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

(Building Code Part 9, Residential)

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

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

	Richmond Hill	City of Ricommosen by Hilling	ipal Author	THE FOR EA	ODM CHEC	KED	
Application No:		Building Division	Model/Cert		MPLIANCE		
	<b>HVAC RE</b>	VIEWED		I OK CO	MITLIANCE	10	
A. Project Informati		PXV		_	IINUMUM		
Building number, street name	Initials:	PAV		REQUIR		March	
Model Type 38-14				·			
Municipality		l'ostal code	Reg. Plan r	umber / other descript	ion	•	
Richmond Hill							
B. Compliance Option [indicate the building code compliance option being employed in this house design]							
■ SB-12 Performance*[SB-12 - 3.1.2.] * Attach energy performance results using an approved software (see guide)					·		
☐ ENERGY STAR®* [SB-12 - 3.1.3.] * Attach Builder Option Package [BOP] form							

\* Attach R-2000 HOT2000 Report

C. Project Building Design Conditions

R-2000® \*[SB-12 - 3.1.3.]

Climatic Zone (SB-1):	Heating Equipment Efficiency	Space Heating F	Fuel Source			
■ Zone 1 (< 5000 degree days)	■ ≥ 92% AFUE	■ Gas	□ Propane	□ Solid Fuel		
□ Zone 2 (≥ 5000 degree days)	□ ≥ 84% < 92% AFUE	□ Oil	□ Electric	□ Earth Energy		
Ratio of Windows, Skylights & Glass	(W, S & G) to Wall Area	Other Building (	Characteristics			
Area of W, S & G = $38.69$ m² orft²    Area of W, S & G = $38.69$ m² orft²    Area of W, S & G = $38.69$ m² orft²    Area of W, S & G = $38.69$ m² orft²    Ground Source Heat Pump (ASHP)  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: A1 Table: 3.1.1.2.A						

#### 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	
Thermal Insulation	Nominal	Effective	Windows & Doors 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		Mechanicals		
Walls Above Grade	R22+R1.5ci		Heating Equip.(AFUE)	96% AFL	IE
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_2_
Slab (all ≤600mm below grade, or heated)	N/A		Combined Space / Dom. Water Heating	N/A	

<sup>(1)</sup> 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 [Subsect	tion 3.1.2. Performance Compliance]				
The annual energy consumption using Subsection	n 3.1.1. SB-12 Reference Building	Package is 156.08 GJ (1 GJ =1000MJ)			
The annual energy consumption of this house as	designed is 121.97 GJ				
The software used to simulate the annual energy	use of the building is: REMRAT	E 16.0.2 Canada			
The building is being designed using an air tightne	ess baseline of:				
☐ OBC reference ACH, NLA or NLR default v	values (no depressurization test r	equired)			
■ Targeted ACH, NLA or NLR. Depressuriza	tion test to meet 2.5 AC	CH50 or NLR or NLA			
Reduction of overall thermal performance envelope of the compliance package it is		pe is not more than 25% of the			
☐ Standard Operating Conditions Applied (A-	-3.1.2.1 - 4.6.2)				
☐ Reduced Operating Conditions for Zero-rate	ted 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					
☐ The NRCan "ENERGY STAR for New Home design result in the building performance me Supplementary Standard SB12 (A-3.1.3.1	eeting or exceeding the prescripti				
☐ The NRCan, "2012 R-2000 Standard " technic performance meeting or exceeding the pres (A-3.1.3.1).					
Performance Energy Modeling Professional					
Energy Evaluator/Advisor/Rater/CEM Name and company:	Accreditation or Evaluato	r/Advisor/Rater License #			
John B Godden/Clearsphere Consulting	80				
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 p	erson(s) providing information herein to s	ubstantiate that design meets the building code!			
<b>G. Designer(s)</b> [name(s) & BCIN(s), if applicable, of person(s) providing information herein to substantiate that design meets the building code] <b>Qualified Designer:</b> Declaration of designer to have reviewed and take responsibility for the design work.					
Name	BCIN	Signature			
MARTHA SANDOVAL	103017	1 Patters.			

Form authorized by OHBA, OBOA, LMCBO. Revised December 1, 2016

# 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.

- <u>SB-12 Performance</u> 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.
- <u>ENERGY STAR</u> houses must be designed to <u>ENERGY STAR</u> requirements and verified on completion by a licensed energy evaluator and/or service organization. The <u>ENERGY STAR</u> 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 <u>SB-12 Prescriptive</u> 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 <u>SB-12 Performance</u> 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.

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

### **Code Compliance Certificate**

Project Title: Model 38-14 - Proposed

Report Date June 21, 2021

Data Filename Model 38-14 - 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) 3841 Conditioned Volume (cubic ft) 37119 Insulated Shell Area (sq ft) 8512

Construction Site Owner Builder HERS Rater

Model 38-14 - Proposed Royal Pine Homes Royal Pine Homes Clearsphere Consulting

Richmond Hill, Model 38-14 - 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

Proposed House Better Than Code

127711	
43356.53	156.08
33879.25	121.97
21.9%	

SB-12 Performance Compliance: PASS

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

Building Summary	Gross Area or	6 % BW I	Continuous
Assembly	Perimeter	Cavity R-Value	R-Value
Ceilings			
Roof 1: Std-R60, Attic G2*****	1623	20.0	40.0
Above-Grade Walls			
AG Wall 1: Std R22 G2 + 1.5 @16*******	3148	22.0	1.5
Joist 1: Cond -> ambient	344	22.0	1.5
Window 1: U=0.282, SHGC 0.45******	403		3.5
Door 1: R6*****	21		6.0
Door 2: Code	18		4.0
Floors Over Garage			
Floor 1: Std-R31 G2*****	537	31.0	0.0
Basement Walls			

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

### **Code Compliance Certificate**

Building Summary	Gross Area or		Continuous
Assembly	Perimeter	<b>Cavity R-Value</b>	R-Value
Wall 1: Std-R-20 Blanket G2*****	1720	0.0	20.0
Window 2: U=0.282, SHGC 0.45******	13		3.5
Door 3	17		4.0
Mechanical Equipment	Name/Type	Size/Input	Efficiency
Heating: Fuel-fired air distribution	96 AFUE Gas ECM 64k******	64.0 kBtuh	96.0 AFUE
Water Heating: Conventional, Gas	50 gal. 0.90 EF Gas******	50 gal	0.90 EF
HRV/ERV		66.0 CFM	75.0% sen/ 0.0% tot

#### **Drain Water Heat Recovery**

2 of 2 Showers connected and 42.0% unit efficiency

#### Air Exchange

2.50 ACH50 or: 0.18 CFM50/sf

#### **Efficient Lighting**

90.0% Interior, 90.0% Exterior, 0.0% Garage

#### Renewables

N/A

**Property** 

Royal Pine Homes Model 38-14 - Proposed

Richmond Hill,

Weather:Toronto, ON\_CAN Model 38-14 - Proposed

Model 38-14 - Proposed.blg

Organization

Clearsphere Consulting

416-481-4218 John Godden

Builder

Royal Pine Homes

**HERS** 

Projected Rating June 21, 2021 Rating No:N/A Rater ID:0001

**Property/Builder Information** 

Building Name Owner's Name Property Address

City, St, Zip Phone Number Model 38-14 - Proposed

Royal Pine Homes

Model 38-14 - Proposed

Richmond Hill,

Builder's Name

Phone Number Fmail Address

Plan/Model Name Community/Development

Identifier/Other

**Royal Pine Homes** 

Model

Centerfiled

Organization Information

Organization Name

Address

Website

City, St, Zip

Phone Number

Clearsphere Consulting

1632 O'Connor Dr.

Toronto, ON\_CAN M4B 3P4

416-481-4218

www.clearsphere.ca

Rating/RESNET Information

Provider ID Sample Set ID

Registry ID

Registry Date Registered

Rater's Name

Rater's ID

Rater's Email

Last Field Insp

Reason for Rating Rating Number

Rating Permit Date

Rating Type

2006-001

00000000

0001

John Godden

howard@clearsphere.ca

June 21, 2021

Projected Rating

New Home

N/A

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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**Property** 

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Richmond Hill,

Weather:Toronto, ON\_CAN Model 38-14 - Proposed Model 38-14 - Proposed.blg Organization

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Royal Pine Homes

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#### **General Building Information**

Area of Conditioned. Space(sq ft) 3841

Volume of Conditioned. Space 37119

Year Built 2021

Housing Type Single-family detached

Level Type(Apartments Only)

Floors on or Above-Grade

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

Thermal Boundary Location

N/A

### **Foundation Wall Information**

Foundation wa	ii iiiioi iiiatioii							
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	173.67	10.08	9.08	1.00	0.034	0.048

<sup>\*</sup> 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** 

**Property** 

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9.08

174

174

0

#### **Foundation Wall Library List**

R-Value 0.0

Uninsulated\*\*\*\*\*\*\*

Ins top 0.00 ft from top of wall on the bottom 0.00 ft below grade

Note

Slab

Slab Floor Information								
Name	Library Entry	Area(sq ft)	Depth Below Grade(ft)	Full Perimeter(ft)	Exposed Perimeter(ft)	On-Grade Perimeter(ft)		

1109

#### Slab Floor Library List

### Slab Floor: Uninsulated\*\*\*\*\*\*\*

Slab CoveringCarpetPerimeter Insulation (R-Value)0.0Perimeter Insulation Depth (ft)0.0Under-Slab Insulation (R-Value)0.0Under-Slab Insulation Width (ft)0.0Slab Insulation Grade3Radiant SlabNo

Note

# Frame Floor InformationNameLibrary EntryLocationArea(sq ft)Uo ValueExposed FloorStd-R31 G2\*\*\*\*\*\*\*Btwn cond & garage5370.039

#### Frame Floor Library List

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

Information From Quick Fill Screen

Continous Insulation R-Value0.0Cavity Insulation R-Value31.0Cavity Insulation Thickness (in.)9.5Cavity Insulation Grade2

Joist Size (w x h, in) 1.5 x 9.5 Joist Spacing (in oc) 16.0

**Property** 

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Weather:Toronto, ON\_CAN Model 38-14 - Proposed Model 38-14 - Proposed.blg Organization

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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	344.20	1.5	22.0	5.5	16.0	2	0.049

ΛΙ				
Abov	'e-(al	าลตะ	e w	าลแ

Above Grade war	•				
Name	Library Entry	Location	Exterior Color	Area(sq ft)	Uo Value
AGW	Std R22 G2 + 1.5 @16******	Cond -> ambient	Medium	3148.10	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)1.5Frame Cavity Insulation (R-Value)22.0Frame Cavity Insulation Thickness (in)5.5Frame Cavity Insulation Grade2Stud Size (w x d, in)1.5 x 5.5

Stud Spacing (in o.c.)

Framing Factor - (default)

Gypsum Thickness (in)

16.0

0.2300

0.5

Note

Window	/ Information											
							Overhang		Inte	rior	Adja	cent
Name	Wall	Orient	U-Value	SHGC	Area	Depth	То Тор	To Btm	Winter	Summer	Winter	Summer
	Assignment				(sqft)	(ft)	(ft)	(ft)	Shading	Shading	Shading	Shading

Property
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Model 38-14 - Proposed
Richmond Hill,

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Builder Royal Pine Homes HERS
Projected Rating
June 21, 2021
Rating No:N/A
Rater ID:0001

Window Ir	nformation											
							Overhang	)	Inte	rior	Adja	cent
Name	Wall Assignment	Orient	U-Value	SHGC	Area (sqft)	Depth (ft)	To Top (ft)	To Btm (ft)	Winter Shading	Summer Shading	Winter Shading	Summer Shading
front	AGWall 1	South	0.282	0.450	5.50	5.0	1.5	2.5	0.85	0.70	None	None
front	AGWall 1	South	0.282	0.450	18.70	5.0	2.5	9.5	0.85	0.70	None	None
front	AGWall 1	South	0.282	0.450	45.00	1.3	1.0	7.0	0.85	0.70	None	None
front	AGWall 1	South	0.282	0.450	15.00	1.3	1.0	7.0	0.85	0.70	None	None
front	AGWall 1	South	0.282	0.450	56.30	0.3	3.0	10.3	0.85	0.70	None	None
Left	FndWall 1	West	0.282	0.450	3.30	0.0	0.0	0.0	0.85	0.70	None	None
Left	AGWall 1	West	0.282	0.450	8.00	1.3	1.8	5.8	0.85	0.70	None	None
Left	AGWall 1	West	0.282	0.450	9.30	1.3	1.8	6.4	0.85	0.70	None	None
Left	AGWall 1	West	0.282	0.450	17.30	1.3	1.8	6.1	0.85	0.70	None	None
back	FndWall 1	North	0.282	0.450	3.33	0.0	0.0	0.0	0.85	0.70	None	None
back	AGWall 1	North	0.282	0.450	60.00	0.0	0.0	0.0	0.85	0.70	None	None
back Sliding	AGWall 1	North	0.282	0.450	72.00	0.0	0.0	0.0	0.85	0.70	None	None
back	AGWall 1	North	0.282	0.450	56.00	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	8.70	1.3	1.8	6.1	0.85	0.70	None	None
Right	AGWall 1	East	0.282	0.450	22.70	1.3	1.8	7.4	0.85	0.70	None	None

<b>Door Information</b>						
Name	Library Entry	Wall Assignment	Opaque Area(sq ft)	Uo Value	R-Value of Opaque Area	Storm Door
Front	R6*****	AGWall 1	20.5	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 Info	rmation								
Name	Library Entry	Ceiling Area(sq ft)	Roof Area(sq ft)	Exterior Color	Radiant Barrier	Туре	Uo Value	Cement or Clay Tiles	Roof Tile Ventilation
Ceiling-with attic	Std-R60, Attic G2*****	1623.00	2028.75	Medium	No	Attic	0.017	No	No

**Property** 

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#### **Roof Library List**

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

Information From Quick Fill Screen

40.0 Continous Insulation (R-Value) 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

**Property** 

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#### **Mechanical Equipment**

Number of Mechanical Systems2Heating SetPoint(F)72.0Heating Setback ThermostatPresentCooling SetPoint(F)75.0Cooling Setup ThermostatPresentDHW 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

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

**Property** 

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#### **DHW Efficiencies**

All bath faucets & showers <= 2gpm false
All DHW pipes fully insulated >= R-3 false

Recirculation type None (standard system)

Farthest fixture to DHW heater 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 2 Number showerheads in home Number showers connected to DWHR 2

**DHW Diagnostics** 

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

**Property** 

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**Duct Systems** 

Vame

Conditioned Floor Area(sq ft) 3841.0 # of Returns 6

Heating System 96 AFUE Gas ECM 64k\*\*\*\*\*\*\*\*\*\*

Cooling System N/A
Supply Duct Surface Area(sq ft) 777.8
Return Duct Surface Area(sq ft) 720.2
No bldg cavities used as ducts FALSE

TypeLocationPercent LocationR-ValueSupplyConditioned space100.00.0ReturnConditioned space100.00.0

**Test Exemptions** 

IECCTRUERESNET 2019TRUEENERGY STAR LtOTRUE

**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

**Property** 

Royal Pine Homes Model 38-14 - Proposed Richmond Hill,

Weather:Toronto, ON\_CAN Model 38-14 - Proposed Model 38-14 - Proposed.blg Organization

Clearsphere Consulting 416-481-4218 John Godden

Builder

Royal Pine Homes

**HERS** 

Projected Rating June 21, 2021 Rating No:N/A Rater ID:0001

#### Infiltration and Mechanical Ventilation

Whole Dwelling Infiltration

Input Type Blower door

Heating Season Infiltration Value 2.50 ACH @ 50 Pascals Cooling Season Infiltration Value 2.50 ACH @ 50 Pascals

Shelter Class 4
Code Verification Tested

Mechanical Ventilation for IAQ

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

Ventilation Strategy for Cooling

Cooling Season Ventilation Natural Ventilation

Good Air Exchange for Multi-Family NA

**Property** 

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**HERS** 

Projected Rating June 21, 2021 Rating No:N/A Rater ID:0001

#### **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.

A. Project Info	ormation					
Building number,	street name				Unit no.	Lot/con.
Municipality		Postal code	Plan number/ other des	orintion		
RICHMOND HILL		Fosial code	Flair fluifiber/ other des	Cription		
	L					
	ho reviews and takes	responsibility to				
Name MICHAEL O'ROU	IDKE		Firm HVAC DESIGNS LTD.			
Street address	IKKL		ITVAC DESIGNS ETD.	Unit no.		Lot/con.
375 FINLEY AVE				202		N/A
Municipality		Postal code	Province	E-mail		
AJAX		L1S 2E2	ONTARIO	info@hvacde	signs.ca	
Telephone numbe	er	Fax number	•	Cell number		
(905) 619-2300		(905) 619-2375		( )		
C. Design activ	vities undertaken by i	ndividual identifi	ied in Section B. [Buil	ding Code Ta	able 3.5.2.1 OF	Division C]
☐ House		⊠ HVAC	House		Building Struc	etural
☐ Small Build	dings		g Services		Plumbing – H	
☐ Large Buile	•		ion, Lighting and Pov		Plumbing – A	
☐ Complex E		☐ Fire Pr	rotection		On-site Sewa	ge Systems
DUCT SIZING RESIDENTIAL M	IN CALCULATIONS  ECHANICAL VENTILATION  STEM DESIGN per CSA  of Designer		MARY Project:	CENTREFIELD	(WEST GORMLEY	)
	-			de eleve t	hat (choose one a	i-t-).
I IVII		rint name)		ueciale t	riat (Crioose one a	as appropriate).
Divisio	on C, of the Building Code s/categories.	or the design work . I am qualified, and	on behalf of a firm registed the firm is registered, in	the	appropriat	ity of Richmond Hill Building Division
	Individual BCIN: Firm BCIN:				AC IL	VILVVLD
☑ I revie design	w and take responsibility t	or the design and a 2.5.of Di visi	am qualified in the approp on C, of the Building Code	riate category a	s:an "oth tials:	PXV
	Individual BCIN:	19669				
	Basis for exemption	from registration an	nd qualification:	O.B.C SEN	NTENCE 3.2.4.	1 (4)
	esign work is exempt for exemption from registr		tion and qualification requion:	irements of the	Building Code.	
I certify that:						
	ne information contained nave submitted this applic		lule is true to the best of m ledge and consent of the	firm.	. 0	
1	ne 21, 2021			Mucha	of Ofounh	le.
	Date	-		,	Signature of	Designer
					Signature of	2 55.6.101

#### NOTE

<sup>1.</sup> 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.

<sup>2.</sup> 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.

