X10	4X10	3X10	3X10	3X10	3X10	3X10	4X10	3X10	3X10	3X10	3X10	4X10
TRUNK	A	D	D	B	C	D	C	B	C	A	C	B	A	A	A	B	D	B	D	A	A	C	B

RUN #	
ROOM NAME	
RM LOSS MBH.	
CFM PER RUN HEAT	
RM GAIN MBH.	
CFM PER RUN COOLING	
ADJUSTED PRESSURE	
ACTUAL DUCT LGH.	
EQUIVALENT LENGTH	
TOTAL EFFECTIVE LENGTH	
ADJUSTED PRESSURE	
ROUND DUCT SIZE	
HEATING VELOCITY (ft/min)	
COOLING VELOCITY (ft/min)	
OUTLET GRILL SIZE	
TRUNK	

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	355	0.09	9.2	10	x	8	639	TRUNK G	0	0.00	0	0	x	8	0	TRUNK O	0	0.05	0	0	x	8	0
TRUNK B	310	0.06	9.7	12	x	8	465	TRUNK H	0	0.00	0	0	x	8	0	TRUNK P	0	0.05	0	0	x	8	0
TRUNK C	497	0.06	11.6	16	x	8	559	TRUNK I	0	0.00	0	0	x	8	0	TRUNK Q	0	0.05	0	0	x	8	0
TRUNK D	613	0.06	12.5	20	x	8	552	TRUNK J	0	0.00	0	0	x	8	0	TRUNK R	0	0.05	0	0	x	8	0
TRUNK E	968	0.06	14.9	26	x	8	670	TRUNK K	0	0.00	0	0	x	8	0	TRUNK S	0	0.05	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	TRUNK T	0	0.05	0	0	x	8	0

RETURN AIR #	1	2	3	4	5	6	7											BR								
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	TRUNK W	0	0.05	0	0	x	8	0	
AIR VOLUME	85	75	75	100	75	320	85	0	0	0	0	0	0	0	0	0	155	TRUNK X	970	0.05	15.6	28	x	8	624	
PLENUM PRESSURE	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	TRUNK Y	310	0.05	10.2	12	x	8	465	
ACTUAL DUCT LGH.	40	70	61	39	58	20	42	1	1	1	1	1	1	1	1	1	14	TRUNK Z	0	0.05	0	0	x	8	0	
EQUIVALENT LENGTH	225	250	245	155	225	175	225	0	0	0	0	0	0	0	0	0	135	DROP	970	0.05	15.6	24	x	10	582	
TOTAL EFFECTIVE LH	265	320	306	194	283	195	267	1	1	1	1	1	1	1	1	1	149									
ADJUSTED PRESSURE	0.06	0.05	0.05	0.08	0.05	0.08	0.06	14.80	14.80	14.80	14.80	14.80	14.80	14.80	14.80	14.80	0.10									
ROUND DUCT SIZE	6	6	6	5.9	6	9.2	6	0	0	0	0	0	0	0	0	0	6.6									
INLET GRILL SIZE	8	8	8	8	8	8	8	0	0	0	0	0	0	0	0	0	8									
	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X									
INLET GRILL SIZE	14	14	14	14	14	30	14	0	0	0	0	0	0	0	0	0	14									

TYPE: 38-8
SITE NAME: CENTREFIELD (WEST GORMLEY)

LO # 87608

09/03/2021
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>3</u> @ 10.6 cfm	<u>31.8</u> cfm
Kitchen & Bathrooms	<u>4</u> @ 10.6 cfm	<u>42.4</u> cfm
Other Rooms	<u>4</u> @ 10.6 cfm	<u>42.4</u> cfm
Table 9.32.3.A.	TOTAL	<u>159.0</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	Per: <u>jocelyn.aguilar</u>	159 cfm
Less Principal Ventil. Capacity	<u>79.5</u>	cfm
Required Supplemental Capacity	<u>79.5</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
PWD	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 #	001820
Date:	April-21

