Home Energy Rating Certificate

Alaska Housing FINANCE CORPORATION

The Home Located At:

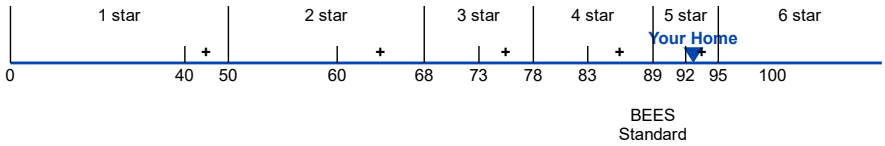
CIHA Brewsters
Anchorage, Alaska

Has Been Energy-Rated As:

★★★★★+

Five Star Plus

Efficiency Score	Renewables Bonus	Combined Score
92.7 points	0.0 points	92.7 points



Amount of CO2 Produced by the Home

160,068 pounds per year

Projected Annual Energy Costs

$27,044 per year

Breakdown of Costs, $ Per Year

Floor	*$411*
Wall/Door	*$731*
Window	*$564*
Ceiling	*$227*
Air/Vent	*$1,263*
Htg System Loss	*$554*
Hot Water	*$1,754*
Cooling	*$0*
Lights/Appl.	*$21,538*
Renewables	*$0*

Client: Cook Inlet Housing Authority, Spark Design, LLC. **Rater:** Linda Frank, Horizons LLC **Date:** 2/6/2023
Rater's City: Eagle River, AK. 99577 **Contact:** 907-240-8585, horizons@mtaonline.net
ver. 2.11.0.0, library: 9/27/2022, file: Brewsters.hm2, Rating Type: From Plans

I certify that this Rating is true and correct, to the best of my knowledge and belief: Linda Frank
Rater Signature

Energy Cost and Features Report

(DOCUMENT DOES NOT NEED TO BE RECORDED)

Property: Cook Inlet Housing Authority, Spark Design, LLC
CIHA Brewsters
Anchorage, Alaska

House: Multi-Family, Whole Building
Living Floor Area: 19,657 square feet
No Attached Garage

Rater: Linda Frank
Horizons LLC
10900 Corrie Way
Eagle River, AK. 99577

Rating: From Plans
ID: Brewsters RBP

Envelope Efficiency

Floor Insulation	R-21.0 *
Wall/Door Insulation	R-17.7
Ceiling Insulation	R-38.0
Window U-Value	U-0.37
Window SHGC	0.37
Window to Wall Ratio, Living Space	14.3%
South Facing Window Area	505 square feet
Air Leakage	2.5 Air Changes per Hour at 50 Pascals 0.20 Air Changes per Hour Natural

* Includes the insulating value of the ground in contact with these components.

Space Heating System

Fuel	Natural Gas
System Type	Boiler
Model	Lochinvar FTX500N X2
Efficiency	87%
Btu/hr Output	97,800 - 978,000 Btu/hr
Primary Htg. Sys. Design Load	269,403 Btu/hr
Garage Htg. Sys. Design Load	0 Btu/hr
Supplemental Fuel	None
Thermostat Setting	70.0 degrees F
Setback Thermostat	Yes, Controls Entire Home

Water Heater

Efficiency	97%
Location	Conditioned Space
Fuel Type	Natural Gas

Space Cooling System

None Present

Ventilation

System Type	Continuous Ventilation without
Required Ventilation	330 CFM
Measured Ventilation	1680 CFM

Other

Number of Bedrooms	19
Clothes Dryer Fuel	Electricity
Cooking Range Fuel	Electricity
Oven Fuel	Electricity
Miscellaneous Lights/Appliance Use	Average
CAZ Test Normal Conditions	Pass