375 Finley Ave. Suite 202 Ajax, ON L1S 2E2
Tel: 905.619.2300 Fax: 905.619.2375
Web: www.hvacdesigns.ca E-mail: info@hvacdesigns.ca

PXV

						Р	XV	'																								
SITE NAME: CENTREFIE	_D (\VES	HOP#	ał8:												D	ATE:	Jun-21			٧	VINTER	NATURAL	AIR CHANG	GE RATE 0.227		HEAT I	LOSS A	ΔT °F.	78		CSA	-F280-12
BUILDER: ROYAL PIN					-	TYPE:	38-14					GFA: 2	2724			LO# 9	1284			SL	JMMER	NATURAL	AIR CHANG	GE RATE 0.071		HEAT	GAIN Δ	ΔT °F.	13	SB-12	PERFOR	RMANCE
ROOM USE		MBR			ENS			MIC			BED-2			BED-3			BED-4			ENS-2					8	S-BATH	Н					
EXP. WALL		37			22			8			33			31			11			6						5						
CLG. HT.		9			9			9			9			9			9			9						9						
FACTORS																																
GRS.WALL AREA LOSS GAI		333			198			72			297			279			99			54						45						
GLAZING		LOSS	GAIN	L	Loss	GAIN			GAIN	L		GAIN	L	oss (	AIN	L	oss	GAIN		LOSS						LOSS						
NORTH 21-8 16.		0	0	-	174	128	0	0	0	0	0	0	0	0	0	0	0	0	8	174	128				0	0	0					
EAST 21.8 41.		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.		0	0	0	0	0	0	0	0	0	0	0	0	0	0	17	370	423	0	0	0				0	0	0					
WEST 21.8 41.		828	1579		414	789	0	0	0			2327			2078	0	0	0	0	0	0				18	392	748					
SKYLT 35.8 101		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				0	0	0					
DOOR\$ 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					
NET EXPOSED WALL 4.2 0.7		1241			719	118	72	303	50				229	963	158	82	345	57	46	193	32				27	114	19					
NET EXPOSED BSMT WALL ABOVE GR 3.7 0.6	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				0	0	0					
NO ATTIC EXPOSED CLG 2.8 1.3		455	203	124 0	163	73 0	105	138	62 0				206	271		195	256 0	115 0	75	99	44 0				85	112 0	50					
		0	0	0	0	0	0	0	0	45 0	126 0	57 0	45 251	126 655	57	0 175	u 457	75	75	0 196	32				0 50	131	0 21					
EXPOSED FLOOR  2.6 0.4  BASEMENT/CRAWL HEAT LOSS		0	۰	U	0	U	٥	0	U	U		۰	251	0	108	1/5	457	/5	75	196	32				50	131	21					
SLAB ON GRADE HEAT LOSS	ע	0			0			0			0			0			0			0						0						
SUBTOTAL HT LOSS		2523			u 1470			441			2583			0 3105			u 1428			662				l		748						
SUB TOTAL HT GAIN		2525	1986			1108		441	112			2650			2521		1420	670		002	236					740	838					
LEVEL FACTOR / MULTIPLIER	0.20	0.16		0.20	0.16	1100	0.20	0.16		0.20			0.20	0.16		0.20	0.16	670	0.20	0.16	230				0.20	0.16	030					
AIR CHANGE HEAT LOSS	0.20	410			239		0.20	72		0.20	420		0.20	505		0.20	232		0.20	108					0.20	122						
AIR CHANGE HEAT GAIN		410	92		233	51		12	5			123		303	117		232	31		100	11					122	39					
DUCT LOSS		0	92		0	91		0	3		0	123		361	'''		166	31		77	"					87	39					
DUCT GAIN		U	0		U	0		U	0		U	0		301	357		100	163		"	25					01	88					
HEAT GAIN PEOPLE 240	2		480	0		0	0		0	1		240	1		240	1		240	0		0				0		0					
HEAT GAIN APPLIANCES/LIGHTS	-		693	٠		0	ľ		0	•		693	•		693	•		693	ľ		0				٠		0					
TOTAL HT LOSS BTU/H		2933	000		1709	Ĭ		512	Ĭ		3003			3970			1827	***		847	ŭ					956	Ĭ					
TOTAL HT GAIN x 1.3 BTU/H									450			4040			5107			2336		•	353						1254					
			4227			1508			152																							
TOTAL HI GAIN X 1.3 BTU/H			4227			1508			152			4818			5107			2336			353						1254					
ROOM USE	<u> </u>		4227		GRT	1508		KIT	152			4010		LAUN	5107		PWD	2336		FOY	353	MUE	)				1254				BAS	
			4227		GRT 61	1508		KIT 52	152			4010			5107		PWD 12	2330		FOY 29	353	MUD 7	)				1234				BAS 168	
ROOM USE			4227			1508			152			4010		LAUN	5107			2336			353		)				1204					
ROOM USE EXP. WALL			4227		61	1508		52	152			4010	1	LAUN 15	5107		12	2336		29	353	7					12.04				168	
ROOM USE EXP. WALL CLG. HT.			4227		61	1508		52	152			4010		LAUN 15	5107		12	2336		29	353	7	)				1204				168	i
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ROOM USE EXP. WALL CLG. HT. FACTORS GRS.WALL AREA LOSS GAII GLAZING NORTH 21.8 16. EAST 21.8 41. SOUTH 21.8 24. WEST 21.8 41. SKYLT. DOORS 25.8 4.3 NET EXPOSED WALL NET EXPOSED WALL ABOVE GR NO ATTIC EXPOSED CLG 1.3 0.6 NO ATTIC EXPOSED CLG 2.8 1.3 EXPOSED CLG 2.8 1.3 EXPOSED FLOOR BASEMENT/CRAWL HEAT LOSS SLAB ON GRADE HEAT LOSS	22			0 60 0 0 0 0 556 0 0	61 10 616 LOSS 0 1307 0 0 0 0 2339 0 0 0 0	GAIN 0 2493 0 0 0 385 0	71 0 0 0 0 454 0	52 10 525 LOSS 0 1547 0 0 0 1910 0 0 0	GAIN 0 2950 0 0 0 314 0			4010	0 0 32 0 0 0 103 0 115 0	LAUN 15 9 135 LOSS 0 0 697 0 0 433 0 151 0 0 0	GAIN 0 0 797 0 0 71 0 68	0 0 9 0 0 0 112 0	12 10 121 LOSS 0 0 196 0 0 472 0 0 0	GAIN 0 0 224 0 0 0 78 0	0 0 0 0 40 282 0 0	29 11 322 LOSS 0 0 0 0 1034 1186 0 0 0	GAIN 0 0 0 0 170 195 0	7 11 78 LOS: 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	S GAIN 0 0 0 0 0 0 85 40 0 0				1234			5 ( ( 5 ( (	168 10 1176 LOS: 3 65 6 131 0 0 0 517 0 0 04 1857 0 0 0 0 5708	5 GAIN 48 125 149 0 0 85 0 7 305 0 0
ROOM USE EXP. WALL CLG. HT. FACTORS GRS.WALL AREA LOSS GAII GLAZING NORTH 21.8 16. EAST 21.8 41. SOUTH 21.8 24. WEST 21.8 41. SKYLT. 35.8 101 DOORS 25.8 4.3 NET EXPOSED WALL 4.2 0.7 NET EXPOSED CLG 1.3 0.6 NO ATTIC EXPOSED CLG 2.8 1.3 EXPOSED FLOOR 2.6 0.4 BASEMENT/CRAWL HEAT LOSS SLAB ON GRADE HEAT LOSS SUBTOTAL HT LOSS	22			0 60 0 0 0 0 556 0 0	61 10 616 LOSS 0 1307 0 0 0 0 2339 0 0 0 0 0 0 3646	GAIN 0 2493 0 0 0 0 3855 0 0 0 0	71 0 0 0 0 454 0	52 10 525 LOSS 0 1547 0 0 0 1910 0 0 0	GAIN 0 2950 0 0 0 314 0 0 0 0			4010	0 0 32 0 0 0 103 0 115 0	LAUN 15 9 135 LOSS 0 697 0 0 433 0 151 0 0	GAIN 0 0 797 0 0 0 71 0 68 0	0 0 9 0 0 0 112 0	12 10 121 LOSS 0 0 196 0 0 472 0 0 0	GAIN 0 0 2224 0 0 78 0 0 0 0	0 0 0 0 40 282 0 0	29 11 322 LOSS 0 0 0 0 0 1034 1186 0 0 0	GAIN 0 0 0 0 1770 1955 0 0 0 0	7 11 78 LOS: 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	S GAIN 0 0 0 0 0 85 40 0 0				1234			5 ( ( 5 ( (	168 10 1176 LOS: 3 65 3 65 3 65 0 0 0 0 5177 0 0 0 0 4 1857 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	G GAIN  48  125  149  0  85  0  7  305  0  0
ROOM USE EXP. WALL CLG. HT. FACTORS GRS.WALL AREA LOSS GAII GLAZING NORTH EAST 21.8 41. SOUTH 21.8 21.8 41. SKYLT. 35.8 101 DOORS 25.8 4.3 NET EXPOSED WALL 4.2 NET EXPOSED WALL 4.2 NO ATTIC EXPOSED CLG 1.3 0.6 NO ATTIC EXPOSED CLG 1.3 0.6 EXPOSED FLOOR 2.6 0.4 BASEMENT/CRAWL HEAT LOSS SLAB ON GRADE HEAT LOSS SUBTOTAL HT GAIN	22			0 60 0 0 0 0 556 0 0	61 10 616 LOSS 0 1307 0 0 0 2339 0 0 0 0 0 0	GAIN 0 2493 0 0 0 385 0	71 0 0 0 0 454 0 0	52 10 525 LOSS 0 1547 0 0 0 1910 0 0 0 0 3457	GAIN 0 2950 0 0 0 314 0				0 0 32 0 0 0 103 0 115 0	LAUN 15 9 135 LOSS 0 0 697 0 0 433 0 151 0 0 0 1281	GAIN 0 0 797 0 0 0 71 0 68 0 0	0 0 9 0 0 0 1112 0 0	12 10 121 LOSS 0 0 196 0 0 472 0 0 0 0 0 668	GAIN 0 0 224 0 0 0 78 0	0 0 0 0 40 282 0 0	29 11 322 LOSS 0 0 0 0 1034 1186 0 0 0 0	GAIN 0 0 0 0 170 1795 0 0 0	7 111 78 LOSS 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	S GAIN 0 0 0 0 0 0 85 40 0 0				1209			50 (0) (0) (0) (0) (0) (0) (0) (0) (0) (0	168 10 1176 LOS3 3 65 6 131 0 0 0 00 5177 0 0 0 04 1857 0 0 0 50 0 0 5708	5 S GAIN 48 125 149 0 0 85 0 7 305 0 0 0 3
ROOM USE EXP. WALL CLG. HT. FACTORS GRS.WALL AREA LOSS GAII GLAZING NORTH 21.8 16. EAST 21.8 41. SOUTH 21.8 21.8 41. SKYLT. 35.8 101 DOORS 25.8 4.3 NET EXPOSED WALL NET EXPOSED WALL 4.2 NET EXPOSED US 4.2 EXPOSED CLG 1.3 0.6 NO ATTIC EXPOSED CLG 2.8 1.3 EXPOSED LO 2.6 0.4 BASEMENT/CRAWL HEAT LOSS SLAB ON GRADE HEAT LOSS SUBTOTAL HT COSS SUBTOTAL HT GAIN LEVEL FACTOR / MULTIPLIER	22			0 60 0 0 0 0 0 556 0 0	61 10 616 LOSS 0 1307 0 0 0 2339 0 0 0 0 0 0 3646	GAIN 0 2493 0 0 0 0 3855 0 0 0 0	71 0 0 0 0 454 0	52 10 525 LOSS 0 1547 0 0 0 1910 0 0 0 0 0 0 3457	GAIN 0 2950 0 0 0 314 0 0 0 0				0 0 32 0 0 0 103 0 115 0	LAUN 15 9 135 LOSS 0 0 697 0 0 0 433 0 151 0 0 0 1281 0 .16	GAIN 0 0 797 0 0 0 71 0 68 0 0	0 0 9 0 0 0 1112 0 0	12 10 121 LOSS 0 0 0 196 0 0 0 472 0 0 0 0 0 0 668	GAIN 0 0 2224 0 0 78 0 0 0 0	0 0 0 0 40 282 0 0	29 11 322 LOSS 0 0 0 0 0 1034 1186 0 0 0 0 2219	GAIN 0 0 0 0 170 1795 0 0 0	7 11 78 LOSS 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	S GAIN 0 0 0 0 0 0 85 40 0 0				1209			50 (0) (0) (0) (0) (0) (0) (0) (0) (0) (0	168 10 1176 LOS: 3 65 3 65 3 65 3 65 0 0 0 0 517 0 0 5 0 5 0 0 5 0 0 5 0 5 0 0 6 0 5 0 0 0 6 0 5 0 0 0 0 6 0 0 0 0 0 6 0 0 0 0 0 0 0 0 0	65 S GAIN 48 125 149 0 0 85 0 7 305 0 0 0 3
ROOM USE EXP. WALL CLG. HT. FACTORS GRS.WALL AREA LOSS GAII GLAZING NORTH 21.8 24. SOUTH 21.8 24. WEST 21.8 41. SKYLT. 35.8 101 DOORS 25.8 4.3 NET EXPOSED WALL NET EXPOSED WALL 4.2 0.3 NO ATTIC EXPOSED CLG 1.3 0.6 NO ATTIC EXPOSED CLG 2.8 1.3 EXPOSED CLG 2.8 1.3 EXPOSED FLOOR BASEMENT/CRAWL HEAT LOSS SLAB ON GRADE HEAT LOSS SUBTOTAL HT LOSS SUBTOTAL HT GAIN LEVEL FACTOR / MULTIPLIER AIR CHANGE HEAT LOSS	22			0 60 0 0 0 0 0 556 0 0	61 10 616 LOSS 0 1307 0 0 0 2339 0 0 0 0 0 0	GAIN 0 2493 0 0 0 0 385 0 0 0 0 2878	71 0 0 0 0 454 0 0	52 10 525 LOSS 0 1547 0 0 0 1910 0 0 0 0 3457	GAIN 0 2950 0 0 0 0 314 0 0 0				0 0 32 0 0 0 103 0 115 0	LAUN 15 9 135 LOSS 0 0 697 0 0 433 0 151 0 0 0 1281	GAIN 0 0 797 0 0 71 0 68 0 0	0 0 9 0 0 0 1112 0 0	12 10 121 LOSS 0 0 196 0 0 472 0 0 0 0 0 668	GAIN 0 0 2224 0 0 0 78 0 0 0	0 0 0 0 40 282 0 0	29 11 322 LOSS 0 0 0 0 1034 1186 0 0 0 0	GAIN 0 0 0 0 0 170 195 0 0 0	7 111 78 LOSS 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	S GAIN 0 0 0 0 0 0 85 40 0 0 0				1209			50 (0) (0) (0) (0) (0) (0) (0) (0) (0) (0	168 10 1176 LOS3 3 65 6 131 0 0 0 00 5177 0 0 0 04 1857 0 0 0 50 0 0 5708	S GAIN 48 125 149 0 0 85 0 7 305 0 0 7 7 7 7 7 7 7 7 7 7
ROOM USE EXP. WALL CLG. HT. FACTORS GRS.WALL AREA LOSS GAII GLAZING NORTH 21.8 41. SOUTH 21.8 24. WEST 21.8 41. SKYLT. 35.8 101 DOORS 25.8 4.3 NET EXPOSED WALL 4.2 0.3 NET EXPOSED USE 3.7 0.6 NO ATTIC EXPOSED CLG 1.3 0.6 NO ATTIC EXPOSED CLG 2.8 1.3 EXPOSED FLOOR 2.6 0.4 BASEMENT/CRAWL HEAT LOSS SLAB ON GRADE HEAT LOSS SUBTOTAL HT GAIN LEVEL FACTOR / MULTIPLIER AIR CHANGE HEAT LOSS AIR CHANGE HEAT GAIN	22			0 60 0 0 0 0 0 556 0 0	61 10 616 LOSS 0 1307 0 0 0 2339 0 0 0 0 0 0 3646	GAIN 0 2493 0 0 0 0 3855 0 0 0 0	71 0 0 0 0 454 0 0	52 10 525 LOSS 0 1547 0 0 0 0 1910 0 0 0 0 3457	GAIN 0 2950 0 0 0 314 0 0 0 0				0 0 32 0 0 0 103 0 115 0	LAUN 15 9 1335 LOSS 0 0 697 0 0 433 0 1551 0 0 0 1281 0.16 208	GAIN 0 0 797 0 0 0 71 0 68 0 0	0 0 9 0 0 0 1112 0 0	12 10 121 LOSS 0 0 196 0 0 0 472 0 0 0 0 0 0 668	GAIN 0 0 2224 0 0 78 0 0 0 0	0 0 0 0 40 282 0 0	29 111 322 LOSS 0 0 0 0 0 1034 1186 0 0 0 0 2219	GAIN 0 0 0 0 170 1795 0 0 0	7 11 78 LOSS 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	S GAIN 0 0 0 0 0 85 40 0 0				12.99			50 (0) (0) (0) (0) (0) (0) (0) (0) (0) (0	168 10 1176 LOS: 3 65 3 65 3 65 3 65 0 0 0 0 517 0 0 5 0 5 0 0 5 0 0 5 0 5 0 0 6 0 5 0 0 0 6 0 5 0 0 0 0 6 0 0 0 0 0 6 0 0 0 0 0 0 0 0 0	65 S GAIN 48 125 149 0 0 85 0 7 305 0 0 0 3
ROOM USE EXP. WALL CLG. HT. FACTORS GRS.WALL AREA LOSS GAII GLAZING NORTH EAST 21.8 41. SOUTH 21.8 21.8 41. SKYLT. 35.8 101 DOORS 25.8 4.5 NET EXPOSED WALL 4.2 NET EXPOSED WALL 4.2 NO ATTIC EXPOSED CLG 1.3 0.6 NO ATTIC EXPOSED CLG 2.8 1.3 EXPOSED FLOOR 2.6 0.4 BASEMENT/CRAWL HEAT LOSS SLAB ON GRADE HEAT LOSS SUB TOTAL HT GAIN LEVEL FACTOR / MULTIPLIER AIR CHANGE HEAT LOSS AIR CHANGE HEAT GAIN DUCT LOSS	22			0 60 0 0 0 0 0 556 0 0	61 10 616 LOSS 0 1307 0 0 0 2339 0 0 0 0 0 0 3646	GAIN 0 2493 0 0 0 0 385 0 0 0 0 2878	71 0 0 0 0 454 0 0	52 10 525 LOSS 0 1547 0 0 0 1910 0 0 0 0 0 0 3457	GAIN 0 2950 0 0 0 0 314 0 0 0				0 0 32 0 0 0 103 0 115 0	LAUN 15 9 135 LOSS 0 0 697 0 0 0 433 0 151 0 0 0 1281 0 .16	GAIN 0 0 797 0 0 0 0 71 0 68 0 0	0 0 9 0 0 0 1112 0 0	12 10 121 LOSS 0 0 0 196 0 0 0 472 0 0 0 0 0 0 668	GAIN 0 224 0 0 0 78 0 0 0	0 0 0 0 40 282 0 0	29 11 322 LOSS 0 0 0 0 0 1034 1186 0 0 0 0 2219	GAIN 0 0 0 0 0 170 195 0 0 0	7 11 78 LOSS 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	S GAIN 0 0 0 0 0 85 40 0 0 0				12.94			50 (0) (0) (0) (0) (0) (0) (0) (0) (0) (0	168 10 1176 LOS: 3 65 3 65 3 65 3 65 0 0 0 0 517 0 0 5 0 5 0 0 5 0 0 5 0 5 0 0 6 0 5 0 0 0 6 0 5 0 0 0 0 6 0 0 0 0 0 6 0 0 0 0 0 0 0 0 0	5 S GAIN 48 125 149 0 0 0 85 0 0 0 0 3 3 2 712 0 7 33 3
ROOM USE EXP. WALL CLG. HT. FACTORS GRS.WALL AREA LOSS GAII GLAZING NORTH 21.8 41. SOUTH 21.8 41. SWYLT. 35.8 101 DOORS 25.8 4.3 NET EXPOSED WALL NET EXPOSED WALL 4.2 0.6 EXPOSED CLG 1.3 0.6 NO ATTIC EXPOSED CLG 2.8 1.3 EXPOSED CLG 3.7 0.6 BASEMENT/CRAWL HEAT LOSS SLAB ON GRADE HEAT LOSS SUBTOTAL HT LOSS SUBTOTAL HT LOSS SUBTOTAL HT GAIN LEVEL FACTOR / MULTIPLIER AIR CHANGE HEAT LOSS AIR CHANGE HEAT GAIN DUCT LOSS DUCT GAIN	22			0 0 0 0 0 0 5556 0 0	61 10 616 LOSS 0 1307 0 0 0 2339 0 0 0 0 0 0 3646	GAIN 0 2493 0 0 0 385 0 0 0 0	71 0 0 0 454 0 0 0	52 10 525 LOSS 0 1547 0 0 0 0 1910 0 0 0 0 3457	GAIN 0 2950 0 0 0 314 0 0 0 3264 152 0				0 0 32 0 0 0 103 0 115 0	LAUN 15 9 1335 LOSS 0 0 697 0 0 433 0 1551 0 0 0 1281 0.16 208	GAIN 0 0 797 0 0 0 71 0 68 0 0 0 936 43 0	0 0 9 0 0 0 112 0 0	12 10 121 LOSS 0 0 196 0 0 0 472 0 0 0 0 0 0 668	GAIN 0 0 224 0 0 0 78 0 0 0 0	0 0 0 40 282 0 0 0	29 111 322 LOSS 0 0 0 0 0 1034 1186 0 0 0 0 2219	GAIN 0 0 0 0 170 195 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	7 111 78 LOSS 0 0 0 0 0 0 0 0 0 0 0 0 20 517 58 243 0 0 0 0 0 0 0 0 0 0 760 0.30 0.32 245	S GAIN 0 0 0 0 0 85 40 0 0 0				12.94			56	168 10 1176 LOS3 3 65 5 131 0 0 0 0 0 5177 0 0 0 5708 8342 50 0.69 5787	5 S GAIN 48 125 149 0 0 85 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
ROOM USE EXP. WALL CLG. HT. FACTORS GRS.WALL AREA LOSS GAII GLAZING NORTH 21.8 24. SOUTH 21.8 24. WEST 21.8 41. SKYLT. 35.8 101 DOORS 25.8 4.3 NET EXPOSED WALL NET EXPOSED WALL 4.2 0.3 NO ATTIC EXPOSED CLG 2.8 1.3 EXPOSED CLG 2.8 1.3 EXPOSED CLG 2.8 1.3 SUBTOTAL HT LOSS SLAB ON GRADE HEAT LOSS SUBTOTAL HT GAIN LEVEL FACTOR MULTIPLIER AIR CHANGE HEAT GAIN DUCT GAIN HEAT GAIN PEOPLE USS SUBTOTAL HT GAIN LEVEL FACTOR MULTIPLIER AIR CHANGE HEAT COSS DUCT GAIN HEAT GAIN PEOPLE	22			0 60 0 0 0 0 0 556 0 0	61 10 616 LOSS 0 1307 0 0 0 2339 0 0 0 0 0 0 3646	GAIN 0 2493 0 0 0 0 385 0 0 0 0 2878 1344 0 0 0	71 0 0 0 0 454 0 0	52 10 525 LOSS 0 1547 0 0 0 0 1910 0 0 0 0 3457	GAIN 0 2950 0 0 0 314 0 0 0 3264 152 0 0 0				0 0 32 0 0 0 103 0 115 0	LAUN 15 9 1335 LOSS 0 0 697 0 0 433 0 1551 0 0 0 1281 0.16 208	GAIN 0 0 0 797 0 0 0 0 688 0 0 0 936 43 0 0	0 0 9 0 0 0 1112 0 0	12 10 121 LOSS 0 0 196 0 0 0 472 0 0 0 0 0 0 668	GAIN 0 0 2224 0 0 78 0 0 0 0	0 0 0 0 40 282 0 0	29 111 322 LOSS 0 0 0 0 0 1034 1186 0 0 0 0 2219	GAIN 0 0 0 0 0 170 195 0 0 0	7 11 78 LOSS 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	S GAIN 0 0 0 0 0 85 40 0 0 0							50 (0) (0) (0) (0) (0) (0) (0) (0) (0) (0	168 10 1176 LOS3 3 65 5 131 0 0 0 0 0 5177 0 0 0 5708 8342 50 0.69 5787	5 S GAIN 48 125 149 0 0 85 0 0 0 0 3 2 712 0 7 33 0 0 0
ROOM USE EXP. WALL CLG. HT. FACTORS GRS.WALL AREA LOSS GAII GLAZING NORTH 21.8 16. EAST 21.8 41. SOUTH 21.8 24. WEST 21.8 41. SKYLT. 35.8 101 DOORS 25.8 4.3 NET EXPOSED WALL 4.2 0.7 NET EXPOSED USE 3.7 0.6 NO ATTIC EXPOSED CLG 2.8 1.3 EXPOSED ELG 2.8 1.3 EXPOSED FLOOR 2.6 0.4 BASEMENT/CRAWL HEAT LOSS SUB TOTAL HT GAIN LEVEL FACTOR / MULTIPLIER AIR CHANGE HEAT LOSS AIR CHANGE HEAT LOSS AIR CHANGE HEAT GAIN DUCT LOSS DUCT GAIN HEAT GAIN PEOPLE HEAT GAIN APPLIANCES/LIGHTS	22			0 60 0 0 0 0 556 0 0 0	61 10 616 LOSS 0 1307 0 0 0 2339 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	GAIN 0 2493 0 0 0 385 0 0 0 0	71 0 0 0 454 0 0 0	52 10 525 LOSS 0 1547 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	GAIN 0 2950 0 0 0 314 0 0 0 3264 152 0				0 0 32 0 0 0 1103 0 115 0	LAUN 15 9 135 LOSS 0 0 697 0 0 433 0 0 1281 0 0 1281 0 0 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	GAIN 0 0 797 0 0 0 71 0 68 0 0 0 936 43 0	0 0 9 0 0 0 112 0 0	12 10 121 LOSS 0 0 196 0 0 0 472 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	GAIN 0 0 224 0 0 0 78 0 0 0 0	0 0 0 40 282 0 0 0	29 11 322 LOSS 0 0 0 0 0 1034 1186 0 0 0 0 0 2219	GAIN 0 0 0 0 170 195 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	7 111 78 LOS: 0	S GAIN 0 0 0 0 0 85 40 0 0 0 125							56	168 10 1176 LOS3 3 65 3 65 6 131 0 0 0 0 5177 0 0 0 5770 0 0 5770 83442 50 0.69 5787	6 S GAIN 48 125 149 0 0 85 0 0 0 0 3 3 2 712 0 7 33 0 0 693
ROOM USE EXP. WALL CLG. HT. FACTORS GRS.WALL AREA LOSS GAIR GLAZING NORTH 21.8 24. SOUTH 21.8 24. WEST 21.8 41. SKYLT. 35.8 101 DOORS 25.8 4.3 NET EXPOSED WALL NET EXPOSED WALL 4.2 0.3 NO ATTIC EXPOSED CLG 3.7 0.6 NO ATTIC EXPOSED CLG 2.8 1.3 EXPOSED CLG 2.8 1.3 EXPOSED CLG 2.8 1.3 EXPOSED FLOOR BASEMENT/CRAWL HEAT LOSS SLAB ON GRADE HEAT LOSS SUB TOTAL HT LOSS SUB TOTAL HT GAIN LEVEL FACTOR / MULTIPLIER AIR CHANGE HEAT COSS AIR CHANGE HEAT COSS DUCT GAIN HEAT GAIN PEOPLE	22			0 60 0 0 0 0 556 0 0 0	61 10 616 LOSS 0 1307 0 0 0 2339 0 0 0 0 0 0 3646	GAIN 0 2493 0 0 0 0 385 0 0 0 0 2878 1344 0 0 0	71 0 0 0 454 0 0 0	52 10 525 LOSS 0 1547 0 0 0 0 1910 0 0 0 0 3457	GAIN 0 2950 0 0 0 314 0 0 0 3264 152 0 0 0				0 0 32 0 0 0 1103 0 115 0	LAUN 15 9 135 LOSS 0 0 697 0 0 0 433 151 0 0 1281 0.16 208	GAIN 0 0 0 797 0 0 0 0 688 0 0 0 936 43 0 0	0 0 9 0 0 0 112 0 0	12 10 121 LOSS 0 0 196 0 0 0 472 0 0 0 0 0 0 668	GAIN 0 0 2224 0 0 78 0 0 0 0	0 0 0 40 282 0 0 0	29 111 322 LOSS 0 0 0 0 0 1034 1186 0 0 0 0 2219	GAIN 0 0 0 0 170 195 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	7 111 78 LOSS 0 0 0 0 0 0 0 0 0 0 0 0 20 517 58 243 0 0 0 0 0 0 0 0 0 0 760 0.30 0.32 245	S GAIN 0 0 0 0 0 85 40 0 0 0 125				12.94			56	168 10 1176 LOS3 3 65 5 131 0 0 0 0 0 5177 0 0 0 5708 8342 50 0.69 5787	6 S GAIN 48 125 149 0 0 85 0 0 0 0 3 3 2 712 0 7 33 0 0 693

