

## Energy Efficiency Design Summary: Performance & Other Acceptable Compliance Methods

(Building Code Part 9, Residential)

This form is used by a **Principal Authority** to certify 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 38-11 Belvedere		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]

<input checked="" type="checkbox"/> <b>SB-12 Performance*</b> [SB-12 - 3.1.2.]	* Attach energy performance results using an approved software (see guide)
<input type="checkbox"/> <b>ENERGY STAR®*</b> [SB-12 - 3.1.3.]	* Attach Builder Option Package [BOP] form
<input type="checkbox"/> <b>R-2000®*</b> [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
<input checked="" type="checkbox"/> Zone 1 (< 5000 degree days)	<input checked="" type="checkbox"/> ≥ 92% AFUE	<input checked="" type="checkbox"/> Gas <input type="checkbox"/> Propane <input type="checkbox"/> Solid Fuel
<input type="checkbox"/> Zone 2 (≥ 5000 degree days)	<input type="checkbox"/> ≥ 84% < 92% AFUE	<input type="checkbox"/> Oil <input type="checkbox"/> Electric <input type="checkbox"/> Earth Energy
Ratio of Windows, Skylights & Glass (W, S & G) to Wall Area		Other Building Characteristics
Area of walls = 336.75 m <sup>2</sup> or _____ ft <sup>2</sup>	W, S & G % = 11.08	<input type="checkbox"/> Log/Post&Beam <input type="checkbox"/> ICF Above Grade <input type="checkbox"/> ICF Basement
Area of W, S & G = 37.32 m <sup>2</sup> or _____ ft <sup>2</sup>		<input type="checkbox"/> Slab-on-ground <input type="checkbox"/> Walkout Basement
<input type="checkbox"/> Air Conditioning <input type="checkbox"/> Combo Unit		
<input type="checkbox"/> Air Source Heat Pump (ASHP)		
<input type="checkbox"/> Ground Source Heat Pump (GSHP)		
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 <sup>(1)</sup>		Building Component	Efficiency Ratings
<b>Thermal Insulation</b>	Nominal	Effective	<b>Windows &amp; Doors</b> Provide U-Value <sup>(1)</sup> 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		<b>Mechanicals</b>	
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/(m<sup>2</sup>·K) or Btu/(h·ft<sup>2</sup>·°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 153.09 GJ (1 GJ =1000MJ)

The annual energy consumption of this house as designed is 120.40 GJ

The software used to simulate the annual energy use of the building is: REMRATE 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

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**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	

# 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 <sup>2</sup> /m <sup>2</sup>	NLR 1.32 L/s/m <sup>2</sup>
Attached dwelling	3.5 ACH50	NLA 2.27 cm <sup>2</sup> /m <sup>2</sup>	NLR 1.44 L/s/m <sup>2</sup>

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.

# Code Compliance Certificate

## Project Title: Model 38-11 - Proposed

Report Date June 22, 2021  
Data Filename Model 38-11 - 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) 3850  
Conditioned Volume (cubic ft) 37620  
Insulated Shell Area (sq ft) 8308

Construction Site	Owner	Builder	HERS Rater
Model 38-11 - Proposed	Royal Pine Homes	Royal Pine Homes	Clearsphere Consulting
Richmond Hill,	Model 38-11 - 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	42524.11	153.09
Proposed House	33445.26	120.40
Better Than Code	21.3%	

### 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*****	1516	20.0	40.0
Above-Grade Walls			
AG Wall 1: Std R22 G2 + 1.5 @16*****	3201	22.0	1.5
Joist 1: Cond -> ambient	339	22.0	1.5
Window 1: U=0.282, SHGC 0.45*****	385		3.5
Door 1: R6*****	9		6.0
Door 2: Code	18		4.0
Floors Over Garage			
Floor 1: Std-R31 G2*****	371	31.0	0.0
Basement Walls			



# 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

1680  
 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: 0.19 CFM50/sf

## Efficient Lighting

90.0% Interior, 90.0% Exterior, 0.0% Garage

## Renewables

N/A

# Building Summary

## Property

Royal Pine Homes  
Model 38-11 - 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 38-11 - Proposed  
Model 38-11 - Proposed.blg

## Builder

Royal Pine Homes

## Property/Builder Information

Building Name	Model 38-11 - Proposed
Owner's Name	Royal Pine Homes
Property Address	Model 38-11 - 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

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

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# Building Summary

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Model 38-11 - Proposed  
Richmond Hill,

## Organization

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416-481-4218  
John Godden

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

Weather:Toronto, ON\_CAN

Model 38-11 - Proposed  
Model 38-11 - Proposed.blg

## Builder

Royal Pine Homes

## General Building Information

Area of Conditioned. Space(sq ft)	3850
Volume of Conditioned. Space	37620
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	170.00	10.08	9.08	1.00	0.034	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
Exterior Insulation	

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Royal Pine Homes

## Foundation Wall Library List

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*****	1167	9.08	170	170	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	371	0.039

## Frame Floor Library List

Floor: Std-R31 G2\*\*\*\*\*

Information From Quick Fill Screen

Continous 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
Joist Spacing (in oc)	16.0

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

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Royal Pine Homes

## Frame Floor Library List

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	338.80	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	3201.10	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 Assignment	Orient	U-Value	SHGC	Area (sqft)	Overhang Depth (ft)	To Top (ft)	To Btm (ft)	Interior Winter Shading	Summer Shading	Adjacent Winter Shading	Summer Shading
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## 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	0.282	0.450	5.70	5.0	0.8	1.8	0.85	0.70	None	None
front	AGWall 1	South	0.282	0.450	18.70	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	22.70	1.3	1.5	7.2	0.85	0.70	None	None
front	AGWall 1	South	0.282	0.450	34.00	1.3	1.5	7.2	0.85	0.70	None	None
front	AGWall 1	South	0.282	0.450	53.30	1.3	1.7	8.3	0.85	0.70	None	None
back	FndWall 1	North	0.282	0.450	10.00	0.0	0.0	0.0	0.85	0.70	None	None
back	AGWall 1	North	0.282	0.450	17.30	0.0	0.0	0.0	0.85	0.70	None	None
back Sliding	AGWall 1	North	0.282	0.450	48.00	0.0	0.0	0.0	0.85	0.70	None	None
back	AGWall 1	North	0.282	0.450	24.00	0.0	0.0	0.0	0.85	0.70	None	None
back	AGWall 1	North	0.282	0.450	70.00	1.3	1.8	6.4	0.85	0.70	None	None
Right	FndWall 1	East	0.282	0.450	6.70	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	45.30	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	17.30	1.3	1.8	6.1	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*****	1516.00	1895.00	Medium	No	Attic	0.017	No	No

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Model 38-11 - Proposed  
Model 38-11 - Proposed.blg

## 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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## Builder

Royal Pine Homes

## 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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## Builder

Royal Pine Homes

## 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	72
TOTAL Pipelength for longest DHW run	102
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

# Building Summary

## Property

Royal Pine Homes  
Model 38-11 - 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 38-11 - Proposed  
Model 38-11 - Proposed.blg

## Builder

Royal Pine Homes

## Duct Systems

### Name

Conditioned Floor Area(sq ft)	3850.0
# of Returns	6
Heating System	96 AFUE Gas ECM 64k*****
Cooling System	N/A
Supply Duct Surface Area(sq ft)	779.6
Return Duct Surface Area(sq ft)	721.9
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	

# Building Summary

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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
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Good Air Exchange for Multi-Family	NA
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Model 38-11 - 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 %	90.0
Exterior LEDs %	90.0
Garage LEDs %	0.0

## 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@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]

- |  |  |   |
|--|--|---|
| <input type="checkbox"/> House             | <input checked="" type="checkbox"/> HVAC – House       | <input type="checkbox"/> Building Structural      |
| <input type="checkbox"/> Small Buildings   | <input type="checkbox"/> Building Services             | <input type="checkbox"/> Plumbing – House         |
| <input type="checkbox"/> Large Buildings   | <input type="checkbox"/> Detection, Lighting and Power | <input type="checkbox"/> Plumbing – All Buildings |
| <input type="checkbox"/> Complex Buildings | <input type="checkbox"/> Fire Protection               | <input type="checkbox"/> 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: 38-11 BELVEDERE FIN BSMT WUB Project: CENTREFIELD (WEST GOSMILEY)
--	---

### D. Declaration of Designer

I, <u>MICHAEL O'ROURKE</u> (print name)	declare that (check one)
<input type="checkbox"/> 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.	Initials: <u>PXV</u>
Individual BCIN: _____ Firm BCIN: _____	
<input checked="" type="checkbox"/> 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>	
<input type="checkbox"/> 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	<u>Michael O'Rourke</u> 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

## 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

09/13/2021

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 <b>MICHAEL O'ROURKE</b>		Firm <b>HVAC DESIGNS LTD.</b>	
Street address <b>375 FINLEY AVE</b>		Unit no. <b>202</b>	Lot/con. <b>N/A</b>
Municipality <b>AJAX</b>	Postal code <b>L1S 2E2</b>	Province <b>ONTARIO</b>	E-mail <b>info@hvacdsgns.ca</b>
Telephone number <b>(905) 619-2300</b>	Fax number <b>(905) 619-2375</b>	Cell number ( )	

### C. Design activities undertaken by individual identified in Section B. [Building Code Table 3.5.2.1 OF Division C]

<input type="checkbox"/> House	<input checked="" type="checkbox"/> HVAC – House	<input type="checkbox"/> Building Structural
<input type="checkbox"/> Small Buildings	<input type="checkbox"/> Building Services	<input type="checkbox"/> Plumbing – House
<input type="checkbox"/> Large Buildings	<input type="checkbox"/> Detection, Lighting and Power	<input type="checkbox"/> Plumbing – All Buildings
<input type="checkbox"/> Complex Buildings	<input type="checkbox"/> Fire Protection	<input type="checkbox"/> On-site Sewage Systems

Description of designer's work <b>HEAT LOSS / GAIN CALCULATIONS DUCT SIZING RESIDENTIAL MECHANICAL VENTILATION DESIGN SUMMARY RESIDENTIAL SYSTEM DESIGN per CSA-F280-12</b>	Model: 38-11 BELVEDERE	<div style="border: 2px solid purple; padding: 5px; text-align: center;"> <b>HVAC REVIEWED</b>          Initials: <span style="border: 1px solid black; padding: 2px 10px;">PXV</span> </div>
	Project: CENTREFIELD WEST GORML	

### D. Declaration of Designer

I, MICHAEL O'ROURKE declare that (choose one as appropriate).

(print name)

☐ I review and take responsibility for the design work on behalf of a firm registered under subsection 3.2.4. of Division C, of the Building Code. I am qualified, and the firm is registered, in the appropriate classes/categories.

Individual BCIN: \_\_\_\_\_  
Firm BCIN: \_\_\_\_\_

☒ I review and take responsibility for the design and am qualified in the appropriate category as an "other designer" under subsection 3.2.5. of Division C, of the Building Code.


Individual BCIN: 19669  
Basis for exemption from registration and qualification: O.B.C SENTENCE 3.2.4.1 (4)

☐ The design work is exempt from the registration and qualification requirements of the Building Code.  
Basis for exemption from registration and qualification: \_\_\_\_\_

I certify that:

- The information contained in this schedule is true to the best of my knowledge.
- 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.
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Application for a Permit Construct or Demolish – Effective January 1, 2015

SITE NAME: CENTREFIELD (WEST GORMLEY)

BUILDER: ROYAL PINE HOMES

TYPE: 38-11

GFA: 2674

DATE: Apr-21

LO# 87614

WINTER NATURAL AIR CHANGE RATE: 0.227

HEAT LOSS AT °F: 78

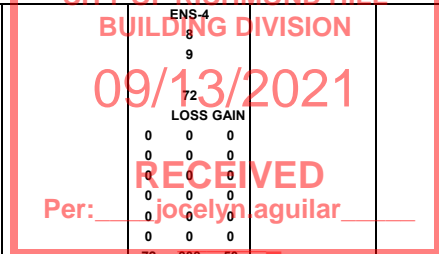
CSA-F280-12

SUMMER NATURAL AIR CHANGE RATE: 0.071

HEAT GAIN AT °F: 13

HSB-12 PERFORMANCE

ROOM USE	EXP. WALL	CLG. HT.	FACTORS	MBR	ENS	WIC	BED-2	BED-3	BED-4	BATH	ENS-4
				41	22	6	18	35	31	7	8
				9	9	9	9	9	9	9	9
GRS.WALL AREA	LOSS	GAIN		369	198	54	162	315	279	63	72
GLAZING	LOSS	GAIN		LOSS	GAIN	LOSS	GAIN	LOSS	GAIN	LOSS	GAIN
NORTH	21.8	16.0	0	0	0	0	0	0	0	0	0
EAST	21.8	41.6	44	958	1828	22	479	914	0	0	0
SOUTH	21.8	24.9	0	0	0	0	0	0	0	0	0
WEST	21.8	41.6	0	0	0	0	0	0	0	0	0
SKYL.	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	325	1367	225	176	740	122	54	227	37
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	355	467	209	125	164	73	70	92	41
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
SLAB ON GRADE HEAT LOSS				0	0	0	0	0	0	0	0
SUBTOTAL HT LOSS				2792	1384	319	1303	2651	3134	500	597
SUB TOTAL HT GAIN					2262	1109	79	684	2464	2709	126
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				507	251	58	237	481	569	91	108
AIR CHANGE HEAT GAIN					114	56	4	34	124	136	6
DUCT LOSS				0	0	0	154	313	370	59	71
DUCT GAIN				0	0	0	175	362	387	28	13
HEAT GAIN PEOPLE	240	2		480	0	0	1	240	1	240	0
HEAT GAIN APPLIANCES/LIGHTS				790	0	0	790	790	790	790	0
TOTAL HT LOSS BTU/H				3299	1635	377	1693	3446	4074	650	776
TOTAL HT GAIN x 1.3 BTU/H				4738	1515	107	2500	5173	5541	395	189



ROOM USE	EXP. WALL	CLG. HT.	FACTORS	FAM	KT/BR	LV/DN	LAUN	PWD	FOY	MUD	BAS
				32	35	39	0	6	29	15	168
				10	10	10	9	10	11	11	10
GRS.WALL AREA	LOSS	GAIN		323	354	394	0	61	322	167	1176
GLAZING	LOSS	GAIN		LOSS	GAIN	LOSS	GAIN	LOSS	GAIN	LOSS	GAIN
NORTH	21.8	16.0	0	0	0	0	0	0	0	0	0
EAST	21.8	41.6	22	479	914	63	1372	2618	0	0	0
SOUTH	21.8	24.9	0	0	0	0	0	0	0	0	0
WEST	21.8	41.6	0	0	0	0	0	0	0	0	0
SKYL.	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	301	1267	208	291	1222	201	356	1497	246
NET EXPOSED BSMT WALL ABOVE GR	3.7	0.6	0	0	0	0	0	0	0	0	0
EXPOSED CLG	1.3	0.6	0	0	0	0	0	0	95	125	56
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
SLAB ON GRADE HEAT LOSS				0	0	0	0	0	0	0	0
SUBTOTAL HT LOSS				1746	2594	2324	125	413	2536	1133	5684
SUB TOTAL HT GAIN					1123	2819	1192	56	260	1101	186
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				567	842	755	23	134	823	368	5814
AIR CHANGE HEAT GAIN					56	142	60	3	13	55	9
DUCT LOSS				0	0	0	0	0	0	0	0
DUCT GAIN				0	0	0	0	0	0	0	0
HEAT GAIN PEOPLE	240	2		0	0	0	0	0	0	0	0
HEAT GAIN APPLIANCES/LIGHTS				790	790	790	790	790	790	790	790
TOTAL HT LOSS BTU/H				2313	3436	3079	148	547	3359	1501	14199
TOTAL HT GAIN x 1.3 BTU/H				2559	4875	2654	76	355	1503	255	2274

TOTAL HEAT GAIN BTU/H:

34984

TONS: 2.92

LOSS DUE TO VENTILATION LOAD BTU/H: 1670

STRUCTURAL HEAT LOSS: 44531

TOTAL COMBINED HEAT LOSS BTU/H: 46201

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

TYPE: 38-11

DATE: Apr-21

GFA: 2674 LO# 87614

HEATING CFM 1145 COOLING CFM 1145  
TOTAL HEAT LOSS 44,531 TOTAL HEAT GAIN 34,710  
AIR FLOW RATE CFM 25.71 AIR FLOW RATE CFM 32.99