09/03/2021

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Per: jocelyn.aguilar

CSA F280-12 Residential Heat Loss and Heat Gain Calculations																																																												
Formula Sheet (For Air Leakage / Ventilation Calculation)																																																												
LO#: 87608	Model: 38-8	Builder: ROYAL PINE HOMES	Date: 4/19/2021																																																									
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>1042</td> <td>10</td> <td>10420</td> </tr> <tr> <td>First</td> <td>1042</td> <td>10</td> <td>10524.2</td> </tr> <tr> <td>Second</td> <td>1324</td> <td>9</td> <td>11916</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>32,860.2 ft³</td> </tr> <tr> <td colspan="3" style="text-align: right;">Total:</td> <td>930.5 m³</td> </tr> </tbody> </table>		Level	Floor Area (ft ²)	Floor Height (ft)	Volume (ft ³)	Bsmt	1042	10	10420	First	1042	10	10524.2	Second	1324	9	11916	Third	0	9	0	Fourth	0	9	0	Total:			32,860.2 ft ³	Total:			930.5 m ³	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 80%;">WINTER NATURAL AIR CHANGE RATE</td> <td style="width: 20%;">0.227</td> </tr> <tr> <td>SUMMER NATURAL AIR CHANGE RATE</td> <td>0.071</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	0.227	SUMMER NATURAL AIR CHANGE RATE	0.071	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																																																										
$HL_{airb} = LR_{airh} \times \frac{V_b}{3.6} \times DTD_h \times 1.2$ 0.227 x 258.47 x 43 °C x 1.2 = 3037 W = 10362 Btu/h		$HG_{salb} = LR_{airc} \times \frac{V_b}{3.6} \times DTD_c \times 1.2$ = 0.071 x 258.47 x 7 °C x 1.2 = 156 W = 532 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_{level})</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>0.5</td> <td rowspan="5" style="text-align: center; vertical-align: middle;">10,362</td> <td>7,840</td> <td>0.661</td> </tr> <tr> <td>2</td> <td>0.3</td> <td>9,868</td> <td>0.315</td> </tr> <tr> <td>3</td> <td>0.2</td> <td>11,296</td> <td>0.183</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>					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 _{level})	1	0.5	10,362	7,840	0.661	2	0.3	9,868	0.315	3	0.2	11,296	0.183	4	0	0	0.000	5	0	0	0.000																														
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*HL_{airbv} = Air leakage heat loss + ventilation heat loss *For a balanced or supply only ventilation system HL_{airve} = 0																																																												

HEAT LOSS AND GAIN SUMMARY SHEET

09/03/2021

MODEL: 38-8 **BUILDER:** ROYAL PINE HOMES
SFQT: 2366 **LO#** 87608 **SITE:** CENTREFIELD (WEST GORMLEY)

Per: jocelyn.aguilar
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):	32860.2	ASSUMED (Y/N):	Y
INTERNAL SHADING:	BLINDS/CURTAINS	ASSUMED OCCUPANTS:	5
INTERIOR LIGHTING LOAD (Btu/h/ft²):	1.60	DC BRUSHLESS MOTOR (Y/N):	Y
FOUNDATION CONFIGURATION	BCIN_1	DEPTH BELOW GRADE:	7.0 ft
LENGTH: 48.0 ft	WIDTH: 31.0 ft	EXPOSED PERIMETER:	158.0 ft

2012 OBC - COMPLIANCE PACKAGE
Component
**Compliance Package
SB-12 PERFORMANCE**
Nominal Min. Eff.

Ceiling with Attic Space Minimum RSI (R)-Value	60	59.20
Ceiling Without Attic Space Minimum RSI (R)-Value	31	27.70
Exposed Floor Minimum RSI (R)-Value	31	29.80
Walls Above Grade Minimum RSI (R)-Value	22+1.5	18.50
Basement Walls Minimum RSI (R)-Value	20	21.12
Below Grade Slab Entire surface > 600 mm below grade Minimum RSI (R)-Value	-	-
Edge of Below Grade Slab ≤ 600 mm Below Grade Minimum RSI (R)-Value	10	10
Heated Slab or Slab ≤ 600 mm below grade Minimum RSI (R)-Value	10	11.13
Windows and Sliding Glass Doors Maximum U-Value	1.6	-
Skylights Maximum U-Value	2.6	-
Space Heating Equipment Minimum AFUE	0.96	-
HRV Minimum Efficiency	75%	-
Domestic Hot Water Heater Minimum EF	TE=94%	-