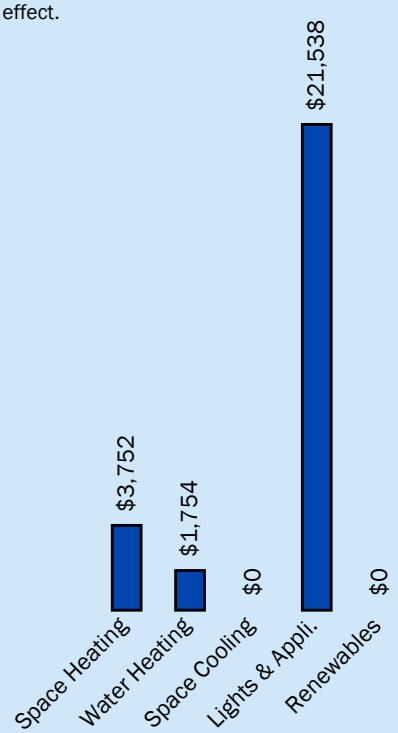
Additional Information:

Ignoring 0.0 MMBtu excess renewable space heat for month 7.

ver. 2.11.0.0, library: 9/27/2022, file: Brewsters.hm2

Estimated Annual Energy Costs

Actual use and costs may vary from these estimates depending upon weather conditions, occupant life styles and utility rates currently in effect.



Electricity: $0.1663/kWh, Natural Gas: $1.02/ccf
Space Heating: 461 kWh of Electricity, 3,596 ccf of Natural Gas
Water Heating: 1,716 ccf of Natural Gas
Space Cooling:
Lights & Appliances: 129,552 kWh of Electricity

Design Heat Loss Report

General

Date of Reporting:	2/6/2023
Date of Rating:	2/6/2023
Client:	Cook Inlet Housing Authority
Home Address:	
Home City:	, AK
AkWarm File Name:	C:\Users\Parker\Documents\AkWarm\Spark Design, LLC\Brewsters.hm2

Temperatures / Wind Speed

Indoor Temperature:	70	deg F
Design Air Temperature:	-13.9	deg F
Deep Ground Temperature:	39	deg F
Garage Temperature:	55	deg F
Airport Design Wind Speed:	3.2	mph

Main Home Heat Loss

Heat Loss from Shell Components

Shell Component Type	ID Name	Net Area, sq. ft.	Total R-Value	UA to Air, Btu/hr/deg-F	UA to Ground, Btu/hr/deg-F	Design Heat Loss, Btu/hour
Below grade Floor Perimeter	Level 1 slab on grade	1,416	8.4	246.1	-77.4	18,218
Below grade Floor Center	Level 1 slab on grade	5,210	35.5	0.0	146.8	4,604
Above grade Wall	Exterior walls	9,547	18.2	515.2	0.0	43,230
Above grade Wall	Rim joist between 1/2 and 2/3	1,021	25.6	39.4	0.0	3,307
Cathedral Ceiling	Ceiling	6,626	38.0	174.2	0.0	14,617
Window	South facing vinyl windows	297	3.3	81.4	0.0	6,827
Window	South facing aluminum commercial glass	208	1.6	107.9	0.0	9,055
Window	West facing vinyl windows	186	3.3	50.9	0.0	4,267

External Door	Metal doors west facing	60	1.7	30.2	0.0	2,538
Window	East facing vinyl windows	186	3.3	50.9	0.0	4,267
Window	East facing aluminum commercial glass	179	1.6	92.6	0.0	7,767
Window	North facing vinyl windows	718	3.3	196.6	0.0	16,498
Total		**25,653**		**1,585.3**	**69.4**	**135,194**

Heat Loss due to Natural Air Leakage and Mechanical Ventilation

Mechanical Ventilation Flow, Unbalanced	330	cfm
Effective Mechanical Ventilation:	50	cfm
Mechanical Ventilation Heat Recovery Effectiveness:	0	%
Natural Air Leakage at Design Conditions:	1,069	cfm
Total Ventilation:	1,118	cfm
	0.31	ACH
Heat Loss per deg F:	1,203	Btu/hr/deg-F
Heat Loss from Air Leakage/Ventilation:	**100,976**	**Btu/hour**