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

**CITY OF RICHMOND HILL**  
**BUILDING DIVISION**  
**09/13/2021**  
**RECEIVED**  
**Mr. Jocelyn Aquila**  
**\*\*CARRIER** AFUE = 97 %  
**59TN6A-060-14V** INPUT (BTU/H) = 60,000  
FAN SPEED 60 OUTPUT (BTU/H) = **58,000**  
LOW 820  
MEDLOW 0  
MEDIUM 1145  
MEDIUM HIGH 0  
HIGH 1520  
DESIGN CFM = **1145**  
CFM @ .6" E.S.P.  
TEMPERATURE RISE **47** °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	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-3	BED-4	MBR	ENS-4	FAM	KT/BR	KT/BR	LV/DN	LAUN	PWD	FOY	MUD	BAS	BAS	BAS	BAS
RM LOSS MBH.	1.65	1.63	0.38	1.69	1.72	2.04	0.65	1.72	2.04	1.65	0.78	2.31	1.72	1.72	3.08	0.15	0.55	3.36	1.50	3.55	3.55	3.55	3.55
CFM PER RUN HEAT	42	42	10	44	44	52	17	44	52	42	20	59	44	44	79	4	14	86	39	91	91	91	91
RM GAIN MBH.	2.37	1.51	0.11	2.50	2.59	2.77	0.40	2.59	2.77	2.37	0.19	2.56	2.44	2.44	2.65	0.08	0.35	1.50	0.25	0.57	0.57	0.57	0.57
CFM PER RUN COOLING	78	50	4	82	85	91	13	85	91	78	6	84	80	80	88	3	12	50	8	19	19	19	19
ADJUSTED PRESSURE	0.17	0.17	0.17	0.16	0.16	0.16	0.17	0.16	0.16	0.17	0.17	0.16	0.17	0.17	0.16	0.17	0.17	0.16	0.17	0.16	0.16	0.16	0.16
ACTUAL DUCT LGH.	69	37	30	32	34	40	32	42	46	56	36	53	42	35	14	32	14	30	45	48	29	8	20
EQUIVALENT LENGTH	130	140	120	150	140	120	120	150	130	190	160	130	150	100	120	180	130	130	140	130	110	130	120
TOTAL EFFECTIVE LENGTH	199	177	150	182	174	160	152	192	176	246	196	183	192	135	134	212	144	160	185	178	139	138	140
ADJUSTED PRESSURE	0.09	0.1	0.11	0.09	0.09	0.1	0.11	0.08	0.09	0.07	0.09	0.09	0.09	0.13	0.12	0.08	0.12	0.1	0.09	0.09	0.12	0.12	0.12
ROUND DUCT SIZE	6	5	4	6	6	6	4	6	6	6	4	6	6	6	6	4	4	6	4	6	6	6	6
HEATING VELOCITY (ft/min)	214	308	115	224	224	265	195	224	265	214	229	301	224	224	403	46	161	438	447	464	464	464	464
COOLING VELOCITY (ft/min)	398	367	46	418	433	464	149	433	464	398	69	428	408	408	449	34	138	255	92	97	97	97	97
OUTLET GRILL SIZE	4X10	3X10	3X10	4X10	4X10	4X10	3X10	4X10	4X10	4X10	3X10	4X10	4X10	4X10	4X10	3X10	3X10	4X10	3X10	4X10	4X10	4X10	4X10
TRUNK	A	B	B	D	C	D	D	C	D	A	D	A	A	B	D	B	C	C	A	A	B	B	C

RUN #	1	2	3	4	5	6	7	8	9	10	11	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-3	BED-4	MBR	ENS-4	FAM	KT/BR	KT/BR	LV/DN	LAUN	PWD	FOY	MUD	BAS	BAS	BAS	BAS
RM LOSS MBH.	1.65	1.63	0.38	1.69	1.72	2.04	0.65	1.72	2.04	1.65	0.78	2.31	1.72	1.72	3.08	0.15	0.55	3.36	1.50	3.55	3.55	3.55	3.55
CFM PER RUN HEAT	42	42	10	44	44	52	17	44	52	42	20	59	44	44	79	4	14	86	39	91	91	91	91
RM GAIN MBH.	2.37	1.51	0.11	2.50	2.59	2.77	0.40	2.59	2.77	2.37	0.19	2.56	2.44	2.44	2.65	0.08	0.35	1.50	0.25	0.57	0.57	0.57	0.57
CFM PER RUN COOLING	78	50	4	82	85	91	13	85	91	78	6	84	80	80	88	3	12	50	8	19	19	19	19
ADJUSTED PRESSURE	0.17	0.17	0.17	0.16	0.16	0.16	0.17	0.16	0.16	0.17	0.17	0.16	0.17	0.17	0.16	0.17	0.17	0.16	0.17	0.16	0.16	0.16	0.16
ACTUAL DUCT LGH.	69	37	30	32	34	40	32	42	46	56	36	53	42	35	14	32	14	30	45	48	29	8	20
EQUIVALENT LENGTH	130	140	120	150	140	120	120	150	130	190	160	130	150	100	120	180	130	130	140	130	110	130	120
TOTAL EFFECTIVE LENGTH	199	177	150	182	174	160	152	192	176	246	196	183	192	135	134	212	144	160	185	178	139	138	140
ADJUSTED PRESSURE	0.09	0.1	0.11	0.09	0.09	0.1	0.11	0.08	0.09	0.07	0.09	0.09	0.09	0.13	0.12	0.08	0.12	0.1	0.09	0.09	0.12	0.12	0.12
ROUND DUCT SIZE	6	5	4	6	6	6	4	6	6	6	4	6	6	6	6	4	4	6	4	6	6	6	6
HEATING VELOCITY (ft/min)	214	308	115	224	224	265	195	224	265	214	229	301	224	224	403	46	161	438	447	464	464	464	464
COOLING VELOCITY (ft/min)	398	367	46	418	433	464	149	433	464	398	69	428	408	408	449	34	138	255	92	97	97	97	97
OUTLET GRILL SIZE	4X10	3X10	3X10	4X10	4X10	4X10	3X10	4X10	4X10	4X10	3X10	4X10	4X10	4X10	4X10	3X10	3X10	4X10	3X10	4X10	4X10	4X10	4X10
TRUNK	A	B	B	D	C	D	D	C	D	A	D	A	A	B	D	B	C	C	A	A	B	B	C

SUPPLY AIR TRUNK SIZE	TRUNK	STATIC	ROUND	RECT	VELOCITY	TRUNK	STATIC	ROUND	RECT	VELOCITY	RETURN AIR TRUNK SIZE	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	317	0.07	9.4	10	x 8	571	0	0.00	0	0	x 8	0	0.05	0	0	x 8
TRUNK B	599	0.07	12	16	x 8	674	0	0.00	0	0	x 8	0	0.05	0	0	x 8
TRUNK C	279	0.08	8.7	10	x 8	502	0	0.00	0	0	x 8	0	0.05	0	0	x 8
TRUNK D	543	0.08	11.2	16	x 8	611	0	0.00	0	0	x 8	0	0.05	0	0	x 8
TRUNK E	0	0.00	0	0	x 8	0	0	0.00	0	0	x 8	0	0.05	0	0	x 8
TRUNK F	0	0.00	0	0	x 8	0	0	0.00	0	0	x 8	0	0.05	0	0	x 8

RETURN AIR #	1	2	3	4	5	6	7											BR	TRUNK W TRUNK X TRUNK Y TRUNK Z DROP																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																										</
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TYPE: 38-11  
SITE NAME: CENTREFIELD (WEST GORMLEY)

LO # 87614

**RESIDENTIAL MECHANICAL VENTILATION DESIGN SUMMARY**
**CITY OF RICHMOND HILL  
BUILDING DIVISION**
**09/13/2021**
**RECEIVED**  
Per: jocelyn.aguilar

COMBUSTION APPLIANCES		9.32.3.1(1)
a)	<input checked="" type="checkbox"/> Direct vent (sealed combustion) only	
b)	<input type="checkbox"/> Positive venting induced draft (except fireplaces)	
c)	<input type="checkbox"/> Natural draft, B-vent or induced draft gas fireplace	
d)	<input type="checkbox"/> Solid Fuel (including fireplaces)	
e)	<input type="checkbox"/> No Combustion Appliances	

HEATING SYSTEM	
<input checked="" type="checkbox"/> Forced Air	<input type="checkbox"/> Non Forced Air
<input type="checkbox"/> Electric Space Heat	

HOUSE TYPE		9.32.1(2)
<input checked="" type="checkbox"/> I	Type a) or b) appliance only, no solid fuel	
<input type="checkbox"/> II	Type I except with solid fuel (including fireplaces)	
<input type="checkbox"/> III	Any Type c) appliance	
<input type="checkbox"/> IV	Type I, or II with electric space heat	
<input type="checkbox"/> Other:	Type I, II or IV no forced air	

SYSTEM DESIGN OPTIONS		O.N.H.W.P.
<input type="checkbox"/> 1	Exhaust only/Forced Air System	
<input type="checkbox"/> 2	HRV with Ducting/Forced Air System	
<input checked="" type="checkbox"/> 3	HRV Simplified/connected to forced air system	
<input type="checkbox"/> 4	HRV with Ducting/non forced air system	
<input type="checkbox"/>	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>4</u> @ 10.6 cfm <u>42.4</u> cfm	
Table 9.32.3.A.	TOTAL <u>169.6</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>169.6</u> cfm	
Less Principal Ventil. Capacity	<u>79.5</u> cfm	
Required Supplemental Capacity	<u>90.1</u> cfm	

PRINCIPAL EXHAUST FAN CAPACITY	
Model: VANEE 65H	Location: BSMT
<u>79.5</u> cfm	<input checked="" type="checkbox"/> 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	<input checked="" type="checkbox"/>	3.5
BATH	BY INSTALLING CONTRACTOR	50	<input checked="" type="checkbox"/>	3.5
ENS-4	BY INSTALLING CONTRACTOR	50	<input checked="" type="checkbox"/>	3.5
PWD	BY INSTALLING CONTRACTOR	50	<input checked="" type="checkbox"/>	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)	<input checked="" type="checkbox"/> 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

09/13/2021

RECEIVED  
jodely@cityofrichmondhill.ca

CSA F280-12 Residential Heat Loss and Heat Gain Calculations																																																												
Formula Sheet (For Air Leakage / Ventilation Calculation)																																																												
LO#: 87614	Model: 38-11	Builder: ROYAL PINE HOMES	Date: 4/19/2021																																																									
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<b>5.2.3.1 Heat Loss due to Air Leakage</b>			<b>6.2.6 Sensible Gain due to Air Leakage</b>																																																									
$HL_{airb} = LR_{airh} \times \frac{V_b}{3.6} \times DTD_h \times 1.2$ <p>0.227 x 290.05 x 43 °C x 1.2 = 3408 W</p> <p>= 11629 Btu/h</p>			$HG_{salb} = LR_{airc} \times \frac{V_b}{3.6} \times DTD_c \times 1.2$ <p>= 0.071 x 290.05 x 7 °C x 1.2 = 175 W</p> <p>= 597 Btu/h</p>																																																									
<b>5.2.3.2 Heat Loss due to Mechanical Ventilation</b>			<b>6.2.7 Sensible heat Gain due to Ventilation</b>																																																									
$HL_{vairb} = PVC \times DTD_h \times 1.08 \times (1 - E)$ <p>80 CFM x 78 °F x 1.08 x 0.25 = 1670 Btu/h</p>			$HL_{vairb} = PVC \times DTD_h \times 1.08 \times (1 - E)$ <p>80 CFM x 13 °F x 1.08 x 0.25 = 275 Btu/h</p>																																																									
<b>5.2.3.3 Calculation of Air Change Heat Loss for Each Room (Floor Multiplier Section)</b>																																																												
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## HEAT LOSS AND GAIN SUMMARY SHEET

<b>MODEL:</b> 38-11	<b>LO#</b> 87614	<b>BUILDER:</b> TROYAL RINE HOMES HILL	<b>SITE:</b> CENTREFIELD (WEST GORMLEY)
<b>SFQT:</b> 2674			
<b>DESIGN ASSUMPTIONS</b>		09/13/2021	
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):	36875.4	ASSUMED (Y/N):	Y
INTERNAL SHADING:	BLINDS/CURTAINS	ASSUMED OCCUPANTS:	5
INTERIOR LIGHTING LOAD (Btu/h/ft²):	1.65	DC BRUSHLESS MOTOR (Y/N):	Y
FOUNDATION CONFIGURATION	BCIN_1	DEPTH BELOW GRADE:	7.0 ft
LENGTH: 52.0 ft	WIDTH: 32.0 ft	EXPOSED PERIMETER:	168.0 ft

2012 OBC - COMPLIANCE PACKAGE		Compliance Package	
Component		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

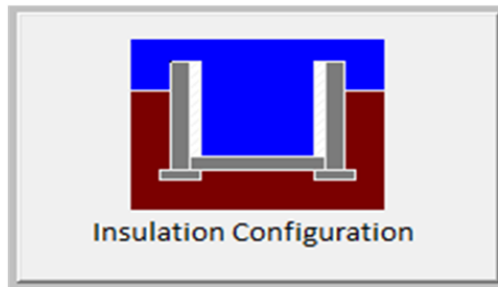
09/10/2021

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):	15.8	 Insulation Configuration
Floor Width (m):	9.8	
Exposed Perimeter (m):	0.0	
Wall Height (m):	3.0	
Depth Below Grade (m):	2.13	
Window Area (m <sup>2</sup> ):	1.4	
Door Area (m <sup>2</sup> ):	1.9	
Radiant Slab		
Heated Fraction of the Slab:	0	
Fluid Temperature (°C):	33	
Design Months		
Heating Month	1	
Foundation Loads		
Heating Load (Watts):		1665

TYPE: 38-11

LO# 87614

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 <sup>3</sup> ):	1044.2			
Air Leakage/Ventilation				
Air Tightness Type:	Energy Star Detached (2.5 ACH)			
Custom BDT Data:	ELA @ 10 Pa.		974.8 cm <sup>2</sup>	
	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: 38-11

LO# 87614



City of Richmond Hill  
Building Division

REVIEWED

By: **PxV** Date: **SEP/10/2021**

Building Permit #: **BP#-2021-50828**

All construction shall comply with the Ontario Building Code and all other applicable statutory regulations. The reviewed documents must be kept on site at all times.

Building inspection line: 905-771-5465 (24 hr)  
buildinginspections@richmondhill.ca  
Building inquiry line 905-771-8810  
building@richmondhill.ca

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

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

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

Volume control dampers to all branches to be installed per OBC 2012, Div.B, 6.2.4.5.

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

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

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

HRV duct connection shall be in compliance with OBC 2012 Div.B 9.32.3.6(3) & 9.32.3.4(7).