TOTAL HEAT GAIN BTU/H:

35307

TONS: 2.94

LOSS DUE TO VENTILATION LOAD BTU/H: 1670

STRUCTURAL HEAT LOSS: 45599

TOTAL COMBINED HEAT LOSS BTU/H: 47269

17.35/21.29 BTU/FT2



HEATING CFM TOTAL HEAT LOSS	<u>JILDER:</u> 1115	ROYAL	COO TOTAL H	WEST GOMES  LING CFM IEAT GAIN RATE CFM  1st 7 1	1115 35,032		ple	furr a/c coil vailable   for enum pre	pressure ace filter pressure	0.6 0.05 0.2 0.35 0.18 0.02	r/a		DATE:				ME N	**	LO#  CARRIE 60  930 1050 1115 1245		OUTPUT	AFUE = (BTU/H) = (BTU/H) = GN CFM = CFM @ .	60,000 <b>58,000</b>	
All S/A diffusers 4"x10" unle				out.			min adjı	isted pre	ssure s/a	0.16	adj	usted pre	ssure r/a	0.15				HIGH	1520	Т	EMPERAT	URE RISE	48	_ °F
All S/A runs 5"Ø unless not	<u>lea olner</u> 1	wise on ia	ayout. 3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
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 (ff/min) COOLING VELOCITY (ff/min) OUTLET GRILL SIZE TRUNK	MBR 1.47 36 2.11 67 0.17 37 150 187 0.09 5 264 492 3X10 A	ENS 1.71 42 1.51 48 0.17 51 190 241 0.07 5 308 352 3X10 A	WIC 0.51 13 0.15 5 0.17 39 130 169 0.1 4 149 57 3X10 D	BED-2 1.50 37 2.41 77 0.17 69 190 259 0.07 <b>6</b> 189 393 4X10 B	BED-3 1.99 49 2.55 81 0.16 66 160 226 0.07 <b>6</b> 250 413 4X10 C	BED-4 1.83 45 2.34 74 0.17 51 170 221 0.08 6 229 377 4X10 C	ENS-2 0.85 21 0.35 11 0.17 26 190 216 0.08 4 241 126 3X10 D	BED-2 1.50 37 2.41 77 0.17 71 180 251 0.07 <b>6</b> 189 393 4X10 B	BED-3 1.99 49 2.55 81 0.16 72 170 242 0.07 <b>6</b> 250 413 4X10 C	MBR 1.47 36 2.11 67 0.17 46 180 226 0.08 5 264 492 3X10 A	S-BATH 0.48 12 0.63 20 0.17 52 150 202 0.09 4 138 229 3X10 C		GRT 2.41 59 2.41 77 0.17 39 170 209 0.08 6 301 393 4X10 A	2.29 56 2.67 85 0.16 38 160 198 0.08 <b>6</b> 286 433 4X10 A	2.29 56 2.67 85 0.16 28 130 158 0.1 <b>6</b> 286 433 4X10 A	S-BATH 0.48 12 0.63 20 0.17 58 140 198 0.09 4 138 229 3X10 C		0.88 22 0.41 13 0.17 47 150 197 0.09 4 252 149 3X10 B	FOY 2.94 72 0.50 16 0.17 55 140 195 0.09 5 529 117 3X10 B	MUD 1.00 25 0.17 5 0.17 9 110 119 0.14 4 287 57 3X10 D	BAS 3.53 86 0.47 15 0.16 34 170 204 0.08 <b>6</b> 438 76 4X10 A	BAS 3.53 86 0.47 15 0.16 25 180 205 0.08 <b>6</b> 438 76 4X10 A	BAS 3.53 86 0.47 15 0.16 19 160 179 0.09 <b>6</b> 438 76 4X10 C	BAS 3.53 86 0.47 15 0.16 43 160 203 0.08 <b>6</b> 438 76 4X10 B
RUN # ROOM NAME RM LOSS MBH. CFM PER RUN HEAT RM GAIN MBH. CFM PER RUN COOLING ADJUSTED PRESSURE ACTUAL DUCT LGH. EQUIVALENT LENGTH TOTAL EFFECTIVE LENGTH ADJUSTED PRESSURE ROUND DUCT SIZE HEATING VELOCITY (ft/min) COOLING VELOCITY (ft/min) OUTLET GRILL SIZE TRUNK																								
SUPPLY AIR TRUNK SIZE																	RETURN A	AIR TRUNK						
TRUNK A TRUNK B TRUNK C TRUNK D TRUNK E TRUNK F	TRUNK CFM 516 254 507 1118 0	STATIC PRESS. 0.07 0.07 0.07 0.07 0.00 0.00 0.00	ROUND DUCT 11.3 8.7 11.2 15.1 0	14 10 14 26 0	x x x x x	8 8 8 8	VELOCITY (ft/min) 663 457 652 774 0		TRUNK G TRUNK H TRUNK I TRUNK J TRUNK K TRUNK L	TRUNK	STATIC PRESS. 0.00 0.00 0.00 0.00 0.00 0.00 0.00	ROUND DUCT 0 0 0 0 0 0	DUCT 0 0 0 0 0 0 0	x x x x x	8 8 8 8	VELOCITY (ff/min) 0 0 0 0 0 0	TRUNK O TRUNK P TRUNK Q TRUNK R TRUNK S TRUNK T	TRUNK CFM 0 0 0 0 0 0 0 0	STATIC PRESS. 0.05 0.05 0.05 0.05 0.05 0.05 0.05 0	ROUND DUCT 0 0 0 0 0 0 0 0	DUCT 0 0 0 0 0 0 0 0 0	x x x x x	8 8 8 8 8	VELOCITY (ft/min)  0  0  0  0  0  0  0
RETURN AIR #  AIR VOLUME PLENUM PRESSURE ACTUAL DUCT LGH. EQUIVALENT LENGTH TOTAL EFFECTIVE LH ADJUSTED PRESSURE ROUND DUCT SIZE INLET GRILL SIZE  INLET GRILL SIZE	1 0 145 0.15 34 175 209 0.07 7 8 X	2 0 115 0.15 62 250 312 0.05 7 8 X	3 0 115 0.15 71 245 316 0.05 7 8 X	4 0 115 0.15 65 205 270 0.05 7 8 X	5 0 105 0.15 30 155 185 0.08 6 8 X	6 0 360 0.15 25 175 200 0.07 9.9 8 X 30	0 0 0.15 1 0 1 14.80 0 0	0 0 0.15 1 0 1 14.80 0 0 0 X	0 0 0.15 1 0 1 14.80 0 0 X	0 0 0.15 1 0 1 14.80 0 0 X	0 0 0.15 1 0 1 14.80 0 0	0 0 0.15 1 0 1 14.80 0 0	0 0 0.15 1 0 1 14.80 0 0 X	0 0 0.15 1 0 1 14.80 0 0 X	0 0 0.15 1 0 1 14.80 0 0	BR 160 0.15 14 135 149 0.10 6.7 8 X	TRUNK U TRUNK V TRUNK W TRUNK X TRUNK Y TRUNK Z DROP	0 0 0 1115 345 0 1115	0.05 0.05 0.05 0.05 0.05 0.05 0.05	0 0 0 16.4 10.6 0 16.4	0 0 0 32 14 0 24	x x x x x	8 8 8 8 8 10	0 0 0 627 444 0 669



TYPE:

SITE NAME:

38-14

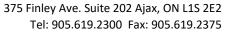
CENTREFIELD (WEST GORMLEY) RESIDENTIAL MECHANICAL VENTILATION DESIGN SUMMARY

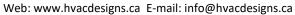
#### LO# 91284

COMBUSTION APPLIANCES	9.32.3.1(1)	SUPPLEMENTAL VENTILAT	TION CAPACITY			9.32.3.5.
a) Direct vent (sealed combustion) only		Total Ventilation Capacity		159	_	cfm
b) Positive venting induced draft (except fireplaces)		Less Principal Ventil. Capacit	ty	79.5	_	cfm
c) Natural draft, B-vent or induced draft gas fireplace		Required Supplemental Capa	acity	79.5	_	cfm
d) Solid Fuel (including fireplaces)						
e) No Combustion Appliances		PRINCIPAL EXHAUST FAN	CAPACITY			
но обправион другинесь		Model: V	ANEE 65H	Location:	BSM	Γ
HEATING SYSTEM		79.5 cfm			✓ HVI	Approved
Forced Air Non Forced Air		PRINCIPAL EXHAUST HEA				
		сғм 79.5 СҒМ X	ΔT °F 78 F X	FACTOR 1.08	% X	6 LOSS 0.25
Electric Space Heat		SUPPLEMENTAL FANS	RY INST	ALLING CON	TRACTOR	
		Location	Model	cfm		Sones
HOUSE TYPE	9.32.1(2)		STALLING CONTRACTOR	50	<b>√</b>	3.5
✓ I Type a) or b) appliance only, no solid fuel			STALLING CONTRACTOR  ISTALLING CONTRACTOR	50 50	✓ ✓	3.5
1 Type a) of b) appliance only, no solid ruel			STALLING CONTRACTOR	50	·	3.5
II Type I except with solid fuel (including fireplaces	)					
III Any Type c) appliance		HEAT RECOVERY VENTILA  Model:	VANEE 65H			9.32.3.11.
		155	cfm high	64	С	fm low
IV Type I, or II with electric space heat		75 %	Sensible Efficiency		✓ HVI.	Approved
Other: Type I, II or IV no forced air			32 deg F ( 0 deg C)			тррготос
		LOCATION OF INSTALLAT	GND. /	0:5	\: - I	1 1 1:11
SYSTEM DESIGN OPTIONS	O.N.H.W.P.		(ichmona	City of R		
1 Exhaust only/Forced Air System		Lot:		Conces Ropi	ding Divi	sion
		Township	HVAC R	FaVIE	WED	
2 HRV with Ducting/Forced Air System		Address				
HRV Simplified/connected to forced air system			Initialar	PX۱	/	
4 HRV with Ducting/non forced air system		Roll #	Initials:			
, , , , , , , , , , , , , , , , , , ,		BUILDER:	OYAL PINE HOMES			
Part 6 Design		Name:				
TOTAL VENTILATION CAPACITY	9.32.3.3(1)	Address:				
Basement + Master Bedroom 2 @ 21.2 cfm 42.4	cfm	City:				
Other Bedrooms <u>3</u> @ 10.6 cfm <u>31.8</u>	cfm	Telephone #:		Fax#:		
Kitchen & Bathrooms5 @ 10.6 cfm53	cfm	INSTALLING CONTRACTOR	₹			
Other Rooms <u>3</u> @ 10.6 cfm <u>31.8</u>	cfm	Name:				
Table 9.32.3.A. TOTAL <u>159.0</u>	cfm	Address:				
		City:				
PRINCIPAL VENTILATION CAPACITY REQUIRED	9.32.3.4.(1)	•				
1 Bedroom 31.8	cfm	Telephone #:		Fax #:		
		DESIGNER CERTIFICATION				
2 Bedroom 47.7	cfm	I hereby certify that this venti in accordance with the Ontari		lesigned		
3 Bedroom 63.6	cfm		IVAC Designs Ltd.	20000		
4 Bedroom 79.5	cfm	Signature:	Meha	1 Ofounde	٤.	
5 Bedroom 95.4	cfm	HRAI#	50.00	001820		
TOTAL 79.5 cfm		Date:		June-21		
I REVIEW AND TAKE RESPONIBILITY FOR THE DESIGN WORK AND AM QUAL	IFIED IN THE API		ESIGNER" UNDER DIVISION C		ILDING CODE.	



