Address: 424 Summer Crescent, Meridian Beach, ALBERTA, T0C2J0

HOMEOWNER INFORMATION SHEET

ENERGUIDE

Your EnerGuide* rating and this report are based on data collected and, where necessary, presumed from your evaluation. Rating calculations are made using standard operating conditions.

Rating: 55 gigajoules per year (GJ/year)

Heated floor area: 135.2 m² (1455.3 ft²)
Rated energy intensity: 0.40 GJ/m²/year
Evaluated by: Chelsah Thomas
Quality assured by: CHBA BC
File number: 51H4N00002
Data collected: September 13, 2023
Year built: 2022

NRCan.gc.ca/myenerguide

HOW YOUR RATING IS CALCULATED:

I.	Rated annual energy consumption	55 GJ/year
II.	Minus renewable energy contribution	- 0 GJ/year
	Equals your **EnerGuide rating**	**= 55 GJ/year**

I. Your rated annual energy consumption is the total amount of energy your house would use in a year based on the EnerGuide Rating System standard operating conditions. For your house, this includes 5.02 GJ of passive solar gain.

Energy Sources	Rated Consumption (GJ/year)	Equivalent Units (per year)	Greenhouse Gas Emissions (tonnes/year)
Electricity	28	7748 kWh	6.2
Natural gas	27	719 m3	1.4
Total	55		7.6

II. On-site renewable power generation systems can offset some or even all of your home's energy consumption. Renewable energy contributions are factored differently for your rating and your greenhouse gas emissions calculations.[1]

On-Site Renewable Energy	Estimated Contribution (GJ/year)	Equivalent Units (per year)	Offset Greenhouse Gas Emissions (tonnes/year)
Electricity	0	0 kWh	0.0
Solar water heating	0	0	0.0
Total	0		0.0

HOW YOUR CONSUMPTION COMPARES:

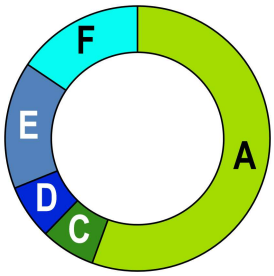
Compared to a typical new house, your house uses:

41.5% less energy;

53.7% less energy, when excluding the estimated energy consumption of lighting, appliances and electronics.

HOW YOUR RATED ENERGY IS USED:

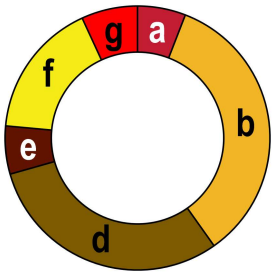
The chart below represents the breakdown of rated annual energy consumption in your home under standard operating conditions. You can use these figures as a guide to help identify where you can lower home energy costs through proper home maintenance, efficient home operation, energy efficiency renovations or equipment replacement.



A.	Space heating	50%
B.	Space cooling	0%
C.	Water heating	5%
D.	Ventilation	6%
E.	Lights & appliances	14%
F.	Other electrical	25%

WHERE YOUR HOME LOSES HEAT:

Houses lose heat through their exterior shell, or building envelope. The chart below shows where and how your home loses heat. The quality and upkeep of your home can have a major impact on the amount of energy your heating and cooling systems use annually.



a.	Attic/Ceiling	6%
b.	Main Walls	35%
c.	Exposed floors	0%
d.	Windows	31%
e.	Exterior doors	4%
f.	Basement/Foundation	17%
g.	Air leakage/ventilation	7%

*EnerGuide is an official mark of Natural Resources Canada.
Refer to the glossary section for an explanation of relevant terms.

HOUSE DETAILS

BUILDING ENVELOPE

ATTIC/CEILING

TYPE	INSULATION VALUE		AREA m² (ft²)
	Nominal RSI (R)	Effective RSI (R)	
Ceiling01 5/12: Scissor	13.38 (76.0)	13.38 (76.0)	5.9 (64)
Ceiling02 61/2: Attic/gable	13.38 (76.0)	13.59 (77.2)	72.7 (783)

MAIN WALLS

TYPE	INSULATION VALUE		AREA m² (ft²)
	Nominal RSI (R)	Effective RSI (R)	
Second level	5.28 (30.0)	5.06 (28.7)	79.4 (854)
Main floor	5.28 (30.0)	5.06 (28.8)	97.8 (1053)

WINDOWS

#	TYPE	U-factor W/m² • °C (Btu/h • ft² • °F)	RSI (R)
1	Door Lite	1.4 (0.24)	0.72 (4.1)
1	Entry lite	1.2 (0.21)	0.83 (4.7)
1	Living Room Patio Door	1.1 (0.19)	0.93 (5.3)
5	Bathroom	1 (0.18)	0.98 (5.6)
2	Maryn & Edyn Bedroom	1 (0.18)	0.99 (5.6)
2	Master Bed/Sitting Room	1 (0.18)	1.00 (5.7)
2	Kitchen	1 (0.17)	1.01 (5.8)
2	Maryn & Edyn Bedroom	1 (0.17)	1.02 (5.8)
2	Masterbedroom Bedroom	1 (0.17)	1.05 (6.0)
1	Maryn & Edyn Bedroom	0.9 (0.16)	1.09 (6.2)
Total window area: 24.78 m² (266.7 ft²)			

EXTERIOR DOORS

#	TYPE	U-factor W/m² • °C (Btu/h • ft² • °F)	RSI (R)
1	User specified	1.3 (0.23)	0.78 (4.4)
1	User specified	1.1 (0.2)	0.88 (5.0)
Total door area: 4.04 m² (43.5 ft²)			

BASEMENT/FOUNDATION

TYPE	INSULATION VALUE		AREA m² (ft²)
	Nominal RSI (R)	Effective RSI (R)	
Slab slab	2.85 (16.2)	2.85 (16.2)	72.7 (783)

AIRTIGHTNESS

Air leakage rate at 50 pascals	1.03 air changes/hour
Equivalent leakage area	150.3 cm² (23 in²)
Normalized leakage area	0.4 cm²/m² (0.6 in²/100 ft²)

MECHANICAL SYSTEMS

SPACE HEATING

TYPE	OUTPUT SIZE	EFFICIENCY
Condensing natural gas furnace	6 kW 20500 BTU/h	96% AFUE
Advanced airtight wood stove	2 kW 7000 BTU/h	30% Steady State
Design heating load: 5.15 kW – refer to glossary for details		

SPACE COOLING

TYPE	OUTPUT SIZE	EFFICIENCY
N/A	N/A	N/A
Design cooling load: 1.56 kW		

WATER HEATING

TYPE	TANK VOLUME	EFFICIENCY
Integrated heat pump	189L (50 USG)	0.99 UEF

WHOLE-HOME VENTILATION

TYPE	AIR FLOW RATE	EFFICIENCY
Home Ventilating Institute listed ENERGY STAR certified heat recovery ventilator	30.5 L/s (65 cfm)	81%

HEATED FLOOR AREA

Above-grade area	135.2 m² (1455 ft²)
Below-grade area	0 m² (0 ft²)

GLOSSARY

A typical new house
is a reference point on your label against which to compare your rating. It shows the estimated energy consumption of a house that is the same size, type and in the same location as yours. The typical new house is based on the energy efficiency requirements of the National Building Code.

Airtightness
describes how well the building envelope resists air leakage and is measured in air changes per hour at 50 pascals (ACH@50 Pa). The fewer air changes per hour, the more airtight the building envelope is. Equivalent leakage area is another way of describing the airtightness of the building envelope. It represents the size of a single hole in your building envelope if all the individual air leakage holes or gaps were added together. The smaller the equivalent leakage area, the less energy you will need to control the temperature of your home (but you will still need to ensure that you have adequate ventilation).