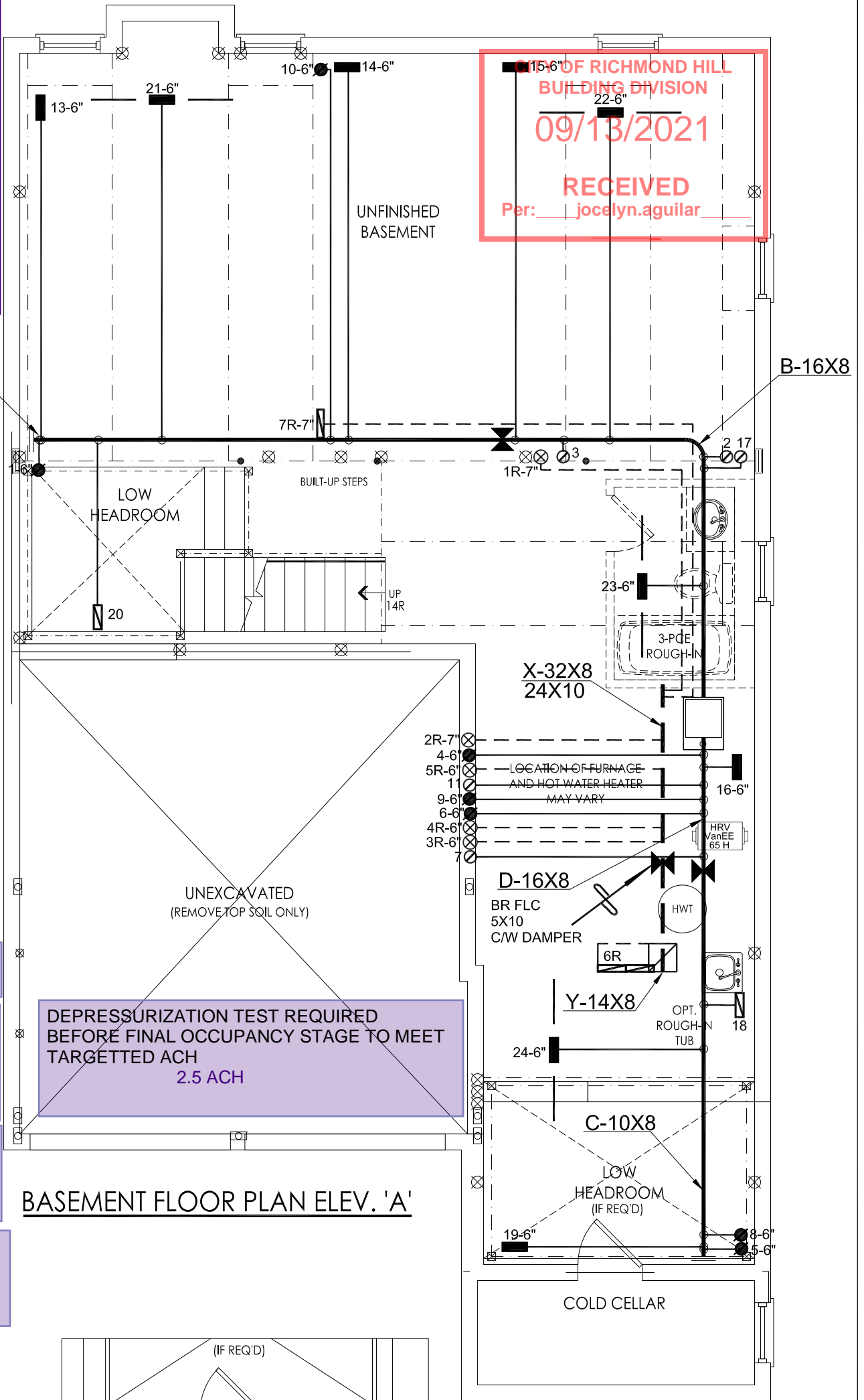
For simplified HRV/ERV installation, with stale air and fresh air connected to return air plenum, stale air intake and fresh air supply shall be separated minimum 3' or as recommended by HRV/ERV Manufacturer.

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

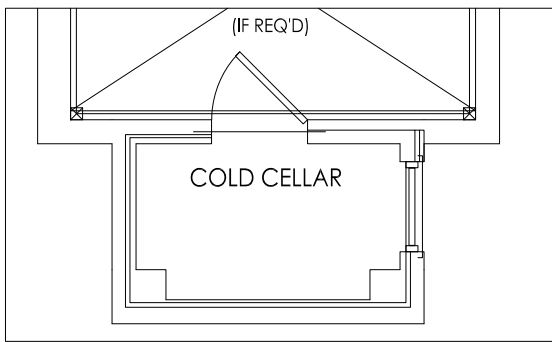
Exterior insulation effective R-Value for wall, roof or exposed floor shall be maintained at the respective location where duct or sanitary pipes are routed inside exterior envelope.

COLD CELLAR

BASEMENT FLOOR PLAN ELEV. 'B'



BASEMENT FLOOR PLAN ELEV. 'A'



BASEMENT FLOOR PLAN ELEV. 'C'

CSA-F280-12

SB-12 PERFORMANCE

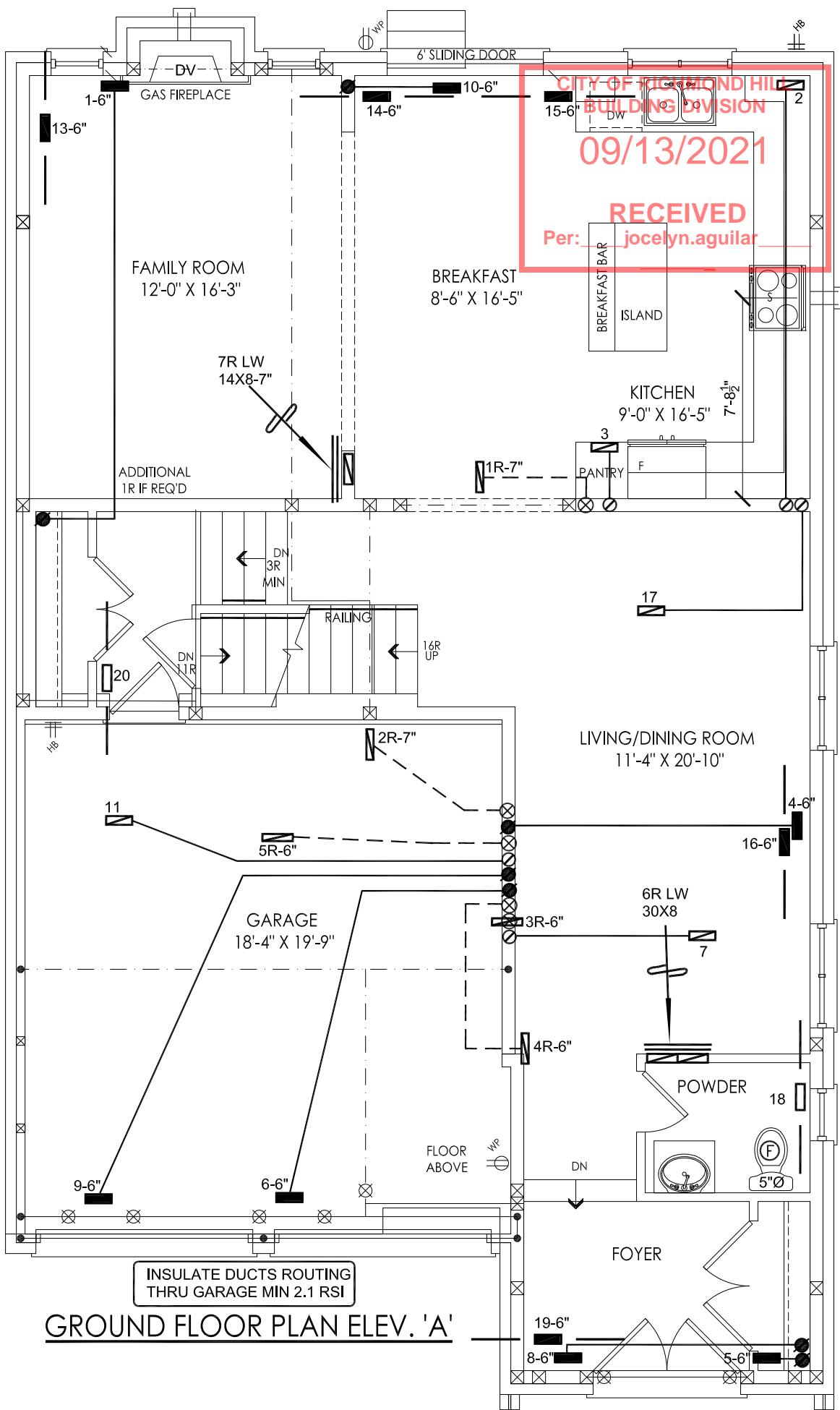
I MICHAEL O'ROURKE HAVE REVIEWED AND TAKE RESPONSIBILITY FOR THE DESIGN WORK AND AM QUALIFIED UNDER DIVISION C, 3.2.5 OF THE BUILDING CODE.

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

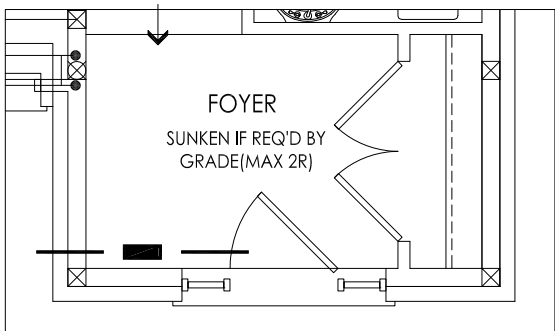
HVAC LEGEND							3.		
SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	2.	REVISAS PER ARCHITECTURALS
	SUPPLY AIR GRILLE		6" SUPPLY AIR BOOT ABOVE		14"x8" RETURN AIR GRILLE		RETURN AIR STACK ABOVE	1.	REVISAS TO PERFORMANCE
	SUPPLY AIR GRILLE 6" BOOT		SUPPLY AIR STACK FROM 2nd FLOOR		30"x8" RETURN AIR GRILLE		RETURN AIR STACK 2nd FLOOR	No.	Description
	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.

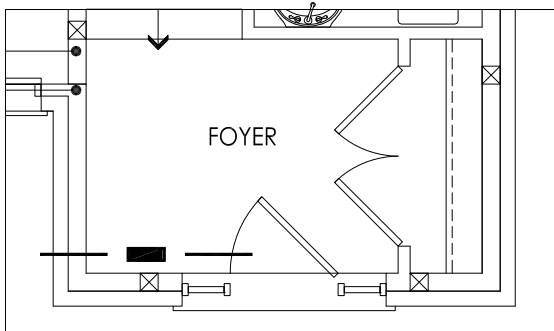
Client		<div></div> <div>375 Finley Ave. Suite 202 - Ajax, Ontario L1S 2E2 Tel. 905.619.2300 - 905.420.5300 Fax 905.619.2375 Email: info@hvacdesigns.ca Web: www.hvacdesigns.ca Specializing in Residential Mechanical Design Services</div>	HEAT LOSS 46201 BTU/H UNIT DATA		# OF RUNS S/A R/A FANS			Sheet Title		
Project Name CENTREFIELD (WEST GORMLEY) RICHMOND HILL, ONTARIO			MAKE	CARRIER	3RD FLOOR				BASEMENT HEATING LAYOUT	
			MODEL	59TN6A-060-14V	2ND FLOOR	12	5	4		
			INPUT	60 MBTU/H	1ST FLOOR	7	2	2		
			OUTPUT	58 MBTU/H	BASEMENT	4	1	0	Date	SEPT/2020
38-11			COOLING	3.0 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	1145 cfm @ 0.6" w.c.	BCIN# 19669						
		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.								
2674 sqft							LO#	87614		



GROUND FLOOR PLAN ELEV. 'A'



GROUND FLOOR PLAN ELEV. 'B'



GROUND FLOOR PLAN ELEV. 'C'

CSA-F280-12

SB-12 PERFORMANCE

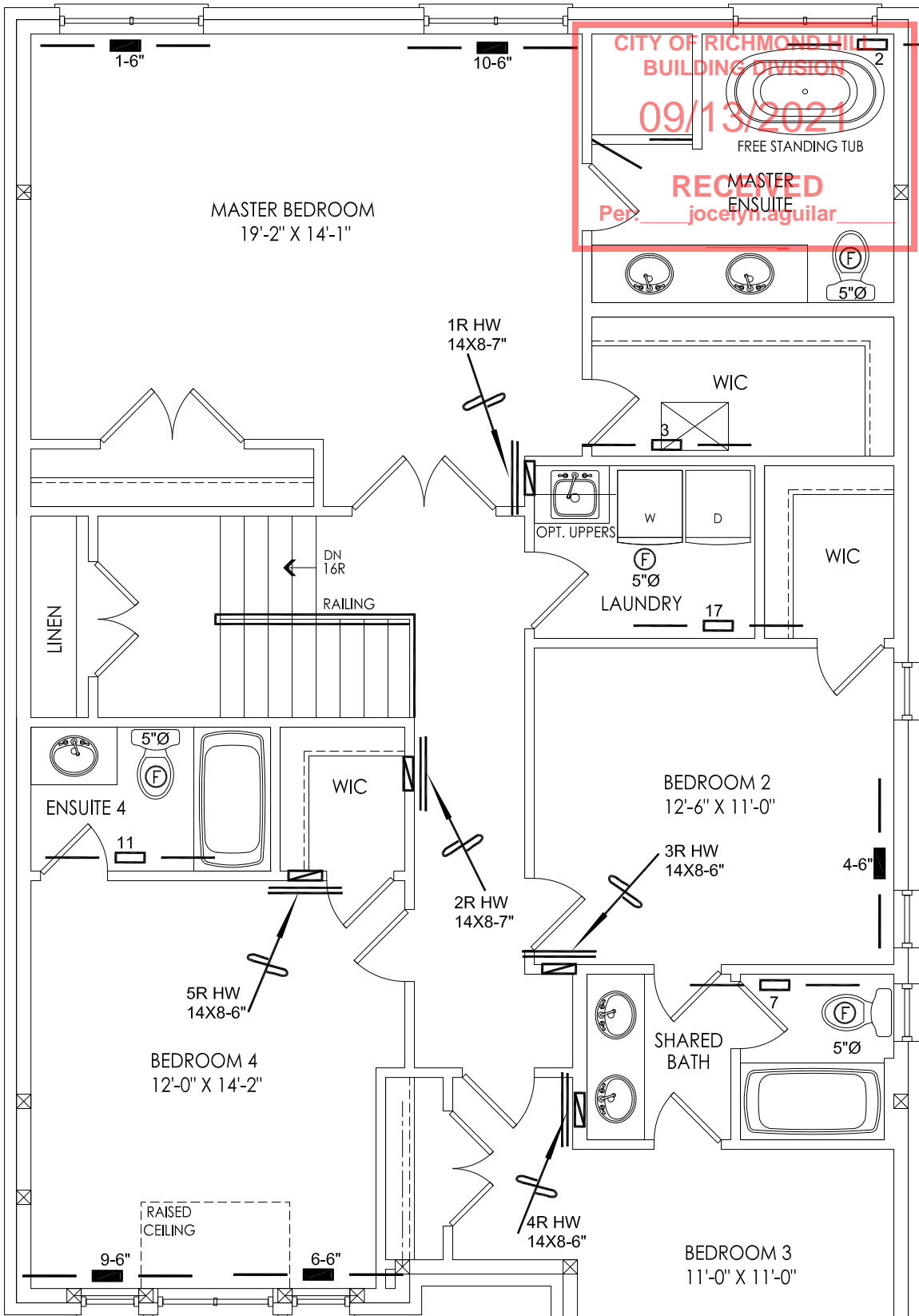
I MICHAEL O'ROURKE HAVE REVIEWED AND TAKE RESPONSIBILITY FOR THE DESIGN WORK AND AM QUALIFIED UNDER DIVISION C, 3.2.5 OF THE BUILDING CODE.  
*Michael O'Rourke*  
Michael O'Rourke, BCIN# 19669  
HVAC DESIGNS LTD.