INDIVIDUAL BCIN: 19669
MICHAEL O'ROURKE

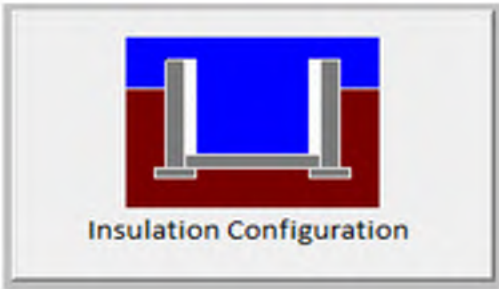


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Per: [Signature]

Residential Foundation Thermal Load Calculator

Supplemental tool for CAN/CSA-F280

Weather Station Description		
Province:	Ontario	
Region:	Richmond Hill	
Site Description		
Soil Conductivity:	Normal conductivity: dry sand, loam, clay	
Water Table:	Normal (7-10 m, 23-33 ft)	
Foundation Dimensions		
Floor Length (m):	14.6	 Insulation Configuration
Floor Width (m):	9.4	
Exposed Perimeter (m):	0.0	
Wall Height (m):	3.0	
Depth Below Grade (m):	2.13	
Window Area (m ²):	1.1	
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):		1558

TYPE: 38-8

LO# 87608

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Per: jocelyn.aguilar

Air Infiltration Residential Load Calculator

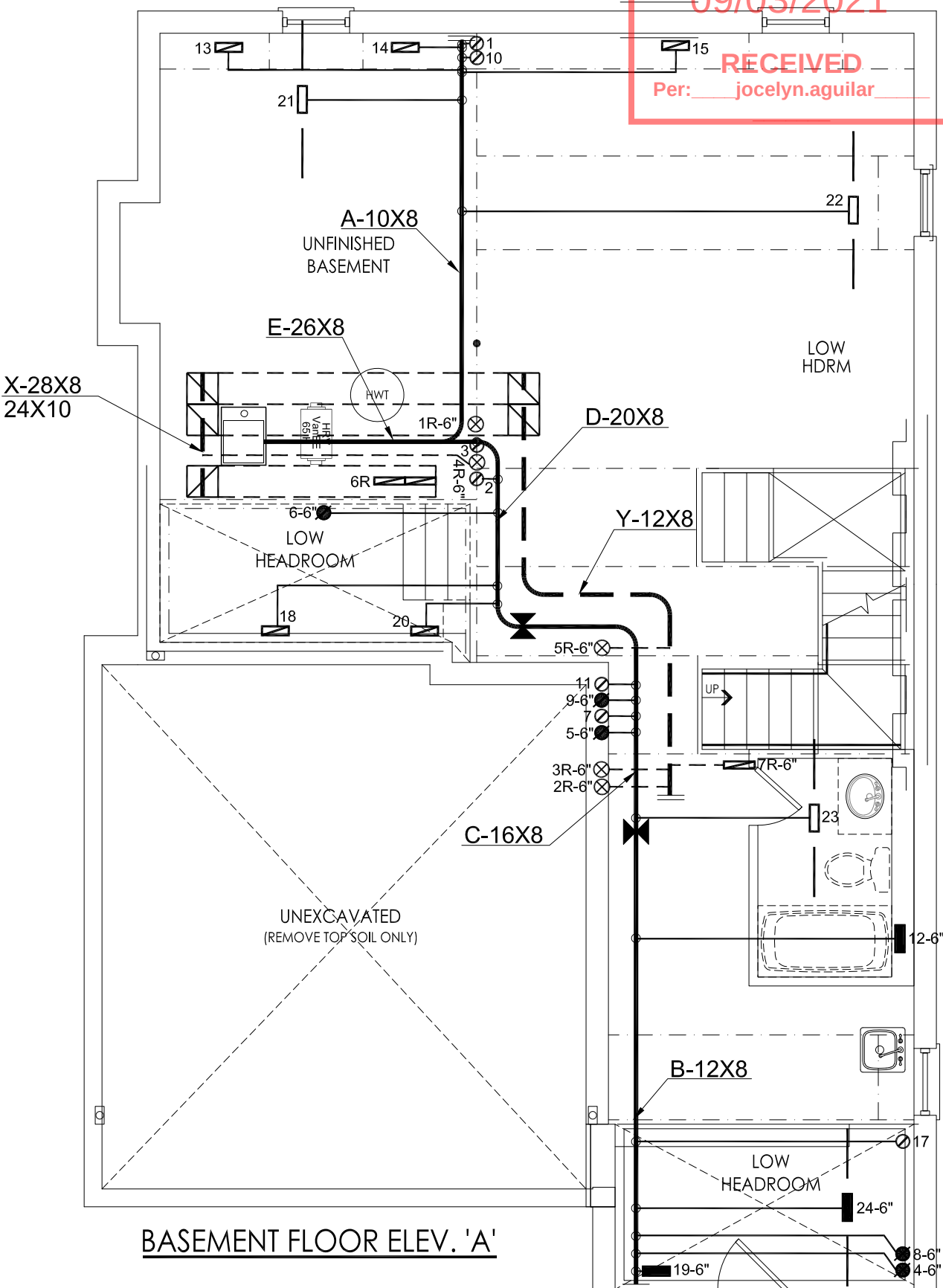
Supplemental tool for CAN/CSA-F280