Design heating/cooling loads
provide an estimate of the capacity of the heating and cooling equipment needed to maintain your home at 22 °C in the winter and 24 °C in the summer and are provided for guidance only. Before having a new heating/cooling system installed, your heating/cooling contractor should perform an independent, detailed heat loss/heat gain calculation on your home in order to select the appropriate equipment.

Gigajoule (GJ)
is a unit of energy. It can be used as a measure of any type of energy that is consumed or produced in your home. Specifically, one GJ is the equivalent of 278 kWh of electricity, 27m³ of natural gas, 26 L of oil, 39 L of propane, or 947 817 BTUs. One GJ is roughly equal to the energy from two standard barbeque propane tanks or 30 litres of gas in a car's gas tank.

Greenhouse gas emissions
are the amounts of carbon dioxide, methane and nitrous oxide that are produced directly, by burning fossil and solid fuels, or indirectly, through the production of electricity. Greenhouse gas emissions are expressed in carbon dioxide equivalent units. Greenhouse gas emissions are calculated by multiplying the quantity of fuel or electricity used in your home by the emission factors for the particular energy source. Electricity factors vary by province because there are different emissions associated with each province's method of producing electricity. One tonne of greenhouse gas emissions is equivalent to the CO_2 emissions produced by driving an average efficiency mid-size vehicle from Toronto to Vancouver.

Heated floor area
represents the total useable area of your home that is heated, measured at the interior of the outer walls or of the walls attached to other buildings.

Insulation values
are expressed in RSI (m² • °C/W) or R-value (h • ft² • °F/Btu) and represent the resistance to the flow of heat of a given thickness of insulation or construction assembly. The higher the RSI-value (R-value), the better the performance.The nominal value represents the resistance to the flow of heat of just the insulation while the effective value represents the resistance to the flow of heat of the entire wall, ceiling or floor assembly considering the structure, insulation, framing, sheathing and all finishing.

On-site renewable energy contributions
are subtracted from the rated annual energy consumption to calculate the EnerGuide rating. For the calculation of the rated greenhouse gas emissions, on-site electricity generation only offsets emissions associated with electricity consumption, whereas a solar water heater reduces the emissions that would have been produced from the source of energy used to heat water.

Passive solar gain
is the heat from the sun that influences your home's heating and cooling requirements. Generally, south facing windows provide more solar gain.

Rated energy intensity
is calculated by dividing your rated annual energy consumption by your home's heated floor area. It allows you to compare the annual energy use of homes of different sizes on a "per square metre" basis.

Standard operating conditions
have been used to calculate your home's EnerGuide Rating. The rating assumes a standard number of occupants and energy use patterns. This allows for comparison of energy use across houses so that the house is rated and not the operation of the house by the occupants. The values are:

- Two adults and one child, at home 50% of the time;
- Hot water use of 158 - 197 L/day, variable depending on incoming ground water temperature and year the house was built;
- Thermostat settings of 21°C for daytime heating, 18°C for nighttime heating and 25°C for cooling; and
- Lighting, appliance and other electrical loads of 19.5 kWh/day.

U-factor
measures heat transferred through windows and doors, expressed in W/m² • °C (BTU/h • ft² • °F). The lower the U-factor, the better the energy efficiency of a window. The inverse of U-factor (1/U-factor) identifies the resistance to the flow of heat, expressed in RSI. The higher the RSI, the better the window is at resisting heat loss. You can use these values to choose more energy efficient windows.

For more details and additional terms, please visit NRCan.gc.ca/myenerguide.

424 Summer Crescent,
Meridian Beach, ALBERTA, T0C2J0

ENERGUIDE

Data collected: September 13, 2023
File number: **51H4N00002**
Evaluated by: Chelsah Thomas

55 This house GJ/year

0 GJ/year
Best energy performance

94 GJ/year
A typical new house

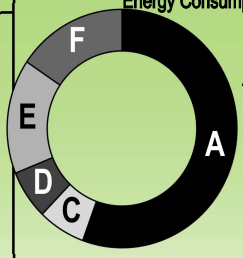
Uses most energy

One gigajoule (GJ) equals the energy from two BBQ propane tanks

Rated Annual Energy Consumption		55 GJ
• Electricity	28	
• Natural gas	27	
On-site renewable energy contributions		**- 0 GJ**
• Electricity	0	
• Solar water heating	0	
EnerGuide Rating:		**= 55 GJ**

Figures may not add up due to rounding.

Breakdown of Rated Annual Energy Consumption:



A	Space heating	50%
B	Space cooling	0%
C	Water heating	5%
D	Ventilation	6%
E	Lights & appliances	14%
F	Other electrical	25%

Rated Energy Intensity: **0.40 GJ/m²/year**

Rated Greenhouse Gas Emissions: **7.6 tonnes/year**

The energy consumption indicated on your utility bills may be higher or lower than your EnerGuide rating. This is because standard assumptions have been made regarding how many people live in your house and how the home is operated. Your rating is based on the condition of your house on the day it was evaluated.

Quality assured by: CHBA BC

Builder: Vleeming Construction

Visit NRCan.gc.ca/myenerguide

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NEXT STEPS

If you have had a Renovation Upgrade Service, refer to your report for the roadmap to making your home more energy efficient. If you have not yet had a Renovation Upgrade Service, why not contact your service organization to learn what you can do to save on energy costs, reduce greenhouse gas emissions and improve home comfort?

Everyone uses energy in their house differently. This report was developed using standard operating conditions as explained in the glossary. Therefore, your EnerGuide rating will not match your utility bills.

UPGRADE CONSIDERATIONS

Before undertaking upgrades or renovations, find out about appropriate products and installation techniques, and ensure that all renovations meet local building codes and by-laws. Natural Resources Canada does not endorse the services of any contractor, nor any specific product, and accepts no liability in the selection of materials, products, contractors nor performance of workmanship.

Where your energy advisor has identified a potential health or safety concern such as insufficient outdoor air, risk of combustion fumes entering your house or risk of exposure to asbestos, they have endeavoured to provide a warning in this report. However, energy advisors are not required to have expertise in health and safety matters, and homeowners are solely responsible for consulting a qualified professional to determine potential hazards before undertaking any upgrades or renovations.

Visit us today at:

NRCan.gc.ca/myenerguide

Address: 765 Springside Close, Meridian Beach, ALBERTA, T0C 2J0

HOMEOWNER INFORMATION SHEET

ENERGUIDE

Your EnerGuide* rating and this report are based on data collected and, where necessary, presumed from your evaluation. Rating calculations are made using standard operating conditions.

Rating: 82 gigajoules per year (GJ/year)

Heated floor area: 283.5 m² (3051.6 ft²)

Rated energy intensity: 0.29 GJ/m²/year

Evaluated by: Jesse Thomas

Quality assured by: Coefficient Building Science Ltd

File number: 5910N00016

Data collected: April 13, 2023

Year built: 2022

NRCan.gc.ca/myenerguide

HOW YOUR RATING IS CALCULATED:

I.	Rated annual energy consumption	82 GJ/year
II.	Minus renewable energy contribution	- 0 GJ/year
	Equals your **EnerGuide rating**	**= 82 GJ/year**

I. Your rated annual energy consumption is the total amount of energy your house would use in a year based on the EnerGuide Rating System standard operating conditions. For your house, this includes 6.88 GJ of passive solar gain.