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		

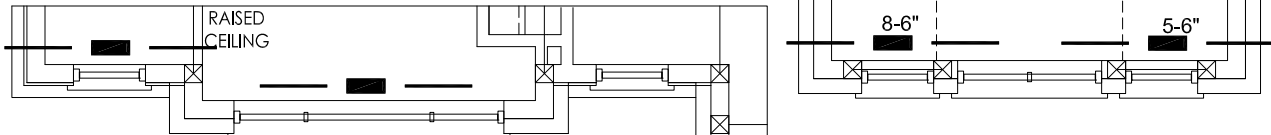
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Client		<div></div> <div>375 Finley Ave. Suite 202 - Ajax, Ontario L1S 2E2 Tel. 905.619.2300 - 905.420.5300 Fax 905.619.2375 Email: info@hvacdesigns.ca Web: www.hvacdesigns.ca Specializing in Residential Mechanical Design Services</div>	Sheet Title	
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"
			BCIN# 19669	
38-11			LO#	87614
2674 sqft				

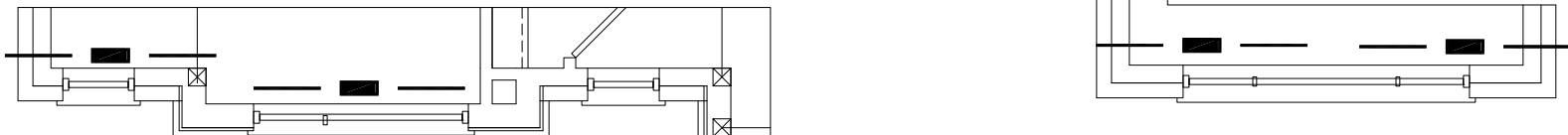




SECOND FLOOR PLAN ELEV. 'A'



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		<div></div> <div>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</div> <div>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.</div>	Sheet Title	
ROYAL PINE HOMES			SECOND FLOOR HEATING LAYOUT	
Project Name CENTREFIELD (WEST GORMLEY) RICHMOND HILL, ONTARIO			Date	SEPT/2020
			Scale	3/16" = 1'-0"
		BCIN# 19669		
38-11	2674 sqft	LO#	87614	



## 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

09/13/2021

RECEIVED

Per: jocelyn aguiar

<b>A. Project Information</b>			
Building number, street name		Unit no.	Lot/con.
Municipality RICHMOND HILL	Postal code	Plan number/ other description	
<b>B. Individual who reviews and takes responsibility for design activities</b>			
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 ( )	
<b>C. Design activities undertaken by individual identified in Section B. [Building Code Table 3.5.2.1 OF Division C]</b>			
<input type="checkbox"/> House <input type="checkbox"/> Small Buildings <input type="checkbox"/> Large Buildings <input type="checkbox"/> Complex Buildings <input checked="" type="checkbox"/> HVAC – House <input type="checkbox"/> Building Services <input type="checkbox"/> Detection, Lighting and Power <input type="checkbox"/> Fire Protection <input type="checkbox"/> Building Structural <input type="checkbox"/> Plumbing – House <input type="checkbox"/> Plumbing – All Buildings <input type="checkbox"/> 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: 38-11 BELVEDERE FIN BSMT WUB Project: CENTREFIELD (WEST GORMLEY)	
<b>D. Declaration of Designer</b>			
I, <u>MICHAEL O'ROURKE</u> (print name)		declare that (choose one as appropriate):	
<input type="checkbox"/> 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: _____			
<input checked="" type="checkbox"/> 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>			
<input type="checkbox"/> 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	

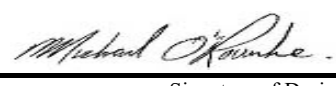
**NOTE:**

- 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**

## Schedule 1: Designer Information

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

<b>A. Project Information</b>			
Building number, street name		Unit no.	Lot/con.
Municipality RICHMOND HILL	Postal code	Plan number/ other description	
<b>B. Individual who reviews and takes responsibility for design activities</b>			
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 ( )	
<b>C. Design activities undertaken by individual identified in Section B. [Building Code Table 3.5.2.1 OF Division C]</b>			
<input type="checkbox"/> House <input type="checkbox"/> Small Buildings <input type="checkbox"/> Large Buildings <input type="checkbox"/> Complex Buildings <input checked="" type="checkbox"/> HVAC – House <input type="checkbox"/> Building Services <input type="checkbox"/> Detection, Lighting and Power <input type="checkbox"/> Fire Protection <input type="checkbox"/> Building Structural <input type="checkbox"/> Plumbing – House <input type="checkbox"/> Plumbing – All Buildings <input type="checkbox"/> 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		<b>Model:</b> 38-11 Belvedere  <b>Project:</b> CENTREFIELD (WEST GORMLEY)	
<b>D. Declaration of Designer</b>			
I, <u>MICHAEL O'ROURKE</u> declare that (choose one as appropriate): (print name)			
<input type="checkbox"/> 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: _____			
<input checked="" type="checkbox"/> 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>			
<input type="checkbox"/> 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.
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**Application for a Permit Construct or Demolish – Effective January 1, 2015**

SITE NAME: CENTREFIELD (WEST GORMLEY)										DATE: Apr-21		WINTER NATURAL AIR CHANGE RATE 0.227		HEAT LOSS ΔT °F. 78		CSA-F280-12	
BUILDER: ROYAL PINE HOMES										LO# 87614		SUMMER NATURAL AIR CHANGE RATE 0.071		HEAT GAIN ΔT °F. 13		SB-12 PERFORMANCE	
TYPE: 38-11										GFA: 2674							
ROOM USE																	
EXP. WALL																	
CLG. HT.																	
FACTORS																	
GRS.WALL AREA	LOSS	GAIN															
GLAZING																	
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	44	958	1828	22	479	914	0	0	0	0	0	0	0	0	0
SOUTH	21.8	24.9	0	0	0	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	325	1367	225	176	740	122	54	227	37	144	606	100	264	942	155
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	355	467	209	125	164	73	70	92	41	232	305	136	162	213	95
NO ATTIC EXPOSED CLG	2.8	1.3	0	0	0	0	0	0	0	0	0	0	0	0	40	112	50
EXPOSED FLOOR	2.6	0.4	0	0	0	0	0	0	0	0	0	0	0	0	40	104	17
BASEMENT/CRAWL HEAT LOSS																	
SLAB ON GRADE HEAT LOSS																	
SUBTOTAL HT LOSS																	
SUB TOTAL HT GAIN																	
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																	
AIR CHANGE HEAT GAIN																	
DUCT LOSS																	
DUCT GAIN																	
HEAT GAIN PEOPLE	240																
HEAT GAIN APPLIANCES/LIGHTS																	
TOTAL HT LOSS BTU/H																	
TOTAL HT GAIN x 1.3 BTU/H																	

ROOM USE																	
EXP. WALL																	
CLG. HT.																	
FACTORS																	
GRS.WALL AREA	LOSS	GAIN															
GLAZING																	
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	22	479	914	63	1372	2618	0	0	0	0	0	0	0	0	0
SOUTH	21.8	24.9	0	0	0	0	0	0	38	828	946	0	0	0	9	196	224
WEST	21.8	41.6	0	0	0	0	0	0	0	0	0	0	0	0	18	392	748
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	40	1034	170
NET EXPOSED WALL	4.2	0.7	301	1267	208	291	1222	201	356	1497	246	0	0	0	52	217	36
NET EXPOSED BSMT WALL ABOVE GR	3.7	0.6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
EXPOSED CLG	1.3	0.6	0	0	0	0	0	0	0	0	0	95	125	56	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																	
SLAB ON GRADE HEAT LOSS																	
SUBTOTAL HT LOSS																	
SUB TOTAL HT GAIN																	
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																	
AIR CHANGE HEAT GAIN																	
DUCT LOSS																	
DUCT GAIN																	
HEAT GAIN PEOPLE	240																
HEAT GAIN APPLIANCES/LIGHTS																	
TOTAL HT LOSS BTU/H																	
TOTAL HT GAIN x 1.3 BTU/H																	

TOTAL HEAT GAIN BTU/H: 34984 TONS: 2.92 LOSS DUE TO VENTILATION LOAD BTU/H: 1670 STRUCTURAL HEAT LOSS: 44531 TOTAL COMBINED HEAT LOSS BTU/H: 46201

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

TYPE: 38-11

DATE: Apr-21

GFA: 2674

LO# 87614

HEATING CFM 1145 COOLING CFM 1145  
TOTAL HEAT LOSS 44,531 TOTAL HEAT GAIN 34,710  
AIR FLOW RATE CFM 25.71 AIR FLOW RATE CFM 32.99

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	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  
min adjusted pressure s/a 0.16 adjusted pressure r/a 0.15

LOW 820  
MEDLOW 0  
MEDIUM 1145  
MEDIUM HIGH 0  
HIGH 1520

DESIGN CFM = **1145**  
CFM @ .6" E.S.P.

TEMPERATURE RISE 47 °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	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-3	BED-4	MBR	ENS-4	FAM	KT/BR	KT/BR	LV/DN	LAUN	PWD	FOY	MUD	BAS	BAS	BAS	BAS
RM LOSS MBH.	1.65	1.63	0.38	1.69	1.72	2.04	0.65	1.72	2.04	1.65	0.78	2.31	1.72	1.72	3.08	0.15	0.55	3.36	1.50	3.55	3.55	3.55	3.55
CFM PER RUN HEAT	42	42	10	44	44	52	17	44	52	42	20	59	44	44	79	4	14	86	39	91	91	91	91
RM GAIN MBH.	2.37	1.51	0.11	2.50	2.59	2.77	0.40	2.59	2.77	2.37	0.19	2.56	2.44	2.44	2.65	0.08	0.35	1.50	0.25	0.57	0.57	0.57	0.57
CFM PER RUN COOLING	78	50	4	82	85	91	13	85	91	78	6	84	80	80	88	3	12	50	8	19	19	19	19
ADJUSTED PRESSURE	0.17	0.17	0.17	0.16	0.16	0.16	0.17	0.16	0.16	0.17	0.17	0.16	0.17	0.17	0.16	0.17	0.17	0.16	0.17	0.16	0.16	0.16	0.16
ACTUAL DUCT LGH.	69	37	30	32	34	40	32	42	46	56	36	53	42	35	14	32	14	30	45	48	29	8	20
EQUIVALENT LENGTH	130	140	120	150	140	120	120	150	130	190	160	130	150	100	120	180	130	130	140	130	110	130	120
TOTAL EFFECTIVE LENGTH	199	177	150	182	174	160	152	192	176	246	196	183	192	135	134	212	144	160	185	178	139	138	140
ADJUSTED PRESSURE	0.09	0.1	0.11	0.09	0.09	0.1	0.11	0.08	0.09	0.07	0.09	0.09	0.09	0.13	0.12	0.08	0.12	0.1	0.09	0.09	0.12	0.12	0.12
ROUND DUCT SIZE	6	5	4	6	6	6	4	6	6	6	4	6	6	6	6	4	4	6	4	6	6	6	6
HEATING VELOCITY (ft/min)	214	308	115	224	224	265	195	224	265	214	229	301	224	224	403	46	161	438	447	464	464	464	464
COOLING VELOCITY (ft/min)	398	367	46	418	433	464	149	433	464	398	69	428	408	408	449	34	138	255	92	97	97	97	97
OUTLET GRILL SIZE	4X10	3X10	3X10	4X10	4X10	4X10	3X10	4X10	4X10	4X10	3X10	4X10	4X10	4X10	4X10	3X10	3X10	4X10	3X10	4X10	4X10	4X10	4X10
TRUNK	A	B	B	D	C	D	D	C	D	A	D	A	A	B	D	B	C	C	A	A	B	B	C

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 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	317	0.07	9.4	10	x	8	571	TRUNK G	0	0.00	0	0	8	0	TRUNK O	0	0.05	0	0	x	8	0	
TRUNK B	599	0.07	12	16	x	8	674	TRUNK H	0	0.00	0	0	8	0	TRUNK P	0	0.05	0	0	x	8	0	
TRUNK C	279	0.08	8.7	10	x	8	502	TRUNK I	0	0.00	0	0	8	0	TRUNK Q	0	0.05	0	0	x	8	0	
TRUNK D	543	0.08	11.2	16	x	8	611	TRUNK J	0	0.00	0	0	8	0	TRUNK R	0	0.05	0	0	x	8	0	
TRUNK E	0	0.00	0	0	x	8	0	TRUNK K	0	0.00	0	0	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	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	
AIR VOLUME	130	130	75	75	85	340	130	0	0	0	0	0	0	0	0	0	0	180
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.	49	41	39	46	45	24	39	1	1	1	1	1	1	1	1	1	14	
EQUIVALENT LENGTH	195	175	275	235	195	120	215	0	0	0	0	0	0	0	0	0	135	
TOTAL EFFECTIVE LH	244	216	314	281	240	144	254	1	1	1	1	1	1	1	1	1	149	
ADJUSTED PRESSURE	0.06	0.07	0.05	0.05	0.06	0.10	0.06	14.80	14.80	14.80	14.80	14.80	14.80	14.80	14.80	0.10		
ROUND DUCT SIZE	7	6.8	6	6	6	8.9	7	0	0	0	0	0	0	0	0	0	7	
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	

TRUNK W	0	0.05	0	0	x	8	0
TRUNK X	1145	0.05	16.6	32	x	8	644
TRUNK Y	340	0.05	10.5	14	x	8	437
TRUNK Z	0	0.05	0	0	x	8	0
DROP	1145	0.05	16.6	24	x	10	687

TYPE: 38-11  
SITE NAME: CENTREFIELD (WEST GORMLEY)

LO # 87614

**RESIDENTIAL MECHANICAL VENTILATION DESIGN SUMMARY**

COMBUSTION APPLIANCES		9.32.3.1(1)
a)	<input checked="" type="checkbox"/> Direct vent (sealed combustion) only	
b)	<input type="checkbox"/> Positive venting induced draft (except fireplaces)	
c)	<input type="checkbox"/> Natural draft, B-vent or induced draft gas fireplace	
d)	<input type="checkbox"/> Solid Fuel (including fireplaces)	
e)	<input type="checkbox"/> No Combustion Appliances	

HEATING SYSTEM	
<input checked="" type="checkbox"/> Forced Air	<input type="checkbox"/> Non Forced Air
<input type="checkbox"/> Electric Space Heat	

HOUSE TYPE		9.32.1(2)
<input checked="" type="checkbox"/> I	Type a) or b) appliance only, no solid fuel	
<input type="checkbox"/> II	Type I except with solid fuel (including fireplaces)	
<input type="checkbox"/> III	Any Type c) appliance	
<input type="checkbox"/> IV	Type I, or II with electric space heat	
<input type="checkbox"/>	Other: Type I, II or IV no forced air	

SYSTEM DESIGN OPTIONS		O.N.H.W.P.
<input type="checkbox"/> 1	Exhaust only/Forced Air System	
<input type="checkbox"/> 2	HRV with Ducting/Forced Air System	
<input checked="" type="checkbox"/> 3	HRV Simplified/connected to forced air system	
<input type="checkbox"/> 4	HRV with Ducting/non forced air system	
<input type="checkbox"/>	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>4</u> @ 10.6 cfm	<u>42.4</u> cfm
Table 9.32.3.A.	TOTAL	<u>169.6</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>169.6</u>	cfm
Less Principal Ventil. Capacity	<u>79.5</u>	cfm
Required Supplemental Capacity	<u>90.1</u>	cfm

PRINCIPAL EXHAUST FAN CAPACITY	
Model:	VANEE 65H
Location:	BSMT
<u>79.5</u> cfm	<input checked="" type="checkbox"/> HVI Approved

PRINCIPAL EXHAUST HEAT LOSS CALCULATION				
CFM	$\Delta T$ °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	<input checked="" type="checkbox"/>	3.5
BATH	BY INSTALLING CONTRACTOR	50	<input checked="" type="checkbox"/>	3.5
ENS-4	BY INSTALLING CONTRACTOR	50	<input checked="" type="checkbox"/>	3.5
PWD	BY INSTALLING CONTRACTOR	50	<input checked="" type="checkbox"/>	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)	<input checked="" type="checkbox"/> 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

I REVIEW AND TAKE RESPONSIBILITY FOR THE DESIGN WORK AND AM QUALIFIED IN THE APPROPRIATE CATEGORY AS AN "OTHER DESIGNER" UNDER DIVISION C, 3.2.5 OF THE BUILDING CODE.  
INDIVIDUAL BCIN: 19669 MICHAEL O'ROURKE