	_	<u> </u>	Forn	nula Sheet (For Air Lea	akage / Ventiliation C	Calculation)				
LO#: 9	91284	Model: 38-14		•	er: ROYAL PINE HOMES	•			Date:	2021-06-21
	-	Volume Calculation	on				Air Change & Delt	a T Data		
			-							
use Volume						WINTER NA	TURAL AIR CHANG	E RATE	0.227	
Level	Floor Area (ft²)	Floor Height (ft)	Volume (ft³)			SUMMER NA	TURAL AIR CHAN	GE RATE	0.071	
Bsmt	1098	10	10980							
First	1098	10	11089.8							
Second	1626	9	14634					mperature Diff		AT 0F
Third	0	9	0	<u> </u>		Winter DTDh	Tin °C	Tout °C	ΔT °C	ΔT °F
Fourth	U	Total:	36,703.8 ft <sup>3</sup>	_		Winter DTDh Summer DTDc	22	-21 31	43 7	78 13
		Total:	1039.3 m <sup>3</sup>			Summer DTDC	24	31	,	13
		Total.	1033.3111	<u></u>						
	5.2	.3.1 Heat Loss due to A	ir Leakage			6.2.6	Sensible Gain due	to Air Leakage		
		17					**			
	HL ains =	= $LR_{airh} \times \frac{V_b}{3.6} \times$	$DTD_{k} \times 1.2$		1	$HG_{salb} = LR_{airc} >$	$\times \frac{V_b}{V_b} \times DTD_a$	× 1 2		
					- 1		0.0			
0.227	x <u>288.70</u>	x 43 °C	x 1.2	= 3392 W	= 0.071	x 288.70	x <u>7°C</u>	x <u>1.2</u>	_ =	174 W
					,				ī	
				= 11574 Btu/h					=	594 Btu/l
	E 2 2 2 LI	eat Loss due to Mecha	nical Vantilation			62750	nsible heat Gain d	uo to Vontilatio	n	
	3.2.3.2 11	eat Loss due to Mecha	ilicai ventilation			0.2.7 361	isible fleat daili u	ue to ventilatio	11	
	HI	$= PVC \times DTD_h \times$	$1.08 \times (1 - F)$		HI.	$_{vairb} = PVC \times D$	TD <sub>b</sub> × 1.08 ×	(1 - E)		
	11 Lvairb	IVO N DID <sub>n</sub> N	1.00 × (1 2)			vairb 170 2	Ση 1.00	(1 2)		
80 CFM	x 78 °F	x 1.08	x 0.25	= 1670 Btu/h	80 CFM	x 13 °F	x 1.08	x 0.25	=	275 Btu/l
						<u> </u>			_ !	
			5.2.3.3 Calcula	ation of Air Change Heat	Loss for Each Room (Flo	or Multiplier Section)				
					•	•				
		$HL_{c}$	$_{uirr} = Level Fact$	$tor \times HL_{airbv} \times \{(H_{airbv}) \times $	$(L_{agcr} + HL_{bgcr}) \div$	$(HL_{agclevel} + HL_{eq})$	bgclevel)}			
			T	1	<u> </u>	1				
		Level	Level Factor (LF)	HLairve Air Leakage +	Level Conductive Heat	Air Leakage Heat Lo	ss Multiplier (LF x			
		Level	Level ractor (Li )	Ventilation Heat Loss	Loss: (HL <sub>clevel</sub> )	HLairbv / I	HLlevel)			
		1	0.5	(Btu/h)	8,342	0.69	4			
		2	0.3	_	10,749	0.32				
		3	0.2	11,574	14,242	0.16				
		4	0	1 ,	0	0.00				
		5	0		0	0.00				
				1	·					







#### **HEAT LOSS AND GAIN SUMMARY SHEET**

		HLAT LOSS AND	GAIN SUIVINANT SHEET	
MODEL:	38-14		BUILDER: ROYAL PINE HOMES	
SFQT:	2724	<b>LO#</b> 91284	SITE: CENTREFIELD (WEST	Γ GORMLEY)
DESIGN AS	SSUMPTIONS			
DESIGN AS	SSUMPTIONS			
HEATING		°F	COOLING	°F
OUTDOOR	R DESIGN TEMP.	-6	OUTDOOR DESIGN TEMP.	88
INDOOR D	ESIGN TEMP.	72	INDOOR DESIGN TEMP. (MAX 75°F)	75
BUILDING	DATA			
ATTACHM	ENT:	DETACHED	# OF STORIES (+BASEMENT):	3
FRONT FA	CES:	EAST	ASSUMED (Y/N):	Υ
AIR CHANG	GES PER HOUR:	2.50	ASSUMED (Y/N):	Υ
AIR TIGHT	NESS CATEGORY:	TIGHT	ASSUMED (Y/N):	Υ
WIND EXP	OSURE:	SHELTERED	ASSUMED (Y/N):	Υ
HOUSE VC	DLUME (ft³):	36703.8	ASSUMED (Y/N):	Υ
INTERNAL	SHADING:	BLINDS/CURTAINS	ASSUMED OCCUPANTS:	5
INTERIOR	LIGHTING LOAD (Btu/	h/ft²): 1.45	DC BRUSHLESS MOTOR (Y/N):	Υ
FOUNDAT	ION CONFIGURATION	BCIN_1	DEPTH BELOW GRADE:	7.0 ft
LENGTH:	53.0 ft	WIDTH: 31.0 ft	EXPOSED PERIMETER:	168.0 ft

2012 OBC - COMPLIANCE PACKAGE		·
	Complian	e Package
Component	SB-12 PE	RFORMANCE
	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





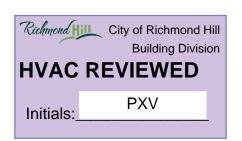
### **Residential Foundation Thermal Load Calculator**

Supplemental tool for CAN/CSA-F280

We	eather Sta	tion Description									
Province:	Ontario										
Region:	Richmon	d Hill									
	Site D	escription									
Soil Conductivity:	Normal c	onductivity: dry sand, loam, clay									
Water Table:	Normal (	7-10 m, 23-33 ft)									
Foundation Dimensions											
Floor Length (m):	16.2										
Floor Width (m):	9.4										
Exposed Perimeter (m):	0.0										
Wall Height (m):	3.0										
Depth Below Grade (m):	2.13	Insulation Configuration									
Window Area (m²):	1.1										
Door Area (m²):	1.9										
	Radia	ant Slab									
Heated Fraction of the Slab:	0										
Fluid Temperature (°C):	33										
	Design	n Months									
Heating Month	1										
	Founda	tion Loads									
Heating Load (Watts):		1672									

**TYPE:** 38-14 **LO#** 91284





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

### **Air Infiltration Residential Load Calculator**

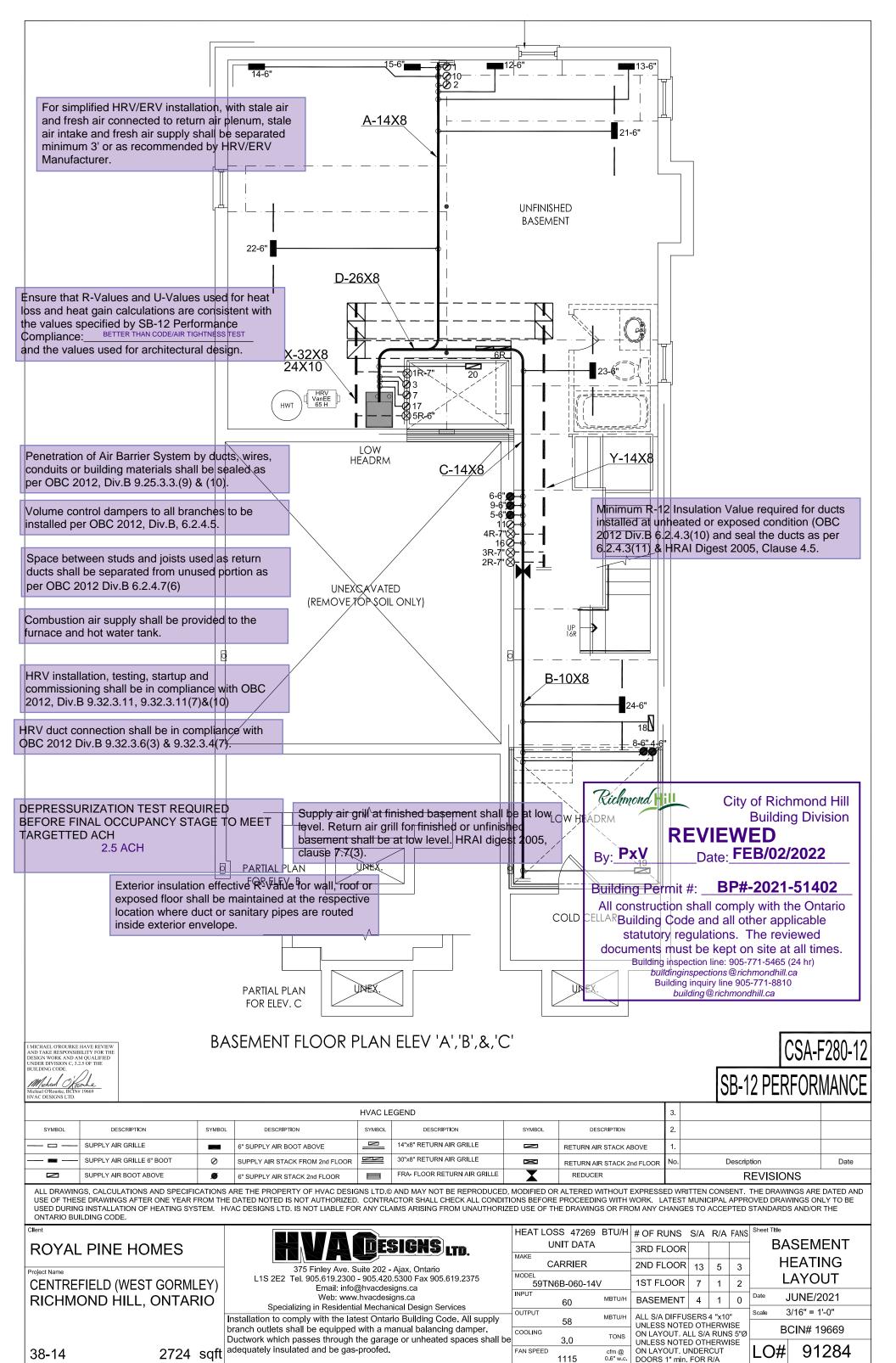
Supplemental tool for CAN/CSA-F280

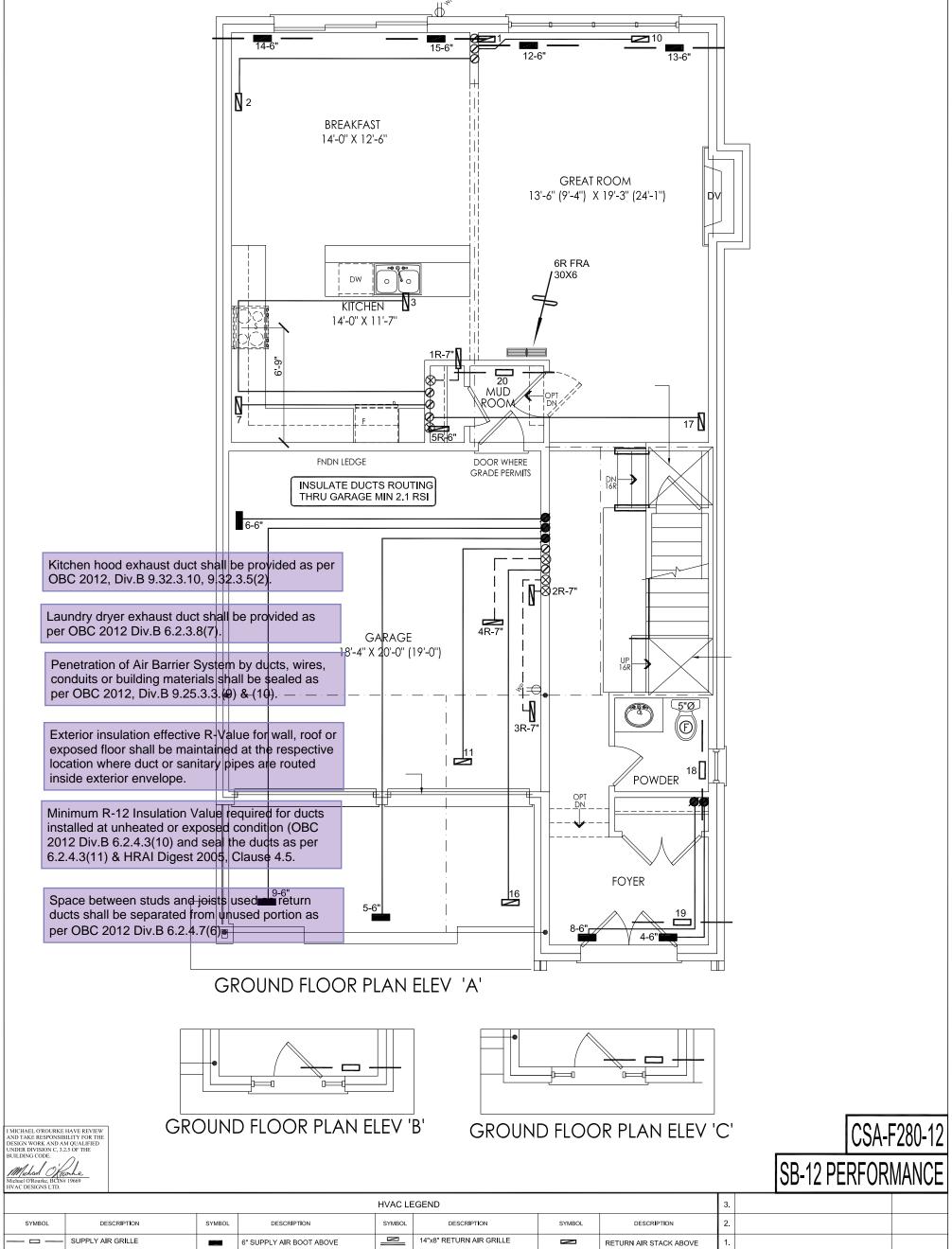
Weather S	tation Description
Province:	Ontario
Region:	Richmond Hill
Weather Station Location:	Open flat terrain, grass
Anemometer height (m):	10
Loca	al Shielding
Building Site:	Suburban, forest
Walls:	Heavy
Flue:	Heavy
Highest Ceiling Height (m):	6.74
Building	g Configuration
Type:	Detached
Number of Stories:	Two
Foundation:	Full
House Volume (m³):	1039.3
Air Leak	age/Ventilation
Air Tightness Type:	Energy Star Detached (2.5 ACH)
Custom BDT Data:	ELA @ 10 Pa.
	∠ 2.50
Mechanical Ventilation (L/s):	Total Supply Total Exhaust
	37.5
F	lue Size
Flue #:	#1 #2 #3 #4
Diameter (mm):	0 0 0 0
Natural I	nfiltration Rates
Heating Air Leakage Rate (ACH	/H): <b>0.227</b>
Cooling Air Leakage Rate (ACH/	/H): 0.071

**TYPE:** 38-14 **LO#** 91284

DEPRESSURIZATION TEST REQUIRED BEFORE FINAL OCCUPANCY STAGE TO MEET TARGETTED ACH

2.5 ach





SUPPLY AIR GRILLE 6" BOOT 30"x8" RETURN AIR GRILLE 0 SUPPLY AIR STACK FROM 2nd FLOOR > <No. Description Date RETURN AIR STACK 2nd FLOOR SUPPLY AIR BOOT ABOVE FRA- FLOOR RETURN AIR GRILLE REDUCER **REVISIONS** 0 6" SUPPLY AIR STACK 2nd FLOOR

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.

### **ROYAL PINE HOMES**

Project Name

38-14

CENTREFIELD (WEST GORMLEY) RICHMOND HILL, ONTARIO

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

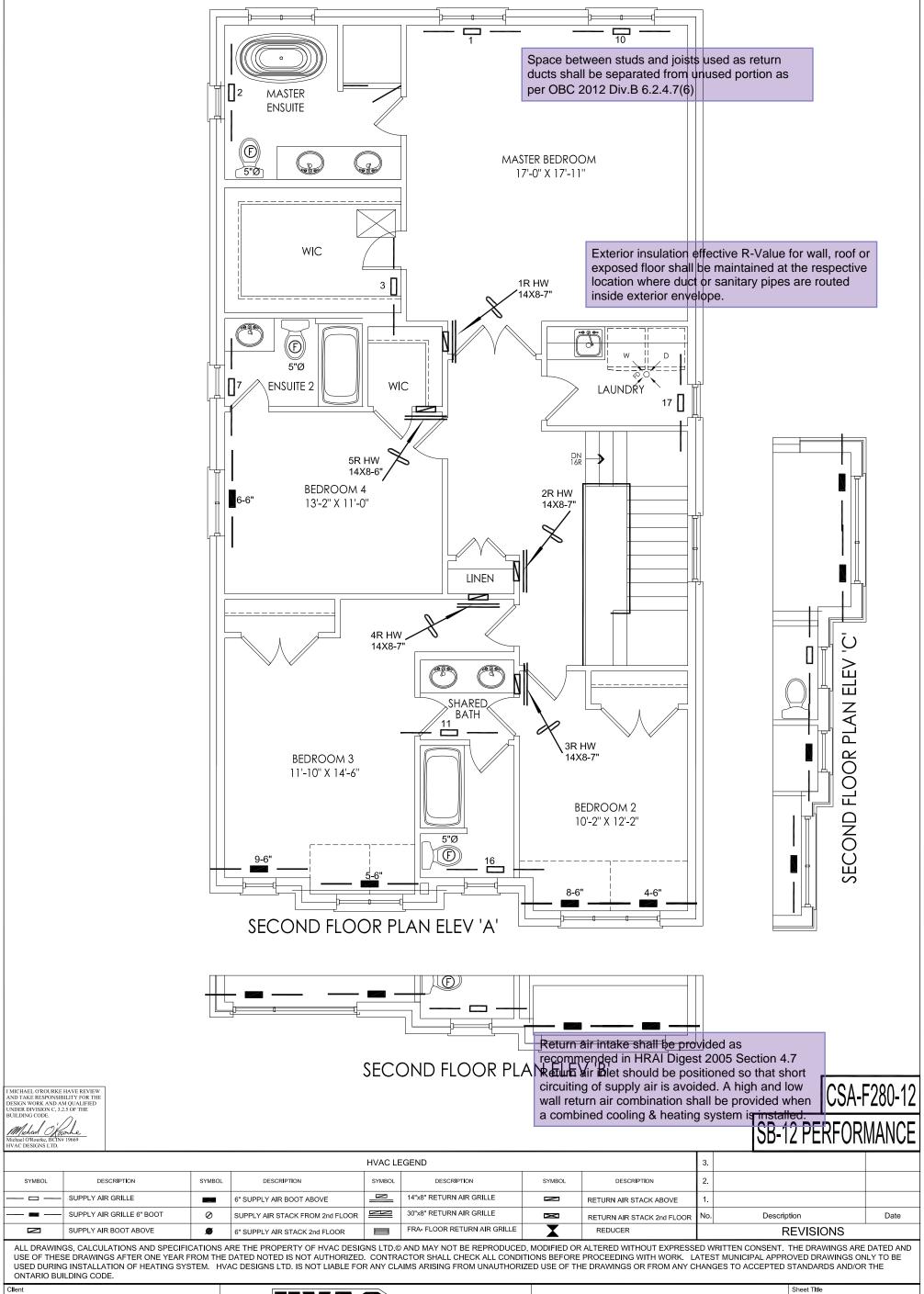
Specializing in Residential Mechanical Design Services

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

FIRST FLOOR **HEATING** LAYOUT JUNE/2021

3/16" = 1'-0" BCIN# 19669

91284 LO#



### **ROYAL PINE HOMES**

Project Name

CENTREFIELD (WEST GORMLEY) RICHMOND HILL, ONTARIO

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

Specializing in Residential Mechanical Design Services

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

SECOND FLOOR **HEATING LAYOUT** 

JUNE/2021 3/16" = 1'-0"

BCIN# 19669 91284 LO#

38-14



#### **Schedule 1: Designer Information**

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

A. Project Information				1.20.1.	PXV
Building number, street name				<sub>บก</sub> ู่เก <u>เน่าals:</u>	
Municipality	Postal code	Plan number/ other desc	cription		
RICHMOND HILL					
B. Individual who reviews and takes	responsibility fo	r design activities			
Name		Firm			
MICHAEL O'ROURKE		HVAC DESIGNS LTD.	I		1
Street address 375 FINLEY AVE			Unit no. <b>202</b>		Lot/con. N/A
Municipality	Postal code	Province	E-mail		JIV/A
AJAX	L1S 2E2	ONTARIO	info@hvacdesi	igns.ca	
Telephone number	Fax number	1	Cell number		
(905) 619-2300	(905) 619-2375		( )		
C. Design activities undertaken by ir	dividual identific	ed in Section B. [Build	ding Code Tab	ole 3.5.2.1 OF Divi	sion C]
☐ House	⊠ HVAC	– House	□ F	Building Structura	al
☐ Small Buildings	Building	g Services	□ F	Plumbing – Hous	е
☐ Large Buildings ☐ Complex Buildings	☐ Detecti☐ Fire Pre	on, Lighting and Pov		Plumbing – All Bu Dn-site Sewage S	
Description of designer's work	u File Pil	Model:	38-14	Jii-sile Sewage .	Systems
HEAT LOSS / GAIN CALCULATIONS		lviodei:	Coventry		
DUCT SIZING			OPT 2ND		
RESIDENTIAL MECHANICAL VENTILATION		ARY Project:	CENTREFIELD (V	WEST GORMLEY)	
RESIDENTIAL SYSTEM DESIGN per CSA	-F280-12			•	
D. Declaration of Designer					
MICHAEL O'ROURKE	int name)	· · · · · · · · · · · · · · · · · · ·	declare tha	at (choose one as ap	propriate):
"	,	<b>6</b> - <b>--</b>		-ti 0 0 4 -f	
☐ I review and take responsibility for Division C, of the Building Code. classes/categories.				appropriate	
Individual BCIN:					
Firm BCIN:			<del></del>		
I review and take responsibility for designer" under subsection 3.		m qualified in the appropo on C, of the Building Code		an "other	
Individual BCIN:	19669				
Basis for exemption f	rom registration and	d qualification:	O.B.C SENT	ENCE 3.2.4.1 (	<u>(4)</u>
☐ The design work is exempt Basis for exemption from registr		ion and qualification requi	rements of the B	uilding Code.	
I certify that:					
The information contained     I have submitted this applications		ule is true to the best of medge and consent of the			
June 21, 2021			Michan	Ofounde	-
Date				Signature of Des	igner

<sup>1.</sup> 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.