Weather Station Description				
Province:	Ontario			
Region:	Richmond Hill			
Weather Station Location:	Open flat terrain, grass			
Anemometer height (m):	10			
Local Shielding				
Building Site:	Suburban, forest			
Walls:	Heavy			
Flue:	Heavy			
Highest Ceiling Height (m):	6.74			
Building Configuration				
Type:	Detached			
Number of Stories:	Two			
Foundation:	Full			
House Volume (m ³):	930.5			
Air Leakage/Ventilation				
Air Tightness Type:	Energy Star Detached (2.5 ACH)			
Custom BDT Data:	ELA @ 10 Pa.		868.6 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):	0.227			
Cooling Air Leakage Rate (ACH/H):	0.071			

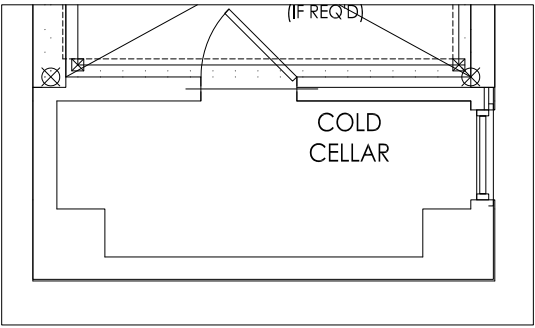
TYPE: 38-8

LO# 87608

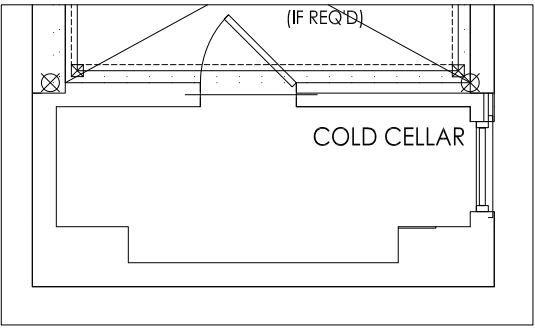
CITY OF RICHMOND HILL
BUILDING DIVISION
09/03/2021
RECEIVED
Per: jocelyn.aguilar



BASEMENT FLOOR ELEV. 'A'



BASEMENT FLOOR PLAN ELEV. 'B'



BASEMENT FLOOR PLAN ELEV. 'C'