CSA F280-12 Residential Heat Loss and Heat Gain Calculations																																																												
Formula Sheet (For Air Leakage / Ventilation Calculation)																																																												
LO#: 87614	Model: 38-11	Builder: ROYAL PINE HOMES	Date: 4/19/2021																																																									
<b>Volume Calculation</b>			<b>Air Change &amp; Delta T Data</b>																																																									
<b>House Volume</b> <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>1154</td> <td>10</td> <td>11540</td> </tr> <tr> <td>First</td> <td>1154</td> <td>10</td> <td>11655.4</td> </tr> <tr> <td>Second</td> <td>1520</td> <td>9</td> <td>13680</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="2" style="text-align: right;">Total:</td> <td></td> <td>36,875.4 ft³</td> </tr> <tr> <td colspan="2" style="text-align: right;">Total:</td> <td></td> <td>1044.2 m³</td> </tr> </tbody> </table>			Level	Floor Area (ft²)	Floor Height (ft)	Volume (ft³)	Bsmt	1154	10	11540	First	1154	10	11655.4	Second	1520	9	13680	Third	0	9	0	Fourth	0	9	0	Total:			36,875.4 ft³	Total:			1044.2 m³	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 80%;">WINTER NATURAL AIR CHANGE RATE</td> <td style="width: 20%; text-align: center;">0.227</td> </tr> <tr> <td>SUMMER NATURAL AIR CHANGE RATE</td> <td style="text-align: center;">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>Tin °C</th> <th>Tout °C</th> <th>ΔT °C</th> <th>ΔT °F</th> </tr> <tr> <td>Winter DTDh</td> <td style="text-align: center;">22</td> <td style="text-align: center;">-21</td> <td style="text-align: center;">43</td> <td style="text-align: center;">78</td> </tr> <tr> <td>Summer DTDc</td> <td style="text-align: center;">24</td> <td style="text-align: center;">31</td> <td style="text-align: center;">7</td> <td style="text-align: center;">13</td> </tr> </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
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<b>5.2.3.1 Heat Loss due to Air Leakage</b>			<b>6.2.6 Sensible Gain due to Air Leakage</b>																																																									
$HL_{airb} = LR_{airh} \times \frac{V_b}{3.6} \times DTD_h \times 1.2$ <p> 0.227      x      290.05      x      43 °C      x      1.2      =      3408 W  =      11629 Btu/h </p>			$HG_{salb} = LR_{airc} \times \frac{V_b}{3.6} \times DTD_c \times 1.2$ <p> = 0.071      x      290.05      x      7 °C      x      1.2      =      175 W  =      597 Btu/h </p>																																																									
<b>5.2.3.2 Heat Loss due to Mechanical Ventilation</b>			<b>6.2.7 Sensible heat Gain due to Ventilation</b>																																																									
$HL_{vairb} = PVC \times DTD_h \times 1.08 \times (1 - E)$ <p> 80 CFM      x      78 °F      x      1.08      x      0.25      =      1670 Btu/h </p>			$HL_{vairb} = PVC \times DTD_h \times 1.08 \times (1 - E)$ <p> 80 CFM      x      13 °F      x      1.08      x      0.25      =      275 Btu/h </p>																																																									
<b>5.2.3.3 Calculation of Air Change Heat Loss for Each Room (Floor Multiplier Section)</b>																																																												
$HL_{airr} = Level\ Factor \times HL_{airbv} \times \{(HL_{agcr} + HL_{bgcr}) \div (HL_{agclevel} + HL_{bgclevel})\}$																																																												
Level	Level Factor (LF)	HLairve Air Leakage + Ventilation Heat Loss (Btu/h)	Level Conductive Heat Loss: (HL <sub>clevel</sub> )	Air Leakage Heat Loss Multiplier (LF x HLairbv / HLlevel)																																																								
1	0.5	11,629	8,384	0.693																																																								
2	0.3		10,746	0.325																																																								
3	0.2		12,804	0.182																																																								
4	0		0	0.000																																																								
5	0		0	0.000																																																								
<p>*HLairbv = Air leakage heat loss + ventilation heat loss</p> <p>*For a balanced or supply only ventilation system HLairve = 0</p>																																																												

**HEAT LOSS AND GAIN SUMMARY SHEET****MODEL:** 38-11**BUILDER:** ROYAL PINE HOMES**SFQT:** 2674**LO#** 87614**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 <sup>3</sup> ):	36875.4	ASSUMED (Y/N):	Y
INTERNAL SHADING:	BLINDS/CURTAINS	ASSUMED OCCUPANTS:	5
INTERIOR LIGHTING LOAD (Btu/h/ft <sup>2</sup> ):	1.65	DC BRUSHLESS MOTOR (Y/N):	Y
FOUNDATION CONFIGURATION	BCIN_1	DEPTH BELOW GRADE:	7.0 ft
LENGTH: 52.0 ft	WIDTH: 32.0 ft	EXPOSED PERIMETER:	168.0 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%	-

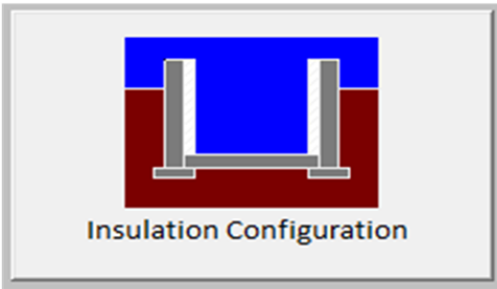
INDIVIDUAL BCIN: 19669

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):	15.8	 <p>Insulation Configuration</p>
Floor Width (m):	9.8	
Exposed Perimeter (m):	0.0	
Wall Height (m):	3.0	
Depth Below Grade (m):	2.13	
Window Area (m <sup>2</sup> ):	1.4	
Door Area (m <sup>2</sup> ):	1.9	
Radiant Slab		
Heated Fraction of the Slab:	0	
Fluid Temperature (°C):	33	
Design Months		
Heating Month	1	
Foundation Loads		
Heating Load (Watts):		1665

TYPE: 38-11

LO# 87614



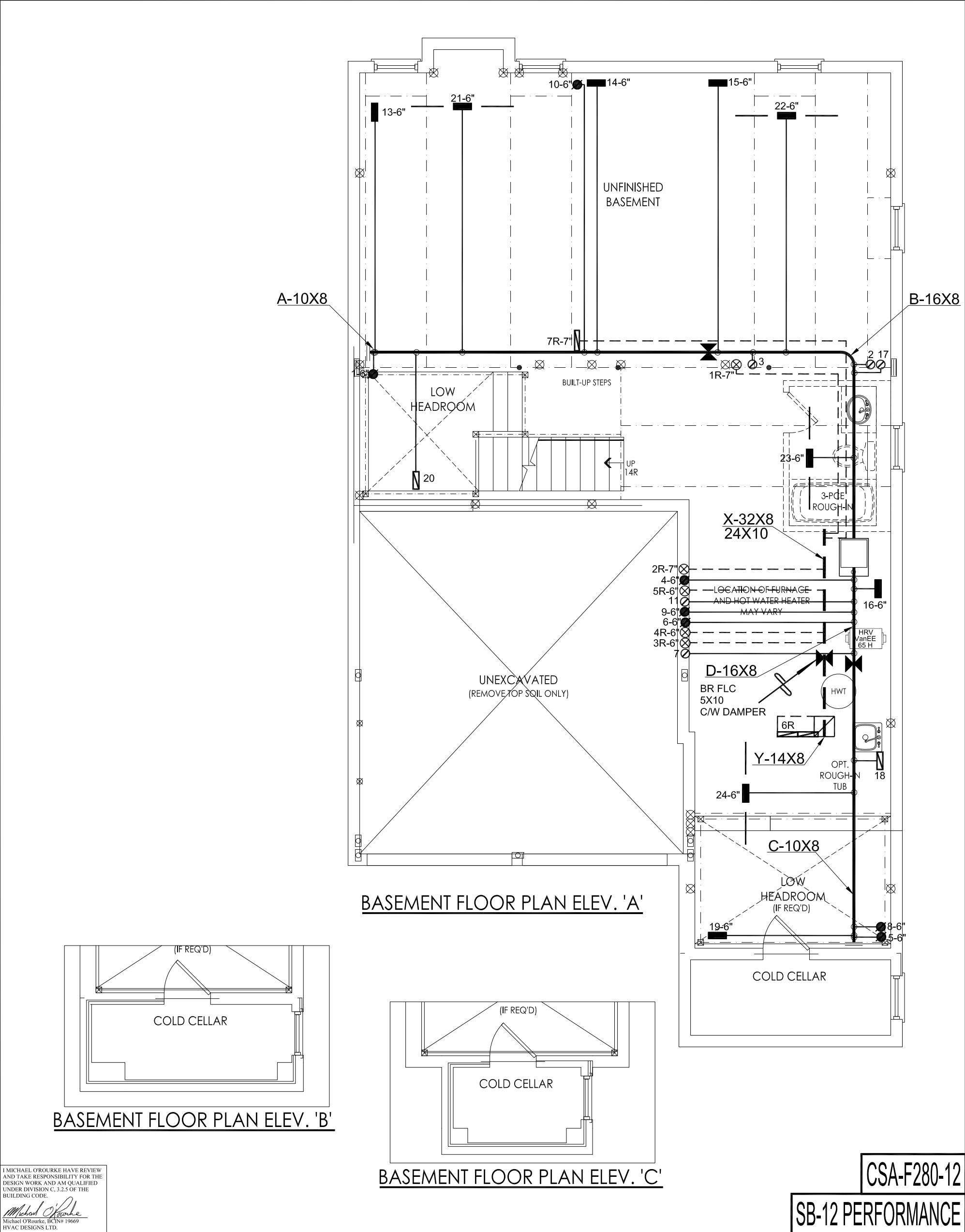
# Air Infiltration Residential Load Calculator

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 <sup>3</sup> ):	1044.2			
Air Leakage/Ventilation				
Air Tightness Type:	Energy Star Detached (2.5 ACH)			
Custom BDT Data:	ELA @ 10 Pa.		974.8 cm <sup>2</sup>	
	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: 38-11

LO# 87614



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

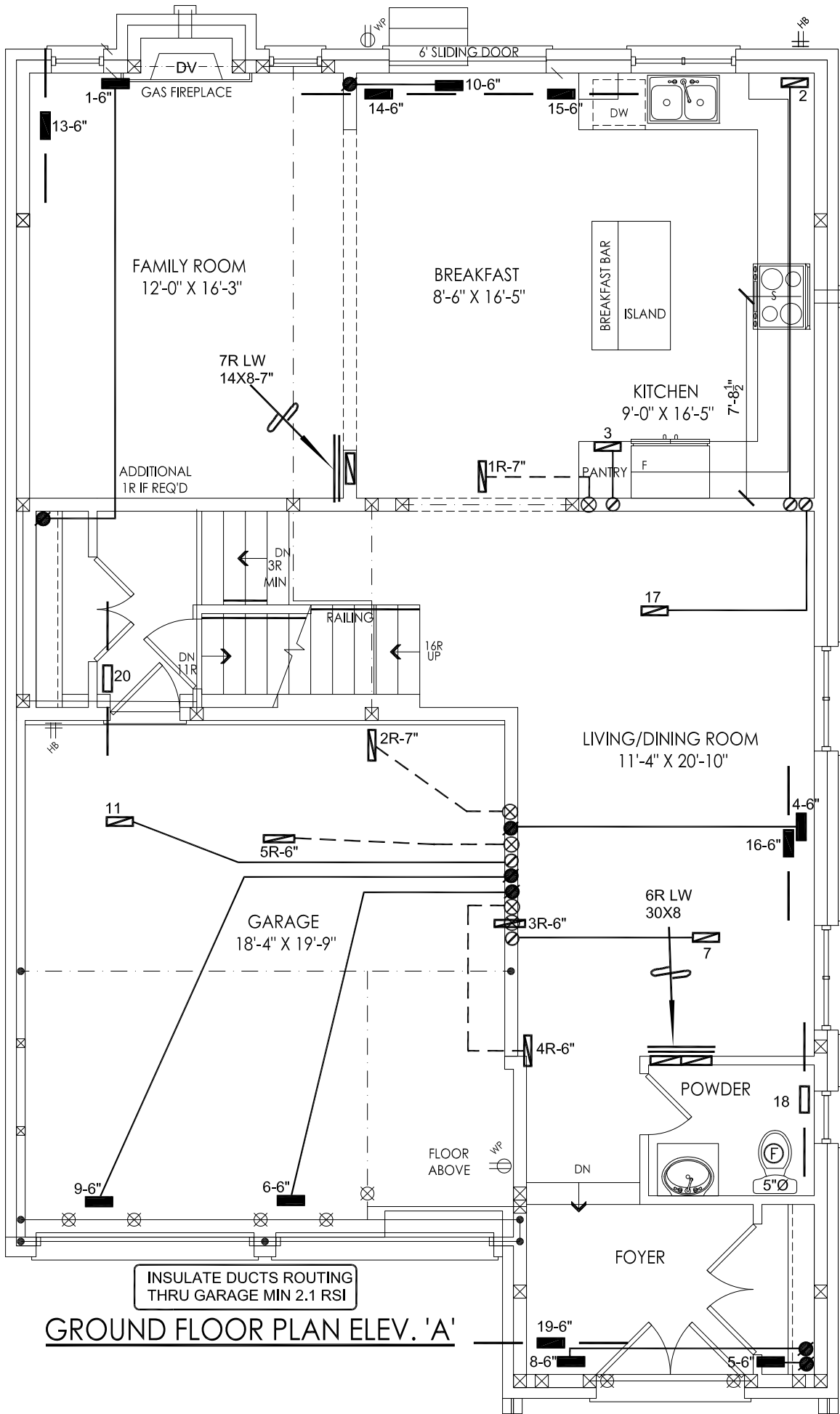
HVAC LEGEND								3.		
SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	2.	REVISED AS PER ARCHITECTURALS	APR/2021
	SUPPLY AIR GRILLE		6" SUPPLY AIR BOOT ABOVE		14"x8" RETURN AIR GRILLE		RETURN AIR STACK ABOVE	1.	REVISED TO PERFORMANCE	SEPT/2020
	SUPPLY AIR GRILLE 6" BOOT		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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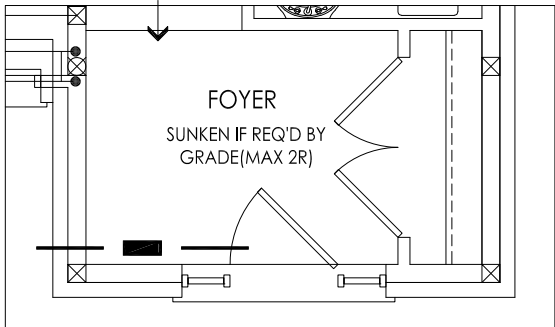
Client		<div><p>375 Finley Ave. Suite 202 - Ajax, Ontario L1S 2E2 Tel. 905.619.2300 - 905.420.5300 Fax 905.619.2375 Email: info@hvacdesigns.ca Web: www.hvacdesigns.ca Specializing in Residential Mechanical Design Services</p></div>	HEAT LOSS 46201 BTU/H		# OF RUNS S/A R/A FANS				Sheet Title  BASEMENT HEATING LAYOUT	
ROYAL PINE HOMES			UNIT DATA		3RD FLOOR					
Project Name			MAKE		2ND FLOOR				Date	
CENTREFIELD (WEST GORMLEY)			CARRIER		12 5 4				SEPT/2020	
RICHMOND HILL, ONTARIO			MODEL		7 2 2				Scale	
		59TN6A-060-14V		1ST FLOOR				3/16" = 1'-0"		
		INPUT		BASEMENT				BCIN# 19669		
		60 MBTU/H		4 1 0				LO#		
		OUTPUT		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				87614		
		58 MBTU/H								
		COOLING								
		3.0 TONS								
		FAN SPEED								
		1145 cfm @ 0.6" w.c.								