Total Design Heat Loss for Main Home

Home Shell Components:	135,194	Btu/hour
Air Leakage + Mechanical Ventilation:	100,976	Btu/hour
Loss to Garage:	0	Btu/hour
Heating System Distribution Loss (100% efficiency):	0	Btu/hour
Required Heating System Output:	**236,170**	**Btu/hour**

Domestic Hot Water Heat Load

The DHW Load is Served by the Primary Heating System

DHW Storage Tank Size	240	gallons
Peak 3 Hour Usage of 120 F Water	592	gallons
Peak 3 Hour DHW Heat Load	79,221	Btu/hour
Extra Heating System Capacity Required	33,233	Btu/hour

NOTE: DHW Load calculation assumes *no* large DHW loads such as Spa tubs.

Required Heating System Output

The table below shows the amount of heat required to be supplied by the heating systems.

Required Output, Btu/hour	No Safety Margin	10% Safety Margin	20% Safety Margin	25% Safety Margin
Primary System serving Main Home, DHW	269,403	296,344	323,284	336,754

The design heat load falls within the output range of the primary heating system, which is 97,800 - 978,000 Btu/hour.

NOTE: DHW Load calculation assumes *no* large DHW loads such as Spa tubs.

If you need to determine the required *Input Rating* of the heating system, you must divide the Output Requirement by the efficiency of the system. For example, if the heating system is 85% efficient and the Output Requirement is 56,000 Btu/hour, the needed Input Rating is 56,000 Btu/hour / 0.85 = 65,900 Btu/hour

AkWarm Home Inputs

Client
Cook Inlet Housing Authority, Spark Design, LLC.
AK

Home Location
CIHA Brewsters
Anchorage, AK 99504

Reference City: Anchorage
Electric Utility: Chugach Electric North - Residential
Gas Utility: Enstar Natural Gas - G1 (Res)

Rating Information
Rating Type: From Plans
ID: Brewsters RBP
Date: 2/6/2023

Rater
Linda Frank
Horizons LLC
10900 Corrie Way
Eagle River, AK. 99577
Phone: 907-240-8585
Email: horizons@mtaonline.net

Occupancy
40 Occupants
Owner Occupied

House Type/Size
House Type: Multi Family - Whole Building
# of units in building: 21
Year Built: 2023
Heated Floor Area, sq.ft.: 19,656.5
level 1: 7.5*18*2+57*111.5
Level 2: 6625.5-((10*8)+(18*1)+(12*1))
Level 3: 6625.5-((10*8)+(18*1)+(12*1))
Conditioned Garage Floor Area, sq.ft.: 0
# of Bedrooms: 19
Windshielding: Average

Actual Energy Costs
Annual Fuel Cost: $0.00
Annual Electric Cost: $0.00

Air
From Blower Test CFM @ 50 Pascals: 9000
ACH @ 50 Pascals: 2.50
Average Ceiling Height to Ground or Exposed Floor: 33
Heated Volume: 216,221.5
level 1: (7.5*18*2+57*111.5)*11
Level 2: (6625.5-((10*8)+(18*1)+(12*1)))*11
Level 3: (6625.5-((10*8)+(18*1)+(12*1)))*11
Ventilation System Type: Mechancial with no Heat Recovery
System has controls to operate at less than maximum flow: Yes

Heating
Thermostat Setpoint: 70
Night Setback Thermostat: All of Home

Primary System
Fuel Type: Natural Gas
Equipment Type: Condensing boiler
No chimney, no draft hood; electric ignition, induced draft fan; either conventional or pulsed combustion burner; small vent fitted to outside of hous
Certified AFUE: 97.7
Output BTU Rating: 97,800 - 978,000 (modulating)
Upgrade Devices: Modulating Aquastat
Heat Distribution: Hydronic
0% in Un-conditioned Space, Not Insulated
0% in Semi-conditioned Space, Not Insulated