Energy Sources	Rated Consumption (GJ/year)	Equivalent Units (per year)	Greenhouse Gas Emissions (tonnes/year)
Natural gas	53	1419 m3	2.8
Electricity	29	8129 kWh	6.5
Total	82		9.3

II. On-site renewable power generation systems can offset some or even all of your home's energy consumption. Renewable energy contributions are factored differently for your rating and your greenhouse gas emissions calculations.[1]

On-Site Renewable Energy	Estimated Contribution (GJ/year)	Equivalent Units (per year)	Offset Greenhouse Gas Emissions (tonnes/year)
Electricity	0	0 kWh	0.0
Solar water heating	0	0	0.0
Total	0		0.0

HOW YOUR CONSUMPTION COMPARES:

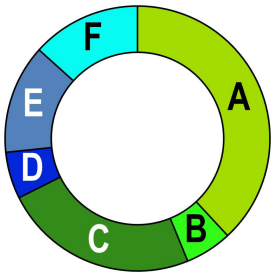
Compared to a typical new house, your house uses:

35.4% less energy;

44.5% less energy, when excluding the estimated energy consumption of lighting, appliances and electronics.

HOW YOUR RATED ENERGY IS USED:

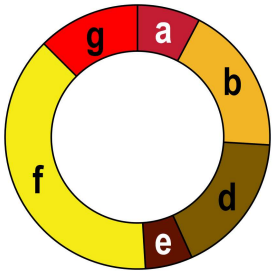
The chart below represents the breakdown of rated annual energy consumption in your home under standard operating conditions. You can use these figures as a guide to help identify where you can lower home energy costs through proper home maintenance, efficient home operation, energy efficiency renovations or equipment replacement.



A.	Space heating	40%
B.	Space cooling	3%
C.	Water heating	25%
D.	Ventilation	1%
E.	Lights & appliances	14%
F.	Other electrical	17%

WHERE YOUR HOME LOSES HEAT:

Houses lose heat through their exterior shell, or building envelope. The chart below shows where and how your home loses heat. The quality and upkeep of your home can have a major impact on the amount of energy your heating and cooling systems use annually.



a.	Attic/Ceiling	8%
b.	Main Walls	19%
c.	Exposed floors	0%
d.	Windows	18%
e.	Exterior doors	2%
f.	Basement/Foundation	40%
g.	Air leakage/ventilation	13%

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Refer to the glossary section for an explanation of relevant terms.

HOUSE DETAILS

BUILDING ENVELOPE

ATTIC/CEILING

TYPE	INSULATION VALUE		AREA m² (ft²)
	Nominal RSI (R)	Effective RSI (R)	
C1: Attic/gable	13.29 (75.5)	13.32 (75.6)	143.3 (1543)

MAIN WALLS

TYPE	INSULATION VALUE		AREA m² (ft²)
	Nominal RSI (R)	Effective RSI (R)	
Main ADJ	5.31 (30.1)	5.11 (29.0)	21.4 (230)
Main	5.28 (30.0)	5.06 (28.8)	119.1 (1282)

WINDOWS

#	TYPE	U-factor W/m² • °C (Btu/h • ft² • °F)	RSI (R)
1	Vinyl, Fixed, Double, Low E	1.7 (0.31)	0.58 (3.3)
1	Patio	1.1 (0.19)	0.92 (5.2)
1	Ensuite	1.1 (0.19)	0.93 (5.3)
1	Laundry	1 (0.17)	1.01 (5.7)
2	Bed 3/Sewing rm	1 (0.17)	1.04 (5.9)
2	Living N	1 (0.17)	1.04 (5.9)
3	Master/Living	1 (0.17)	1.05 (6.0)
2	Bed 2	0.9 (0.17)	1.07 (6.1)
Total window area: 21.25 m² (228.7 ft²)			

EXTERIOR DOORS

#	TYPE	U-factor W/m² • °C (Btu/h • ft² • °F)	RSI (R)
1	User specified	1.2 (0.21)	0.85 (4.8)
Total door area: 2.6 m² (28 ft²)			

BASEMENT/FOUNDATION

TYPE	INSULATION VALUE		AREA m² (ft²)
	Nominal RSI (R)	Effective RSI (R)	
Foundation concrete walls: exterior	N/A	N/A	139.5 (1501)
Foundation concrete walls: interior	3.87 (22.0)	3.95 (22.0)	139.5 (1501)
Foundation header	6.32 (35.9)	6.13 (34.8)	18 (194)
Foundation slab	2.85 (16.2)	2.85 (16.2)	140.2 (1509)

AIRTIGHTNESS

Air leakage rate at 50 pascals	0.37 air changes/hour
Equivalent leakage area	95.6 cm² (15 in²)
Normalized leakage area	0.2 cm²/m² (0.2 in²/100 ft²)

MECHANICAL SYSTEMS

SPACE HEATING

TYPE	OUTPUT SIZE	EFFICIENCY
Condensing natural gas furnace	12.31 kW 42500 BTU/h	96% AFUE
Advanced airtight wood stove	2 kW 7000 BTU/h	30% Steady State
Design heating load: 5.53 kW – refer to glossary for details		

SPACE COOLING

TYPE	OUTPUT SIZE	EFFICIENCY
Central air conditioner	1.7 kW 6000 BTU/h	17 SEER
Design cooling load: 2 kW		

WATER HEATING

TYPE	TANK VOLUME	EFFICIENCY
Natural gas direct vented storage tank	189L (50 USG)	0.62 EF

WHOLE-HOME VENTILATION

TYPE	AIR FLOW RATE	EFFICIENCY
Home Ventilating Institute listed ENERGY STAR certified heat recovery ventilator	47.19 L/s (100 cfm)	73%

HEATED FLOOR AREA

Above-grade area	143.3 m² (1542 ft²)
Below-grade area	140.2 m² (1509 ft²)

GLOSSARY

A typical new house
is a reference point on your label against which to compare your rating. It shows the estimated energy consumption of a house that is the same size, type and in the same location as yours. The typical new house is based on the energy efficiency requirements of the National Building Code.

Airtightness
describes how well the building envelope resists air leakage and is measured in air changes per hour at 50 pascals (ACH@50 Pa). The fewer air changes per hour, the more airtight the building envelope is. Equivalent leakage area is another way of describing the airtightness of the building envelope. It represents the size of a single hole in your building envelope if all the individual air leakage holes or gaps were added together. The smaller the equivalent leakage area, the less energy you will need to control the temperature of your home (but you will still need to ensure that you have adequate ventilation).

Design heating/cooling loads
provide an estimate of the capacity of the heating and cooling equipment needed to maintain your home at 22 °C in the winter and 24 °C in the summer and are provided for guidance only. Before having a new heating/cooling system installed, your heating/cooling contractor should perform an independent, detailed heat loss/heat gain calculation on your home in order to select the appropriate equipment.

Gigajoule (GJ)
is a unit of energy. It can be used as a measure of any type of energy that is consumed or produced in your home. Specifically, one GJ is the equivalent of 278 kWh of electricity, 27m³ of natural gas, 26 L of oil, 39 L of propane, or 947 817 BTUs. One GJ is roughly equal to the energy from two standard barbeque propane tanks or 30 litres of gas in a car's gas tank.

Greenhouse gas emissions
are the amounts of carbon dioxide, methane and nitrous oxide that are produced directly, by burning fossil and solid fuels, or indirectly, through the production of electricity. Greenhouse gas emissions are expressed in carbon dioxide equivalent units. Greenhouse gas emissions are calculated by multiplying the quantity of fuel or electricity used in your home by the emission factors for the particular energy source. Electricity factors vary by province because there are different emissions associated with each province's method of producing electricity. One tonne of greenhouse gas emissions is equivalent to the CO_2 emissions produced by driving an average efficiency mid-size vehicle from Toronto to Vancouver.

Heated floor area
represents the total useable area of your home that is heated, measured at the interior of the outer walls or of the walls attached to other buildings.

Insulation values
are expressed in RSI (m² • °C/W) or R-value (h • ft² • °F/Btu) and represent the resistance to the flow of heat of a given thickness of insulation or construction assembly. The higher the RSI-value (R-value), the better the performance.The nominal value represents the resistance to the flow of heat of just the insulation while the effective value represents the resistance to the flow of heat of the entire wall, ceiling or floor assembly considering the structure, insulation, framing, sheathing and all finishing.