Installation to comply with the latest Ontario Building Code. All supply branch outlets shall be equipped with a manual balancing damper. Ductwork which passes through the garage or unheated spaces shall be adequately insulated and be gas-proofed.	
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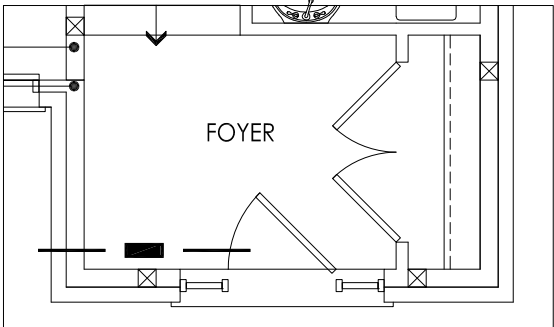
38-11	2674 sqft
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GROUND FLOOR PLAN ELEV. 'A'



GROUND FLOOR PLAN ELEV. 'B'



GROUND FLOOR PLAN ELEV. 'C'

CSA-F280-12

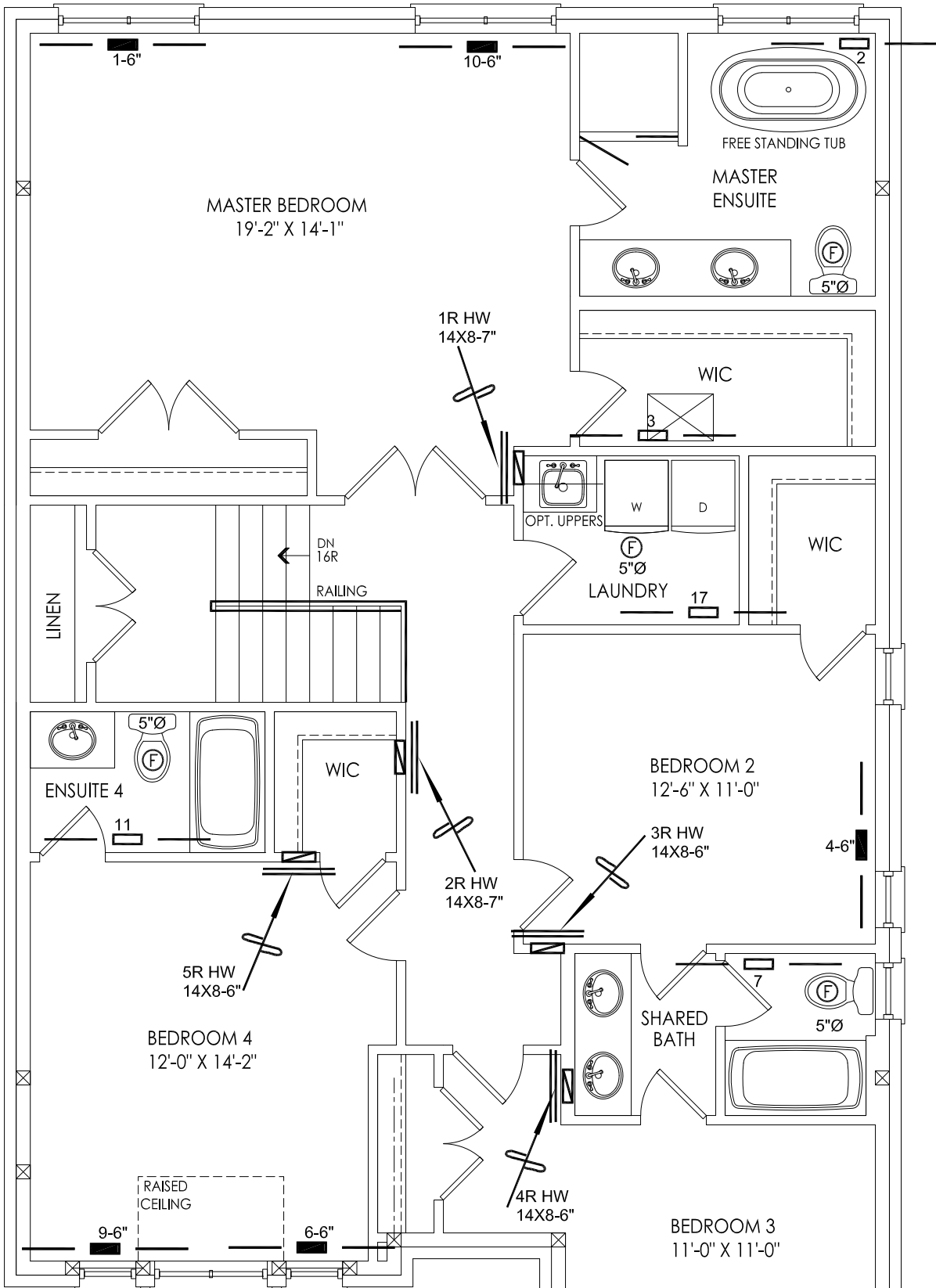
SB-12 PERFORMANCE

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.

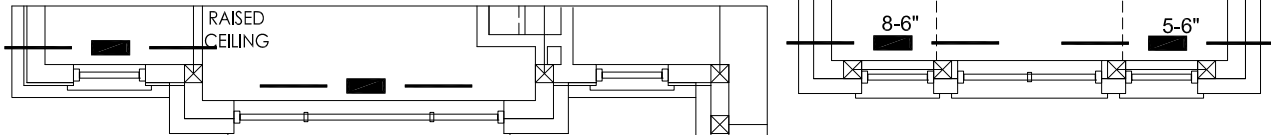
HVAC LEGEND								3.		
SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	2.	REVISED AS PER ARCHITECTURALS	APR/2021
	SUPPLY AIR GRILLE		6" SUPPLY AIR BOOT ABOVE		14"x8" RETURN AIR GRILLE		RETURN AIR STACK ABOVE	1.	REVISED TO PERFORMANCE	SEPT/2020
	SUPPLY AIR GRILLE 6" BOOT		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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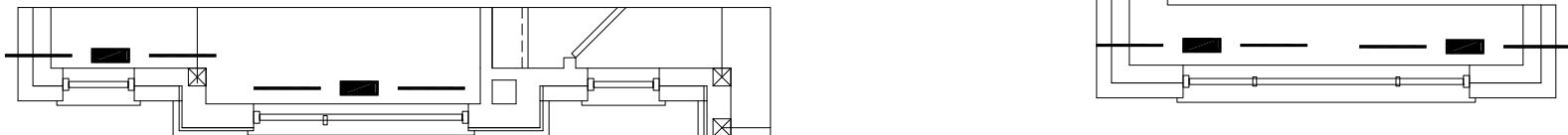
Client		<div></div> <div>375 Finley Ave. Suite 202 - Ajax, Ontario L1S 2E2 Tel. 905.619.2300 - 905.420.5300 Fax 905.619.2375 Email: info@hvacdesigns.ca Web: www.hvacdesigns.ca Specializing in Residential Mechanical Design Services</div>	Sheet Title	
ROYAL PINE HOMES			FIRST FLOOR HEATING LAYOUT	
Project 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"
			BCIN# 19669	
38-11			LO#	87614
2674 sqft				



SECOND FLOOR PLAN 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

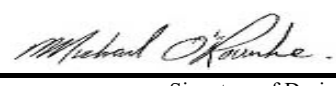
HVAC LEGEND								3.		
SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	2.	REVISED AS PER ARCHITECTURALS	APR/2021
	SUPPLY AIR GRILLE		6" SUPPLY AIR BOOT ABOVE		14"x8" RETURN AIR GRILLE		RETURN AIR STACK ABOVE	1.	REVISED TO PERFORMANCE	SEPT/2020
	SUPPLY AIR GRILLE 6" BOOT		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		<div></div> <div>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</div> <div>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.</div>	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"
38-11		BCIN# 19669		
2674 sqft		LO#	87614	

## Schedule 1: Designer Information

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

<b>A. Project Information</b>			
Building number, street name		Unit no.	Lot/con.
Municipality RICHMOND HILL	Postal code	Plan number/ other description	
<b>B. Individual who reviews and takes responsibility for design activities</b>			
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 ( )	
<b>C. Design activities undertaken by individual identified in Section B. [Building Code Table 3.5.2.1 OF Division C]</b>			
<input type="checkbox"/> House <input type="checkbox"/> Small Buildings <input type="checkbox"/> Large Buildings <input type="checkbox"/> Complex Buildings <input checked="" type="checkbox"/> HVAC – House <input type="checkbox"/> Building Services <input type="checkbox"/> Detection, Lighting and Power <input type="checkbox"/> Fire Protection <input type="checkbox"/> Building Structural <input type="checkbox"/> Plumbing – House <input type="checkbox"/> Plumbing – All Buildings <input type="checkbox"/> 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		<b>Model:</b> 38-11 BELVEDERE FIN BSMT WUB <b>Project:</b> CENTREFIELD (WEST GORMLEY)	
<b>D. Declaration of Designer</b>			
I, <u>MICHAEL O'ROURKE</u> declare that (choose one as appropriate): (print name)			
<input type="checkbox"/> 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: _____			
<input checked="" type="checkbox"/> 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>			
<input type="checkbox"/> 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.

**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: 38-11										GFA: 2674										LO# 87615										SUMMER NATURAL AIR CHANGE RATE 0.071										HEAT GAIN ΔT °F. 13										SB-12 PERFORMANCE									
ROOM USE			MBR			ENS			WIC			BED-2			BED-3			BED-4			BATH									ENS-4			B-BATH																																				
EXP. WALL			41			22			6			18			35			31			7									8			9																																				
CLG. HT.			9			9			9			9			9			9			9									9			10																																				
FACTORS																																																																					
GRS.WALL AREA			LOSS GAIN			369			198			54			162			315			279			63						72			63																																				
GLAZING			LOSS GAIN			LOSS GAIN			LOSS GAIN			LOSS GAIN			LOSS GAIN			LOSS GAIN			LOSS GAIN			LOSS GAIN			LOSS GAIN			LOSS GAIN			LOSS GAIN			LOSS GAIN			LOSS GAIN																														
NORTH			21.8	16.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0																																	
EAST			21.8	41.6	44	958	1828	22	479	914	0	0	0	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	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0																																
WEST			21.8	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	0	0	0	0	0	0	0	0																																
SKYLT.			35.8	101.2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0																																
DOORS			25.8	4.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0																																
NET EXPOSED WALL			4.2	0.7	325	1367	225	176	740	122	54	227	37	144	606	100	264	1110	183	224	942	155	56	236	39																																												
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																																												
EXPOSED CLG			1.3	0.6	355	467	209	125	164	73	70	92	41	232	305	136	162	213	95	198	260	116	85	112	50																																												
NO ATTIC EXPOSED CLG			2.8	1.3	0	0	0	0	0	0	0	0	0	0	0	0	40	112	50	40	112	50	0	0	0																																												
EXPOSED FLOOR			2.6	0.4	0	0	0	0	0	0	0	0	0	0	0	0	40	104	17	238	621	102	0	0	0																																												
BASEMENT/CRAWL HEAT LOSS																																																																					
SLAB ON GRADE HEAT LOSS																																																																					
SUBTOTAL HT LOSS																																																																					
SUB TOTAL HT GAIN																																																																					
LEVEL FACTOR / MULTIPLIER			0.20	0.18			0.20	0.18			0.20	0.18			0.20	0.18			0.20	0.18			0.20	0.18			0.20	0.18			0.50	0.66																																					
AIR CHANGE HEAT LOSS																																																																					
AIR CHANGE HEAT GAIN																																																																					
DUCT LOSS																																																																					
DUCT GAIN																																																																					
HEAT GAIN PEOPLE			240		2		480	0		0	0		1		240	1		240	1		240	0		0				0		0		0		0		0																																	
HEAT GAIN APPLIANCES/LIGHTS																																																																					
TOTAL HT LOSS BTU/H							3299			1635		377		1693		3446		4074		650																																																	
TOTAL HT GAIN x 1.3 BTU/H							4674			1514		107		2431		5103		5470		395																																																	

ROOM USE					FAM		KT/BR		LV/DN		LAUN		PWD		FOY		MUD								WUB		BAS					
EXP. WALL					32		35		39		0		6		29		15								17		142					
CLG. HT.					10		10		10		9		10		11		11								10		10					
FACTORS																																
GRS.WALL AREA	LOSS	GAIN			323		354		394		0		61		322		167								170		994					
GLAZING	LOSS	GAIN	LOSS	GAIN	LOSS	GAIN	LOSS	GAIN	LOSS	GAIN	LOSS	GAIN	LOSS	GAIN	LOSS	GAIN	LOSS	GAIN	LOSS	GAIN	LOSS	GAIN	LOSS	GAIN	LOSS	GAIN	LOSS	GAIN				
NORTH	21.8	16.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
EAST	21.8	41.6	22	479	914	63	1372	2618	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	65	125	6	131	249		
SOUTH	21.8	24.9	0	0	0	0	0	0	38	828	946	0	0	0	9	196	224	0	0	0	0	0	0	0	0	0	0	6	131	149		
WEST	21.8	41.6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	18	392	748	0	0	0	0	0	0	0	0	0	0		
SKYLT.	35.8	101.2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
DOORS	25.8	4.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	40	1034	170	20	517	85	20	517	85	20	517	85	20	517	85
NET EXPOSED WALL	4.2	0.7	301	1267	208	291	1222	201	356	1497	246	0	0	0	52	217	36	264	1110	183	147	616	101	147	618	102	0	0	0	0	0	
NET EXPOSED BSMT WALL ABOVE GR	3.7	0.6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
EXPOSED CLG	1.3	0.6	0	0	0	0	0	0	0	0	0	95	125	56	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
NO ATTIC EXPOSED CLG	2.8	1.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
EXPOSED FLOOR	2.6	0.4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
BASEMENT/CRAWL HEAT LOSS																																
SLAB ON GRADE HEAT LOSS																																
SUBTOTAL HT LOSS						1746		2594		2324		125		413		2536		1133							106							4744
SUB TOTAL HT GAIN							1123		2819		1192		56		260		1101		186							1306						7091
LEVEL FACTOR / MULTIPLIER	0.30	0.32				0.30	0.32		0.30	0.32		0.20	0.18		0.30	0.32		0.30	0.32		0.30	0.32				311			0.50	0.66		742
AIR CHANGE HEAT LOSS						567		842		755		23		134		823		368														5529
AIR CHANGE HEAT GAIN							56		140		59		3		13		55		9													52
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	0	0
HEAT GAIN APPLIANCES/LIGHTS						742		742		742		0		0		0		0		0		0	0	0	0	0	0	0	0	0	0	742
TOTAL HT LOSS BTU/H						2313		3436		3079		148		547		3359		1501							1306							12620
TOTAL HT GAIN x 1.3 BTU/H						2496		4810		2591		76		354		1502		254							405							1997

TOTAL HEAT GAIN BTU/H: 34767 TONS: 2.90 LOSS DUE TO VENTILATION LOAD BTU/H: 1670 STRUCTURAL HEAT LOSS: 44977 TOTAL COMBINED HEAT LOSS BTU/H: 46647

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

FIN BSMT WUB  
TYPE: 38-11

DATE: Apr-21

GFA: 2674 LO# 87615

HEATING CFM 1145 COOLING CFM 1145  
TOTAL HEAT LOSS 44,977 TOTAL HEAT GAIN 34,492  
AIR FLOW RATE CFM 25.46 AIR FLOW RATE CFM 33.2

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

LOW 820  
MEDLOW 0  
MEDIUM 1145  
MEDIUM HIGH 0  
HIGH 1520

DESIGN CFM = 1145  
CFM @ .6" E.S.P.

TEMPERATURE RISE 47 °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	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-3	BED-4	MBR	ENS-4	FAM	KT/BR	KT/BR	LV/DN	LAUN	PWD	FOY	MUD	BAS	BAS	B-BATH	BAS
RM LOSS MBH.	1.65	1.63	0.38	1.69	1.72	2.04	0.65	1.72	2.04	1.65	0.78	2.31	1.72	1.72	3.08	0.15	0.55	3.36	1.50	3.48	3.48	0.72	3.48
CFM PER RUN HEAT	42	42	10	43	44	52	17	44	52	42	20	59	44	44	78	4	14	86	38	89	89	18	89
RM GAIN MBH.	2.34	1.51	0.11	2.43	2.55	2.74	0.39	2.55	2.74	2.34	0.19	2.50	2.41	2.41	2.59	0.08	0.35	1.50	0.25	0.60	0.60	0.12	0.60
CFM PER RUN COOLING	78	50	4	81	85	91	13	85	91	78	6	83	80	80	86	3	12	50	8	20	20	4	20
ADJUSTED PRESSURE	0.17	0.17	0.17	0.16	0.16	0.16	0.17	0.16	0.16	0.17	0.17	0.16	0.17	0.17	0.16	0.17	0.17	0.16	0.17	0.16	0.16	0.17	0.16
ACTUAL DUCT LGH.	69	37	30	32	34	40	32	42	46	56	36	53	42	35	14	32	14	30	45	61	37	8	20
EQUIVALENT LENGTH	130	140	120	150	140	120	120	150	130	190	160	130	150	100	120	180	130	130	140	160	140	130	120
TOTAL EFFECTIVE LENGTH	199	177	150	182	174	160	152	192	176	246	196	183	192	135	134	212	144	160	185	221	177	138	140
ADJUSTED PRESSURE	0.09	0.1	0.11	0.09	0.09	0.1	0.11	0.08	0.09	0.07	0.09	0.09	0.09	0.13	0.12	0.08	0.12	0.1	0.09	0.07	0.09	0.12	0.12
ROUND DUCT SIZE	6	5	4	6	6	6	4	6	6	6	4	6	5	5	6	4	4	6	4	6	6	4	6
HEATING VELOCITY (ft/min)	214	308	115	219	224	265	195	224	265	214	229	301	323	323	398	46	161	438	436	454	454	207	454
COOLING VELOCITY (ft/min)	398	367	46	413	433	464	149	433	464	398	69	423	587	587	438	34	138	255	92	102	102	46	102
OUTLET GRILL SIZE	4X10	3X10	3X10	4X10	4X10	4X10	3X10	4X10	4X10	4X10	3X10	4X10	3X10	3X10	4X10	3X10	3X10	4X10	3X10	4X10	4X10	3X10	4X10
TRUNK	A	B	B	D	C	D	D	C	D	A	D	A	A	B	D	B	C	C	A	A	B	B	C