Secondary System
No System Installed

Cooling
Cooling System: None Present

Hot Water Heater
Fuel Type: Natural Gas
Equipment Type: Gas: Direct vent/sealed combustion
Gas/propane tank with a direct vent to the outside from combustion hood, to exhaust flue gases.
Energy Factor: 0.97
Location: Conditioned Space, > 60 deg F

Other
Dryer: Electricity
Range: Electricity
Oven: Electricity
Misc. Electric Use: Average

Fuel Prices
Electricity, ($/kWh): $0.19 (Approx. Utility Price)
Natural Gas, ($/ccf): $1.02 (Approx. Utility Price)

Shell Components

Floors - Total Area 6,625.5 sq. ft.

Below Grade Floor Perimeter: Level 1 slab on grade
Temperature: Living Space
Gross Area, Sq. Ft.: 1,416
(18+7.5+77+7.5+18+33+1.5+31.5+111.5+64.5)*4-64
Distance to Grade: On Grade
Insulation Covers Slab Perimeter: No
Insulation for 0' to 2' Perimeter: EPS Type IX - psi 25, 2 inches
Insulation for 2' to 4' Perimeter: EPS Type IX - psi 25, 2 inches
Insulation Quality: OK
Calculated R-Value: 8.4

Below Grade Floor Center: Level 1 slab on grade
Temperature: Living Space

Gross Area, Sq. Ft.: 5,209.5
6625.5
-1416
Distance to Grade: On Grade
Center Insulation: None
Insulation Quality: OK
Calculated R-Value: 35.5

Walls - Total Area 12,401.4 sq. ft.

Above Grade Wall: Exterior walls
Temperature: Living Space
Gross Area, Sq. Ft.: 11,380
Lvl 1: (18+7.5+77+7.5+18+33+1.5+31.5+111.5+64.5)*10
Lvl 2: (18+7.5+77+7.5+18+33+1.5+30.5+111.5+7+8+1+63.5)*10
Lvl 3: (18+7.5+77+7.5+18+33+1.5+30.5+111.5+7+8+1+63.5)*10
Wall Type: Single Stud
Siding Configuration: Siding and Sheathing
Insul. Sheathing: None
Structural Wall: 2 x 6, 16 inches on center
R-21 Batt:FG or RW, 5.5 inches
Window and door headers are insulated: Yes
Insulation Quality: OK
Calculated R-Value: 18.2

Above Grade Wall: Rim joist between 1/2 and 2/3
Temperature: Living Space
Gross Area, Sq. Ft.: 1,021.4
Lvl 2: (18+7.5+77+7.5+18+33+1.5+30.5+111.5+7+8+1+63.5)*1.33
Lvl 3: (18+7.5+77+7.5+18+33+1.5+30.5+111.5+7+8+1+63.5)*1.33
Wall Type: Single Stud
Siding Configuration: Siding and Sheathing
Insul. Sheathing: None
Structural Wall: 16"TJI, 16 inches on center
Phenolic Foam:closed cell, 3 inches
Window and door headers are insulated: No
Insulation Quality: OK
Calculated R-Value: 25.6

Doors - Total Area 60 sq. ft.

Exterior Door: Metal doors west facing
Temperature: Living Space
Gross Area, Sq. Ft.: 60
40+20
Door Type: Entrance, Metal, fiberglass core; metal edge
Storm Door: None
Calculated R-Value: 1.7

Windows - Total Area 1,772.9 sq. ft.