On-site renewable energy contributions
are subtracted from the rated annual energy consumption to calculate the EnerGuide rating. For the calculation of the rated greenhouse gas emissions, on-site electricity generation only offsets emissions associated with electricity consumption, whereas a solar water heater reduces the emissions that would have been produced from the source of energy used to heat water.

Passive solar gain
is the heat from the sun that influences your home's heating and cooling requirements. Generally, south facing windows provide more solar gain.

Rated energy intensity
is calculated by dividing your rated annual energy consumption by your home's heated floor area. It allows you to compare the annual energy use of homes of different sizes on a "per square metre" basis.

Standard operating conditions
have been used to calculate your home's EnerGuide Rating. The rating assumes a standard number of occupants and energy use patterns. This allows for comparison of energy use across houses so that the house is rated and not the operation of the house by the occupants. The values are:

- Two adults and one child, at home 50% of the time;
- Hot water use of 158 - 197 L/day, variable depending on incoming ground water temperature and year the house was built;
- Thermostat settings of 21°C for daytime heating, 18°C for nighttime heating and 25°C for cooling; and
- Lighting, appliance and other electrical loads of 19.5 kWh/day.

U-factor
measures heat transferred through windows and doors, expressed in W/m² • °C (BTU/h • ft² • °F). The lower the U-factor, the better the energy efficiency of a window. The inverse of U-factor (1/U-factor) identifies the resistance to the flow of heat, expressed in RSI. The higher the RSI, the better the window is at resisting heat loss. You can use these values to choose more energy efficient windows.

For more details and additional terms, please visit NRCan.gc.ca/myenerguide.

765 Springside Close,
Meridian Beach, ALBERTA, T0C 2J0

ENERGUIDE

Data collected: April 13, 2023
File number: **5910N00016**
Evaluated by: Jesse Thomas

82 This house GJ/year

0 GJ/year
Best energy performance

127 GJ/year
A typical new house

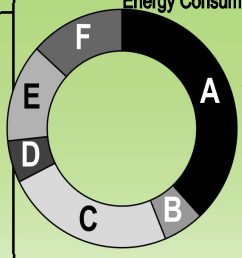
Uses most energy

One gigajoule (GJ) equals the energy from two BBQ propane tanks

Rated Annual Energy Consumption		82 GJ
• Natural gas	53	
• Electricity	29	
On-site renewable energy contributions		**- 0 GJ**
• Electricity	0	
• Solar water heating	0	
EnerGuide Rating:		**= 82 GJ**

Figures may not add up due to rounding.

Breakdown of Rated Annual Energy Consumption:



A	Space heating	**40%**
B	Space cooling	**3%**
C	Water heating	**25%**
D	Ventilation	**1%**
E	Lights & appliances	**14%**
F	Other electrical	**17%**

Rated Energy Intensity: **0.29 GJ/m²/year**

Rated Greenhouse Gas Emissions: **9.3 tonnes/year**

The energy consumption indicated on your utility bills may be higher or lower than your EnerGuide rating. This is because standard assumptions have been made regarding how many people live in your house and how the home is operated. Your rating is based on the condition of your house on the day it was evaluated.

Quality assured by: Coefficient Building Science Ltd

Builder: Vleeming Construction Ltd.

Visit NRCan.gc.ca/myenerguide

Natural Resources Canada | Ressources naturelles Canada | Canada

NEXT STEPS

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Before undertaking upgrades or renovations, find out about appropriate products and installation techniques, and ensure that all renovations meet local building codes and by-laws. Natural Resources Canada does not endorse the services of any contractor, nor any specific product, and accepts no liability in the selection of materials, products, contractors nor performance of workmanship.

Where your energy advisor has identified a potential health or safety concern such as insufficient outdoor air, risk of combustion fumes entering your house or risk of exposure to asbestos, they have endeavoured to provide a warning in this report. However, energy advisors are not required to have expertise in health and safety matters, and homeowners are solely responsible for consulting a qualified professional to determine potential hazards before undertaking any upgrades or renovations.

Visit us today at:

NRCan.gc.ca/myenerguide

Address: 27430 Twp Rd 402, Lacombe County, ALBERTA, T0C 0C0

HOMEOWNER INFORMATION SHEET

ENERGUIDE

Your EnerGuide* rating and this report are based on data collected and, where necessary, presumed from your evaluation. Rating calculations are made using standard operating conditions.

Rating: 95 gigajoules per year (GJ/year)

Heated floor area: 256.4 m² (2759.9 ft²)
Rated energy intensity: 0.37 GJ/m²/year
Evaluated by: Jesse Thomas
Quality assured by: Coefficient Building Science Ltd
File number: 5910N00025
Data collected: July 19, 2024
Year built: 2024

NRCan.gc.ca/myenerguide

HOW YOUR RATING IS CALCULATED:

I.	Rated annual energy consumption	95 GJ/year
II.	Minus renewable energy contribution	- 0 GJ/year
	Equals your **EnerGuide rating**	**= 95 GJ/year**

I. Your rated annual energy consumption is the total amount of energy your house would use in a year based on the EnerGuide Rating System standard operating conditions. For your house, this includes 10.14 GJ of passive solar gain.

Energy Sources	Rated Consumption (GJ/year)	Equivalent Units (per year)	Greenhouse Gas Emissions (tonnes/year)
Natural gas	65	1743 m3	3.4
Electricity	30	8224 kWh	6.0
Total	95		9.4

II. On-site renewable power generation systems can offset some or even all of your home's energy consumption. Renewable energy contributions are factored differently for your rating and your greenhouse gas emissions calculations.[1]

On-Site Renewable Energy	Estimated Contribution (GJ/year)	Equivalent Units (per year)	Offset Greenhouse Gas Emissions (tonnes/year)
Electricity	0	0 kWh	0.0
Solar water heating	0	0	0.0
Total	0		0.0

HOW YOUR CONSUMPTION COMPARES:

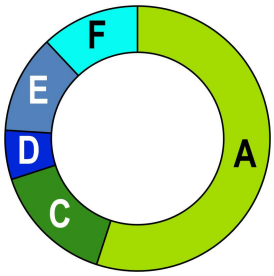
Compared to a typical new house, your house uses:

30.1% less energy;

37.7% less energy, when excluding the estimated energy consumption of lighting, appliances and electronics.

HOW YOUR RATED ENERGY IS USED:

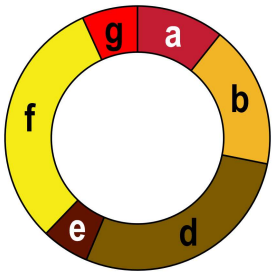
The chart below represents the breakdown of rated annual energy consumption in your home under standard operating conditions. You can use these figures as a guide to help identify where you can lower home energy costs through proper home maintenance, efficient home operation, energy efficiency renovations or equipment replacement.



A.	Space heating	55%
B.	Space cooling	0%
C.	Water heating	15%
D.	Ventilation	3%
E.	Lights & appliances	12%
F.	Other electrical	15%

WHERE YOUR HOME LOSES HEAT:

Houses lose heat through their exterior shell, or building envelope. The chart below shows where and how your home loses heat. The quality and upkeep of your home can have a major impact on the amount of energy your heating and cooling systems use annually.



a.	Attic/Ceiling	11%
b.	Main Walls	18%
c.	Exposed floors	0%
d.	Windows	29%
e.	Exterior doors	3%
f.	Basement/Foundation	32%
g.	Air leakage/ventilation	7%

*EnerGuide is an official mark of Natural Resources Canada.
Refer to the glossary section for an explanation of relevant terms.