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

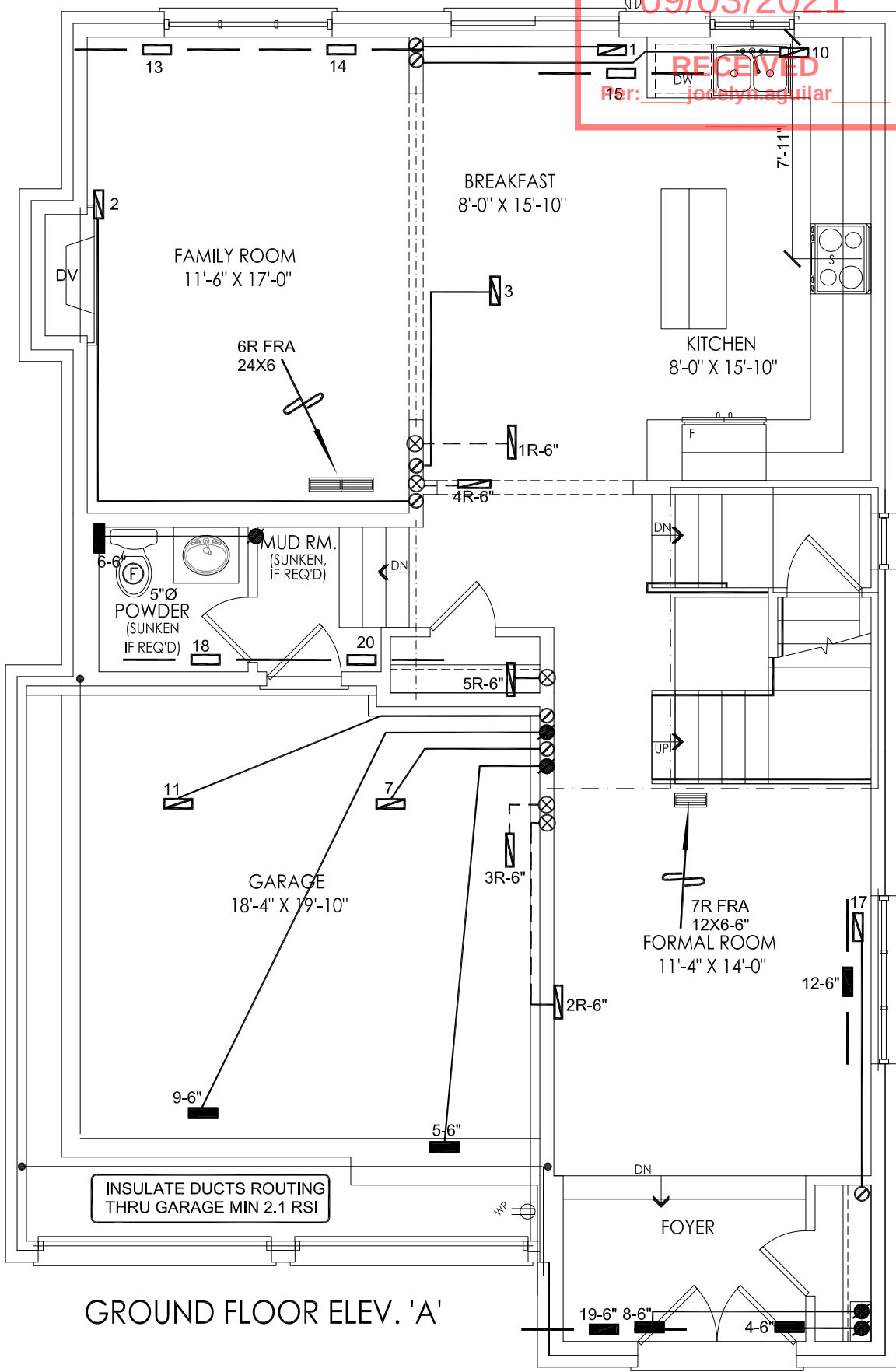
SB-12 PERFORMANCE

HVAC LEGEND								3.		
SYMBOL	DESCRIPTION	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		RETURN AIR STACK ABOVE	1.	REVISED TO PERFORMANCE	SEPT/2020
	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		