<sup>2.</sup> 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.



BIRGING FROM PRINCIPLE   WINE   PRINCIPLE   WINE   PRINCIPLE   WINE	SITE NAME:	CENTRE	FIELD (	WEST	GORM	LEY)				OPT 21	ND								DATE:	Jun-21			v	WINTER	NATU	RAL AI	R CHAN	GE RA	TE 0.22	27	HEAT LOSS	S ΔT °F.	78		CSA	-F280-12	
MORE   SAY MAIL   SAY						,					-				GFA:	2724																		SB-12	PERFO	RMANCE	
SP- WALL   Carte   Act Tools   Carte					MBR						WIC						BED-3							- 1													
C.C. I. M. ACTORD  MATCHINE  MATCHIN  MATCHIN																																					
Color											9															9											
GERMALIAREA (LOSS CAM)  GREAT 128 614 30 829 71 19 444 70 00 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0		FACTOR	s																																		
CALANDO   CALA	GRS.WALL AREA		-		333			198			54			297			261			99						54		5	4		45						
MOTTH  21.0   16.0   0   0   0   0   0   0   0   0   0						ΑΙΝ			GAIN			GAIN			GAIN			GAIN			GAIN						ΔIN			N		N					
BAST 128   814   33   818   819   819   810   8   810   8   8   819   810   8   8   8   8   8   8   8   8   8		21.8	16.0						-																												
SOUTH 12 A 34 B 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0				-						-		-	_	-	-	-	-			-					0							a Hil	II Ci	itvlot	Rich	mono	Hill B
WEST   15.4   16.5   0   0   0   0   0   0   0   0   0											-	-	-		-	-	-			-					9	-								•			
Second						-		n		-	-	ň	_		-										n									В	uildin	g Div	sion
DOORS   28   43   0   0   0   0   0   0   0   0   0		-		-	-	-	-	-	-	-	-	ň							-	-	-				0	-			-								
METERPORED WALL   A2   07   295 Tal   710 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1					-	-	-	-	-	-	-	0	-	-	-	-	-	-	-	-	-				٨	-					$\mathbf{H}\mathbf{X}/\mathbf{A}$	$\mathbf{C}$	RE	VII	=\//		
STRENGE CLAFF   1.0			-					-	-			-		-			-			-	-				•	-							.,_	A I F	_ , ,		
EXPOSED CLG   3   0   0   0   0   0   0   0   0   0						-						-																									
ANATICEPROBLE CLG   23   13   0   0   0   0   0   0   0   0   0															-										-									ים	<i>/</i> \ /		
SEMINATION   PART   P																																		Ρ,	٦V		
BASEMENTICRAMI, HEAT LOSS   0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0					-	-	-	•	-	-	-	-								-	-				-						ຼາເຫຼດສາ	<b>ড</b>					
SLAB ON GRADE HEAT LOSS   SUBTOTAL HT CARE   SUBT		2.6	0.4	U		۰	U	-	U	U		۰	U	-	۷	251		100	1/5		/5				U	0	۰										
SUBTOTAL INT CLOSS   SUBTOTAL INT CAN   SUBTOTAL					•			•			•			•			•			•						0											
SUB TOTAL INT CANN   1986					-			-			-			-			-			-						-		_			-						
LEVEL FACTOR MULTIPLIER   0.20 0.16   0.								1470			365						3029			1428								46		_							
ARI CHANGE HEAT COSS   405   0   0   50   5   5   5   121   114   31   31   31   31   31   31									1108			99			2650			2509			670											<sup>3</sup>					
ARCHANGE HEAT GAIN DUCT CARN POUT LOSS DUCT CARN PLOY AND PAGE 128 AND			١,			0.				0.20			0.20			0.20			0.20						0.20		0.			0.2							
DUCT CAMP PEPPLE 240					405			236			59	_		414			486			229						74		7									
DUCT GAN   FACTORS   FACTORS   FACTORS   FACTORS   FOR   FACTORS   FOR   FACTORS   F						90			50			5			121			114			31						13			•							
HEAT CAIM PEOPLE   240   2					0			0			0			0			351			166						0		0									
HEAT CARM APPLANCESLIDITS   100   2228   1106   424   2297   138   683   1823   5.99						- 1						-			-														-								
TOTAL HT LOSS BTUM		240		2			0		-	0		-	1			1			1						0		-	0	-								
TOTAL HT GAIN x 1.3 BTUM    4228						693			0			0			693			693			693						0		-		•						
ROOM USE   EXP. WALL   61   52   16   16   12   29   7   11   11   11   10   10   9   10   11   11								1706			424						3866			1823								53									
EXP. WALL CLG, HT. T. FACTORS GRS.WALL AREA LOSS GAIN CLOSS GAIN C	TOTAL HT GAIN x 1.3 BTU/H					4225			1507			135			4815			5085			2335						395		395	5	1251	3					
EXP. WALL CLG, HT. T. FACTORS GRS.WALL AREA LOSS GAIN CLOSS GAIN C																															1200	-,					
CLG, HT   FACTORS   FACTORS   GAIN   GLZNING	ROOM USE							GRT		I	KIT						DEN			PWD			FOY			MUD					1200				BA	s	
GRS.WALL AREA, LOSS GAIN GRS.WALL AREA, LOSS G																															1200						
GRS.WALLAREA LOSS GAIN GLAZING	EXP. WALL							61			52						16			12			29			7					1200				168	3	
GLAZING NORTH CAST 21.8 16.0 CAST 21	EXP. WALL	FACTOR	s					61			52						16			12			29			7					120				168	3	
NORTH   21.8   15.0   0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	EXP. WALL CLG. HT.							61 10			52 10						16 9			12 10			29 11			7 11					120				168 10	3	
EAST 21.8 41.6 SOUTH 21.8 24.9 SO 1 00 71 1547 2950 SOUTH 21.8 24.9 SO 1 00 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	EXP. WALL CLG. HT. GRS.WALL AREA							61 10 616	GAIN		52 10 525	GAIN					16 9 144			12 10 121			29 11 322	GAIN		7 11 78	SAIN				120				168 10 117	6	
SOUTH 21.8 24.9	EXP. WALL CLG. HT. GRS.WALL AREA GLAZING	LOSS G	SAIN					61 10 616 LOSS	-	0	52 10 525 LOSS					0	16 9 144 LOSS	GAIN	0	12 10 121 LOSS	GAIN		29 11 322 LOSS	GAIN		7 11 78 LOSS 0					1200				166 10 117 LOS	3 6 S GAIN	
WEST   218   416	EXP. WALL CLG. HT. GRS.WALL AREA GLAZING NORTH	LOSS 6	16.0				0	61 10 616 LOSS 0	0		52 10 525 LOSS 0	0				0	16 9 144 LOSS 0	GAIN 0		12 10 121 LOSS 0	GAIN 0	0	29 11 322 LOSS 0	0	0	7 11 78 LOSS 0	0				1200				166 10 117 LOS 3 65	6 S GAIN 48	
SKYLT. 38.8 101.2 DOORS 25.8 4.3 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	EXP. WALL CLG. HT. GRS.WALL AREA GLAZING NORTH EAST	21.8 21.8	16.0 41.6				0 60	61 10 616 LOSS 0 1307	0 2493	71	52 10 525 LOSS 0 1547	0 2950				0	16 9 144 LOSS 0	GAIN 0 0	0	12 10 121 LOSS 0	GAIN 0 0	0	29 11 322 LOSS 0 0	0	0	7 11 78 LOSS 0 0	0								166 10 117 LOS 3 65 3 65	6 S GAIN 48 125	
DOORS	EXP. WALL CLG. HT. GRS.WALL AREA GLAZING NORTH EAST SOUTH	21.8 21.8 21.8 21.8	16.0 41.6 24.9				0 60 0	61 10 616 LOSS 0 1307	0 2493 0	71 0	52 10 525 LOSS 0 1547 0	0 2950 0				0 0 33	16 9 144 LOSS 0 0 719	GAIN 0 0 822	9	12 10 121 LOSS 0 0	GAIN 0 0 224	0 0 0	29 11 322 LOSS 0 0	0 0 0	0 0 0	7 11 78 LOSS 0 0 0	0 0 0				1200				166 10 117 LOS 3 65 3 65 3 13	6 S GAIN 48 125 I 149	
NET EXPOSED WALL 4.2 0.7 NET EXPOSED BMR WALL 4.2 0.7 NET EXPOSED BMR WALL ABOVE GR 3.7 0.6 NET EXPOSED CLG 13.7 0.6 UN ATTIC EXPOSED CLG 13.7 0.6 NO ATTIC EXPOSED CLG 13.8 1.3 UN ATTIC EXPOSED FLOOR 2.6 0.4 UN ATTIC EXPOSED FLOOR 2.6 UN ATTIC EXPOSED FLOOR 2.6 UN ATTIC EXPOSED FLOOR 2.6 0.4 UN ATTIC EXPOSED FLOOR 2.6 UN ATTIC EXPOS	EXP. WALL CLG. HT. GRS.WALL AREA GLAZING NORTH EAST SOUTH WEST	21.8 21.8 21.8 21.8 21.8	16.0 41.6 24.9 41.6				0 60 0	61 10 616 LOSS 0 1307 0	0 2493 0 0	71 0 0	52 10 525 LOSS 0 1547 0	0 2950 0 0				0 0 33 0	16 9 144 LOSS 0 0 719 0	GAIN 0 0 822 0	0 9 0	12 10 121 LOSS 0 0 196 0	GAIN 0 0 224 0	0 0 0	29 11 322 LOSS 0 0 0	0 0 0	0 0 0	7 11 78 LOSS 0 0 0 0	0 0 0				1200				166 10 117 LOS 3 65 3 65 6 13°	6 S GAIN 48 125 I 149 0	
NET EXPOSED DESMIT WALL ABOVE GR	EXP. WALL CLG. HT. GRS.WALL AREA GLAZING NORTH EAST SOUTH WEST SKYLT.	21.8 21.8 21.8 21.8 21.8 35.8	16.0 41.6 24.9 41.6 101.2				0 60 0 0	61 10 616 LOSS 0 1307 0 0	0 2493 0 0	71 0 0 0	52 10 525 LOSS 0 1547 0 0	0 2950 0 0				0 0 33 0	16 9 144 LOSS 0 0 719 0	GAIN 0 0 822 0	0 9 0	12 10 121 LOSS 0 0 196 0	GAIN 0 0 224 0	0 0 0 0	29 11 322 LOSS 0 0 0 0	0 0 0 0	0 0 0 0	7 11 78 LOSS 0 0 0 0 0	0 0 0 0				1200				166 10 117 LOS 3 65 3 65 6 13' 0 0	6 S GAIN 48 125 I 149 0	
EXPOSED CLG   1.3   0.6   0   0   0   0   0   0   0   0   0	EXP. WALL CLG. HT. GRS.WALL AREA GLAZING NORTH EAST SOUTH WEST SKYLT. DOORS	21.8 21.8 21.8 21.8 21.8 35.8 25.8	16.0 41.6 24.9 41.6 101.2				0 60 0 0 0	61 10 616 LOSS 0 1307 0 0	0 2493 0 0 0	71 0 0 0 0	52 10 525 LOSS 0 1547 0 0	0 2950 0 0 0				0 0 33 0 0	16 9 144 LOSS 0 0 719 0	GAIN 0 0 822 0 0	0 9 0 0	12 10 121 LOSS 0 0 196 0	GAIN 0 0 224 0 0	0 0 0 0 0 40	29 11 322 LOSS 0 0 0 0 0	0 0 0 0 0 170	0 0 0 0 0	7 11 78 LOSS 0 0 0 0 0 0	0 0 0 0 0 85				1200			2	166 100 1177 LOS 3 65 3 65 6 13° 0 0 0	6 S GAIN 48 125 I 149 0 0 7 85	
NO ATTIC EXPOSED CLG     EXPOSED FLOOR     EXPOSED FLOOR     BASEMENT/CRAWL HEAT LOSS     SLAB ON GRADE HEAT LOSS     SUBTOTAL HT GAIN     LEVEL FACTOR / MULTIPLIER     AIR CHANGE HEAT LOSS     AIR CHANGE HEAT GAIN     DUCT GAIN     HEAT GAIN PEOPLE     HEAT GA	EXP. WALL CLG. HT. GRS.WALL AREA GLAZING NORTH EAST SOUTH WEST SKYLT. DOORS NET EXPOSED WALL	21.8 21.8 21.8 21.8 21.8 21.8 25.8 4.2	16.0 41.6 24.9 41.6 101.2 4.3 0.7			5	0 60 0 0 0	61 10 616 LOSS 0 1307 0 0 0 0	0 2493 0 0 0 0 385	71 0 0 0 0 0 454	52 10 525 LOSS 0 1547 0 0 0	0 2950 0 0 0 0 314				0 0 33 0 0 0	16 9 144 LOSS 0 0 719 0 0 0 467	GAIN 0 0 822 0 0 0	0 9 0 0 0 112	12 10 121 LOSS 0 0 196 0 0	GAIN 0 0 224 0 0 0	0 0 0 0 0 40 282	29 11 322 LOSS 0 0 0 0 0 1034 1186	0 0 0 0 0 170	0 0 0 0 0 20 58	7 11 78 LOSS 0 0 0 0 0 0 517 243	0 0 0 0 0 0 85				1200			2	166 100 1177 LOS 3 65 3 65 6 13° 0 0 0 0 0 51°	6 SS GAIN 48 125 I 149 0 0 7 85 0	
EXPOSED FLOOR   2.6   0.4   0   0   0   0   0   0   0   0   0	EXP. WALL CLG. HT. GRS.WALL AREA GLAZING NORTH EAST SOUTH WEST SKYLT. DOORS NET EXPOSED WALL NET EXPOSED WALL	21.8 21.8 21.8 21.8 21.8 25.8 4.2 3.7	16.0 41.6 24.9 41.6 101.2 4.3 0.7			5	0 60 0 0 0 0 556	61 10 616 LOSS 0 1307 0 0 0 2339	0 2493 0 0 0 0 385 0	71 0 0 0 0 454 0	52 10 525 LOSS 0 1547 0 0 0 1910	0 2950 0 0 0 0 314				0 0 33 0 0 0 111	16 9 144 LOSS 0 0 719 0 0 467	GAIN 0 0 822 0 0 0 77	0 9 0 0 0 112 0	12 10 121 LOSS 0 0 196 0 0 0 472	GAIN 0 0 224 0 0 0 78	0 0 0 0 0 40 282 0	29 11 322 LOSS 0 0 0 0 0 1034 1186 0	0 0 0 0 0 170 195	0 0 0 0 0 20 58	7 11 78 LOSS 0 0 0 0 0 0 517 243 0	0 0 0 0 0 0 85 40				1200			2	166 100 117 LOS 65 65 137 0 0 0 511 0 0 04 185	6 GAIN 48 125 I 149 0 0 7 85 0 7 305	
BASEMENT/CRAWL HEAT LOSS SLAB ON GRADE HEAT LOSS SLAB ON GRADE HEAT LOSS SUBTOTAL HT LOSS SUBTOTAL HT GAIN S	EXP. WALL CLG. HT. GRS.WALL AREA GLAZING NORTH EAST SOUTH WEST SKYLT. DOORS NET EXPOSED WALL NET EXPOSED BBMT WALL ABOVE GR	21.8 21.8 21.8 21.8 21.8 35.8 25.8 4.2 3.7	16.0 41.6 24.9 41.6 101.2 4.3 0.7 0.6 0.6			5	0 60 0 0 0 0 556 0	61 10 616 LOSS 0 1307 0 0 0 2339 0	0 2493 0 0 0 0 0 385 0	71 0 0 0 0 454 0	52 10 525 LOSS 0 1547 0 0 0 1910 0	0 2950 0 0 0 0 314 0				0 0 33 0 0 0 111 0 135	16 9 144 LOSS 0 0 719 0 0 0 467 0	GAIN 0 0 822 0 0 0 77 0 79	0 9 0 0 0 112 0	12 10 121 LOSS 0 0 196 0 0 472 0	GAIN 0 0 224 0 0 0 78 0	0 0 0 0 0 40 282 0	29 11 322 LOSS 0 0 0 0 0 1034 1186 0	0 0 0 0 170 195 0	0 0 0 0 0 20 58 0	7 11 78 LOSS 0 0 0 0 0 0 517 243 0	0 0 0 0 0 0 85 40 0				1200			50	166 100 117 LOS 65 65 13° 0 0 0 51° 0 0 0 0 4 185 0 0 0	6 S GAIN 48 125 1 149 0 0 7 85 0 7 305 0	
SLAB ON GRADE HEAT LOSS   0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	EXP. WALL CLG. HT. GRS.WALL AREA GLAZING NORTH EAST SOUTH WEST SKYLT. DOORS NET EXPOSED WALL NET EXPOSED WALL NET EXPOSED CLG NO ATTIC EXPOSED CLG	21.8 21.8 21.8 21.8 35.8 25.8 4.2 3.7 1.3 2.8	6AIN 16.0 41.6 24.9 41.6 101.2 4.3 0.7 0.6 0.6 1.3			5	0 60 0 0 0 0 0 0 0 0	61 10 616 LOSS 0 1307 0 0 0 2339 0	0 2493 0 0 0 0 0 385 0	71 0 0 0 0 454 0	52 10 525 LOSS 0 1547 0 0 0 1910 0	0 2950 0 0 0 0 314 0				0 0 33 0 0 0 111 0 135	16 9 144 LOSS 0 0 719 0 0 467 0 177	GAIN 0 0 822 0 0 77 0 79	0 9 0 0 0 112 0 0	12 10 121 LOSS 0 0 196 0 0 472 0	GAIN 0 0 224 0 0 0 78 0	0 0 0 0 0 40 282 0	29 11 322 LOSS 0 0 0 0 1034 1186 0 0	0 0 0 0 170 195 0	0 0 0 0 0 20 58 0	7 11 78 LOSS 0 0 0 0 0 0 517 243 0 0	0 0 0 0 0 85 40 0				1200			50	166 100 117 LOS 3 65 137 0 0 0 517 0 0 0 4 185 0 0 0 0	6 SS GAIN 48 125 1 149 0 0 7 85 0 7 305 0 0	
SUBTOTAL HT LOSS SUB TOTAL HT GAIN 2878 3264 978 302 365 125 712 712 712 712 712 712 712 712 712 712	EXP. WALL CLG. HT. GRS.WALL AREA GLAZING NORTH EAST SOUTH WEST SKYLT. DOORS NET EXPOSED WALL NET EXPOSED BBMT WALL ABOVE GR EXPOSED CLG NO ATTIC EXPOSED CLG EXPOSED FLOOR	21.8 21.8 21.8 21.8 35.8 25.8 4.2 3.7 1.3 2.8	6AIN 16.0 41.6 24.9 41.6 101.2 4.3 0.7 0.6 0.6 1.3			5	0 60 0 0 0 0 0 0 0 0	61 10 616 LOSS 0 1307 0 0 0 2339 0	0 2493 0 0 0 0 0 385 0	71 0 0 0 0 454 0	52 10 525 LOSS 0 1547 0 0 0 1910 0	0 2950 0 0 0 0 314 0				0 0 33 0 0 0 111 0 135	16 9 144 LOSS 0 0 719 0 0 467 0 177 0	GAIN 0 0 822 0 0 77 0 79	0 9 0 0 0 112 0 0	12 10 121 LOSS 0 0 196 0 0 472 0 0	GAIN 0 0 224 0 0 0 78 0	0 0 0 0 0 40 282 0	29 11 322 LOSS 0 0 0 0 1034 1186 0 0	0 0 0 0 170 195 0	0 0 0 0 0 20 58 0	7 11 78 LOSS 0 0 0 0 0 0 517 243 0 0	0 0 0 0 0 85 40 0				1200			50	166 100 117 LOS 3 65 137 0 0 0 0 517 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	6 SS GAIN 48 125 1 149 0 0 7 85 0 7 305 0 0 0	
SUB TOTAL HT GAIN LEVEL FACTOR / MULTIPLIER AIR CHANGE HEAT GAIN DUCT LOSS DUCT GAIN HEAT GAIN POPLIA HEAT GAIN POPLIA TOTAL HT LOSS BTU/H  AR23 A826	EXP. WALL CLG. HT. GRS.WALL AREA GLAZING NORTH EAST SOUTH WEST SKYLT. DOORS NET EXPOSED WALL NET EXPOSED WALL NET EXPOSED CLG NO ATTIC EXPOSED CLG EXPOSED FLOOR BASEMENT/CRAWL HEAT LOSS	21.8 21.8 21.8 21.8 35.8 25.8 4.2 3.7 1.3 2.8	6AIN 16.0 41.6 24.9 41.6 101.2 4.3 0.7 0.6 0.6 1.3			5	0 60 0 0 0 0 0 0 0 0	61 10 616 LOSS 0 1307 0 0 0 2339 0 0 0	0 2493 0 0 0 0 0 385 0	71 0 0 0 0 454 0	52 10 525 LOSS 0 1547 0 0 0 1910 0 0 0	0 2950 0 0 0 0 314 0				0 0 33 0 0 0 111 0 135	16 9 144 LOSS 0 0 719 0 0 467 0 177 0	GAIN 0 0 822 0 0 77 0 79	0 9 0 0 0 112 0 0	12 10 121 LOSS 0 0 196 0 0 472 0 0 0	GAIN 0 0 224 0 0 0 78 0	0 0 0 0 0 40 282 0	29 11 322 LOSS 0 0 0 0 1034 1186 0 0	0 0 0 0 170 195 0	0 0 0 0 0 20 58 0	7 11 78 LOSS 0 0 0 0 0 0 517 243 0 0 0	0 0 0 0 0 85 40 0				1200			50 50 0	166 100 117 LOS 3 65 137 0 0 0 0 517 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	6 SS GAIN 48 125 1 149 0 0 7 85 0 7 305 0 0 0	
LEVEL FACTOR / MULTIPLIER	EXP. WALL CLG. HT. GRS.WALL AREA GLAZING NORTH EAST SOUTH WEST SKYLT. DOORS NET EXPOSED WALL NET EXPOSED BSMT WALL ABOVE GR EXPOSED CLG NO ATTIC EXPOSED CLG BASEMENTICRAWL HEAT LOSS SLAB ON GRADE HEAT LOSS	21.8 21.8 21.8 21.8 35.8 25.8 4.2 3.7 1.3 2.8	6AIN 16.0 41.6 24.9 41.6 101.2 4.3 0.7 0.6 0.6 1.3			5	0 60 0 0 0 0 0 0 0 0 0 0 0	61 10 616 LOSS 0 1307 0 0 0 2339 0 0 0	0 2493 0 0 0 0 0 385 0	71 0 0 0 0 454 0	52 10 525 LOSS 0 1547 0 0 0 1910 0 0 0	0 2950 0 0 0 0 314 0				0 0 33 0 0 0 111 0 135	16 9 144 LOSS 0 0 719 0 0 467 0 177 0 0	GAIN 0 0 822 0 0 77 0 79	0 9 0 0 0 112 0 0	12 10 121 LOSS 0 0 196 0 0 472 0 0 0	GAIN 0 0 224 0 0 0 78 0	0 0 0 0 0 40 282 0 0	29 11 322 LOSS 0 0 0 0 1034 1186 0 0 0	0 0 0 0 170 195 0	0 0 0 0 0 20 58 0 0	7 11 78 LOSS 0 0 0 0 0 517 243 0 0 0 0	0 0 0 0 0 85 40 0				1200			50 50 0	166 100 1177 LOS 3 655 137 0 0 0 0 517 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	6 S GAIN 48 125 0 0 7 85 0 7 305 0 0 0 8	