HOUSE DETAILS

BUILDING ENVELOPE

ATTIC/CEILING

TYPE	INSULATION VALUE		AREA m² (ft²)
	Nominal RSI (R)	Effective RSI (R)	
C1: Attic/gable	13.29 (75.5)	13.47 (76.5)	256.4 (2760)

MAIN WALLS

TYPE	INSULATION VALUE		AREA m² (ft²)
	Nominal RSI (R)	Effective RSI (R)	
Main ADJ	6.51 (37.0)	6.33 (36.0)	27.5 (296)
Main	6.51 (37.0)	6.29 (35.7)	206.3 (2221)

WINDOWS

#	TYPE	U-factor W/m² • °C (Btu/h • ft² • °F)	RSI (R)
1	Vinyl, Fixed, Triple, Low E	1.5 (0.26)	0.67 (3.8)
1	Front entry lite	1.3 (0.24)	0.75 (4.3)
1	Mud rm	1.1 (0.19)	0.91 (5.2)
4	Living N-1	1.1 (0.19)	0.92 (5.2)
1	Ensuite	1.1 (0.19)	0.94 (5.4)
2	Master	1.1 (0.19)	0.95 (5.4)
2	Foyer	1 (0.18)	0.99 (5.6)
1	Office	1 (0.17)	1.03 (5.9)
2	Bed 2/3	1 (0.17)	1.04 (5.9)
1	Dining patio	1 (0.17)	1.05 (6.0)
1	Rec rm	0.9 (0.16)	1.07 (6.1)
2	Kitchen 1	0.9 (0.16)	1.08 (6.1)
1	Kitchen 2	0.9 (0.16)	1.14 (6.4)
Total window area: 42.89 m² (461.7 ft²)			

EXTERIOR DOORS

#	TYPE	U-factor W/m² • °C (Btu/h • ft² • °F)	RSI (R)
1	User specified	1.2 (0.22)	0.81 (4.6)
1	Fibreglass polystyrene core	1.2 (0.21)	0.85 (4.8)
1	User specified	0.8 (0.13)	1.32 (7.5)
Total door area: 6.1 m² (65.7 ft²)			

BASEMENT/FOUNDATION

TYPE	INSULATION VALUE		AREA m² (ft²)
	Nominal RSI (R)	Effective RSI (R)	
Slab-on-grade slab	2.85 (16.2)	2.85 (16.2)	256.4 (2760)

AIRTIGHTNESS

Air leakage rate at 50 pascals	0.48 air changes/hour
Equivalent leakage area	126.4 cm² (20 in²)
Normalized leakage area	0.2 cm²/m² (0.2 in²/100 ft²)

MECHANICAL SYSTEMS

SPACE HEATING

TYPE	OUTPUT SIZE	EFFICIENCY
Condensing natural gas furnace	12.31 kW 42500 BTU/h	96% AFUE
Natural gas fireplace with pilot	2 kW 7000 BTU/h	30% Steady State
Design heating load: 7.27 kW – refer to glossary for details		

SPACE COOLING

TYPE	OUTPUT SIZE	EFFICIENCY
N/A	N/A	N/A
Design cooling load: 2.32 kW		

WATER HEATING

TYPE	TANK VOLUME	EFFICIENCY
Natural gas direct vented storage tank	189L (50 USG)	0.89 UEF

WHOLE-HOME VENTILATION

TYPE	AIR FLOW RATE	EFFICIENCY
Home Ventilating Institute listed ENERGY STAR certified heat recovery ventilator	33.04 L/s (70 cfm)	65%

HEATED FLOOR AREA

Above-grade area	256.4 m² (2760 ft²)
Below-grade area	0 m² (0 ft²)

GLOSSARY

A typical new house
is a reference point on your label against which to compare your rating. It shows the estimated energy consumption of a house that is the same size, type and in the same location as yours. The typical new house is based on the energy efficiency requirements of the National Building Code.

Airtightness
describes how well the building envelope resists air leakage and is measured in air changes per hour at 50 pascals (ACH@50 Pa). The fewer air changes per hour, the more airtight the building envelope is. Equivalent leakage area is another way of describing the airtightness of the building envelope. It represents the size of a single hole in your building envelope if all the individual air leakage holes or gaps were added together. The smaller the equivalent leakage area, the less energy you will need to control the temperature of your home (but you will still need to ensure that you have adequate ventilation).

Design heating/cooling loads
provide an estimate of the capacity of the heating and cooling equipment needed to maintain your home at 22 °C in the winter and 24 °C in the summer and are provided for guidance only. Before having a new heating/cooling system installed, your heating/cooling contractor should perform an independent, detailed heat loss/heat gain calculation on your home in order to select the appropriate equipment.

Gigajoule (GJ)
is a unit of energy. It can be used as a measure of any type of energy that is consumed or produced in your home. Specifically, one GJ is the equivalent of 278 kWh of electricity, 27m³ of natural gas, 26 L of oil, 39 L of propane, or 947 817 BTUs. One GJ is roughly equal to the energy from two standard barbeque propane tanks or 30 litres of gas in a car's gas tank.

Greenhouse gas emissions
are the amounts of carbon dioxide, methane and nitrous oxide that are produced directly, by burning fossil and solid fuels, or indirectly, through the production of electricity. Greenhouse gas emissions are expressed in carbon dioxide equivalent units. Greenhouse gas emissions are calculated by multiplying the quantity of fuel or electricity used in your home by the emission factors for the particular energy source. Electricity factors vary by province because there are different emissions associated with each province's method of producing electricity. One tonne of greenhouse gas emissions is equivalent to the CO_2 emissions produced by driving an average efficiency mid-size vehicle from Toronto to Vancouver.

Heated floor area
represents the total useable area of your home that is heated, measured at the interior of the outer walls or of the walls attached to other buildings.

Insulation values
are expressed in RSI (m² • °C/W) or R-value (h • ft² • °F/Btu) and represent the resistance to the flow of heat of a given thickness of insulation or construction assembly. The higher the RSI-value (R-value), the better the performance.The nominal value represents the resistance to the flow of heat of just the insulation while the effective value represents the resistance to the flow of heat of the entire wall, ceiling or floor assembly considering the structure, insulation, framing, sheathing and all finishing.

On-site renewable energy contributions
are subtracted from the rated annual energy consumption to calculate the EnerGuide rating. For the calculation of the rated greenhouse gas emissions, on-site electricity generation only offsets emissions associated with electricity consumption, whereas a solar water heater reduces the emissions that would have been produced from the source of energy used to heat water.

Passive solar gain
is the heat from the sun that influences your home's heating and cooling requirements. Generally, south facing windows provide more solar gain.

Rated energy intensity
is calculated by dividing your rated annual energy consumption by your home's heated floor area. It allows you to compare the annual energy use of homes of different sizes on a "per square metre" basis.

Standard operating conditions
have been used to calculate your home's EnerGuide Rating. The rating assumes a standard number of occupants and energy use patterns. This allows for comparison of energy use across houses so that the house is rated and not the operation of the house by the occupants. The values are:

- Two adults and one child, at home 50% of the time;
- Hot water use of 158 - 197 L/day, variable depending on incoming ground water temperature and year the house was built;
- Thermostat settings of 21°C for daytime heating, 18°C for nighttime heating and 25°C for cooling; and
- Lighting, appliance and other electrical loads of 19.5 kWh/day.

U-factor
measures heat transferred through windows and doors, expressed in W/m² • °C (BTU/h • ft² • °F). The lower the U-factor, the better the energy efficiency of a window. The inverse of U-factor (1/U-factor) identifies the resistance to the flow of heat, expressed in RSI. The higher the RSI, the better the window is at resisting heat loss. You can use these values to choose more energy efficient windows.

For more details and additional terms, please visit NRCan.gc.ca/myenerguide.