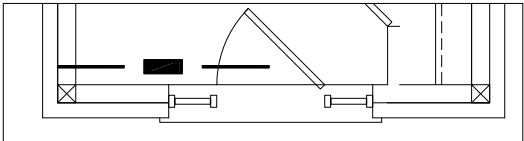
ALL DRAWINGS, CALCULATIONS AND SPECIFICATIONS ARE THE PROPERTY OF HVAC DESIGNS LTD.© AND MAY NOT BE REPRODUCED, MODIFIED OR ALTERED WITHOUT EXPRESSED WRITTEN CONSENT. THE DRAWINGS ARE DATED AND USE OF THESE DRAWINGS AFTER ONE YEAR FROM THE DATED NOTED IS NOT AUTHORIZED. CONTRACTOR SHALL CHECK ALL CONDITIONS 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 41439 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			MODEL 59TN6A-060-14V	2ND FLOOR	12	5	3	Date	
CENTREFIELD (WEST GORMLEY) RICHMOND HILL, ONTARIO			INPUT 60 MBTU/H	1ST FLOOR	7	2	2	SEPT/2020	
			OUTPUT 58 MBTU/H	BASEMENT	4	1	0	Scale	
		COOLING 2.5 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				3/16" = 1'-0"		
		FAN SPEED 970 cfm @ 0.6" w.c.					BCIN# 19669		
38-8		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.		LO#				87608	
2366 sqft									

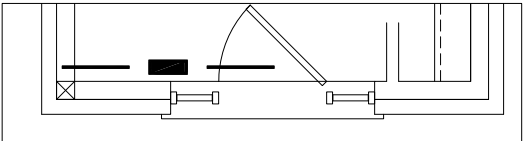
CITY OF RICHMOND HILL
BUILDING DIVISION
09/03/2021
RECEIVED
For: joselyn.aguiar



GROUND FLOOR ELEV. 'A'



GROUND FLOOR PLAN ELEV. 'B'



GROUND FLOOR PLAN ELEV. 'C'

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.		
SYMBOL	DESCRIPTION	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		RETURN AIR STACK ABOVE	1.	REVISED TO PERFORMANCE	SEPT/2020
	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		