AIR CHANGE HEAT LOSS	EXP. WALL CLG. HT. GRS.WALL AREA GLAZING NORTH EAST SOUTH WEST SKYLT. DOORS NET EXPOSED WALL NET EXPOSED WALL NET EXPOSED BASE NO ATTIC EXPOSED CLG EXPOSED FLOOR BASEMENT/CRAWL HEAT LOSS SLAB ON GRADE HEAT LOSS SUBTOTAL HT LOSS	21.8 21.8 21.8 21.8 35.8 25.8 4.2 3.7 1.3 2.8	6AIN 16.0 41.6 24.9 41.6 101.2 4.3 0.7 0.6 0.6 1.3			5	0 60 0 0 0 0 0 0 0 0 0 0 0	61 10 616 LOSS 0 1307 0 0 0 2339 0 0 0	0 2493 0 0 0 0 385 0 0	71 0 0 0 0 454 0	52 10 525 LOSS 0 1547 0 0 0 1910 0 0 0	0 2950 0 0 0 0 314 0 0				0 0 33 0 0 0 111 0 135	16 9 144 LOSS 0 0 719 0 0 467 0 177 0 0	GAIN 0 0 822 0 0 0 77 0 79 0	0 9 0 0 0 112 0 0	12 10 121 LOSS 0 0 196 0 0 472 0 0 0	GAIN 0 2224 0 0 78 0 0	0 0 0 0 0 40 282 0 0	29 11 322 LOSS 0 0 0 0 1034 1186 0 0 0	0 0 0 0 170 195 0 0	0 0 0 0 0 20 58 0 0	7 11 78 LOSS 0 0 0 0 0 517 243 0 0 0 0 0 760	0 0 0 0 0 85 40 0 0				1200			50 50 0	166 100 1177 LOS 3 655 137 0 0 0 0 517 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	6 SS GAIN 48 125 1 149 0 0 7 85 0 0 0 0 8	
AIR CHANGE HEAT GAIN DUCT LOSS 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	EXP. WALL CLG. HT. GRS.WALL AREA GLAZING NORTH EAST SOUTH WEST SKYLT. DOORS NET EXPOSED WALL NET EXPOSED BMT WALL ABOVE GR EXPOSED CLG NO ATTIC EXPOSED CLG EXPOSED FLOOR BASEMENT/CRAWL HEAT LOSS SLAB ON GRADE HEAT LOSS SUBTOTAL HT GAIN	21.8 21.8 21.8 21.8 35.8 25.8 4.2 3.7 1.3 2.8	6AIN 16.0 41.6 24.9 41.6 101.2 4.3 0.7 0.6 0.6 1.3			5	0 0 0 0 0 0 0 556 0 0	61 10 616 LOSS 0 1307 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 2493 0 0 0 0 385 0 0	71 0 0 0 0 454 0 0	52 10 525 LOSS 0 1547 0 0 0 1910 0 0 0 0 3457	0 2950 0 0 0 0 314 0 0				0 0 33 0 0 0 111 0 135 0	16 9  144  LOSS 0 0 719 0 0 467 0 1777 0 0 0 1363	GAIN 0 0 822 0 0 0 77 0 79 0	0 9 0 0 0 112 0 0	12 10 121 LOSS 0 0 196 0 0 472 0 0 0 0	GAIN 0 2224 0 0 78 0 0	0 0 0 0 40 282 0 0	29 11 322 LOSS 0 0 0 0 0 1034 1186 0 0 0 0 0	0 0 0 0 0 170 195 0 0 0	0 0 0 0 0 20 58 0 0	7 11 78 LOSS C 0 0 0 0 517 243 0 0 0 0 760	0 0 0 0 0 85 40 0 0				1200			50	166 10 117 LOS 3 655 6 133 0 0 0 0 0 517 0 0 0 0 4 185 0 0 0 0 570	6 SS GAIN 48 125 1 149 0 0 7 85 0 0 0 0 8 2 712	
DUCT LOSS DUCT GAIN HEAT GAIN PEOPLE 100 TOTAL HT LOSS BTU/H         0	EXP. WALL CLG. HT. GRS.WALL AREA GLAZING NORTH EAST SOUTH WEST SKYLT. DOORS NET EXPOSED WALL NET EXPOSED WALL NET EXPOSED BSMT WALL ABOVE GR EXPOSED CLG NO ATTIC EXPOSED CLG EXPOSED FLOOR BASEMENT/CRAWL HEAT LOSS SLAB ON GRADE HEAT LOSS SUBTOTAL HT GAIN LEVEL FACTOR / MULTIPLIER	21.8 21.8 21.8 21.8 35.8 25.8 4.2 3.7 1.3 2.8	6AIN 16.0 41.6 24.9 41.6 101.2 4.3 0.7 0.6 0.6 1.3			5	0 60 0 0 0 0 556 0 0	61 10 616 LOSS 0 1307 0 0 0 0 2339 0 0 0 0 0 0 3646	0 2493 0 0 0 0 385 0 0	71 0 0 0 0 454 0 0	52 10 525 LOSS 0 1547 0 0 0 1910 0 0 0 0 0 3457	0 2950 0 0 0 0 314 0 0				0 0 33 0 0 0 111 0 135 0	16 9  1444 LOSS 0 0 719 0 0 467 0 1777 0 0 0 1363	GAIN 0 0 822 0 0 0 77 0 79 0	0 9 0 0 0 112 0 0	12 10 121 LOSS 0 0 196 0 0 472 0 0 0 0 0 668	GAIN 0 2224 0 0 78 0 0	0 0 0 0 40 282 0 0	29 11 322 LOSS 0 0 0 0 0 0 1034 1186 0 0 0 0 0 2219	0 0 0 0 0 170 195 0 0 0	0 0 0 0 0 20 58 0 0	7 11 78 LOSS C 0 0 0 0 0 0 517 243 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 85 40 0 0				1200			50	163 100 1177 LOS 3 655 3 655 6 133 0 0 0 0 0 517 0	6 (SS GAIN 48 125 1 149 0 0 7 85 0 7 305 0 0 8 2 712 9	
DUCT GAIN HEAT GAIN PEOPLE         0 </td <td>EXP. WALL CLG. HT. GRS.WALL AREA GLAZING NORTH EAST SOUTH WEST SKYLT. DOORS NET EXPOSED WALL NET EXPOSED WALL NET EXPOSED CLG NO ATTIC EXPOSED CLG EXPOSED FLOOR BASEMENT/CRAWL HEAT LOSS SUBTOTAL HT LOSS SUBTOTAL HT GAIN LEVEL FACTOR / MULTIPLIER AIR CHANGE HEAT LOSS</td> <td>21.8 21.8 21.8 21.8 35.8 25.8 4.2 3.7 1.3 2.8</td> <td>6AIN 16.0 41.6 24.9 41.6 101.2 4.3 0.7 0.6 0.6 1.3</td> <td></td> <td></td> <td>5</td> <td>0 60 0 0 0 0 556 0 0</td> <td>61 10 616 LOSS 0 1307 0 0 0 0 2339 0 0 0 0 0 0 3646</td> <td>0 2493 0 0 0 0 385 0 0 0</td> <td>71 0 0 0 0 454 0 0</td> <td>52 10 525 LOSS 0 1547 0 0 0 1910 0 0 0 0 0 3457</td> <td>0 2950 0 0 0 0 314 0 0 0</td> <td></td> <td></td> <td></td> <td>0 0 33 0 0 0 111 0 135 0</td> <td>16 9  1444 LOSS 0 0 719 0 0 467 0 1777 0 0 0 1363</td> <td>GAIN 0 0 822 0 0 0 77 0 0 0 978</td> <td>0 9 0 0 0 112 0 0</td> <td>12 10 121 LOSS 0 0 196 0 0 472 0 0 0 0 0 668</td> <td>GAIN 0 2224 0 0 78 0 0 0</td> <td>0 0 0 0 40 282 0 0</td> <td>29 11 322 LOSS 0 0 0 0 0 0 1034 1186 0 0 0 0 0 2219</td> <td>0 0 0 0 0 170 195 0 0 0</td> <td>0 0 0 0 0 20 58 0 0</td> <td>7 11 78 LOSS C 0 0 0 0 0 0 517 243 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0</td> <td>0 0 0 0 0 85 40 0 0 0</td> <td></td> <td></td> <td></td> <td>1200</td> <td></td> <td></td> <td>50</td> <td>163 100 1177 LOS 3 655 3 655 6 133 0 0 0 0 0 517 0</td> <td>6 S GAIN 48 125 1 149 0 0 7 85 0 0 0 0 8 2 712 9 7</td> <td></td>	EXP. WALL CLG. HT. GRS.WALL AREA GLAZING NORTH EAST SOUTH WEST SKYLT. DOORS NET EXPOSED WALL NET EXPOSED WALL NET EXPOSED CLG NO ATTIC EXPOSED CLG EXPOSED FLOOR BASEMENT/CRAWL HEAT LOSS SUBTOTAL HT LOSS SUBTOTAL HT GAIN LEVEL FACTOR / MULTIPLIER AIR CHANGE HEAT LOSS	21.8 21.8 21.8 21.8 35.8 25.8 4.2 3.7 1.3 2.8	6AIN 16.0 41.6 24.9 41.6 101.2 4.3 0.7 0.6 0.6 1.3			5	0 60 0 0 0 0 556 0 0	61 10 616 LOSS 0 1307 0 0 0 0 2339 0 0 0 0 0 0 3646	0 2493 0 0 0 0 385 0 0 0	71 0 0 0 0 454 0 0	52 10 525 LOSS 0 1547 0 0 0 1910 0 0 0 0 0 3457	0 2950 0 0 0 0 314 0 0 0				0 0 33 0 0 0 111 0 135 0	16 9  1444 LOSS 0 0 719 0 0 467 0 1777 0 0 0 1363	GAIN 0 0 822 0 0 0 77 0 0 0 978	0 9 0 0 0 112 0 0	12 10 121 LOSS 0 0 196 0 0 472 0 0 0 0 0 668	GAIN 0 2224 0 0 78 0 0 0	0 0 0 0 40 282 0 0	29 11 322 LOSS 0 0 0 0 0 0 1034 1186 0 0 0 0 0 2219	0 0 0 0 0 170 195 0 0 0	0 0 0 0 0 20 58 0 0	7 11 78 LOSS C 0 0 0 0 0 0 517 243 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 85 40 0 0 0				1200			50	163 100 1177 LOS 3 655 3 655 6 133 0 0 0 0 0 517 0	6 S GAIN 48 125 1 149 0 0 7 85 0 0 0 0 8 2 712 9 7	
HEAT GAIN PEOPLE   240   0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	EXP. WALL CLG. HT. GRS.WALL AREA GLAZING NORTH EAST SOUTH WEST SKYLT. DOORS NET EXPOSED WALL NET EXPOSED BMIT WALL ABOVE OR EXPOSED LG NO ATTIC EXPOSED CLG EXPOSED FLOOR BASEMENTICRAWL HEAT LOSS SLAB ON GRADE HEAT LOSS SUB TOTAL HT GAIN LEVEL FACTOR / MULTIPLIER AIR CHANGE HEAT LOSS AIR CHANGE HEAT LOSS	21.8 21.8 21.8 21.8 35.8 25.8 4.2 3.7 1.3 2.8	6AIN 16.0 41.6 24.9 41.6 101.2 4.3 0.7 0.6 0.6 1.3			5	0 60 0 0 0 0 556 0 0	61 10 616 LOSS 0 1307 0 0 0 2339 0 0 0 0 0 3646	0 2493 0 0 0 0 385 0 0 0	71 0 0 0 0 454 0 0	52 10 525 LOSS 0 1547 0 0 0 0 1910 0 0 0 0 3457	0 2950 0 0 0 0 314 0 0 0				0 0 33 0 0 0 111 0 135 0	16 9  144  LOSS 0 0 719 0 0 467 0 1777 0 0 0 1363	GAIN 0 0 822 0 0 0 77 0 0 0 978	0 9 0 0 0 112 0 0	12 10 121 LOSS 0 0 196 0 0 0 472 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	GAIN 0 2224 0 0 78 0 0 0	0 0 0 0 40 282 0 0	29 11 322 LOSS 0 0 0 0 0 1034 1186 0 0 0 0 2219	0 0 0 0 0 170 195 0 0 0	0 0 0 0 0 20 58 0 0	7 111 78 LOSS 0 0 0 0 0 0 517 243 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 85 40 0 0 0				1200			50	163 100 1177 LOS 3 655 3 655 6 133 0 0 0 0 0 517 0	6 S GAIN 48 125 1 149 0 0 7 85 0 0 0 0 8 2 712 9 7	
HEAT GAIN APPLIANCES/LIGHTS         693         693         693         0         0         0         693         693         1005         14130	EXP. WALL CLG. HT. GRS.WALL AREA GLAZING NORTH EAST SOUTH WEST SKYLT. DOORS NET EXPOSED WALL NET EXPOSED WALL NET EXPOSED BSMT WALL ABOVE GR EXPOSED CLG NO ATTIC EXPOSED CLG EXPOSED FLOOR BASEMENT/CRAWL HEAT LOSS SLAB ON GRADE HEAT LOSS SUBTOTAL HT GAIN LEVEL FACTOR / MULTIPLIER AIR CHANGE HEAT LOSS AIR CHANGE HEAT GAIN DUCT LOSS	21.8 21.8 21.8 21.8 35.8 25.8 4.2 3.7 1.3 2.8	6AIN 16.0 41.6 24.9 41.6 101.2 4.3 0.7 0.6 0.6 1.3			5	0 60 0 0 0 0 556 0 0	61 10 616 LOSS 0 1307 0 0 0 2339 0 0 0 0 0 3646	0 2493 0 0 0 0 385 0 0 0 0	71 0 0 0 0 454 0 0	52 10 525 LOSS 0 1547 0 0 0 0 1910 0 0 0 0 3457	0 2950 0 0 0 0 314 0 0 0				0 0 33 0 0 0 111 0 135 0	16 9  144  LOSS 0 0 719 0 0 467 0 1777 0 0 0 1363	GAIN 0 0 8222 0 0 0 777 0 0 0 978	0 9 0 0 0 112 0 0	12 10 121 LOSS 0 0 196 0 0 0 472 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	GAIN 0 0 224 0 0 78 0 0 0 302	0 0 0 0 40 282 0 0	29 11 322 LOSS 0 0 0 0 0 1034 1186 0 0 0 0 2219	0 0 0 0 170 195 0 0 0 0	0 0 0 0 0 20 58 0 0	7 111 78 LOSS 0 0 0 0 0 0 517 243 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 85 40 0 0 0 0							50	163 100 1177 LOS 3 655 3 655 6 133 0 0 0 0 0 517 0	6 SS GAIN 48 149 0 0 7 85 0 0 7 305 0 0 8 2 712 9 7 32	
TOTAL HT LOSS BTU/H 4823 4573 1582 884 2936 1005 14130	EXP. WALL CLG. HT. GRS.WALL AREA GLAZING NORTH EAST SOUTH WEST SKYLT. DOORS NET EXPOSED WALL NET EXPOSED WALL NET EXPOSED BSMT WALL ABOVE GR EXPOSED CLG NO ATTIC EXPOSED CLG EXPOSED FLOOR BASEMENT/CRAWL HEAT LOSS SLAB ON GRADE HEAT LOSS SUBTOTAL HT GAIN LEVEL FACTOR / MULTIPLIER AIR CHANGE HEAT LOSS AIR CHANGE HEAT GAIN DUCT LOSS DUCT GAIN	21.8 21.8 21.8 21.8 21.8 35.8 25.8 4.2 3.7 1.3 2.8 2.6	6AIN 16.0 41.6 24.9 41.6 101.2 4.3 0.7 0.6 0.6 1.3			5	0 60 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	61 10 616 LOSS 0 1307 0 0 0 2339 0 0 0 0 0 3646	0 2493 0 0 0 0 385 0 0 0 0 2878	71 0 0 0 454 0 0 0	52 10 525 LOSS 0 1547 0 0 0 0 1910 0 0 0 0 3457	0 2950 0 0 0 314 0 0 0 0				0 0 33 0 0 0 1111 0 135 0 0	16 9  144  LOSS 0 0 719 0 0 467 0 1777 0 0 0 1363	GAIN 0 0 0 822 0 0 0 77 0 79 0 0 0 978	0 9 0 0 0 112 0 0 0	12 10 121 LOSS 0 0 196 0 0 0 472 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	GAIN 0 0 2224 0 0 0 78 0 0 0 0	0 0 0 0 40 282 0 0 0	29 11 322 LOSS 0 0 0 0 0 1034 1186 0 0 0 0 2219	0 0 0 0 170 195 0 0 0 0	0 0 0 0 0 20 58 0 0 0	7 111 78 LOSS 0 0 0 0 0 0 517 243 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 85 40 0 0 0 0							56	166 100 11177 LOSD 111	6 SS GAIN 48 125 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	
	EXP. WALL CLG. HT. GRS.WALL AREA GLAZING NORTH EAST SOUTH WEST SKYLT. DOORS NET EXPOSED WALL NET EXPOSED WALL NET EXPOSED USED NO ATTIC EXPOSED CLG EXPOSED FLOOR BASEMENT/CRAWL HEAT LOSS SLAB ON GRADE HEAT LOSS SUB TOTAL HT GAIN LEVEL FACTOR / MULTIPLIER AIR CHANGE HEAT LOSS AIR CHANGE HEAT LOSS OUCT GAIN HEAT GAIN PEOPLE	21.8 21.8 21.8 21.8 21.8 35.8 25.8 4.2 3.7 1.3 2.8 2.6	6AIN 16.0 41.6 24.9 41.6 101.2 4.3 0.7 0.6 0.6 1.3			5	0 60 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	61 10 616 LOSS 0 1307 0 0 0 2339 0 0 0 0 0 3646	0 2493 0 0 0 0 3855 0 0 0 0 0 2878 1311 0 0 0	71 0 0 0 454 0 0 0	52 10 525 LOSS 0 1547 0 0 0 0 1910 0 0 0 0 3457	0 2950 0 0 0 0 314 0 0 0 0 0				0 0 33 0 0 0 1111 0 135 0 0	16 9  144  LOSS 0 0 719 0 0 467 0 1777 0 0 0 1363	GAIN 0 0 0 8222 0 0 77 0 0 0 978 45 0 0 0	0 9 0 0 0 112 0 0 0	12 10 121 LOSS 0 0 196 0 0 0 472 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	GAIN 0 0 0 2224 0 0 0 0 78 0 0 0 0 302 14 0 0 0	0 0 0 0 40 282 0 0 0	29 11 322 LOSS 0 0 0 0 0 1034 1186 0 0 0 0 2219	0 0 0 0 170 195 0 0 0 0 365	0 0 0 0 0 20 58 0 0 0	7 111 78 LOSS 0 0 0 0 0 0 517 243 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 85 40 0 0 0 0							56	166 100 11177 LOSD 111	6 SS GAIN 48 125 1 149 0 0 0 7 85 0 0 0 0 8 2 712 9 7 32 0 0 0	
TOTAL HT GAIN x 1.3 BTU/H 4812 5338 2230 410 496 170 1869	EXP. WALL CLG. HT. GRS.WALL AREA GLAZING NORTH EAST SOUTH WEST SKYLT. DOORS NET EXPOSED WALL NET EXPOSED BSMT WALL ABOVE GR EXPOSED LG NO ATTIC EXPOSED CLG EXPOSED FLOOR BASEMENT/CRAWL HEAT LOSS SLAB ON GRADE HEAT LOSS SUBTOTAL HT GAIN LEVEL FACTOR / MULTIPLIER AIR CHANGE HEAT LOSS AIR CHANGE HEAT LOSS DUCT GAIN DUCT LOSS DUCT GAIN HEAT GAIN PEOPLE HEAT GAIN APPLIANCES/LIGHTS	21.8 21.8 21.8 21.8 21.8 35.8 25.8 4.2 3.7 1.3 2.8 2.6	6AIN 16.0 41.6 24.9 41.6 101.2 4.3 0.7 0.6 0.6 1.3			5	0 60 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	61 10 616 LOSS 0 1307 0 0 0 2339 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 2493 0 0 0 0 3855 0 0 0 0 0 2878 1311 0 0 0	71 0 0 0 454 0 0 0	52 10 525 LOSS 0 1547 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 2950 0 0 0 0 314 0 0 0 0 0				0 0 33 0 0 0 1111 0 135 0 0	16 9 144 LOSS 0 0 7119 0 0 0 1777 0 0 0 1363 0.16 219 0	GAIN 0 0 0 8222 0 0 77 0 0 0 978 45 0 0 0	0 9 0 0 0 112 0 0 0	12 10 121 LOSS 0 0 0 196 0 0 0 472 0 0 0 0 0 0 668 0.32 216	GAIN 0 0 0 2224 0 0 0 0 78 0 0 0 0 302 14 0 0 0	0 0 0 0 0 40 282 0 0 0 0	29 11 322 LOSS 0 0 0 0 0 1034 1186 0 0 0 0 0 2219	0 0 0 0 170 195 0 0 0 0 365	0 0 0 0 0 20 58 0 0 0	7 111 78 LOSS 0 0 0 0 0 0 0 517 243 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 85 40 0 0 0 0							56	16i 10  117 LOS  65 13:3 655 6 13:3 6 1	6 SS GAIN 48 149 0 0 7 85 0 0 0 8 8 2 712 9 7 32 0 693	
	EXP. WALL CLG. HT. GRS.WALL AREA GLAZING NORTH EAST SOUTH WEST SKYLT. DOORS NET EXPOSED WALL NET EXPOSED WALL NET EXPOSED BSMT WALL ABOVE GR EXPOSED CLG NO ATTIC EXPOSED CLG EXPOSED FLOOR BASEMENT/CRAWL HEAT LOSS SLAB ON GRADE HEAT LOSS SUBTOTAL HT GAIN LEVEL FACTOR / MULTIPLIER AIR CHANGE HEAT LOSS AIR CHANGE HEAT GAIN DUCT LOSS DUCT GAIN HEAT GAIN PEOPLE HEAT GAIN APPLIANCES/LIGHTS TOTAL HT LOSS BTU/H	21.8 21.8 21.8 21.8 21.8 35.8 25.8 4.2 3.7 1.3 2.8 2.6	6AIN 16.0 41.6 24.9 41.6 101.2 4.3 0.7 0.6 0.6			5	0 60 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	61 10 616 LOSS 0 1307 0 0 0 2339 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 2493 0 0 0 0 3855 0 0 0 0 0 2878 1311 0 0 693	71 0 0 0 454 0 0 0	52 10 525 LOSS 0 1547 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 2950 0 0 0 0 314 0 0 0 3264				0 0 33 0 0 0 1111 0 135 0 0	16 9 144 LOSS 0 0 7119 0 0 0 1777 0 0 0 1363 0.16 219 0	GAIN 0 0 822 0 0 0 777 0 779 0 0 0 978 45 0 693	0 9 0 0 0 112 0 0 0	12 10 121 LOSS 0 0 0 196 0 0 0 472 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	GAIN 0 0 0 2224 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 40 282 0 0 0 0	29 11 322 LOSS 0 0 0 0 0 1034 1186 0 0 0 0 0 2219	0 0 0 0 170 195 0 0 0 0 365	0 0 0 0 0 20 58 0 0 0	7 111 78 LOSS C 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 885 40 0 0 0 0 0 0							56	16i 10  117 LOS  65 13:3 655 6 13:3 6 1	6 SS GAIN 48 149 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	