Window: South facing vinyl windows
Temperature: Living Space
Gross Area, Sq. Ft.: 297
B: 6*6*5.5
C: 6*3*5.5
Orientation: South
External Shading: Moderate

Glass: Double, Low-E
Certified U-Value: 0.30
Certified SHGC: 0.300
Solar Heat Gain Coefficient including Window Coverings: 0.23

Window: South facing aluminum commercial glass
Temperature: Living Space
Gross Area, Sq. Ft.: 208.3
SF2: 10.16*8
CW1: 10.16*12.5
Orientation: South
External Shading: Moderate
Glass: Double, glass
Frame: Aluminum w/ Thermal Break
Spacing Between Layers: Half Inch
Gas Fill Type: Air
Calculated U-Value: 0.62
Solar Heat Gain Coefficient including Window Coverings: 0.46

Window: West facing vinyl windows
Temperature: Living Space
Gross Area, Sq. Ft.: 185.6
A: 3*8.25*5.5
C: 3*3*5.5
Orientation: Not South
External Shading: Moderate
Glass: Double, Low-E
Certified U-Value: 0.30
Certified SHGC: 0.300
Solar Heat Gain Coefficient including Window Coverings: 0.23

Window: East facing vinyl windows
Temperature: Living Space
Gross Area, Sq. Ft.: 185.6
A: 3*8.25*5.5
C: 3*3*5.5
Orientation: Not South
External Shading: Moderate
Glass: Double, Low-E
Certified U-Value: 0.30
Certified SHGC: 0.300
Solar Heat Gain Coefficient including Window Coverings: 0.23

Window: East facing aluminum commercial glass
Temperature: Living Space
Gross Area, Sq. Ft.: 178.6
CW2: 8*22.33
Orientation: Not South
External Shading: Moderate
Glass: Double, glass
Frame: Aluminum w/ Thermal Break
Spacing Between Layers: Half Inch
Gas Fill Type: Air
Calculated U-Value: 0.62
Solar Heat Gain Coefficient including Window Coverings: 0.46

Window: North facing vinyl windows
Temperature: Living Space

Gross Area, Sq. Ft.: 717.8
A: 8.25*5.5*6
B: 6*5.5*9
C: 3*5.5*9
Orientation: Not South
External Shading: Moderate
Glass: Double, Low-E
Certified U-Value: 0.30
Certified SHGC: 0.300
Solar Heat Gain Coefficient including Window Coverings: 0.23

Ceilings - Total Area 6,626 sq. ft.

Cathedral Ceiling: Ceiling
Temperature: Living Space
Gross Area, Sq. Ft.: 6,626
Framing Type: Standard
Framing Spacing: 24 inches
Insulated Sheathing: None
Bottom Insulation Layer: EPS Type XIV - psi 40, 8.75 inches
Top Insulation Layer: None
Insulation Quality: OK
Calculated R-Value: 38

Design Heat Loss
Outdoor Temperature at Heating Design Conditions Option: Use Library Value
Outdoor Temperature at Heating Design Conditions Value (deg F): -13.9
Airport Wind Speed at Heating Design Conditions Option: Use Library Value
Airport Wind Speed at Heating Design Conditions Value (mph): 3.2
Mechanical Ventilation Flow Rate Option: Ventilation Max Capacity
Mechanical Ventilation Flow Rate Value (cfm): 329.9
Main Home Heating System Distribution Efficiency Option: From Primary Heating System
Main Home Heating System Distribution Efficiency Value (%): 100.0
DHW Load is Served by Primary Heating System: Yes
DHW Storage Tank Size (gallons): 240
Garage Load is Served by Primary Heating System: No
Garage Temperature (deg F): 55.0
House/Garage Uninsulated Common Area (sq feet): 0.0
Mechanical Ventilation Rate for Garage (cfm): 0.0
Garage Heating System Distribution Eff (%): 100.0

AkWarm Version Info
Application: AkWarm, Version 2.11.0.0
Calculation Engine: 2.11.0.0
Energy Library: 9/27/2022

Filename: C:\Users\Parker\Documents\AkWarm\Spark Design, LLC\Brewsters.hm2
Report Date: 2/6/2023