27430 Twp Rd 402,
Lacombe County, ALBERTA, T0C 0C0

ENERGUIDE

Data collected: July 19, 2024
File number: **5910N00025**
Evaluated by: Jesse Thomas

95 This house GJ/year

0 GJ/year
Best energy performance

136 GJ/year
A typical new house

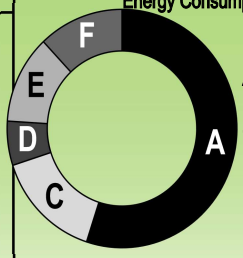
Uses most energy

One gigajoule (GJ) equals the energy from two BBQ propane tanks

Rated Annual Energy Consumption		95 GJ
• Natural gas	65	
• Electricity	30	
On-site renewable energy contributions		**- 0 GJ**
• Electricity	0	
• Solar water heating	0	
EnerGuide Rating:		**= 95 GJ**

Figures may not add up due to rounding.

Breakdown of Rated Annual Energy Consumption:



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E	Lights & appliances	**12%**
F	Other electrical	**15%**

Rated Energy Intensity: **0.37 GJ/m²/year**

Rated Greenhouse Gas Emissions: **9.4 tonnes/year**

The energy consumption indicated on your utility bills may be higher or lower than your EnerGuide rating. This is because standard assumptions have been made regarding how many people live in your house and how the home is operated. Your rating is based on the condition of your house on the day it was evaluated.

Quality assured by: Coefficient Building Science Ltd

Builder: Vleeming Construction Ltd.

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BC STEP CODE COMPLIANCE CHECKLIST - PERFORMANCE PATHS FOR PART 9 BUILDINGS

A: PROJECT INFORMATION

Building Permit #:	
Builder:	C0530 Prevail Solutions Inc
Project Address:	123 Suncrest Rd
Municipality / District:	Castlegar
Postal Code:	V1N 4T5
PID or Legal Description:	027-235-823

As Built

Building Type

Single Detached

# of Dwelling Units: 1

B: CODE COMPLIANCE SUMMARY

BC Building Code Performance Compliance Path:

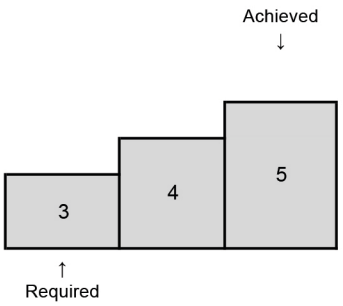
9.36.6. BC Energy Step Code ERS

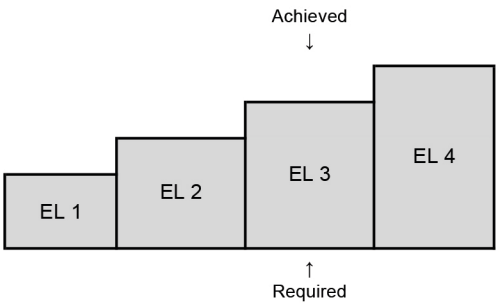
Energy Step Code

Step Required	Step Achieved
3	**5**

Zero Carbon Step Code

Level Required	Level Achieved
EL 3 - Strong	**EL 3 - Strong**





Based on info provided by the builder & drawings prepared by: Robinson Residential

Site Visit Date Nov 8th 2024

C: COMPLETED BY

Full Name (Print):
Company Name:
Phone:
Address:
Email:

Date (YYYY-MM-DD):
Service Organisation
Energy Advisor ID #
CODECO placed in Field 8 of H2K

N File # 9K11N00108

D: BUILDING CHARACTERISTICS SUMMARY

	Details (Assembly / System Type / Fuel Type / Etc.)		Average Effective RSI
Roof / Ceilings	9.25" Greenstone Panels		5.88
Above Grade Walls	7.5" Greenstone Panels		5.08
Rim Joists / Floor Headers and Lintels	9.25" EPS		7.44
Floors Over Unheated Space	N/A		
Walls Below Grade	9.25" Greenstone Panels		6.22
Slabs	5.5" Greenstone Panels		3.87
			Performance Values
		USI	**SHGC**
Windows and glazed doors	Triple glazed, low-e, argon fill	1.60	0.30
		1.02	0.22
		1.25	0.22
Doors	Insulated core	**USI**	1.60
Air Barrier System & Location	Sealed Greenstone Panels	**ACH**	0.23
		NLA	0.12
		NLR	0.08
Space Heating/ Cooling	Principal: Air Source Heat Pump	**HSPF**	10.76
		SEER	18.00
	Supplementary:	**-**	
		-	
Domestic Hot Water	Electric conserver tank	**EF**	0.90
		% EFF	**L/s**
Ventilation	HRV	71 @ 0 Deg C	44.50
Other			
Fossil Fuels	The building including all units is designed with NO fossil fuel use or infrastructure		

E: 9.36.5. ENERGY PERFORMANCE COMPLIANCE

Complete this section if using the Energy Performance Compliance Path in Subsection 9.36.5.

Proposed House Energy Consumption (GJ/year)	
HVAC	
DHW Heating	
SUM	**0**

Reference House Rated Energy Target (GJ/year)	
HVAC	
DHW Heating	
SUM	**0**

The airtightness value used in the energy model calculations for the Proposed house is:
Or Tested At: 0.80

The above calculation was performed in compliance with Subsection 9.36.5. of Division B:

F: 9.36.6. ENERGY STEP CODE COMPLIANCE

As Built House Rated Energy Consumption (GJ/year): 22 **Reference House Rated Energy Target (GJ/year):** 46

Proposed House Metrics	Unit	As Built Step Requirements		As-built Calculations: As-built House Result	As-built House Pass or Fail
Step Code Level	Step 3, 4 or 5	5			
Mechanical Energy Use Intensity (MEUI)	kWh/(m²·year)	63	*(max)*	61	Pass
% Improvement	%	70	*(min)*	51	
Thermal Energy Demand (TEDI)	kWh/(m²·year)	22	*(max)*	23	Pass
~~% Heat Loss Reduction~~	~~%~~	~~40~~	~~*(min)*~~	40	
Airtightness in Air Changes per Hour at 50 Pa differential	ACH @ 50 Pa	1	*(max)*	0.2	Pass
Normalized Leakage Area (NLA_{10})	10 Pa (cm²/m²)	0.48	*(max)*	0.1	
Normalized Leakage Rate (NLR_{50})	L/s/m²	0.35	*(max)*	0.1	
			Step Code Requirements Met:		**Yes**

Software Used: Hot 2000 Version: 11.12

Heated Floor Area (m^2) 102.50 Climate Data (Location): NELSON

Building Volume (m^3) 451.60 Degree Days Below 18°C (HDD): 3482

FWDR: 11.9% % Of Space Cooled More than 50%

G: ZERO CARBON STEP CODE

Proposed House Metrics		Unit	Proposed Level Requirement		Proposed Calculations: Proposed House Result	Proposed House Pass or Fail
Zero Carbon Step Code Level		EL-1 - EL-4	EL 3 - Strong			
Total GHG		kg CO_{2e}/ year	440	*(max)*	147	Pass
CO_{2e} per floor area with max	Per Floor area	kg CO_{2e}/m²/year	1.5	*(max)*	1.4	Pass
	Max	kg CO_{2e}	500	*(max)*	147	
Perscriptive		Heating	Zero Carb		Zero Carb	Pass
		Hot Water	Zero Carb		Zero Carb	
		All building systems,equipment and appliances	Zero Carb		Zero Carb	
				Target Reached		**Yes**

Sustainability and Building Performance Specialist
PO Box 70003 Creekside PO, Airdrie
O: 403.702.5471 | www.ecosynergy.ca

September 20, 2024

BLOWER DOOR TESTING 2024
TEST RESULTS - ARVIAT

Client:
GREENSTONE BUILDING PRODUCTS
4000B Richmond Ave East Brandon,
MB R7A 7P8
Phone 204.726.1426

Attn: Weldon Loewen

Introduction:

EcoSynergy was contracted to perform third party mid—construction air tightness testing to determine the maximum allowable uncontrolled air leakage rate for the 8 Unit complex in Arviat, Nunavut.