RUN #	25
ROOM NAME	BAS
RM LOSS MBH.	3.48
CFM PER RUN HEAT	89
RM GAIN MBH.	0.60
CFM PER RUN COOLING	20
ADJUSTED PRESSURE	0.16
ACTUAL DUCT LGH.	20
EQUIVALENT LENGTH	160
TOTAL EFFECTIVE LENGTH	180
ADJUSTED PRESSURE	0.09
ROUND DUCT SIZE	6
HEATING VELOCITY (ft/min)	454
COOLING VELOCITY (ft/min)	102
OUTLET GRILL SIZE	4X10
TRUNK	B

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	314	0.07	9.4	10	x	8	565	TRUNK G	0	0.00	0	0	x	8	0	TRUNK O	0	0.05	0	0	x	8	0		
TRUNK B	610	0.07	12	16	x	8	686	TRUNK H	0	0.00	0	0	x	8	0	TRUNK P	0	0.05	0	0	x	8	0		
TRUNK C	277	0.08	8.7	10	x	8	499	TRUNK I	0	0.00	0	0	x	8	0	TRUNK Q	0	0.05	0	0	x	8	0		
TRUNK D	539	0.08	11.1	16	x	8	606	TRUNK J	0	0.00	0	0	x	8	0	TRUNK R	0	0.05	0	0	x	8	0		
TRUNK E	0	0.00	0	0	x	8	0	TRUNK K	0	0.00	0	0	x	8	0	TRUNK 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	0	
AIR VOLUME	130	130	75	75	85	340	130	0	0	0	0	0	0	0	0	0	0	0	180
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
ACTUAL DUCT LGH.	49	41	39	46	45	24	39	1	1	1	1	1	1	1	1	1	1	1	14
EQUIVALENT LENGTH	195	175	275	235	195	120	215	0	0	0	0	0	0	0	0	0	0	0	135
TOTAL EFFECTIVE LH	244	216	314	281	240	144	254	1	1	1	1	1	1	1	1	1	1	1	149
ADJUSTED PRESSURE	0.06	0.07	0.05	0.05	0.06	0.10	0.06	14.80	14.80	14.80	14.80	14.80	14.80	14.80	14.80	14.80	14.80	14.80	0.10
ROUND DUCT SIZE	7	6.8	6	6	6	8.9	7	0	0	0	0	0	0	0	0	0	0	0	7
INLET GRILL SIZE	8	8	8	8	8	8	8	0	0	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	X	X
INLET GRILL SIZE	14	14	14	14	14	30	14	0	0	0	0	0	0	0	0	0	0	0	14

TRUNK W	0	0.05	0	0	x	8	0
TRUNK X	1145	0.05	16.6	32	x	8	644
TRUNK Y	340	0.05	10.5	14	x	8	437
TRUNK Z	0	0.05	0	0	x	8	0
DROP	1145	0.05	16.6	24	x	10	687

TYPE: 38-11  
SITE NAME: CENTREFIELD (WEST GORMLEY)

LO # 87615  
FIN BSMT WUB

**RESIDENTIAL MECHANICAL VENTILATION DESIGN SUMMARY**

COMBUSTION APPLIANCES		9.32.3.1(1)
a)	<input checked="" type="checkbox"/> Direct vent (sealed combustion) only	
b)	<input type="checkbox"/> Positive venting induced draft (except fireplaces)	
c)	<input type="checkbox"/> Natural draft, B-vent or induced draft gas fireplace	
d)	<input type="checkbox"/> Solid Fuel (including fireplaces)	
e)	<input type="checkbox"/> No Combustion Appliances	

HEATING SYSTEM	
<input checked="" type="checkbox"/> Forced Air	<input type="checkbox"/> Non Forced Air
<input type="checkbox"/> Electric Space Heat	

HOUSE TYPE		9.32.1(2)
<input checked="" type="checkbox"/> I	Type a) or b) appliance only, no solid fuel	
<input type="checkbox"/> II	Type I except with solid fuel (including fireplaces)	
<input type="checkbox"/> III	Any Type c) appliance	
<input type="checkbox"/> IV	Type I, or II with electric space heat	
<input type="checkbox"/>	Other: Type I, II or IV no forced air	

SYSTEM DESIGN OPTIONS		O.N.H.W.P.
<input type="checkbox"/> 1	Exhaust only/Forced Air System	
<input type="checkbox"/> 2	HRV with Ducting/Forced Air System	
<input checked="" type="checkbox"/> 3	HRV Simplified/connected to forced air system	
<input type="checkbox"/> 4	HRV with Ducting/non forced air system	
<input type="checkbox"/>	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>6</u> @ 10.6 cfm	<u>63.6</u> cfm
Other Rooms	<u>4</u> @ 10.6 cfm	<u>42.4</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	<input checked="" type="checkbox"/> HVI Approved

PRINCIPAL EXHAUST HEAT LOSS CALCULATION				
CFM	$\Delta T$ °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	<input checked="" type="checkbox"/>	3.5
BATH	BY INSTALLING CONTRACTOR	50	<input checked="" type="checkbox"/>	3.5
ENS-4	BY INSTALLING CONTRACTOR	50	<input checked="" type="checkbox"/>	3.5
PWD	BY INSTALLING CONTRACTOR	50	<input checked="" type="checkbox"/>	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	<input checked="" type="checkbox"/> 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#: 87615	Model: 38-11	Builder: ROYAL PINE HOMES	Date: 4/19/2021																																																									
<b>Volume Calculation</b>			<b>Air Change &amp; Delta T Data</b>																																																									
<b>House Volume</b> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>Level</th> <th>Floor Area (ft<sup>2</sup>)</th> <th>Floor Height (ft)</th> <th>Volume (ft<sup>3</sup>)</th> </tr> </thead> <tbody> <tr> <td>Bsmt</td> <td>1154</td> <td>10</td> <td>11540</td> </tr> <tr> <td>First</td> <td>1154</td> <td>10</td> <td>11655.4</td> </tr> <tr> <td>Second</td> <td>1520</td> <td>9</td> <td>13680</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>36,875.4 ft<sup>3</sup></td> </tr> <tr> <td colspan="3" style="text-align: right;">Total:</td> <td>1044.2 m<sup>3</sup></td> </tr> </tbody> </table>			Level	Floor Area (ft <sup>2</sup> )	Floor Height (ft)	Volume (ft <sup>3</sup> )	Bsmt	1154	10	11540	First	1154	10	11655.4	Second	1520	9	13680	Third	0	9	0	Fourth	0	9	0	Total:			36,875.4 ft <sup>3</sup>	Total:			1044.2 m <sup>3</sup>	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 80%;">WINTER NATURAL AIR CHANGE RATE</td> <td style="width: 20%; text-align: center;">0.227</td> </tr> <tr> <td>SUMMER NATURAL AIR CHANGE RATE</td> <td style="text-align: center;">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<sub>in</sub> °C</th> <th>T<sub>out</sub> °C</th> <th>ΔT °C</th> <th>ΔT °F</th> </tr> <tr> <td>Winter DTD<sub>h</sub></td> <td style="text-align: center;">22</td> <td style="text-align: center;">-21</td> <td style="text-align: center;">43</td> <td style="text-align: center;">78</td> </tr> <tr> <td>Summer DTD<sub>c</sub></td> <td style="text-align: center;">24</td> <td style="text-align: center;">31</td> <td style="text-align: center;">7</td> <td style="text-align: center;">13</td> </tr> </table>		WINTER NATURAL AIR CHANGE RATE	0.227	SUMMER NATURAL AIR CHANGE RATE	0.071	Design Temperature Difference						T <sub>in</sub> °C	T <sub>out</sub> °C	ΔT °C	ΔT °F	Winter DTD <sub>h</sub>	22	-21	43	78	Summer DTD <sub>c</sub>	24	31	7	13
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<b>5.2.3.1 Heat Loss due to Air Leakage</b>			<b>6.2.6 Sensible Gain due to Air Leakage</b>																																																									
$HL_{airb} = LR_{airh} \times \frac{V_b}{3.6} \times DTD_h \times 1.2$ <p>0.227 x 290.05 x 43 °C x 1.2 = 3408 W</p> <p>= 11629 Btu/h</p>			$HG_{salb} = LR_{airc} \times \frac{V_b}{3.6} \times DTD_c \times 1.2$ <p>= 0.071 x 290.05 x 7 °C x 1.2 = 175 W</p> <p>= 597 Btu/h</p>																																																									
<b>5.2.3.2 Heat Loss due to Mechanical Ventilation</b>			<b>6.2.7 Sensible heat Gain due to Ventilation</b>																																																									
$HL_{vairb} = PVC \times DTD_h \times 1.08 \times (1 - E)$ <p>80 CFM x 78 °F x 1.08 x 0.25 = 1670 Btu/h</p>			$HL_{vairb} = PVC \times DTD_h \times 1.08 \times (1 - E)$ <p>80 CFM x 13 °F x 1.08 x 0.25 = 275 Btu/h</p>																																																									
<b>5.2.3.3 Calculation of Air Change Heat Loss for Each Room (Floor Multiplier Section)</b>																																																												
$HL_{airr} = Level\ Factor \times HL_{airbv} \times \{(HL_{agcr} + HL_{bgcr}) \div (HL_{agclevel} + HL_{bgclevel})\}$ <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>Level</th> <th>Level Factor (LF)</th> <th>HL<sub>airve</sub> Air Leakage + Ventilation Heat Loss (Btu/h)</th> <th>Level Conductive Heat Loss: (HL<sub>clevel</sub>)</th> <th>Air Leakage Heat Loss Multiplier (LF x HL<sub>airbv</sub> / HL<sub>level</sub>)</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>0.5</td> <td rowspan="5" style="text-align: center; vertical-align: middle;">11,629</td> <td style="text-align: center;">8,831</td> <td style="text-align: center;">0.658</td> </tr> <tr> <td>2</td> <td>0.3</td> <td style="text-align: center;">10,746</td> <td style="text-align: center;">0.325</td> </tr> <tr> <td>3</td> <td>0.2</td> <td style="text-align: center;">12,804</td> <td style="text-align: center;">0.182</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> <p>*HL<sub>airbv</sub> = Air leakage heat loss + ventilation heat loss  *For a balanced or supply only ventilation system HL<sub>airve</sub> = 0</p>					Level	Level Factor (LF)	HL <sub>airve</sub> Air Leakage + Ventilation Heat Loss (Btu/h)	Level Conductive Heat Loss: (HL <sub>clevel</sub> )	Air Leakage Heat Loss Multiplier (LF x HL <sub>airbv</sub> / HL <sub>level</sub> )	1	0.5	11,629	8,831	0.658	2	0.3	10,746	0.325	3	0.2	12,804	0.182	4	0	0	0.000	5	0	0	0.000																														
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5	0		0	0.000																																																								

**HEAT LOSS AND GAIN SUMMARY SHEET**

<b>MODEL:</b> 38-11	<b>FIN BSMT WUB</b>	<b>BUILDER:</b> ROYAL PINE HOMES
<b>SFQT:</b> 2674	<b>LO#</b> 87615	<b>SITE:</b> 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 <sup>3</sup> ):	36875.4	ASSUMED (Y/N):	Y
INTERNAL SHADING:	BLINDS/CURTAINS	ASSUMED OCCUPANTS:	5
INTERIOR LIGHTING LOAD (Btu/h/ft <sup>2</sup> ):	1.55	DC BRUSHLESS MOTOR (Y/N):	Y
FOUNDATION CONFIGURATION	BCIN_1	DEPTH BELOW GRADE:	7.0 ft
LENGTH: 52.0 ft	WIDTH: 32.0 ft	EXPOSED PERIMETER:	151.0 ft

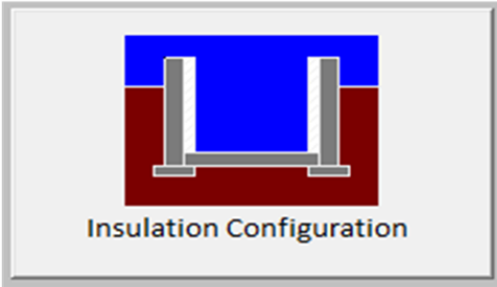
2012 OBC - COMPLIANCE PACKAGE		Compliance Package SB-12 PERFORMANCE	
Component		Nominal	Min. Eff.
Ceiling with Attic Space Minimum RSI (R)-Value		60	59.20
Ceiling Without Attic Space Minimum RSI (R)-Value		31	27.70
Exposed Floor Minimum RSI (R)-Value		31	29.80
Walls Above Grade Minimum RSI (R)-Value		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

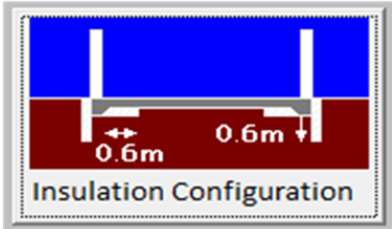
Weather Station Description		
Province:	Ontario	
Region:	Richmond Hill	
Site Description		
Soil Conductivity:	Normal conductivity: dry sand, loam, clay	
Water Table:	Normal (7-10 m, 23-33 ft)	
Foundation Dimensions		
Floor Length (m):	15.8	
Floor Width (m):	9.8	
Exposed Perimeter (m):	46.0	
Wall Height (m):	3.0	
Depth Below Grade (m):	2.13	
Window Area (m <sup>2</sup> ):	1.7	
Door Area (m <sup>2</sup> ):	3.7	
Radiant Slab		
Heated Fraction of the Slab:	0	
Fluid Temperature (°C):	33	
Design Months		
Heating Month	1	
Foundation Loads		
Heating Load (Watts):		1469

TYPE: 38-11  
LO# 87615

FIN BSMT WUB

## 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):	4.6	
Width (m):	0.6	
Exposed Perimeter (m):	5.2	
Radiant Slab		
Heated Fraction of the Slab:	0	
Fluid Temperature (°C):	33	
Design Months		
Heating Month	1	
Results		
Heating Load (Watts):		31

TYPE: 38-11  
LO# 87615

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 <sup>3</sup> ):	1044.2			
Air Leakage/Ventilation				
Air Tightness Type:	Energy Star Detached (2.5 ACH)			
Custom BDT Data:	ELA @ 10 Pa.		974.8 cm <sup>2</sup>	
	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: 38-11  
LO# 87615

FIN BSMT WUB



City of Richmond Hill  
Building Division

**REVIEWED**

By: **PxV** Date: **SEP/10/2021**

Building Permit #: **BP#-2021-50828**

All construction shall comply with the Ontario Building Code and all other applicable statutory regulations. The reviewed documents must be kept on site at all times.

Building inspection line: 905-771-5465 (24 hr)  
buildinginspections@richmondhill.ca  
Building inquiry line 905-771-8810  
building@richmondhill.ca

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

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

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

Volume control dampers to all branches to be installed per OBC 2012, Div.B, 6.2.4.5.