STRUCTURAL HEAT LOSS: 45708 TOTAL HEAT GAIN BTU/H: 35743 TONS: 2.98 LOSS DUE TO VENTILATION LOAD BTU/H: 1670 TOTAL COMBINED HEAT LOSS BTU/H: 47378

Mehal Oxombe.



		CENTRE ROYAL			ORMLEY	١							DATE:	Jun-21			GFA:	2724	LO#	91285				
HEATING CFM TOTAL HEAT LOSS AIR FLOW RATE CFM	24.39		TOTAL H	LING CFM IEAT GAIN RATE CFM	35,469 31.44		а	furr a/c coil vailable	pressure nace filter pressure pressure r s/a & r/a	0.6 0.05 0.2 0.35								060-14V SPEED LOW	930	R	OUTPUT	AFUE = (BTU/H) = (BTU/H) =	60,000 <b>58,000</b>	
RUN COUNT S/A R/A All S/A diffusers 4"x10" unl All S/A runs 5"Ø unless not				1st 7 1 out.	8as 4 1		max	s/a dif p	essure s/a ress. loss essure s/a	0.18 0.02 0.16		grille pre	pressure ess. Loss essure r/a	0.02			N	EDLOW MEDIUM IM HIGH HIGH	1050 1115 1245 1520	Т			6 " E.S.P.	- _ °F
RUN # ROOM NAME RM LOSS MBH. CFM PER RUN HEAT RM GAIN MBH. CFM PER RUN COOLING ADJUSTED PRESSURE ACTUAL DUCT LGH. EQUIVALENT LENGTH TOTAL EFFECTIVE LENGTH ADJUSTED PRESSURE ROUND DUCT SIZE HEATING VELOCITY (ft/min) COOLING VELOCITY (ft/min) OUTLET GRILL SIZE TRUNK	1 MBR 1.46 36 2.11 66 0.17 37 150 187 0.09 5 264 485 3X10 A	2 ENS 1.71 42 1.51 47 0.17 51 190 241 0.07 5 308 345 3X10 A	3 WIC 0.42 10 0.17 39 130 169 0.1 4 115 46 3X10 D	4 BED-2 1.50 37 2.41 76 0.17 69 190 259 0.07 <b>6</b> 189 388 4X10 B	5 BED-3 1.93 47 2.54 80 0.17 66 160 226 0.08 <b>6</b> 240 408 4X10 C	6 BED-4 1.82 44 2.34 73 0.17 51 170 221 0.08 <b>6</b> 224 372 4X10 C	7 ENS-4 0.54 13 0.39 12 0.17 26 190 216 0.08 4 149 138 3X10 D	8 BED-2 1.50 37 2.41 76 0.17 71 180 251 0.07 <b>6</b> 189 388 4X10 B	9 BED-3 1.93 47 2.54 80 0.17 72 170 242 0.07 <b>6</b> 240 408 4X10 C	10 MBR 1.46 36 2.11 66 0.17 46 180 226 0.08 5 264 485 3X10 A	11 ENS-3 0.54 13 0.39 12 0.17 52 150 202 0.09 4 149 138 3X10 C	12 GRT 2.41 59 2.41 76 0.17 30 160 190 0.09 <b>6</b> 301 388 4X10 A	13 GRT 2.41 59 2.41 76 0.17 39 170 209 0.08 <b>6</b> 301 388 4X10 A	14 KIT 2.29 56 2.67 84 0.16 38 160 198 0.08 <b>6</b> 286 428 4X10 A	15 KIT 2.29 56 2.67 84 0.16 28 130 158 0.1 <b>6</b> 286 428 4X10 A	16 ENS-2 0.95 23 1.25 39 0.17 58 140 198 0.09 4 264 447 3X10 C	17 DEN 1.58 39 2.23 70 0.17 30 150 180 0.1 5 286 514 3X10 D	18 PWD 0.88 22 0.41 13 0.17 47 150 197 0.09 4 252 149 3X10 B	19 FOY 2.94 72 0.50 16 0.17 55 140 195 0.09 5 529 117 3X10 B	20 MUD 1.00 25 0.17 5 0.17 9 110 119 0.14 4 287 57 3X10 D	21 BAS 3.53 86 0.47 15 0.16 34 170 204 0.08 <b>6</b> 438 76 4X10 A	22 BAS 3.53 86 0.47 15 0.16 25 180 205 0.08 <b>6</b> 438 76 4X10 A	23 BAS 3.53 86 0.47 15 0.16 19 160 179 0.09 <b>6</b> 438 76 4X10 C	24 BAS 3.53 86 0.47 15 0.16 43 160 203 0.08 <b>6</b> 438 76 4X10 B
RUN # ROOM NAME RM LOSS MBH. CFM PER RUN HEAT RM GAIN MBH. CFM PER RUN COOLING ADJUSTED PRESSURE ACTUAL DUCT LGH. EQUIVALENT LENGTH TOTAL EFFECTIVE LENGTH ADJUSTED PRESSURE ROUND DUCT SIZE HEATING VELOCITY (ft/min) COOLING VELOCITY (ft/min) OUTLET GRILL SIZE TRUNK																								
SUPPLY AIR TRUNK SIZE	TRUNK	STATIC	ROUND	RECT			VELOCITY			TRUNK	STATIC	ROUND	RECT			VELOCITY	RETURN A	AIR TRUNK	( SIZE STATIC	ROUND	RECT			VELOCITY
TRUNK A TRUNK B TRUNK C TRUNK D TRUNK E TRUNK F	516 254 514	0.07 0.07 0.07 0.07 0.07 0.00 0.00	11.3 8.7 11.3 15.1 0	14 10 14 26 0	x x x x x	8 8 8 8 8	(ft/min) 663 457 661 773 0		TRUNK G TRUNK H TRUNK I TRUNK J TRUNK K TRUNK L	0 0 0 0 0 0	0.00 0.00 0.00 0.00 0.00 0.00 0.00	0 0 0 0 0 0	0 0 0 0 0 0	x x x x x	8 8 8 8 8	(ft/min) 0 0 0 0 0 0	TRUNK O TRUNK P TRUNK Q TRUNK R TRUNK S TRUNK T TRUNK U TRUNK U	O O O O O O O O	0.05 0.05 0.05 0.05 0.05 0.05 0.05 0.05	DUCT 0 0 0 0 0 0 0	DUCT 0 0 0 0 0 0 0	x x x x x x	8 8 8 8 8 8	(ft/min) 0 0 0 0 0 0
RETURN AIR #  AIR VOLUME PLENUM PRESSURE ACTUAL DUCT LGH. EQUIVALENT LENGTH TOTAL EFFECTIVE LH ADJUSTED PRESSURE ROUND DUCT SIZE INLET GRILL SIZE  INLET GRILL SIZE	1 0 145 0.15 34 175 209 0.07 7 8 X 14	2 0 115 0.15 62 250 312 0.05 7 8 X 14	3 0 115 0.15 71 245 316 0.05 7 8 X 14	4 0 115 0.15 65 205 270 0.05 7 8 X 14	5 0 105 0.15 30 155 185 0.08 6 8 X	6 0 360 0.15 25 175 200 0.07 9.9 8 X 30	0 0 0.15 1 0 1 14.80 0 0 X	0 0 0.15 1 0 1 14.80 0 0 X 0	0 0 0.15 1 0 1 14.80 0 0 X	0 0 0.15 1 0 1 14.80 0 0 X	0 0 0.15 1 0 1 14.80 0 0 X	0 0 0.15 1 0 1 14.80 0 0 X	0 0 0.15 1 0 1 14.80 0 0 X	0 0 0.15 1 0 1 14.80 0 0 X	0 0 0.15 1 0 1 14.80 0 0 X	160 0.15 14 135 149 0.10 6.7 8 X 14	TRUNK W TRUNK X TRUNK Y TRUNK Z DROP	0 1115 345 0 1115	0.05 0.05 0.05 0.05 0.05 0.05	16.4 10.6 0 16.4	0 32 14 0 24	x x x x	8 8 8 8 10	0 627 444 0 669



TYPE: 38-14

SITE NAME: CENTREFIELD (WEST GORMLEY)

LO # 91285 OPT 2ND

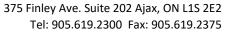
#### RESIDENTIAL MECHANICAL VENTILATION DESIGN SUMMARY

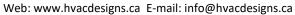
COMBUSTION APPLIANCES 9	9.32.3.1(1)	SUPPLEMENTAL V	/ENTILATION CAPACITY		9.32	.3.5.
a) Direct vent (sealed combustion) only		Total Ventilation Ca	pacity	169.6	cfm	
b) Positive venting induced draft (except fireplaces)		Less Principal Vent	il. Capacity	79.5	cfm	
c) Natural draft, B-vent or induced draft gas fireplace		Required Suppleme	ental Capacity	90.1	cfm	
d) Solid Fuel (including fireplaces)						
e) No Combustion Appliances		PRINCIPAL EXHAL	JST FAN CAPACITY			
		Model:	VANEE 65H	Location:	BSMT	
HEATING SYSTEM		79.5	cfm		✓ HVI Appro	ved
Forced Air Non Forced Air		PRINCIPAL EXHAU	JST HEAT LOSS CALCULATION ΔT °F	FACTOR	% LOSS	3
Electric Space Heat		79.5 CFM	X 78 F X	1.08	X 0.25	
		SUPPLEMENTAL I	FANS BY INST	TALLING CON cfm	TRACTOR HVI Sones	
HOUSE TYPE	9.32.1(2)	ENS	BY INSTALLING CONTRACTOR	50	✓ 3.5	
Type a) or b) appliance only, no solid fuel		ENS-2 PWD	BY INSTALLING CONTRACTOR BY INSTALLING CONTRACTOR	50 50	✓ 3.5 ✓ 3.5	
II Type I except with solid fuel (including fireplaces)				50	1 1 2.2	
III Any Type c) appliance		HEAT RECOVERY Model:	VANEE 65H		9.32.3	3.11.
IV Type I, or II with electric space heat		155	cfm high	64	cfm low	V
Other: Type I, II or IV no forced air		75	% Sensible Efficiency @ 32 deg F ( 0 deg C)		✓ HVI Appro	ved
Gildi. Type I, II of IV no lorded dil		LOCATION OF INS				_
SYSTEM DESIGN OPTIONS O	N.H.W.P.		TALLATION			
1 Exhaust only/Forced Air System		Lot:		Concession		
2 HRV with Ducting/Forced Air System		Township		Plan:		
✓ 3 HRV Simplified/connected to forced air system		Address				
4 HRV with Ducting/non forced air system		Roll #		Building Pern	nit #	
Part 6 Design		BUILDER:	ROYAL PINE HOMES			
- art o Design		Name:				
TOTAL VENTILATION CAPACITY	9.32.3.3(1)	Address:				
Basement + Master Bedroom 2 @ 21.2 cfm 42.4	cfm	City:				
Other Bedrooms 3 @ 10.6 cfm 31.8	cfm	Telephone #:		Fax #:		
Kitchen & Bathrooms 6 @ 10.6 cfm 63.6	cfm	INSTALLING CON	TRACTOR			
Other Rooms 3 @ 10.6 cfm 31.8	cfm	Name:				
Table 9.32.3.A. TOTAL <u>169.6</u>	cfm	Address:				
		City:				
PRINCIPAL VENTILATION CAPACITY REQUIRED 9	.32.3.4.(1)	Telephone #:		Fax#:		
1 Bedroom 31.8	cfm	DESIGNER CERTII	FICATION			
2 Bedroom 47.7	cfm	I hereby certify that	this ventilation system has been the Ontario Building Code.	designed		
3 Bedroom 63.6	cfm	Name:	HVAC Designs Ltd.	~		
4 Bedroom 79.5	cfm	Signature:	Michi	al Ofounde	۷.	
5 Bedroom 95.4	cfm	HRAI#	Richmond Hill Cit	y 1991 PRiichn	nond Hill	
TOTAL 79.5 cfm	TED IN THE	Date:	THE DECIDING		Division	
I REVIEW AND TAKE RESPONIBILITY FOR THE DESIGN WORK AND AM QUALIF INDIVIDUAL BCIN: 19669 MICHAEL O'ROL Mahan Offinae.		PROPRIATE CATEGORY AS AN	HVAC REV	/IEWE	ED CODE.	
Muses Annal.				PXV		
				$\Gamma \Lambda V$		