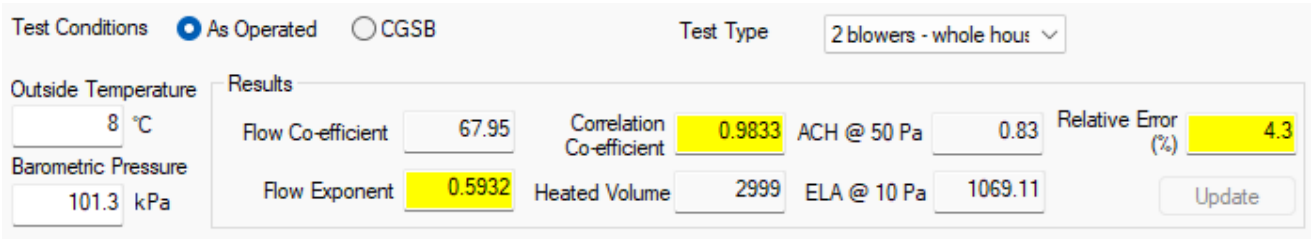
Equipment used:
The blower door equipment used was composed of retractable aluminium door frames and tarps along with a Retrotec blower model 5000 and a DM32 Digital Anemometer and a Minneapolis model 3 fan with variable speed controller one DG-1000 pressure and flow gauge.

Exterior climate conditions:
The days of the testing, winds were variable, with occasional gusts, sunny and blue skies with an outdoor temperature of 8° C.

Testing procedure:

The blower door test procedure utilized on-site aligns with Standard CAN/CGSB-149.10-2019 “Determination of the airtightness of building envelopes by the fan depressurization method”, “two zones- two blower fans- 1 test”. This is achieved by having both fans will be operating at the same time.

Testing Results Negative pressure test:



Summary of results negative pressure test at 50 pa:

- Total Internal volume: 2999.3 m³
  - Main Floor Volume of 1395 m³ (not inlcuding Service Room)
  - Second Floor Volume of 1604.3 m³
- ELA @ 10 Pa: 958.6 cm²
- Flow exponent: 0.6663
- Co-efficient of Flow: 51.48
- Co-efficient of leakage (corrolation Co-efficient): 0.9960
- Relative Error (%): 4.3
- **Air changes per hour @ 50 Pa: 0.830319 ACH**

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O: 403.702.5471 | www.ecosynergy.ca

Here are some notes on the different readings to help you better understand the data:

- **ELA:** The equivalent leakage area (EqLA) or effective leakage area (EfLA, in cm^2 or in^2) represents the size of a single hole that would result in the same air leakage as that of all the air leakage pathways through the enclosure combined
- **Flow Exponent:** One of the output metrics obtained from undertaking a fan pressurization test that is used to characterize how the air flows through the various adventitious cracks and gaps that exist in the building fabric. It should range from 0.5 to 1.0, with figures approaching 0.5 representing fully developed turbulent flow and figures approaching 1.0 representing more laminar flow. Turbulent flow is associated with air flow through a series of large apertures, whilst laminar flow is associated with air flow through a multitude of tiny gaps and cracks.
- **Co-efficient of Flow:** The flow coefficient of a device is a relative measure of its efficiency at allowing fluid flow. It describes the relationship between the pressure drop across an orifice valve or other assembly and the corresponding flow rate.
- **Co-efficient of Leakage:** A correlation coefficient is a numerical measure of some type of correlation, meaning a statistical relationship between two variables. The variables may be two columns of a given data set of observations, often called a sample, or two components of a multivariate random variable with a known distribution.
- **Air Changes Per Hour**: Air changes per hour, which is often abbreviated as ACH, is a calculation of how many times per hour the entire volume of air in a given space is replaced with supply and/or recirculated air. It is also sometimes referred to as “air change rate” or “air exchange rate.”

Site Data:

Results for Retrotec blower model 5000 used for the entire main floor:

Test 1/Equip1 | Test 1/Equip2

Fan Type: Retrotec 5000 | Manometer: DM32

Initial Static Pressure: -1 Pa | Inside Temperature: 8 ℃

Final Static Pressure: -1.2 Pa | Zone Heated Vol: 1395 m³

Hse Pressure Pa	Fan Pressure Pa	Measured Flow L/s	Flow Ranges	Measured Flow L/s	Corrected Pressure Pa	Corrected Flow L/s	Error %
-50	170	0	B4	393	48.9	393	2.1
-45.4	154.5	0	B4	372	44.3	372	-2.0
-40	122	0	B4	326	38.9	326	-1.1
-35	93	0	B4	281	33.9	281	1.1
-30	75	0	B4	249	28.9	249	-2.3
-25.6	51.2	0	B4	205	24.5	205	1.6
-20	28.9	0	B4	160	18.9	160	2.0

Results for Minneapolis model 3 used for the entire second floor

Test 1/Equip1 | Test 1/Equip2

Fan Type: Minneapolis Model 3 | Manometer: DG 1000

Initial Static Pressure: -0.5 Pa | Inside Temperature: 8.0000009 ℃

Final Static Pressure: -0.9 Pa | Zone Heated Vol: 1604.3009 m³

Hse Pressure Pa	Fan Pressure Pa	Measured Flow L/s	Flow Ranges	Measured Flow L/s	Corrected Pressure Pa	Corrected Flow L/s	Error %
-50.3	114.3	0	B	300	49.6	300	-3.2
-45	99.6	0	B	280	44.3	280	-0.5
-40	85	0	B	259	39.3	259	2.9
-29.9	62.40	0	B	222	29.2	222	7.2
-19.3	57.80	0	B	214	18.6	214	-5.4

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PO Box 70003 Creekside PO, Airdrie
O: 403.702.5471 | www.ecosynergy.ca

Additional Testing Notes:

Typical areas of leakage that were found on site, but not limited to, the following:

- Windows – it was discovered that some of the windows had small areas of leakage at the corners of the windows (the mechanical joint in the window frame).
- Windows – as the windows typically only had a single positive latch, not all corners were completely sealed
- Doors – many of the doors were not the final doors and therefore still required final installation.
- Doors – most doors did not have final hardware installed.
- Plumbing – the final plumbing rough-in was not complete, therefore, not all wall/ceiling penetrations were present. All open plumbing pipes were taped closed to the best of our ability.
- Mechanical – no mechanical piping was installed at time of testing, therefore, not all wall/ceiling penetrations were present.
- Electrical – it appeared that all electrical rough-ins were complete and any penetrations were sealed.
- Mechanical Chase – the mechanical chase volume was added to the main floor volume calculation, as there where plumbing/mechanical penetrations between the main floor and chase.
- Service Room – the Service Room was NOT included in the main floor volume calculation, as there was a large temporary exterior door that was open/not sealed.
- Service Room / Mechanical Chase – as these two spaces are connected, there was significant air leakage between these two spaces.
- Walls/Ceilings – as these two items were both constructed with the Greenstone Panels, there was NO SIGNIFICANT air leakage at the panels. Areas that were found with MINIMAL leakage were the connection between the floor and wall panel and the ceiling and wall panels.
- Additional Air/Vapour Barrier – this 8-unit complex had a secondary air/vapour barrier installed, utilizing 6 mil Poly. There were no significant signs of any additional benefit to having this secondary barrier installed.
- Relative Error (%): 4.3 – this percentage of error is within the acceptable guidelines and was most likely caused by the exposure of the project and the variable wind conditions.

Summary:

In summary, the mid-construction building envelope air leakage testing, performed on September 18, 2024 by Jean White, REA and Marcela Mitrengova, REA on the 8-unit housing complex in Arviat, went very smoothly. The final test results of 0.83 ACH @ 50 Pa.