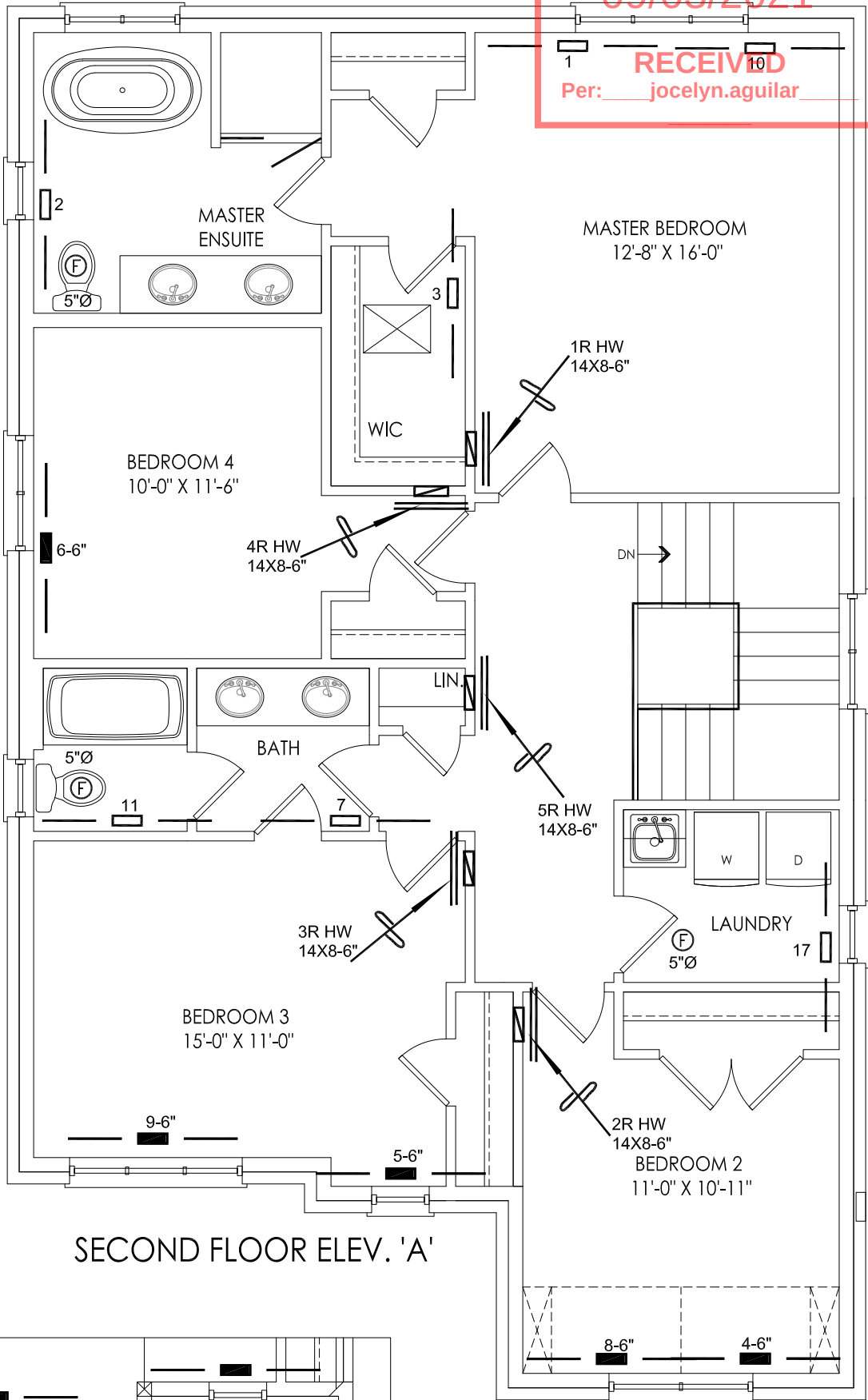
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Client		 375 Finley Ave. Suite 202 - Ajax, Ontario L1S 2E2 Tel. 905.619.2300 - 905.420.5300 Fax 905.619.2375 Email: info@hvacdesigns.ca Web: www.hvacdesigns.ca Specializing in Residential Mechanical Design Services	Sheet Title	
ROYAL PINE HOMES			FIRST FLOOR HEATING LAYOUT	
Project Name CENTREFIELD (WEST GORMLEY) RICHMOND HILL, ONTARIO			Date SEPT/2020	Scale 3/16" = 1'-0"
		BCIN# 19669		
38-8		LO# 87608		
2366 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.				

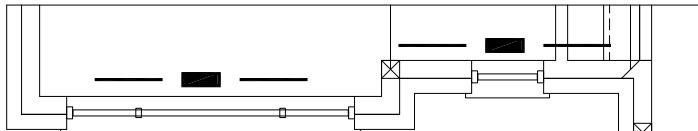
CITY OF RICHMOND HILL
BUILDING DIVISION

09/03/2021

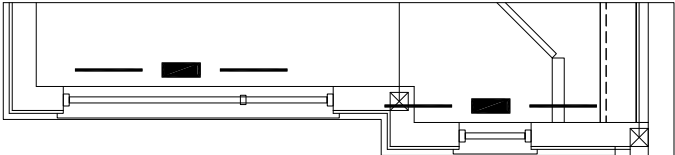
RECEIVED
Per: jocelyn.aguilar



SECOND FLOOR ELEV. 'A'



SECOND FLOOR PLAN ELEV. 'B'



SECOND FLOOR PLAN ELEV. 'C'

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.		
SYMBOL	DESCRIPTION	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		RETURN AIR STACK ABOVE	1.	REVISED TO PERFORMANCE	SEPT/2020
	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			SECOND FLOOR HEATING LAYOUT	
Project Name CENTREFIELD (WEST GORMLEY) RICHMOND HILL, ONTARIO			Date	SEPT/2020
38-8			Scale	3/16" = 1'-0"
2366 sqft			BCIN# 19669	
		LO#	87608	

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: 38-8 Ashton Project: CENTREFIELD (WEST GORMLEY)	
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.			
April 19, 2021		 Signature of Designer	
Date		CITY OF RICHMOND HILL BUILDING DIVISION 08/12/2021 RECEIVED Per: <u>laura.dalbarto</u>	

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