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

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

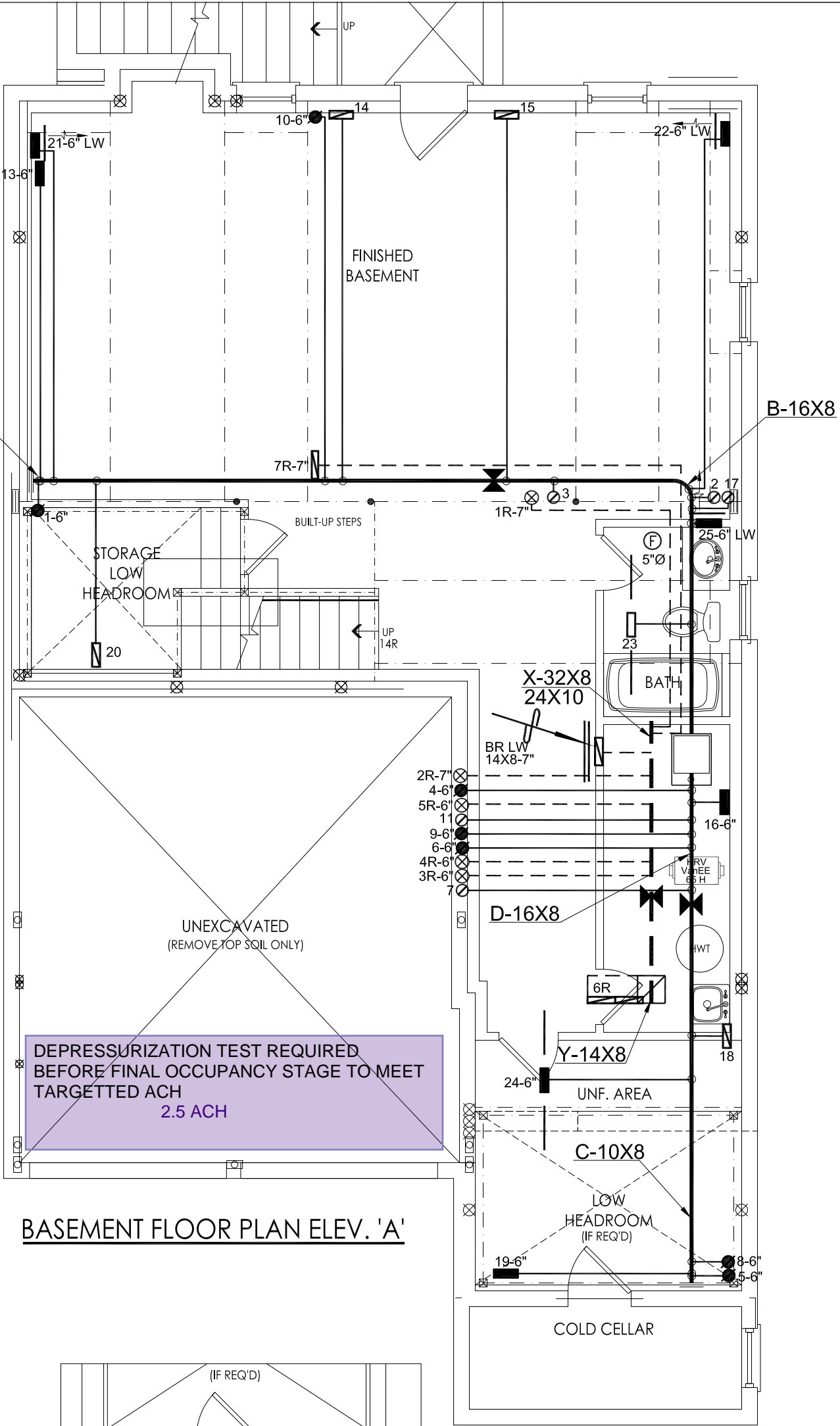
HRV installation, testing, startup and commissioning shall be in compliance with OBC 2012, Div.B 9.32.3.11, 9.32.3.11(7)&(10)

HRV duct connection shall be in compliance with OBC 2012 Div.B 9.32.3.6(3) & 9.32.3.4(7).

For simplified HRV/ERV installation, with stale air and fresh air connected to return air plenum, stale air intake and fresh air supply shall be separated minimum 3' or as recommended by HRV/ERV Manufacturer.

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

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



BASEMENT FLOOR PLAN ELEV. 'A'

BASEMENT FLOOR PLAN ELEV. 'B'

BASEMENT FLOOR PLAN ELEV. 'C'

**WUB**

**CSA-F280-12**

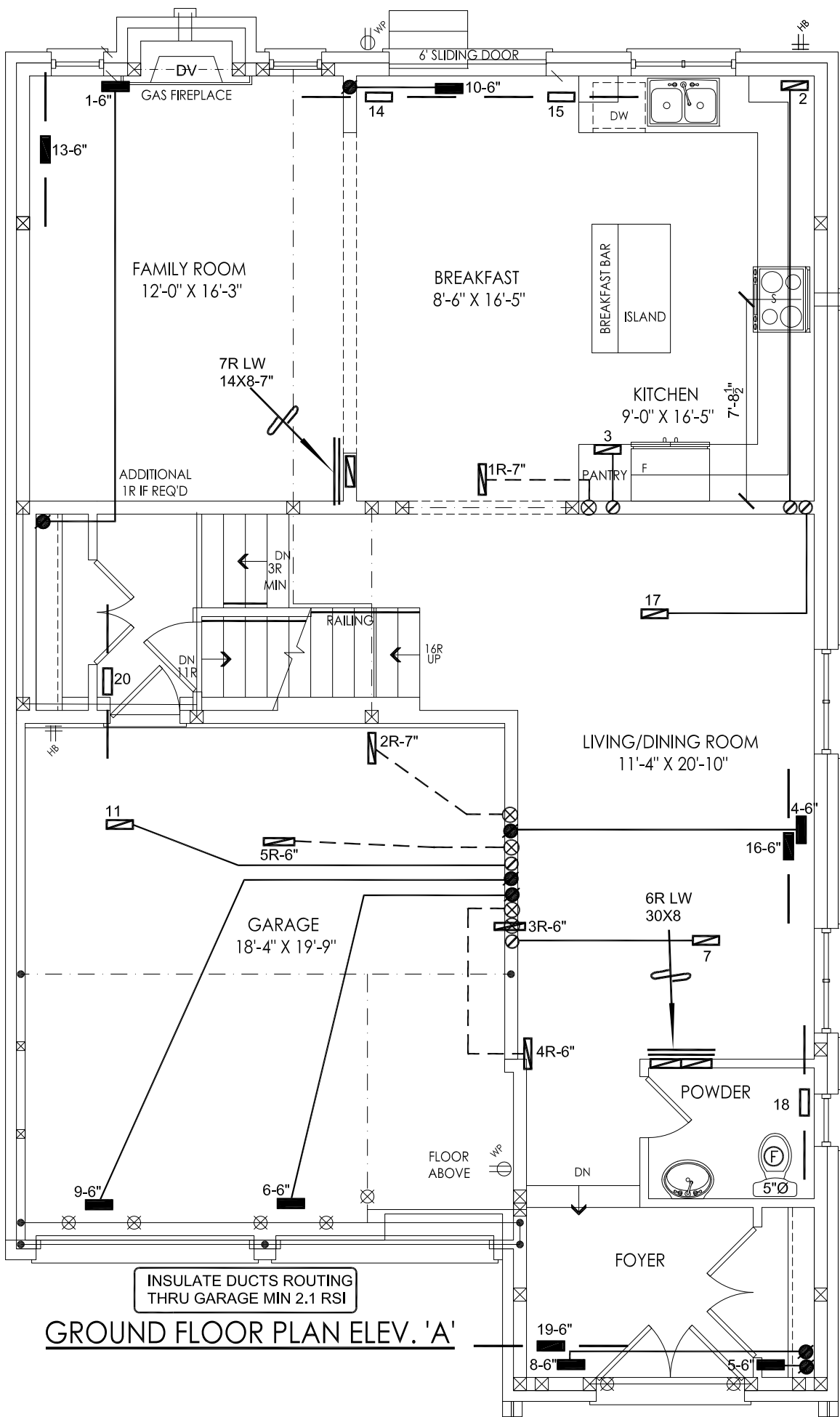
**SB-12 PERFORMANCE**

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.

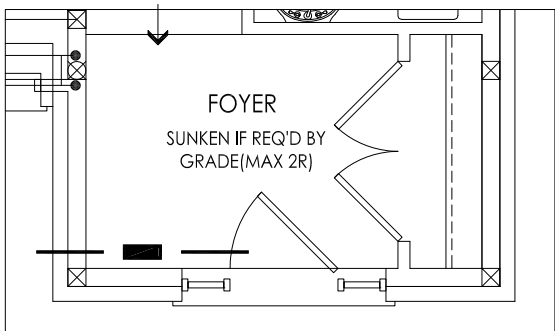
HVAC LEGEND								3.		
SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	2.	REVISED AS PER ARCHITECTURALS	APR/2021
	SUPPLY AIR GRILLE		6" SUPPLY AIR BOOT ABOVE		14"x8" RETURN AIR GRILLE		RETURN AIR STACK ABOVE	1.	REVISED TO PERFORMANCE	SEPT/2020
	SUPPLY AIR GRILLE 6" BOOT	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

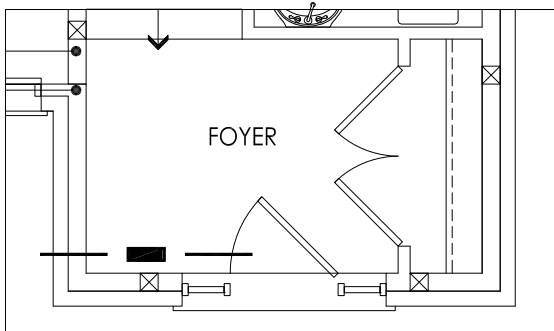
Client	<div><p>375 Finley Ave. Suite 202 - Ajax, Ontario L1S 2E2 Tel. 905.619.2300 - 905.420.5300 Fax 905.619.2375 Email: info@hvacdesigns.ca Web: www.hvacdesigns.ca Specializing in Residential Mechanical Design Services</p><p>Installation to comply with the latest Ontario Building Code. All supply branch 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.</p></div>	HEAT LOSS 46647 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		4
CENTREFIELD (WEST GORMLEY) RICHMOND HILL, ONTARIO		INPUT 60 MBTU/H	1ST FLOOR			7	2		2
FIN BSMT WUB 38-11		OUTPUT 58 MBTU/H	BASEMENT			5	1	1	Date SEPT/2020
2674 sqft		COOLING 3.0 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 1145 cfm @ 0.6" w.c.						BCIN# 19669	
								LO# 87615	



GROUND FLOOR PLAN ELEV. 'A'



GROUND FLOOR PLAN ELEV. 'B'



GROUND FLOOR PLAN ELEV. 'C'

WUB

CSA-F280-12

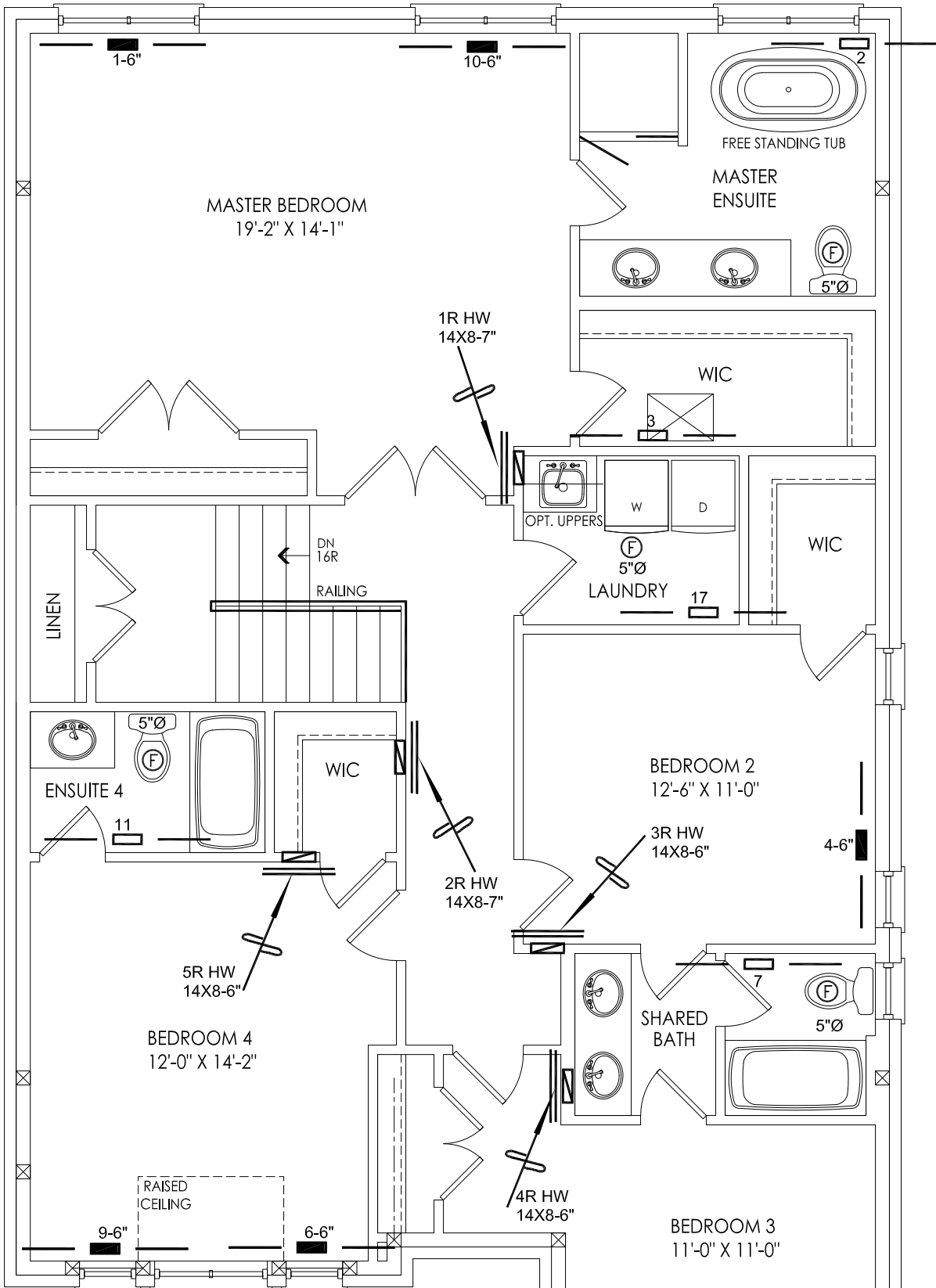
SB-12 PERFORMANCE

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.

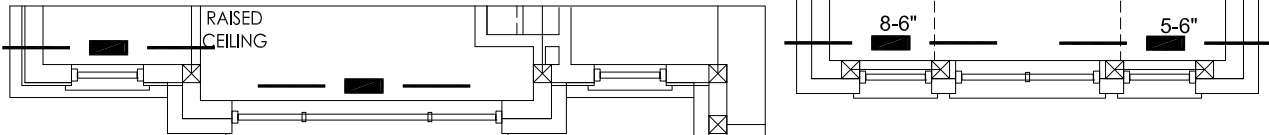
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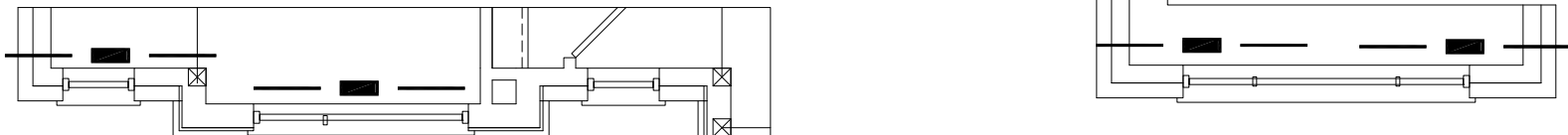
Client		<div></div> <div>375 Finley Ave. Suite 202 - Ajax, Ontario L1S 2E2 Tel. 905.619.2300 - 905.420.5300 Fax 905.619.2375 Email: info@hvacdesigns.ca Web: www.hvacdesigns.ca Specializing in Residential Mechanical Design Services</div> <div>Installation to comply with the latest Ontario Building Code. 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.</div>	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"
FIN BSMT WUB 38-11		BCIN# 19669		
2674 sqft		LO#	87615	



SECOND FLOOR PLAN ELEV. 'A'



SECOND FLOOR PLAN ELEV. 'B'



SECOND 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.

WUB

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"
FIN BSMT WUB 38-11		BCIN# 19669		
2674 sqft		LO#	87615	



## 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@hvacadesigns.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]

- |  |  |   |
|--|--|---|
| <input type="checkbox"/> House             | <input checked="" type="checkbox"/> HVAC – House       | <input type="checkbox"/> Building Structural      |
| <input type="checkbox"/> Small Buildings   | <input type="checkbox"/> Building Services             | <input type="checkbox"/> Plumbing – House         |
| <input type="checkbox"/> Large Buildings   | <input type="checkbox"/> Detection, Lighting and Power | <input type="checkbox"/> Plumbing – All Buildings |
| <input type="checkbox"/> Complex Buildings | <input type="checkbox"/> Fire Protection               | <input type="checkbox"/> 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: 38-11 BELVEDERE FIN BSMT WUB Project: CENTREFIELD (WEST GOSMILEY)
--	---

### D. Declaration of Designer

I, <u>MICHAEL O'ROURKE</u> declare that (check one)	
(print name)	
<input type="checkbox"/>	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: _____
<input checked="" type="checkbox"/>	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>
<input type="checkbox"/>	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