Initials:



			Form	nula Sheet (For Air Lea	akage / Ventiliation C	alculation)									
LO#: 912	85	Model: 38-14		Builde	er: ROYAL PINE HOMES				Date:	2021-06-21					
		Volume Calculati	on			Air Change & Delta T Data									
				7						i					
se Volume	-1 (6:3)	T =1	(6.3)			WINTER NATURAL AIR CHANGE RATE 0.227									
Level	Floor Area (ft²)	Floor Height (ft)	Volume (ft³)			SUMMER NATURAL AIR CHANGE RATE 0.071									
Bsmt	1098	10	10980												
First Second	1098 1626	10 9	11089.8 14634				Design Te	mperature Diff	oronco						
Third	0	9	0	-			Tin °C	Tout °C	ΔT °C	ΔT°F					
Fourth	0	9	0	1		Winter DTDh	22	-21	43	78					
		Total:	36,703.8 ft <sup>3</sup>	†		Summer DTDc	24	31	7	13					
		Total:	1039.3 m <sup>3</sup>	1					<u>.                                    </u>						
				_											
	5.2.3	3.1 Heat Loss due to A	Air Leakage			6.2.6	Sensible Gain due	to Air Leakage							
		<i>V</i> <sub>1</sub> .					V.								
	$HL_{airb} =$	$LR_{airh} \times \frac{V_b}{3.6} \times$	$DTD_h \times 1.2$		Н	$IG_{salb} = LR_{airc}$	$\times \frac{v_b}{2c} \times DTD_c$	× 1.2							
0.227		5.0		= 3392 W	- I		5.0		_ ,	174 W					
0.227	x <u>288.70</u>	x <u>43 °C</u>	X 1.2	= 3392 W	= 0.071	X 200.70	_ x <u>7°C</u>	X 1.2	_ =	1/4 W					
				= 11574 Btu/h	τ <b>Ι</b>				=	594 Btu/h					
				- 113/4 Btu/II	1				-	334 Btu/1					
	5.2.3.2 He	at Loss due to Mecha	nical Ventilation			6.2.7 Se	nsible heat Gain d	ue to Ventilatio	n						
	$HL_{vairb} =$	$PVC \times DTD_h \times$	$1.08 \times (1 - E)$		HL	$_{vairb} = PVC \times D$	$TD_h \times 1.08 \times$	(1 - E)							
80 CFM	x 78 °F	x 1.08	x 0.25	= 1670 Btu/h	80 CFM	x 13 °F	x 1.08	x 0.25	=	275 Btu/h					
			<del></del> -			_									
			5.2.3.3 Calcula	tion of Air Change Heat	Loss for Each Room (Flo	or Multiplier Section)									
					\	(	) >								
		HL	<sub>airr</sub> = Level Fact	$or \times HL_{airbv} \times \{(H_{airbv}) \times \{$	$(L_{agcr} + HL_{bgcr}) \div$	$(HL_{agclevel} + HL$	bgclevel)}								
				HLairve Air Leakage +	Level Conductive Heat	Air Lookees Heat Lo	as Baulainlian (LF								
		Level	Level Factor (LF)	Ventilation Heat Loss		_									
				(Btu/h)	Loss: (HL <sub>clevel</sub> )	HLairbv /	HLIevel)								
		1	0.5		8,342	0.69	94								
		2	0.3		10,749	0.32	23								
		3	0.2	11,574	14,438	0.16	50								
		4	0	]	0	0.00	00								
		5	0		0	0.00	00								
				+ ventilation heat loss											







#### **HEAT LOSS AND GAIN SUMMARY SHEET**

MODEL:	38-14		OPT 2ND	BUILDER: ROYAL PINE HOMES						
SFQT:	2724	LO#	91285	SITE: CENTREFIELD (WES	T GORMLEY)					
DESIGN A	SSUMPTIONS									
HEATING			°F	COOLING	°F					
OUTDOO	R DESIGN TEMP.		-6	OUTDOOR DESIGN TEMP.	88					
INDOOR I	DESIGN TEMP.		72	INDOOR DESIGN TEMP. (MAX 75°F)	75					
BUILDING	G DATA									
ATTACHM	1ENT:		DETACHED	# OF STORIES (+BASEMENT):	3					
FRONT FA	ACES:		EAST	ASSUMED (Y/N):	Υ					
AIR CHAN	IGES PER HOUR:		2.50	ASSUMED (Y/N):	Υ					
AIR TIGHT	TNESS CATEGORY:		TIGHT	ASSUMED (Y/N):	Υ					
WIND EX	POSURE:	9	SHELTERED	ASSUMED (Y/N):	Υ					
HOUSE V	OLUME (ft³):		36703.8	ASSUMED (Y/N):	Υ					
INTERNAL	L SHADING:	BLINDS,	/CURTAINS	ASSUMED OCCUPANTS:	5					
INTERIOR	LIGHTING LOAD (Btu/	/h/ft²):	1.45	DC BRUSHLESS MOTOR (Y/N):	Υ					
FOUNDAT	FION CONFIGURATION		BCIN_1	DEPTH BELOW GRADE:	7.0 ft					
LENGTH:	53.0 ft	WIDTH:	31.0 ft	EXPOSED PERIMETER:	168.0 ft					

2012 OBC - COMPLIANCE PACKAGE					
	Compliance Package				
Component	SB-12 PERF	ORMANCE			
	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

We	eather Sta	tion Description									
Province:	Ontario	·									
Region:	Richmon	d Hill									
	Site D	escription									
Soil Conductivity:	Normal o	conductivity: dry sand, loam, clay									
Water Table:	Normal (	7-10 m, 23-33 ft)									
Foundation Dimensions											
Floor Length (m):	16.2										
Floor Width (m):	9.4										
Exposed Perimeter (m):	0.0										
Wall Height (m):	3.0										
Depth Below Grade (m):	2.13	Insulation Configuration									
Window Area (m²):	1.1										
Door Area (m²):	1.9										
	Radi	ant Slab									
Heated Fraction of the Slab:	0										
Fluid Temperature (°C):	33										
	Desig	n Months									
Heating Month	1										
	Founda	tion Loads									
Heating Load (Watts):		1672									

**TYPE:** 38-14 **LO#** 91285

OPT 2ND



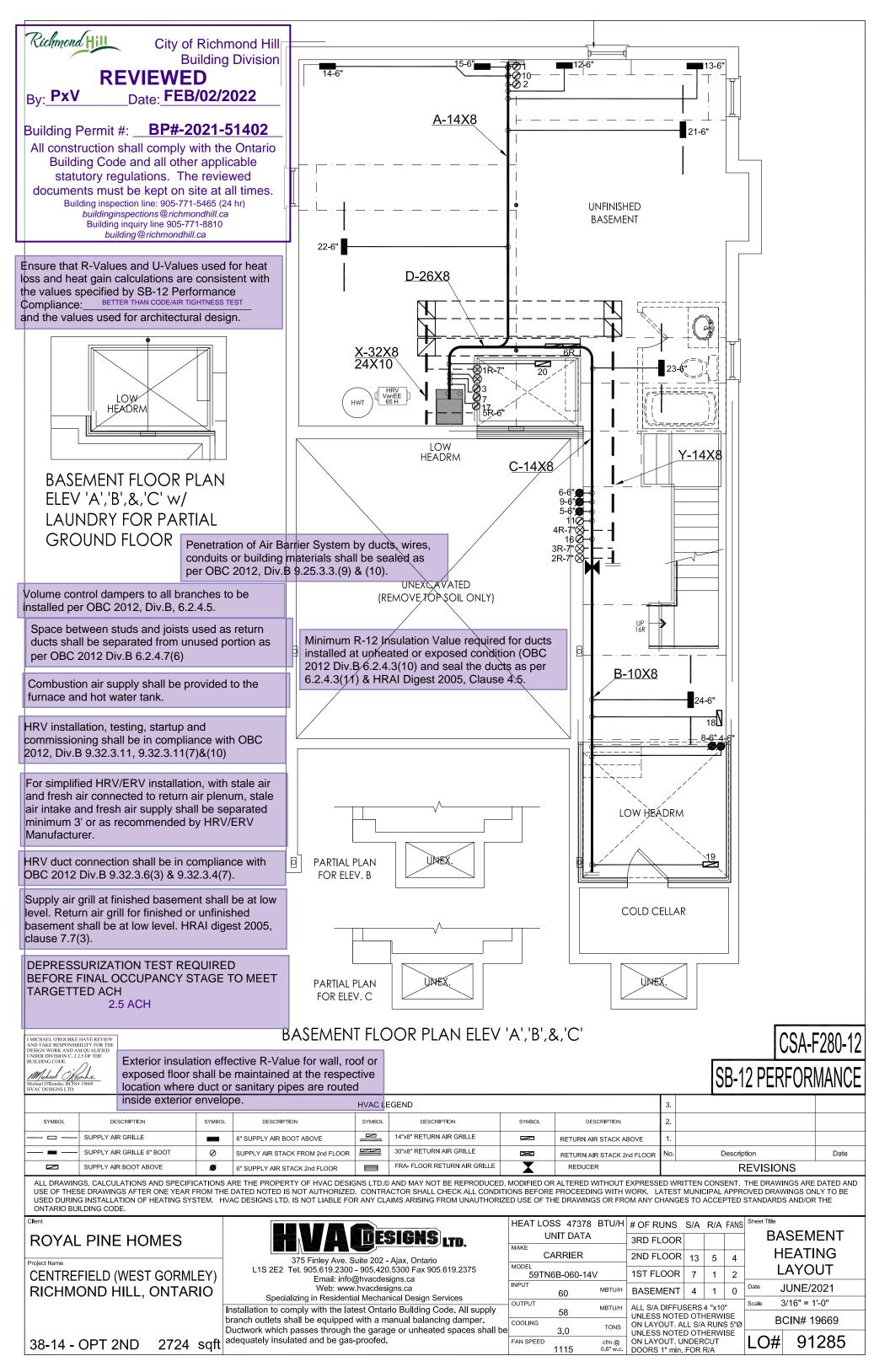
### **Air Infiltration Residential Load Calculator**

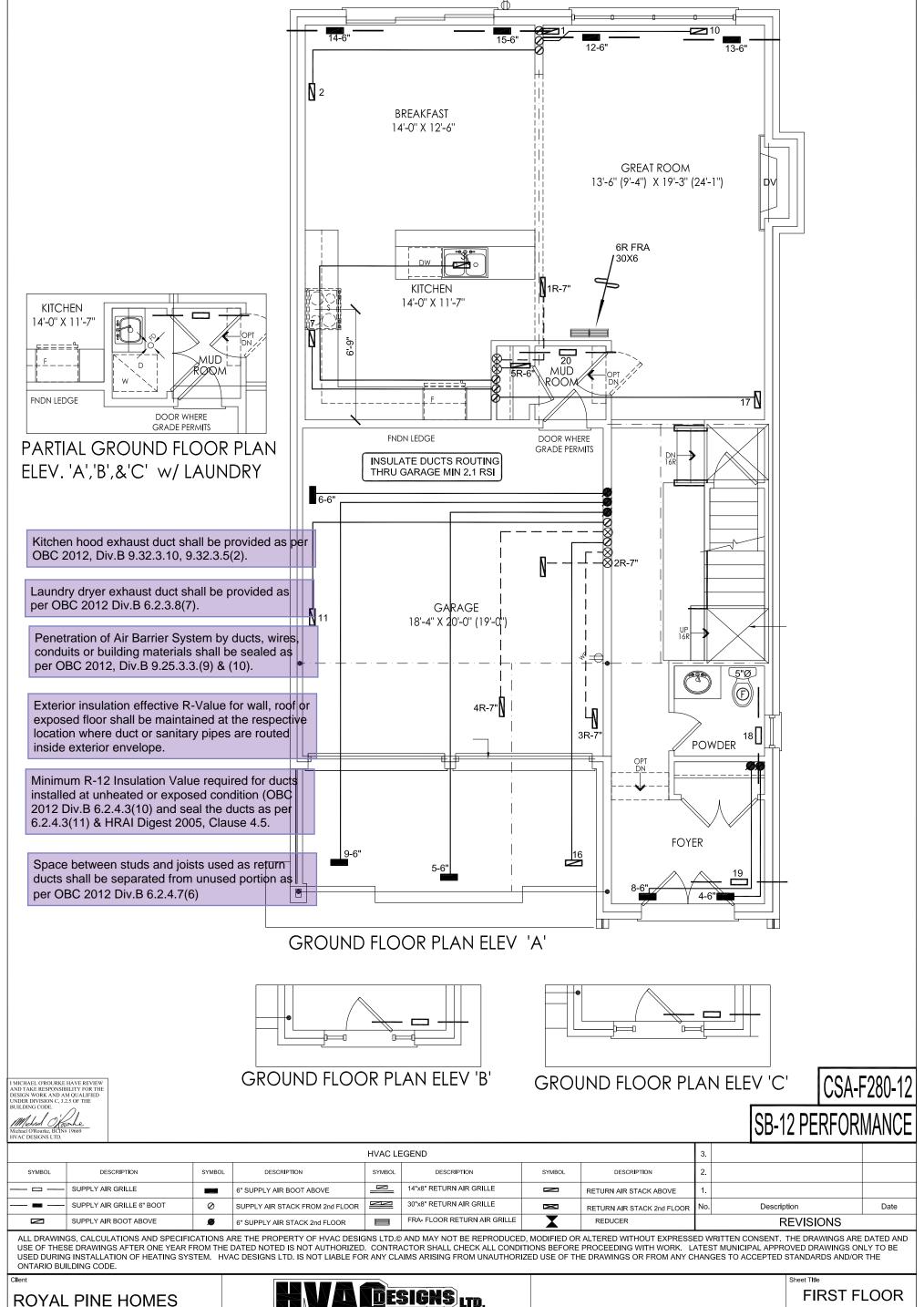
Supplemental tool for CAN/CSA-F280

Weather	r Station Description	
Province:	Ontario	
Region:	Richmond Hill	
Weather Station Location:	Open flat terrain, grass	
Anemometer height (m):	10	
Lo	ocal Shielding	
Building Site:	Suburban, forest	
Walls:	Heavy	
Flue:	Heavy	
Highest Ceiling Height (m):	6.74	
Buildi	ing Configuration	
Туре:	Detached	
Number of Stories:	Two	
Foundation:	Full	
House Volume (m³):	1039.3	
Air Lea	akage/Ventilation	
Air Tightness Type:	Energy Star Detached (2.5 ACH)	
Custom BDT Data:	ELA @ 10 Pa. 970.2 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	
Natura	al Infiltration Rates	
Heating Air Leakage Rate (AC	CH/H): 0.227	
Cooling Air Leakage Rate (AC	H/H): 0.071	

**TYPE:** 38-14 **LO#** 91285

DEPRESSURIZATION TEST REQUIRED
BEFORE FINAL OGGUNANCY STAGE TO MEET
TARGETTED ACH
2.5 ach





Project Name

38-14 - OPT 2ND

CENTREFIELD (WEST GORMLEY) RICHMOND HILL, ONTARIO

2724 sqft

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

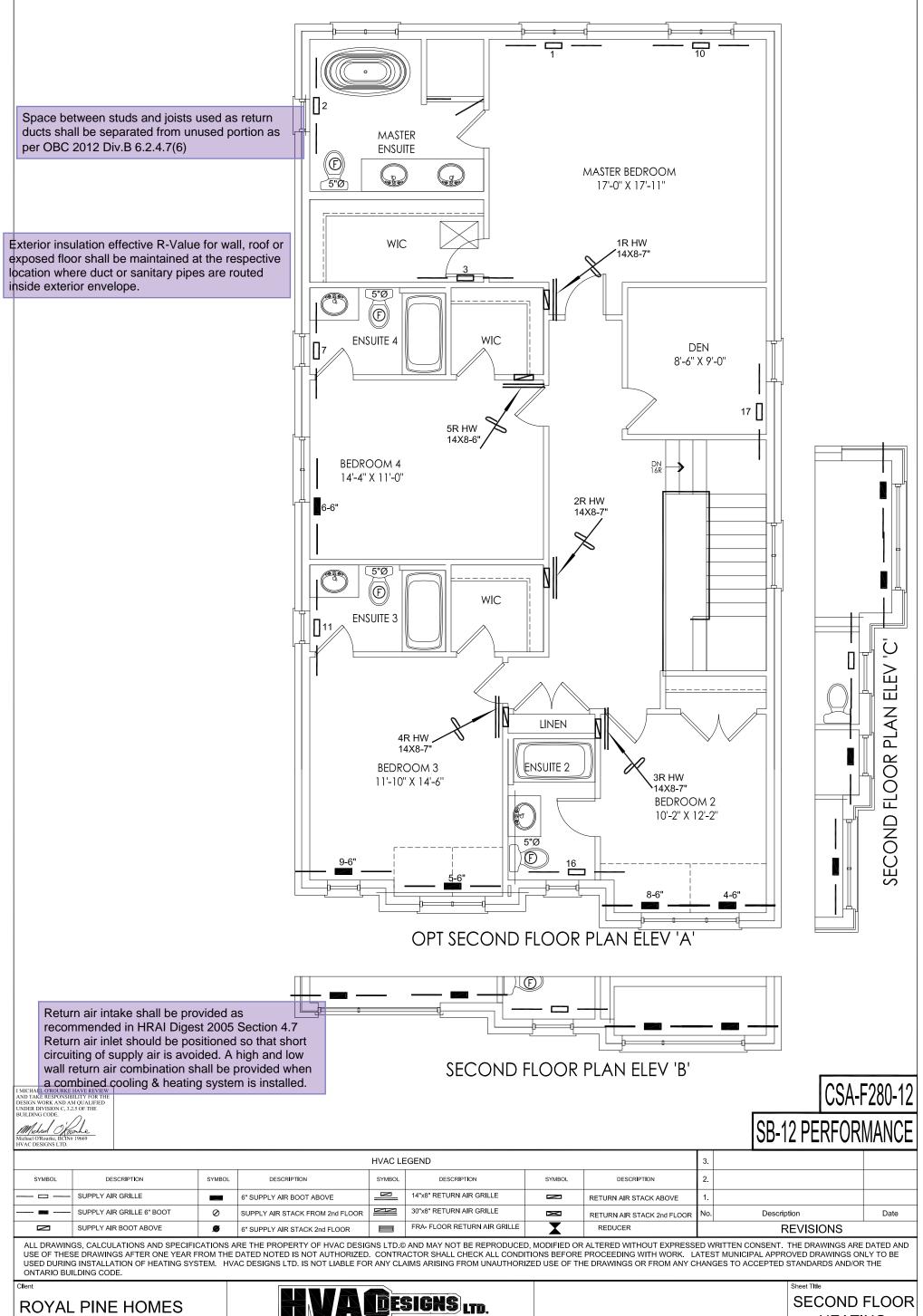
Specializing in Residential Mechanical Design Services

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

**HEATING** LAYOUT

JUNE/2021 3/16" = 1'-0" BCIN# 19669

91285 LO#



Project Name

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2724 sqft

38-14 - OPT 2ND

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**HEATING** 

LAYOUT JUNE/2021

> 3/16" = 1'-0" BCIN# 19669

91285 LO#