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September 20, 2024

BLOWER DOOR TESTING 2024
TEST RESULTS – RANKIN INLET

Client:
GREENSTONE BUILDING PRODUCTS
4000B Richmond Ave East Brandon,
MB R7A 7P8
Phone 204.726.1426

Attn: Weldon Loewen

Introduction:

EcoSynergy was contracted to perform third party mid—construction air tightness testing to determine the maximum allowable uncontrolled air leakage rate for the 8 Unit complex in Rankin Inlet, Nunavut.

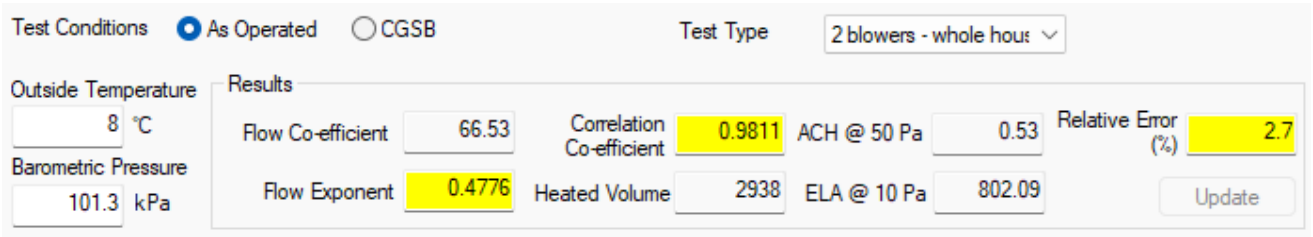
Equipment used:
The blower door equipment used was composed of retractable aluminium door frames and tarps along with a Retrotec blower model 5000 and a DM32 Digital Anemometer and a Minneapolis model 3 fan with variable speed controller one DG-1000 pressure and flow gauge.

Exterior climate conditions:
The days of the testing, winds were variable, with occasional gusts, sunny and blue skies with an outdoor temperature of 8° C.

Testing procedure:

The blower door test procedure utilized on-site aligns with Standard CAN/CGSB-149.10-2019 “Determination of the airtightness of building envelopes by the fan depressurization method”, “two zones- two blower fans- 1 test”. This is achieved by having both fans will be operating at the same time.

Testing Results Negative pressure test:



Summary of results negative pressure test at 50 pa:

- Total Internal volume: 2937.93 m³
  - Main Floor Volume of 1333.6 m³ (not inlcuding Service Room)
  - Second Floor Volume of 1604.3 m³
- ELA @ 10 Pa: 802.09 cm²
- Flow exponent: 0.4776
- Co-efficient of Flow: 66.53
- Co-efficient of leakage (corrolation Co-efficient): 0.9811
- Relative Error (%): 2.7
- **Air changes per hour @ 50 Pa: 0.527982 ACH**

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Here are some notes on the different readings to help you better understand the data:

- **ELA:** The equivalent leakage area (EqLA) or effective leakage area (EfLA, in cm^2 or in^2) represents the size of a single hole that would result in the same air leakage as that of all the air leakage pathways through the enclosure combined
- **Flow Exponent:** One of the output metrics obtained from undertaking a fan pressurization test that is used to characterize how the air flows through the various adventitious cracks and gaps that exist in the building fabric. It should range from 0.5 to 1.0, with figures approaching 0.5 representing fully developed turbulent flow and figures approaching 1.0 representing more laminar flow. Turbulent flow is associated with air flow through a series of large apertures, whilst laminar flow is associated with air flow through a multitude of tiny gaps and cracks.
- **Co-efficient of Flow:** The flow coefficient of a device is a relative measure of its efficiency at allowing fluid flow. It describes the relationship between the pressure drop across an orifice valve or other assembly and the corresponding flow rate.
- **Co-efficient of Leakage:** A correlation coefficient is a numerical measure of some type of correlation, meaning a statistical relationship between two variables. The variables may be two columns of a given data set of observations, often called a sample, or two components of a multivariate random variable with a known distribution.
- **Air Changes Per Hour**: Air changes per hour, which is often abbreviated as ACH, is a calculation of how many times per hour the entire volume of air in a given space is replaced with supply and/or recirculated air. It is also sometimes referred to as “air change rate” or “air exchange rate.”

<u>Site Data:</u>

Results for Retrotec blower model 5000 used for the entire main floor:

Test 1/Equip1 | Test 1/Equip2

Fan Type: Retrotec 5000 | Manometer: DM32

Initial Static Pressure: 0 Pa | Inside Temperature: 8 ℃

Final Static Pressure: 0.3 Pa | Zone Heated Vol: 1333.6 m³

Hse Pressure Pa	Fan Pressure Pa	Measured Flow L/s	Flow Ranges	Measured Flow L/s	Corrected Pressure Pa	Corrected Flow L/s	Error %
-50.9	61	0	B4	226	51.0	226	0.1
-45.5	50	0	B4	205	45.7	205	0.8
-39.8	41	0	B4	186	40.0	186	-0.8
-35	32.6	0	B4	169	35.2	169	-1.5
-30	22	0	B4	146	30.1	146	0.4
-25	12.4	0	B4	125	25.1	125	1.3

Results for Minneapolis model 3 used for the entire second floor

Test 1/Equip1 | Test 1/Equip2

Fan Type: Minneapolis Model 3 | Manometer: DG1000

Initial Static Pressure: -1.4 Pa | Inside Temperature: 8.0000009[illegible] ℃

Final Static Pressure: -1 Pa | Zone Heated Vol: 1604.3338[illegible] m³

Hse Pressure Pa	Fan Pressure Pa	Measured Flow L/s	Flow Ranges	Measured Flow L/s	Corrected Pressure Pa	Corrected Flow L/s	Error %
-50	57.5	0	B	213	48.8	213	-5.1
-44.9	53.6	0	B	206	43.7	206	-2.7
-39.9	43.3	0	B	185	38.7	185	6.4
-35	41.4	0	B	181	33.8	181	7.1
-29.8	46.1	0	B	191	28.6	191	0.2
-24.9	45.1	0	B	189	23.7	189	-0.7
-19	44.5	0	B	188	17.8	188	-3.2

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Additional Testing Notes:

Typical areas of leakage that were found on site, but not limited to, the following:

- Windows – it was discovered that some of the windows had small areas of leakage at the corners of the windows (the mechanical joint in the window frame).
- Windows – as the windows typically only had a single positive latch, not all corners were completely sealed
- Doors – many of the doors were not the final doors and therefore still required final installation.
- Doors – most doors did not have final hardware installed.
- Plumbing – the plumbing rough-in was not started, therefore, no wall/ceiling penetrations were present.
- Mechanical – no mechanical piping was installed at time of testing, therefore, no wall/ceiling penetrations were present.
- Electrical – no electrical was installed at time of testing, therefore, no wall/ceiling penetrations were present.
- Mechanical Chase – the mechanical chase volume was NOT added to the main floor volume calculation, as there where NO plumbing/mechanical penetrations between the main floor and chase.
- Service Room – the Service Room was NOT included in the main floor volume calculation, as there where NO penetrations between the main floor and chase
- Walls/Ceilings – as these two items were both constructed with the Greenstone Panels, there was NO SIGNIFICANT air leakage at the panels. Areas that were found with MINIMAL leakage were the connection between the floor and wall panel and the ceiling and wall panels.
- Relative Error (%): 2.7 – this percentage of error is within the acceptable guidelines and was most likely caused by the exposure of the project and the variable wind conditions.

Summary:

In summary, the mid-construction building envelope air leakage testing, performed on September 17, 2024 by Jean White, REA and Marcela Mitrengova, REA on the 8-unit housing complex in Arviat, went very smoothly. The final test results of 0.53 ACH @ 50 Pa.

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